

Project: **John Young Parkway Reclaimed Water Imps.**Job Number: **201319**Sheet **1** of **4**

Manager: _____ Client: _____ Project Description: _____

Location: _____

Boring	Sample Description	Fines	Water Content	LL	PI	Organic Content	k (ft/day)		AASHTO	USCS
Depth	#4 #10 #40 #60 #100	#200								
103+00	Dark brown fine sand with silt									
5.5		10.1								SP-SM
107+00	Dark yellowish brown fine sand with silt									
4.0		10.2								SP-SM
107+00	Very pale brown fine sand with silt									
8.5		10.0								SP-SM
112+00	Yellowish brown fine sand with silt									
4.0		5.8								SP-SM
117+00	Pale yellow silty fine sand									
8.5		20.9								SM
122+00	Light olive brown silty fine sand									
5.5		14.2								SM
122+00	Light yellowish brown silty fine sand									
8.5		19.5								SM
127+00	Light olive brown silty fine sand									
4.0		15.6								SM
129+00	Very dark brown silty fine sand									
8.5		12.8								SM
129+00	Grayish brown silty fine sand									
23.5		30.9								SM
135+70	Light gray silty fine sand									
13.5		13.2								SM
135+70	Gray sandy clay									
23.5		54.1	24	51.9	35.0					CH
137+20	Light gray silty fine sand									
18.5		20.1								SM
137+20	Gray clay									
23.5		90.5	38	90.9	70.6					CH
142+00	Dark grayish brown fine sand with silt									
5.5		6.4								SP-SM
144+00	Grayish brown silty fine sand									
13.5		21.9								SM
144+00	Dark grayish brown silty fine sand									
23.5		23.3								SM
145+80	Brown fine sand with silt									
13.5		11.5								SP-SM
145+80	Gray sandy clay									
23.5		65.1	23	40.5	25.8					CL

Summary Of Laboratory Test Results



Project: **John Young Parkway Reclaimed Water Imps.**Job Number: **201319**Sheet **2** of **4**

Manager: _____ Client: _____ Project Description: _____

Location: _____

Boring	Sample Description	Fines	Water Content	LL	PI	Organic Content	k (ft/day)		AASHTO	USCS
Depth	#4 #10 #40 #60 #100	#200								
146+80E	Dark brown fine sand with silt									
4.0		10.9								SP-SM
146+80E	Dark yellowish brown silty fine sand									
5.5		13.8								SM
146+80E	Gray silty fine sand									
18.5		21.8								SM
146+80W	Pale brown silty fine sand									
23.5		23.1								SM
151+00	Brown silty fine sand									
7.0		18.8								SM
161+00	Light olive brown silty fine sand									
23.5		30.1								SM
166+00	Light gray silty fine sand									
18.5		19.2								SM
171+00	Very dark brown fine sand with silt									
5.5		8.8								SP-SM
176+00	Light brownish gray silty fine sand									
8.5		17.7								SM
181+00	Yellow fine sand with silt									
4.0		10.2								SP-SM
186+00	Pale brown fine sand with silt									
5.5		7.1								SP-SM
191+00	Very dark brown fine sand with silt									
8.5		10.5								SP-SM
199+00	Light brownish gray silty fine sand									
18.5		32.2								SM
201+00	Dark yellowish brown fine sand with silt									
2.5		10.2								SP-SM
201+00	Grayish brown sandy clay									
18.5		56.4								CL
201+00	Pale yellow silty fine sand									
23.5		15.7								SM
204+00	Dark brown fine sand with silt									
2.5		7.8								SP-SM
204+00	Dark yellowish brown silty fine sand									
7.0		19.0								SM
204+00	Light brownish gray silty fine sand									
13.5		21.0								SM

Summary Of Laboratory Test Results



Project: **John Young Parkway Reclaimed Water Imps.**Job Number: **201319**Sheet **3** of **4**

Manager: _____ Client: _____ Project Description: _____

Location: _____

Boring	Sample Description	Fines	Water Content	LL	PI	Organic Content	k (ft/day)		AASHTO	USCS
Depth	#4 #10 #40 #60 #100	#200								
206+00	Very dark brown silty fine sand									
8.5		15.0								SM
206+00	Light yellowish brown silty fine sand									
23.5		14.1								SM
215+00	Dark yellowish brown fine sand									
2.5		4.6								SP
215+00	Very dark brown fine sand with silt									
5.5		8.9								SP-SM
220+00	Dark yellowish brown silty fine sand									
2.5		13.3								SM
220+00	Dark yellowish brown silty fine sand									
5.5		15.7								SM
225+00	Very dark brown fine sand with silt									
4.0		7.2								SP-SM
235+00	Light yellowish brown fine sand									
2.5		3.8								SP
245+00	Very dark grayish brown fine sand with silt									
4.0		6.4								SP-SM
255+00	Dark grayish brown fine sand with silt									
7.0		8.1								SP-SM
271+00	Grayish brown silty fine sand									
23.5		21.3								SM
275+00	Very dark brown silty fine sand									
5.5		12.2								SM
277+50	Light brownish gray silty fine sand									
18.5		24.3								SM
280+00	Very dark grayish brown silty fine sand									
7.0		21.5								SM
280+00	Very dark grayish brown silty fine sand									
13.5		19.7								SM
280+00	Light brownish gray silty fine sand									
18.5		21.6								SM
283+00	Gray silty fine sand									
23.5		33.5								SM
286+50	Grayish brown silty fine sand									
8.5		23.8								SM
291+00	Gray silty fine sand									
18.5		25.6								SM

Summary Of Laboratory Test Results



Project: **John Young Parkway Reclaimed Water Imps.**Job Number: **201319**Sheet **4** of **4**

Manager: _____ Client: _____ Project Description: _____

Location: _____

Boring	Sample Description					Fines	Water	LL	PI	Organic	k		AASHTO	USCS
Depth	#4	#10	#40	#60	#100	#200	Content			Content	(ft/day)			
294+50	Light gray fine sand													
13.5						4.0								SP
299+00	Very dark brown silty fine sand													
5.5						14.3								SM
306+00	Gray silty fine sand													
4.0						30.6								SM
306+00	Gray silty fine sand													
8.5						25.6								SM
306+00	Gray silty fine sand													
13.5						30.2								SM
306+00	Grayish brown silty fine sand													
23.5						18.4								SM
310+80	Grayish brown fine sand with silt													
7.0						11.1								SP-SM
310+80	Brown silty fine sand													
13.5						17.8								SM
310+80	Dark gray clayey fine sand													
23.5						47.1	20	38.0	17.8					SC
318+00	Very dark grayish brown fine sand with silt													
5.5						9.0								SP-SM
322+10	Pale brown silty fine sand													
18.5						15.1								SM

Summary Of Laboratory Test Results



APPENDIX B

Important Information about Your Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical-Engineering Report Is Based on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical-engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical-engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time to perform additional study.* Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold-prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical-engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold-prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your GBA-Member Geotechnical Engineer for Additional Assistance

Membership in the GEOPROFESSIONAL BUSINESS ASSOCIATION exposes geotechnical engineers to a wide array of risk confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your GBA-member geotechnical engineer for more information.



**GEOPROFESSIONAL
BUSINESS
ASSOCIATION**

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

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APPENDIX C

ANTILLIAN ENGINEERING ASSOCIATES, INC.

CONSTRAINTS AND RESTRICTIONS

WARRANTY

Antillian Engineering Associates, Inc. has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

UNANTICIPATED SOIL CONDITIONS

The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings.

CHANGED CONDITIONS

We recommend that the specifications for the project require that the contractor immediately notify Antillian Engineering Associates, Inc., as well as the owner, when subsurface conditions are encountered that are different from those present in this report.

No claim by the contractor for any conditions differing from those anticipated in the plans, specifications, and those found in this report, should be allowed unless the contractor notifies the owner and Antillian Engineering Associates, Inc. of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of Antillian Engineering Associates, Inc. to monitor field conditions and changes, to verify design assumptions and to evaluate and recommend any appropriate modifications to this report.

MISINTERPRETATION OF SOIL ENGINEERING REPORT

Antillian Engineering Associates, Inc. is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If the conclusions or recommendations based upon the data presented are made by others, those conclusions or recommendations are not the responsibility of Antillian Engineering Associates, Inc..

CHANGED STRUCTURE OR LOCATION

This report was prepared in order to aid in the evaluation of this project and to assist the architect or engineer in the design of this project. If any changes in the design or location of the structure as outlined in this report are planned, or if any structures are included or added that are not discussed in the report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved by Antillian Engineering Associates, Inc..

USE OF REPORT BY BIDDERS

Bidders who are examining the report prior to submission of a bid are cautioned that this report was prepared as an aid to the designers of the project and it may affect actual construction operations.

