City of Tampa
Jane Castor, Mayor

Contract Administration
Michael W. Chucran, Director
306 East Jackson Street, 4N
Tampa, FL 33602

Office (813) 274-8116
Fax: (813) 274-7368

ADDENDUM 2
Via E-Mail
DATE: January 24, 2020

Contract: 19-C-00057; Davis Islands Water Main Replacement

Bidders on the above referenced project are hereby notified that the following addendum is made to the Contract Documents. BIDS TO BE SUBMITTED SHALL CONFORM TO THIS NOTICE.

Item 1: The Bid Date for the above referenced project is hereby changed to February 18, 2020.

Item 2: Replace proposal pages P-2, P-3 and P-4 with the attached pages P-2R, P-3R and P-4R.

Item 3: Replace pages WM-1 through WM-55 with the attached pages WM-1 through WM-55.

Item 4: Replace pages CP-1 through CP-21 with the attached pages CP-1 through CP-21.

Item 5: Replace plan sheets 01 through 31 with the attached plan sheets 01 through 31.

Item 6: Insert the attached Exhibit 1.

All other provisions of the Contract Documents and Specifications not in conflict with this Addendum shall remain in full force and effect. Questions are to be e-mailed to Contract Administration@tampagov.net.

Jim Greiner

Jim Greiner, P.E., Contract Management Supervisor

COT Water Department
FY18 CIP Project - Davis Island Water Main Replacement Project
TWD Work Order # WTR-18-0001

Itemized Bid Sheet

Item	Description	Unit	Approx. Quantity	Unit Price in Word		Unit Price		Total Price
2100	F&I 4" ductile iron pipe with 5' trench or less	LF	48					
2102	F&I 6" ductile iron pipe (0-5' trench)	LF	3626					
2103	F&I 6" ductile iron pipe (5'+ trench)	LF	239					
2104	F&I 8" ductile iron pipe (0-5' trench)	LF	10					
2106	F&I 12" ductile iron pipe with 5' trench or less	LF	261					
2107	F&I 12" ductile iron pipe with more than 5' trench	LF	40					
2108	F&I 16" ductile iron with more than 5' trench	LF	6138					
2216	F&I 16" TR Flex® RJ DIP w/TR Flex® fittings at various depths	LF	694					
2600	Cut and plug 3" and smaller in diameter pipe	EA	1					
2601	Cut and plug 4", 6" and 8" diameter pipe	EA	14					
2602	Cut and plug 10", 12" and 16" diameter pipe	EA	13					
3000	F&I 4" wedge-action or flange restraint	EA	13					
3001	F&I 6" wedge-action or flange restraint	EA	195					
3002	F&I 8" wedge-action or flange restraint	EA	6					
3003	F&I 12" wedge-action or flange restraint	EA	11					
3004	F&I 16" wedge-action or flange restraint	EA	100					
3071	Furnish 6" push-on restraint gaskets	EA	86					
3073	Furnish 12" push-on restraint gaskets	EA	13					

