

Utility Design by FDOT Consultant Agreement Projects for Water and Sewer Pipelines



Presented by:
A&P Consulting Transportation Engineers (APCTE)



Arnelio Alfonso, PE
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Special Appreciation: Tony Soto, FDOT D6 Utilities Administrator

Introduction - Topics to be Discussed

- I. Definition of the Utility Design by FDOT Consultant Agreement
- II. Advantages to Utility Agency/Owner (UAO) and FDOT
- III. Process
- IV. Forms – Design and Construction
- V. Design Standards and Manuals
- VI. Design Challenges (Water & Sewer Projects)
- VII. Construction Challenges (Water & Sewer Projects)
- VIII. Examples of Water and Sewer Projects Built as Utility Work by Highway Contractor
- IX. Lessons Learned

What is a Utility Design by FDOT Consultant Agreement?

It is an agreement requested by the Utility Agency Owner (UAO) once the need for the utility work is identified due to either a planned system betterment, a conflict with the proposed roadway work or by FDOT R/W Department as an easement vacancy by the UAO. UAO sends a letter to FDOT Utility Office requesting to enter into the “Design Agreement”, at this time FDOT prepares the “Utility Design by FDOT Consultant Agreement”, notifies the design consultant and sends the agreement to the UAO.

The “Utility Design by FDOT Consultant Agreement”:

- ◆ Indicates willingness of FDOT and the UAO to enter into an Agreement for the FDOT Consultant to design utility improvements
- ◆ Defines cost of design, to be paid by UAO (30 days prior to the NTP)
- ◆ Plans package should be in the same format of the FDOT Roadway Project and in compliance with FDOT PPM, the UAM, and the UAO Standards.
- ◆ Provides legal responsibilities and procedures in case of default of UAO or FDOT
- ◆ Includes design man-hour estimate, design scope of services, and preliminary construction cost estimate

Advantages for UAO and FDOT

Utility Traffic Control Plans follow sequence of construction of roadway project

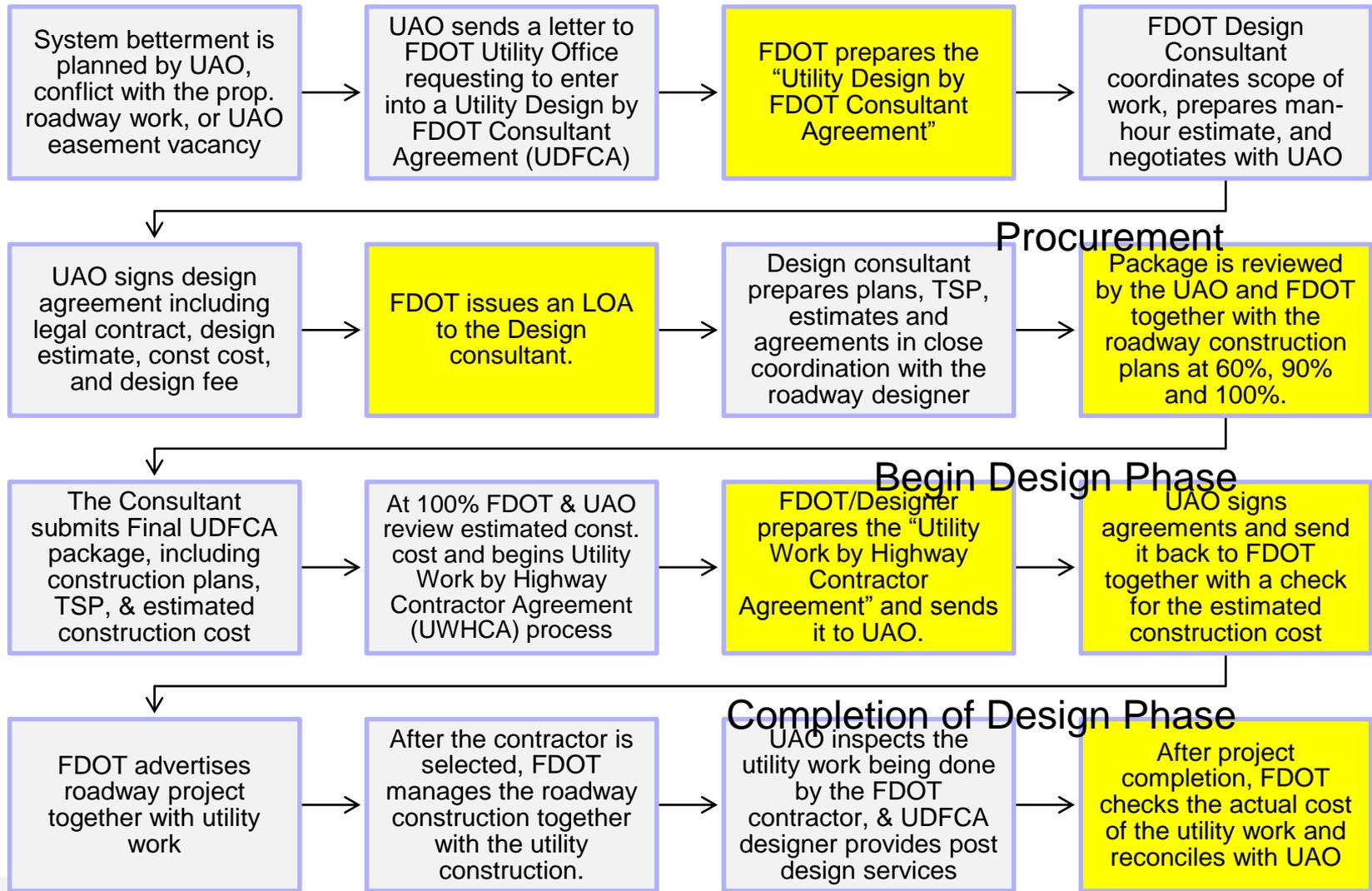
One contractor in charge of both projects

Public involvement and construction administration costs are shared

Pavement restoration is partially or entirely eliminated from the utility work

General public is impacted by construction activities just once

Process



Forms – Design and Construction

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
UTILITY DESIGN BY FOOT CONSULTANT AGREEMENT
 (AT UTILITY EXPENSE)

Form No. 710-010-56
 UTILITIES
 10/04

Financial Project ID:	Federal Project ID:
County:	State Road No.:
District Document No:	
Utility Agency/Owner (UAO):	

THIS AGREEMENT, entered into this _____ day of _____, year of _____, by and between the STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION, hereinafter referred to as the "FDOT," and _____, hereinafter referred to as the "UAO";

WITNESSETH:

WHEREAS, the FDOT, is constructing, reconstructing, or otherwise changing a portion of a public road or publicly owned rail corridor, said project being identified as _____, State Road No.: _____, hereinafter referred to as the "Project"; and

WHEREAS, the UAO owns or desires to install certain utility facilities which are located within the limits of the Project hereinafter referred to as the "Facilities" (said term shall be deemed to include utility facilities as the same may be relocated, adjusted, installed, or placed out of service pursuant to this Agreement); and

WHEREAS, the Project requires the location (vertically and/or horizontally), protection, relocation, installation, adjustment or removal of the Facilities, or some combination thereof, hereinafter referred to as "Utility Work"; and