Bidders are urged to make their own soil borings, test pits, test caissons or other investigations to determine those conditions that may affect construction operations. Antillian Engineering Associates, Inc. cannot be responsible for any interpretations made from this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which will affect construction operations.

STRATA CHANGES

Strata changes are indicated by a definite line on the boring logs which accompany this report. However, the actual change in the ground may be more gradual. Where changes occur between soil samples, the location of the change must necessarily be estimated using all available information and may not be shown at the exact depth.

OBSERVATIONS DURING DRILLING

Attempts are made to detect and/or identify occurrences during drilling and sampling, such as: water level, boulders, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation of driving resistance, obstructions, etc.; however, lack of mention does not preclude their presence.

WATER LEVELS

Water level readings have been made in the drill holes during drilling and they indicate normally occurring conditions. Water levels may not have been stabilized at the last reading. This data has been reviewed and interpretations made in this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, tides, and other factors not evident at the time measurements were made and reported. Since the probability of such variations is anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based upon such assumptions of variations.

LOCATION OF BURIED OBJECTS

All users of this report are cautioned that there was no requirement for Antillian Engineering Associates, Inc. to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by Antillian Engineering Associates, Inc. to locate any such buried objects. Antillian Engineering Associates, Inc. cannot be responsible for any buried man-made objects which are subsequently encountered during construction that are not discussed within the text of this report.

TIME

This report reflects the soil conditions at the time of investigation. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.

NPDES GROUNDWATER QUALITY REPORT

FOR

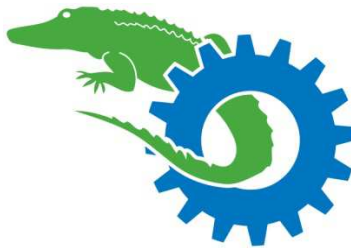
JOHN YOUNG PARKWAY RECLAIMED WATER IMPROVEMENTS

**SOUTH JOHN YOUNG PARKWAY,
ORANGE COUNTY, FLORIDA**

Prepared for

Barnes, Ferland and Associates, Inc.
1230 Hillcrest Street
Orlando, Florida 32803

Prepared by



Gator Engineering & Aquifer Restoration, Inc. (GEAR)
185 Middle Street, Suite 1351
Lake Mary, FL 32746

DECEMBER 2014



December 17, 2014

Mr. Geoff Hennessy, PE
Project Manager
BFA Environmental Consultants
1230 Hillcrest Street, Orlando, FL 32803

RE: NPDES Groundwater Quality Report
Y12-822-PH - John Young Parkway Reclaimed Water Improvements

Dear Mr. Hennessy:

Gator Engineering & Aquifer Restoration, Inc. (GEAR) is pleased to provide you with this letter report detailing the work performed by GEAR for the referenced Orange County Utilities (OCU) project. The work scope was based on the information provided to GEAR by BFA Environmental Consultants (BFA).

Work Scope

BFA was contracted by OCU to conduct improvements to the underground reclaimed water piping along South John Young Parkway, from the intersection with Town Center Boulevard north to just north of the State Road 528 Overpass. The nature of the improvements requires the operation of a dewatering system to lower the surficial aquifer in order to conduct the improvements. BFA contracted GEAR to create and conduct a groundwater sampling plan to conform with the United States Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES).

Groundwater Sampling Plan

GEAR's sampling plan was based on the NPDES requirement of one (1) sampling point approximately every 1,000 feet and/or the presence of a known contaminated site. GEAR performed an environmental data review and determined that the only site in the vicinity with known contamination is 7-Eleven Store No. 39368 located at 2948 Camomile Drive. However, a review of the October 14, 2014 Site Assessment Report prepared by CB&I Environmental & Infrastructure, Inc. indicated groundwater contamination was limited to one sample collected near the center of the property. Thus, the sampling points for this project were based on the linear distance of approximately 22,000 feet, for a total of 22 sampling points. The temporary monitor well locations are depicted on the figures accompanying this report.

185 Middle Street, Ste 1351
Lake Mary, FL 32746
407-878-0950



From November 12 through 14, 2014, GEAR personnel performed 22 temporary monitor well installations along the length of the proposed work area. Soil borings were advanced via hand auger into the water table; borehole completion depth, as well as the interface with the groundwater table, varied between each boring and was mainly determined by local topography and the extent to which borehole collapse occurred within the water table. Upon reaching completion depth, a temporary monitor well, consisting of 1 inch schedule 40 PVC with 5 feet of 0.006 slot screen and 5 feet of solid riser was pushed into the boring, to the extent borehole collapse would allow, and the annulus space was filled with a 30/65 silica sand filter pack. The wells were developed, using a peristaltic pump, for a period of 30 minutes or until turbidity was below 10 NTUs. The field notes, including well construction and development logs, are included as Attachment A.

From November 17 through 19, 2014, GEAR personnel collected groundwater samples from the temporary monitor wells. The samples were collected in accordance with Florida Department of Environmental Protection (FDEP) SOP FS 2200 for all of the analytes except low-level Mercury, which required the use of FDEP SOP FS 8200. Following collection, the samples were placed on ice in a cooler and delivered to Advanced Environmental Laboratories, Inc. (AEL) for analysis per Table 1 of FDEP document 62-621.300(2) [*Generic Permit For The Discharge of Produced Groundwater from Any Non-Contaminated Site Activity*]. The analyses are as follows:

Method	Analyte(s)
EPA 200.8	Cadmium, Copper, Lead, Zinc
8260B	Benzene, Naphthalene
SM3500-CR D	Hexavalent Chromium
SM4500H+B	pH
SM5310B	Total Organic Carbon
EPA 1631 E	Low-level Mercury

The field notes, including groundwater sampling logs, are included as Attachment B.

Groundwater Sampling Data

The results of the groundwater analyses identified the presence of Mercury in three groundwater samples (TW-4, TW-7 and TW-13) at concentrations (0.0447 µg/L, 0.0964 µg/L and 0.0276 µg/L, respectively) exceeding the Freshwater Surface Water Cleanup Target Level (FSWCTL), as defined by Table 1 of FDEP document 62-621.300(2) [*Generic Permit For The Discharge of Produced Groundwater from Any Non-Contaminated Site Activity*], of 0.012 µg/L; all other contaminants of concern tested below their respective FSWCTLs. With respect to the groundwater chemistry, the pH

for 5 of the samples (TW-7, TW-9, TW-10, TW-11, and TW-14) was less than the minimum pH requirement of 6.0 standard units, and all but two of the samples (TW-1 and TW-17) exceeded the Total Organic Carbon limit of 10 mg/L. The data is presented in the table accompanying this report. The laboratory analytical report, with chains of custody, is included as Attachment C.

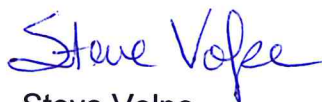
Conclusions and Recommendations

Based on the groundwater laboratory analytical results, GEAR believes the exceedances of pH, Total Organic Carbon and Mercury encountered in the groundwater data are representative of variable background levels and are not the result of a historical release of contaminants into the environment. To remedy the exceedances GEAR recommends the following:

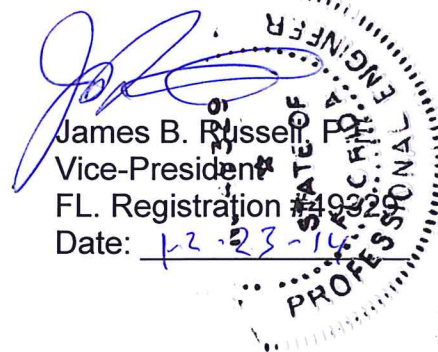
- pH – Levels can be increased by introducing an alkaline during the dewatering process.
- TOC – A variance can be requested concerning the elevated TOC levels based on the known presence of organic soils and laboratory analysis for Total Recoverable Petroleum Hydrocarbons (TRPH).
- Mercury – A microfiltration/ion exchange component can be added to the dewatering system.

If you have any questions, please feel free to contact me at 407-878-0950 extension 26. Thank you for selecting GEAR to be on your team for this project.

Sincerely,
Gator Engineering & Aquifer Restoration, Inc.



Steve Volpe
Senior Geologist



James B. Russell, P.E.
Vice-President
FL. Registration #19329
Date: 12-23-14
PROFESSIONAL ENGINEER
STATE OF FLORIDA

Table

TABLE 1: Groundwater Analytical Data

Project Name: John Young Parkway Reclaimed Water Improvements

See notes at end of table.

