

Pedestrian Feasibility Studies

City of Port Orange Sidewalk Gaps Feasibility Study



LTG Job No.: 3903.07

Prepared For:



Prepared By:



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Ormond Beach, Florida

Revised March 2017

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1. EXECUTIVE SUMMARY

The River to Sea Transportation Planning Organization (R2CTPO) provides support to its member communities by conducting bicycle and pedestrian feasibility studies for projects with applications for funding through the priority project selection process. The City of Port Orange has submitted an application for a Sidewalk Feasibility Study to include five separate roadway segments (R2CTPO SCHL-2016-036). The original application is included as Appendix A.

The purpose of this study is to assess the feasibility for newly constructed sidewalk along five urban roadways within the City of Port Orange. The specific segments have been selected by City Staff as high-priority due to location, existing pedestrian patterns, to enhance safety and ultimately address the existing sidewalk gap issue within the existing pedestrian network. Those segments selected are identified below. For the site-specific study area, please refer to the **INTRODUCTION** section of the report.

- A. Taylor Branch Road
- B. Clyde Morris Boulevard
- C. Ravenwood Drive
- D. Woodlake Drive
- E. Herbert Street

A site visit was conducted along each study area segment on Thursday, October 13, 2016 which included the City of Port Orange, the R2CTPO, and Lassiter Transportation Group, Inc. (LTG) staff. The site visit consisted of driving and walking segments to evaluate potential constraints within the apparent right-of-way. To aid in identifying the apparent right-of-way, the following items were reviewed prior to the site visit: Volusia County property appraiser's website, As-builts drawings provided by the City of Port Orange, Volusia County Geographical Information Systems (GIS) files, and aerial maps. Right-of-way material is included as Appendix B. Based on the information contained in these documents, previous studies, and field review, the following bullet points summarize the results of this sidewalk feasibility study.

- All study area segments are located within urbanized areas.
- The minimum amount of right-of-way amongst the combined locations is 50 ft. along Woodlake Drive.
- The primary proposed sidewalk width is 5 ft.; however, 6 ft. and 8 ft. wide sidewalk sections are also identified to either meet design standards, or as requested by City Staff.
- The proposed sidewalks will connect to the existing sidewalks and provide improved connectivity to the surrounding community. Crosswalk pavement markings, detectable warnings and stop bar modifications are used to enhance pedestrian safety at intersections within the study area.
- All the proposed sidewalk alignments are to be placed as close to the apparent right-of-way line as possible, ideally with a minimum of 3 ft. offset for utilities and clearance.

- All existing curb ramps within the study area are to be reconstructed to meet current ADA standards.
- Right-of-way or easements for sidewalk are required along Taylor Branch Road and Clyde Morris Boulevard for a combined maximum area of 3,672 square-foot. The right-of-way cost included in the engineers probable cost estimate has been calculated from just property values obtained from the Volusia County Property Appraisers website. Please refer to the Engineers Estimate of Probable Cost section of the report for further detail. Special right-of-way acquisition standards are in place for right-of-way along County maintained roadways. Contact Volusia County prior to any acquisition along county roadways.
- Numerous utility adjustments will be required to accommodate the proposed alignments. It is assumed that all utilities are located within the right-of-way with agency approval. An estimated cost of \$5,000.00 has been included for any utility adjustment.
- Where feasible, the proposed sidewalk follows the existing roadway grades and alignment.
- Due to proposed crosswalk locations, the two-way stop controlled intersection at Ravenwood Drive and Woodlake Drive is to be modified to an all-way stop controlled intersection. Relocation of the existing eastbound stop bar along Ravenwood Drive will also be required.

The results of this Sidewalk Gap Feasibility Study for the varied sidewalk widths and alignments recommended for each study area location estimates the probable cost for the gaps studied to be \$531,000. The proposed sidewalks will enhance pedestrian connectivity to the surrounding community, improve safety by use of sidewalk spacing, crosswalks and sidewalk alignments, and ultimately address the existing gap issue in the overall sidewalk network. By the year 2020, the estimated construction cost for those recommended improvements is expected to increase to \$575,200. Other than possible difficulties in acquiring the necessary right-of-way or easements identified in the study, no physical barriers or impediments were identified that would make construction of the sidewalk gaps not possible. Therefore, construction is considered feasible assuming funding becomes available.

2. INTRODUCTION

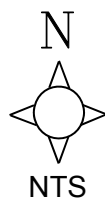
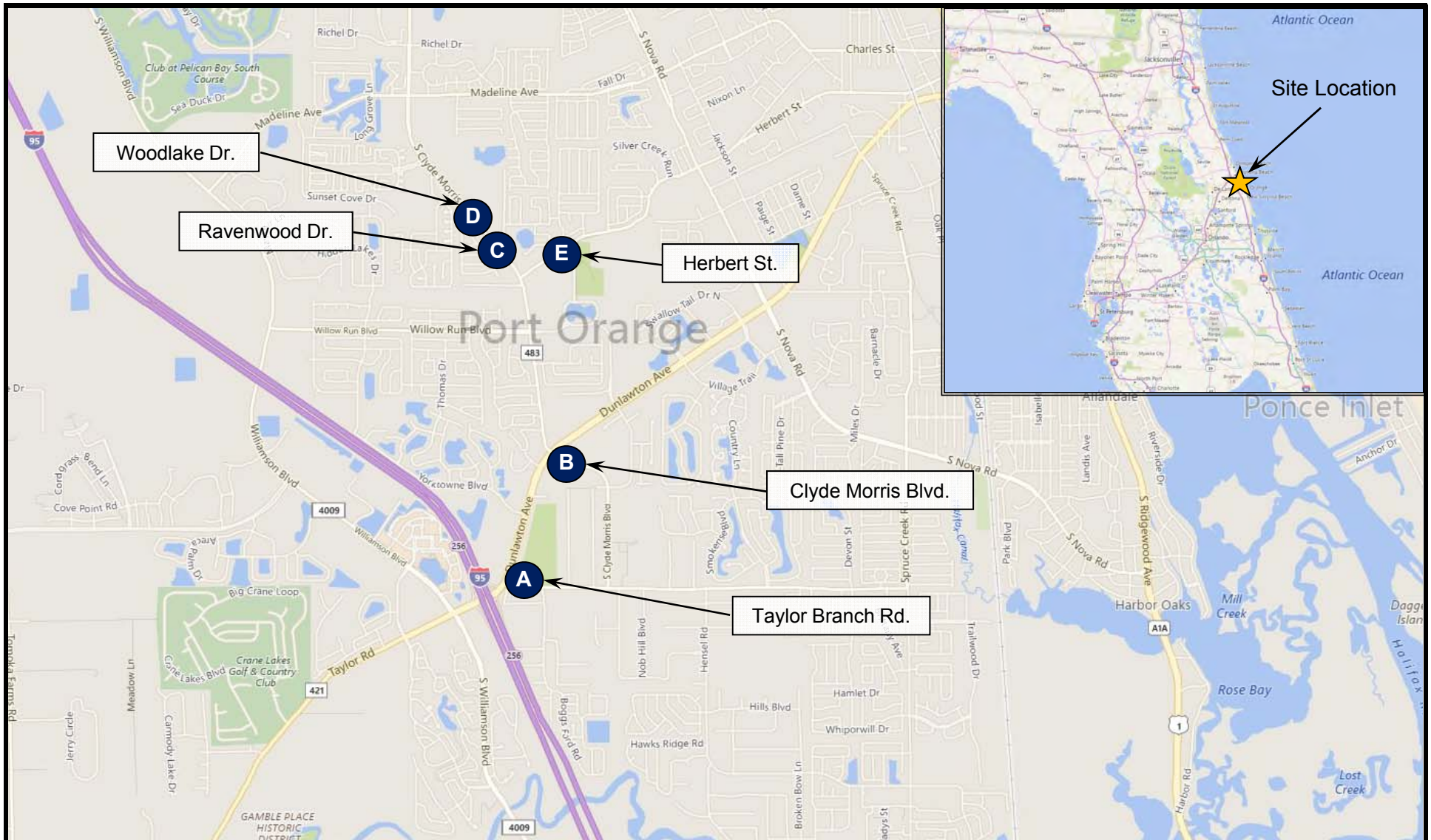
Lassiter Transportation Group, Inc. (LTG) has been retained by the River to Sea Transportation Planning Organization (R2CTPO) to prepare a sidewalk feasibility study along five (5) separate segments located within the City of Port Orange. The City of Port Orange submitted an application to the FDOT requesting a feasibility study in March 21 of 2016. This sidewalk safety and connectivity project includes the construction of new sidewalks to fill gaps within the existing pedestrian network. The roadway segments that have been selected by the City to be included in the sidewalk feasibility study are as follows:

- A. Taylor Branch Road (from Dunlawton Avenue to 150 ft. east of Journey's End Drive)
- B. Clyde Morris Boulevard (from Dunlawton Avenue to Walgreens/Pines Plaza Service Road)
- C. Ravenwood Drive (from Clyde Morris Boulevard to Woodlake Drive)
- D. Woodlake Drive (from Clyde Morris Boulevard to Existing Sidewalk)
- E. Herbert Street (from City Center Drive to Gulfstream Village driveway)

All the study area segments are within proximity to community assets and serve as direct access to such establishments. Community developments within 1-mile of the study area locations include the following:

- U.S. Social Security Administration
- Sweetwater Elementary School
- Port Orange Urgent Care
- City Center Sports Complex
- Silver Sands Middle School
- Community Learning Center East
- Port Orange City Center
- Port Orange Branch Library
- Port Orange YMCA

This report summarizes LTG's investigation into the physical feasibility for sidewalk construction, recommendations for improvement and an estimated cost for such improvements, as requested by the City of Port Orange. Figure 1 shows the general location of each study area segment in relation to the surrounding network.



Sidewalk Feasibility Study City of Port Orange, FL Site Location Map

Project No.: 3903.07

Figure: 1



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The following information outlines the supporting statements for sidewalk connectivity in the City's Comprehensive Plan and Code of Ordinances:

Chapter 2, Transportation Mobility Element - Sidewalks

The City places great emphasis on pedestrian systems and requires the construction of sidewalks on both sides of the streets upon development of a subdivision or site. – *City of Port Orange Comprehensive Plan, 2010 – 2025, pg. 2-30*

Where gaps or substandard sidewalks in the network exist, the City will continue to prioritize its investments to benefit the greatest number of users and increase safety. Sidewalk facilities may also be provided in conjunction with development or redevelopment of property, as part of community improvement projects, and as part of new capital improvement projects – *City of Port Orange Comprehensive Plan, 2010 – 2025, pg. 2-30*

Sec. 14-317: Pavement Surfaces: All sidewalk and road pavement surfaces shall be maintained to be free of cracks, potholes and other defects posing a hazard to pedestrian and vehicle safety, and shall be patched, seal coated or resurfaced as required to maintain the structural integrity of the pavement base and surface. Vegetation shall be trimmed to provide sign visibility per the MUTCD – *City of Port Orange Code of Ordinances, 2016*

3. PURPOSE AND OBJECTIVES

The purpose of this project is to conduct a site-specific study that will assess the feasibility of sidewalk improvements and construction along five (5) roadway segments within the City of Port Orange. The total length of sidewalk gaps along each segment within the study area is approximately 0.57 miles, or 3,000 ft., in length. The purpose and objectives identified for each site location are summarized below:

- A. Taylor Branch Road** - The proposed 6 ft. sidewalk is located along the west side of Taylor Road and extends approximately 330 ft. from Dunlawton Avenue across Journey's End Drive. The sidewalk segment connects to an existing sidewalk in the southwest quadrant at the intersection of Dunlawton Avenue and terminates at an existing 8 ft. wide sidewalk/bicycle path east of Journey's End Drive. A newly constructed sidewalk at this location will address the existing sidewalk gap issue between a nearby hotel and residential community, and a newly developed shopping plaza. The segment of Taylor Branch Road is within county owned right-of-way, county standards will govern final design. The improvement will enhance pedestrian safety and overall connectivity to the surrounding community.
- B. Clyde Morris Boulevard** - The proposed 5 ft. and 6 ft. sidewalks are located along the west side of Clyde Morris Boulevard and extend approximately 350 ft. from Dunlawton Avenue to the Walgreens/Pine Plaza Service Road. The proposed sidewalk segment at this location connects to an existing sidewalk in the southwest quadrant at the intersection of Dunlawton Avenue. The southern boundary of the sidewalk will provide access to the Service Road and an existing Votran bus stop (located directly in front of the U.S. Social Security Administration). This segment of Clyde Morris is within County

owned right-of-way, county standards will govern final design. A newly constructed sidewalk along this segment will address the sidewalk gap issue, improve pedestrian safety, and enhance connectivity to the surrounding community.

- C. Ravenwood Drive** – A 5 ft. sidewalk is proposed along both sides of Ravenwood Drive (north and south), with each extending approximately 315 ft. from Clyde Morris Boulevard to Woodlake Drive. The eastern sidewalk boundary connects to existing sidewalk along the west side of Clyde Morris Boulevard. The western boundary of the sidewalk will extend across Woodlake Drive and connect to existing sidewalks, west of the two-way stop intersection. Ravenwood Drive is one of two access points provided for the single-family subdivision located at the western side of the segment, with approximately 95 lots. The proposed sidewalk connection will provide access to the residential neighborhood and immediate businesses/services along Clyde Morris Boulevard, and will ultimately enhance the sidewalk connectivity and safety in this area.
- D. Woodlake Drive** – A 5 ft. sidewalk is proposed along both sides of Woodlake Drive (north and south) with each extending approximately 340 ft. from the existing sidewalks on Clyde Morris Boulevard to the existing sidewalks along Woodlake Drive. Woodlake Drive is one of two access points provided for a single-family subdivision with approximately 95 lots. The proposed sidewalk connection will provide access to the residential neighborhood and immediate businesses/services along Clyde Morris Boulevard. No pedestrian access from the subdivision to Clyde Morris Boulevard is provided at this time. The proposed sidewalk connection will address the sidewalk gap issue, improve pedestrian safety, and enhance connectivity.
- E. Herbert Street** - The proposed 5 ft. sidewalk is located along the south side of Herbert Street and extends approximately 800 ft. from City Center Drive to the Gulfstream Village driveway. This proposed sidewalk segment will provide access to the existing sidewalk network east of City Center Drive and west to Clyde Morris Boulevard to ultimately enhance pedestrian connectivity to the City Center Sports Complex and the Silver Sands Middle School. A newly constructed sidewalk at this location will address the sidewalk gap issue, improve pedestrian safety, and enhance connectivity to the surrounding establishments.

This study evaluates existing conditions and proposes recommendations for construction of the desired sidewalks described at each location. Recommended conceptual alignments for segments are presented in this report. A cost estimate for the recommended alignment is included in this report with sufficient detail supporting the estimate provided in Section 8. The cost estimate is provided to assist the R2CTPO and the City of Port Orange in the budgeting and planning of this project. For the purposes of data collection, concept development, corridor evaluation, and cost estimation, field visits were conducted by LTG staff.

4. STUDY METHODOLOGY

The following tasks were completed per the project scope to provide an informed feasibility report in accordance with R2CTPO policies, procedures, and rules. In addition, the tasks will meet the procedures currently used by FDOT District 5 to evaluate transportation (SU funded), bicycle and pedestrian corridor projects.

- A project scope meeting was held with R2CTPO, The City of Port Orange, Volusia County, FDOT, and LTG staff on Thursday, July 26, 2016. The purpose of the meeting was to discuss the scope of the project and to obtain any relevant project information from the stakeholders.
- Data collection for the project consisted of obtaining copies of planning, land use, and engineering information, including the following:
 - a. Volusia County right-of-way maps and as-builts drawings from nearby developments
 - b. Volusia County Property Appraiser's parcel maps were downloaded to delineate the area right-of-way boundaries in order to check for consistency with as-builts and field observations. Fence locations, drainage structures and minimal utility information is also identified where applicable. The right-of-way boundaries shown on Figures 2A-2E are approximate. Locations that should be further investigated or could potentially require right-of-way purchase are also shown.
 - c. County of Volusia LiDAR
 - d. USGS Soil Maps and data show several different soil types within the study area.
 - e. Data also consisted of referencing readily available information from a variety of sources, including: The R2CTPO, The City of Port Orange, Volusia County, and FDOT.
- A site visit at each location was conducted on Thursday, October 13, 2016 and included The R2CTPO, The City of Port Orange, and LTG Staff. The meeting provided an opportunity for stakeholders to gain familiarity with the study area and to discuss site specific challenges that may affect feasibility. Photographs, measurements, and field notes were collected to document any potential obstructions/obstacles specific to each site location. Additional field visits were conducted by LTG staff to obtain additional information.
- Concept plans for each proposed sidewalk were developed based on the results of the three previous tasks and applicable design criteria. The concept plans are based on design criteria for pedestrian facilities contained in the FDOT Design Standards, Plans Preparation Manual, Manual on Uniform Minimum Standards for Design, Construction, and Maintenance (the Florida Greenbook), and the maintaining agency standards.

- An Engineer's Opinion of Probable Costs (EOPC) for construction was prepared based on the conceptual design to construct the sidewalk within the existing right-of-way limits where possible. The EOPC was prepared based on FDOT historical cost data.

5. EXSITING CONDITIONS

The existing conditions summary for each sidewalk gap location are provided, and include the adjacent roadway classification, site specific characteristics and nearby developments. Photographs along each roadway segment were taken during scheduled site visits to capture the existing conditions described below. Aerial graphics and photographs for each study area location are included on Figures 2A – 2E.

- A. Taylor Branch Road** – Taylor Branch Road is currently maintained by the City of Port Orange and provides connectivity to Interstate I-95 via Dunlawton Avenue, nearby shopping centers, restaurants and services, hotels, multiple residential neighborhoods, and Spruce Creek High School. The section of Taylor Branch Road within the study area (from Dunlawton Avenue to Yorktowne Boulevard) is classified as a two-lane divided, urban major collector with a posted speed limit of 30 miles per hour (mph).

From Dunlawton Avenue to Journey's End Drive, a typical section includes 12-ft. wide travel lanes, 4 ft. bike lanes in both directions, and a 15-ft. wide median. The roadway grades vary from approximately 7.7% (near Dunlawton Avenue) to 0.4% (near Journey's End Drive). An existing gas station with convenience store is located directly west of Taylor Branch Road and contains multiple vehicular access points. A continuous 8 ft. sidewalk/shared path is located on the east side of the roadway. Type-F and E curbing were identified through this section as well as Type-C curbside drainage inlets located at the Journey's End Drive intersection. An island landscaping buffer is present between the gas station and Taylor Branch Road, and includes low shrubs, two oak trees, and a concrete span wire pole within the right-of-way. The southern island buffer includes hedge landscaping offset approximately 9-ft. from the back of curb. The right-of-way along Taylor Branch Road varies along the segment from approximately 85-ft. to 54-ft.

A horizontal curve is present along Taylor Branch Road that begins directly north of the Journey's End Drive intersection. The roadway deflection is approximately 120 degrees, realigning the orientation from north-south to east-west. The horizontal curve appears to include normal crown design. The typical section of the roadway includes 12-ft. travel lanes and bi-directional median openings, with no designated bike lanes. A 4-ft. concrete traffic separator is also provided. An 8-ft. sidewalk is provided along the north side and east beyond the project limits on the south side of the roadway. The Type-F curbing, drainage structures and swales located directly adjacent to the eastbound travel lane indicate an urban drainage system is present along this section.

Overhead utilities run along the northern side of Journey's End Drive, cross over Taylor Branch Road and continue south along the eastern side of Taylor Branch Road.

- B. Clyde Morris Boulevard** – Clyde Morris Boulevard is a county-maintained roadway that provides connectivity to South Daytona, nearby shopping centers and services, multiple residential neighborhoods and medical facilities. The section of Clyde Morris Boulevard

within the study area (from Dunlawton Avenue to the Service Road) is classified as a four-lane undivided, urban major arterial with a posted speed limit of 40 mph.

The roadway typical section includes 12-ft. wide vehicular travel lanes and exclusive left and right-turn lanes. No designated bicycle lanes are provided; however, an existing 8-ft. sidewalk is directly adjacent to the back of curb along the northern side of Clyde Morris Boulevard. Additionally, an existing 8-ft. sidewalk is also located along the southern side of Clyde Morris Boulevard, and begins east of the Service Road intersection. The parcels directly adjacent to the roadway section are fully developed, however natural landscaping buffers currently provide varied width of separation. The roadway grade is primarily flat from Dunlawton Avenue to the Service Road directly east of the Walgreens Pharmacy. A horizontal curve in the roadway alignment begins at the Service Road intersection and appears to be a reverse crown design with a superelevation. The right-of-way throughout this section of Clyde Morris varies from 132-ft. near Dunlawton Avenue to 109-ft. east of the Service Road.

Type-F curb and gutter were identified for both directions of travel and indicate a closed drainage system is being utilized. Retention areas are also present, however appear to serve as storm water treatment areas for the adjacent parcels and not the roadway itself. Fiber optics and utility markers were recognized near the existing Mast Arm structure located in the southwest quadrant of the Dunlawton Avenue intersection. The exact location and alignment of the underground utilities could not be determined from the surface; however, it should be noted that coordination with utility owners will be required before improvements are constructed.

- C. Ravenwood Drive** – Ravenwood Drive is maintained by the City of Port Orange and provides primary access to a single-family residential neighborhood located west of Clyde Morris Boulevard. The section of Ravenwood Drive included in the study area (from Clyde Morris Boulevard to Woodlake Drive) also provides secondary access to the Ravenwood Square shopping center and the Sandcastle Learning Center located directly adjacent to Ravenwood Drive. Please note that both full access driveway turnouts include Type-D curbing that meets the back of gutter along Ravenwood Drive. The roadway is currently classified as a two-lane undivided, minor street collector with a posted speed limit of 25 mph and is approximately 350-ft. in length.

The roadway typical section includes 20-ft. vehicular travel lanes and no designated bicycle or pedestrian paths. Roadway grades along the segment are primarily flat and the alignment does not include horizontal or vertical curvature. Although the roadway is primarily flat, a positive change in slope is apparent between the edge of pavement and existing landscape buffer along the south side of the roadway (see Figure 2C, photos 6 & 7). Existing sidewalks are present along Clyde Morris Boulevard, and currently surround the neighborhood at the west end of the study area. The approximate right-of-way along Ravenwood Drive is 70-ft.

Closed drainage features are present along the study area segment that includes a shoulder gutter system along both travel directions and four drainage inlets located at each corner of the Woodlake Drive intersection. No retention areas were identified to serve this section of roadway. Overhead utilities/powerlines are present along the West side of Clyde Morris Boulevard, crossing Ravenwood Drive.

- D. Woodlake Drive** – Woodlake Drive is maintained by the City of Port Orange and provides primary access to a single-family residential neighborhood located west of Clyde Morris Boulevard, and adjacent to the Ravenwood Veterinary Clinic and a specialty retail/service shopping center. The section of Woodlake Drive included in the study area (from Clyde Morris Boulevard to approximately 340-ft. west) is currently classified as a two-lane undivided, minor street collector with a posted speed limit of 25 mph.

The roadway typical section includes 10-ft. vehicular travel lanes and no designated bicycle or pedestrian paths. Roadway grades along the segment are primarily flat. The roadway alignment includes two reverse horizontal curves within the study segment. Existing 5-ft. wide sidewalks are located along Clyde Morris Boulevard. Existing sidewalks, approximately 340-ft. west of Clyde Morris Boulevard, are 4-ft. wide and are damaged due to settlement. The northern sidewalk terminates at an existing fire hydrant. The apparent right-of-way through this section of Woodlake Drive is 50-ft.

Closed drainage features are present along the study area segment that includes a Miami gutter system along both travel directions. No retention areas were identified to serve this section of roadway. Please note that both full access driveway turnouts include Type-D curbing that meets the back of gutter along Woodlake Drive. Over-head utilities/powerlines are present along the west side of Clyde Morris Boulevard, crossing Woodlake Drive. The utility lines continue along the north side of Woodlake Drive for approximately 175-ft.

Employee parking for Ravenwood Veterinary Clinic was observed along the southern side of Woodlake Drive. However, an increase in the existing parking capacity is currently underway. It is assumed that the parking expansion will be completed prior to new sidewalk construction.

- E. Herbert Street** – Herbert Street is maintained by the City of Port Orange and provides primary access to multiple single-family residential areas, City Center Sports Complex, Silver Sands Middle School, Community Learning Center, and nearby commercial establishments located at the Clyde Morris Boulevard intersection. The section of Herbert Street included in the study area (from approximately 830-ft. east of Clyde Morris Boulevard to City Center Drive) is currently classified as a two-lane undivided, minor street collector with a posted speed limit of 30 mph.

The roadway typical section includes 11-ft. vehicular travel lanes, a concrete designated bicycle lane along the south side of Herbert Street that varies in width, and a 5-ft. sidewalk along the northern side of the roadway. An existing 8-ft. sidewalk is also present along the east side of City Center Drive and continues east along Herbert Street. Roadway grades along the segment includes gentle vertical curves that transition to flat sections along the length of the roadway. The roadway does not include any horizontal curves within the study area. Open drainage features are primarily present along the study area that consist of roadside swales/ditches that run parallel to the roadway on the south side. A dysfunctional mitered end section is currently located in the southwest corner of the City Center Drive two-way stop-controlled intersection. The change in grade between the edge of roadway pavement and the MES opening creates a safety

hazard for pedestrians and bicyclists. The approximate right-of-way through this section of Herbert Street varies from 100-ft. to 65-ft.

Overhead utility/power lines run along the northern side of Herbert Street for the length of the study area. Gas pipes are located on the south side of the roadway, near the City Center Drive intersection, and are directly adjacent to a private, residential property. The property boundary is surrounded by a chain-link fence that runs along Herbert Street for approximately 385-ft. A significant grade change is present between the edge of the eastbound travel lane and the private property boundary. The distance between the edge of pavement and the chain-link fence varies from 18.25-ft. to 17-ft. and includes a 6- ft. to 5-ft. flat section directly adjacent to the private property boundary. The average side slope of the ditch/drop-off, at the steepest point, is approximately 1:2.5. West of Brandy Hills Drive, the terrain along the southern side of Herbert Street levels out to match the grade of the roadway. However, patches of thick natural landscape begin to encroach on the right-of-way width. Three driveway turnouts are located on the southern side of the study area and provide access to industrial/commercial developments.

The U.S. Department of Agriculture's (USDA) Web Soil Survey and Volusia County Kiosk Map were used to approximate the soil quality conditions at each study area location. The most prominent soil qualities identified at each study area location are summarized below. Appendix B provides the existing soil classification maps and a description of the soil properties for each location.

Taylor Branch Road: Tavares Fine Sand with 0 to 5 percent slopes, and Smyrna-Smyrna, wet, fine sand with 0 to 2 percent slopes. Tavares Fine Sand can be described as deep, moderately well drained soils typically located on hills/ridges. Smyrna series classifications consist of very deep, poor to very poorly drained soil with rapid to moderately rapid permeability.

Clyde Morris Boulevard: Satellite Sand with 0 to 2 percent slopes, and Immokalee Sand. Satellite sand consists of nearly level, fairly poorly drained soils that occur in south and central Florida. Immokalee sand can be described as very poorly drained soil that is very acidic in nature.

Ravenwood Drive & Woodlake Drive: Daytona Sand with 0 to 5 percent slopes. Daytona sand consists of moderately well drained, sandy soil with a permeability rate of greater than 20 inches per hour.

Herbert Street: Paola Fine Sand with 0 to 8 percent slopes, Cassia Fine Sand, and Daytona Sand with 0 to 5 percent slopes. Paola consists of deep, excessively drained, very rapidly permeable soils that are highly acidic. Cassia Fine Sand consists of moderately poorly drained, moderately rapid permeable soils located on low ridges/knolls. The Daytona Sand is described above, however is the least prominent soil type at this location.



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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD	COUNTY	PROJECT ID		
					TAYLOR RD.	VOLUSIA	SCHL-2015-056		



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION		
ROAD	COUNTY	PROJECT ID
-	VOLUSIA	SCHL-2016-036

CITY OF PORT ORANGE - SIDEWALK FEASIBILITY STUDY
 FIGURE 2B
CLYDE MORRIS BOULEVARD

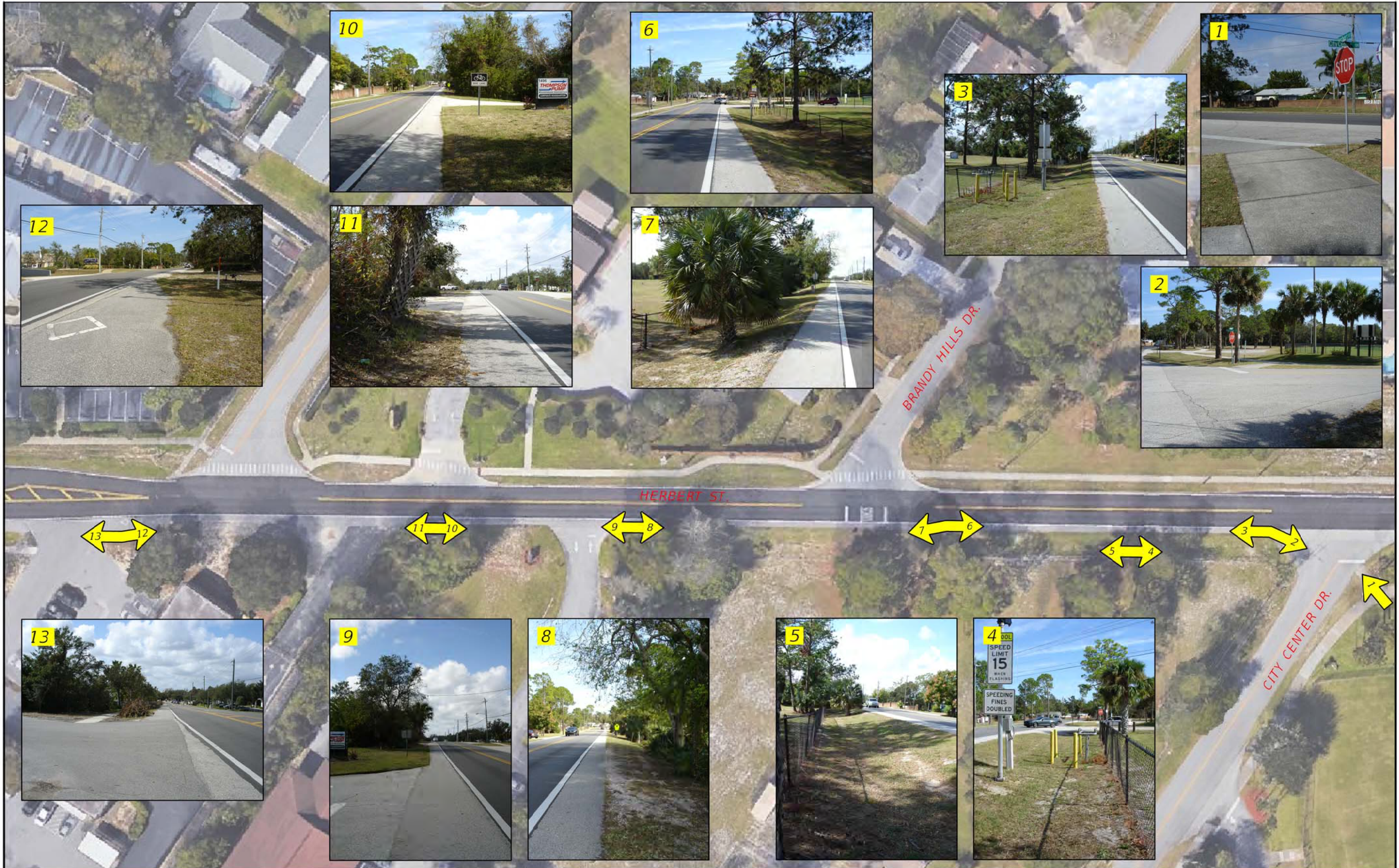
SHEET NO.
13



REVISIONS				Lassiter Transportation Group, Inc. Engineering and Planning MARK NEIMAN P.E. No. 44077 1450 W. GRANADA BOULEVARD SUITE 2 ORMOND BEACH, FLORIDA 32174 PH: 386.257.2571 FAX: 386.257.6996 CDE NO. 9227	RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION			CITY OF PORT ORANGE - SIDEWALK FEASIBILITY STUDY FIGURE 2C RAVENWOOD DRIVE	SHEET NO. 14
DATE					ROAD	COUNTY	PROJECT ID		
						VOLUSIA	SCHL-2016-036		



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DATE					ROAD	COUNTY	PROJECT ID		
						VOLUSIA	SCHL-2016-036		



REVISIONS				Lassiter Transportation Group, Inc. Engineering and Planning MARK NEIMAN P.E. No. 44077 1450 W. GRANADA BOULEVARD SUITE 2 ORMOND BEACH, FLORIDA 32174 PH: 386.257.2571 FAX: 386.257.6996 CDE NO. 9227	RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION		CITY OF PORT ORANGE - SIDEWALK FEASIBILITY STUDY FIGURE 2E HERBERT STREET	SHEET NO. 16
DATE					ROAD	COUNTY		
						VOLUSIA		
						PROJECT ID	SCHL-2016-036	

6. DESIGN CRITERIA

The concept plan included within this report was developed based on design criteria set forth and adopted by FDOT and the City of Port Orange. The following publications were used to prepare the concept design and cost estimates:

- Design Standards (FDOT)
- Florida Greenbook (FDOT)
- Manual on Uniform Traffic Control Devices (MUTCD)
- Volusia County Land Development Code
- City of Port Orange Land Development Code
- Standard Specifications for Road and Bridge Construction (FDOT)
- Basis of Estimates (FDOT)

The following specific criteria should be used in development of the final construction plans:

The Florida Greenbook, which governs design of the non-state roadway system, recommends that pedestrian pathways be placed as far from the roadway as possible, in the following sequence of desirability:

1. Outside of the right-of-way in a separately dedicated corridor adjacent to the right-of-way
2. At or near the right-of-way
3. Outside of the minimum required clear zone
4. As far from the edge of the driving lane as practical

The Florida Greenbook criteria were selected as appropriate for design of the sidewalk at each study area location. It is recommended that the proposed alignment be placed as close as possible to the right-of-way limits where practical. Due to the proposed 8-ft. width of sidewalk section along Taylor Branch Road, a recommended horizontal clearance of 3-ft. from fences or other lateral obstructions was applicable. These criteria would primarily apply to the back of the proposed path at the Taylor Branch Road location.

The Florida Greenbook recommends that sidewalks be transitioned toward the roadway at intersections to establish a more functional crossing location that also meets driver expectations for stop line and crosswalk location. The concept plan has been developed so that the proposed sidewalk intersects existing streets, driveways, and sidewalks at approximate right angles to cross in parallel movements to the adjacent roadway where applicable. Sidewalk re-alignments, crosswalk implications and/or stop bar adjustments may be used to fine-tune existing skews in alignment.

Accessibility, Slopes, and Grades

Curb ramps, maximum slopes, minimum widths, clear zones, and design treatments for the visually impaired, such as truncated domes, are design features that result in part from the Americans with Disabilities Act (ADA). These design features must be accounted for when designing new pedestrian facilities and retrofitting existing facilities. The following list of design criteria should be considered when preparing the final construction plans for the project.