WHEREAS, the DEPARTMENT and the UTILITY have determined that it would be to the best interest of the general public and to the economic advantage of both parties to enter into an agreement providing for the design of the Utility Work by the engineer designing the Project for the FDOT, hereinafter referred to as the "FDOT Consultant," which design of the Utility Work shall hereinafter be referred to as the "Utility Design"; and

WHEREAS, the UAO, pursuant to the terms and conditions hereof, will bear certain costs associated with the Utility Design;

NOW, THEREFORE, in consideration of the premises and the mutual covenants contained herein, the FDOT and the UAO hereby agree as follows:

1. Design of Utility Work

- a. FDOT Consultant shall prepare, at the UAO's sole cost and expense, final engineering design, plans, other necessary related design documents, and cost estimate for the Utility Work (hereinafter referred to as the "Plans Package") more specifically described in the FDOT's Supplemental Agreement # _____ to Consultant _____ Design Services Contract.
- b. The Plans Package shall be in the same format as the FDOT's contract documents for the Project.
- c. The Plans Package shall include any and all activities and work effort required to perform the Utility Work, including but not limited to, all clearing and grubbing, survey work and shall include a traffic control plan.
- d. The Plans Package shall be prepared in compliance with the FDOT's Utility Accommodation Manual and the FDOT's Plans Preparation Manual in effect at the time the Plans Package is prepared, and the FDOT's contract documents for the Project. If the FDOT's Plans Preparation Manual is updated and conflicts with the FDOT's Utility Accommodation Manual, the Utility Accommodation Manual shall apply where such conflicts exist.
- e. The technical special provisions which are a part of the Plans Package shall be prepared in

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
UTILITY WORK BY HIGHWAY CONTRACTOR AGREEMENT
 (AT UTILITY EXPENSE)

710-010-22
 UTILITIES
 OGC - 10/12

Financial Project ID:	Federal Project ID:
County:	State Road No.:
District Document No:	
Utility Agency/Owner (UAO):	

THIS AGREEMENT, entered into this _____ day of _____, year of _____, by and between the STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION, hereinafter referred to as the "FDOT", and _____, hereinafter referred to as the "UAO";

WITNESSETH:

WHEREAS, the FDOT, is constructing, reconstructing, or otherwise changing a portion of a public road or publicly owned rail corridor, said project being identified as _____, State Road No.: _____, hereinafter referred to as the "Project"; and

WHEREAS, the UAO owns or desires to install certain utility facilities which are located within the limits of the Project hereinafter referred to as the "Facilities" (said term shall be deemed to include utility facilities as the same may be relocated, adjusted, installed, or placed out of service pursuant to this Agreement); and

WHEREAS, the Project requires the location (vertically and/or horizontally), protection, relocation, installation, adjustment or removal of the Facilities, or some combination thereof, hereinafter referred to as "Utility Work"; and

WHEREAS, the FDOT and the UAO desire to enter into a joint agreement pursuant to Section 337.403(1)(b), Florida Statutes for the Utility Work to be accomplished by the FDOT's contractor as part of the construction of the Project; and

WHEREAS, the UAO, pursuant to the terms and conditions hereof, will bear certain costs associated with the Utility Work;

NOW, THEREFORE, in consideration of the premises and the mutual covenants contained herein, the FDOT and the UAO hereby agree as follows:

1. Design of Utility Work

- a. UAO shall prepare, at UAO's sole cost and expense, a final engineering design, plans, technical special provisions, a cost estimate, and a contingency Utility Work Schedule (said contingency schedule to be used in the case of a bid rejection) for the Utility Work (hereinafter referred to as the "Plans Package") on or before _____, year of _____.
- b. The Plans Package shall be in the same format as the FDOT's contract documents for the Project and shall be suitable for reproduction.
- c. Unless otherwise specifically directed in writing, the Plans Package shall include any and all activities and work effort required to perform the Utility Work, including but not limited to, all clearing and grubbing, survey work and shall include a traffic control plan.
- d. The Plans Package shall be prepared in compliance with the FDOT's Utility Accommodation Manual and the FDOT's Plans Preparation Manual in effect at the time the Plans Package is prepared, and the FDOT's contract documents for the Project. If the FDOT's Plans Preparation Manual has been updated and conflicts with the Utility Accommodation Manual, the Utility Accommodation Manual shall apply where such conflicts exist.
- e. The technical special provisions which are a part of the Plans Package shall be prepared in accordance with the FDOT's guidelines on preparation of technical special provisions and shall not

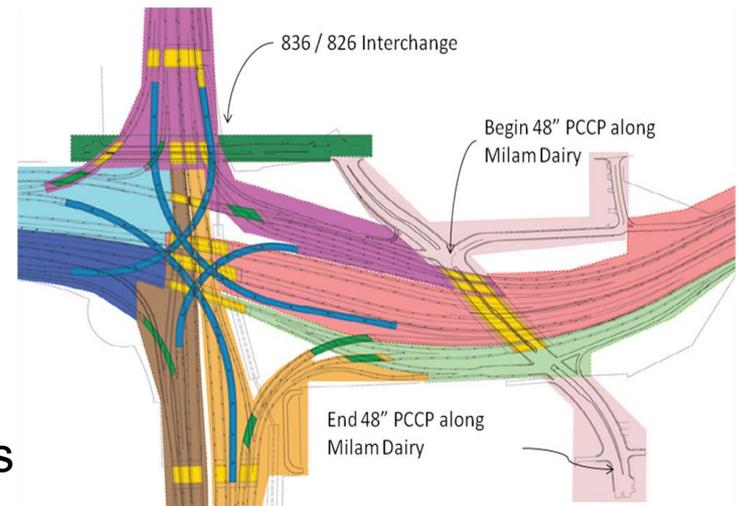


Design Standards & Manuals

- ◆ FDOT PPM, Volume II, Chapter 27 - Utility Work by Highway Contractor Agreement Plans
- ◆ UAO Standards for the design of the utility work
- ◆ FDOT Standard Indexes
- ◆ FDOT Standard Specifications for applicable items such as concrete, metal casting, bricks, embankment, fill, pavement restoration, etc.
- ◆ Utility Accommodations Manual
- ◆ Permit requirements for the installation of utility in public R/W
- ◆ Other Applicable Standards
 - ✓ ANSI American National Standards Institute, Inc.
 - ✓ ASTM American Society for Testing and Materials
 - ✓ AWWA American Water Works Association
 - ✓ FDEP Florida Department of Environmental Protection
 - ✓ SFWMD South Florida Water Management District
 - ✓ EPA Environmental Protection Agency
 - ✓ NFPA National Fire Protection Association
 - ✓ NSF / ANSI Standard 61 Drinking Water System Component
 - ✓ NSF National Sanitation Foundation
 - ✓ Local standards

Design Challenges

- Utility verification
- Small vs. Large Diameter Pipe
- Permits
- Technical Special Provisions
- Electronic/Digital Delivery
- Engineer's Estimate of Construction Costs
- Schedule
- Maintenance of Traffic (MOT)
- Evaluation of Contractor Bids
- Post Design Services
- Coordination with Roadway Designer
- Pavement Design
- Environmental Concerns



Design Challenges

Utility Verification

FDOT performs
initial utility contact

Initial site assessment to
locate existing water and
sewer services & other
utilities