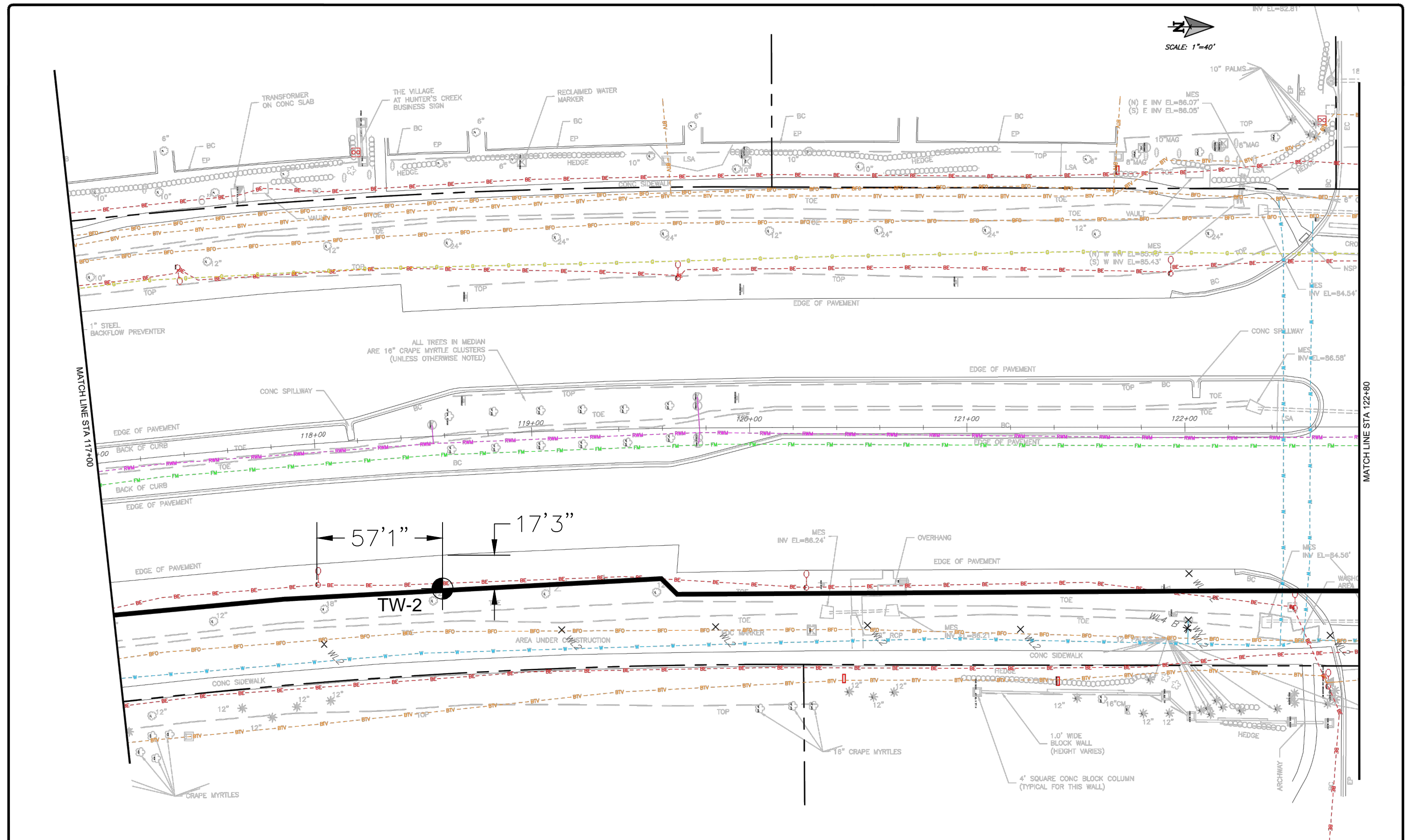
Sample		Benzene	Naphthalene	Cadmium	Copper	Lead	Zinc	Hexavalent Chromium	Low-Level Mercury	pH	Total Organic Carbon
Location	Date	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(SU)	(mg/L)
TW-1	11/19/2014	0.34 U	0.73 U	0.056 U	0.67 I	0.48 U	1.6 U	0.0025 U	0.00464	6.1	8.0
TW-2	11/17/2014	0.34 U	0.73 U	0.056 U	0.91 I	0.48 U	1.6 U	4.0 I	0.00211	6.7	32
TW-3	11/17/2014	0.34 U	0.73 U	0.099 I	0.22 I	0.48 U	1.6 U	0.0025 U	0.00192	6.3	29
TW-4	11/19/2014	0.34 U	0.73 U	0.056 U	1.3 I	2.8	1.6 U	0.0025 U	0.04470	6.2	11
TW-5	11/19/2014	0.34 U	0.73 U	0.056 U	0.58 I	0.48 U	1.6 U	0.0025 U	0.00500	6.0	11
TW-6	11/19/2014	0.34 U	0.73 U	0.24 I	0.41 I	0.48 U	1.6 U	0.0025 U	0.00352	6.6	20
TW-7	11/18/2014	0.34 U	0.73 U	0.070 I	0.67 I	2.8	1.6 U	0.0025 U	0.09640	5.7	16
TW-8	11/18/2014	0.34 U	0.73 U	0.081 I	0.63 I	1.0 I	1.6 U	0.0025 U	0.00742	6.1	15
TW-9	11/18/2014	0.34 U	0.73 U	0.056 U	0.42 I	0.48 U	1.6 U	0.0025 U	0.00210	5.9	17
TW-10	11/17/2014	0.34 U	0.73 U	0.056 U	0.22 U	0.48 U	1.6 U	0.0030 I	0.00168	5.0	13
TW-11	11/18/2014	0.34 U	0.73 U	0.056 U	0.95 I	0.48 U	1.6 U	0.0025 U	0.00717	5.8	20
TW-12	11/18/2014	0.34 U	0.73 U	0.056 U	1.5	0.48 U	1.6 U	0.0025 U	0.00298	6.4	25
TW-13	11/18/2014	0.34 U	0.73 U	0.13 I	2.4	1.2 I	1.6 U	0.0025 U	0.02760	6.0	20
TW-14	11/18/2014	0.34 U	0.73 U	0.056 U	0.66 I	0.72 I	1.6 U	0.0025 U	0.00974	5.9	29
TW-15	11/18/2014	0.34 U	0.73 U	0.056 U	1.5	2.1	1.6 U	0.0025 U	0.00560	6.4	32
TW-16	11/17/2014	0.34 U	0.73 U	0.056 U	0.63 I	0.48 U	1.6 U	0.0030 I	0.00195	6.9	19
TW-17	11/17/2014	0.34 U	0.73 U	0.056 U	0.60 I	0.48 U	1.6 U	0.0080 I	0.00469	6.8	10
TW-18	11/18/2014	0.34 U	0.73 U	0.056 U	1.3 I	0.68 I	1.6 U	0.0025 U	0.00554	6.6	15
TW-19	11/17/2014	0.34 U	0.73 U	0.056 U	0.64 I	0.48 U	1.6 U	0.0080 I	0.00132	6.7	12
TW-20	11/17/2014	0.34 U	0.73 U	0.056 U	0.60 I	0.48 U	1.6 U	0.0080 I	0.00144	6.2	21
TW-21	11/18/2014	0.34 U	0.73 U	0.056 U	0.5 I	0.48 U	1.6 U	0.0025 U	0.00760	6.5	15
TW-22	11/18/2014	0.34 U	0.73 U	0.056 U	0.25 I	0.52 I	1.6 U	0.0025 U	0.00195	6.6	20
FSWCTLs		1.0**	100.0**	9.3**	2.9**	30.0**	86.0**	11.0**	0.012**	6.0 - 8.5**	10.0**

Notes: FSWCTLs = Freshwater Surface Water Cleanup Target Levels

** = As provided in Table 1, Chapter 62-621.300(2), F.A.C.

SU = Standard Units

Figures



No.	REVISIONS	BY	DATE

LINE IS 1 INCH
AT FULL SIZE
(IF NOT SCALE ACCORDINGLY)

SCALE: AS NOTED



ORANGE COUNTY UTILITIES
9150 CURRY FORD ROAD
ORLANDO, FLORIDA 32825

BFA Environmental Consultants
Barnes, Ferland and Associates, Inc.
1230 E. Hillcrest Street, Orlando, FL 32803
TEL: (407) 896-8608 FAX: (407) 896-1822
ENGINEERING BUSINESS No. 6899

JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVEMENTS

RECLAIMED WATER MAIN PLAN
STA 117+00 TO STA 122+80

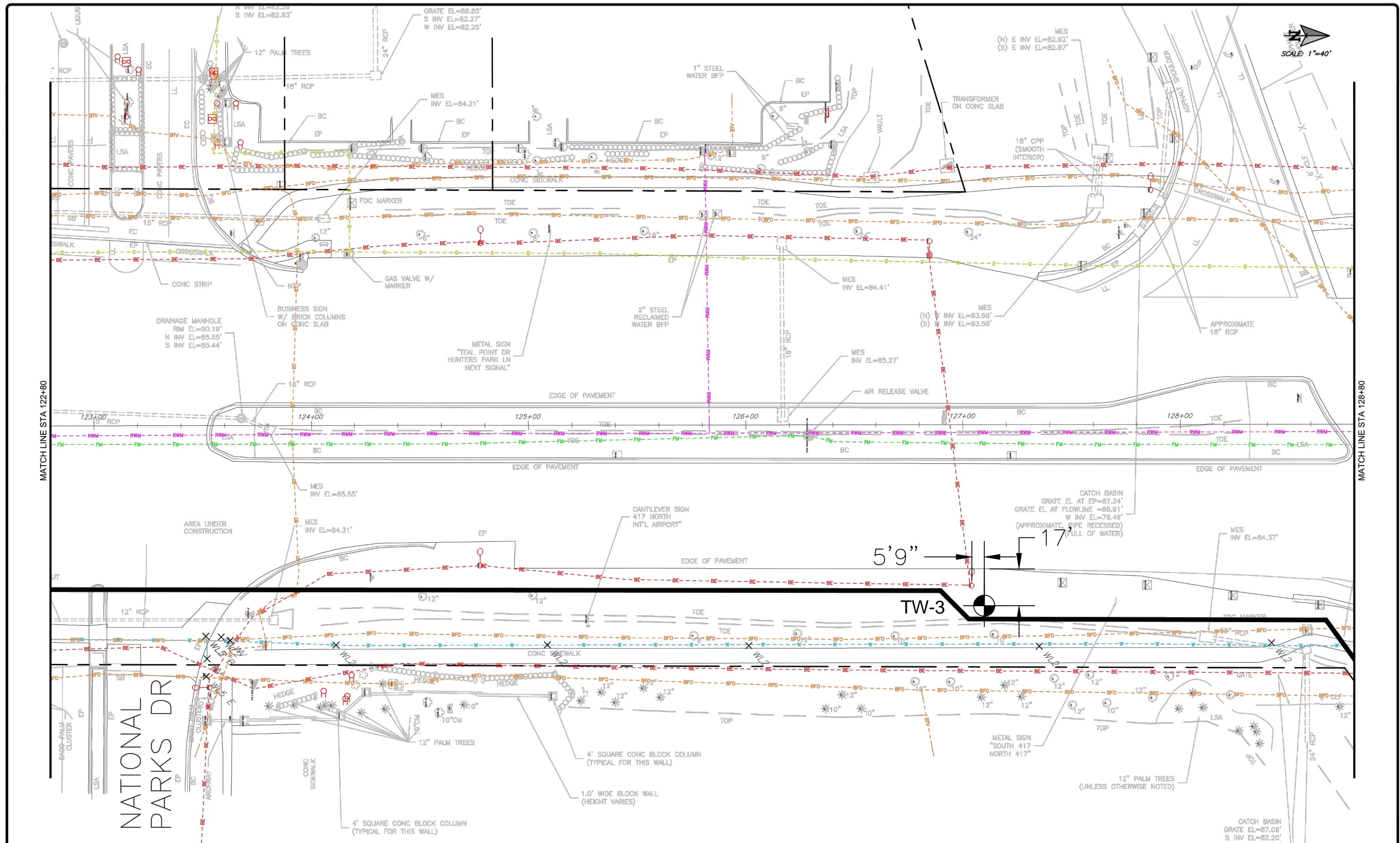
DESIGN ENGINEER
CYNTHIA K. MALONE, P.E.

FLORIDA REGISTRATION No.
58885

PROJECT No.: 2012-39
PROJECT DATE: DEC 2014
DESIGNED BY: CKM
DRAWN BY: JAB
CHECKED BY: GJH
DRAWING FILE: SEE MARGIN

DRAWING No.
U-7


SHEET
OF SN#



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ENGINEERING BUSINESS No. 6899

JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVMENTS

RECLAIMED WATER MAIN PLAN
STA 122+80 TO STA 128+80

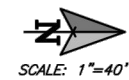
DESIGN ENGINEER
CYNTHIA K. MALONE, P.E.

FLORIDA REGISTRATION No.
56885

PROJECT No.: 2012-39
PROJECT DATE: DEC 2014
DESIGNED BY: CKM
DRAWN BY: JAB
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DRAWING No.
U-9

SHEET
OF SN#



CATCH BASIN
GRATE EL=86.00'
W INV EL=81.23'
E INV EL=81.22'

2.5'X2.5' BRICK COLUMN
(TYPICAL FOR THIS WALL)

DRAINAGE MANHOLE
RIM EL=89.02'
N INV EL=78.43'
S INV EL=76.16'
E INV EL=77.76'

N INV EL=76.03'
E INV EL=80.87'

49'

TW-5

24'1"

CATCH BASIN
GRATE EL=87.82'
W INV EL=81.51'
E INV EL=81.58'

CATCH BASIN
GRATE EL=87.82'
W INV EL=81.51'
E INV EL=81.58'

6" HOLLY TREES
(UNLESS OTHERWISE NOTED)

CATCH BASIN
GRATE EL=87.90'
W INV EL=81.61'
E INV EL=82.52'

MES (W) S INV EL=84.94'
(E) S INV EL=84.97'

MES (W) N INV EL=85.38'
(E) N INV EL=85.38'

CATCH BASIN
GRATE EL=86.83'
W INV EL=82.76'
E INV EL=82.77'

CATCH BASIN
W/ NOTCH ON NORTH
AND SOUTH SIDES
GRATE EL=85.41'
N NOTCH EL=84.24'
S NOTCH EL=84.20'
W INV EL=82.75'

INV EL=78.45'
(HEADWALL & CONTROL
STRUCTURE NOT LOCATED)

MATCH LINE STA 146+80

MATCH LINE STA 152+80

No.	REVISIONS	BY	DATE

LINE IS 1 INCH
AT FULL SIZE
(IF NOT SCALE ACCORDINGLY)

SCALE: AS NOTED



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TEL: (407) 896-9608 FAX: (407) 896-1825
ENGINEERING BUSINESS No. 6899

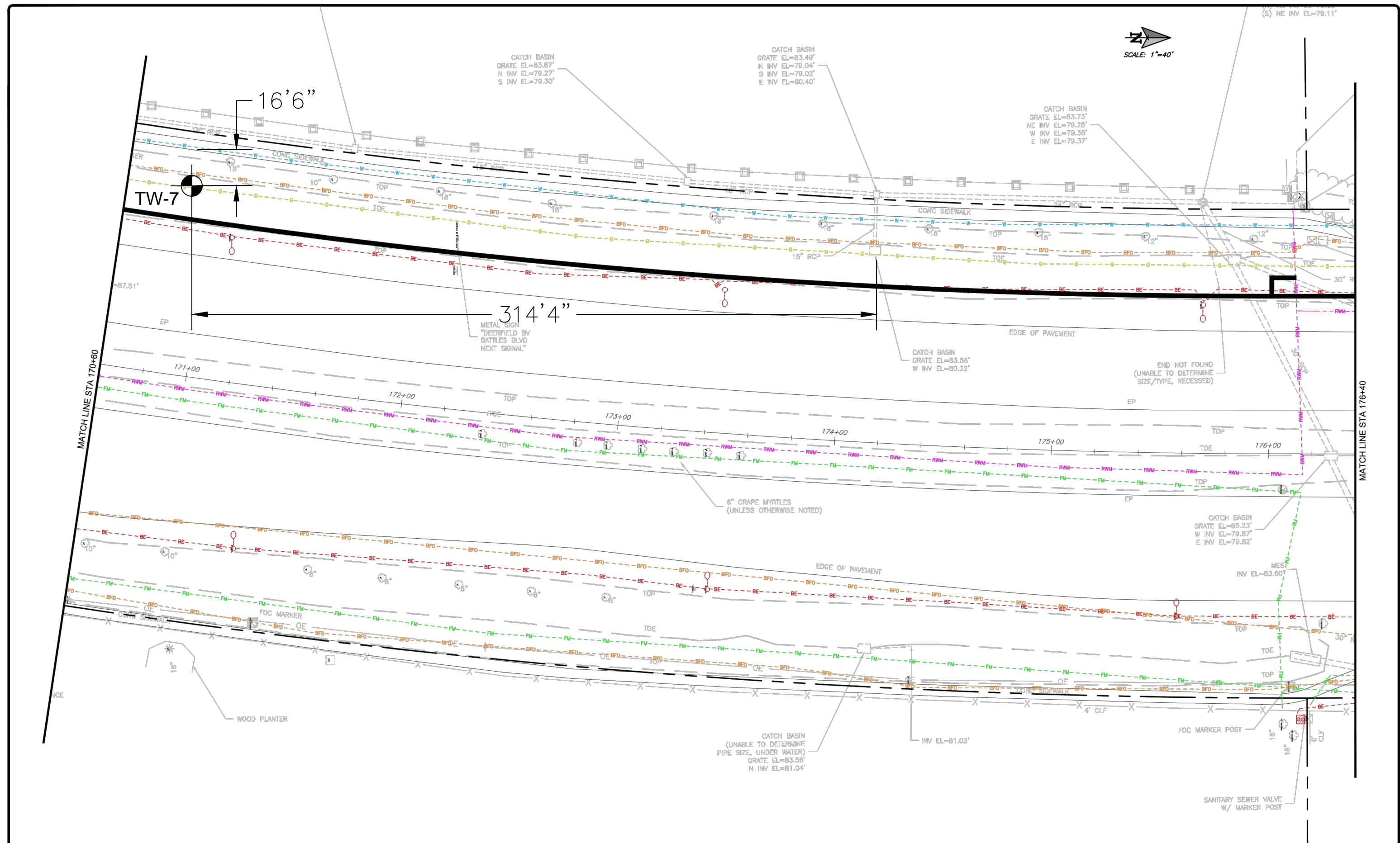
JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVEMENTS

RECLAIMED WATER MAIN PLAN
STA 146+80 TO STA 152+80

DESIGN ENGINEER
CYNTHIA K. MALONE, P.E.
FLORIDA REGISTRATION No.
58985

PROJECT No.: 2012-39
PROJECT DATE: DEC 2014
DESIGNED BY: CKM
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CHECKED BY: GJH
DRAWING FILE: SEE MARGIN

DRAWING No.
U-17
SHEET OF SNT#

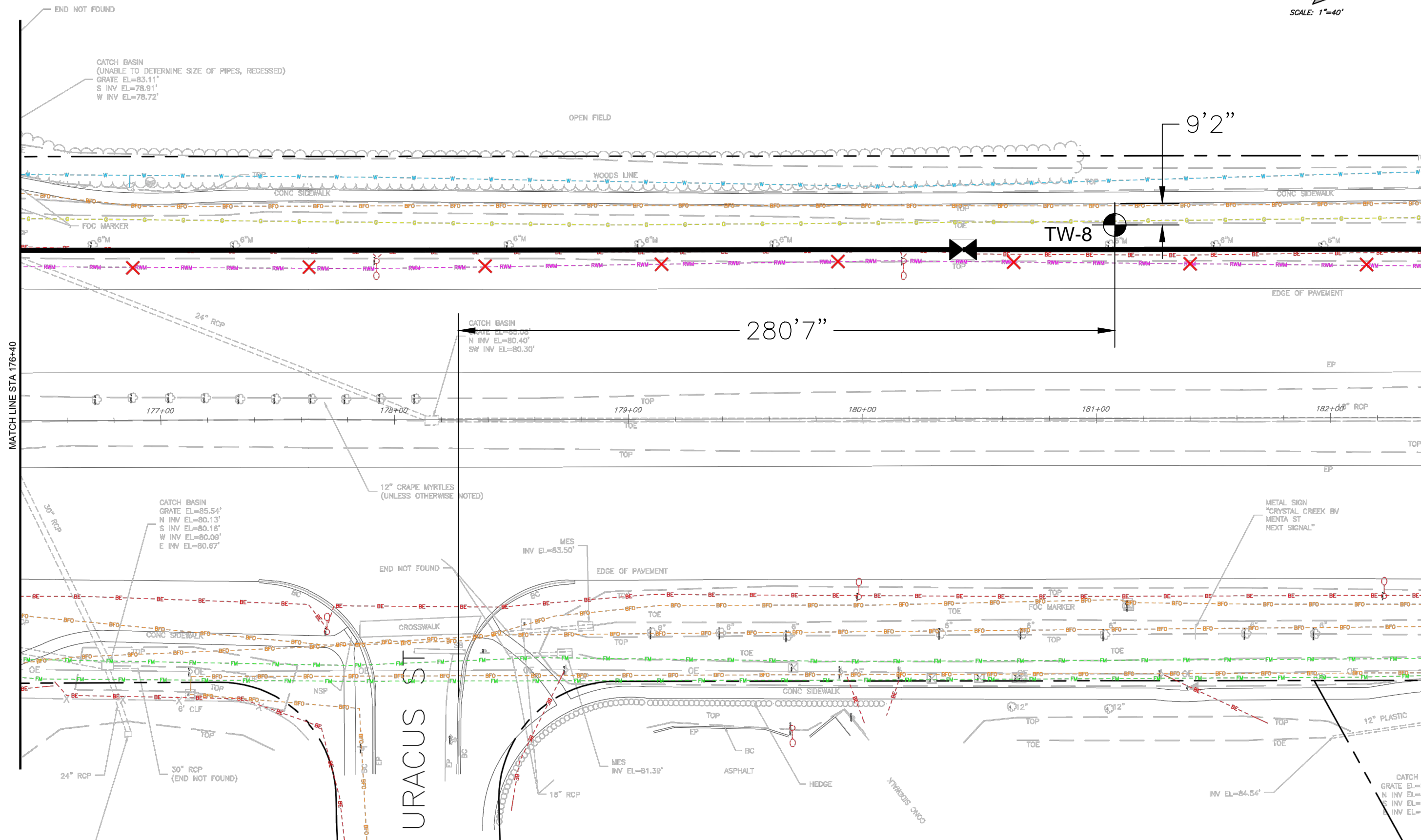


No.	REVISIONS	BY	DATE	<div>LINE IS 1 INCH</div> <div>AT FULL SIZE</div> <div>(IF NOT SCALE ACCORDINGLY)</div> <div>SCALE: AS NOTED</div>	<div>ORANGE COUNTY GOVERNMENT FLORIDA</div> <div>ORANGE COUNTY UTILITIES</div> <div>9150 CURRY FORD ROAD</div> <div>ORLANDO, FLORIDA 32825</div>	<div>BFA Environmental Consultants</div> <div>Barnes, Ferland and Associates, Inc.</div> <div>1230 E. Hillcrest Street, Orlando, FL 32803</div> <div>TEL: (407) 896-8608 FAX: (407) 896-1822</div> <div>ENGINEERING BUSINESS No. 6899</div>	<div>JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVEMENTS</div> <div>RECLAIMED WATER MAIN PLAN</div> <div>STA 170+60 TO STA 176+40</div>	DESIGN ENGINEER	PROJECT No.: 2012-39	DRAWING No.	
			CYNTHIA K. MALONE, P.E.					PROJECT DATE: DEC 2014	U-25		
								DESIGNED BY: CKM			SHEET OF SNT#
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								CHECKED BY: GJH			
				FLORIDA REGISTRATION No. 58685				DRAWING FILE: SEE MARGIN			

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ORLANDO, FLORIDA 32825

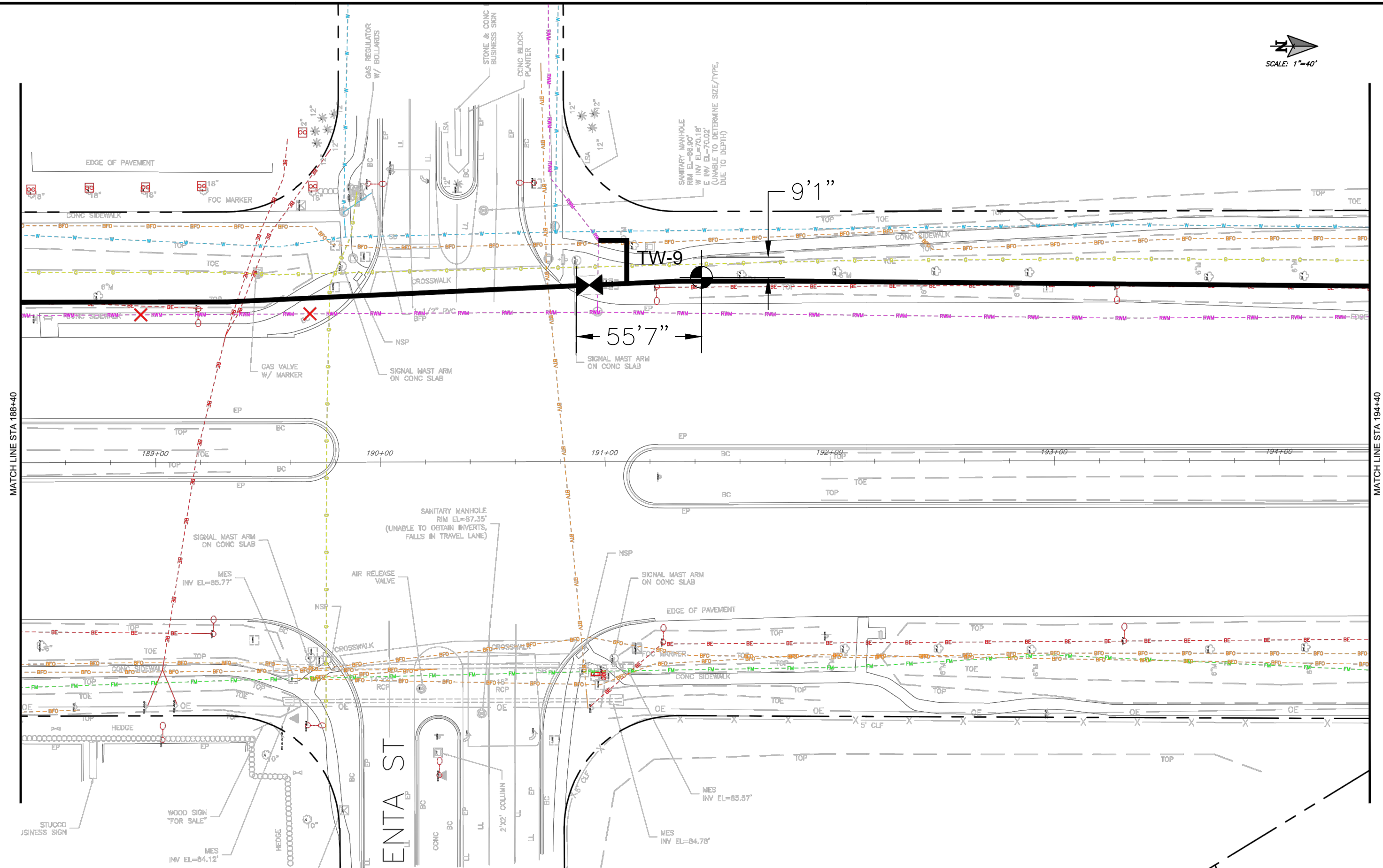
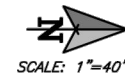
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ENGINEERING BUSINESS NO. 6899