3074	Furnish 16" push-on restraint gaskets	EA	171					
4001	F&I 4" ductile iron bends, offsets, sleeves or reducers w/DIP, CIP or PVCP	EA	5					
4005	F&I 6" ductile iron bends, offsets, sleeves or reducers w/DIP, CIP or PVCP	EA	39					
4006	F&I 6" ductile iron tee w/ DIP, CIP or PVC	EA	11					
4007	F&I 6" ductile iron cross w/ DIP, CIP or PVCP	EA	2					
4008	F&I 8" ductile iron plug or cap w/ DIP, CIP or PVCP	EA	1					
4009	F&I 8" ductile iron bends, offsets, sleeves or reducers w/ DIP, CIP or PVCP	EA	1					
4013	F&I 12" bends, offsets, sleeves or reducers with DIP , CIP or PVCP	EA	3					
4017	F&I 16" bends, offset, sleeves or reducers with DIP, CIP or PVCP	EA	24					
4018	F&I 16" ductile iron tee with DIP, CIP or PVCP	EA	15					
4019	F&I 16" ductile iron cross with DIP or CIP	EA	3					
5000	F&I full fire hydrant assembly on new or existing mains	EA	15					
5200	Remove and salvage of fire hydrant	EA	14					
6001	F&I 4" gate or tapping valve with box on DIP, CIP or PVCP	EA	1					
6002	F&I 6" gate or tapping valve with box on DIP, CIP or PVCP	EA	31					
6003	F&I 8" gate or tapping valve with box on DIP, CIP or PVCP	EA	1					
6004	F&I 12" gate or tapping valve with box on DIP, CIP or PVCP	EA	2					
6005	F&I 16" gate or tapping valve with box on DIP, CIP or PVCP	EA	1					
6006	F&I 16" plug valve with box on DIP, CIP or PVCP	EA	14					
6102	F&I 6" Linestop on Existing Water Main (0-5')	EA	2					
7001	F&I 6" tapping sleeve and make tap	EA	8					
7002	F&I 8" tapping sleeve and make tap	EA	2					
7004	F&I 16" tapping sleeve and make tap	EA	2					
8100	Furnish tap and install 3/4" or 1" meter service on PVCP, DIP, or CIP (0-15' HDPE)	EA	19					
8101	Furnish tap and install 3/4" meter service on PVCP, DIP or CIP (+15-80' HDPE)	EA	190					
9200	Furnish, place and compact limerock base	CY	1,317					
9205	Furnish and install asphalt concrete surface Superpave Type SP-12.5	TN	1,738					
9207	Furnish, place, grade and compact Superpave Type SP-9.5 asphaltic concrete overlay	TN	650					
9209	Mechanical milling of asphalt roadways in 1-inch increments	SY-IN	12,215					
9208	Mobilization to perform mechanical milling	EA	1					
9300	Furnish and install Type “D” concrete curb	LF	150					
9307	Furnish and install 4" thick concrete sidewalk	SY	27					
9309	Grade and sod roadside/ditch bottoms and sides - Bahia	SY	531					
9310	Grade and sod roadside/ditch bottoms and sides - St. Augustine	SY	1					
9400	Grout abandoned pipe	CY	351					
9500	Furnish, form and place reinforced concrete	CY	8					

9505	Video photography	LF	10,226					
9910	Valve Box Adjustment or removal	EA	35					
9950	F&I new project signs	EA	1					
9970	As-Built Survey Installed Pipeline	LF	11,056					
9980	Contingency allowance (Water) to be used as directed by the Engineer	LS		Five Hundred Seventeen Thousand Eight Hundred and Twenty		517,820.00		517,820.00
9100	Maintenance of Traffic	LS		Two Hundred Fifty Eight Thousand Nine Hundred and Ten		258,910.00		258,910.00
10000	Mobilization	LS		Two Hundred Twenty One Thousand Nine Hundred and Three		201,903.00		201,903.00

W-00 GENERAL REQUIREMENTS

All materials shall be in accordance with these Material Specifications and shall, in no event, be less than that necessary to conform to the requirements of any applicable law, ordinances and codes. All materials or products that will be in contact with potable water shall be listed by the National Science Foundation (NSF-61 listed) or by an approved certifying agency as conforming to the requirements of ANSI/NSF-61.

Materials provided for construction on or for the City's reclaimed water distribution system shall be in accordance with color coding specifications provided in the Florida Administrative Code (F.A.C.), Chapter 62-610. All piping, pipeline appurtenances (including valves and outlets) shall be color coded to differentiate reclaimed water from domestic or other water. Underground piping which is not manufactured of metal shall be color coded or marked for reclaimed water distribution systems using Pantone Purple 522C using light stable colorants - underground metal pipe shall be color coded using purple as a predominant color. Visible, above-ground portions of the reclaimed water distribution system shall be clearly color coded or marked. All reclaimed water valves shall be appropriately tagged or labeled (bearing the words in English and Spanish: "Do not drink" together with the equivalent standard international symbol) to warn the public and employees that the water is not intended for drinking.

Items designated to be "domestically manufactured" shall be manufactured, assembled and tested in their entirety within the United States of America or its territories. Items designated to be "domestically assembled" may be foreign-manufactured but shall be assembled and tested in their entirety within the United States of America or its territories. Items requiring a "domestic presence" may be foreign-manufactured and/or assembled and/or tested, but the manufacturer shall have a designated representative or agent located within the United States of America, and that representative or agent shall be available to provide on-site service if required by the City of Tampa Water Department (Department).