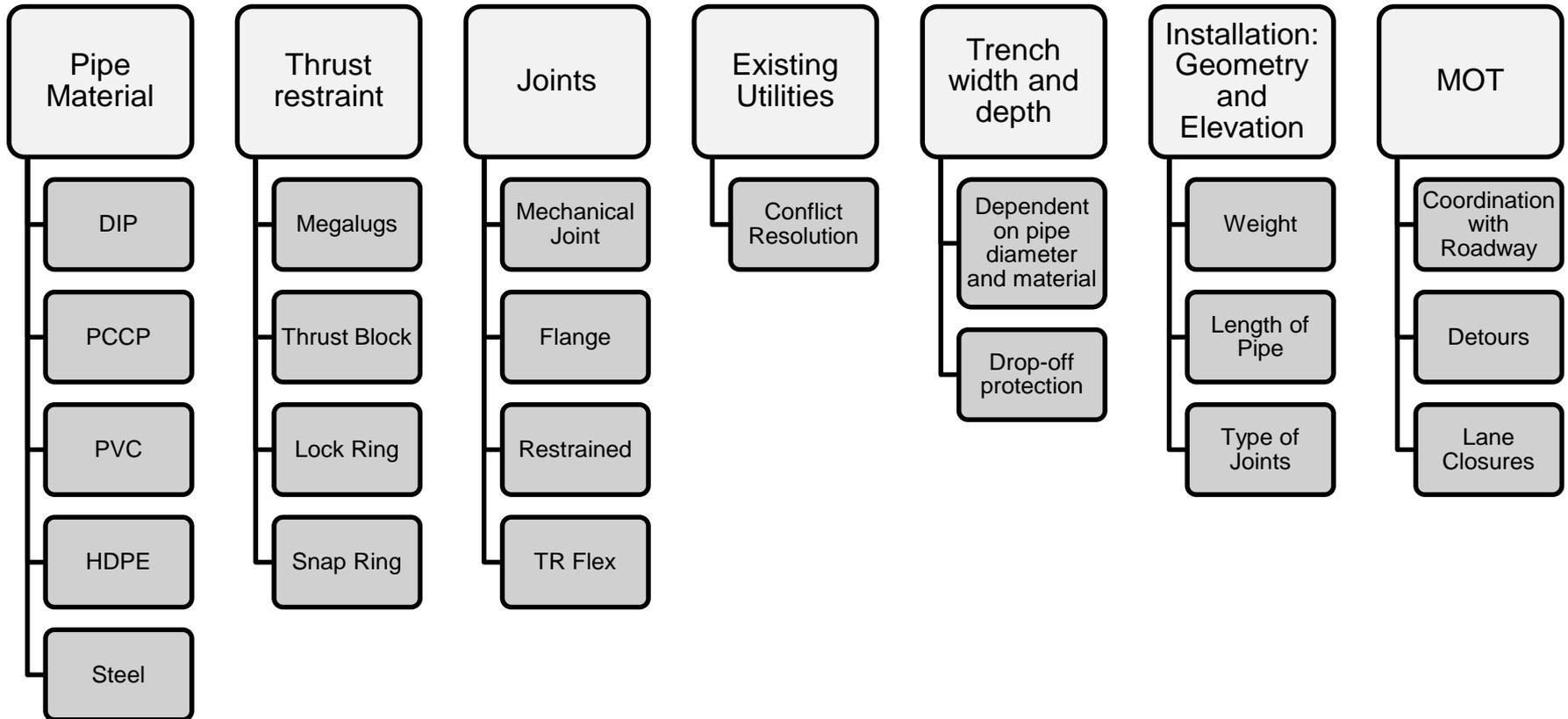
Obtain available as-built
drawings from utility
agencies