RECLAIMED WATER MAIN PLAN
STA 176+40 TO STA 182+40

DESIGN ENGINEER
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FLORIDA REGISTRATION No. 58685

PROJECT No.:	2012-39
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U-27
SHEET
SN# OF SNT#



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ENGINEERING BUSINESS No. 6899

JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVEMENTS

RECLAIMED WATER MAIN PLAN
STA 188+40 TO STA 194+40

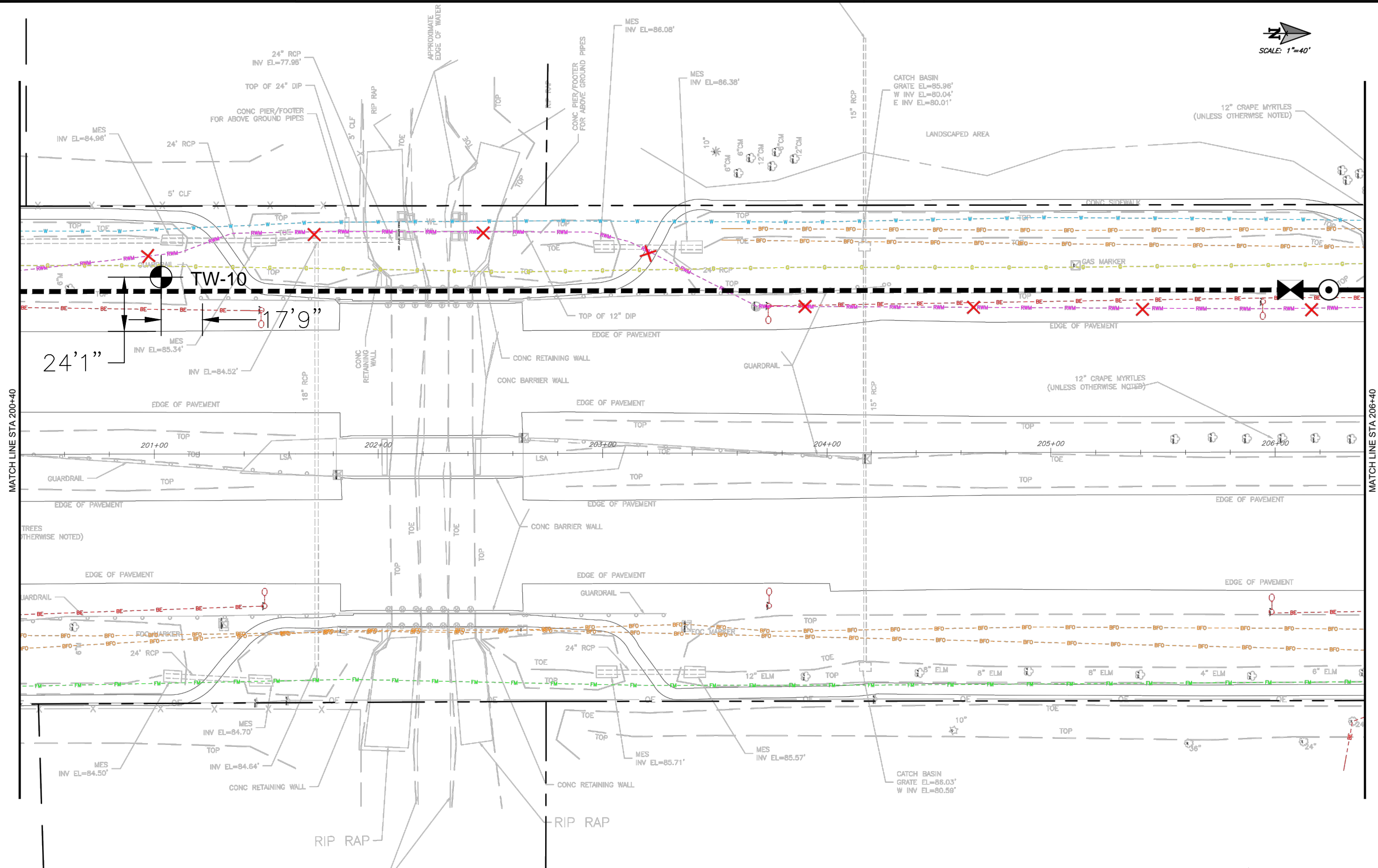
DESIGN ENGINEER
CYNTHIA K. MALONE, P.E.

FLORIDA REGISTRATION No.
59885

PROJECT No.: 2012-39
PROJECT DATE: DEC 2014
DESIGNED BY: CKM
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DRAWING No.
U-31

SHEET
OF 31



No.	REVISIONS	BY	DATE

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SCALE: AS NOTED



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JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVEMENTS

RECLAIMED WATER MAIN PLAN
STA 200+40 TO STA 206+40

DESIGN ENGINEER
CYNTHIA K. MALONE, P.E.

FLORIDA REGISTRATION No.
58885

PROJECT No.: 2012-39
PROJECT DATE: DEC 2014
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DRAWING FILE: SEE MARGIN

DRAWING No.
U-35

SHEET
OF SNT#

SCALE: 1"=40'

END NOT FOUND

343'3"

LANDSCAPED AREA
(PALM TREES)

TW-11

25'



CATCH BASIN
GRATE EL=88.04'
W INV EL=82.73'
E INV EL=82.76'

CATCH BASIN
GRATE EL=89.79'
W INV EL=83.08'
E INV EL=83.22'

BIV-CATCH BASIN
GRATE EL=88.09'
W INV EL=83.54'

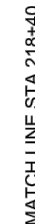
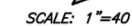
MATCH LINE STA 212+40

MATCH LINE STA 218+40

No.		REVISIONS		BY	DATE	LINE IS 1 INCH AT FULL SIZE (IF NOT SCALE ACCORDINGLY)	SCALE: AS NOTED		ORANGE COUNTY UTILITIES 9150 CURRY FORD ROAD ORLANDO, FLORIDA 32825	 Barnes, Ferland and Associates, Inc. 1230 E. Hillcrest Street, Orlando, FL 32803 PH: (407) 896-3608 FAX: (407) 896-1822 ENGINEERING BUSINESS No. 6899	JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVEMENTS		RECLAIMED WATER MAIN PLAN STA 212+40 TO STA 218+40		DESIGN ENGINEER CYNTHIA K. MALONE, P.E.	PROJECT No.: 2012-39 PROJECT DATE: DEC 2014	DRAWING No.
											FLORIDA REGISTRATION No. 58685	DESIGNED BY: CKM DRAWN BY: JAB CHECKED BY: GJH DRAWING FILE: SEE MARGIN	SN# OF: SNT#				

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SCALE: AS NOTE



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RECLAIMED WATER MAIN PLAN
STA 218+40 TO STA 224+40

DESIGN ENGINEER
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FLORIDA REGISTRATION No.
58685