1. The Florida Greenbook states that curb ramps meeting the requirements of ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction shall be constructed at crosswalks at all intersections where curbs and sidewalks are constructed to give persons with disabilities safe access.
2. In general, proper design of pedestrian crossings shall consider the following:
 - a. Crossings should be placed at locations with ample sight distances.
 - b. At crossings, the roadway should be free from changes in alignment or cross section.
 - c. The entire length of the crosswalk shall be visible to drivers at a sufficient distance to allow a stopping maneuver.
 - d. STOP lines shall be provided adjacent to all signalized crosswalks to inform drivers of the proper location to stop. The STOP line should be separated from the crosswalk and should not be closer than 4-ft.
 - e. All crosswalks shall be easily identified and clearly delineated, in accordance with MUTCD (Rule 14-15.010).
3. The most important design consideration for persons with disabilities are curb ramps. Therefore, new and retrofitted streets with sidewalks should have curb ramps installed at all delineated crossings, and it is desirable to provide separate ramps for each crosswalk at intersections with perpendicular approaches. Two curb cuts at each corner with a curb separating each ramp provides a greater amount of information to visually impaired pedestrians in street crossing designs.
4. Crossings shall also meet the same grade and cross slope requirements as sidewalks where the longitudinal grade should not exceed 5% and the maximum cross slope shall be no more than 2%.
5. Marked crosswalks on an uncontrolled leg of an intersection or midblock shall be supplemented with other treatments (including beacons, curb extensions, raised medians, raised traffic islands, or enhanced overhead lighting) when any of the following conditions exist: 1) Where posted speeds are greater than 40 mph, 2) Inadequate stopping sight distance exists, such as on hills or curves, 3) Block length is shorter than 600-ft and high pedestrian volumes exist, and 4) Multiple conflict points that demand driver attention away from the crosswalk. Based on those four requirements, this criteria is not currently applicable to this project.

7. CONCEPT PLAN DEVELOPMENT

Per the City of Port Orange's project funding application for this project, the sidewalk concepts are to address sidewalk gaps at five locations chosen by City Staff. The conceptual sidewalk designs include 5-ft., 6-ft., and 8-ft. sidewalk widths and specific modifications per location. The proposed sidewalk alignments at each location are summarized below. The concept plans are provided in Figures 3A-3E. The right-of-way data for each study area location is in Appendix C.

- A. Taylor Branch Road** - On the western boundary of Taylor Branch Road, at Dunlawton Avenue, the proposed sidewalk intersects an existing sidewalk in the southwest quadrant. The landing area at the base of the curb ramp at this location is to be reconstructed. The sidewalk alignment continues south, along the west side of Taylor Branch Road. The 6-ft. sidewalk is to be placed along the back of the existing curb and extends approximately 65-ft. until reaching the first gas station driveway. The sidewalk continues through the landscaped median island beyond the driveway and requires the relocation/removal of an existing oak tree. There is an existing concrete strain pole and span wire located in the landscaped island that is to remain. Crosswalk pavement markings are recommended across the southern gas station driveway due to the extended width. The 6-ft. sidewalk alignment terminates at the north side of Journey's End Drive. Reconstruction of the curb ramps at the Journey's End Drive intersection is recommended to address ADA compliancy concerns in regards to slope and access. Detectable warnings are to be included at each approach. It has been assumed that the nearby drainage structures will not require modification.

Due to existing change in grade through the crosswalk, it is recommended that the turnout be reconstructed/reworked to match current ADA standards. The improvement includes saw cutting and removal of the existing pavement, construction of base material and superpave asphaltic concrete as needed for approximately 38 square-yards of roadway. It is understood that other methods may be available to the design engineer, but the method proposed is included in the cost estimate.

South-east of Journey's End Drive, three separate alternatives have been developed to provide flexibility for the final design. Based on discussions with the City, the property owner directly adjacent to Taylor Road has verbally committed to donating 12-ft. of right-of-way as a sidewalk and utility easement resulting in 1,632 square feet of right-of-way. Two of the three alternatives require additional right-of-way. Each alternative is summarized below:

Alternative #1 – The proposed 8-ft. sidewalk aligns perpendicular to the back of the proposed curb ramp at the southern sidewalk approach to the Journey's End Drive intersection. crossing the existing drainage ditch, the sidewalk alignment bends to run parallel to Taylor Road, and ultimately ties into the 8-ft. existing sidewalk. Even with the donated easement, approximately 952 square-foot of right-of-way is required to complete the proposed alignment. The improvement for this alignment also includes fill of the existing drainage ditch, two mitered-end sections, and approximately 15-ft. of 18" pipe. It should be noted that modifying the existing storm water system will require an assessment of impacts to storage volume, compensating storage, and a St. John's River Water Management District (SJRWMD) permit.

Alternative #2 - The proposed 8-ft. sidewalk alignment follows the existing road alignment, south of Journey's End Drive, and is located at the back of the existing curb for approximately 48-ft. Three single-post signs are to be relocated to the back of the proposed sidewalk. The alignment shifts south to avoid an existing damaged endwall. It is recommended that both endwalls be removed and replaced with an 18" pipe and mitered end sections. Approximately 495 square-foot of right-of-way is required for the proposed alignment. Due to the existing driveway access, the Alternative 2 improvement is not expected to negatively impact the existing stormwater storage. Therefore, no permit is anticipated.

Alternative #3 – Alternative 3 includes a proposed 6-ft. sidewalk alignment intended to follow the existing road alignment for approximately 130-ft., and is located at the back of the existing curb. Four single-post signs are to be relocated to the back of the sidewalk. The sidewalk crosses over an existing roadside flume and turns 90-degrees south for approximately 20-ft. A Type-4 curb inlet, and Type-J structure bottom is recommended to replace the existing flume structure. Removal of the endwalls, fill of the existing drainage ditch, two mitered-end sections, and approximately 75-ft. of pipe are also included in the recommendation. It should be noted that modifying the existing storm water system will require an assessment of impacts to storage volume, compensating storage, and a St. John's River Water Management District (SJRWMD) permit.

Additionally, due to existing tripping hazards and irregular sidewalk connection identified along the existing 8-ft. sidewalk, 10-ft. of the sidewalk will be removed and replaced as part of the final improvement. The apparent right-of-way through this section of the alignment suggests that right-of-way mitigation will be required. To preserve the existing natural landscaping, selective clearing and grubbing, from Station 15+00 to Station 15+30, is recommended. As such, construction standards regarding tree growth near sidewalks has been adopted by the City and should be implemented. Special precautions should be considered to address future root expansion where applicable.

Recommendation - Based on the drainage concerns identified for Alternatives 1 and 3, Alternative 2 is considered the most feasible option and is recommended for final design.

- B. Clyde Morris Boulevard** – The proposed 5-ft. sidewalk intersects an existing sidewalk in the southwest quadrant of the Dunlawton Avenue intersection and extends to Station 22+80. It is understood that a northbound right-turn lane along Dunlawton Avenue is currently under investigation as a potential intersection improvement. Such an improvement would alter the existing turn radii in the southwest quadrant of the intersection. Therefore, the front side of the sidewalk shall be offset 2-ft. from the back of the existing Mast Arm structure and align with the existing landing area provided for the curb ramps. Signal pull boxes, fiber optics, pedestrian signals and utilities were also identified within the immediate vicinity of the proposed sidewalk connection. The pull box located within the proposed sidewalk alignment shall be adjusted to the appropriate elevation so that the top of the pull box is level with the sidewalk surface.

The alignment continues east along Clyde Morris Boulevard and is to be offset at least 3-ft. from the apparent right-of-way line. A nearby utility pole and single-post street sign shall be avoided. The proposed 5-ft. sidewalk terminates at Station 21+20 as it

meanders around the existing utility pole and positioned along the back of the curb. A 6-ft. sidewalk is proposed for the remaining section of sidewalk until reaching the Service Road. Due to apparent right-of-way constraints along this section of the sidewalk, an 8-ft. wide sidewalk and utility easement is recommended. The 8-ft. right-of-way increase is also recommended to manage any potential grading concerns associated with the slope of the adjacent landscape buffer. An existing single-post speed limit sign and utility pole with guy wires are to be relocated within the easement. It should be noted that existing damage to the Type-D curb along the Service Road access turnout has been identified. Based on the width of the roadway (Service Road) and the turn radii provided in the northwest quadrant of the intersection, vehicular impacts to the curb is the associated cause for the damage. Approximately 10-ft. of curb and gutter have been included as part of the overall improvement to the proposed curb ramp.

Due to existing cross slopes ($>2\%$) at the western side of the Service Road intersection, it is recommended that the turnout be reconstructed/reworked to match current ADA standards. It is anticipated that the existing pavement will be saw cut and removed. The area will then be graded to meet ADA cross slope and paved. The improvement includes base material and superpave asphaltic concrete for approximately 31 square-yards of roadway. It is understood that other methods may be available to the design engineer, but the method mentioned in this report is included in the cost estimate.

Crosswalk pavement markings and stop bar relocation at the Service Road intersection have been included to address the safety concerns associated with pedestrian awareness. Properly aligned detectable warnings shall be placed at each sidewalk approach. Additionally, the 5-ft. sidewalk located on the west side of the Service Road is to be reconstructed to reduce the existing skew in sidewalk alignment. Due to a grade drop between the back of the proposed sidewalk to the adjacent landscape buffer, handrails along the backside of the sidewalk at this location are suggested. Fill with a sod embankment should also be considered for settlement and stabilization of the sidewalk. The slight modification to the existing roadside ditch is not expected to negatively impact the existing drainage system. Therefore, no other improvements in that regard are proposed. The termination of the proposed sidewalk shall match the existing sidewalk (Station 24+55).

- C. Ravenwood Drive** – a 5-ft. sidewalk is proposed along the north and south sides of Ravenwood Drive, intersecting the existing sidewalk network along Clyde Morris Boulevard. The curb ramps at each approach of the Clyde Morris Boulevard intersection are to be replaced to address ADA compliancy issues identified in regards to curb ramp slopes and grade transitions. Detectable warnings shall be included in the curb ramp reconstruction, as well as curb and gutter reconstruction. The proposed sidewalk alignment shall begin at the back of the reconstructed curb ramp to avoid an uneven sidewalk transition. Existing utility pole and single-post stop sign relocations are anticipated to accommodate the proposed alignment. Both alignments mimic the roadway alignment and intersect at driveways of adjacent businesses. In accordance with the Florida Greenbook, a 4-ft. clearance should be provided between the back of curb and the front side of the proposed sidewalk.

The slope of the landscape buffer along the south side of Ravenwood, directly adjacent to the back of curb, is approximately 1:4 from Station 30+95 to Station 32+20. Due to

this grade change, from the back of curb to the edge of the right-of-way, a 4 ft. retaining wall is suggested along the back side of the proposed sidewalk. The northern sidewalk alignment through this section shall be placed as close to the right-of-way line as possible. The sidewalk alignment will also require the relocation of the existing stop bar at the Sandcastle Learning Center driveway.

The northern and southern alignments continue southwest along Ravenwood Drive and connect to existing sidewalks along the western side of Woodlake Drive. The alignments have been shifted to avoid existing drainage inlets located at each quadrant of the Woodlake Drive intersection, and to minimize pedestrian exposure to vehicular traffic. It is recommended that the two-way stop intersection be modified to operate as an all-way stop intersection to enhance pedestrian safety at the newly established crosswalks. Due to City policy, no crosswalk pavement markings shall be provided. The relocation of the existing eastbound stop bar on Ravenwood Drive, and newly placed stop bars along Woodlake Drive should be offset 4-ft. from the back of the crossing. Detectable warnings shall be placed at each sidewalk approach to the intersection.

The proposed sidewalk shall terminate on the west side of Woodlake Drive and match the existing 4-ft. sidewalk. The change in slope, between the edge of curb to the front side of the existing sidewalk, for the northwest and southwest quadrants are approximately 1:7 and 1:15, respectively. Special attention to the northwest sidewalk should be considered regarding the final running slope of the sidewalk surface. The existing sidewalk is recommended to be reconstructed to provide gradual change in slope, from the existing sidewalk elevation to the roadside elevation.

- D. Woodlake Drive** – A 5-ft. sidewalk is proposed along the north and south sides of Woodlake Drive, intersecting the existing 5-ft. sidewalk network along Clyde Morris Boulevard. The curb ramps at the Clyde Morris Boulevard intersection shall be reconstructed to comply with current ADA standards. Detectable warnings shall be included as part of the curb ramp replacement. The proposed alignments shall begin at the back of the reconstructed curb ramp for an even sidewalk transition. Existing utility poles located in the northwest quadrant are to be relocated to the edge of the right-of-way.

The northern sidewalk intersects the driveway of an adjacent business near Station 41+00. At Station 42+15 the alignment is redirected 25 degrees for approximately 40-ft. From here, the back of the sidewalk is offset from the apparent right-of-way line a minimum of 1-ft. and the alignment mimics the existing roadway curvature. The proposed sidewalk terminates at an existing 4-ft. sidewalk. Approximately 5-ft. of the existing sidewalk shall be replaced with new 5-ft. wide sidewalk. An existing fire hydrant shall be relocated to the front side of the sidewalk to accommodate the proposed alignment.

The back side of the southern proposed sidewalk shall be placed directly adjacent to the right-of-way line for the length of the sidewalk, and the proposed alignment mimics the existing roadway. The stop bar location and single-post stop sign shall be relocated just within the right-of-way to accommodate the alignment. The sidewalk continues west, following the existing roadway curvature, and terminates at an existing 4-ft. sidewalk.

Due to trip hazards and an uneven surface, approximately 8-ft. of existing 4-ft. sidewalk shall be replaced with new 5-ft. wide sidewalk.

- E. Herbert Street** – A 5-ft. wide sidewalk is proposed along the south side of Herbert Street and begins on the east side of an existing driveway (Station 51+30). As part of the overall sidewalk improvement, approximately 18.5-ft. of existing sidewalk (east of the existing driveway) shall be replaced to match current ADA standards. Furthermore, based on cross slope field measurements taken along the existing driveway (Station 50+80 – Station 51+30) reconstruction of the driveway turnout is required to bring the existing cross slope into compliance with ADA cross slope standards. The improvement includes base material and superpave asphaltic concrete for approximately 38 square-yards of roadway.

Due to existing fiber optic cables, drainage inlets, and survey land markers located at the back of right-of-way, the proposed sidewalk alignment is offset 3-ft. from the adjacent 4 ft. designated bicycle path. From the edge of the driveway, the alignment shifts approximately 18-degrees for 50-ft. From Station 51+80 to Station 55+60 the sidewalk alignment follows the existing roadway. Special details within this section of study area include grinding of existing concrete pavement along the 2nd commercial driveway and removal of two palm trees. The existing historical benchmark located at Sta. 53+40 shall be preserved. Additionally, cross slope field measurements taken along the 3rd existing commercial driveway (Station 54+30 – Station 54+70) suggest approximately 274 square-feet of the driveway turnout be reconstructed.

Due to the sloped roadside shoulder conditions, from the edge of the bicycle lane to the right-of-way, a gradual shift in sidewalk alignment from Station 55+60 to Station 57+20 is proposed. Handrails and gravity walls are provided for those sections of sidewalk exposed to the grade drop offs at the back of the sidewalk. The unpaved driveway near Station 56+60 is approximately 20-ft. wide and is recommended for reconstruction as part of the improvement. This section of the alignment is relatively flat and serves as a transition point between the adjacent sloped sidewalk sections. At Station 56+80, the sidewalk slope gradually decreases as the alignment transitions to 1-ft. from the back of the right-of-way to avoid grade drop. Once the sidewalk alignment reaches this point, the sidewalk slope is nearly flat and continues along the property boundary to Station 58+50. The existing pine tree located within the proposed sidewalk alignment shall be removed. Other landscaping in the immediate area shall be preserved where allowable to minimize the amount of clearing and grubbing.

From Station 58+60 to Station 59+00, the sidewalk alignment shifts 40-degrees north to avoid an existing school zone traffic signal, electrical box, and gas pipes surrounded by four concrete poles. The sidewalk extends approximately 30-ft. before returning to the back of the right-of-way line and intersects perpendicular to the west side of City Center Drive. The proposed sidewalk connection to City Center Drive shall be aligned to avoid the existing mitered end section located in the southwest quadrant of the intersection. The drainage structure is to be replaced with a Type-C inlet and reconstructed to match the existing roadway elevation. The inlet shall include a device to maintain flow through the system that provides minimal maintenance. Fill and sod were also included in the estimated improvement cost for the reconstruction.

An 8-ft. wide crosswalk is recommended at the City Center Drive intersection to delineate the pedestrian path. The stop bar location shall be a minimum of 4-ft. from the back of the crosswalk. Due to the skewed sidewalk alignment, from the east side of City Center Drive to the west side, it is recommended that the existing 8-ft. sidewalk in the southeast quadrant be realigned (see Figure 3E). The realignment will include the relocation of the single-post stop sign, the removal of the existing sidewalk connection, removal and replacement of the stop bar, and the removal of a nearby palm tree. Both sidewalk approaches to the City Center Drive intersection will include detectable warnings. The maximum allowable longitudinal slope of the sidewalk shall be 1:12 for all sections along the segment limited to 30 linear feet segments per ADA.

Pedestrian lighting fixtures were investigated for feasibility at each study area location. Each study area location in regards to existing and/or proposed lighting fixtures are summarized below:

Taylor Branch Road – The existing light fixtures at the Dunlawton Avenue and Taylor Branch Road intersection are expected to provide sufficient lighting for the existing crosswalks at the intersection. Existing lighting includes an intersection luminaire in the south-east corner of the intersection, and pedestrian lighting along the eastern sidewalk approach. The existing street-side lighting at the Journey's End Drive intersection is expected to provide sufficient lighting at the crosswalk connection. Therefore, no additional lighting fixtures are proposed at this location.

Clyde Morris Boulevard – The existing light fixtures in the north-east and north-west corners of the Dunlawton Avenue intersection currently provide lighting to the intersection and crosswalks. However, no existing lighting is present at the Service Road T-intersection. It is recommended that upon relocation of the existing utility pole and guy wires, that a street-side luminaire be attached to the fixture to provide sufficient lighting at the crosswalk.

Ravenwood Drive – Two existing light fixtures, located at the Clyde Morris Boulevard intersection and the south-west corner of the Woodlake Drive intersection, are expected to provide sufficient lighting at the crosswalk locations. No additional pedestrian lighting fixtures are recommended.

Woodlake Drive – Existing lighting along Clyde Morris Boulevard, located in the north-west quadrant, is expected to provide sufficient lighting for the existing crosswalk. Since the proposed sidewalk alignment is recommended to match the existing sidewalk, no further light fixtures are proposed along Woodlake Drive.

Based on discussions with the City, no further pedestrian lighting fixtures are required along sidewalks within residential neighborhoods.

Herbert Street – The existing over-head utilities along the northern side of Herbert Street also includes intermittent luminaries primarily located at side street intersections. Based on the existing light configuration, the proposed crosswalk at the City Center Drive intersection is expected to receive sufficient lighting. However, a slight adjustment in the orientation of the existing light fixture is recommended to direct the light at the proposed crosswalk. Please note that this improvement has been anticipated to be covered under City maintenance and has not been included in the probable cost estimate.

LEGEND

 APPARENT R/W

 EXISTING EDGE OF PAVEMENT

 PROPOSED FRONT OF SIDEWALK

 PROPOSED BACK OF SIDEWALK

 EXISTING FRONT OF SIDEWALK

 EXISTING BACK OF SIDEWALK

 PROPOSED 2' DETECTABLE WARNING

 EXISTING UTILITY POLE

 EXISTING DRAINAGE STRUCTURE

 SAWCUT

 FIRE HYDRANT

 EXISTING LIGHT FIXTURE

 PROPOSED LIGHT FIXTURE

0

15

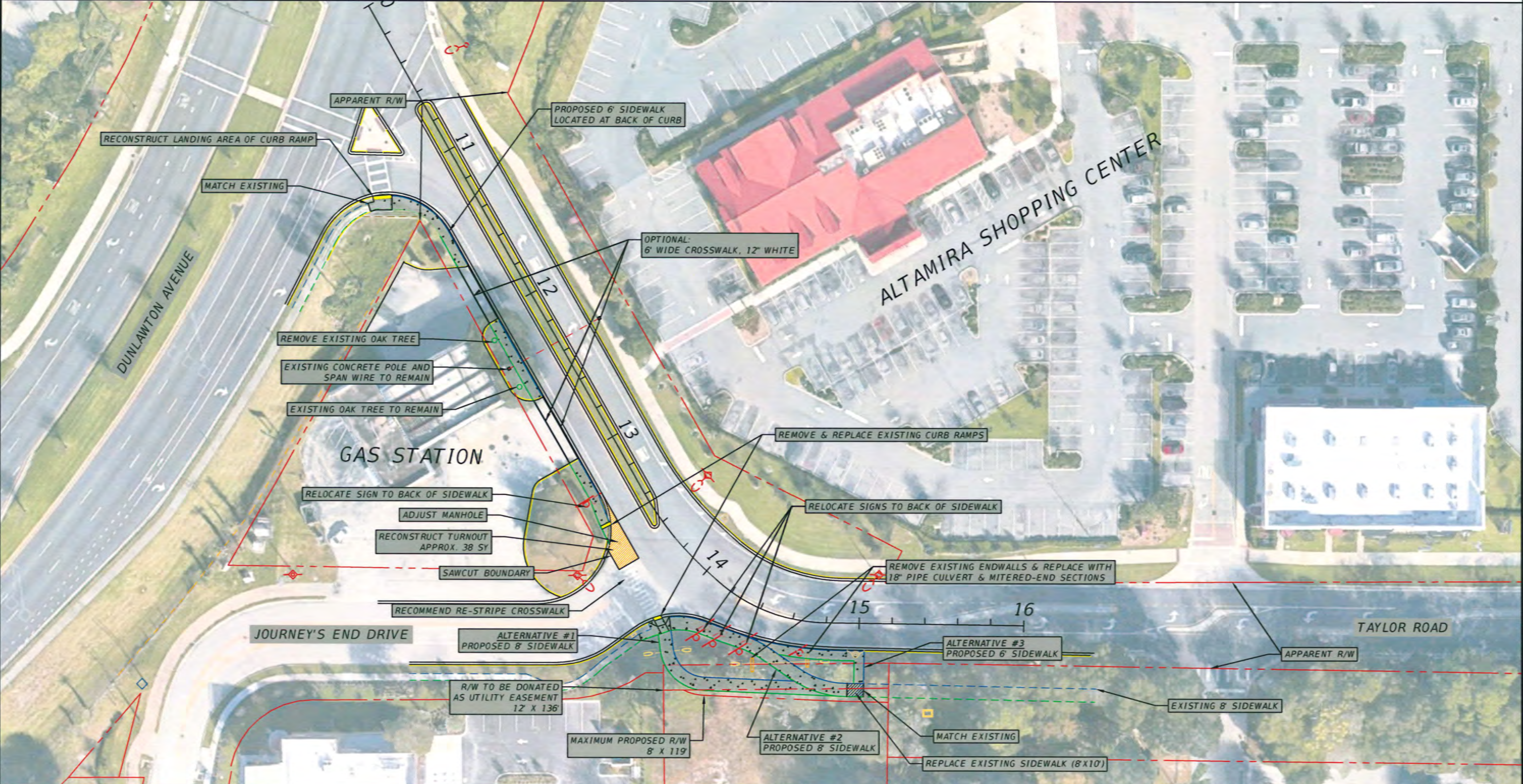
30

60

GRAPHIC SCALE

1" = 60'

SCALE



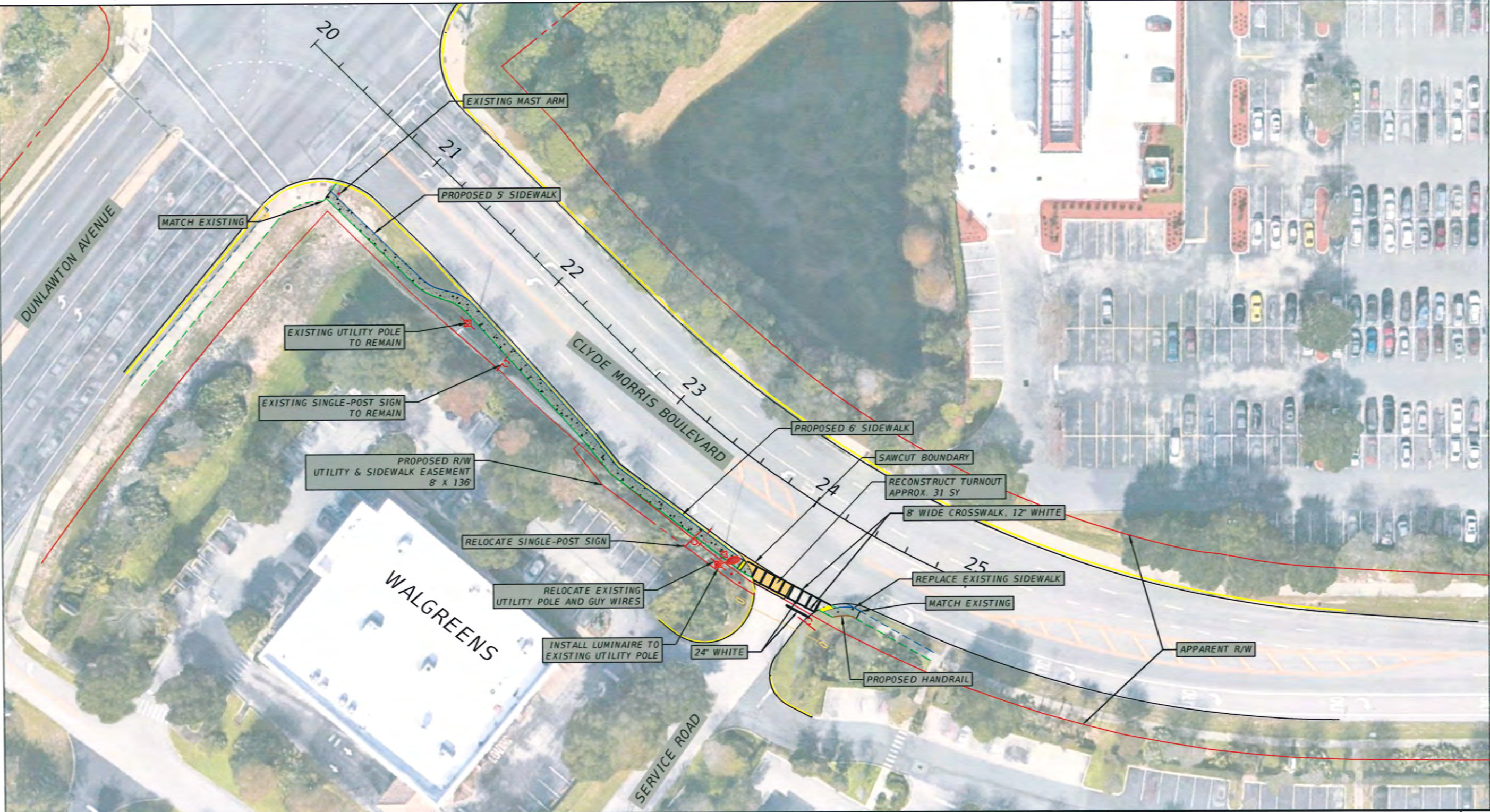
REVISIONS				 Lassiter Transportation Group, Inc. Engineering and Planning MARK NEWMAN P.E. No. 44077 1450 W. GRANADA BOULEVARD SUITE 2 ORLANDO BEACH, FLORIDA 32174 PH: 386.257.2571 FAX: 386.257.6996 COE NO. 9227	RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION			CITY OF PORT ORANGE - SIDEWALK FEASIBILITY STUDY		SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD	COUNTY	PROJECT ID	FIGURE 3A TAYLOR BRANCH ROAD POSTED SPEED LIMIT: 30 MPH	25	
					-	VOLUSIA	SCHL-2016-036			

LEGEND
 --- APPARENT R/W
 --- EXISTING EDGE OF PAVEMENT
 --- PROPOSED FRONT OF SIDEWALK
 --- PROPOSED BACK OF SIDEWALK
 --- EXISTING FRONT OF SIDEWALK
 --- EXISTING BACK OF SIDEWALK

PROPOSED 2' DETECTABLE WARNING
 EXISTING UTILITY POLE
 EXISTING DRAINAGE STRUCTURE
 SAWCUT
 FIRE HYDRANT
 EXISTING LIGHT FIXTURE
 PROPOSED LIGHT FIXTURE

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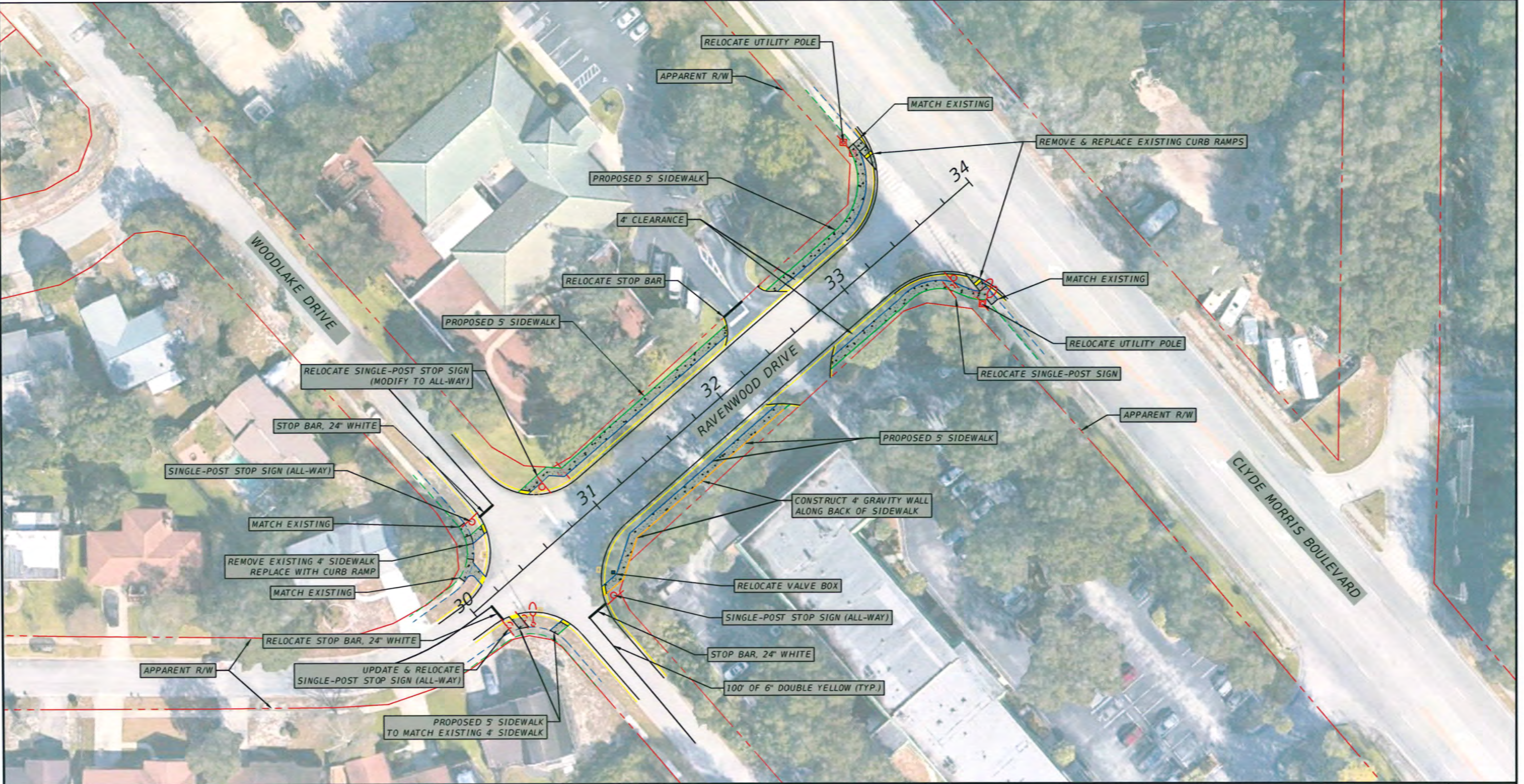
REVISIONS				<div>Lassiter Transportation Group, Inc. Engineering and Planning MARK NEWMAN P.E. No. 44077 1450 W. GRANADA BOULEVARD SUITE 2 ORMOND BEACH, FLORIDA 32174 PH: 386.257.2571 FAX: 386.257.6996 CDE NO. 9227</div>	RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION			CITY OF PORT ORANGE - SIDEWALK FEASIBILITY STUDY		SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD	COUNTY	PROJECT ID	FIGURE 3B	CLYDE MORRIS BOULEVARD	26
					-	VOLUSIA	SCHL-2016-036			

LEGEND
 APPARENT R/W
 EXISTING EDGE OF PAVEMENT
 PROPOSED FRONT OF SIDEWALK
 PROPOSED BACK OF SIDEWALK
 EXISTING FRONT OF SIDEWALK
 EXISTING BACK OF SIDEWALK

PROPOSED 2' DETECTABLE WARNING
 EXISTING UTILITY POLE
 EXISTING DRAINAGE STRUCTURE
 SAWCUT
 FIRE HYDRANT
 EXISTING LIGHT FIXTURE
 PROPOSED LIGHT FIXTURE

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GRAPHIC SCALE
 0 15 30 60
 1" = 60'
 SCALE



REVISIONS				<div> <div> Lassiter Transportation Group, Inc. Engineering and Planning MARK NEWMAN P.E. No. 44077 1450 W. GRANADA BOULEVARD SUITE 2 ORLANDO BEACH, FLORIDA 32174 PH: 386.257.2571 FAX: 386.257.8998 COE NO. 9227 </div> <div> RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION ROAD COUNTY PROJECT ID - VOLUSIA SCHL-2016-036 </div> </div>	<div> CITY OF PORT ORANGE - SIDEWALK FEASIBILITY STUDY FIGURE 3C RAVENWOOD DRIVE POSTED SPEED LIMIT: 25 MPH </div>	<div> SHEET NO. 27 </div>
DATE	DESCRIPTION	DATE	DESCRIPTION			

LEGEND

 APPARENT R/W

 EXISTING EDGE OF PAVEMENT

 PROPOSED FRONT OF SIDEWALK

 PROPOSED BACK OF SIDEWALK

 EXISTING FRONT OF SIDEWALK

 EXISTING BACK OF SIDEWALK

 PROPOSED 2' DETECTABLE WARNING

 EXISTING UTILITY POLE

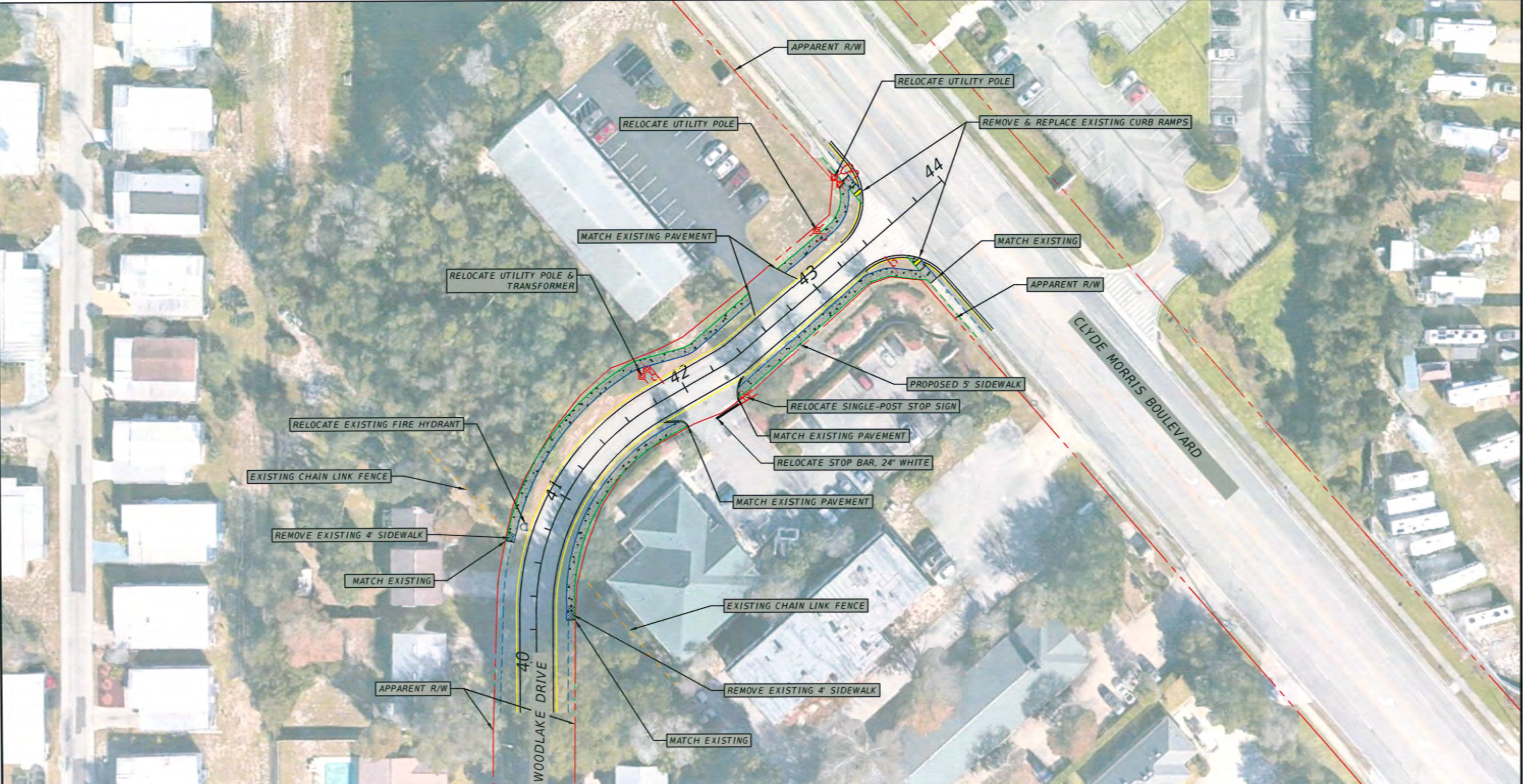
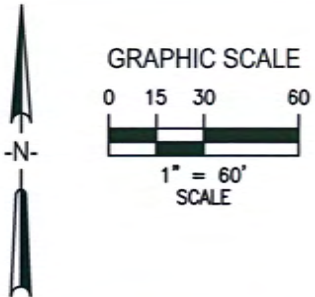
 EXISTING DRAINAGE STRUCTURE

 SAWCUT

 FIRE HYDRANT

 EXISTING LIGHT FIXTURE

 PROPOSED LIGHT FIXTURE



REVISIONS				<div><div>Lassiter Transportation Group, Inc. Engineering and Planning MARK NEWMAN P.E. No. 44077 1450 W. GRANADA BOULEVARD SUITE 2 ORLANDO BEACH, FLORIDA 32174 PH: 386.257.2571 FAX: 386.257.8996 COE NO. 9227</div></div>	RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION			CITY OF PORT ORANGE - SIDEWALK FEASIBILITY STUDY FIGURE 3D WOODLAKE DRIVE POSTED SPEED LIMIT: 30 MPH	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD	COUNTY	PROJECT ID		28
					-	VOLUSIA	SCHL-2016-036		

8. ENGINEER'S OPINION OF PROBABLE COST (EOPC)

It was determined by R2CTPO staff that the five locations be evaluated as one complete sidewalk gap study. Therefore, a preliminary cost estimate for the design and construction for the sidewalk gap improvements is provided in Table 1. The estimated costs determined for each study area location are provided in Appendix D for site-specific details. These cost estimates are to be considered an opinion of probable cost based solely on the results of this feasibility study. The pay item number and unit of measure are based on the Florida Department of Transportation (FDOT) Basis of Estimates (BOE) Manual. The unit prices are based on historical average costs for each pay item as provided by FDOT. Some unit prices may have been adjusted due to the small nature of the project or the lack of sufficient historical cost data.