Perform soft digs to verify
utility location to avoid
conflicts



Design Challenges

Small vs. Large Diameter Pipe



Design Challenges

Permits

DOH Permit for Water Main

Approval from the Fire Department

FDEP Permit for Sewer

Local Environmental Agencies

Rail Road Crossing when applicable

Building Department approval for sanitary lift stations

Public Works Department when work is outside FDOT ROW

SFWMD ROW Permit for Canal Crossings

Critical Activities

Early Submittal

Request permit fees from UAO

Respond to RFIs

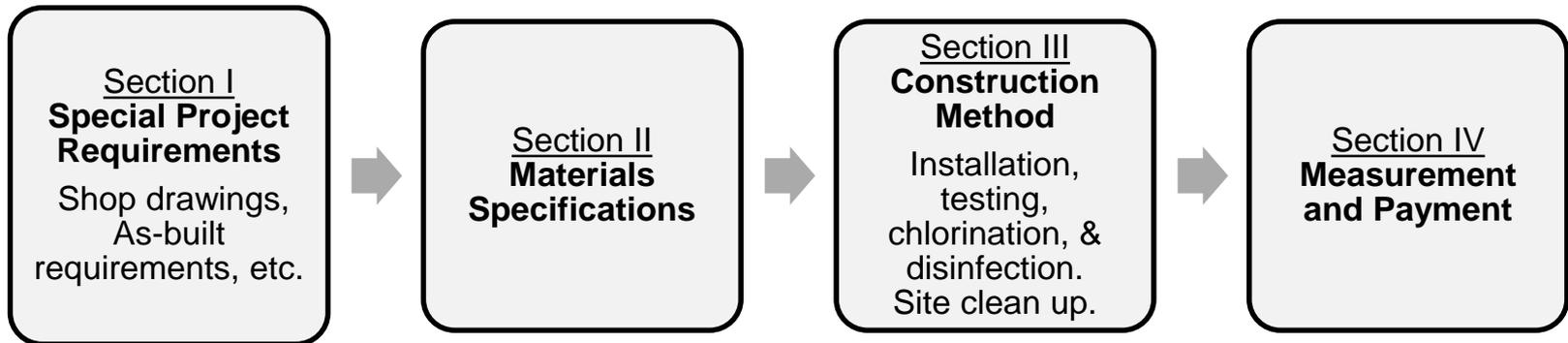
Plan Revisions

Plan Production Submittal deadline

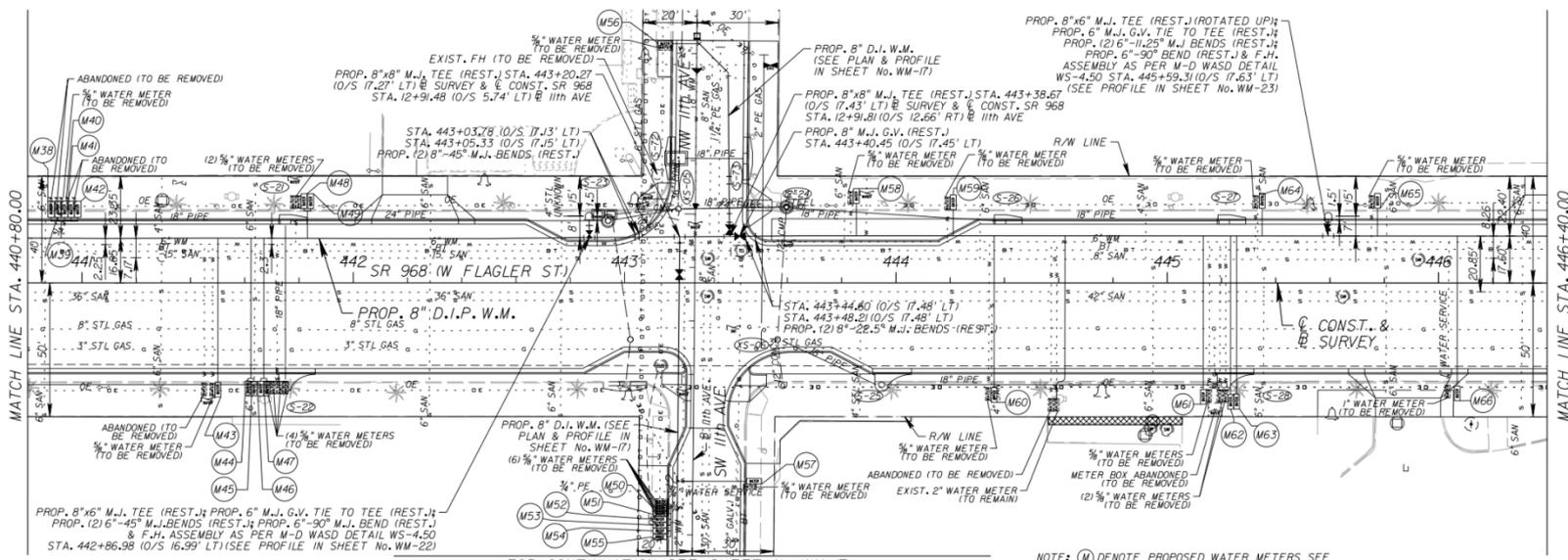
Design Challenges

Technical Special Provisions (TSP)

Follow FDOT Handbook to develop TSP

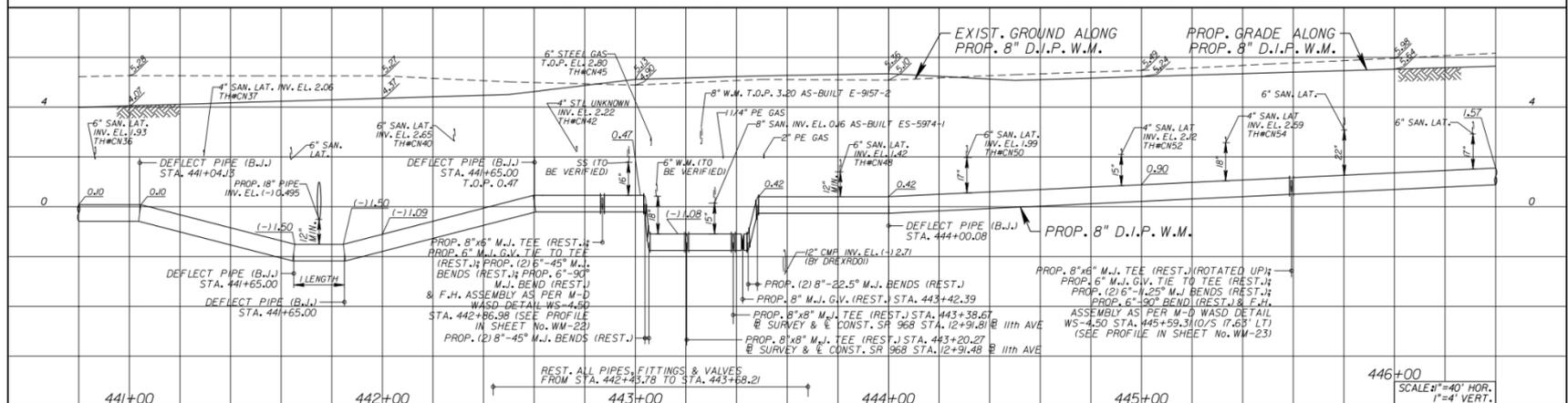


- ◆ TSP should be coordinated, reviewed and approved by both FDOT and UAO
- ◆ TSP does not contradict FDOT Specs.
- ◆ All pay items for work to be done is covered in Measurement and Payment
- ◆ Progression of Work and Sequence of Construction for all activities to be done in Utility Design by FDOT Consultant Agreement following the proposed MOT
- ◆ Include Buy America Provisions for all Utility Design by FDOT Consultant Agreement projects



FOR CONTINUATION SEE SHEET No. WM-17

NOTE: (M) DENOTE PROPOSED WATER METERS SEE SHEET WM-25 & 26 FOR WATER METER SCHEDULE



DATE	DESCRIPTION	DATE	DESCRIPTION

A&P Consulting Transportation Engineers Corp.
 10306 N.W. 41 Street, suite 115
 Miami, FL 33178
 (305) 592-7283 / fax: (305) 593-1594
 CA No. : EB-00737
 Amelio Alfonso, P.E. No. 52566

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION
 ROAD NO. COUNTY FINANCIAL PROJECT ID
 968 MIAMI-DADE 414633-1-56-01

**PROP. 8" D.I. W.M.
 PLAN & PROFILE**

SHEET NO.
 WM-09

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Design Challenges

Engineer's Opinion of Cost for Construction

Based on historical cost data and previous experience

Pay items as per FDOT BOE

Must determine average cost of multiple items with same pay item number

FDOT and UAO must approve

Includes Mobilization, MOT, Contingency, and C.E.A.