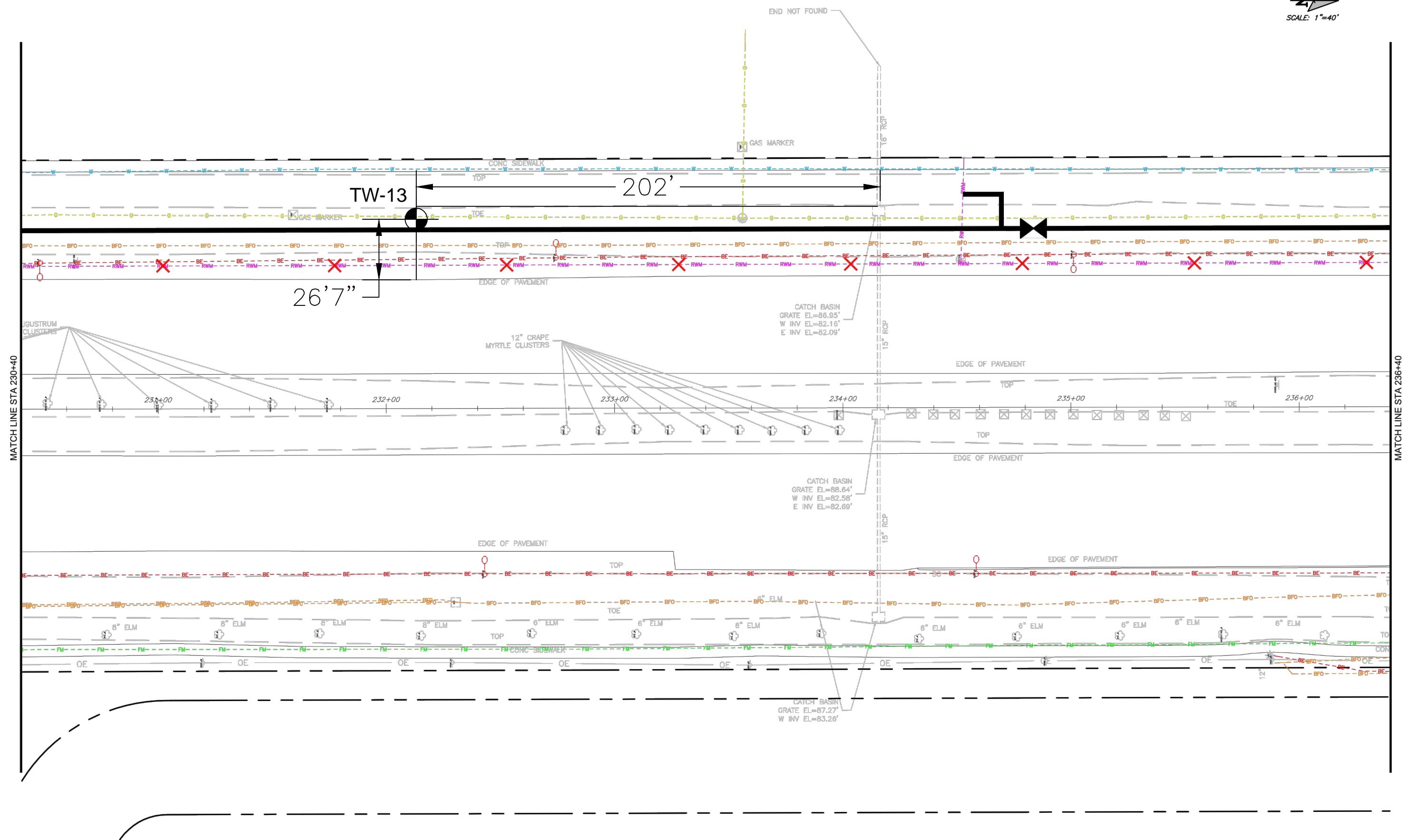
PROJECT No.:	2012-39
PROJECT DATE:	DEC 2014
DESIGNED BY:	CKM
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DRAWING No.
U-41
SHEET
SN# OF SNT#

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SCALE: 1"=40'



No.	REVISIONS	BY	DATE

LINE IS 1 INCH
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(IF NOT SCALE ACCORDINGLY)

SCALE: AS NOTED



ORANGE COUNTY UTILITIES
9150 CURRY FORD ROAD
ORLANDO, FLORIDA 32825

BFA Environmental Consultants
Barnes, Ferland and Associates, Inc.
1230 E. Hillcrest Street, Orlando, FL 32803
PH: (407) 896-8608 FAX: (407) 896-1825
ENGINEERING BUSINESS No. 6899

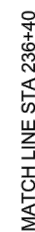
JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVEMENTS

RECLAIMED WATER MAIN PLAN
STA 230+40 TO STA 236+40

DESIGN ENGINEER
CYNTHIA K. MALONE, P.E.
FLORIDA REGISTRATION No.
58885

PROJECT No.: 2012-39
PROJECT DATE: DEC 2014
DESIGNED BY: CKM
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DRAWING FILE: SEE MARGIN

DRAWING No.
U-45
SHEET OF SNT#



LINE IS 1 INCH
AT FULL SIZE
(IF NOT SCALE ACCORDINGLY)

SCALE: AS NOTED

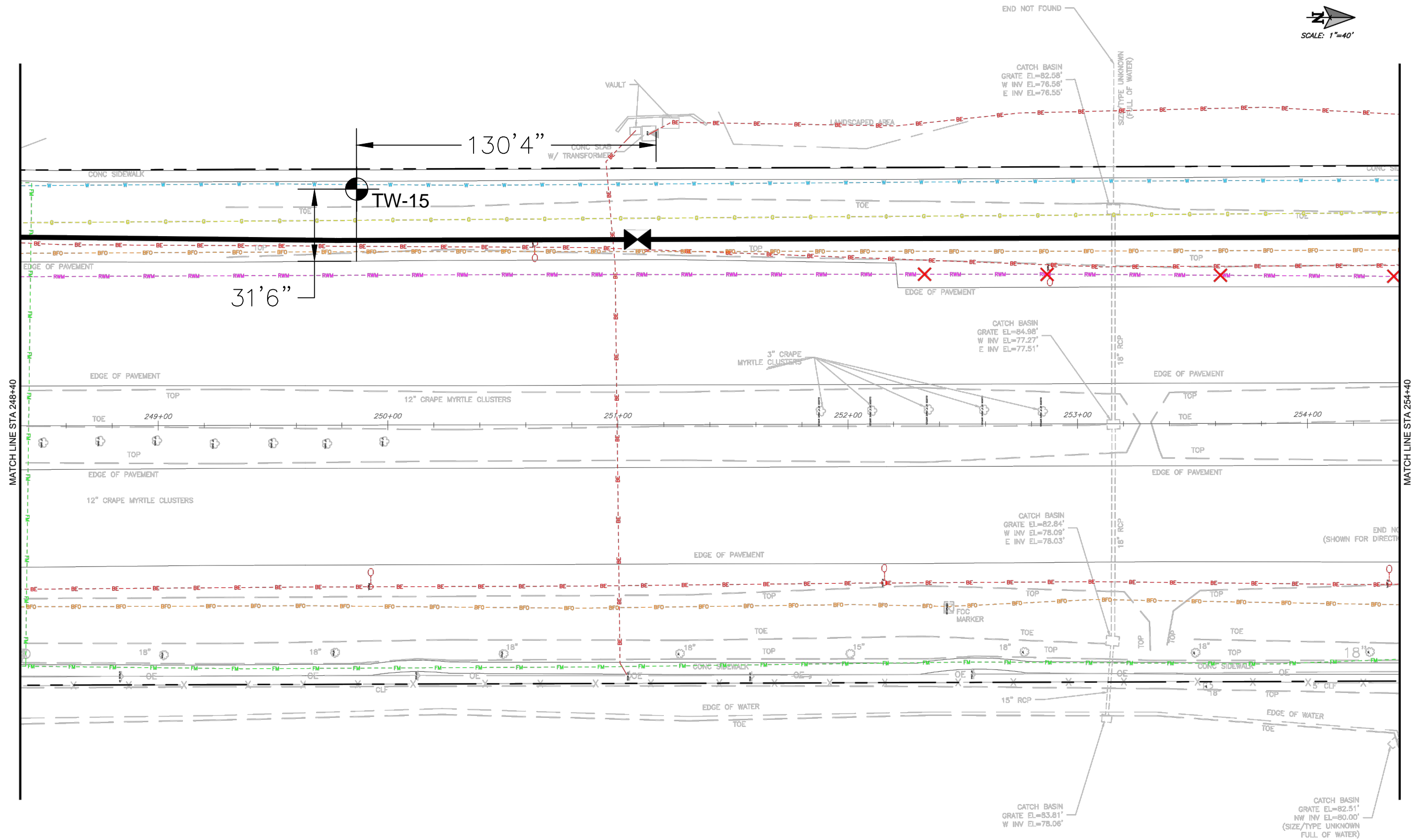
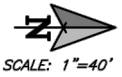
ORANGE COUNTY UTILITIES
9150 CURRY FORD ROAD
ORLANDO, FLORIDA 32825

JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVEMENTS

DESIGN ENGINEER
CYNTHIA K. MALONE, P.E.