Right-of-way acquisition fees have been development based on Volusia County Property Appraiser website for purposes of this study. However, it should be noted that a right-of-way acquisition phase should be included at the beginning of the design process. Please note that right-of-way acquisition along County roads will need to be coordinated with the County's right-of-way group. The proposed maximum amount of potential right-of-way required is 3,672 square-foot, and includes the 12' utility easement donation along the vacant parcel at the Taylor Branch Road site. Additionally, numerous utility adjustments are anticipated for completion of the proposed sidewalk improvements. The City has requested a cost of \$5,000 per relocation of existing utilities. Based upon findings in the feasibility study, the total estimated probable cost for all sidewalk gaps is \$531,000.00. The individual probable cost estimates developed at each site are included as Appendix D.

To adjust for potential future increases in the project's cost estimate, an annual inflationary factor was applied. The FDOT provides annual inflation factors for roadway construction costs which may be used as a guideline for this sidewalk project. The 2017 cost estimate provided herein may be adjusted by the FDOT inflationary factors (included in Appendix E) for the next three years (2018, 2019, and 2020) as follows:

- Total preliminary future cost for the sidewalk gap improvements:
 - \$545,400.00, \$560,800.00, and \$575,200.00 respectively.

Table 1
Engineer's Opinion of Probable Cost
City of Port Orange, Sidewalk Feasibility Study

PAY ITEM NUMBER	PAY ITEM DESCRIPTION	TOTAL QTY	UNIT MEASURE	UNIT PRICE	TOTAL PRICE
101-1	MOBILIZATION	1	LS	\$58,391.28	\$58,391.28
102-1	MAINTENANCE OF TRAFFIC	1	LS	\$48,659.40	\$48,659.40
Sidewalk Mobilization and Maintenance of Traffic:					\$107,050.68
110-1-1	CLEARING AND GRUBBING	0.7	AC	\$18,028.84	\$12,706.27
110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT	120.2	SY	\$33.71	\$4,050.58
120-1	REGULAR EXCAVATION	341.0	CY	\$6.59	\$2,246.51
120-6	EMBANKMENT	833.0	CY	\$11.28	\$9,396.24
285-706	OPTIONAL BASE, BASE GROUP 06	105.8	SY	\$32.88	\$3,477.97
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	8.7	TN	\$208.48	\$1,819.34
352-70	GRINDING CONCRETE PAVEMENT	3.3	SY	\$4.88	\$16.28
400-0-11	CONCRETE CLASS NS, GRAVITY WALL	94.8	CY	\$658.30	\$62,432.79
425-1521	INLETS, DT BOT, TYPE C, <10'	1.0	EA	\$3,644.88	\$3,644.88
425-5	MANHOLE, ADJUST	1.0	EA	\$1,282.45	\$1,282.45
425-6	VALVE BOXES, ADJUST	1.0	EA	\$596.63	\$596.63
430-174-118	PIPE CULVERT, OPT, MATERIAL, ROUND 18" SD	125.0	LF	\$88.80	\$11,100.00
430-984-125	MITERED END SECTION, OPT ROUND, 18" SD	3.0	EA	\$1,449.49	\$4,348.48
515-1-2	PIPE HANDRAIL - GUIDERAIL, ALUMINUM	132.0	LF	\$53.03	\$6,999.70
520-1-10	CONCRETE CURB & GUTTER, TYPE F	140.0	LF	\$52.63	\$7,368.48
522-1	CONCRETE SIDEWALK AND DRIVEWAYS 4" THICK	1,548.6	SY	\$45.88	\$71,041.53
522-2	CONCRETE SIDEWALK AND DRIVEWAYS 6" THICK	53.9	SY	\$94.37	\$5,085.39
527-2	DETECTABLE WARNINGS	166.0	SF	\$38.11	\$6,326.59
570-1-2	PERFORMANCE TURF, SOD	566.3	SY	\$2.70	\$1,529.10
630-2-11	CONDUIT OPEN TRENCH	350.0	LF	\$21.40	\$7,488.60
635-2-11	PULL & SPLICE BOX	2.0	EA	\$826.93	\$1,653.86
639-1-121	ELECTRICAL POWER SERVICE	1.0	AS	\$5,671.99	\$5,671.99
639-2-1	ELECTRICAL SERVICE WIRE	350.0	LF	\$5.74	\$2,007.60
700-1-40	SINGLE-POST SIGN, INSTALL	2.0	AS	\$518.00	\$1,036.01
700-1-50	SINGLE-POST SIGN, RELOCATE	10.0	AS	\$163.60	\$1,635.96
711-11-123	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12"	364.0	LF	\$3.44	\$1,253.62
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24"	332.0	LF	\$7.43	\$2,466.10
711-11-221	THERMOPLASTIC, STANDARD, YELLOW, SOLID, 6"	600.0	LF	\$3.55	\$2,131.20
711-17	THERMOPLASTIC, REMOVE	888.0	SF	\$2.80	\$2,482.85
715-1-11	LIGHTING CONDUCTORS, F&I	350.0	LF	\$0.95	\$331.80
715-5-11	LUMINAIRE & BRACKET ARM, F&I, ALUMINUM	1.0	EA	\$2,440.80	\$2,440.80
1644-800	FIRE HYDRANT, RELOCATE	1.0	EA	\$2,972.00	\$2,972.00
Sidewalk Subtotal:					\$246,069.59
N/A	UTILITY POLE ADJUSTMENT	7.00	EA	\$5,000.00	\$35,000.00
N/A	RIGHT-OF-WAY	3,672.00	SF	-	\$20,397.28
Additional Purchases:					\$55,397.28
Total Construction Subtotal:					\$408,517.55
N/A	PRELIMINARY ENGINEERING	1	LS	20%	\$81,703.51
N/A	CEI	1	LS	10%	\$40,851.75
Grand Total:					\$531,072.81
FDOT Inflation Adjusted Estimate		Inflation Factor	PDC Multiplier	Adjusted Cost Estimate	
Inflation-Adjusted Estimate (2017) - Base		BASE	1.000	\$531,072.81	
Year 1 Inflation-Adjusted Estimate (2018)		2.70%	1.027	\$545,411.78	
Year 2 Inflation-Adjusted Estimate (2019)		2.80%	1.056	\$560,812.89	
Year 3 Inflation-Adjusted Estimate (2020)		2.60%	1.083	\$575,151.85	

9. CONCLUSION

The purpose of this study was to evaluate the feasibility of constructing new sidewalks along five roadway segments within the City of Port Orange. The proposed sidewalks will enhance current connectivity within the immediate area and help address sidewalk gaps in the existing pedestrian network. The total length of sidewalk gaps within the study area is approximately 0.57 miles, or 3,000 ft., in length. Based upon findings in this report, all proposed sidewalks are physically feasible for construction. The total engineer's probable cost estimate is approximately \$531,000.00 in present day value. The cost includes design, construction and inspection for completion of all proposed sidewalks, as well as the additional right-of-way anticipated at two of the study area locations (3,672 square-feet).

10. DATA COLLECTION REFERENCES

- Volusia County GIS
- Volusia County Property Appraiser
- River to Sea TPO
- FDOT Design Standards (2017)
- FDOT Basis of Estimates (2016)
- FDOT Florida Greenbook (2013)
- FDOT Long Range Estimates
- Google Earth
- Manual on Uniform Traffic Control Devices (2009)
- City of Port Orange Comprehensive Plan
- City of Port Orange Land Development Code
- United States Geological Survey
- American Association of State Highway and Transportation Officials Greenbook

APPENDIX A

APPLICATION



2016 Application for Project Prioritization – FEASIBILITY STUDY

Bicycle/Pedestrian and B/P Local Initiatives Projects

Project Title: Port Orange Sidewalk Gap/2016 Clyde Morris Blvd./Taylor Rd. Corridors

Applicant (project sponsor): City of Port Orange Date: March 21, 2016

Contact Person: Tim Burman Job Title: Planning Manager

Address: 1000 City Center Circle, Port Orange, FL 32129

Phone: 386-506-5675 FAX: 386-756-5290

E-mail: tburman@port-orange.org

Governmental entity with maintenance responsibility for roadway facility on which proposed project is located: City of Port Orange will be responsible for sidewalks within Clyde Morris Blvd.R/W and Taylor Road R/W

[If not the same as Applicant, attach letter of support for proposed project from the responsible entity. This letter of support must include a statement describing the responsible entity's expectations for maintenance of the proposed improvements, i.e., what the applicant's responsibility will be.]

Priority of this proposed project relative to other applications submitted by the Applicant: 4

Project Description: The proposed sidewalk project is to complete sidewalk gaps along Clyde Morris Blvd. and Taylor Rd. to enhance pedestrian connectivity to schools, bus stops, parks, and retail areas.

Project Location (include project length and termini, if appropriate, and attach location map): Exhibit A- Clyde Morris Blvd. and Taylor Rd.

Project Eligibility for Federal Funds (check the appropriate box):

- ☒ the proposed improvement is located on the Federal-aid system;
- ☒ the proposed improvement is **not** located on the Federal-aid system, but qualifies as a type of improvement identified in 23 U.S.C. §133 that is not restricted to the Federal-aid system.

Project Purpose and Need Statement:

In the space provided below, describe the purpose and need for this proposed project. It is very important that the Purpose and Need Statement is clear and complete. It will be the principle consideration in ranking

the project application for a feasibility study. It must convince the public and decision-makers that the expenditure of funds is necessary and worthwhile and that the priority the project is being given relative to other needed transportation projects is warranted. The Purpose and Need Statement will also help to define the scope for the feasibility study, the consideration of alternatives (if appropriate), and project design.

The purpose is analogous to the problem. It should focus on particular issues regarding the transportation system (e.g., mobility and/or safety). Other important issues to be addressed by the project should be identified as ancillary benefits. The purpose should be stated in one or two sentences as the positive outcome that is expected. For example, "The purpose is to provide a connection between a park and a school." It should avoid stating a solution as a purpose, such as: "The purpose of the project is to add a sidewalk." It should be stated broadly enough so that no valid solutions will be dismissed prematurely.

The need should establish the evidence that the problem exists, or will exist if anticipated conditions are realized. It should support the assertion made in the Purpose Statement. For example, if the Purpose Statement is based on safety improvements, the Need Statement should support the assertion that there is or will be a safety problem to be corrected. When applying for a feasibility study, you should support your Need Statement with the best available evidence. However, you will not be expected to undertake new studies.

The Purpose and Need Statement should address all of the following Priority Criteria:

1. **Proximity to Community Assets:** this measure will estimate the potential demand of bicyclists and pedestrians based on the number of productions or attractions the facility may serve within a one (1) mile radius for Shared Use Paths or a one-half (½) mile radius for Sidewalks. A maximum of 20 points will be assessed.
2. **Connectivity and Accessibility:** this measure considers the gaps that exist in the current network of bike lanes, bike paths and sidewalks. The measurement will assess points based on the ability of the proposed project to join disconnected networks or complete fragmented facilities. A maximum of 20 points will be assessed.
3. **Safety/Security:** this measure provides additional weight to applications that have included safety as a component of the overall project and includes school locations identified as hazardous walking/biking zones and areas with significant numbers of safety concerns. A maximum of 25 points will be assessed.
4. **Contribution to "Livability" and Sustainability in the Community:** this measure considers factors that have an impact on "livability" and sustainability in the community. A maximum of 10 points will be assessed.
5. **Enhancements to the Transportation System:** this measure considers the demonstrated and defensible relationship to surface transportation. A maximum of 10 points will be assessed.
6. **Public Support/Special Considerations:** describe whether the proposed facility has public support and provide documentation (e.g., letters of support/signed petitions/public comments from community groups, homeowners associations, school administrators). Describe any special issues or concerns that are not being addressed by the other criteria. A maximum of 5 points will be assessed.
7. **Local Matching Funds > 10%:** if local matching funds greater than 10% of the estimated project cost are available, describe the local matching fund package in detail. A maximum of 10 points will be assessed.

Commentary: The proposed sidewalk gap project is intended to complete sidewalk gaps along major roadways to enhance pedestrian connectivity to schools, bus stops, parks, and retail areas. Completing these gaps will improve the safety of pedestrians that walk along these major roadway corridors by eliminating the need to use the shoulder or roadway. Each sidewalk project would consist of constructing the appropriate width (minimum of 5'), along with associated improvements (drainage, crosswalks, signage, lighting, and ADA compliance). The following sidewalk gaps have been identified to be included with this application (Exhibit A):

1. Clyde Morris Boulevard (west side), 300' south of Dunlawton Avenue;
2. Herbert Street (south side), from City Center Drive to Gulfstream Village Driveway;

3. Taylor Road (west side), from Dunlawton Avenue to Journey's End Way; and

4. Woodlake Drive and Ravenwood Drive (north and south side), 300' west of Clyde Morris Boulevard.

This project is specifically geared to filling in sidewalk gaps within the Taylor Road, Herbert Street, and Clyde Morris Boulevard corridors. Bicycle and pedestrian access will be enhanced by filling these gaps and providing a continuous sidewalk network, encouraging residents to consider using an alternative mode of transportation in these corridors. These sidewalk gap projects contain destinations at each end, which allows users to continue their trip on the improved existing facilities. As indicated in the attached photographs (Exhibit B), completing these sidewalk gaps will improve accessibility and make pedestrian and bicycle trips more convenient and safer. These sidewalk gap projects are located along corridors with VOTRAN stops (Exhibit C) and will lead to improved access to the transit system.

Completing these sidewalk gaps will improve the safety of pedestrians that walk along these major roadway corridors by eliminating the need to use the shoulder or roadway and enhance pedestrian connectivity to schools, bus stops/transit, parks, and retail areas.

1. Clyde Morris Boulevard (west side), 300' south of Dunlawton Avenue: Sidewalks would enhance pedestrian connectivity to schools (Spruce Creek High School and Spruce Creek Elementary), bus stops/transit (Route 7), and retail areas (Pines Plaza, Walmart, Gaff's Meat Market, etc.).

2. Herbert Street (south side), from City Center Drive to Gulfstream Village driveway: Sidewalks would enhance pedestrian connectivity to a school (Silver Sands Middle School), bus stops/transit (Route 12), parks (City Center complex), and retail areas (Gulfstream Village).

3. Taylor Road (west side), from Dunlawton Avenue to Journey's End Way: Sidewalks would enhance pedestrian connectivity to bus stops/transit (Route 7) and commercial areas (Gateway Center, Altamira Village, and Country Inn and Suites Hotel).

4. Woodlake Drive and Ravenwood Drive (north and south side), 300' west of Clyde Morris Boulevard: Sidewalks would enhance pedestrian connectivity to bus stops/transit (Route 12), parks (City Center complex), and commercial areas (Gulfstream Village, Ravenwood Square, Ritter's Frozen Custard, etc.).

Completion of the sidewalk gap on the west side of Clyde Morris Boulevard, from Dunlawton Avenue to the Walgreens driveway, will require additional right-of-way or an easement to accommodate a sidewalk. For the other three (3) sidewalk gap projects, additional right-of-way or an easement is not anticipated to accommodate a sidewalk.

Completing existing sidewalk gaps is a priority expressed by the City of Port Orange Parks and Recreation Board and City Council. Port Orange residents have asked for a sidewalk network that would improve the safety along these major roadway corridors and enhance pedestrian connectivity to schools, bus stops, parks, and commercial areas. The sidewalk gap projects implement the City's Comprehensive Plan, specifically those listed in the Transportation Element, Objective 2.1, Policy 2.1.7, and Table 2.

SIDEWALK GAPS

HALF MILE BOUNDARY
AROUND ALL PROPOSED
SIDEWALK GAPS



City Boundary

Sidewalk Gap

Bus Route (Votran)

12

40

7

Bus Stop (Votran)

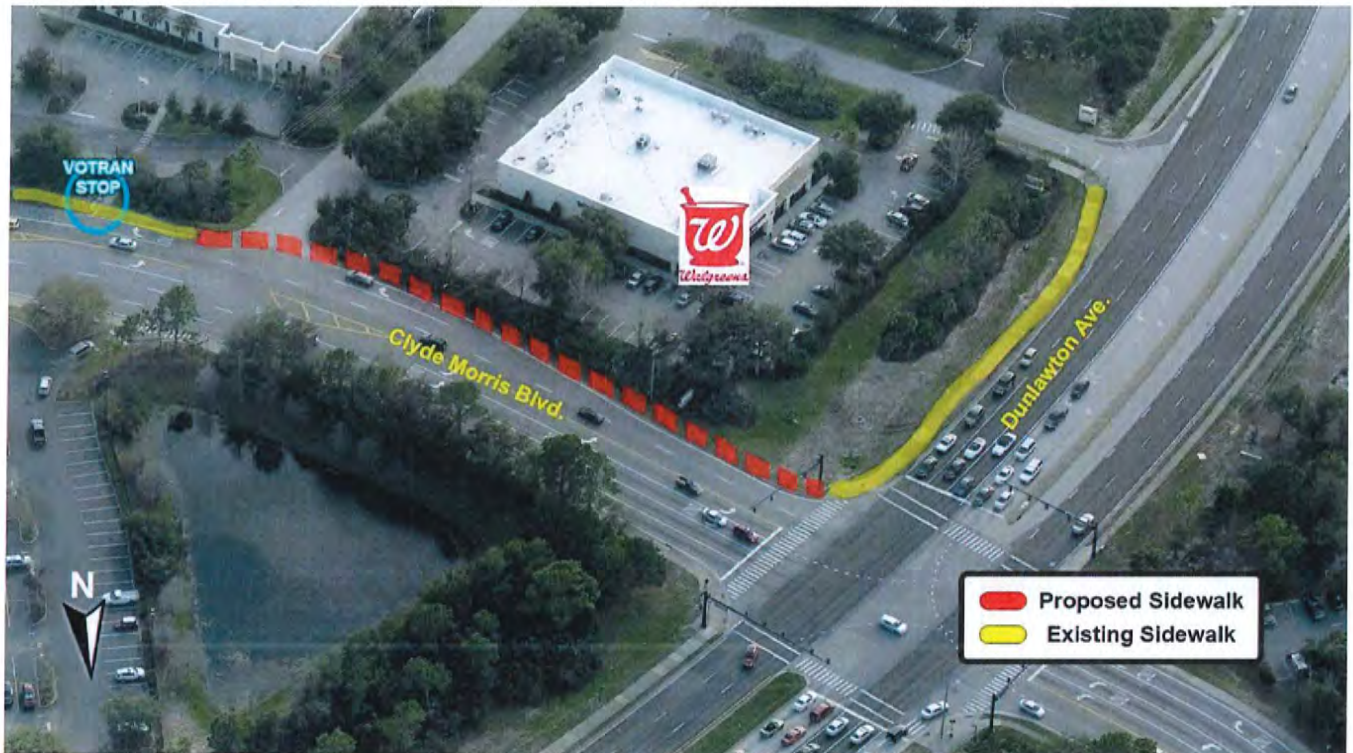
(locations provided by Votran's Website)

Public Schools

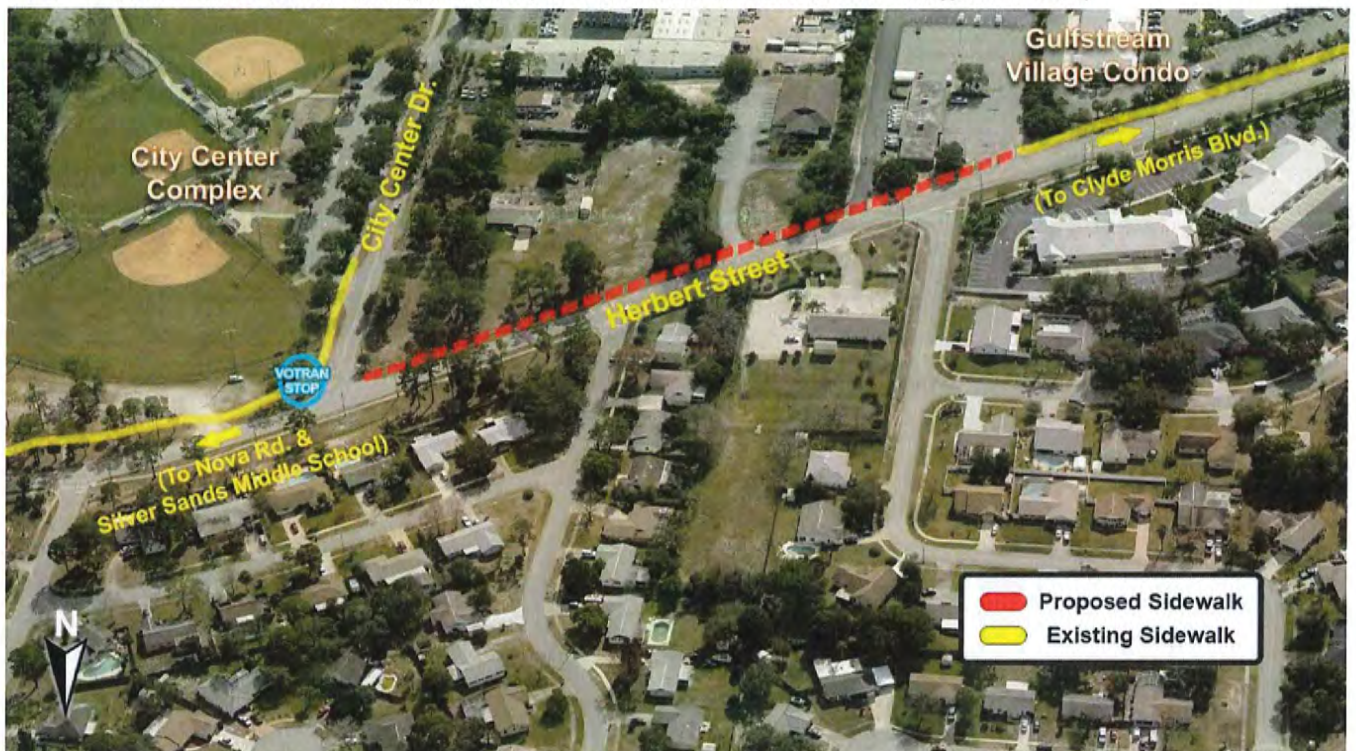


EXHIBIT B

#1 - Clyde Morris Boulevard (west side), from Dunlawton Avenue to Walgreens Driveway



#2 - Herbert Street (south side), from City Center Drive to Gulfstream Village Driveway



#3 - Taylor Road (west side), from Dunlawton Avenue to Journey's End Way



#4 - Ravenwood Drive (north and south side), 300' west of Clyde Morris Boulevard



#4 – Woodlake Drive (north and south side), 300' west of Clyde Morris Boulevard

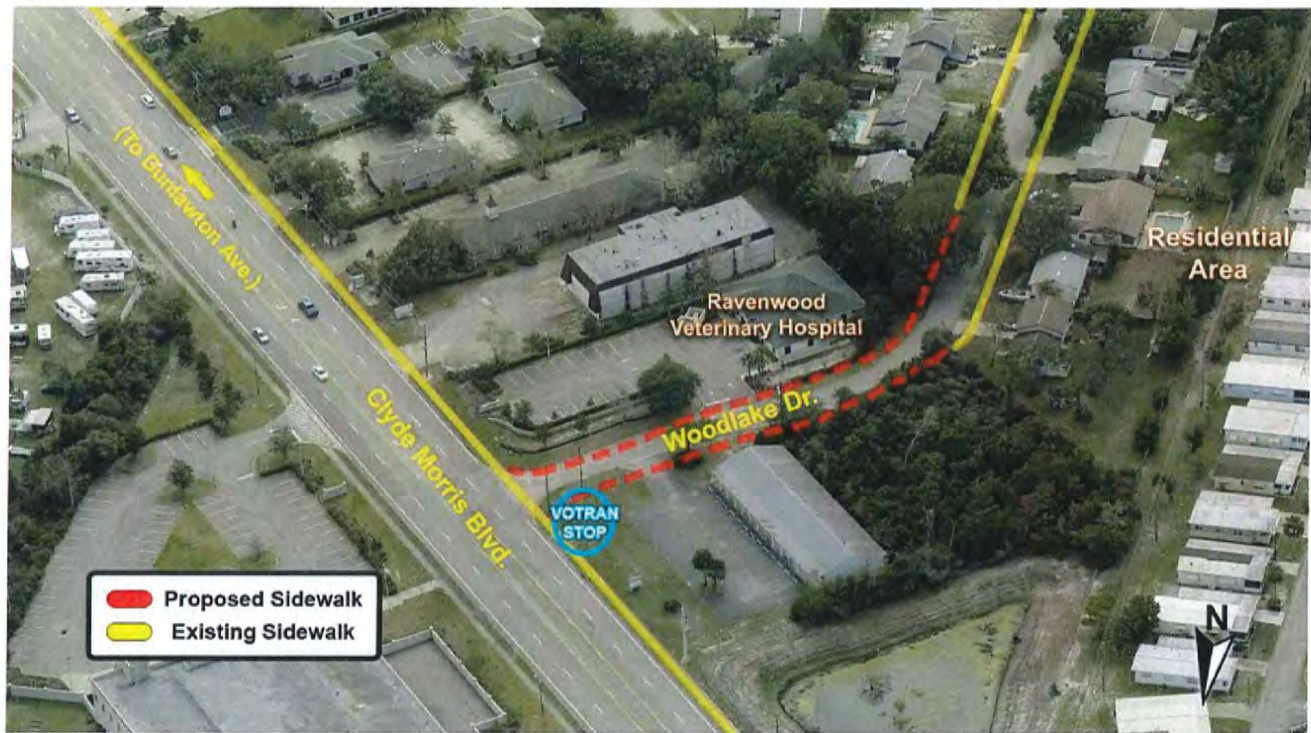
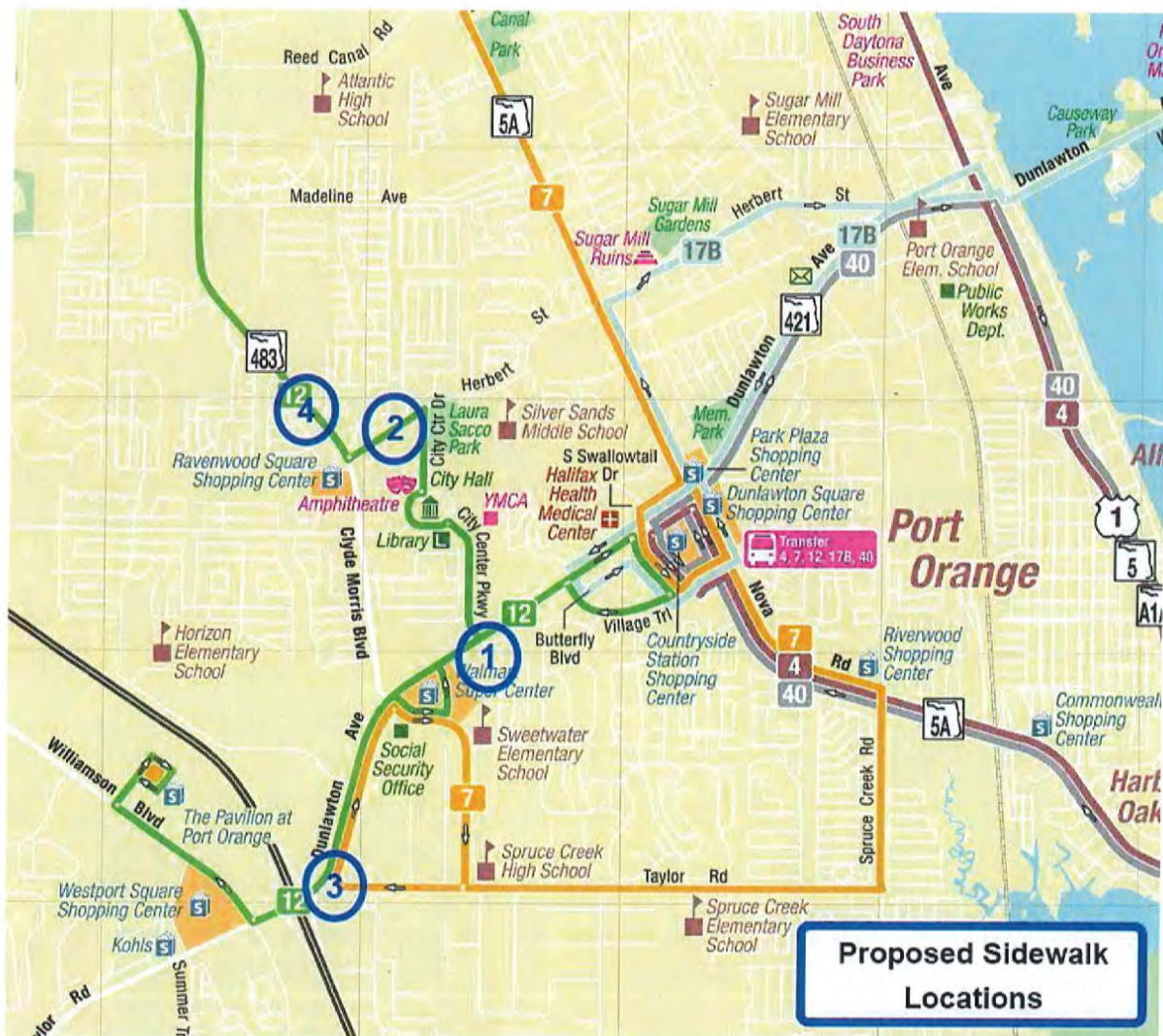


EXHIBIT C

"PROJECT AREA VOTRAN MAPS"



Objective 2.1: Bicycle/Pedestrian Modal Split. The City shall increase the use of non-motorized modes of transportation by constructing a continuous network of bikeways and pedestrian facilities. The City will work to achieve a 1.5% modal split for bicycle and pedestrian traffic by the year 2015. The City will utilize revised modal split targets, which will be adopted after obtaining 2010 Census Data.

Policy 2.2.2: Pedestrian and bicycle facilities should provide effective and convenient access to new commercial and multi-family residential structures. Main public entrances to buildings should include direct pedestrian access points from parking areas and from adjacent sidewalks and bikeways.

Policy 2.1.7: The City shall develop interconnected pedestrian and bicycle access ways to public uses such as schools, libraries, parks, intermodal transit stops and nodes, and between residential and commercial developments, where feasible.