All materials shall be new, unused, and correctly designed. They shall be of standard first grade quality, produced by expert workmen, and intended for the use for which they are offered. Materials or equipment which, in the opinion of the Department, are inferior or are lower grade than indicated, specified or required, shall not be accepted. All materials used in this contract must be approved in advance by the Engineer. In conformance with section G-4.02 of these contract documents, any two items of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer. Unless approved in advance by the engineer, only one manufacturer may be used for each item under this contract.

W-10 DUCTILE IRON PIPE

1. GENERAL

Ductile iron pipe shall be domestically manufactured in accordance with the latest revision of ANSI/AWWA C-151/A21.51. Pipe shall be furnished in 18 or 20 foot laying lengths. Pipe shall be lined with a standard thickness cement mortar lining and seal coated in accordance with the latest revision of ANSI/AWWA C-104/A21.4 and NSF 61. Pipe outside coating shall be an asphaltic coating in accordance with ANSI/AWWA C-151/A21.51, latest revision. All pipe materials used in potable water systems shall comply with NSF Standard 61. Unrestrained joint pipe shall be either the rubber-ring compression-type push-on joint or mechanical joint.

2. PRODUCTS

a) Push-on Joint Pipe

i) Push-on joint pipe shall be supplied with all joint accessories. Accessories shall include gaskets and lubricant in sufficient quantity for the proper assembly of each joint. Gaskets for push-on joints shall be made of ethylene

propylene diene monomer (EPDM) rubber, except: Acrylonitrile butadiene (NBR) gaskets shall be used for potable water mains that are located in soil that is contaminated with low molecular-weight petroleum products or non-chlorinated organic solvents or non-aromatic organic solvents. Fluorocarbon (FKM) gaskets shall be used for potable water mains that are located in soil that is contaminated with aromatic hydrocarbons or chlorinated hydrocarbons. Fluorocarbon (FKM) gaskets shall be used for potable water mains if the soil is contaminated with aromatic hydrocarbons or chlorinated hydrocarbons, and is also contaminated with low molecular-weight petroleum products or organic solvents. All plain ends shall be painted with a circular stripe on the pipe barrel to allow a visual means of checking proper assembly.

ii) All push-on joints shall be in accordance with ANSI/AWWA C-111/A21.11, latest revision.

iii) Pressure Class shall be as follows:

Diameter	Min. Pressure Class
4” to 16"	350
> 16"	250

b) Mechanical Joint Pipe

i) Mechanical joint pipe shall be supplied with all joint accessories. Accessories shall include lubricant, gaskets, ductile iron glands, bolts, and nuts, all in sufficient quantity for the assembly of each joint. The bolts and nuts shall be manufactured of high-strength, low-alloy steel such as "Corten", "Usalloy", or "Acipalloy". The follower gland shall be ductile iron. Gaskets for mechanical joints shall be made of ethylene propylene diene monomer (EPDM) rubber.

ii) All mechanical joints shall be in accordance with ANSI/AWWA C-111/A21.11, latest revision.

iii) Pressure Class shall be as follows:

Diameter	Min. Pressure Class
4” - 16"	350
>16"	250

c) Flanged Flexible Joint Pipe

i) Flexible-joint pipe shall be push-on, ball-and-socket, freely deflecting, and restrained using a corrosion resistant locking device. Accessories shall include locking segments, rubber retainers, lubricant, and gaskets. Thickness class shall be as follows:

Diameter	Min. Thickness Class
6”	54
8”	55
12”	56

16”	57

ii) The joint shall be capable of a full 15° free deflection with no reduction in the waterway.

d) Flanged Pipe

i) Flanged pipe shall conform to the requirements of AWWA C115, in nominal 18- or 20-foot lay lengths. The pipe shall be minimum Special Thickness Class 53 rated for a maximum working pressure of 250 psi.

ii) Flanges shall be ductile iron and shall have long hubs. There shall be no leakage through the pipe threads, and the flanges shall be designed to prevent corrosion of the threads from outside.

iii) Flanges shall meet the requirements of ASME B16.1, class 125 flanges. Flanges, flange facing, drilling, and protecting shall be as specified for flanged pipe. Bolts and nuts for flanged joints shall be Type 316 stainless steel unless otherwise stated on the Plans or directed by the Engineer.