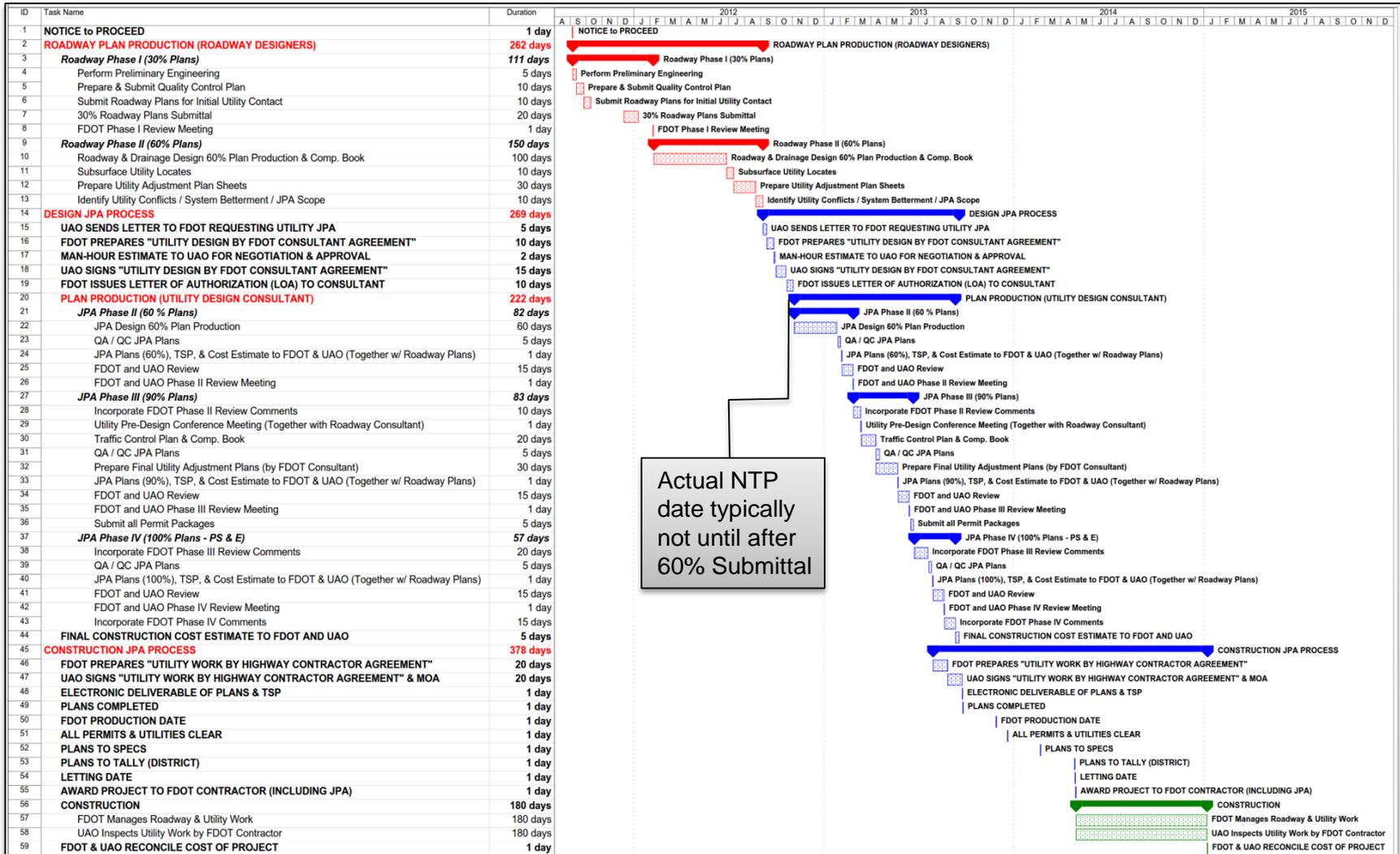
CONSTRUCTION COST ESTIMATE

8" Water Main along W. Flagler ST from 14th Avenue to 7th Avenue.
Financial Project No. 414833-1-58-01
Miami Dade Water and Sewer Department

ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL
8" Water Main along W. Flagler ST from 14th Avenue to 7th Avenue.					
1050-11-321	Utility Pipe (F&I) (PE) (Water) (3/4")	LF	\$16.00	3,098.00	\$49,568.00
1050-11-321	Utility Pipe (F&I) (PE) (Water) (1")	LF	\$18.00	121.00	\$2,178.00
1050-11-322	Utility Pipe (F&I) (PE) (Water) (2")	LF	\$22.34	62.00	\$1,385.08
1050-11-322	Utility Pipe (F&I) (PE) (Water) (3")	LF	\$22.34	17.00	\$379.78
1050-11-422	Utility Pipe (F&I) (D.I.) (Water) (4")	LF	\$39.50	3.00	\$118.50
1050-11-423	Utility Pipe (F&I) (D.I.) (Water) (6")	LF	\$46.60	319.00	\$14,865.40
1050-11-424	Utility Pipe (F&I) (D.I./C.I.) (Water) (8")	LF	\$85.61	5,049.00	\$432,244.89
	Utility Pipe (F&I) (D.I./C.I.) (Water) (12")	LF	\$85.61	289.00	\$24,741.29
1050-18-002	Utility Pipe (Plug & Place Out of Service) (2")	LF	\$31.30	153.00	\$4,788.90
	Utility Pipe (Plug & Place Out of Service) (3")	LF	\$31.30	18.00	\$563.40
1050-18-003	Utility Pipe (Plug & Place Out of Service) (6")	LF	\$31.30	4,220.00	\$132,086.00
	Utility Pipe (Plug & Place Out of Service) (8")	LF	\$9.95	618.00	\$6,149.10
1050-18-004	Utility Pipe (Plug & Place Out of Service) (12")	LF	\$9.95	302.00	\$3,004.90
1055-11-414	Utility Fittings (F&I) (D.I./C.I.) (Elbow) (90°) (8")	EA	\$1,283.68	1.00	\$1,283.68
	Utility Fittings (F&I) (D.I./C.I.) (Elbow) (45°) (8")	EA	\$1,283.68	79.00	\$1,014,10.72
	Utility Fittings (F&I) (D.I./C.I.) (Elbow) (22.5°) (8")	EA	\$1,283.68	15.00	\$19,255.20
	Utility Fittings (F&I) (D.I./C.I.) (Elbow) (22.5°) (12")	EA	\$1,283.68	2.00	\$2,567.36
	Utility Fittings (F&I) (D.I./C.I.) (Elbow) (45°) (12")	EA	\$1,283.68	10.00	\$12,836.80
1055-11-424	Utility Fittings (F&I) (D.I./C.I.) (Tee) (8"x4")	EA	\$2,259.61	1.00	\$2,259.61
	Utility Fittings (F&I) (D.I./C.I.) (Tee) (8"x6")	EA	\$2,259.61	16.00	\$36,153.76
	Utility Fittings (F&I) (D.I./C.I.) (Tee) (8"x8")	EA	\$2,259.61	12.00	\$27,115.32
1055-11-434	Utility Fittings (F&I) (D.I./C.I.) (Reducer) (8"x6")	EA	\$611.13	1.00	\$611.13
	Utility Fittings (F&I) (D.I./C.I.) (Reducer) (12"x8")	EA	\$611.13	3.00	\$1,833.39
	Utility Fittings (F&I) (D.I./C.I.) (Plug) (8")	EA	\$976.34	13.00	\$12,692.42
1055-11-454	Utility Fittings (F&I) (D.I./C.I.) (Plug) (12")	EA	\$976.34	3.00	\$2,929.02
	Utility Fittings (F&I) (D.I./C.I.) (Cap) (8")	EA	\$976.34	2.00	\$1,952.68
1055-11-494	Utility Fittings (F&I) (D.I./C.I.) (Cross) (8")	EA	\$976.34	2.00	\$1,952.68
1080-11-101	Utility Fixture (F&I) (5/8") (Valve/ Meter Box)	EA	\$638.03	122.00	\$77,839.66
1080-11-201	Utility Fixture (F&I) (1") (Valve/ Meter Box)	EA	\$888.27	1.00	\$888.27
	Utility Fixture (F&I) (2") (Valve/ Meter Box)	EA	\$888.27	1.00	\$888.27
1080-11-203	Utility Fixture (F&I) (3") (Gold Sleeve)	EA	\$1,843.00	1.00	\$1,843.00
1080-11-204	Utility Fixture (F&I) (3") (Valve Assembly)	EA	\$938.96	1.00	\$938.96
1080-11-205	Utility Fixture (F&I) (2") (F.V.O. Assembly)	EA	\$1,438.11	3.00	\$4,314.33
1080-11-206	Utility Fixture (F&I) (2") (Air Release Assembly)	EA	\$4,989.78	17.00	\$84,826.26
1080-11-303	Utility Fixture (F&I) (6") (Gold Sleeve)	EA	\$2,283.87	3.00	\$6,851.61
1080-11-304	Utility Fixture (F&I) (6") (Valve Assembly)	EA	\$1,274.00	16.00	\$20,384.00
1080-11-403	Utility Fixture (F&I) (8") (Gold Sleeve)	EA	\$5,883.90	15.00	\$88,258.50
	Utility Fixture (F&I) (12") (Gold Sleeve)	EA	\$5,883.90	3.00	\$17,651.70
	Utility Fixture (F&I) (8") (Valve Assembly)	EA	\$2,787.59	25.00	\$69,689.75
1080-11-404	Utility Fixture (F&I) (12") (Valve Assembly)	EA	\$2,787.59	1.00	\$2,787.59
1080-11-503	Utility Fixture (F&I) (24"x8") (Tapp. Sleeve & Tapp. Valve)	EA	\$15,000.00	1.00	\$15,000.00
1080-16	Utility Fixture (Remove & Dispose) (Meter Box)	EA	\$276.05	146.00	\$40,303.30
1644-114-08	Fire Hydrant (F&I) (STD) (2 Way, Flush Type, 1 Hose, 1 Pumper) (6")	EA	\$5,084.44	14.00	\$71,182.16
1644-900	Fire Hydrant (Removed)	EA	\$586.49	6.00	\$3,518.94
Total					\$1,404,093.31
101-1-	MOBILIZATION (10%)	LB	\$140,409.33	1	\$140,409.33
102-1-	MAINTENANCE OF TRAFFIC (M.O.T.) (5%)	LB	\$70,204.67	1	\$70,204.67
TOTAL ESTIMATED CONSTRUCTION COST					\$1,614,707.31
999-25	CONTINGENCY FUND (10%)				\$161,470.73
	CONST. ENGINEERING ADMINISTRATION [C.E.A.] (2%)				\$32,294.15
8" WATER MAIN GRAND TOTAL					\$1,808,472.19