FLORIDA REGISTRATION No. 58685

DRAWING No.
U-47
SHEET
SN# OF SNT#



No.	REVISIONS	BY	DATE

LINE IS 1 INCH
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(IF NOT SCALE ACCORDINGLY)

SCALE: AS NOTED



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ORLANDO, FLORIDA 32825

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TEL: (407) 896-8606 FAX: (407) 896-1822
ENGINEERING BUSINESS No. 6899

JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVEMENTS

RECLAIMED WATER MAIN PLAN
STA 248+40 TO STA 254+40

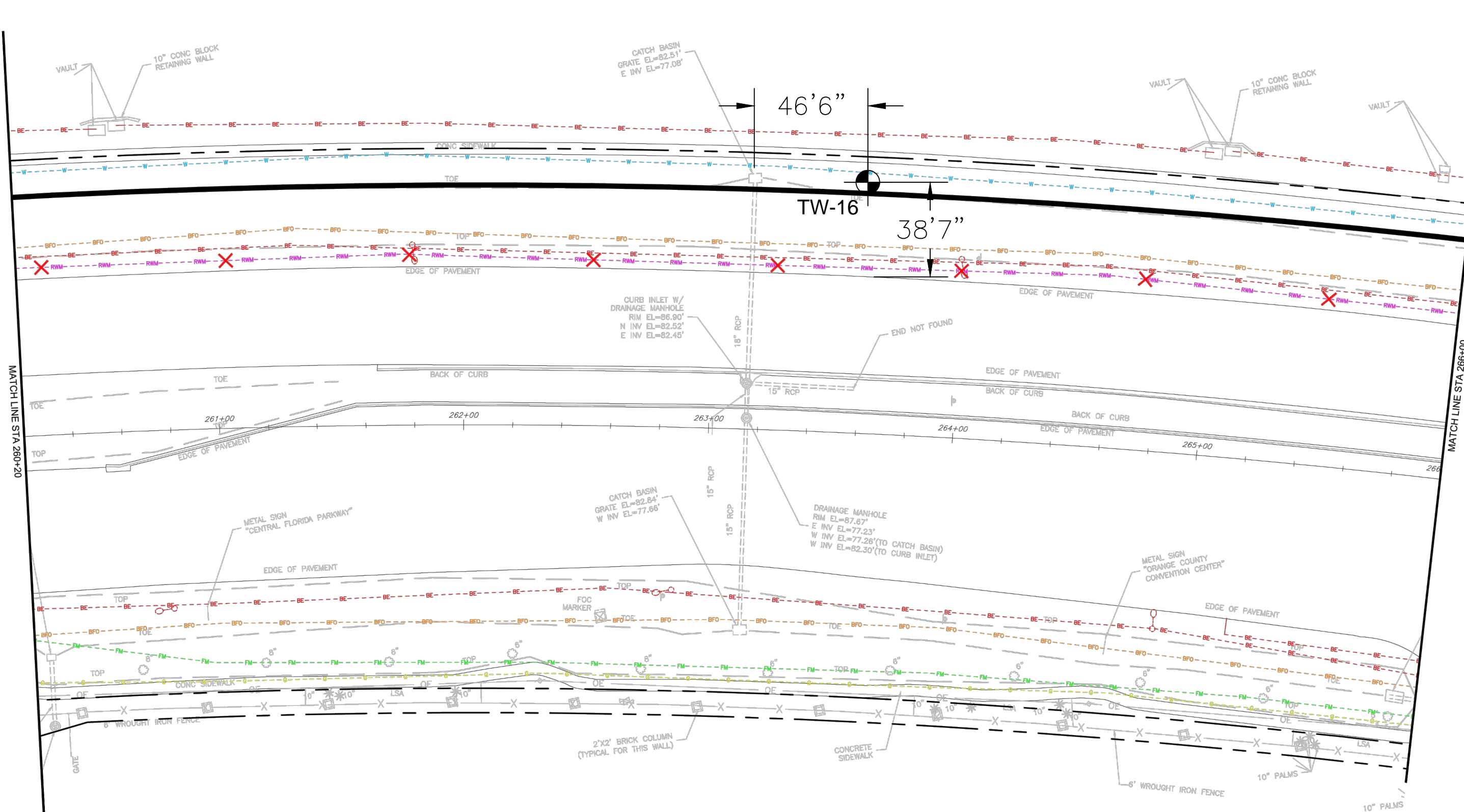
DESIGN ENGINEER
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FLORIDA REGISTRATION No.
58885

PROJECT No.: 2012-39
PROJECT DATE: DEC 2014
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DRAWING No.
U-51

SHEET
OF SNT#



No.	REVISIONS	BY	DATE

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ENGINEERING BUSINESS No. 6899

JOHN YOUNG PARKWAY RECLAIMED WATER MAIN IMPROVEMENTS

RECLAIMED WATER MAIN PLAN
STA 260+20 TO STA 266+00

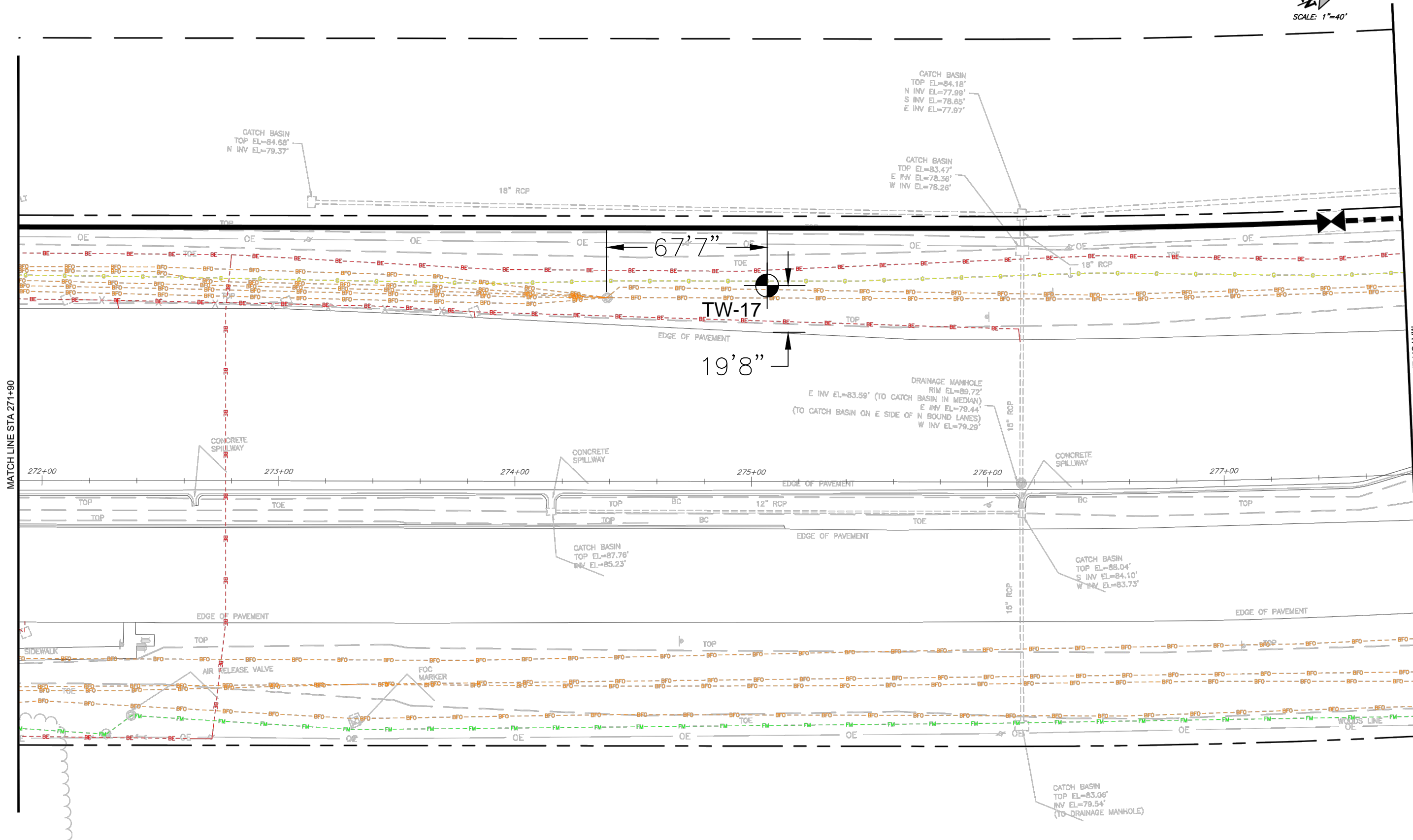
DESIGN ENGINEER
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FLORIDA REGISTRATION No.
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PROJECT No.: 2012-39
PROJECT DATE: DEC 2014
DESIGNED BY: CKM
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DRAWING No.
U-55
SHEET OF SNT#



SCALE: 1"=40'



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										RECLAIMED WATER MAIN PLAN STA 271+90 TO STA 277+80		DRAWN BY: CKM	CHECKED BY: JAB	
												FLORIDA REGISTRATION No. 58885	DRAWING FILE: SEE MARGIN	

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