iv) Except where otherwise directed by the Engineer, gaskets for flanged joints shall be of the full-face type, meeting the requirements of ANSI B16.21. Gaskets shall be EPDM rubber.

e) Manufactured Restrained Joint Pipe

i) Joints shall be push-on in accordance with ANSI/AWWA C-111/A21.11. Joints shall be secured by wedged locking shims or a follower gland which shoulder against a retaining ring permanently fastened to the spigot end of the pipe within the joint. Gaskets for manufactured restrained pipe joints shall be made of EPDM rubber.

ii) Pressure Class shall be as follows:

Diameter	Min. Pressure Class
4” -16"	350
>16"	250

3. QUALITY CONTROL AND TESTING

a) All pipe shall meet or exceed all hydrostatic, performance and acceptance tests as set forth in ANSI/AWWA C-151/A21.51, latest revision.

b) Submittals shall include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, pressure class or thickness class, performance standards, etc. If this documentation is omitted, the ductile iron pipe may be rejected at the sole option of the City.

4. MANUFACTURER

a) Ductile iron pipe, unless specified below, shall be by U.S Pipe, American (aka American Cast Iron Pipe Company), McWane Cast Iron Pipe Company, Griffin Pipe Products Company, or approved equal.

b) Flexible Joint pipe shall be “Flex-Lok Boltless Ball Joint Pipe" (American), “USI FLEX Boltless Flexible Joint Pipe" (U.S. Pipe), “Snap-Lok River Crossing Pipe” Griffin Pipe Products), or approved equal.

c) Manufactured Restrained Joint pipe shall be “Flexring" (American), “TR-Flex" (U.S. Pipe), “Super-Lock" (20-in. & 24-in. pipe) and “Thrust-Lock” (30-in. &36-in.) (McWane Cast Iron Pipe Company), “Snap-Lok” (Griffin Pipe Products), or approved equal.

d) Ductile iron pipe shall be domestically manufactured in the United States.

W-11 HDPE (HIGH DENSITY POLYETHYLENE) PIPE

1. GENERAL

HDPE pipe shall be manufactured in accordance with the latest edition of AWWA C906. Pipe shall be furnished in 40-foot laying lengths.

2. PRODUCTS

a) Pipe outside diameter shall be ductile iron pipe size.

b) Standard dimension ratio shall be DR-11. Pressure class shall be 160 psi.

c) All HDPE pipe, sizes 4-inch and larger, shall meet the requirements of AWWA Standard C 906-99 (or latest revision).

d) The piping shall be permanently blue-coded to provide water main identification. When pipe is striped, stripes shall be blue, along the entire outside length of the pipe 90 or 120 degrees apart, and shall be made by co-extrusion or impregnation. Fully colored blue pipe co-extruded from permanently pigmented HDPE is also acceptable.

e) Pipe shall have manufactured markings as following:

i) Nominal size and OD base

ii) Standard material code designation

iii) Dimension

iv) Pressure class

v) AWWA designation (AWWA C906-99)

vi) Material test category of pipe

vii) Manufacturer’s test code

f) All HDPE pipe shall be installed with tracer wire, per the *Tracer Wire* specifications.

g) Stainless steel inserts are required in HDPE pipe ends to facilitate connections to fittings or valves.

3. QUALITY CONTROL AND TESTING

a) All pipe shall meet or exceed all hydrostatic performance and acceptance tests as set forth in AWWA C906, latest edition. Manufacturer shall furnish an affidavit that all materials delivered comply with standards set forth in these specifications.

b) HDPE pipe shall be made of resin approved by the National Sanitation Foundation (NSF).

c) All HDPE pipe shall meet the requirements of NSF Standard 61.

d) All HDPE pipe shall be made of materials conforming to polyethylene code designation PE 4710, with a minimum cell classification of PE 454474 C or higher.

4. MANUFACTURER

HDPE Pipe provided shall be better than or equal to: CRS "PolyPipe", PE 4710;

Quail Piping, PE 4710; Performance Pipe "DriscoPlex 4000 Series", PE-4710, 4"- 12" diameter

W-12 HDPE TUBING

1. GENERAL

All water service lines two (2) inches in diameter and smaller shall be constructed of high-density polyethylene (HDPE) pressure tubing.