Chapter Transportation Mobility Element

TABLE 2 : SIDEWALK GAPS ON COLLECTOR AND ARTERIAL ROADS

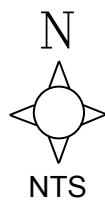
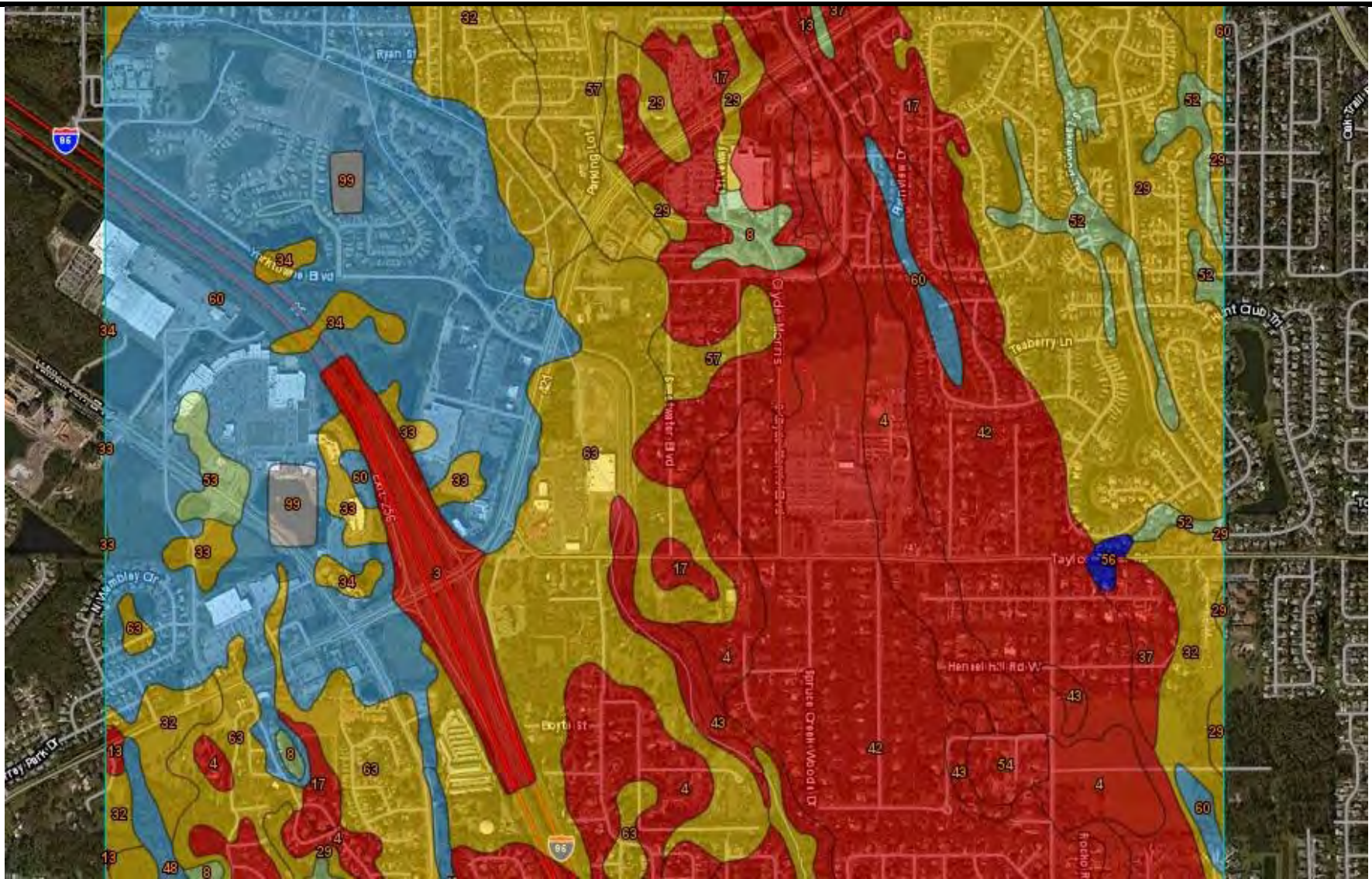
ROADWAY SEGMENT	FROM-TO	DISTANCE
Bruner Road	Madeline Avenue- Clyde Morris Blvd.	2300'
Canal View Blvd.	Nova Road – Spruce Creek Road	4000'
Clyde Morris Blvd.(west side)	Dunlawton Avenue- 200' south	200'
Halifax Drive	Ocean Ave.- Dunlawton Avenue	1800'
Halifax Avenue/Riverside Drive	White Place-Seminole Street	6600'
Herbert Street (north side)	Nova Road- FEC Railway	6100'
Herbert Street (south side)	Nova Road- FEC Railway.	6100'
Herbert Street (north side)	Carya Circle- Nova Road	1350'
Herbert Street (south side)	Golden Gate Dr.-Nova Road	3000'
Herbert Street (south side)	Village Terrace Dr.-City Center Dr.,	700'
Madeline Ave.	Clyde Morris Blvd.-Bruner Road	1235'
Madeline Ave.	Town Park Dr.- Sunset Cove Drive	2000'
Oak Street	Dunlawton Avenue- FEC Ry.	3200'
Ocean Avenue	Halifax Drive- Ridgewood Avenue	500'
Pioneer Trail	East of Stonehealth Lane- Turnbull Bay Road	7800'
Reed Canal Road (north side)	Red Sail Lane-East of Atlantic High School	2250'
Ridgewood Avenue	Poinciana Avenue- Rose Bay (east side)	2000'
Seminole Street	Riverside Drive- Ridgewood Avenue	400'
Spruce Creek Road	Herbert Street- Dunlawton Avenue	1700'
Spruce Creek Road (east side)	Oak Street- 200' south	200'
Spruce Creek Road (west side)	Selin Circle-Little Town Rd.	900'
Spruce Creek Road (east side)	Nova Road –Angelina Court	1350'
Spruce Creek Road (west side)	Taylor Road- Central Park Blvd.	5150'
Taylor Road (north side)	Dunlawton Avenue- Clyde Morris Blvd.	2600'

Objective 2.1: Bicycle/Pedestrian Modal Split. The City shall increase the use of non-motorized modes of transportation by constructing a continuous network of bikeways and pedestrian facilities. The City will work to achieve a 1.5% modal split for bicycle and pedestrian traffic by the year 2015. The City will utilize revised modal split targets, which will be adopted after obtaining 2010 Census Data.

Policy 2.1.7: The City shall develop interconnected pedestrian and bicycle access ways to public uses such as schools, libraries, parks, intermodal transit stops and nodes, and between residential and commercial developments, where feasible.

APPENDIX B

SOIL CLASSIFICATION



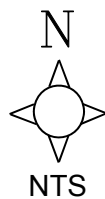
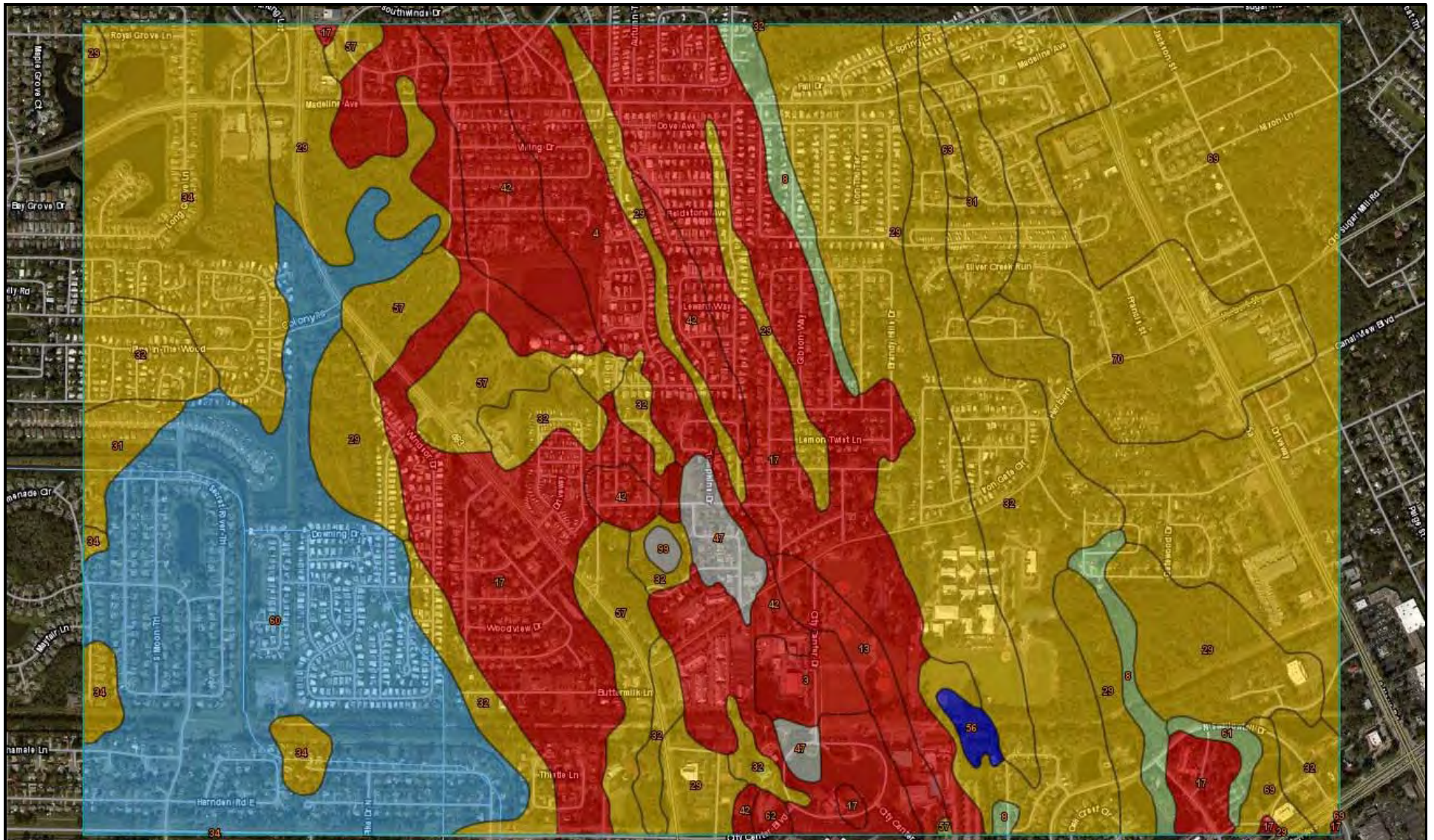
Soil Map – Taylor Branch Road & Clyde Morris Boulevard

Project No.:3903.07

Appendix B



1450 W. Granada Blvd, Suite 2 – Ormond Beach, Florida 32174
Telephone: 386.257.2571 Fax: 386.257.6996 EB# 0009227



Soil Map – Ravenwood Drive, WoodLake Drive & Herbert Street

Project No.:3903.07

Appendix B



1450 W. Granada Blvd, Suite 2 – Ormond Beach, Florida 32174
Telephone: 386.257.2571 Fax: 386.257.6996 EB# 0009227

Roads and Streets, Shallow Excavations, and Lawns and Landscaping

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Roads and Streets, Shallow Excavations, and Lawns and Landscaping

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Roads and Streets, Shallow Excavations, and Lawns and Landscaping—Volusia County, Florida							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3—Arents							
Arents	50	Not rated		Very limited		Very limited	
				Low strength	1.00	Depth to saturated zone	1.00
				Depth to saturated zone	0.22	Unstable excavation walls	1.00
Arents	50	Not rated		Very limited		Very limited	
				Low strength	1.00	Unstable excavation walls	1.00
						Depth to saturated zone	0.95

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Volusia County, Florida							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4—Astatula fine sand, 0 to 8 percent slopes							
Astatula	85	Very limited		Very limited		Very limited	
		Droughty	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Low exchange capacity	1.00				
8—Basinger fine sand, depression, 0 to 1 percent slopes							
Basinger, depression	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00			Unstable excavation walls	1.00
13—Cassia fine sand, 0 to 2 percent slopes							
Cassia	80	Very limited		Somewhat limited		Very limited	
		Low exchange capacity	1.00	Depth to saturated zone	0.75	Depth to saturated zone	1.00
		Depth to saturated zone	0.75			Unstable excavation walls	1.00
		Droughty	0.43				
17—Daytona sand, 0 to 5 percent slopes							
Daytona	85	Very limited		Very limited		Very limited	
		Low exchange capacity	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Droughty	1.00			Depth to saturated zone	0.47
		Too sandy	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Volusia County, Florida							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
29—Immokalee sand							
Immokalee, non-hydric	65	Very limited		Very limited		Very limited	
		Low exchange capacity	1.00	Low strength	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.99	Unstable excavation walls	1.00
		Droughty	0.92				
		Too sandy	0.50				
Immokalee, hydric	10	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Droughty	0.92				
		Too sandy	0.50				
31—Malabar fine sand							
Malabar, hydric	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Droughty	0.83				
Malabar, non-hydric	5	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Droughty	0.83				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Volusia County, Florida							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
32—Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes							
Myakka	75	Very limited		Somewhat limited		Very limited	
		Low exchange capacity	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
		Depth to saturated zone	0.99			Unstable excavation walls	1.00
		Droughty	0.21				
Myakka, wet	15	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00			Unstable excavation walls	1.00
		Droughty	0.21				
33—Myakka fine sand, frequently ponded, 0 to 1 percent slopes							
Myakka	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00			Unstable excavation walls	1.00
		Droughty	0.64				
34—Myakka-St. Johns complex							
Myakka, depressional	60	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Droughty	0.75				
St. Johns, depressional	25	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00	Low strength	1.00	Unstable excavation walls	1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Volusia County, Florida							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
37—Orsino fine sand, 0 to 5 percent slopes							
Orsino	80	Very limited		Very limited		Very limited	
		Low exchange capacity	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Droughty	1.00			Depth to saturated zone	0.53
42—Paola fine sand, 0 to 8 percent slopes							
Paola	85	Very limited		Not limited		Very limited	
		Low exchange capacity	1.00			Unstable excavation walls	1.00
		Droughty	0.01				
43—Paola fine sand, 8 to 17 percent slopes							
Paola	85	Very limited		Very limited		Very limited	
		Droughty	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Low exchange capacity	1.00	Slope	0.63	Slope	0.63
		Slope	0.63				
47—Pits							
Pits	100	Not rated		Not rated		Not rated	
52—Pompano fine sand							
Pompano, non-hydric	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Droughty	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Low exchange capacity	1.00				
Pompano, hydric	16	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Droughty	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Low exchange capacity	1.00				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Volusia County, Florida							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
53—Pompano-Placid complex							
Pompano, depressional	55	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Droughty	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Low exchange capacity	1.00				
Placid	25	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00	Low strength	1.00	Unstable excavation walls	1.00
56—Samsula muck, frequently ponded, 0 to 1 percent slopes							
Samsula	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Organic matter content	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Subsidence	1.00	Organic matter content	1.00
		Dusty	0.22	Low strength	1.00	Dusty	0.22
						Unstable excavation walls	0.01
57—Satellite sand, 0 to 2 percent slopes							
Satellite	85	Very limited		Somewhat limited		Very limited	
		Low exchange capacity	1.00	Depth to saturated zone	0.75	Depth to saturated zone	1.00
		Droughty	1.00			Unstable excavation walls	1.00
		Depth to saturated zone	0.75				
		Too sandy	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Volusia County, Florida							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
60—Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes							
Smyrna, non-hydric	76	Very limited		Somewhat limited		Very limited	
		Low exchange capacity	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
		Depth to saturated zone	0.99			Unstable excavation walls	0.99
		Droughty	0.67				
Smyrna, hydric	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00			Unstable excavation walls	0.99
		Droughty	0.67				
61—St. Johns fine sand							
St. Johns, hydric	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00	Low strength	1.00	Unstable excavation walls	1.00
St. Johns, non-hydric	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	1.00	Low strength	1.00	Unstable excavation walls	1.00
62—St. Lucie fine sand, 0 to 8 percent slopes							
St. Lucie	75	Very limited		Very limited		Very limited	
		Droughty	1.00	Low strength	1.00	Unstable excavation walls	1.00
		Low exchange capacity	1.00				
63—Tavares fine sand, 0 to 5 percent slopes							
Tavares	90	Very limited		Not limited		Very limited	
		Droughty	1.00			Unstable excavation walls	1.00
		Low exchange capacity	1.00			Depth to saturated zone	0.24

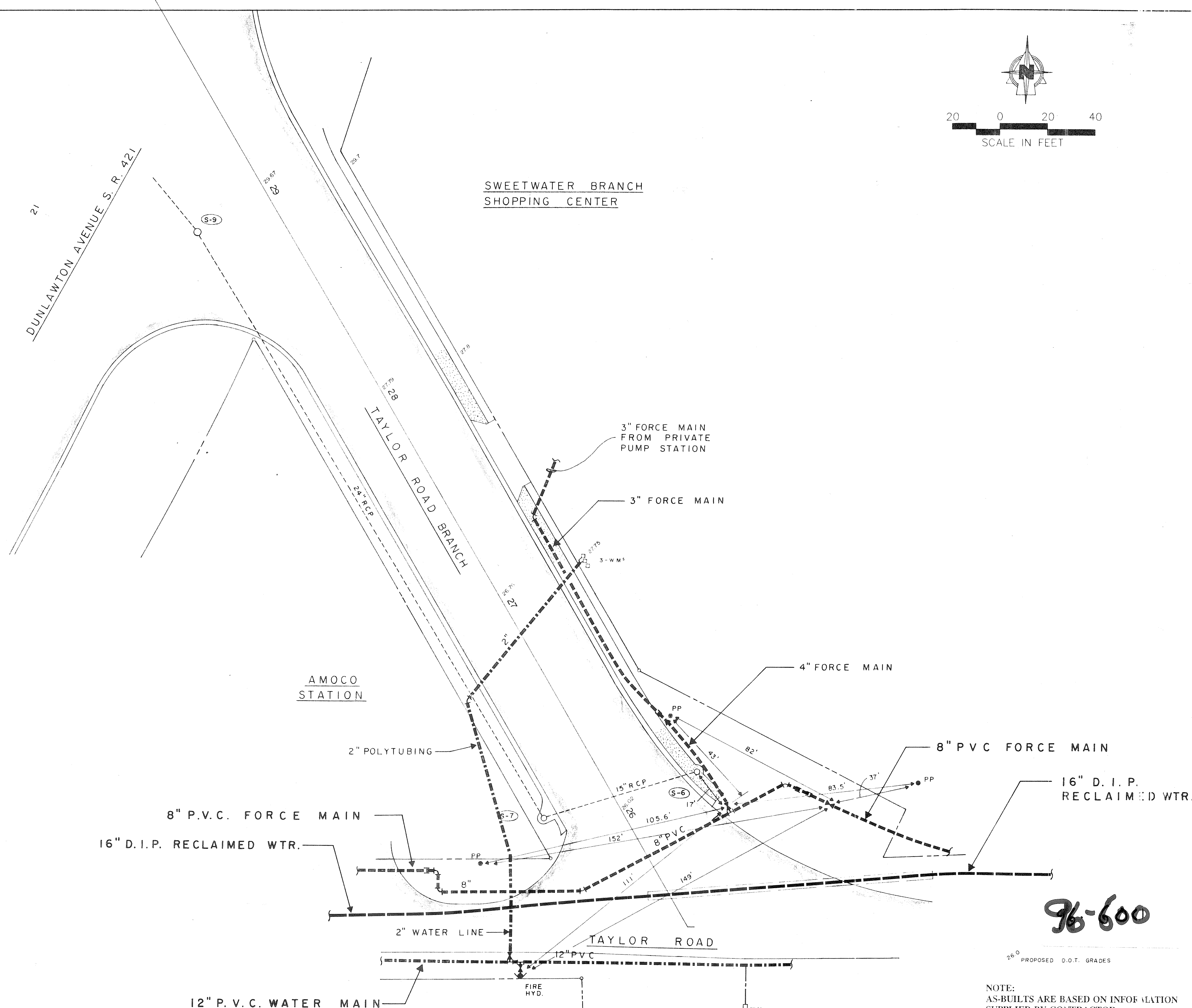
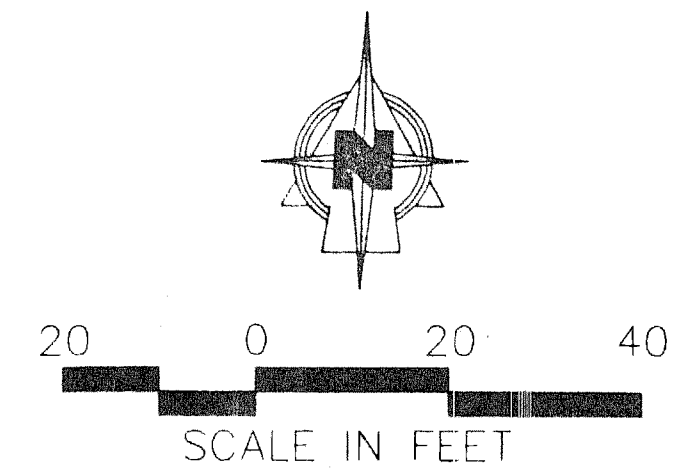
Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Volusia County, Florida							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
69—Tuscahill fine sand							
Tuscahill	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	0.50			Unstable excavation walls	0.62
		Droughty	0.03				
70—Tuscahill-Urban land complex							
Tuscahill	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low exchange capacity	0.50			Unstable excavation walls	0.62
		Droughty	0.03				
Urban land	40	Not rated		Not rated		Not rated	
99—Water							
Water	100	Not rated		Not rated		Not rated	

Data Source Information

Soil Survey Area: Volusia County, Florida
 Survey Area Data: Version 15, Sep 20, 2016

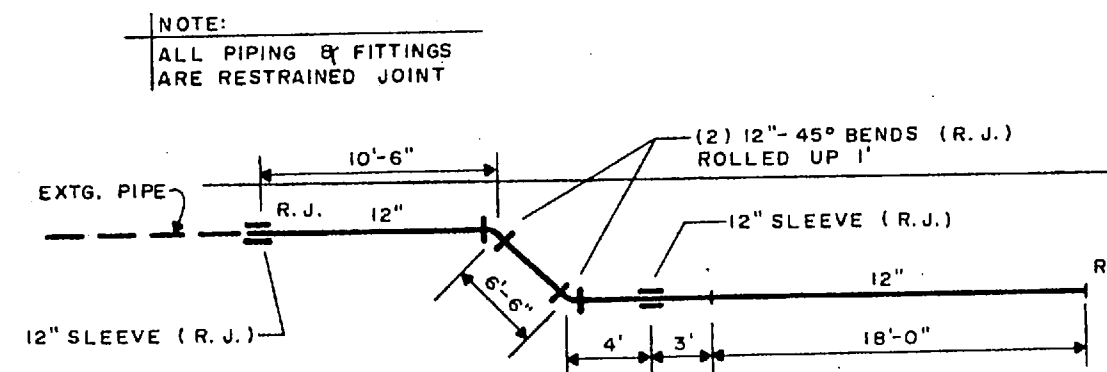
APPENDIX C

RIGHT-OF-WAY MAPS/ AS-BUILTS

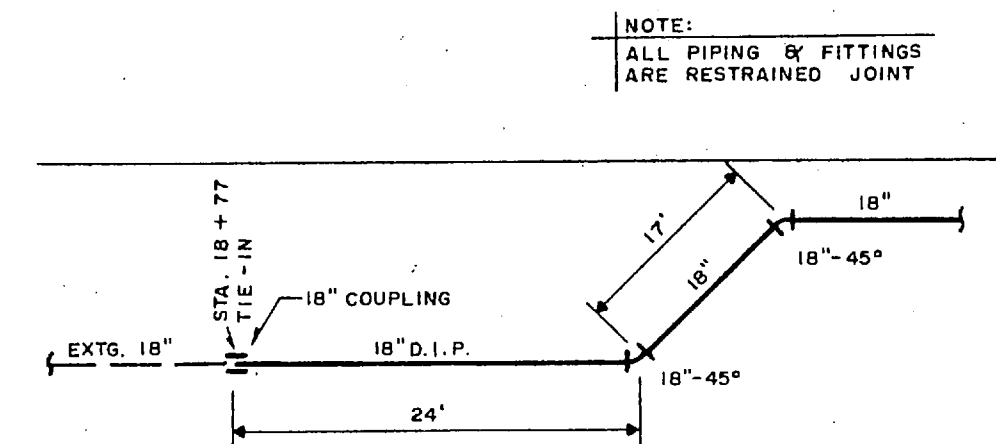


NOTE:
AS-BUILTS ARE BASED ON INFORMATION
SUPPLIED BY CONTRACTOR.

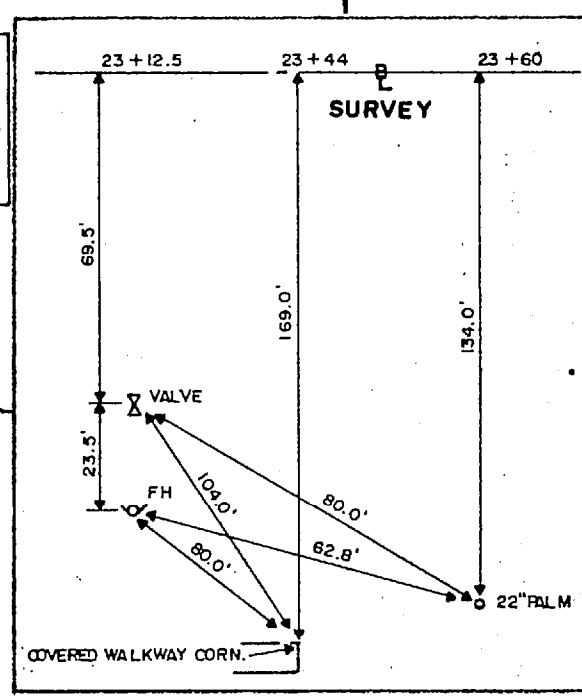
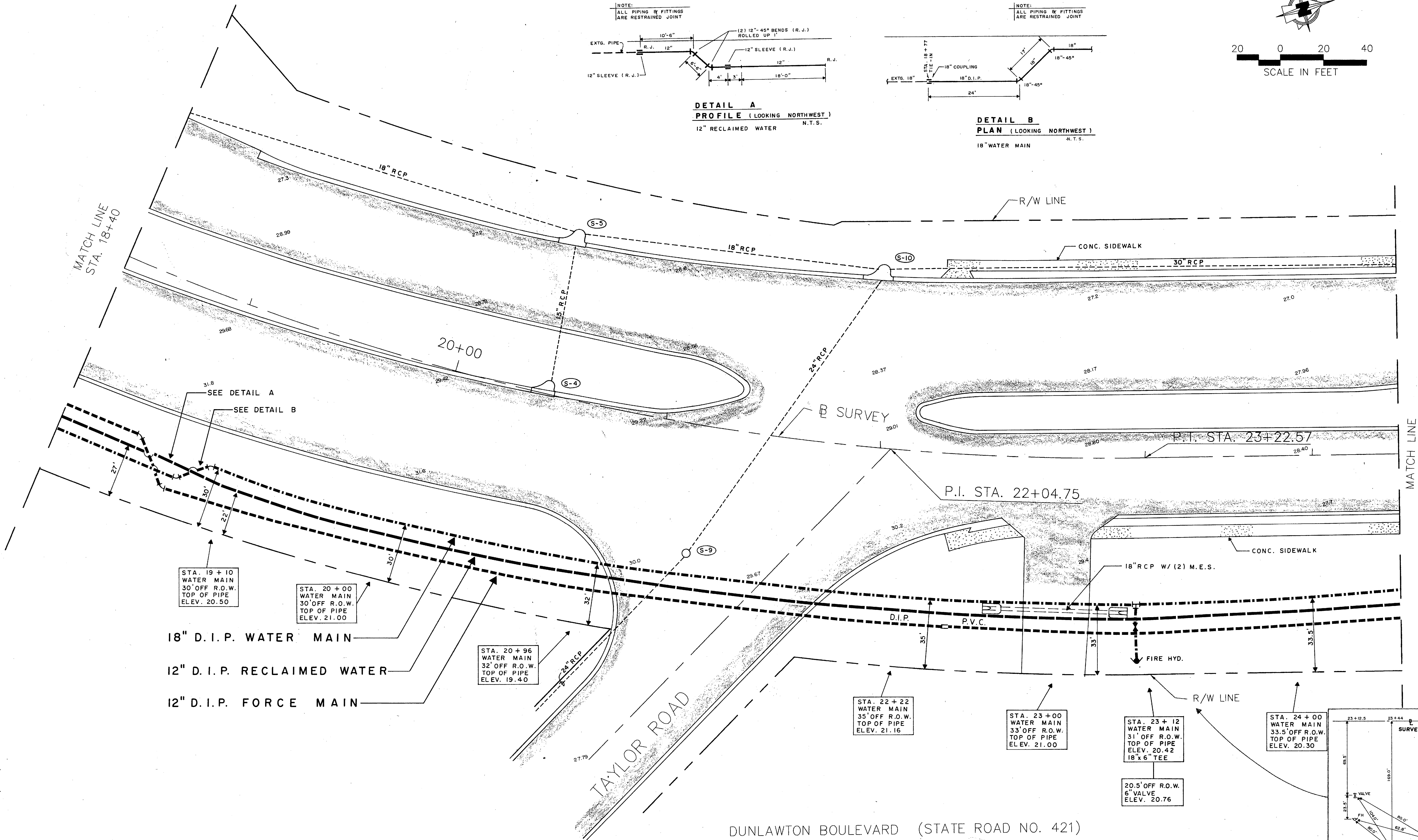
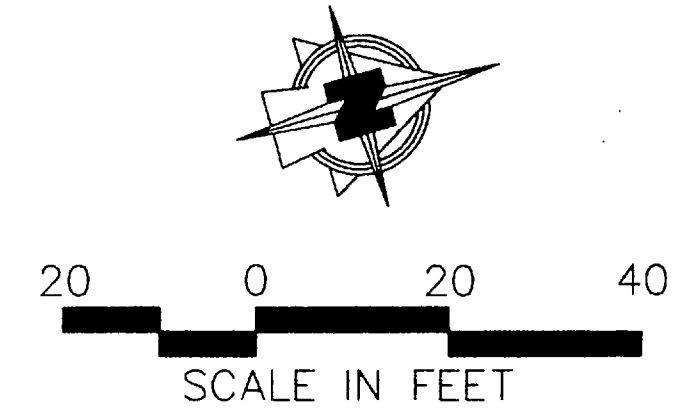
		QUENTIN L. HAMPTON ASSOCIATES, INC.			CITY OF		DUNLAWTON AVENUE		"AS-BUILTS"		DESIGNED	MAH	DATE	/96	SCALE AS SHOWN	SHEET NO.
		CONSULTING ENGINEERS			PORT ORANGE		STATE ROAD 421		STA. TO STA.		DRAWN	JRB	DATE	/96		
											CHECKED	MAH	DATE	/96		
											APPROVED		DATE			
P.O. DRAWER 290247		PORT ORANGE, FLORIDA 32129-0247			VOLUSIA COUNTY, FLORIDA		UTILITIES RELOCATION								JOB NO.	
REVISIONS		DATE														



DETAIL A
PROFILE (LOOKING NORTHWEST)
12" RECLAIMED WATER N.T.S.



DETAIL B
PLAN (LOOKING NORTHWEST)
18" WATER MAIN N.T.S.