Design Challenges



Design Challenges

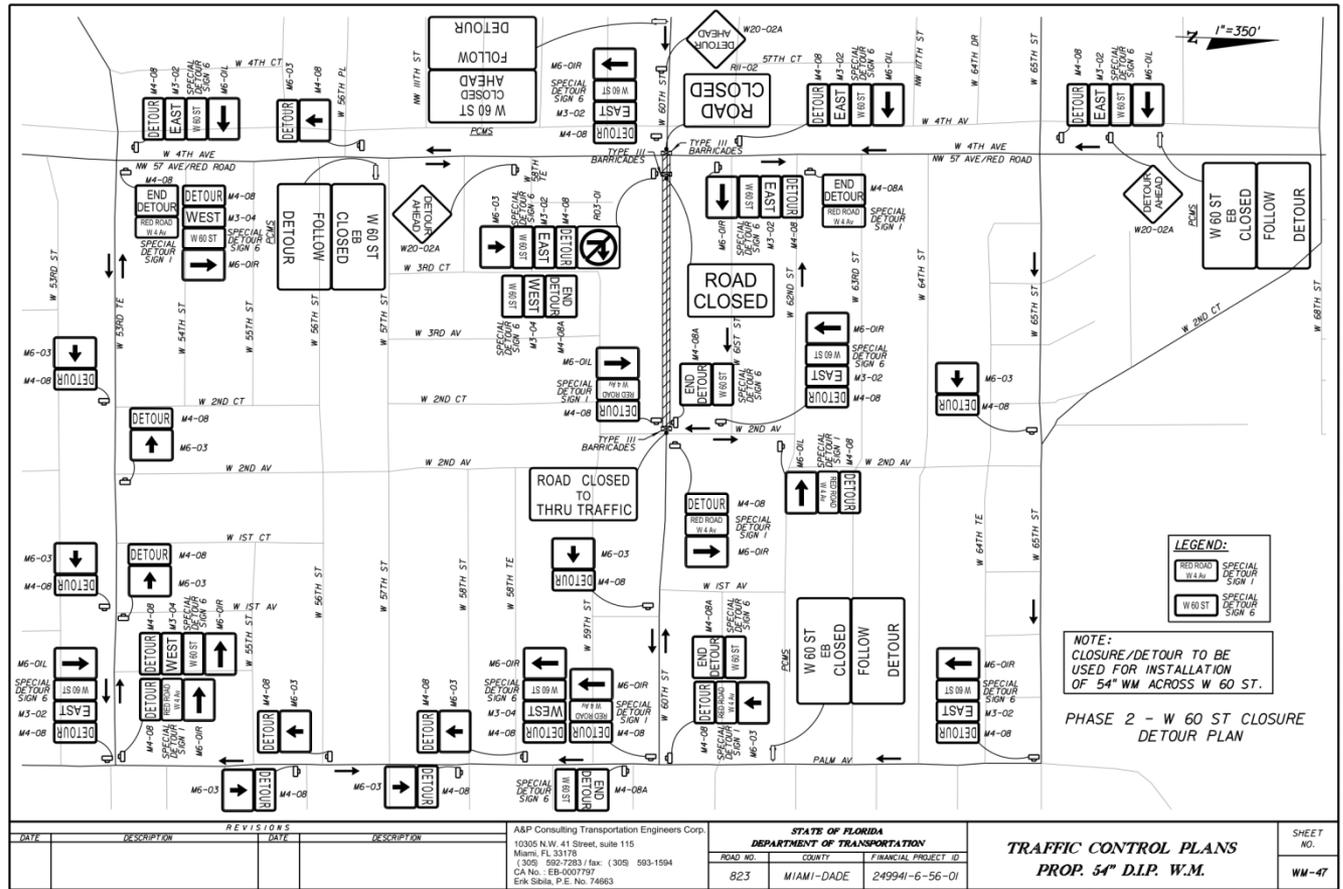
Maintenance of Traffic (MOT)

Coordination with roadway MOT design

Propose any necessary modifications to MOT design and/or phasing

Develop separate Traffic Control Plans for UDFCA project

Coordinate pay items and quantities with roadway designer



REVISIONS		DATE		DESCRIPTION	

ASP Consulting Transportation Engineers Corp. 10305 N.W. 41 Street, suite 115 Miami, FL 33178 (305) 592-7283 fax: (305) 593-1594 CA No. - EB-0007797 ERM 500a, P.E. No. 74863		STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		FINANCIAL PROJECT ID 249941-6-56-01	
ROAD NO. 823		COUNTY MIAMI-DADE		FINANCIAL PROJECT ID 249941-6-56-01	

TRAFFIC CONTROL PLANS PROP. 54" D.I.P. W.M.			SHEET NO. WM-47
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Construction Challenges

Evaluation of Contractor Bids

Determine validity

Evaluate W&S bid vs. Total Cost

Compare with Estimate

Prepare Bid Analysis

Prepare recommendation

CONSTRUCTION COST VS BID ANALYSIS

Water and Sewer Improvements along NW 25th Street from NW 89th Avenue to SR 826/Palmetto Expressway
Relocate 36-inches D.I.P. Force main and Relocate 16-inches D.I.P. Water Main at NW 79th Avenue
Financial Project No. 251185-1-56-01

ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL	BID			Difference	Remarks
						UNIT PRICE	QUANTITY	TOTAL		
730- 76-116	Steel Casing, Open Trench, F & I, 30"	LF	\$350.00	36.00	\$12,600.00	\$334.20	36.00	\$12,031.20	-\$568.80	
730- 76-124	Steel Casing, Open Trench, F & I, 54"	LF	\$700.00	36.00	\$25,200.00	\$403.86	36.00	\$14,538.96	-\$10,661.04	
1050- 11-423	Utility Pipe, F & I, D.I./ C.I., Water/Sewer, 5-7.9"	LF	\$33.00	220.00	\$7,260.00	\$81.78	220.00	\$17,991.60	\$10,731.60	
1050- 11-424	Utility Pipe, F & I, D.I./ C.I., Water/Sewer, 8-19.9"	LF	\$60.00	318.00	\$19,080.00	\$91.27	318.00	\$29,023.86	\$9,943.86	
1050- 11-425	Utility Pipe, F & I, D.I./ C.I., Water/Sewer, 20-49.9"	LF	\$120.00	1,279.00	\$153,480.00	\$194.86	1,279.00	\$249,225.94	\$95,745.94	This is for Furnishing and Installing the 36" F.M. Unit Price Bid is over 20% above average.
1050-16-003	Utility Pipe, Remove & Dispose, 5-7.9"	LF	\$25.00	130.00	\$3,250.00	\$17.16	130.00	\$2,230.80	-\$1,019.20	
1050-16-004	Utility Pipe, Remove & Dispose, 8-19.9"	LF	\$50.00	307.00	\$15,350.00	\$20.50	307.00	\$6,293.50	-\$9,056.50	
1050-16-005	Utility Pipe, Remove & Dispose, 20-49.9"	LF	\$75.00	856.00	\$64,200.00	\$22.82	856.00	\$19,533.92	-\$44,666.08	
1050-18-003	Utility Pipe, Plug & Place Out of Service, 5-7.9"	LF	\$20.00	590.00	\$11,800.00	\$31.30	590.00	\$18,467.00	\$6,667.00	
1050-18-005	Utility Pipe, Plug & Place Out of Service, 20-49.9"	LF	\$25.00	361.00	\$9,025.00	\$45.64	361.00	\$16,476.04	\$7,451.04	
1055- 11-414	Utility Fittings, F & I, D.I./ C.I., Elbow, 8-19.9"	EA	\$610.00	19.00	\$11,590.00	\$1,202.50	19.00	\$22,847.50	\$11,257.50	
1055- 11-415	Utility Fittings, F & I, D.I./ C.I., Elbow, 20-49.9"	EA	\$2,000.00	19.00	\$38,000.00	\$6,633.44	19.00	\$126,035.36	\$88,035.36	This is for Furnishing and Installing the 36" Elbows. Unit Price Bid by contractor is well above average price.

Construction Challenges

Post Design Services

- Attend pre-construction meeting
- Revise Shop Drawings
- Revise RFIs
- Field Visits
- Plan Revisions
- Inspect pressure tests
- Revise As-Builts
- Certify the project



FDOT D6 Projects Built as Utility Work by Highway Contractor

SR 5 (ROOSEVELT BLVD.) WATER & SEWER IMPROVEMENTS

PROJECT LOCATION

SR 5 (Roosevelt Blvd.) from Georgia St. to 14th St., City of Key West, Florida

SCOPE OF WORK

This Project comprised of the installation of 29,000 LF of WM (PVC & DI) and 10,000 LF 24" PVC (C-905) force main along SR 5 (North Roosevelt Boulevard) from Georgia St. to 14th St., in Monroe County, Florida. The project was a Joint Participation Agreement (JPA) between FDOT and the City of Key West.



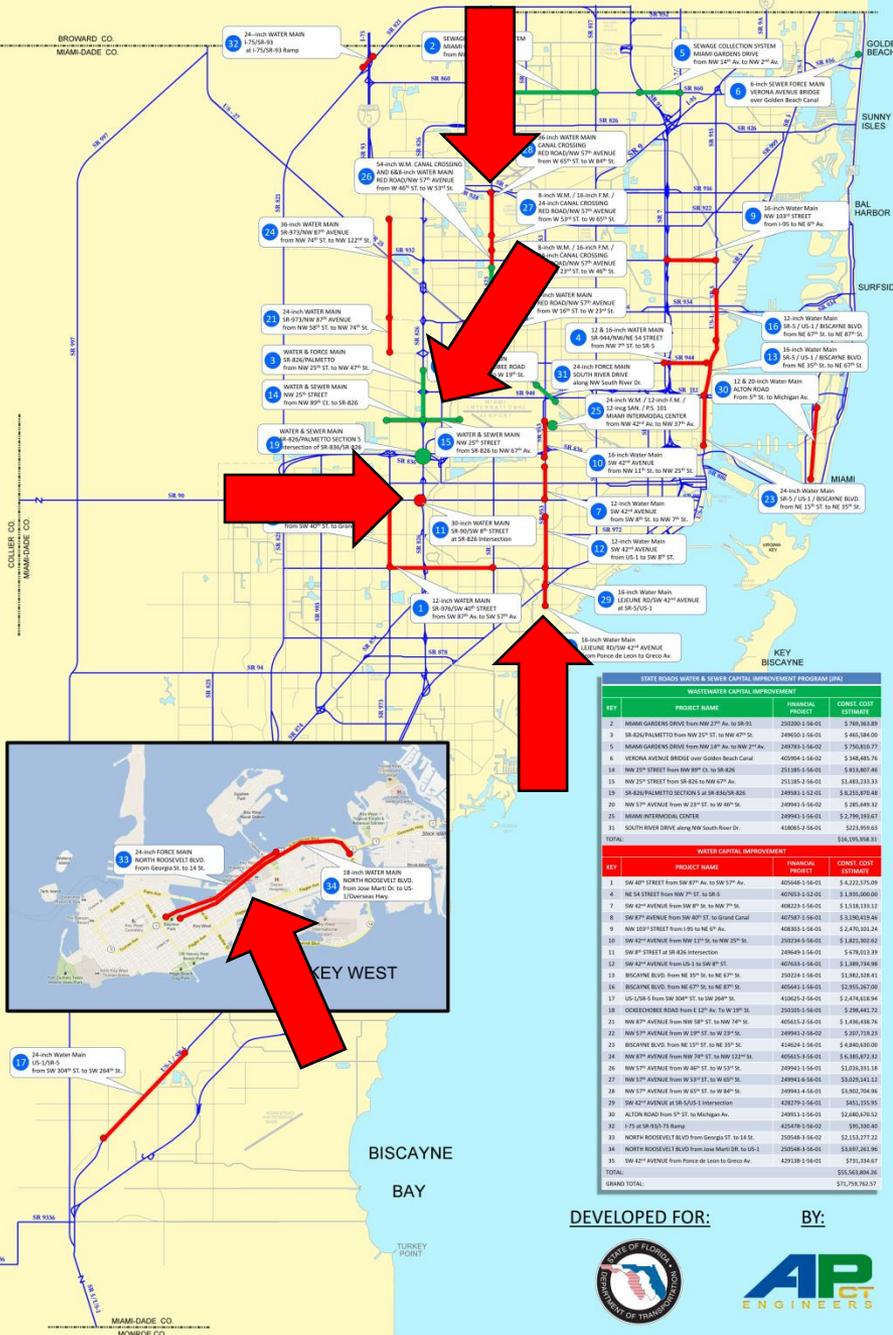
The water main scope of work for the project included a transmission and distribution water main running the length of the project. Both PVC and ductile iron were used for the transmission and distribution mains. The Transmission main was an 18" PVC (C-905) WM over 14,000 LF in length with a 1,000 LF section of ductile iron. The distribution main was approximately 15,000 LF in length.