2. PRODUCT

a) The standard dimension ratio (SDR) shall be 9 for CTS tubing sizes. The average outside diameter, minimum wall thickness and respective tolerances for any cross-section shall be as specified in ASTM D2737. The average inside diameter, minimum wall thickness, and respective tolerances for any cross-section shall be as specified in ASTM D2239.

b) Polyethylene extrusion compound from which the PE tubing are extruded shall comply with the applicable requirements for the Type III, color and U.V. code E, Class C, PE 4710, very high molecular weight polyethylene plastic material manufactured in accordance with AWWA C-901, latest revision, as specified in ASTM D1248.

c) HDPE pressure tubing shall have a color and ultraviolet code E and a minimum cell classification of PE 454474 E as specified in ASTM D3350.

d) The polyethylene extrusion compound shall be of virgin quality approved for potable water service by the National Sanitation Foundation. The polyethylene extrusion compound shall be manufactured with sufficient and proper ultra-violet color stabilizers.

e) Polyethylene tubing shall be blue and have U.V. color stabilizers so that the pipe is not affected in color or flexibility for a minimum of four (4) years.

3. QUALITY CONTROL AND TESTING

a) Environmental stress cracking resistance testing shall be performed in accordance with ASTM D1693, Condition C, and shall have no failures after 5000 hours duration.

b) When submitting for approval of HDPE not listed in Section 4, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the HDPE may be rejected at the sole option of the City.

4. MANUFACTURER

All HDPE tubing shall be manufactured by Performance Pipes "DriscoPlex", Endot EndoPure", Vanguard "Bruiser", Charter Plastics "Blue Ice" or approved equal.

W-13 PVC (POLYVINYL CHLORIDE) PIPE

1. GENERAL

All PVC pressure pipe shall be manufactured in accordance with ANSI/AWWA C900, C909, or C905, latest revision.

2. PRODUCT

a) Pipe 4" through 12"

i) Shall be DR-18 pressure class 235 psi with ductile iron pipe equivalent ODs.

ii) Shall be approved by the National Sanitation Foundation for use as a potable water main.

iii) Joints shall be "push-on" and shall be made by joining pipe spigot end and integral wall-thickened bell end.

iv) The pipe color shall be blue and the nominal laying length per pipe section shall be 20 ft.

v) Each bell shall be an integral-wall section joint assembly using elastomeric-gasket seals.

vi) All integral joint gaskets shall be made of EDPM rubber.

vii) When required for fitting and valve connection, restraints used shall be mechanical devices designed specifically for PVC pipe, per the Restraints specification.

viii) Service taps on PVC mains shall require a service saddle manufactured specifically for PVC pipe per the Service Saddle specifications. The cutting tool shall be a shell type for PVC pipe (hole) cutter with internal teeth or double slots and be designed to accommodate AWWA C-900 pipe (twist drill bits and auger bits shall be prohibited). Saddles used should provide full support around the circumference of the pipe and provide a bearing area of sufficient width along the axis of the pipe (2" minimum), ensuring that the pipe will not be distorted when the saddle is tightened.

ix) All PVC pipe shall be installed with tracer wire, per the *Tracer Wire* specifications.

x) Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other visible deleterious faults.

b) Other pipe sizes

i) PVC pipe is not approved in sizes other than 4” through 12” - Ductile Iron Pipe must be used for pipe installations larger than 12”. See the *Ductile Iron* specification.

3. QUALITY CONTROL AND TESTING

a) All pipe shall meet or exceed all hydrostatic, performance and acceptance tests as set forth in AWWA C-900, latest revision.

b) If requested by the Engineer, prior to shipment of the pipe to the project site, the Contractor shall submit to the Engineer, test reports and certifications as described below duly certified by the manufacturer's testing facility or an independent certified testing laboratory demonstrating full compliance with AWWA C-900. Certification from the supplier is not acceptable.

c) All joints shall meet all requirements of ASTM Standard D3139. All gaskets shall meet all requirements for performance as specified by ASTM F-477.

d) If requested by the Engineer, notarized certificates of conformance shall be provided by the manufacturer that each lot of pipe has been manufactured, sampled, and tested per AWWA C-900. The City shall be provided in writing the means to cross-reference the markings with the certification and test reports (i.e. date of manufacturer, a lot number and shift number etc.) If this information is marked on the pipe in a code, the markings shall be decoded in writing.