DUNLAWTON SH 1.DWG		QUENTIN L. HAMPTON ASSOCIATES, INC.		CITY OF		DUNLAWTON AVENUE		76.606		DESIGNED MAH		DATE /96		SCALE		SHEET NO.	
		CONSULTING ENGINEERS		PORT ORANGE		STATE ROAD 421		AD		DRAWN JRB		DATE /96		AS SHOWN			
		P.O. DRAWER 290247 PORT ORANGE, FLORIDA 32129-0247 904 761-6810		VOLUSIA COUNTY, FLORIDA		UTILITIES RELOCATION		STA. 18+40 TO STA. 24+40		CHECKED MAH		DATE /96		JOB NO.			
NO		BY		REVISIONS		DATE				APPROVED		DATE				OF	

C:\ACAD\TOWN\SH 1.DWG 15:20:32 30 1995

ASBUILT SURVEY

FILENAME: PO-GC

1207003 STORM UNDER WATER 7/11/12
WATER MAIN ASBUILTS 7/25/12
SANITARY ASBUILTS 9/22/12
ADD UTILITY TIES/ENCL. COMMENTS 9/29/12
ADD GREASE TRAP MANHOLE TIES 10/02/12
DETAIL OF WATER TIE IN AREA 10/12/12
REVISE PER CITY COMMENTS 10/16/12

REVISIONS
DATE FOR: KSM CONST. DATE: 5/22/12 NO. 1205002 F.B. FILE

AS-BUILT MH 3
T.C. = 25.04
N. INV. = 18.03
E. INV. = 18.08

AS-BUILT MH 4
T.C. = 25.17
W. INV. = 18.40
S. INV. = 18.51

AS-BUILT S-29
T.C. = 25.00
N. INV. = 18.34
S. INV. = 18.33
SUMP = 15.44

AS-BUILT S-28
T.C. = 24.49
N. INV. = 18.49
S. INV. = 18.55
SUMP = 15.45

AS-BUILT MH 5
T.C. = 24.84
N. INV. = 18.37
S. INV. = 18.42
E. INV. = 18.49

AS-BUILT MH 6
T.C. = 24.75
N. INV. = 18.74

AS-BUILT S-30
T.C. = 24.59
N. INV. = 16.67
SUMP = 15.91

AS-BUILT S-31
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-32
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-33
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-34
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-35
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-36
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-37
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-38
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-39
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-40
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-41
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-42
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-43
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-44
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-45
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-46
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-47
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-48
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

AS-BUILT S-49
T.C. = 24.77
N. INV. = 18.93
E. INV. = 18.48
NE INV. 20.68
SW INV. 19.22
N INV. 19.22

NO.	DATE	REVISION	BY
1	10-10-11	DATE	NO.
2	10-10-11	PER CITY OF PORT ORANGE	2
3	10-11-12	PER CITY OF PORT ORANGE	3

DESIGNER	DRAWN BY	FILE	PROJECT	DATE	SCALE
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DESIGNER	DRAWN BY	FILE	PROJECT	DATE	SCALE
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DESIGNER	DRAWN BY	FILE	PROJECT	DATE	SCALE
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DESIGNER	DRAWN BY	FILE	PROJECT	DATE	SCALE
KAB	JCP	1104.1	1104-1	05-10-11	1"=30'

ALANN ENGINEERING GROUP, INC.
CONSULTING ENGINEERS
113 ORANGE BEACH, FL 32174
386/673-3927
386/673-3927

GOLDEN CORRAL
CITY OF PORT ORANGE, FLORIDA
UTILITY PLAN

LOT 1
CRAIG FARMS PLAT
NUMBER TWO MAP
BOOK 11, PAGE 80

LOT 2
CRAIG FARMS PLAT
NUMBER TWO MAP
BOOK 11, PAGE 80

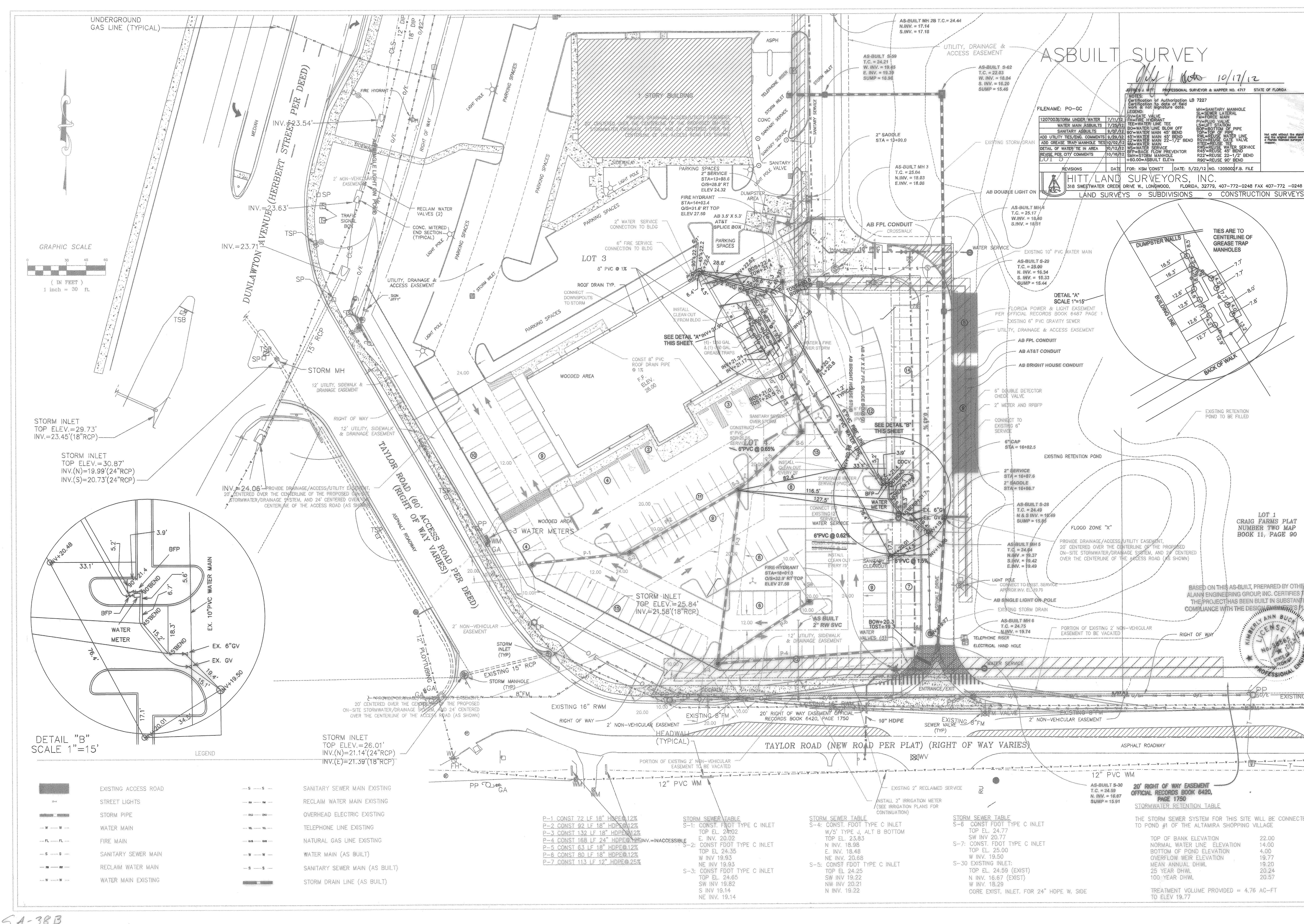
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CRAIG FARMS PLAT
NUMBER TWO MAP
BOOK 11, PAGE 80

LOT 4
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NUMBER TWO MAP
BOOK 11, PAGE 80

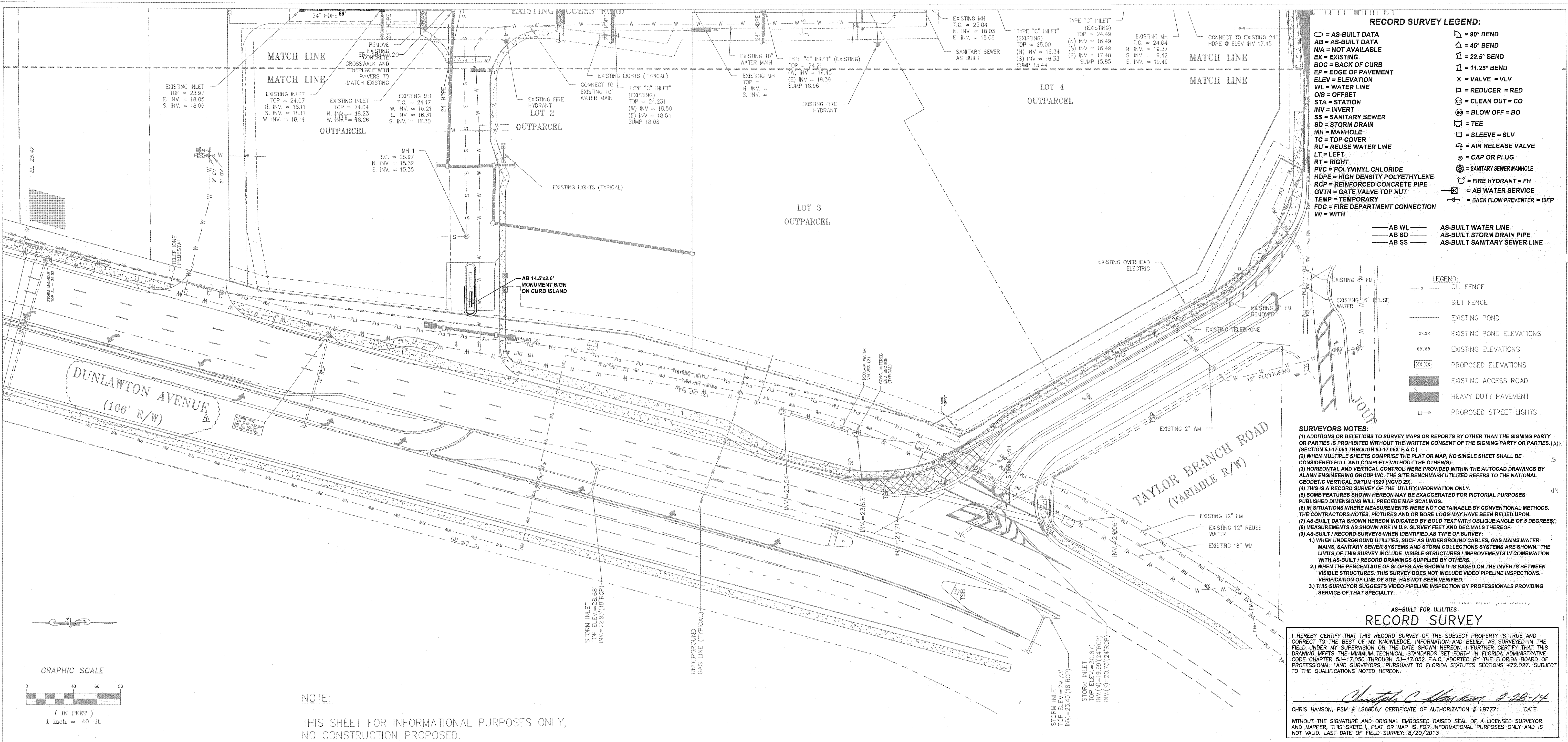
LOT 5
CRAIG FARMS PLAT
NUMBER TWO MAP
BOOK 11, PAGE 80

LOT 6
CRAIG FARMS PLAT
NUMBER TWO MAP
BOOK 11, PAGE 80

LOT 7
CRAIG FARMS PLAT
NUMBER TWO MAP
BOOK 11, PAGE 80



SA-383



SEWER STRUCTURE TABLE		SEWER STRUCTURE TABLE		PIPE TABLE					PIPE TABLE					PIPE TABLE					STORM STRUCTURE TABLE		STORM STRUCTURE TABLE		STORM STRUCTURE TABLE		STORM STRUCTURE TABLE		STORM STRUCTURE TABLE		STORM STRUCTURE TABLE		
STRUCTURE NAME	DETAILS	STRUCTURE NAME	DETAILS	NAME	SIZE	LENGTH	SLOPE	MATERIAL	NAME	SIZE	LENGTH	SLOPE	MATERIAL	NAME	SIZE	LENGTH	SLOPE	MATERIAL	STRUCTURE NAME	DETAILS	STRUCTURE NAME	DETAILS	STRUCTURE NAME	DETAILS	STRUCTURE NAME	DETAILS	STRUCTURE NAME	DETAILS	STRUCTURE NAME	DETAILS	
MH-2	MANHOLE TOP = 25.63 INV IN (N) = 17.88 INV IN (S) = 17.79 INV OUT (W) = 17.83	MH-9	MANHOLE TOP = 24.47 INV IN (NE) = 20.16 INV OUT (W) = 20.08	SS P-1	8"	187'	0.42%	PVC SDR 35	P-20	48"	173'	0.28%	RCP	P-39	30"	127'	0.28%	HDPPE	S-21	TYPE "C" INLET W/TYPE J ALT B BOTTOM TOP = 22.28 SUMP = 13.83 INV IN (SE) = 17.68 INV IN (W) = 14.55 INV IN (SW) = 17.38 INV OUT (E) = 14.50	S-27	TYPE "C" INLET RAISE TOP TO TOP = 24.31 SUMP = 17.84 INV IN (W) = 18.10 INV OUT (E) = 18.05	S-34	TYPE "C" INLET TOP = 24.22 SUMP = 20.22 INV (N) = 20.70	S-42	SMH TOP = 24.65 SUMP = 13.29 INV IN (SW) = 18.29 INV IN (NW) = 13.63 INV OUT (SE) = 13.81	S-56	TYPE "C" INLET TOP = 23.86 SUMP = 19.35 INV OUT (W) = 19.98	S-64	TYPE "C" INLET TOP = 24.57 SUMP = 19.75 INV IN (S) = 19.77 INV OUT (NW) = 19.97	
MH-3	MANHOLE TOP = 24.62 INV IN (E) = 18.86 INV OUT (S) = 18.79	MH-10	MANHOLE TOP = 23.86 INV IN (N) = 20.55 INV OUT (SW) = 20.41	SS P-2	8"	59'	0.42%	PVC SDR 35	P-21	48"	160'	0.26%	HDPE	P-40	42"	213'	0.21%	HDPE	S-22	TYPE "C" INLET W/TYPE J ALT B BOTTOM TOP = 24.24 SUMP = 14.20 INV IN (S) = 17.28 INV OUT (E) = 16.87	S-28	TYPE "C" INLET TOP = 24.29 SUMP = 16.48 INV IN (W) = 17.78 INV IN (S) = 17.28 INV OUT (E) = 16.87	S-35	TYPE "C" INLET RAISE TOP TO TOP = 24.65 SUMP = 15.50 INV OUT (S) = 16.03	S-43	HEADWALL INV IN (HW) = 13.56 INV IN (E) = 20.33 INV OUT (N) = 20.31	S-57	TYPE "C" INLET TOP = 24.24 SUMP = 19.72 INV IN (E) = 20.33 INV OUT (N) = 20.31	S-65	SMH TOP = 25.03 SUMP = 16.86 INV IN (N) = 19.57 INV OUT (W) = 17.48	
MH-4	MANHOLE TOP = 23.48 INV IN (S) = 19.87 INV OUT (W) = 19.71	MH-11	MANHOLE TOP = 25.04 INV OUT (S) = 21.33	SS P-3	8"	216'	0.40%	PVC SDR 35	P-22	48"	160'	0.18%	HDPE	P-41	42"	117'	0.21%	RCP	S-23	TYPE "C" INLET W/TYPE J ALT B BOTTOM TOP = 24.24 SUMP = 17.93 INV IN (W) = 17.93 INV OUT (N) = 16.52	S-29	TYPE "C" INLET TOP = 24.43 SUMP = 18.43 INV IN (S) = 18.59 INV OUT (E) = 19.48	S-36	TYPE "C" INLET W/TYPE J ALT B BOTTOM TOP = 24.76 SUMP = 14.95 INV IN (N) = 15.30 INV OUT (E) = 15.24	S-50	TYPE "C" INLET TOP = 24.76 SUMP = 20.50 INV OUT (S) = 20.97	S-58	SMH TOP = 25.03 SUMP = 16.86 INV IN (N) = 19.57 INV OUT (W) = 17.48	S-20	SMH TOP = 24.65 SUMP = 13.53 INV IN (N) = 18.83 INV OUT (S) = 13.94 INV IN (W) = 14.91	
MH-5	MANHOLE TOP = 24.91 INV OUT (N) = 20.07	STUB-1	STUB CONNECTION INV IN (E) = 16.35	SS P-4	8"	383'	0.37%	PVC SDR 35	P-23	30"	65'	0.31%	HDPE	P-42	42"	117'	0.21%	RCP	S-24	TYPE "C" INLET RAISE TOP TO TOP = 24.74 SUMP = 14.61 AB INV E=17.74 INV IN (W) = 18.26 INV IN (S) = 15.64 INV OUT (N) = 15.13	S-30	TYPE "C" INLET (EXISTING) RAISE TOP TO TOP = 24.25 SUMP = 17.32 INV IN (W) = 18.45 INV OUT (N) = 18.52	S-39	TYPE "C" INLET TOP = 24.28 SUMP = 17.17 INV IN (S) = 18.10 INV OUT (N) = 17.83	S-52	TYPE "C" INLET TOP = 24.56 SUMP = 19.88 INV IN (N) = 20.52 INV OUT (W) = 20.48	S-59	TYPE "C" INLET TOP = 24.73 SUMP = 19.21 INV OUT (N) = 19.77 INV IN (S) = 20.23	S-60	TYPE "C" INLET TOP = 24.51 SUMP = 17.76 INV IN (S) = 18.34 INV OUT (N) = 18.29	
MH-6	MANHOLE TOP = 25.24 INV OUT (W) = 20.17	STUB-2	STUB CONNECTION INV IN (E) = 19.61	SS P-5	8"	129'	0.41%	PVC SDR 35	P-24	42"	83'	0.37%	HDPE	P-43	42"	117'	0.26%	RCP	S-31	TYPE "C" INLET W/TYPE J ALT B BOTTOM TOP = 24.16 SUMP = 15.01 INV IN (W) = 15.67 INV IN (S) = 15.42 INV OUT (S) = 20.41	S-33	TYPE "C" INLET TOP = 24.40 SUMP = 19.90 INV (N) = 20.50 INV (S) = 20.50	S-40	TYPE "C" INLET W/TYPE J ALT B BOTTOM TOP = 24.28 SUMP = 13.63 INV IN (W) = 14.90 INV IN (S) = 18.83 INV IN (SW) = 19.73 INV OUT (E) = 14.39	S-54	TYPE "C" INLET TOP = 24.38 SUMP = 19.40 INV IN (S) = 19.95 INV OUT (H) = 19.93	S-63	QUARTZ POLYCAST CATCH BASIN TO TRENCH DRAIN TOP = 21.33 SUMP = 17.87 INV OUT (NE) = 16.77			
MH-8	MANHOLE TOP = 24.84 INV IN (E) = 19.23 INV OUT (W) = 19.19			SS P-6	8"	43'	0.47%	PVC SDR 35	P-25	36"	49'	0.35%	HDPE	P-44	42"	117'	0.26%	RCP	S-25	TYPE "C" INLET W/TYPE J ALT B BOTTOM TOP = 24.55 SUMP = 15.87 INV IN (S) = 19.19 INV IN (W) = 16.45 INV OUT (E) = 16.47			S-41	TYPE "C" INLET W/TYPE J ALT B BOTTOM TOP = 24.27 SUMP = 17.30 INV IN (W) = 13.94 INV OUT (SE) = 13.94							
				NOTE: ALL PVC PIPE IS "SDR 26" UNLESS OTHERWISE NOTED.																											

ALANN ENGINEERING GROUP, INC.
CONSULTING ENGINEERS
860 AIRPORT ROAD, SUITE 113
ORLANDO, FL 32174
TEL: (386) 673-3927

ALTAMIRA SHOPPING VILLAGE
PORT ORANGE, FLORIDA
UTILITY PLAN

1/14/13	FO #2: REVISED BLDG	KAB	BY
1	9/05/12	FO #1: CLEAN UP ITEMS	KAB
		REVISION	
		NO.	DATE

DESIGNER
KAB

DRAWN BY
JCP

FILE
1107.8

PROJECT
1107-8

DATE
05-15-12

SCALE
1"=40'

SHEET
A100f22

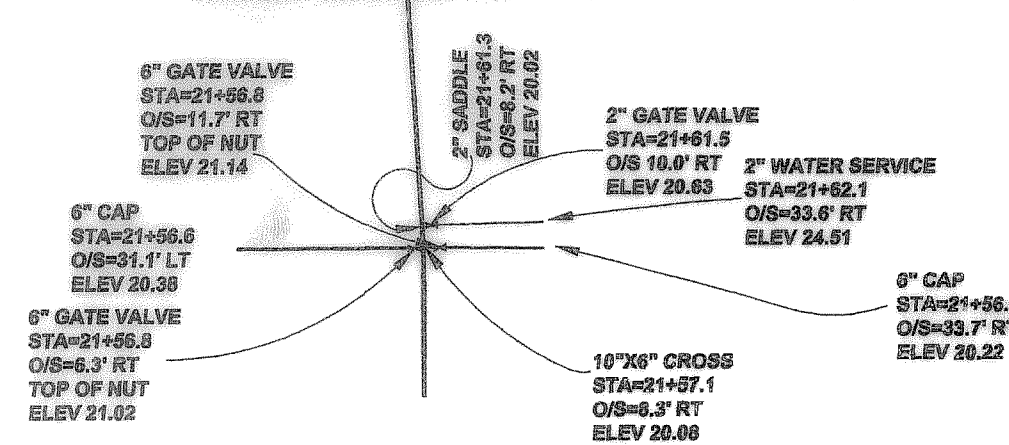
AS-BUILT DATA PROVIDED BY:



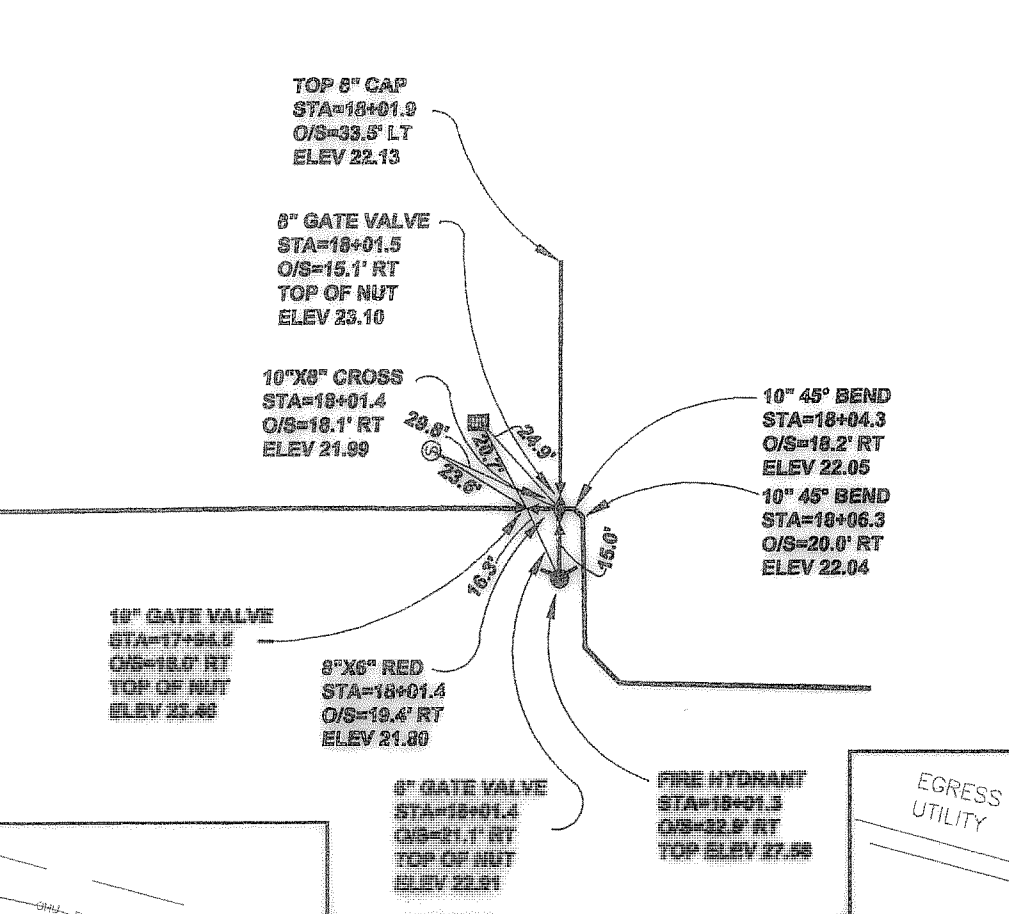
2080 SOUTH NOVA ROAD
SUITE A107
SOUTH DAYTONA, FLORIDA 32119
PHONE: 386-763-4130
FAX: 386-763-4129
CHRISH@OCEANSIDESURVEYING.COM

RECORD SURVEY LEGEND:
STA = STATION
O/S = OFFSET
ELEV = ELEVATION
LT = LEFT
RT = RIGHT
WL = WATER LINE
RED = REDUCER
T.C. = TOP COVER
INV. = INVERT
CONC. = CONCRETE
MES = METRIC END SECTION
AB = AS-BUILT DATA
RWM = REUSE WATER
SLV = SLEEVE
SVC = SERVICE
HDPE = HIGH DENSITY POLYETHYLENE
○ = AS-BUILT DATA

WATER LINE DETAIL 21+57 NOT TO SCALE



WATER LINE DETAIL 18+00 NOT TO SCALE



SANITARY SEWER STRUCTURE TABLE

MH1	TOP ELEVATION 25.72	MH4	TOP ELEVATION 25.17
N INVERT ELEVATION 15.33	W. INVERT ELEVATION 15.33	W. INVERT ELEVATION 15.33	15.33
E INVERT ELEVATION 15.33	S. INVERT ELEVATION 15.33	S. INVERT ELEVATION 15.33	15.33
MH2	TOP ELEVATION 24.17	MH5	TOP ELEVATION 24.64
W. INVERT ELEVATION 15.33	N. INVERT ELEVATION 15.33	N. INVERT ELEVATION 15.33	15.33
E&S INVERT ELEVATION 15.33	E&S INVERT ELEVATION 15.33	E&S INVERT ELEVATION 15.33	15.33
MH2B	TOP ELEVATION 24.44	MH6	TOP ELEVATION 24.72
W. INVERT ELEVATION 15.33	N. INVERT ELEVATION 15.33	N. INVERT ELEVATION 15.33	15.33
S INVERT ELEVATION 15.33	S INVERT ELEVATION 15.33	S INVERT ELEVATION 15.33	15.33
MH3	TOP ELEVATION 24.94		
N INVERT ELEVATION 15.33	N. INVERT ELEVATION 15.33	N. INVERT ELEVATION 15.33	15.33
E INVERT ELEVATION 15.33	E INVERT ELEVATION 15.33	E INVERT ELEVATION 15.33	15.33

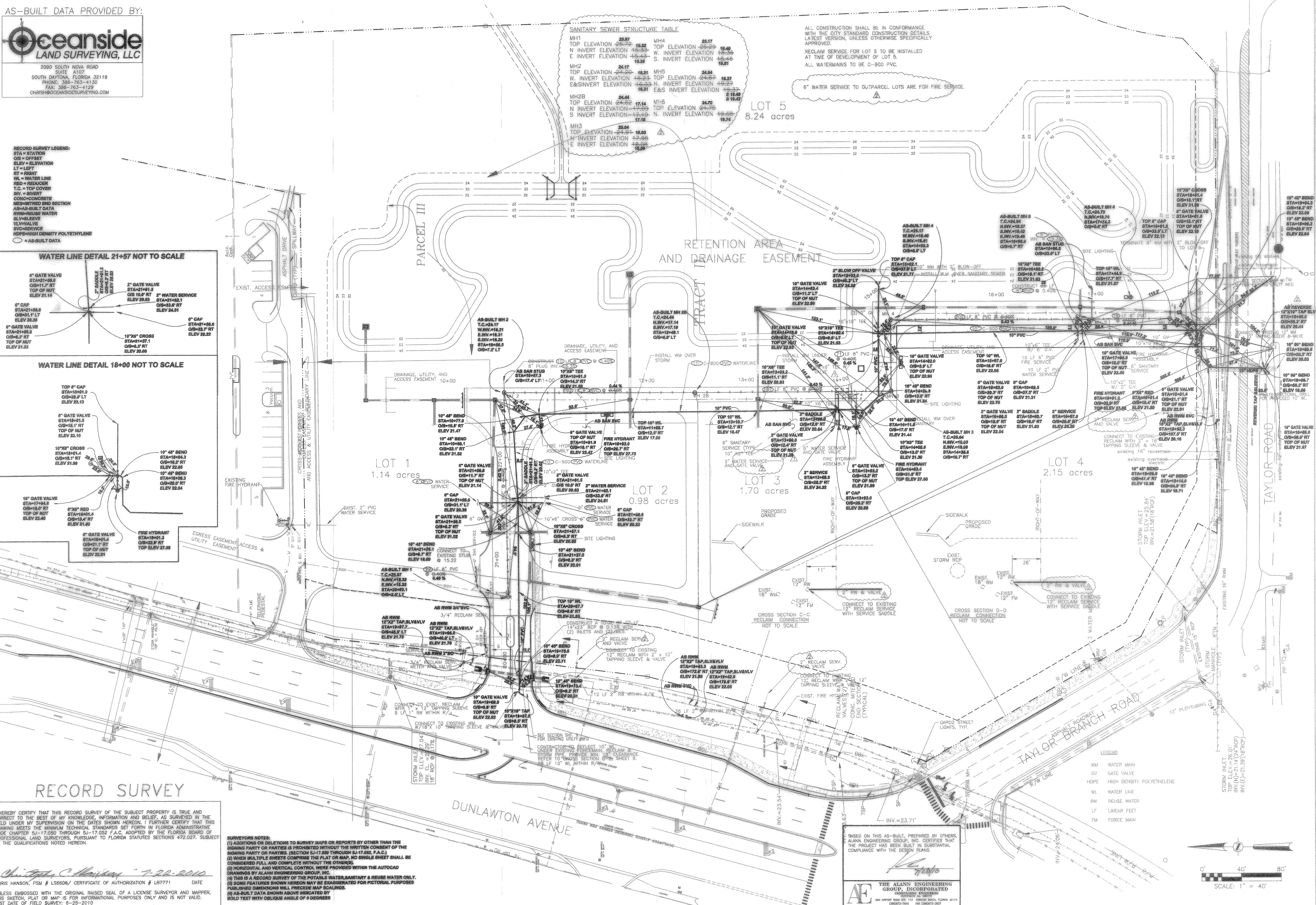
ALL CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE CITY STANDARD CONSTRUCTION DETAILS LATEST VERSION, UNLESS OTHERWISE SPECIFICALLY APPROVED.

RECLAIM SERVICE FOR LOT 5 TO BE INSTALLED AT TIME OF DEVELOPMENT OF LOT 5. ALL WATERMANS TO BE C-900 PVC.

6" WATER SERVICE TO OUTPARCEL LOTS ARE FOR FIRE SERVICE.

LOT 5
8.24 acres

RETENTION AREA AND DRAINAGE EASEMENT



RECORD SURVEY

I HEREBY CERTIFY THAT THIS RECORD SURVEY OF THE SUBJECT PROPERTY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, AS SURVEYED IN THE FIELD UNDER MY SUPERVISION ON THE DATES SHOWN HEREON. I FURTHER CERTIFY THAT THIS DRAWING MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH IN FLORIDA ADMINISTRATIVE CODE CHAPTER 5J-17.050 THROUGH 5J-17.052 F.A.C. ADOPTED BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS, PURSUANT TO FLORIDA STATUTES SECTIONS 472.027, SUBJECT TO THE QUALIFICATIONS NOTED HEREON.

CHRIS HANSON, F.S.M. # 158606 / CERTIFICATE OF AUTHORIZATION # LB7771 DATE 7-22-2010

UNLESS EMBOSSED WITH THE ORIGINAL RAISED SEAL OF A LICENSE SURVEYOR AND MAPPER, THIS SKETCH, PLAT OR MAP IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT VALID. LAST DATE OF FIELD SURVEY: 6-26-2010

SURVEYOR'S NOTES:
(1) ADDITIONS OR DELETIONS TO SURVEY MAPS OR REPORTS BY OTHER THAN THE SIGNING PARTY OR PARTIES IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES. (SECTION 5J-17.050 THROUGH 5J-17.052 F.A.C.)
(2) WHEN MULTIPLE SHEETS COMPOSE THE PLAT OR MAP, NO SINGLE SHEET SHALL BE CONSIDERED FULL AND COMPLETE WITHOUT THE OTHERS.
(3) HORIZONTAL AND VERTICAL CONTROL, WERE PROVIDED WITHIN THE AUTOCAD DRAWINGS BY ALANN ENGINEERING GROUP, INC.
(4) THIS IS A RECORD SURVEY OF THE POTABLE WATER, SANITARY & REUSE WATER ONLY.
(5) SOME FEATURES SHOWN HEREON MAY BE EXAGGERATED FOR PICTORIAL PURPOSES.
(6) AS-BUILT DATA SHOWN ABOVE INDICATED BY BOLD TEXT WITH OBlique ANGLE OF 5 DEGREES

BASED ON THIS AS-BUILT, PREPARED BY OTHERS, ALANN ENGINEERING GROUP, INC. CERTIFIES THAT THE PROJECT HAS BEEN BUILT IN SUBSTANTIAL COMPLIANCE WITH THE DESIGN PLANS.

THE ALANN ENGINEERING GROUP, INCORPORATED
CONSULTING ENGINEERS
800 AIRPORT ROAD, STE. 113 ORLANDO, FLORIDA 32714
(407) 973-3897 FAX: (407) 973-3897

ALANN ENGINEERING GROUP, INC.
CONSULTING ENGINEERS
CERTIFICATE NO. EB2479
880 AIRPORT ROAD, STE. 113
ORLANDO, FLORIDA 32714
TEL: (407) 973-3897 FAX: (407) 973-3897

ALTAMIRA SHOPPING VILLAGE
PORT ORANGE, FLORIDA
WATER AND SEWER PLAN

NO.	DATE	REVISION	BY
1	7/27/10	ADDENDUM NO. 1	RES
2	11/25/10	ADDENDUM NO. 2	RES
3	11/19/10	FINAL BID DOCUMENTS	RES

DESIGNER
KAB
DRAWN BY

FILE

PROJECT
0323-1

DATE
07/2009

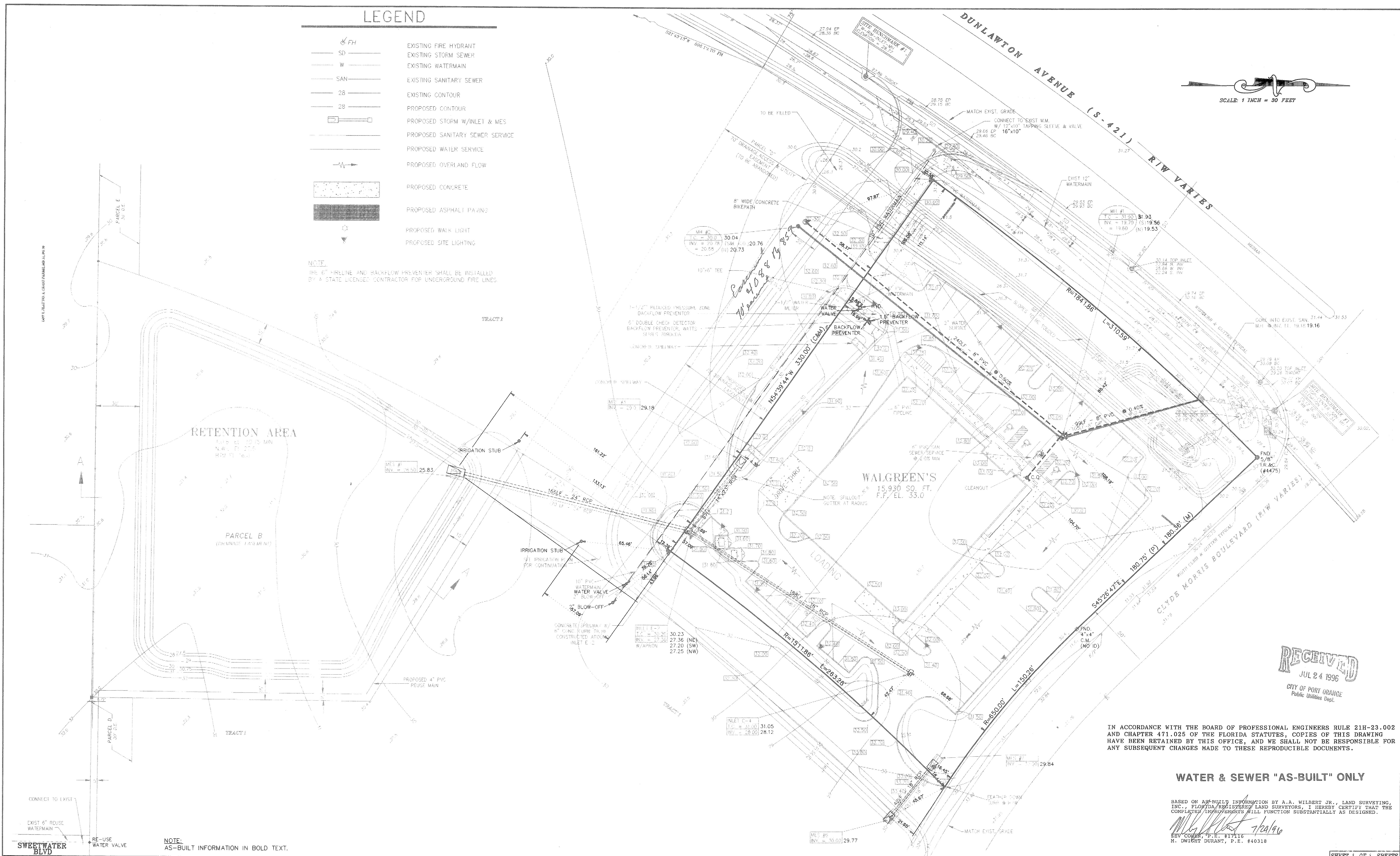
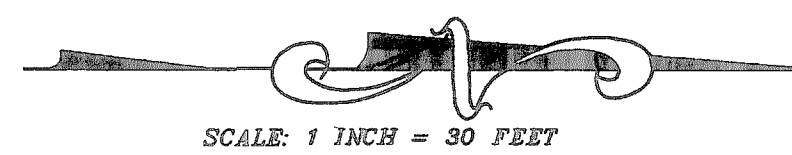
SCALE

SHEET
7 OF 18

LEGEND

- EXISTING FIRE HYDRANT
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED STORM W/INLET & MES
- PROPOSED SANITARY SEWER SERVICE
- PROPOSED WATER SERVICE
- PROPOSED OVERLAND FLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT PAVING
- PROPOSED WALK LIGHT
- PROPOSED SITE LIGHTING

NOTE:
THE 6" HIRLINE AND BACKFLOW PREVENTER SHALL BE INSTALLED BY A STATE LICENSED CONTRACTOR FOR UNDERGROUND FIRE LINES



IN ACCORDANCE WITH THE BOARD OF PROFESSIONAL ENGINEERS RULE 21H-23.002 AND CHAPTER 471.025 OF THE FLORIDA STATUTES, COPIES OF THIS DRAWING HAVE BEEN RETAINED BY THIS OFFICE, AND WE SHALL NOT BE RESPONSIBLE FOR ANY SUBSEQUENT CHANGES MADE TO THESE REPRODUCIBLE DOCUMENTS.