The project included a special connection of the new 24" force main to the existing 16" force main of Key West. The connection was done at the intersection of Truman Ave and Georgia Street. Due to the amount of utilities in the area, bends and deflection were required to cross along Eisenhower Dr. Another challenging crossing was the 2-60" cross drains, just north of Jose Marti Dr. The project also included an aerial crossing along Salt Run Bridge (FDOT Bridge No. 900128) of the Salt Run Channel with 220 LF of steel pipe for the 24-inch force main. Since shutting down the existing 16" force main attached to the bridge was not feasible, a temporary by-pass was designed. The by-pass was based on a 12" PVC pipe located on top of the existing bridge. The project included reconnection to all existing force mains and lift stations that were discharging into the existing 16" force main.



The Maintenance of Traffic (MOT) was a very important element of the design of this project due to the importance of North Roosevelt Blvd. as a major arterial road in the City of Key West. The MOT was also coordinated with the reconstruction of the road. The construction of the project is being finalized this year.

APCTE was the engineer of record for this project; providing, planning, design, and post-design services. Arnelio Alfonso, P.E. (APCTE) was the project manager of the project; overseeing all facets of design and post design services.



STREET ROADS WATER & SEWER CAPITAL IMPROVEMENT PROGRAM (JPA)			
KEY	PROJECT NAME	TRANSMISSION PROJECT	CONCRETE COST ESTIMATE
2	MIAMI GARDENS DRIVE FROM NW 27th AVE. TO SW 31st	250200 - 15602	\$ 760,380.89
3	SR 826 PALMETTO FROM NW 27th ST. TO NW 47th ST.	248600 - 15602	\$ 436,384.00
5	MIAMI GARDENS DRIVE FROM NW 18th AVE. TO NW 27th AVE.	248700 - 15602	\$ 750,852.77
6	VERONA AVENUE BRIDGE OVER Golden Beach Canal	400004 - 15602	\$ 340,485.76
8	NW 20th STREET FROM SW 45th TO SW 47th ST.	251300 - 15602	\$ 183,897.94
15	NW 20th STREET FROM SW 45th TO NW 47th ST.	251300 - 15602	\$ 1,483,233.33
18	SR 826 PALMETTO SECTION 5 SR 826/828	248930 - 15602	\$ 8,250,870.48
20	NW 57th AVENUE FROM W 23rd ST. TO W 40th ST.	248940 - 15602	\$ 200,648.32
21	MIAMI INTERMEDICAL CENTER	248940 - 15602	\$ 2,200,292.67
31	SOUTH RIVER DRIVE along NW South River Dr.	438065 - 15602	\$ 233,955.63
TOTAL			\$16,395,954.33

WATER CAPITAL IMPROVEMENT			
KEY	PROJECT NAME	TRANSMISSION PROJECT	CONCRETE COST ESTIMATE
1	SW 40th STREET FROM SW 87th AVE. TO SW 57th AVE.	400440 - 15602	\$ 4,232,375.09
4	NE 54 STREET FROM SW 77th ST. TO SW 82	400500 - 15602	\$ 2,800,000.00
7	SW 42nd AVENUE FROM SW 87th ST. TO NW 77th ST.	408220 - 15602	\$ 1,538,133.12
8	SW 87th STREET FROM SW 40th ST. TO GRAND CANAL	407300 - 15602	\$ 3,330,453.40
9	SW 20th STREET FROM SW 45th TO SW 47th ST.	408300 - 15602	\$ 2,470,002.24
10	SW 40th AVENUE FROM NW 13th ST. TO NW 20th ST.	250200 - 15602	\$ 1,800,360.82
11	SW 87th STREET AT SR 828 INTERSECTION	248400 - 15602	\$ 478,033.39
12	SW 82nd AVENUE FROM US 1 TO SW 87th ST.	400030 - 15602	\$ 1,389,774.98
13	BISCAYNE BLVD. FROM NE 20th ST. TO NE 27th ST.	200200 - 15602	\$ 1,000,000.00
14	BISCAYNE BLVD. FROM NE 27th ST. TO NE 87th ST.	405440 - 15602	\$ 2,451,267.90
17	US-1/8A S FROM SW 80th ST. TO SW 26th ST.	418020 - 15602	\$ 2,474,618.94
18	OCEANVIEW BOULEVARD FROM E 23rd AVE. TO W 30th ST.	200100 - 15602	\$ 200,648.32
21	NW 67th AVENUE FROM NW 18th ST. TO NW 74th ST.	400510 - 15602	\$ 1,000,000.00
22	NW 57th AVENUE FROM W 23rd ST. TO W 28th ST.	248940 - 15602	\$ 200,718.23
23	BISCAYNE BLVD. FROM NE 13th ST. TO NE 33rd ST.	418420 - 15602	\$ 4,840,650.00
24	SW 87th AVENUE FROM NW 30th ST. TO NW 22nd ST.	400510 - 15602	\$ 3,360,877.92
25	NW 57th AVENUE FROM W 40th ST. TO W 57th ST.	248940 - 15602	\$ 2,000,000.00
27	NW 57th AVENUE FROM W 31st ST. TO W 47th ST.	248940 - 15602	\$ 850,243.12
28	NW 57th AVENUE FROM W 37th ST. TO W 40th ST.	248940 - 15602	\$ 300,704.96
29	SW 27th AVENUE FROM SW 82nd ST. INTERSECTION	420700 - 15602	\$ 603,100.90
30	ALTON ROAD FROM 57th ST. TO Michigan Ave.	248910 - 15602	\$ 2,480,070.52
32	17th St SW 93rd St Ramp	425470 - 15602	\$ 90,330.40
33	NORTH ROOSEVELT BLVD FROM Georgia ST. TO 14 St.	200480 - 15602	\$ 2,333,377.22
34	NORTH ROOSEVELT BLVD FROM SW MARLIN DR. TO 14 St.	200580 - 15602	\$ 800,285.86
35	SW 42nd AVENUE From Ponce de Leon to Glades Av.	420100 - 15602	\$ 751,334.67
TOTAL			\$15,543,884.26
GRAND TOTAL			\$71,792,762.57

DEVELOPED FOR:

BY:



KEY PERSONNEL

Antonio Acosta, P.E. (Principal-in-Charge), Arnelio Alfonso, P.E. (Project Manager), Lazaro Ferrero, P.E. (Water Resources Engineer), Erik Sibila, P.E. (Project Eng.)

ENGINEERING DISCIPLINES

Services: Planning, Design, Specifications, Permitting, Contract Development, & Post Design; Material: PVC, Ductile Iron, & Steel; Installation: Open Cut & Aerial Crossing; Purpose: Major (Designed, Constructed, & Operating) Water Transmission Pipeline, Major (Designed, Constructed, & Operating) Wastewater Transmission Pipeline, & Water Distribution



Lessons Learned

Beware that most LOAs are received when the roadway projects are at 60% or more, and require a fast track schedule

Prepare UDFCA documents for the utility agencies and educate them regarding the process to assist FDOT in a quick turn around

Develop Technical Special Provisions that are consistent with FDOT requirements as well as with the utility's owner requirements

Develop accurate estimated construction costs using FDOT pay items and in coordination with the current market value

Develop relationship with permitting agencies to expedite the process

Prepare for Electronic submittal/Digital Delivery, which requires heavy effort in coordinating design files to comply with the FDOT requirements

Perform extensive post design services including review of Shop Drawings, RFIs, and As-builts

Avoid change orders!!

Questions?