WATER & SEWER "AS-BUILT" ONLY

BASED ON AS-BUILT INFORMATION BY A.A. WILBERT JR., LAND SURVEYING, INC., FLORIDA REGISTERED LAND SURVEYORS, I HEREBY CERTIFY THAT THE COMPLETED IMPROVEMENTS WILL FUNCTION SUBSTANTIALLY AS DESIGNED.

[Signature]
ZEV COHEN, P.E. #17116
N. DWIGHT DURANT, P.E. #40318

PROPERTY LIES IN FLOOD ZONE ON FIRM COMMUNITY PANEL NUMBER		PER PLOT OF DESCRIBED PROPERTY (AS SCALED) DATED		PUBLISHED BASE FLOOD ELEVATION COMMUNITY ESTIMATED BASE FLOOD ELEVATION		BEARING STRUCTURE PER PLAT OF		ELEVATIONS BASED ON PER ENGINEERING PLANS BM DESCRIPTION SITE B.M. # 1 & SITE B.M. # 2 (PER ENGINEERING PLAN)		PUBLISHED ELEVATION #28.77 / #23.34	
LEGEND											
-- DEGREES, -- FEET -- SECONDS: WHEN USED IN A BEARING, T = TANGENT, I.P. = IRON PIPE, R = REINFORCED CONCRETE, C = CONCRETE, N = NORTH, S = SOUTHERN, E = EAST, W = WEST, N.E. = NORTH-EAST, S.E. = SOUTH-EAST, N.W. = NORTH-WEST, S.W. = SOUTH-WEST, C.B.R. = CURB BEARING, C.R. = RADIAL LINE, C.F. = CHAIN-LINK FENCE, C.G. = CHORD BEARING, C.H. = CHORD DISTANCE, N.G.V.D. 1927 = NATIONAL GEOGRAPHIC VERTICAL DATUM, F.O.D.T. = FLORIDA DEPARTMENT OF TRANSPORTATION											
-- (M) = FIELD MEASURED (N) = DEED CALL (S) = SOUTHERN POWER & LIGHT (E) = EAST (W) = WEST (N.E.) = NORTH-EAST (S.E.) = SOUTH-EAST (N.W.) = NORTH-WEST (S.W.) = SOUTH-WEST (C.B.R.) = CURB BEARING (C.R.) = RADIAL LINE (C.F.) = CHAIN-LINK FENCE (C.G.) = CHORD BEARING (C.H.) = CHORD DISTANCE (N.G.V.D. 1927) = NATIONAL GEOGRAPHIC VERTICAL DATUM (F.O.D.T.) = FLORIDA DEPARTMENT OF TRANSPORTATION											
T = TANGENT I.P. = IRON PIPE R = REINFORCED CONCRETE C = CONCRETE N = NORTH S = SOUTHERN E = EAST W = WEST N.E. = NORTH-EAST S.E. = SOUTH-EAST N.W. = NORTH-WEST S.W. = SOUTH-WEST C.B.R. = CURB BEARING C.R. = RADIAL LINE C.F. = CHAIN-LINK FENCE C.G. = CHORD BEARING C.H. = CHORD DISTANCE N.G.V.D. 1927 = NATIONAL GEOGRAPHIC VERTICAL DATUM F.O.D.T. = FLORIDA DEPARTMENT OF TRANSPORTATION											
P.L.S. # 2820 LB. # 4287 VALID ONLY WITH EMBOSSED SEAL											
UNLESS IT BEARS THE SIGNATURE AND THE ORIGINAL RASD SEAL OF A FLORIDA LICENSED SURVEYOR AND IS ACCOMPANIED BY THE ORIGINAL SURVEYOR'S FIELD BOOK, THIS PLAT OF SURVEY IS NOT VALID.											

PREPARED BY:

A.A. WILBERT JR., LAND SURVEYING, INC.

55 SETON PLAT ORMOND BEACH, FLORIDA 32178
(904) 678-9038

GENERAL NOTES:
NO INSTRUMENTS OF RECORD REFLECTING EASEMENTS, RIGHTS-OF-WAY AND OR OWNERSHIP WERE FURNISHED TO THIS SURVEYOR. EXCEPT AS SHOWN THERE MAY BE ADDITIONAL RESTRICTIONS AND OR OTHER MATTERS THAT ARE NOT SHOWN ON THIS PLAT OF SURVEY THAT MAY BE FOUND IN THE PUBLIC RECORDS OF THIS COUNTY. NO UNDERGROUND INSTALLATIONS OR IMPROVEMENTS HAVE BEEN LOCATED EXCEPT AS SHOWN. SURVEY PERFORMED WITHOUT THE BENEFIT OF AN ABSTRACT OR OPINION OF TITLE. ALL MEASUREMENTS SHOWN ARE IN FEET AND HUNDREDTHS THEREOF.

THE TERM CERTIFIED AS USED IN THIS STATEMENT IS UNDERSTOOD TO BE THE PROFESSIONAL OPINION OF THIS SURVEYOR AND FIRM WHICH IS FORMULATED ON HIS BEST KNOWLEDGE, INFORMATION AND BELIEF, AND AS SUCH IT DOES NOT CONSTITUTE A GUARANTEE OR WARRANTY, EITHER EXPRESSED OR IMPLIED. FURTHERMORE, THIS SURVEYOR AND FIRM DOES NOT ASSUME RESPONSIBILITY AND SHALL NOT BE LIABLE FOR CLAIMS ARISING FROM ERRONEOUS OR INCORRECT INFORMATION FURNISHED BY THE OWNER, LENDER, OR OWNER'S CONTRACTORS OR OTHERS, WHICH IS USED AS A BASIS TO FORMULATE THIS SURVEYOR'S OPINION.

TYPE OF SURVEY: AS-BUILT

THIS PLAT IS ALSO HEREBY CERTIFIED TO:

- 1.)
- 2.)
- 3.)
- 4.)

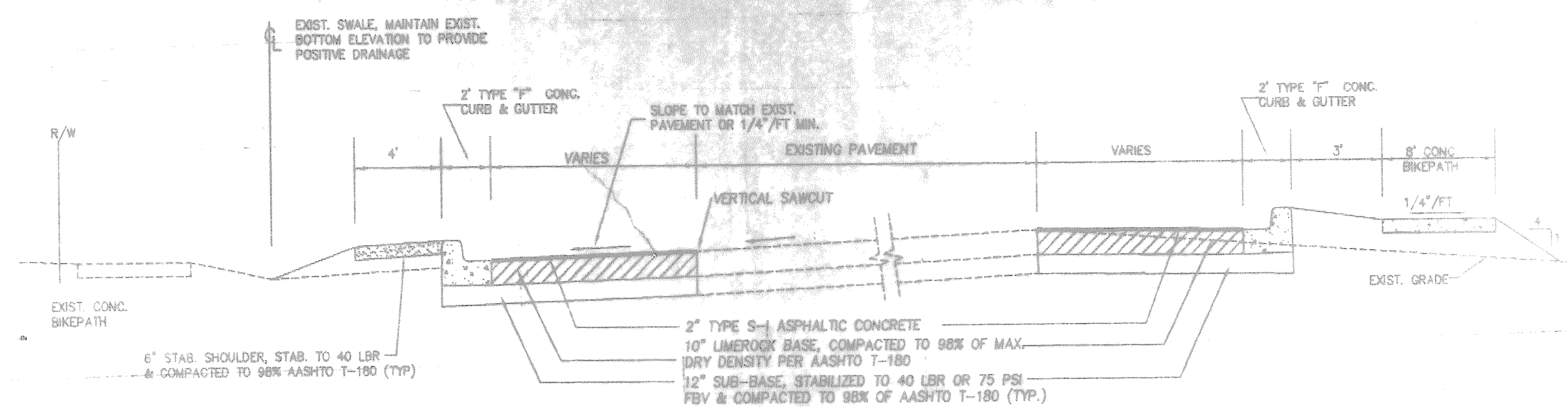
SURVEY FOR THE EXCLUSIVE USE OF:

MARTIN PAVING

THIS PLAT IS HEREBY CERTIFIED AS MEETING THE MINIMUM TECHNICAL STANDARDS (61G17-6, F.A.C.) SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS PURSUANT TO SECTION 472.027 OF THE FLORIDA STATUTES.

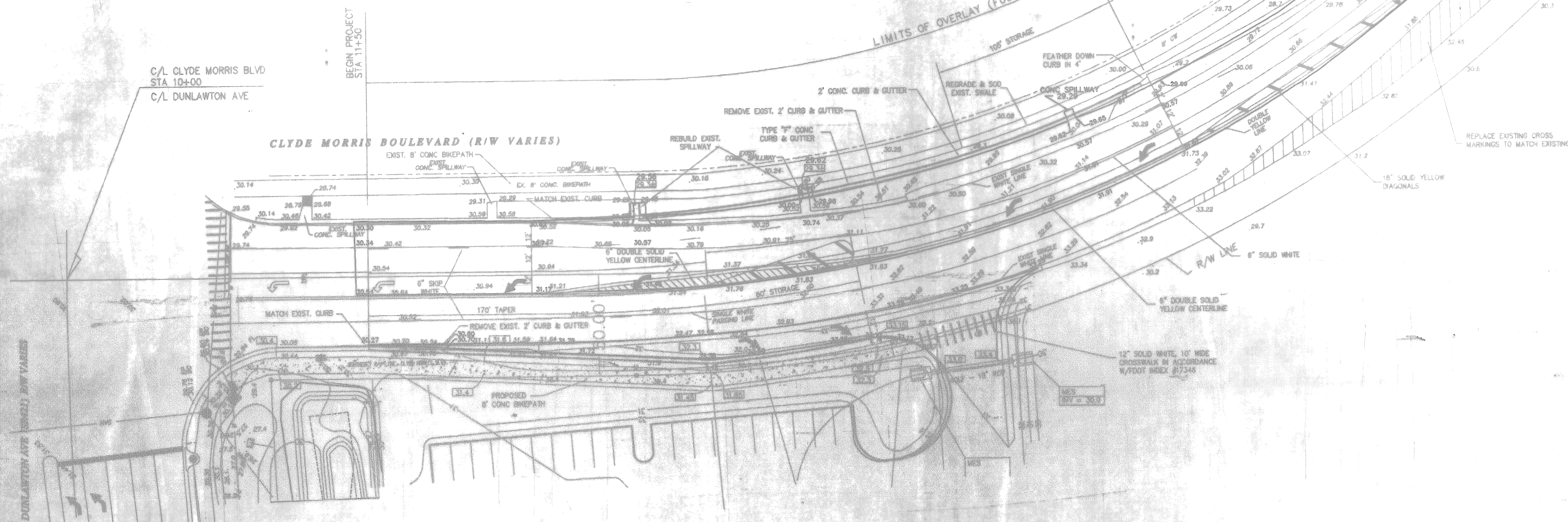
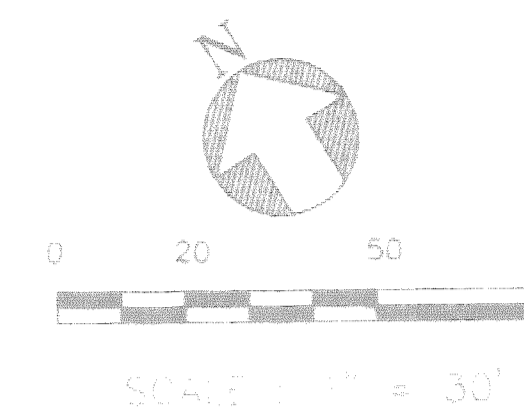
PARTY CHIEF M.F.P.	DRAWN BY: RWR DATE: 07-22-96	CHECKED BY: A.A.W.	FIELD BOOK 121 / 35-36	JOB NO. 96-4558	FIELD SURVEYED 07-10-96	SCALE 1" = 30'
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1. THE LOCATION OF EXISTING UTILITIES HAS BEEN OBTAINED FROM THE MOST RECENT INFORMATION AVAILABLE TO THE ENGINEER. THIS DATA IS NOT GUARANTEED, AND IT SHALL BE THE RESPONSIBILITY OF EACH CONTRACTOR TO DETERMINE THE EXACT LOCATION AND NATURE OF ALL UTILITIES AND NOTIFY THE ENGINEER AS TO DISCREPANCIES, IF ANY EXIST. EACH CONTRACTOR SHALL MAKE HIS FIELD INSPECTION OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION.
2. EXISTING CONDITIONS WITHIN ARE TAKEN FROM SURVEY PERFORMED BY ACCURIGHT SURVEYS OF ORLANDO, INC.
3. ALL WORK WITHIN THE RIGHT-OF-WAY SHALL BE IN CONFORMANCE WITH THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND ROADWAY AND TRAFFIC DESIGN STANDARDS, CURRENT EDITIONS.
4. ALL WORK WITHIN THE F.D.O.T. OR COUNTY RIGHTS-OF-WAY SHALL BE IN CONFORMANCE WITH THE FLORIDA DEPARTMENT OF TRANSPORTATION DRIVEWAY AND UTILITY CONNECTION PERMITS FOR THE PROJECT.
5. ROADWAY SIGNAGE AND MARKING SHALL BE IN CONFORMANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.
6. NON-APPLICABLE EXISTING ROADWAY SIGNAGE SHALL BE REMOVED IN ACCORDANCE WITH FLORIDA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS AND REGULATIONS. APPLICABLE EXISTING ROADWAY SIGNAGE SHALL BE RELOCATED IF REQUIRED FOR CONSTRUCTION.
7. ALL PAVEMENT MARKING WITHIN THE RIGHT-OF-WAY SHALL BE THERMOPLASTIC IN ACCORDANCE W/FDOT STANDARD INDEX NO.17346. COLOR AND SIZE AS INDICATED ON DRAWINGS.
8. PAVEMENT MARKING LAYOUT SHALL BE PERFORMED BY THE CONTRACTOR AND APPROVED IN THE FIELD BY THE FLORIDA DEPARTMENT OF TRANSPORTATION PRIOR TO PLACEMENT.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF TRAFFIC DURING CONSTRUCTION AT ALL TIMES AS APPROVED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION.
10. ALL DISTURBED AREAS WITHIN THE RIGHT-OF-WAY SHALL BE SODDED.
11. WHERE PROPOSED PAVEMENT ABOUT EXISTING PAVEMENT, THE EXISTING PAVEMENT SHALL BE VERTICAL SAWCUT PRIOR TO PLACEMENT OF THE PROPOSED. SAWCUT LOCATIONS SHALL BE APPROVED BY THE FDOT OR COUNTY, AS APPLICABLE, PRIOR TO BEGINNING.
12. REFLECTIVE PAVEMENT MARKERS SHALL BE PROVIDED ON CLYDE MORRIS BLVD. IN ACCORDANCE W/FDOT INDEX NO. 17352



SECTION "A" - "A"

OPTION:
16" COMPACTED LIMEROCK BASE
2-8" LIFTS COMPACTED TO 98% MAX.
DRY DENSITY PER AASHTO T-180



IN ACCORDANCE WITH THE BOARD OF PROFESSIONAL ENGINEERS RULE 21H-23.002 AND CHAPTER 471.025 OF THE FLORIDA STATUTES, COPIES OF THIS DRAWING HAVE BEEN RETAINED BY THIS OFFICE, AND WE SHALL NOT BE RESPONSIBLE FOR ANY SUBSEQUENT CHANGES MADE TO THESE REPRODUCIBLE DOCUMENTS.

BASED ON AS-BUILT INFORMATION BY SLIGER & ASSOCIATES, INC. FLORIDA
REGISTERED LAND SURVEYORS, I HEREBY CERTIFY THAT THE COMPLETED
IMPROVEMENTS WILL FUNCTION SUBSTANTIALLY AS DESIGNED.

ZEV COHEN FLA. P.E. #17116
M: DWIGHT DURANT P.E. #40318

SHEET 2 OF 2 SHEET

MARTIN PAVING

THIS PLAT IS HEREBY CERTIFIED AS MEETING THE MINIMUM TECHNICAL STANDARDS (61017-8, F.A.C.) SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS PURSUANT TO SECTION 472.027 OF THE FLORIDA STATUTES.

TYPE OF SURVEY: AS-BUILT

THIS PLAT IS ALSO HEREBY CERTIFIED TO:

- 1.)
- 2.)
- 3.)
- 4.)

PARTY CHIEF D.C.B.	DRAWN BY DATE: 08
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WNB -96	CHECKED BY A.A.W.
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FIELD BOOK
L / L

JOB NO.
96-4858

FIELD SUR
09-03

VEYED -96	SCALE 1" = 30'
--------------	-------------------

D-41-2

PROPERTY LIES IN PLAIN ZONE		PER PLOT OF DESCRIBED PROPERTY (AC) (DD)		PUBLISHED BASE FLOOD ELEVATION		MEASURING STRUCTURE PER PLAT OF		ELEVATIONS BASED ON 1988 MEANINGFUL PLAIN		ELEVATION SURVEY		
(01) FIRM COMMUNITY PLANE NUMBER		(02) DATED		COMMUNITY ESTIMATED BASE FLOOD ELEVATION				ON DESCRIPTION		SURVEY		
LEGEND:	(03) RECOVERED - 1/4 AC. OR LESS	(04) SECONDARY: HERE LIES	(05) IN A BEARING	(06) T	(07) RADIUS	(08) L.P. = NON P.P.	(09) R/O = REINFORCING R/O	(10) MAS = MASONRY	(11) STMT = SOUTHERN BELL	(12) P.C.P. = PERMANENT COATING	(13) NM = WATER METER	(14) STY = STORY
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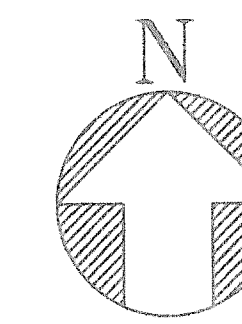
PREPARED BY:
A.A. WILBERT JR., LAND SURVEYING, INC.
55 SETON TRAIL ORMOND BEACH, FLORIDA 32176
(404) 676-0036

P.L.S. # 2820 L.B. # 4267 VALID ONLY WITH EMBROSSED SEAL
 EXAMINER AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR

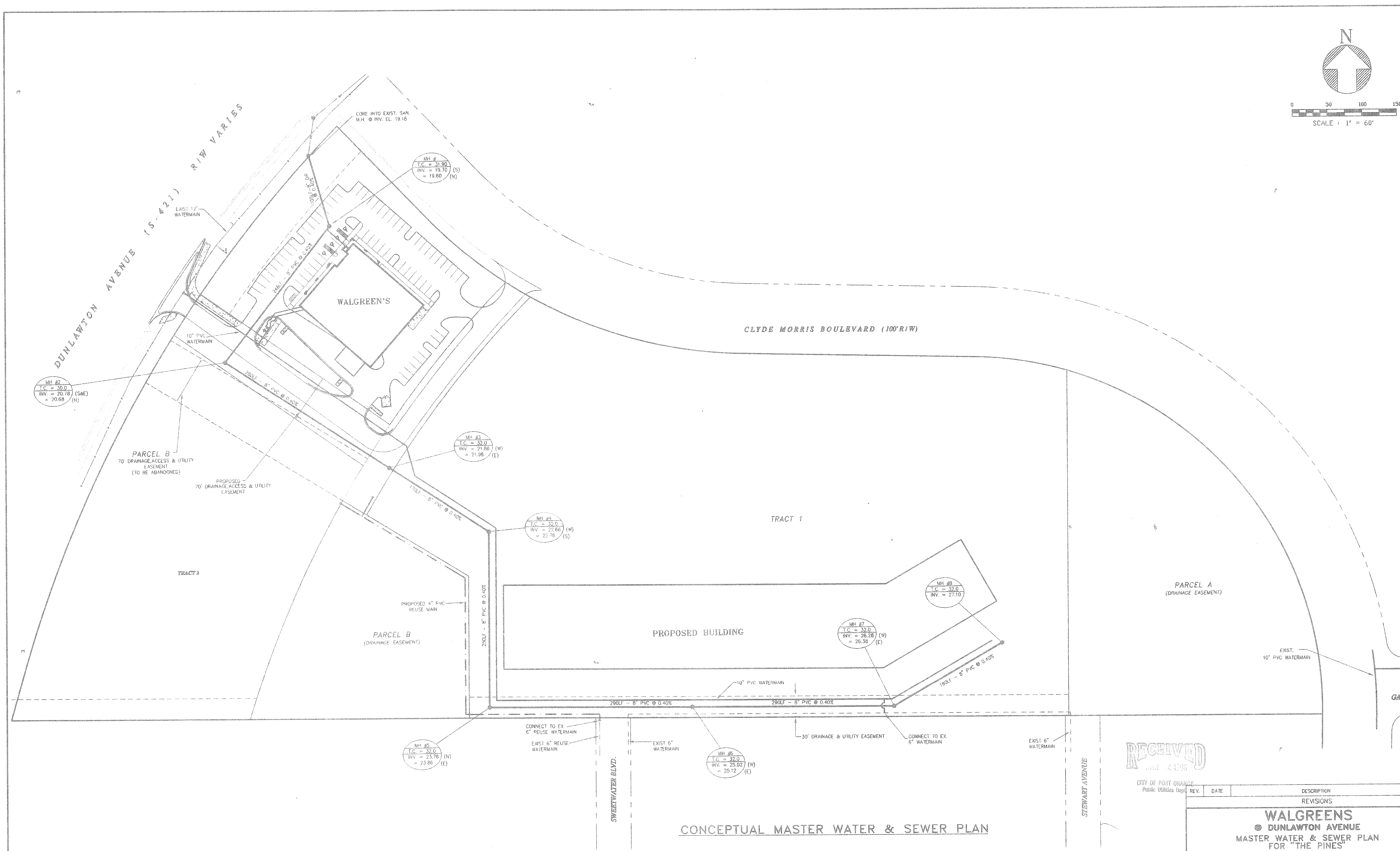
GENERAL NOTES:
NO INSTRUMENTS OF RECORD REFLECTING EASEMENTS, RIGHTS-OF-WAY AND OR OWNERSHIP WERE FURNISHED THIS SURVEYOR, EXCEPT AS SHOWN. THERE MAY BE ADDITIONAL RESTRICTIONS AND OR OTHER MATTERS THAT ARE NOT SHOWN ON THIS PLAT OF SURVEY THAT MAY BE FOUND IN THE RECORDS OF THIS COUNTY. NO UNDERGROUND INSTALLATIONS OR IMPROVEMENTS HAVE BEEN LOCATED EXCEPT AS SHOWN. SURVEY PERFORMED WITHOUT THE BENEFIT OF AN ABSTRACT OR OP OF TITLE. ALL MEASUREMENTS SHOWN ARE IN FEET AND HUNDREDTHS THEREOF.

THE TERM CERTIFIED AS USED IN THIS STATEMENT, IS UNDERSTOOD TO BE THE PROFESSIONAL OPINION OF THIS SURVEYOR AND FIRM WHICH IS FORMULATED ON HIS BEST KNOWLEDGE, INFORMATION AND BELIEF, AND AS SUCH, IT DOES NOT CONSTITUTE A GUARANTEE OR WARRANTY, EITHER EXPRESSED OR IMPLIED. FURTHERMORE, THIS SURVEYOR AND FIRM DOES NOT ASSUME RESPONSIBILITY AND SHALL NOT BE LIABLE FOR CLAIMS ARISING FROM ERRONEOUS OR INCORRECT INFORMATION FURNISHED BY THE OWNER, LENDER, OR OWNER'S CONTRACTORS OR OTHERS, WHICH IS USED AS A BASIS TO FORMULATE THIS SURVEYOR'S OPINION.

SA-21 WALGREEN



0 50 100 150
SCALE: 1" = 60'



CONCEPTUAL MASTER WATER & SEWER PLAN

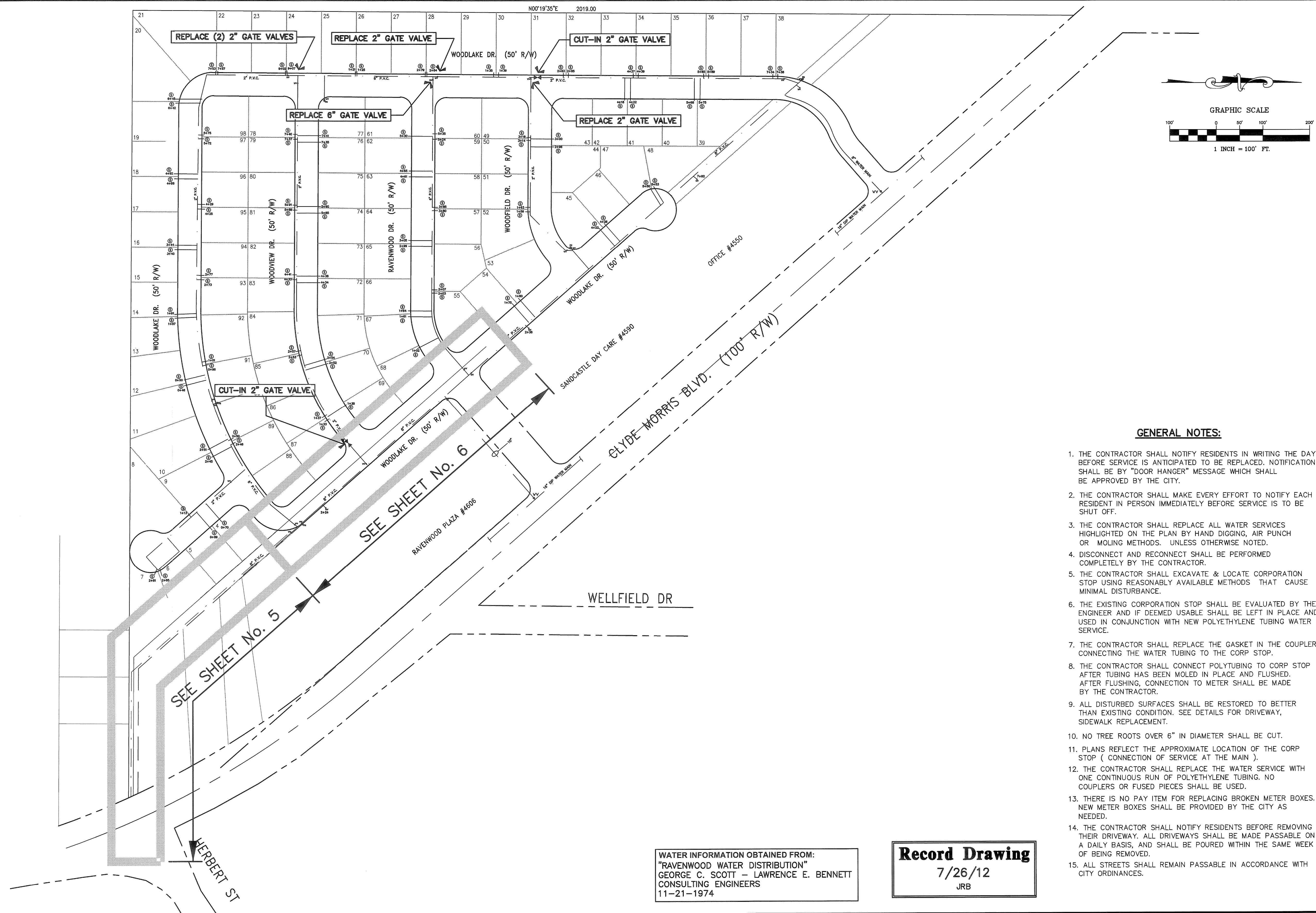
RECEIVED
JAN 4 1996

CITY OF PORT ORANGE Public Utilities Dept.		REV.	DATE	DESCRIPTION	BY
REVISIONS					
WALGREENS © DUNLAWTON AVENUE MASTER WATER & SEWER PLAN FOR "THE PINES"					
CITY OF PORT ORANGE VOLUSIA COUNTY, FLORIDA					
ZEV COHEN & ASSOCIATES, INC. 55 Selzer Trail, Ormond Beach, Florida, 32176 (904) 677-2482 FAX 677-2505					
ENGINEERS • PLANNERS • SURVEYORS • LANDSCAPE ARCHITECTS (EB 4516) (LB 4516) (LC 62)					
© COPYRIGHT BY ZEV COHEN & ASSOCIATES INC. 1995					
DRAWING # 95119-		DATE PREPARED: 1-4-96		95119MST	
DESIGNED BY: ZC	DRAFTED BY: RJD	CHECKED BY:	16-2		
SCALE: 1" = 60'	SHEET	1 OF 1	FILE LOCATION		

SA-21A

PU-336 VIII

J:\KOS\WALGREEN\95119MST Thu Jan 4 16:30:16 1996



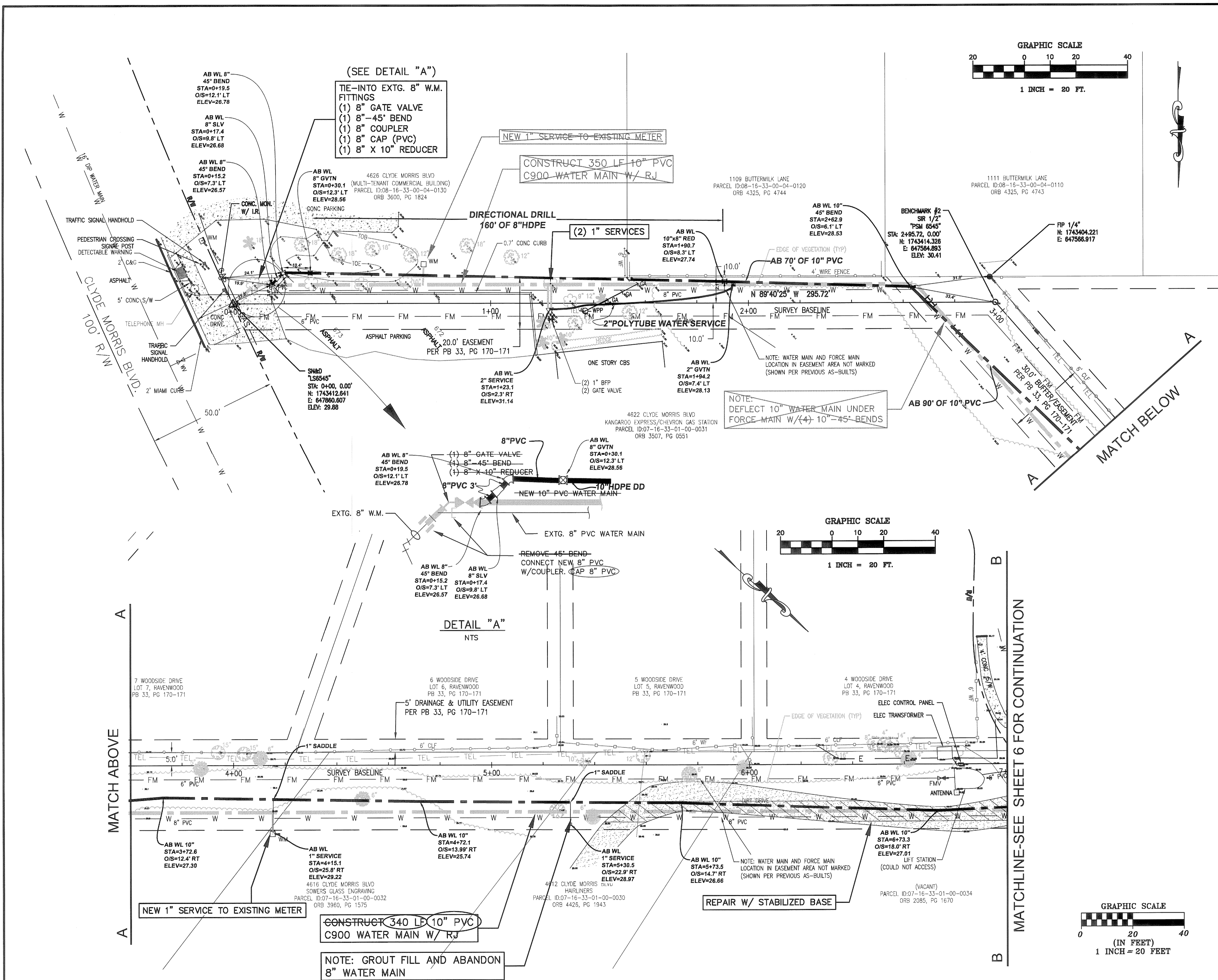
GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTIFY RESIDENTS IN WRITING THE DAY BEFORE SERVICE IS ANTICIPATED TO BE REPLACED. NOTIFICATION SHALL BE BY "DOOR HANGER" MESSAGE WHICH SHALL BE APPROVED BY THE CITY.
2. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO NOTIFY EACH RESIDENT IN PERSON IMMEDIATELY BEFORE SERVICE IS TO BE SHUT OFF.
3. THE CONTRACTOR SHALL REPLACE ALL WATER SERVICES HIGHLIGHTED ON THE PLAN BY HAND DIGGING, AIR PUNCH OR MOLING METHODS. UNLESS OTHERWISE NOTED.
4. DISCONNECT AND RECONNECT SHALL BE PERFORMED COMPLETELY BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL EXCAVATE & LOCATE CORPORATION STOP USING REASONABLY AVAILABLE METHODS THAT CAUSE MINIMAL DISTURBANCE.
6. THE EXISTING CORPORATION STOP SHALL BE EVALUATED BY THE ENGINEER AND IF DEEMED USABLE SHALL BE LEFT IN PLACE AND USED IN CONJUNCTION WITH NEW POLYETHYLENE TUBING WATER SERVICE.
7. THE CONTRACTOR SHALL REPLACE THE GASKET IN THE COUPLER CONNECTING THE WATER TUBING TO THE CORP STOP.
8. THE CONTRACTOR SHALL CONNECT POLYTUBING TO CORP STOP AFTER TUBING HAS BEEN MOLED IN PLACE AND FLUSHED. AFTER FLUSHING, CONNECTION TO METER SHALL BE MADE BY THE CONTRACTOR.
9. ALL DISTURBED SURFACES SHALL BE RESTORED TO BETTER THAN EXISTING CONDITION. SEE DETAILS FOR DRIVEWAY, SIDEWALK REPLACEMENT.
10. NO TREE ROOTS OVER 6" IN DIAMETER SHALL BE CUT.
11. PLANS REFLECT THE APPROXIMATE LOCATION OF THE CORP STOP (CONNECTION OF SERVICE AT THE MAIN).
12. THE CONTRACTOR SHALL REPLACE THE WATER SERVICE WITH ONE CONTINUOUS RUN OF POLYETHYLENE TUBING. NO COUPLERS OR FUSED PIECES SHALL BE USED.
13. THERE IS NO PAY ITEM FOR REPLACING BROKEN METER BOXES. NEW METER BOXES SHALL BE PROVIDED BY THE CITY AS NEEDED.
14. THE CONTRACTOR SHALL NOTIFY RESIDENTS BEFORE REMOVING THEIR DRIVEWAY. ALL DRIVEWAYS SHALL BE MADE PASSABLE ON A DAILY BASIS, AND SHALL BE POURED WITHIN THE SAME WEEK OF BEING REMOVED.
15. ALL STREETS SHALL REMAIN PASSABLE IN ACCORDANCE WITH CITY ORDINANCES.

WATER INFORMATION OBTAINED FROM:
"RAVENWOOD WATER DISTRIBUTION"
GEORGE C. SCOTT - LAWRENCE E. BENNETT
CONSULTING ENGINEERS
11-21-1974

Record Drawing
7/26/12
JRB

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SURVEYORS NOTES:

- (1) ADDITIONS OR DELETIONS TO SURVEY MAPS OR REPORTS BY OTHER THAN THE SIGNING PARTY OR PARTIES IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES. (SECTION 5-17.050 THROUGH 5-17.052, F.A.C.)
- (2) WHEN MULTIPLE SHEETS COMPRISE THE PLAT OR MAP, NO SINGLE SHEET SHALL BE CONSIDERED FULL AND COMPLETE WITHOUT THE OTHER(S).
- (3) HORIZONTAL AND VERTICAL CONTROL WERE PROVIDED WITHIN THE AUTOCAD DRAWINGS QUENTIN L. HAMPTON ASSOCIATES, INC. CONSULTING ENGINEERS.
- (4) THIS IS A RECORD SURVEY OF THE WATER MAIN INFORMATION ONLY.
- (5) SOME FEATURES SHOWN HEREON MAY BE EXAGGERATED FOR PICTORIAL PURPOSES PUBLISHED DIMENSIONS WILL PRECEDE MAP SCALINGS.
- (6) NOT ALL MEASUREMENTS WERE OBTAINABLE BY CONVENTIONAL METHODS. THE CONTRACTORS NOTES, PICTURES AND OR BORE LOGS MAY HAVE BEEN RELIED UPON.
- (7) AS-BUILT DATA SHOWN HEREON INDICATED BY BOLD TEXT WITH OBLIQUE ANGLE OF 5 DEGREES.
- (8) MEASUREMENTS AS SHOWN ARE IN U.S. SURVEY FEET AND DECIMALS THEREOF.
- (9) AS-BUILT / RECORD SURVEYS WHEN IDENTIFIED AS TYPE OF SURVEY:
 - 1.) WHEN UNDERGROUND UTILITIES, SUCH AS UNDERGROUND CABLES, GAS MAINS, WATER MAINS, SANITARY SEWER SYSTEMS AND STORM COLLECTIONS SYSTEMS ARE SHOWN, THE LIMITS OF THIS SURVEY INCLUDE VISIBLE STRUCTURES / IMPROVEMENTS IN COMBINATION WITH AS-BUILT / RECORD DRAWINGS SUPPLIED BY OTHERS.
 - 2.) WHEN THE PERCENTAGE OF SLOPES ARE SHOWN IT IS BASED ON THE INVERTS BETWEEN VISIBLE STRUCTURES. THIS SURVEY DOES NOT INCLUDE VIDEO PIPELINE INSPECTIONS. VERIFICATION OF LINE OF SITE HAS NOT BEEN VERIFIED.
 - 3.) THIS SURVEYOR SUGGESTS VIDEO PIPELINE INSPECTION BY PROFESSIONALS PROVIDING SERVICE OF THAT SPECIALTY.

- RECORD SURVEY LEGEND:**
- = AS-BUILT
 - AB = AS-BUILT DATA
 - ELEV = ELEVATION
 - EX = EXISTING
 - WL = WATER LINE
 - OS = OFFSET
 - STA = STATION
 - TO = TOP COVER
 - T.O.P. = TOP OF PIPE
 - FM = FIRE HYDRANT
 - SLV = SLEEVE
 - LTH = LEFT
 - RT = RIGHT
 - PV = PLUG VALVE
 - BO = BLOW OFF
 - RED = REDUCER
 - VLV = VALVE
 - LS = LIFT STATION
 - DIP = DIPLOMATIC IRON PIPE
 - PVC = POLYVINYLCHLORIDE
 - HDPE = HIGH DENSITY POLYETHYLENE
 - GVTN = GATE VALVE TOP NUT
 - PE = POLYETHYLENE
 - LF = LINEAR FEET
 - DD = DIRECTIONAL DRILL
 - AB-10-WL = AS-BUILT 10" WATER LINE
 - AB-8-WL = AS-BUILT 8" WATER LINE
 - = GATE VALVE
 - = FIRE HYDRANT
 - = REDUCER
 - = CROSS TEE
 - = TEE
 - = 45° BEND
 - = 22.5° BEND
 - = TAPPING VALVE
 - = TAPPING SLEEVE
 - = BLOWOFF
 - = SLEEVE
 - = DOUBLE WATER SERVICE
 - = SINGLE WATER SERVICE
 - = 90° BEND
 - = 11.25° BEND
 - = AIR RELEASE VALVE
 - = ABANDONED GATE VALVE

Record Drawing
7/26/12
JRB

AS-BUILT DATA PROVIDED BY:
Oceanside
LAND SURVEYING, LLC
2090 SOUTH NOVA ROAD
SUITE 107
SOUTH DAYTONA, FLORIDA 32119
PHONE: 386-763-4130
FAX: 386-763-4129
CHRISH@OCEANSIDESURVEYING.COM

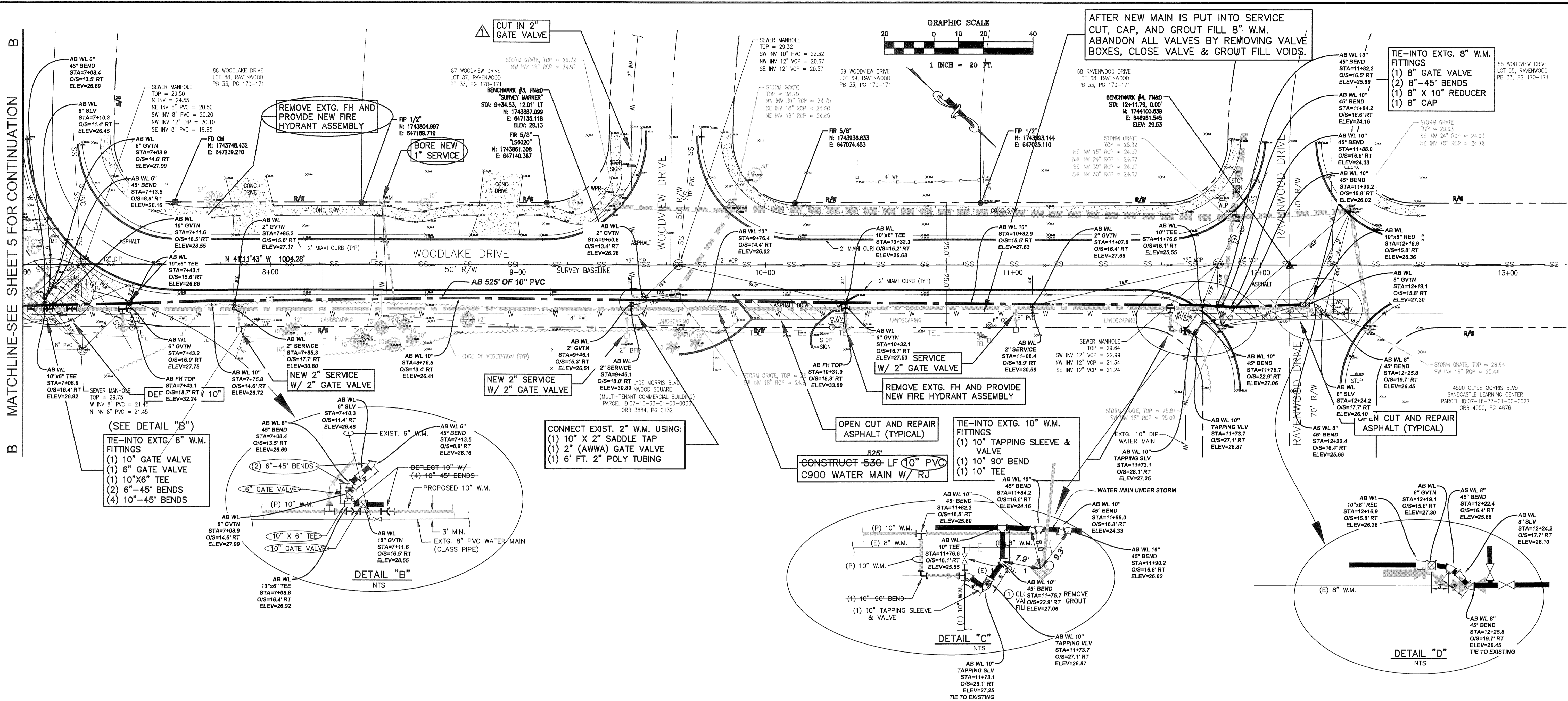
RECORD SURVEY

I HEREBY CERTIFY THAT THIS RECORD SURVEY OF THE SUBJECT PROPERTY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, AS SURVEYED IN THE FIELD UNDER MY SUPERVISION ON THE DATE SHOWN HEREON. I FURTHER CERTIFY THAT THIS DRAWING MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH IN FLORIDA ADMINISTRATIVE CODE CHAPTER 5J-17.050 THROUGH 5J-17.052 F.A.C. ADOPTED BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS, PURSUANT TO FLORIDA STATUTES SECTIONS 472.027. SUBJECT TO THE QUALIFICATIONS NOTED HEREON.

CHRIS HANSON, PSM # LS6606 / CERTIFICATE OF AUTHORIZATION # LB7771 DATE
WITHOUT THE SIGNATURE AND ORIGINAL EMBOSSED RAISED SEAL OF A LICENSED SURVEYOR AND MAPPER, THIS SKETCH, PLAT OR MAP IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT VALID. LAST DATE OF FIELD SURVEY: 6/29/2012

No.		BY	REVISIONS	DATE	No.		BY	REVISIONS	DATE	QUENTIN L. HAMPTON ASSOCIATES, INC. CONSULTING ENGINEERS FLORIDA CERTIFICATE OF AUTHORIZATION No. 626 PHONE: (386) 761-6810 FAX: (386) 761-3977 P.O. DRAWER 290247, PORT ORANGE, FL 32129-0247		CITY of PORT ORANGE VOLUSIA COUNTY, FLORIDA		WATER SYSTEM REPLACEMENT 2012 PROJECT No. P0251		RAVENWOOD SUBDIVISION		ANDREW M. GIANNINI, P.E. FLORIDA REGISTRATION #46601		SHEET No. 5 OF 11	
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B MATCHLINE-SEE SHEET 5 FOR CONTINUATION



Record Drawing
7/26/12
JRB

AS-BUILT DATA PROVIDED BY:
Oceanside
LAND SURVEYING, LLC
2090 SOUTH NOVA ROAD
SUITE A107
SOUTH DAVENPORT, FLORIDA 32119
PHONE: 386-783-4130
FAX: 386-783-4129
CHRIS@OCEANSIDESURVEYING.COM

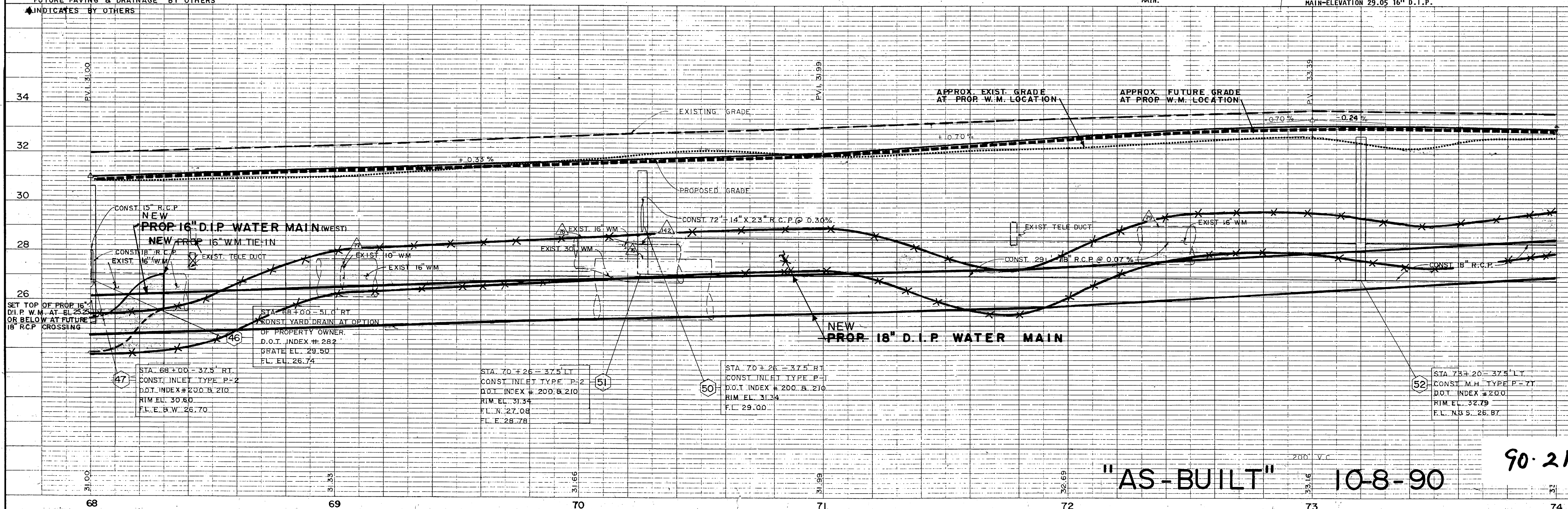
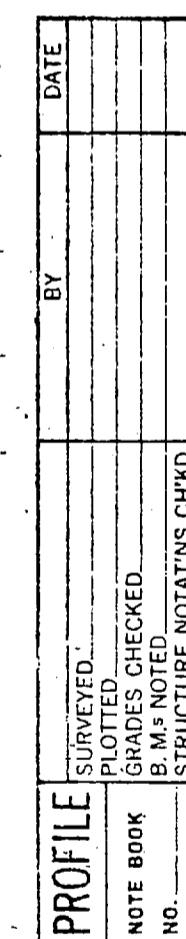
RECORD SURVEY

I HEREBY CERTIFY THAT THIS RECORD SURVEY OF THE SUBJECT PROPERTY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, AS SURVEYED IN THE FIELD UNDER MY SUPERVISION ON THE DATE SHOWN HEREON. I FURTHER CERTIFY THAT THIS DRAWING MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH IN FLORIDA ADMINISTRATIVE CODE CHAPTER 5J-17.050 THROUGH 5J-17.052 F.A.C., ADOPTED BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS, PURSUANT TO FLORIDA STATUTES SECTIONS 472.027, SUBJECT TO THE QUALIFICATIONS NOTED HEREON.

CHRIS HANSON, PSM # LS6806 / CERTIFICATE OF AUTHORIZATION # LB7771 DATE
WITHOUT THE SIGNATURE AND ORIGINAL EMBOSSED RAISED SEAL OF A LICENSED SURVEYOR AND MAPPER, THIS SKETCH, PLAT OR MAP IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT VALID. LAST DATE OF FIELD SURVEY: 6/29/2012

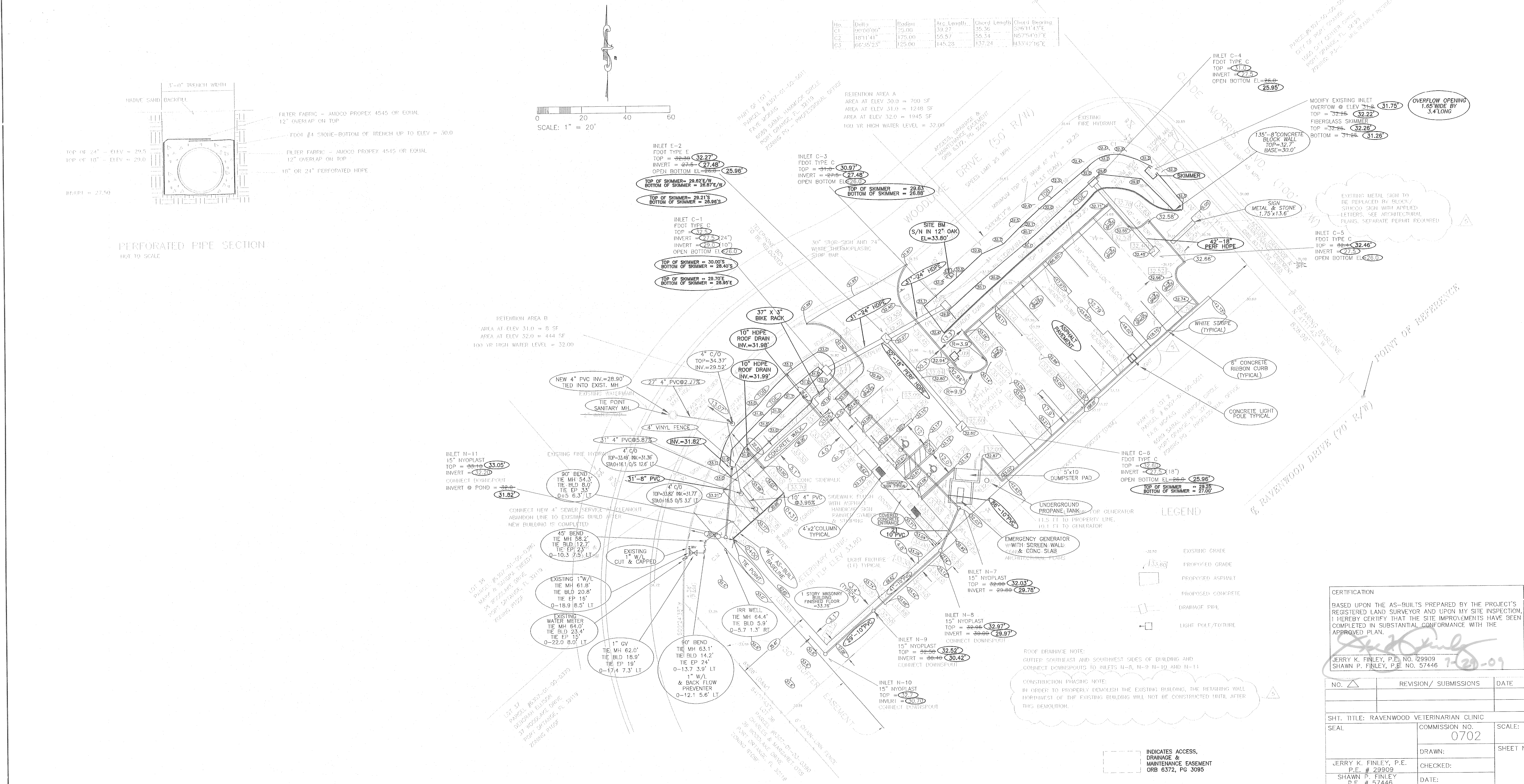
REVISIONS			REVISIONS		
No.	BY	DATE	No.	BY	DATE

QUENTIN L. HAMPTON ASSOCIATES, INC. CONSULTING ENGINEERS FLORIDA CERTIFICATE OF AUTHORIZATION No. 628 PHONE: (386) 761-8810 FAX: (386) 761-3977 P.O. DRAWER 290247, PORT ORANGE, FL. 32129-0247	CITY OF PORT ORANGE VOLUSIA COUNTY, FLORIDA	WATER SYSTEM REPLACEMENT 2012 PROJECT No. P0251	RAVENWOOD SUBDIVISION	ANDREW M. GIANNINI, P.E. FLORIDA REGISTRATION #46601	SHEET No. 6 OF 11
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			QUENTIN L. HAMPTON ASSOCIATES, INC. CONSULTING ENGINEERS PORT ORANGE - LARGO FLORIDA	CITY OF PORT ORANGE VOLUSIA COUNTY, FLORIDA	PROJECT No CLYDE MORRIS BLVD. UTILITY RELOCATION	PLAN & PROFILE STA. 68+00 TO STA. 74+00	DESIGNED BY <u>MAH</u> DATE _____ DRAWN BY <u>TS</u> DATE _____ CHECKED BY <u>MAH</u> DATE _____ SCALE: AS SHOWN DATE <u>8/</u> / <u>88</u> SHEET No <u>15</u> OF <u>34</u> SHEETS
I	1/89	REVISED PER G & R 9/88 REVISION					
REV. No	DATE	DESCRIPTION					

K:\AS-BUILT\SRavenwood Veterinary\FINAL AS-Built\3-5-09\090305_vv.dwg, 7/20/2009 5:45:09 PM, RW-470MP.pc3, MURPHY



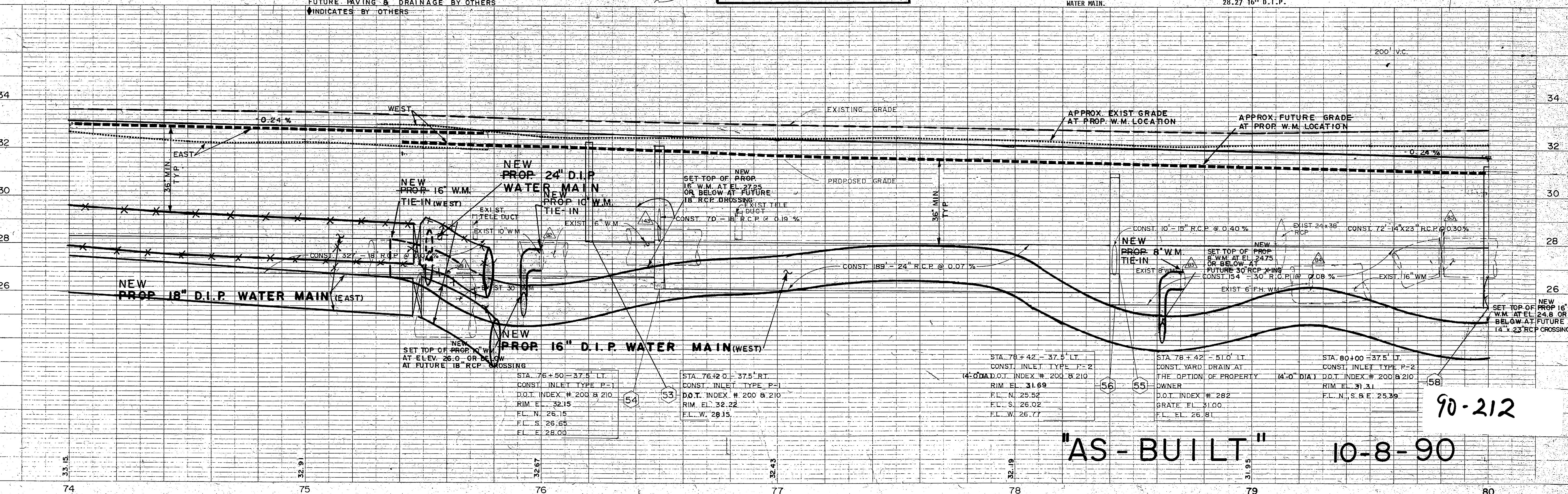
SLIGER & ASSOCIATES, INC. PROFESSIONAL LAND SURVEYORS LICENSED BUSINESS CERTIFICATION # 3019 Copyright © 2009 Sliger & Associates, Inc. 3921 NOVA ROAD • PORT ORANGE, FL 32127 • (386) 761-5385		AS-BUILT SURVEY SHEET 1 OF 1		REFERENCE: RAVENWOOD VETERINARIAN CLINIC FOR: BOMAR CONSTRUCTION INC.		NOT A BOUNDARY SURVEY. AS-BUILT SURVEY OF: SANITARY SEWER GRAVITY LINE & SERVICES POTABLE WATERMAIN, VALVES, FITTINGS, & SERVICES STORM SEWER PIPE/STRUCTURES PAVING/CURB GRADING RETENTION/SWALE AREAS ABOVE GROUND IMPROVEMENTS AS DIRECTED BY CLIENT	
AS-BUILT PREPARED FOR THE FOLLOWING: (ONLY THE LAST DATE IS CERTIFIED ON SEALED COPY) THIS AS-BUILT SURVEY IS CERTIFIED TO AND PREPARED FOR THE SOLE AND EXCLUSIVE BENEFIT OF THE ENTITIES AND/OR INDIVIDUALS LISTED BELOW, ON THE MOST CURRENT DATE, AND SHALL NOT BE RELIED UPON BY ANY OTHER ENTITY		DATE: 7/20/2009 JOB NUMBER: 09-0396		DRAWING DERIVED FROM PLANS SUPPLIED BY: FINLEY ENGINEERING GROUP 5531 SOUTH RIDGEWOOD AVENUE, UNIT 1 PORT ORANGE, FLORIDA 32127		SURVEYOR'S NOTES: THIS IS NOT A BOUNDARY SURVEY. THERE MAY BE ADDITIONAL RESTRICTIONS AND/OR OTHER MATTERS THAT ARE NOT SHOWN ON THIS PLAT OF SURVEY/SKETCH OF DESCRIPTION THAT MAY BE FOUND IN THE PUBLIC RECORDS OF THIS COUNTY. THIS SURVEY/ SKETCH PREPARED WITHOUT BENEFIT OF AN ABSTRACT. DIMENSIONS ARE SHOWN IN FEET AND DECIMALS THEREOF. UNLESS OTHERWISE SHOWN, RECORD DISTANCES AND DIRECTIONS AND FIELD MEASURED DISTANCES AND DIRECTIONS ARE THE SAME. UNDERGROUND FOUNDATIONS, IF ANY, NOT LOCATED. THE PERCENT OF SLOPE DEPICTED ON SANITARY SEWER AND/OR STORM SEWER LINES WAS DERIVED FROM PIPE INVERT DATA ACQUIRED ONLY AT THE STRUCTURES AT THE TERMINATION OF THE UTILITY LINE. THE REMAINDER OF THE UTILITY LINE WAS NOT VISUALLY INSPECTED BY THE SURVEYOR. AS-BUILT PIPE LENGTHS ARE MEASURED TO CENTERLINE OF MANHOLES, CLEAN OUTS, JUNCTION BOXES, INLETS, YARD DRAINS, THE END OF MITERED END SECTIONS AND OUTSIDE EDGE OF HEADWALLS. DIRECTIONAL DRILLS ARE LOCATED AT THE ENDS OF PIPE ONLY. THE APPROXIMATE ROUTE DEPICTED ON THIS DRAWING IS GENERATED FROM THE DRILL REPORTS AND INFORMATION FROM THE CONTRACTOR AND MAY NOT BE THE ACTUAL LOCATION WHICH WAS NOT FIELD LOCATED. ELEVATIONS BASED ON SITE DATUM.	
REVISION: #		DATE: BY:		INDICATES ACCESS, DRAINAGE & MAINTENANCE EASEMENT ORB 6372, PG 3065		SURVEYOR'S CERTIFICATE I HEREBY CERTIFY THAT THIS PLAN MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS IN CHAPTER 6107-6, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 422.02, FLORIDA STATUTES. J.E. ZAPERT, P.L.S. NO. 4046 STEVEN T. KRUGER, P.L.S. NO. 4722 C.D. VAN KLEECK, JR., P.E. NO. 6149 MICHAEL S. MURPHY P.E. NO. 6208 "NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER."	
SCALE: 1"=20'		FIELD BOOK: 1269, 1275		PAGE(S): 41, 49		FILE NUMBER: 09036A.TXT	

AS-BUILT ABBREVIATIONS		AS-BUILT LEGEND	
W/ WITH	TO TOP COVER	RES. RESIDENCE	IRC. IRON ROD & CAP
CM. CONCRETE MONUMENT	WV. WATER VALVE	RES. WITHIN END SECTION	WCS. WITNESS END SECTION
TOP. TOP OF BANK	TSE. TRAFFIC SIGNAL BOX	—T— BURIED TELEPHONE LINE	RCF. REINFORCED CONCRETE PIPE
TOE. TOE OF SLOPE	FM. FIRE HYDRANT	—W— BURIED WATER LINE	CMP. CORRUGATED METAL PIPE
CLS. CENTERLINE OF SWALE	WM. WATER METER	—E— BURIED ELECTRIC LINE	MH. MANHOLE
STA. STATION	LP. LIGHT POLE	—R— BURIED GAS LINE	MB. MAP BOOK
CD. CLEARED	W. IRRIGATION VALVE	—TV— BURIED TELEVISION LINE	—C— CONCRETE
SN. SANITARY	GA. GUY ANCHOR	—FM— BURIED FIBER OPTIC CABLE	EL. ELEVATION
ES. ELECTRIC SERVICE	CPP. CORRUGATED PLASTIC PIPE	—RND— NATIONAL GEODETIC VERTICAL DATUM	CHD. CHORD DISTANCE
NRE. HIGH DENSITY POLYETHYLENE PIPE	DR. DUCKILE IRON PIPE	USC & CS. UNITED STATES COAST AND GEODETIC SURVEY	CHD. CHORD BEARING
VOP. VITRIFIED CLAY PIPE	PVC. POLYVINYL CHLORIDE	NAV. NORTH AMERICAN DATUM	CHD. CHORD DISTANCE
CV. CHECK VALVE	DR. DRIVEWAY	GEN. GENERATOR	CHD. CHORD BEARING
CE. CENTERLINE	GEN. GENERATOR	BM. BENCHMARK	CHD. CHORD BEARING
BLD. BUILDING	A/C. AIR CONDITIONER	S/N. SPIKE NAIL	CHD. CHORD BEARING

1. ELECTRIC BOX	2. TRAFFIC SIGNAL BOX	3. CLEAN OUT	4. CONCRETE MONUMENT
5. PERMANENT REFERENCE MONUMENT	6. LIGHT POLE	7. WATER VALVE	8. GATE VALVE
9. EXISTING ELEVATION	10. CABLE TELEVISION BOX	11. RE-USE WATER VALVE	

SA-CL9

PROFILE	SURVEYED _____	BY _____	DATE _____
	PLOTTED _____		
NOTE BOOK	GRADES CHECKED _____		
NO. _____	H. M. S. NOTED _____		
	STRUCTURE NOTATIONS CHWD _____		



DESIGNED BY	<u>MAH</u>	DATE	<u> </u>
DRAWN BY	<u>T.S</u>	DATE	<u> </u>
CHECKED BY	<u>MAH</u>	DATE	<u> </u>
SCALE: AS SHOWN			
DATE		<u>8/</u>	<u>/88</u>
SHEET NO		<u>16</u>	OF <u>34</u> SHEETS

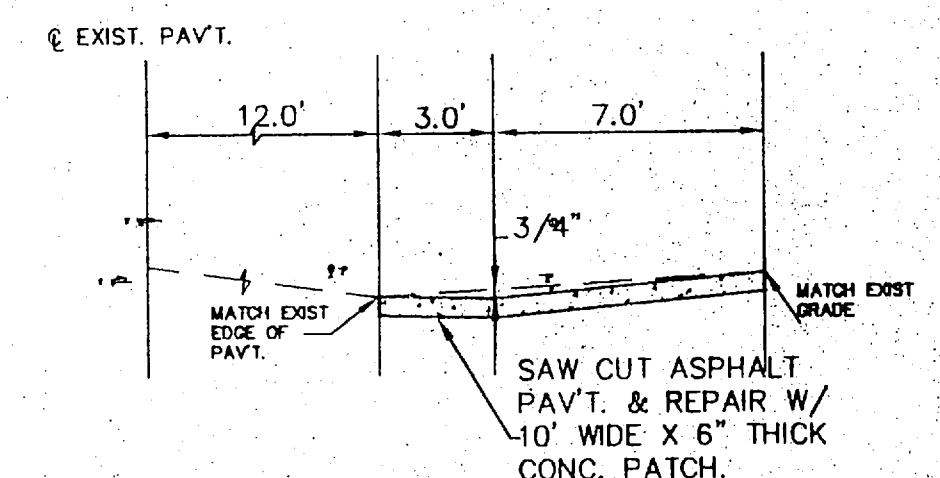
SURVEY SYMBOLS AND SCHEDULE		
SYMBOL	DESCRIPTION	SYMBOL
(12) OAK TREE	(1) SANITARY FORCE MAIN	(1) SANITARY FORCE MAIN
(15) PINE TREE	(2) SANITARY FORCE MAIN	(2) SANITARY FORCE MAIN
(16) PALM TREE	(3) SANITARY FORCE MAIN	(3) SANITARY FORCE MAIN
(17) MAGNOLIA TREE	(4) SANITARY FORCE MAIN	(4) SANITARY FORCE MAIN
(18) HICKORY TREE	(5) SANITARY FORCE MAIN	(5) SANITARY FORCE MAIN
(19) TOOTHACHE TREE	(6) SANITARY FORCE MAIN	(6) SANITARY FORCE MAIN
(20) HACKBERRY TREE	(7) SANITARY FORCE MAIN	(7) SANITARY FORCE MAIN
(21) BAY TREE	(8) SANITARY FORCE MAIN	(8) SANITARY FORCE MAIN
(22) CEDAR TREE	(9) SANITARY FORCE MAIN	(9) SANITARY FORCE MAIN
(23) CYPRESS TREE	(10) SANITARY FORCE MAIN	(10) SANITARY FORCE MAIN
(24) SWEETGUM TREE	(11) SANITARY FORCE MAIN	(11) SANITARY FORCE MAIN
(25) CHINA BERRY TREE	(12) SANITARY FORCE MAIN	(12) SANITARY FORCE MAIN
(26) MAPLE TREE TREE	(13) SANITARY FORCE MAIN	(13) SANITARY FORCE MAIN
(27) SYCAMORE TREE	(14) SANITARY FORCE MAIN	(14) SANITARY FORCE MAIN
(28) ELM TREE	(15) SANITARY FORCE MAIN	(15) SANITARY FORCE MAIN
(29) BRUSH OR VEGETATION	(16) SANITARY FORCE MAIN	(16) SANITARY FORCE MAIN
(30) SWALE	(17) SANITARY FORCE MAIN	(17) SANITARY FORCE MAIN
(31) EXTG. RECLAIMED WATER	(18) SANITARY FORCE MAIN	(18) SANITARY FORCE MAIN
(32) SANITARY FORCE MAIN	(19) SANITARY FORCE MAIN	(19) SANITARY FORCE MAIN
(33) WATER MAIN	(20) SANITARY FORCE MAIN	(20) SANITARY FORCE MAIN
(34) SANITARY SEWER	(21) SANITARY FORCE MAIN	(21) SANITARY FORCE MAIN
(35) STORM SEWER	(22) SANITARY FORCE MAIN	(22) SANITARY FORCE MAIN
(36) ASPHALT PAVEMENT	(23) SANITARY FORCE MAIN	(23) SANITARY FORCE MAIN
(37) UNPAVED DIRT/SHELL	(24) SANITARY FORCE MAIN	(24) SANITARY FORCE MAIN
(38) CHAIN LINK FENCE	(25) SANITARY FORCE MAIN	(25) SANITARY FORCE MAIN
(39) WOOD FENCE	(26) SANITARY FORCE MAIN	(26) SANITARY FORCE MAIN
(40) UNDER GROUND TELEPHONE	(27) SANITARY FORCE MAIN	(27) SANITARY FORCE MAIN
(41) UNDER GROUND TELEVISION CABLE	(28) SANITARY FORCE MAIN	(28) SANITARY FORCE MAIN
(42) GAS MAIN	(29) SANITARY FORCE MAIN	(29) SANITARY FORCE MAIN
(43) GAS VALVE	(30) SANITARY FORCE MAIN	(30) SANITARY FORCE MAIN
(44) UNDER GROUND ELECTRIC	(31) SANITARY FORCE MAIN	(31) SANITARY FORCE MAIN
(45) EXISTING ELEVATION	(32) SANITARY FORCE MAIN	(32) SANITARY FORCE MAIN
(46) FOUND CONCRETE MARKER	(33) SANITARY FORCE MAIN	(33) SANITARY FORCE MAIN
(47) FOUND IRON PIN OR PIPE	(34) SANITARY FORCE MAIN	(34) SANITARY FORCE MAIN
(48) SET IRON ROD & CAP	(35) SANITARY FORCE MAIN	(35) SANITARY FORCE MAIN
(49) LICENSED BUSINESS NO 3612	(36) SANITARY FORCE MAIN	(36) SANITARY FORCE MAIN
(50) DISTANCE NOT SUPPORTED BY FIELD MEASUREMENT MORE OR LESS	(37) SANITARY FORCE MAIN	(37) SANITARY FORCE MAIN

SCALE: 1" = 40'

- NOTES:
- RECLAIMED WATER SERVICE LOCATIONS WILL BE DETERMINED IN THE FIELD AND ARE SUBJECT TO APPROVAL BY THE ENGINEER'S REPRESENTATIVE AND PROPERTY OWNER. CONTRACTOR WILL PROVIDE A WRITTEN CONSTRUCTION SCHEDULE TWO WEEKS IN ADVANCE OF CONSTRUCTION IN EACH SUBDIVISION AREA. CITY FORCES WILL INTERVIEW PROPERTY OWNERS TO DETERMINE SERVICE LOCATIONS. CONTRACTOR SHALL SCHEDULE CONSTRUCTION ACCORDINGLY.
 - SERVICES SHALL BE INSTALLED UNDER PAVEMENT AND SIDEWALK BY BORING AND JACKING OR BY A SIMILAR APPROVED METHOD. JETTING OR OPEN CUTTING OF PAVEMENT SHALL NOT BE ALLOWED UNLESS SHOWN OTHERWISE. (TYPICAL THIS PROJECT)
 - ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE SODDED TO MATCH EXISTING SPECIES AND VARIETY OF GRASS. PIPE INSTALLATION UNIT PRICE SHALL INCLUDE RESTORATION AND SODDING TO EQUAL OR BETTER CONDITION.
 - DRIVEWAYS ARE 6" THICK 2500 PSI CONCRETE UNLESS OTHERWISE NOTED.
 - CONTRACTOR SHALL INSPECT THE SITE PRIOR TO BID. ADDITIONAL HOUSES, DRIVEWAYS AND SIDEWALKS MAY HAVE BEEN CONSTRUCTED SINCE THE SURVEY WAS COMPLETED. THIS NEW CONSTRUCTION IS NOT SHOWN ON THESE PLANS. PAYMENT WILL BE MADE FOR REPAIR OF DRIVEWAYS AND SIDEWALKS ACCORDING TO THE LINE ITEM AMOUNT IN THE SCHEDULE OF UNIT PRICES.
 - ALL DRIVEWAYS TO BE REPAIRED TO EXISTING OR BETTER CONDITIONS. ASPHALT DRIVEWAYS TO BE SAWCUT AND REPAIRED. OVERLAY DRIVEWAY FROM EDGE OF ROAD OR BACK OF CURB TO RIGHT OF WAY LINE. CONCRETE DRIVE TO BE REPLACED FROM EDGE OF ROAD OR BACK OF CURB TO RIGHT OF WAY LINE AND/OR NEAREST CONSTRUCTION OR EXPANSION JOINT.
 - PAVEMENT OVERLAY PRICE TO INCLUDE VALVE BOX AND MANHOLE ADJUSTMENT AND RESTRICTION.
 - CALL FOR UTILITY LOCATES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. ALL CITY LOCATES WILL BE THROUGH THE ENGINEER'S REPRESENTATIVE.
 - IN AREAS WHERE PIPELINE INSTALLATION WILL DISTURB EXISTING SWALES, ELEVATIONS WILL BE REQUIRED AT 50 FT. INTERVALS AT LEAST 2 WEEKS PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE SURVEYS WILL BE BY A F.L.A. REGISTERED SURVEYOR AND ARE SUBJECT TO APPROVAL BY THE ENGINEER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.

SERVICE COUNT	
ON R.W.M. SIDE OF ROAD - 0	
ON OPPOSITE SIDE OF ROAD - 0	
TOTAL - 0	

L.F. OF BIKEPATH REPLACEMENT-180



DRIVEWAY REPAIR
DETAIL "A"
N.T.S.

AS-BUILT 3/96

AS-BUILT SURVEY NOTES:
1. SANITARY SEWER TOPS, INVERTS, LENGTHS, AND PERCENTAGE OF SLOPE.
2. WATER LINE VALVES, FIRE HYDRANTS
3. SANITARY SERVICES PER CONTRACTOR
4. WATERLINE SERVICES PER CONTRACTOR
5. STORM SEWER TOPS, INVERTS, LENGTHS
6. SEWER SERVICE LOCATION
7. DISTANCE FROM LOW END MANHOLE
8. WATER SERVICE AND FITTING LOCATION
9. DISTANCE FROM LOW END MANHOLE
10. DISTANCE RIGHT OR LEFT
11. ELEVATIONS REFER TO SITE DATUM
12. INDICATES AS-BUILT INFORMATION
AS-BUILT SURVEY DATE
I HEREBY CERTIFY THAT THIS PLAT OF SURVEY MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS IN CHAPTER 461-7, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.021, FLORIDA STATUTES.
GUS A. SLIGER, P.L.S. NO. 3254
STEPHEN D. SLIGER, P.L.S. NO. 3794
J.D. DAVERT, P.L.S. NO. 4046
STEVEN T. KRUGER, P.L.S. NO. 4722
VALID WITH SIGNATURE AND EMBOSSED SEAL ONLY.

DESIGNED	MAH	DATE	SCALE	SHEET NO.
DRAWN	HB	DATE 3-94	AS SHOWN	9A
CHECKED	MAH	DATE		
APPROVED		DATE	JOB NO.	OF 80

NO	BY	REVISIONS	DATE
1	HB-DB	REPLACED "UGTV" W/ "UGTV FIBER OPTIC" - 3 PLACES FIBER OPTIC CAUTION BOX BOLDER - 2 PLACES CHANGED SHT NO. 9 TO 9A	

QUENTIN L. HAMPTON ASSOCIATES, INC.
CONSULTING ENGINEERS

P.O. DRAWER 290247 PORT ORANGE, FLORIDA 32129-0247 904 761-6810

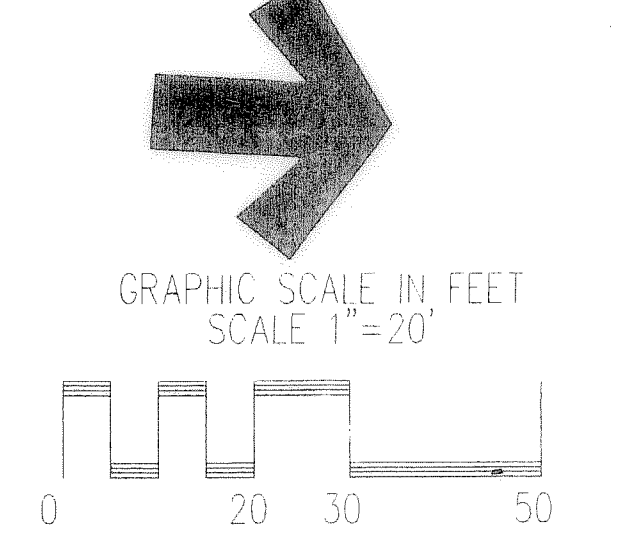
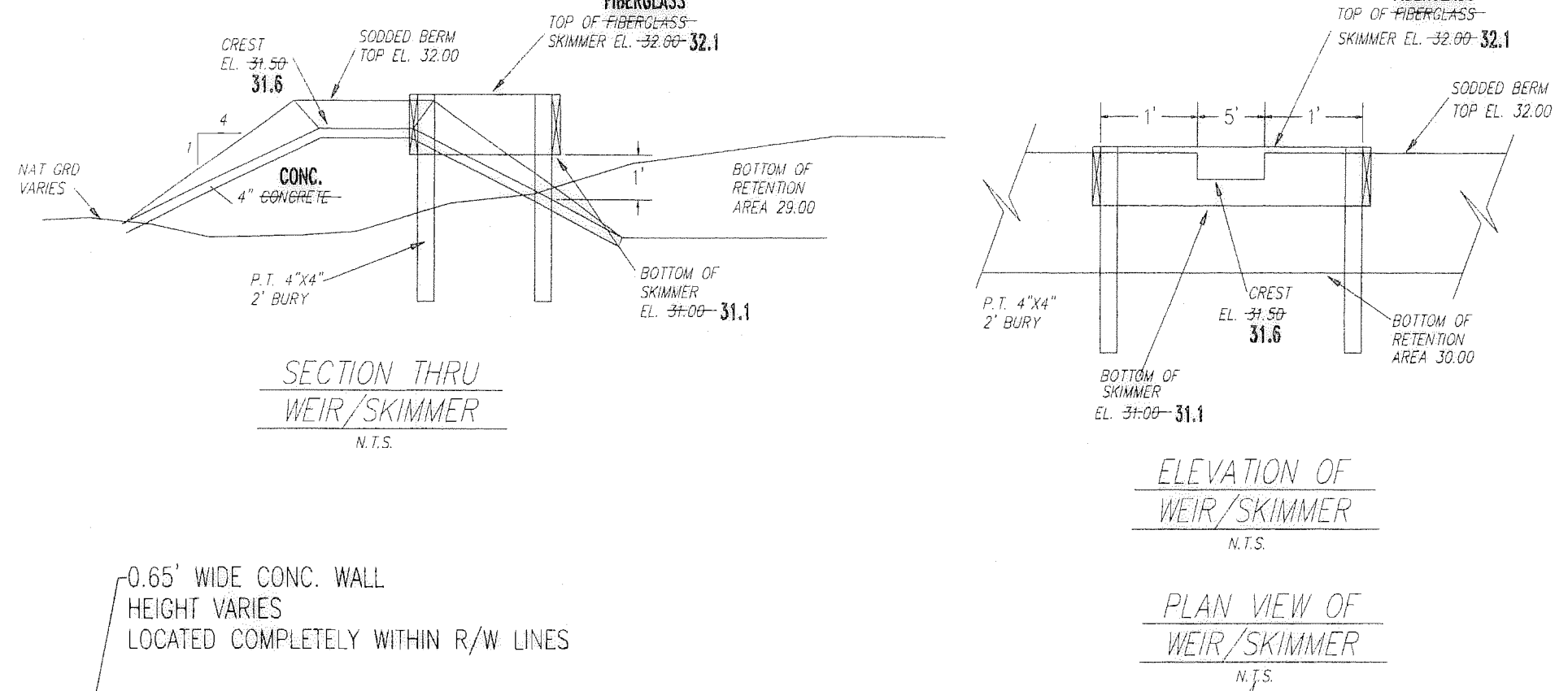
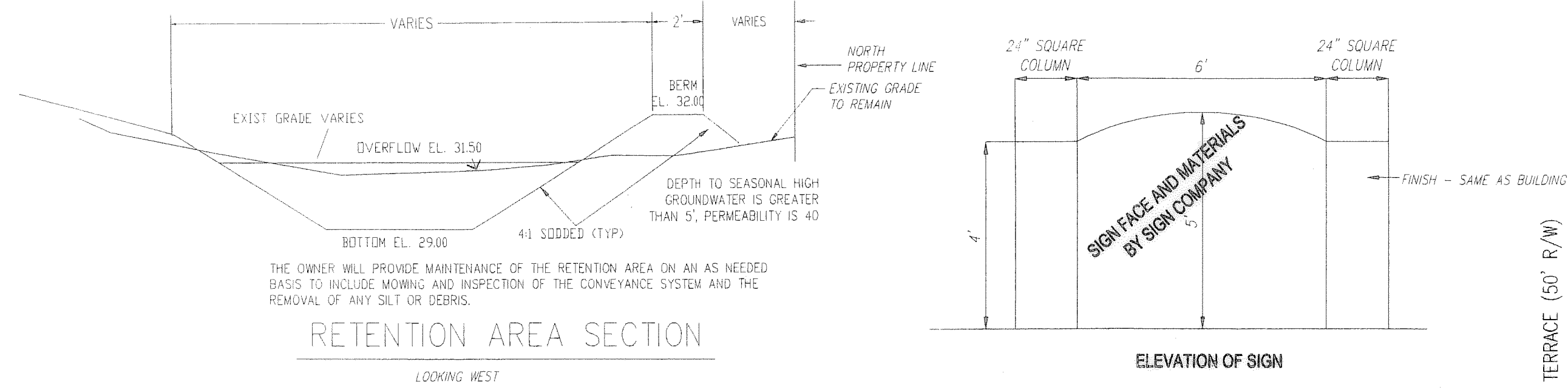
THE CITY OF
PORT ORANGE
VOLUSIA COUNTY, FLORIDA

RECLAIMED WATER/REUSE FACILITIES
(DISTRIBUTION SYSTEM)
STATE PROJECT No. CS120725070

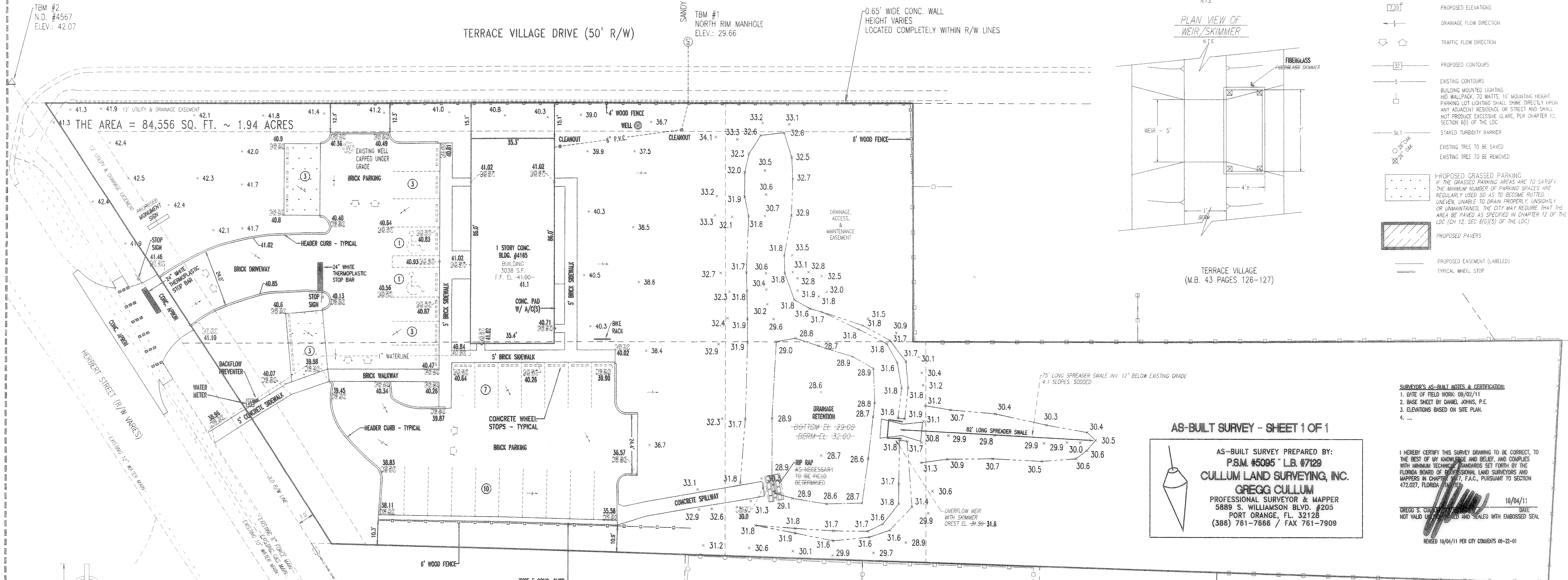
HERBERT ST.
BRANDY HILLS SOUTH
TERRACE VILLAGE SOUTH

96.802

96.803	DESIGNED	MAH	DATE	SCALE AS SHOWN	SHEET NO.
	DRAWN	HB	DATE 12-94		9-B
		IN	DATE		
			DATE		
				JOB NO.	
					OF 80



- LEGEND**
- 7.20 EXISTING ELEVATIONS
 - 7.20 PROPOSED ELEVATIONS
 - DRAINAGE FLOW DIRECTION
 - TRAFFIC FLOW DIRECTION
 - PROPOSED CONTOURS
 - EXISTING CONTOURS
 - BUILDING MOUNTED LIGHTING
HID WALLPACK, 70 WATTS, 10' MOUNTING HEIGHT
PARKING LOT LIGHTING SHALL SHINE DIRECTLY UPON ANY ADJACENT RESIDENCE OR STREET AND SHALL NOT PRODUCE EXCESSIVE GLARE, PER CHAPTER 12, SECTION 6(1) OF THE LDC
 - STAKED TURBIDITY BARRIER
 - EXISTING TREE TO BE SAVED
 - EXISTING TREE TO BE REMOVED
 - PROPOSED GRASSED PARKING
IF THE GRASSED PARKING AREAS ARE TO SATISFY THE MINIMUM NUMBER OF PARKING SPACES ARE REGULARLY USED SO AS TO BECOME RUTTED, UNEVEN, UNABLE TO DRAIN PROPERLY, UNSIGHTLY OR UNMAINTAINED, THE CITY MAY REQUIRE THAT THE AREA BE PAVED AS SPECIFIED IN CHAPTER 12 OF THE LDC (CH 12, SEC 6(1)(5) OF THE LDC)
 - PROPOSED PAVERS
 - PROPOSED EASEMENT (LABELED)
 - TYPICAL WHEEL STOP



APPENDIX D

COST ESTIMATES

APPENDIX D - Cost Estimates

ID:	Taylor Branch Road	County:	Volusia
Project:	3903.07 River-to-Sea TPO	FAP No.:	
Description:	Sidewalk Feasibility Study - City of Port Orange		

Alignment #1

PAY ITEM NUMBER	PAY ITEM DESCRIPTION	TOTAL QTY	UNIT MEASURE	UNIT PRICE	TOTAL PRICE
110-1-1	CLEARING AND GRUBBING	0.11	AC	\$18,028.84	\$2,069.43
110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT	65	SY	\$33.71	\$2,202.26
120-1	REGULAR EXCAVATION	42	CY	\$6.59	\$276.70
120-6	EMBANKMENT	20	CY	\$11.28	\$229.78
285-706	OPTIONAL BASE, BASE GROUP 06	38	SY	\$32.88	\$1,249.44
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	3	TN	\$208.48	\$653.58
425-5	MANHOLE, ADJUST	1	EA	\$1,282.45	\$1,282.45
430-174-118	PIPE CULVERT, OPT, MATERIAL, ROUND 18" SD	15	LF	\$88.80	\$1,332.00
430-984-125	MITERED END SECTION, OPT ROUND, 18" SD	2	EA	\$1,449.49	\$2,898.98
520-1-10	CONCRETE CURB & GUTTER, TYPE F	30	LF	\$52.63	\$1,578.96
522-1	CONCRETE SIDEWALK AND DRIVEWAYS 4" THICK	232	SY	\$45.88	\$10,627.94
522-2	CONCRETE SIDEWALK AND DRIVEWAYS 6" THICK	54	SY	\$94.37	\$5,085.39
527-2	DETECTABLE WARNINGS	20	SF	\$38.11	\$762.24
570-1-2	PERFORMANCE TURF, SOD	62	SY	\$2.70	\$168.00
700-1-50	SINGLE-POST SIGN, RELOCATE	1	AS	\$163.60	\$163.60
711-11-123	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12"	162	LF	\$3.44	\$557.93
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24"	180	LF	\$7.43	\$1,337.04
711-17	THERMOPLASTIC, REMOVE	840	SF	\$2.80	\$2,348.64
N/A	RIGHT-OF-WAY	2,584	SF	\$6.42	\$16,589.28
Total Construction Subtotal:					\$51,413.63

*NOTE: SUBTOTAL DOES NOT INCLUDE COST TO PROVIDE COMPENSATING STORAGE AREA.

Alignment #2 - Recommended

PAY ITEM NUMBER	PAY ITEM DESCRIPTION	TOTAL QTY	UNIT MEASURE	UNIT PRICE	TOTAL PRICE
110-1-1	CLEARING AND GRUBBING	0.11	AC	\$18,028.84	\$2,069.43
110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT	65	SY	\$33.71	\$2,202.26
120-1	REGULAR EXCAVATION	42	CY	\$6.59	\$276.70
120-6	EMBANKMENT	38	CY	\$11.28	\$428.64
285-706	OPTIONAL BASE, BASE GROUP 06	37	SY	\$32.88	\$1,223.87
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	3	TN	\$208.48	\$640.21
425-5	MANHOLE, ADJUST	1	EA	\$1,282.45	\$1,282.45
430-174-118	PIPE CULVERT, OPT, MATERIAL, ROUND 18" SD	45	LF	\$88.80	\$3,996.00
430-984-125	MITERED END SECTION, OPT ROUND, 18" SD	2	EA	\$1,449.49	\$2,898.98
520-1-10	CONCRETE CURB & GUTTER, TYPE F	30	LF	\$52.63	\$1,578.96
522-1	CONCRETE SIDEWALK AND DRIVEWAYS 4" THICK	223	SY	\$45.88	\$10,220.15
522-2	CONCRETE SIDEWALK AND DRIVEWAYS 6" THICK	54	SY	\$94.37	\$5,085.39
527-2	DETECTABLE WARNINGS	20	SF	\$38.11	\$762.24
570-1-2	PERFORMANCE TURF, SOD	62	SY	\$2.70	\$168.00
700-1-50	SINGLE-POST SIGN, RELOCATE	4	AS	\$163.60	\$654.38
711-11-123	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12"	162	LF	\$3.44	\$557.93
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24"	180	LF	\$7.43	\$1,337.04
711-17	THERMOPLASTIC, REMOVE	840	SF	\$2.80	\$2,348.64
N/A	RIGHT-OF-WAY	2,127	SF	\$6.42	\$13,655.34
Total Construction Subtotal:					\$51,386.60

Alignment #3

PAY ITEM NUMBER	PAY ITEM DESCRIPTION	TOTAL QTY	UNIT MEASURE	UNIT PRICE	TOTAL PRICE
110-1-1	CLEARING AND GRUBBING	0.11	AC	\$18,028.84	\$2,069.43
110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT	65	SY	\$33.71	\$2,202.26
120-1	REGULAR EXCAVATION	42	CY	\$6.59	\$276.70
120-6	EMBANKMENT	122	CY	\$11.28	\$1,378.67
285-706	OPTIONAL BASE, BASE GROUP 06	38	SY	\$32.88	\$1,249.44
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	3	TN	\$208.48	\$653.58
425-1441	INLETS, CURB, TYPE J-4, <10'	1	EA	\$10,798.61	\$10,798.61
425-5	MANHOLE, ADJUST	1	EA	\$1,282.45	\$1,282.45
430-174-118	PIPE CULVERT, OPT, MATERIAL, ROUND 18" SD	75	LF	\$88.80	\$6,660.00
430-984-125	MITERED END SECTION, OPT ROUND, 18" SD	2	EA	\$1,449.49	\$2,898.98
520-1-10	CONCRETE CURB & GUTTER, TYPE F	30	LF	\$52.63	\$1,578.96
522-1	CONCRETE SIDEWALK AND DRIVEWAYS 4" THICK	202	SY	\$45.88	\$9,251.66
522-2	CONCRETE SIDEWALK AND DRIVEWAYS 6" THICK	54	SY	\$94.37	\$5,095.87
527-2	DETECTABLE WARNINGS	20	SF	\$38.11	\$762.24
570-1-2	PERFORMANCE TURF, SOD	108	SY	\$2.70	\$291.00
700-1-50	SINGLE-POST SIGN, RELOCATE	5	AS	\$163.60	\$817.98
711-11-123	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12"	162	LF	\$3.44	\$557.93
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24"	180	LF	\$7.43	\$1,337.04
711-17	THERMOPLASTIC, REMOVE	840	SF	\$2.80	\$2,348.64
N/A	RIGHT-OF-WAY	96	SF	\$6.42	\$616.32
Total Construction Subtotal:					\$52,127.75

*NOTE: SUBTOTAL DOES NOT INCLUDE COST TO PROVIDE COMPENSATING STORAGE AREA.

APPENDIX D - Cost Estimates

ID:	Clyde Morris Boulevard	County:	Volusia
Project:	3903.07 River-to-Sea TPO	FAP No.:	
Description:	Sidewalk Feasibility Study - City of Port Orange		

PAY ITEM NUMBER	PAY ITEM DESCRIPTION	TOTAL QTY	UNIT MEASURE	UNIT PRICE	TOTAL PRICE
110-1-1	CLEARING AND GRUBBING	0.09	AC	\$18,028.84	\$1,655.54
110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT	7.2	SY	\$33.71	\$243.45
120-1	REGULAR EXCAVATION	36.0	CY	\$6.59	\$237.17
120-6	EMBANKMENT	45.0	CY	\$11.28	\$507.60
285-706	OPTIONAL BASE, BASE GROUP 06	31.0	SY	\$32.88	\$1,019.28
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	2.6	TN	\$208.48	\$533.19
515-1-2	PIPE HANDRAIL - GUIDERAIL, ALUMINUM	12.0	LF	\$53.03	\$636.34
520-1-10	CONCRETE CURB & GUTTER, TYPE F	10	LF	\$52.63	\$526.32
522-1	CONCRETE SIDEWALK AND DRIVEWAYS 4" THICK	253.3	SY	\$45.88	\$11,621.92
527-2	DETECTABLE WARNINGS	20.0	SF	\$38.11	\$762.24
570-1-2	PERFORMANCE TURF, SOD	77.1	SY	\$2.70	\$208.20
630-2-11	CONDUIT OPEN TRENCH	350.0	LF	\$21.40	\$7,488.60
635-2-11	PULL & SPLICE BOX	2.0	EA	\$826.93	\$1,653.86
639-1-121	ELECTRICAL POWER SERVICE	1.0	AS	\$5,671.99	\$5,671.99
639-2-1	ELECTRICAL SERVICE WIRE	350.0	LF	\$5.74	\$2,007.60
700-1-50	SINGLE-POST SIGN, RELOCATE	1.0	AS	\$163.60	\$163.60
711-11-123	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12"	97.0	LF	\$3.44	\$334.07
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24"	76.0	LF	\$7.43	\$564.53
715-1-11	LIGHTING CONDUCTORS, F&I	350.0	LF	\$0.95	\$331.80
715-5-11	LUMINAIRE & BRACKET ARM, F&I, ALUMINUM	1.0	EA	\$2,440.80	\$2,440.80
N/A	UTILITY ADJUSTMENT	1	EA	\$5,000.00	\$5,000.00
N/A	RIGHT-OF-WAY	1,088	SF	\$3.50	\$3,808.00
Total Construction Subtotal:					\$47,416.09

APPENDIX D - Cost Estimates

ID:	Ravenwood Drive	County:	Volusia
Project:	3903.07 River-to-Sea TPO	FAP No.:	
Description:	Sidewalk Feasibility Study - City of Port Orange		

PAY ITEM NUMBER	PAY ITEM DESCRIPTION	TOTAL QTY	UNIT MEASURE	UNIT PRICE	TOTAL PRICE
110-1-1	CLEARING AND GRUBBING	0.18	AC	\$18,028.84	\$3,311.08
110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT	31	SY	\$33.71	\$1,052.44
120-1	REGULAR EXCAVATION	160	CY	\$6.59	\$1,054.08
120-6	EMBANKMENT	0	CY	\$11.28	\$0.00
400-0-11	CONCRETE CLASS NS, GRAVITY WALL	52	CY	\$658.30	\$34,126.06
425-6	VALVE BOXES, ADJUST	1	EA	\$596.63	\$596.63
520-1-10	CONCRETE CURB & GUTTER, TYPE F	80	LF	\$52.63	\$4,210.56
522-1	CONCRETE SIDEWALK AND DRIVEWAYS 4" THICK	379	SY	\$45.88	\$17,397.20
527-2	DETECTABLE WARNINGS	80	SF	\$38.11	\$3,048.96
570-1-2	PERFORMANCE TURF, SOD	125	SY	\$2.70	\$337.20
700-1-40	SINGLE-POST SIGN, INSTALL	2	AS	\$518.00	\$1,036.01
700-1-50	SINGLE-POST SIGN, RELOCATE	3	AS	\$163.60	\$490.79
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24"	36	LF	\$7.43	\$267.41
711-11-221	THERMOPLASTIC, STANDARD, YELLOW, SOILD, 6"	600	LF	\$3.55	\$2,131.20
N/A	UTILITY ADJUSTMENT	2	EA	\$5,000.00	\$10,000.00
Total Construction Subtotal:					\$79,059.61

APPENDIX D - Cost Estimates

ID:	Woodlake Drive	County:	Volusia
Project:	3903.07 River-to-Sea TPO	FAP No.:	
Description:	Sidewalk Feasibility Study - City of Port Orange		

PAY ITEM NUMBER	PAY ITEM DESCRIPTION	TOTAL QTY	UNIT MEASURE	UNIT PRICE	TOTAL PRICE
110-1-1	CLEARING AND GRUBBING	0.15	AC	\$18,028.84	\$2,648.86
110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT	6	SY	\$33.71	\$205.99
120-1	REGULAR EXCAVATION	53	CY	\$6.59	\$349.16
120-6	EMBANKMENT	0	CY	\$11.28	\$0.00
520-1-10	CONCRETE CURB & GUTTER, TYPE F	20	LF	\$52.63	\$1,052.64
522-1	CONCRETE SIDEWALK AND DRIVEWAYS 4" THICK	268	SY	\$45.88	\$12,310.06
527-2	DETECTABLE WARNINGS	20	SF	\$38.11	\$762.24
570-1-2	PERFORMANCE TURF, SOD	128	SY	\$2.70	\$346.80
700-1-50	SINGLE-POST SIGN, RELOCATE	1	AS	\$163.60	\$163.60
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24"	12	LF	\$7.43	\$89.14
711-17	THERMOPLASTIC, REMOVE	24	SF	\$2.80	\$67.10
1644-800	FIRE HYDRANT, RELOCATE	1	EA	\$2,972.00	\$2,972.00
N/A	UTILITY ADJUSTMENT	3	EA	\$5,000.00	\$15,000.00
Total Construction Subtotal:					\$35,967.60

APPENDIX D - Cost Estimates

ID:	Herbert Street	County:	Volusia
Project:	3903.07 River-to-Sea TPO	FAP No.:	
Description:	Sidewalk Feasibility Study - City of Port Orange		

PAY ITEM NUMBER	PAY ITEM DESCRIPTION	TOTAL QTY	UNIT MEASURE	UNIT PRICE	TOTAL PRICE
110-1-1	CLEARING AND GRUBBING	0.17	AC	\$18,028.84	\$3,021.36
110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT	10	SY	\$33.71	\$346.44
120-1	REGULAR EXCAVATION	50	CY	\$6.59	\$329.40
120-6	EMBANKMENT	750	CY	\$11.28	\$8,460.00
285-706	OPTIONAL BASE, BASE GROUP 06	38	SY	\$32.88	\$1,234.83
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	3	TN	\$208.48	\$645.94
352-70	GRINDING CONCRETE PAVEMENT	3	SY	\$4.88	\$16.28
400-0-11	CONCRETE CLASS NS, GRAVITY WALL	43	CY	\$658.30	\$28,306.73
425-1521	INLETS, DT BOT, TYPE C, <10'	1	EA	\$3,644.88	\$3,644.88
430-174-118	PIPE CULVERT, OPT, MATERIAL, ROUND 18" SD	80	LF	\$88.80	\$7,104.00
430-984-125	MITERED END SECTION, OPT ROUND, 18" SD	1	EA	\$1,449.49	\$1,449.49
515-1-2	PIPE HANDRAIL - GUIDERAIL, ALUMINUM	120	LF	\$53.03	\$6,363.36
522-1	CONCRETE SIDEWALK AND DRIVEWAYS 4" THICK	425	SY	\$45.88	\$19,492.20
527-2	DETECTABLE WARNINGS	26	SF	\$38.11	\$990.91
570-1-2	PERFORMANCE TURF, SOD	174	SY	\$2.70	\$468.90
700-1-50	SINGLE-POST SIGN, RELOCATE	1	AS	\$163.60	\$163.60
711-11-123	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12"	105	LF	\$3.44	\$361.62
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24"	28	LF	\$7.43	\$207.98
711-17	THERMOPLASTIC, REMOVE	24	SF	\$2.80	\$67.10
N/A	UTILITY ADJUSTMENT	1	EA	\$5,000.00	\$5,000.00
Total Construction Subtotal:					\$87,675.03

APPENDIX E

FDOT INFLATION FACTORS



Inflation Factors

This “*Transportation Costs*” report is one of a series of reports issued by the Office of Policy Planning. It provides information on inflation factors and other indices that may be used to convert Present Day Costs (PDC) to Year Of Expenditure costs (YOE) or vice versa. This report is updated annually when the factors are posted within the FDOT Work Program Instructions.

Please note that the methodology for Inflationary adjustments relating to specific transportation projects should be addressed with the district office where the project will be located. For general use or non-specific areas, the guidelines provided herein may be used for inflationary adjustments.

Construction Cost Inflation Factors

The table on the next page includes the inflation factors and present day cost (PDC) multipliers that are applied to the Department’s Work Program for highway construction costs expressed in Fiscal Year 2017 dollars.

Other Transportation Cost Inflation Factors

Other indices may be used to adjust project costs for other transportation modes or non-construction components of costs. Examples are as follows:

The Consumer Price Index (CPI, also retail price index) is a weighted average of prices of a specified set of products and services purchased by wage earners in urban areas. As such, it provides one measure of inflation. The CPI is a fixed quantity price index and a reasonable cost-of-living index.

The Employment Cost Index (ECI) is based on the National Compensation Survey. It measures quarterly changes in compensation costs, which include wages, salaries, and other employer costs for civilian workers (nonfarm private industry and state and local government).

The monthly series, Producer Price Index for Other Non-residential Construction, is available from the Bureau of Labor Statistics (BLS). It is not exclusively a highway construction index, but it is the best available national estimate of changes in highway costs from month to month.



FLORIDA DEPARTMENT OF TRANSPORTATION

TRANSPORTATION COSTS REPORTS

Work Program Highway Construction Cost Inflation Factors

Fiscal Year	Inflation Factor	PDC Multiplier
2017	Base	1.000
2018	2.7%	1.027
2019	2.8%	1.056
2020	2.6%	1.083
2021	2.5%	1.110
2022	2.7%	1.140
2023	2.8%	1.172
2024	2.9%	1.206
2025	3.0%	1.242
2026	3.1%	1.281
2027	3.2%	1.322
2028	3.3%	1.365
2029	3.3%	1.410
2030	3.3%	1.457
2031	3.3%	1.505
2032	3.3%	1.555
2033	3.3%	1.606
2034	3.3%	1.659
2035	3.3%	1.714
2036	3.3%	1.770
2037	3.3%	1.829
Source: Office of Work Program and Budget, (Fiscal Year 2017 is July 1, 2016 to June 30, 2017)		

Advisory Inflation Factors For Previous Years

Another “*Transportation Costs*” report covers highway construction cost inflation for previous years. “*Advisory Inflation Factors For Previous Years (1987-2015)*” provides Present Day Cost (PDC) multipliers that enable project cost estimates from previous years to be updated to FY 2015. This report is updated about once a year. For the table and text providing this information, please go to <http://www.dot.state.fl.us/planning/policy/costs/RetroCostInflation.pdf>.