4. MANUFACTURER

a) All push-on joint (and unrestrained) C-900 PVC DR18 pipe shall be domestically manufactured and shall be equal to or better than: Vasallo C-900; Diamond Plastics C-900; North American Pipe Corporation C-900; or JM C-900 PVC pipe.

b) Restrained joint PVC pipe shall be: JM Eagle “Eagle Loc 900”, CertainTeed Certa-Lok C900 RJ PVC, or approved equal.

W-20 VALVES

1. GENERAL

This section includes all valves to be owned and maintained by the City of Tampa Water Department. Requirements of this section apply to all valves unless exceptions are shown or stated on the plans or specific provisions.

Resilient Seat Gate Vales ("Valves") provided under this specification shall be suitable for installation on ductile iron or cast iron pipe, and C-900 PVC. Valves shall be manufactured in accordance with AWWA C-509 or AWWA C-515, latest editions, as applicable, and as specified herein.

Plug valves “valves” shall be of non-lubricating, eccentric type, shall meet or exceed the latest revision of AWWA Standard C517, and shall meet or exceed the requirements of this specification

2. PRODUCT

a) Valve Boxes

i) Shall be designed to provide access to an underground valve’s 2-inch operating nut at a depth of two-feet or greater. Valve boxes shall be suitable for installation in areas subject to heavy vehicle traffic loading.

ii) Shall include removable valve box cover with "WATER" label as shown on the Standard Dimension Detail titled "Valve Box".

iii) Shall be manufactured of Class 30 or 35 grey iron.

iv) Shall consist of four parts: valve box cover, riser, top section, and bottom section.

v) Shall be the same dimension, within manufacturing tolerances, as shown in Standard Dimension Detail "Valve Box".

b) Gate Valves (4-inch and larger)

i) Gate valve operation

(1) Valves installed in public rights-of-way shall be right-hand (clockwise) open.

(2) Valves installed on the David L. Tippin Water Treatment Plant property (or at remote pumping locations) shall be left-hand (counter clockwise) open.

ii) Valve installed below grade shall have mechanical joint ends. Valves installed above grade shall be flanged.

iii) Mechanical joints and accessories shall be manufactured in accordance with AWWA Standards C-110 and C-111.

iv) Mechanical joint bolts-and-nuts shall be manufactured of high-strength, low-alloy steel such as "Corten", "USalloy", or "ACIPalloy".

v) Valves stems shall be non-rising and manufactured from stainless steel in accordance with AWWA C-509/C-515.

vi) Stems, stem-nuts and wedges shall act independently. Stems shall be sealed by at least two O-ring seals, one located both above and below the thrust collar, and shall be replaceable with the valve full open and while subjected to full rated pressure. Stems shall be provided with low-friction torque-reducing thrust bearings located both above and below the stem collar . Thrust washers may be used to separate the thrust collar from iron surfaces.

vii) Valve bodies and gates shall be cast iron or ductile iron manufactured in accordance with ASTM A126 or ASTM A536 respectively, and AWWA C-509 or AWWA C-515 as applicable.

viii) All internal and external exposed ferrous surfaces of the valve body and gate shall have an epoxy coating applied to a minimum of eight mils, in accordance with AWWA C-550.

ix) The wedge shall be bronze manufactured in accordance with ASTM B62. It shall be fully encapsulated with rubber molded in place and bonded in accordance with ASTM D429 A or B as specified in AWWA C-509/C-515. Mechanically attached seats will not be accepted.

x) Hollow gates shall be provided with a drain in the bottom to flush the internal cavity of foreign material and stagnant water each time the valve is operated.

xi) Gate valves provided under this specification shall be suitable for installation on ductile iron or cast iron pipe, and C-900 PVC.

xii) Gate Valves shall have an EPDM Resilient seat.

xiii) All bonnet bolts, gland bolts, nuts and other trim hardware exposed to the outside environment shall be stainless steel. Thrust collar tie-rod bolts shall be stainless steel.

c) Tapping Valves

(Note: Tapping Valve materials specifications shall be equivalent to those listed herein for Gate Valves, except as alternately specified below.)

i) Tapping valves shall be resilient seat gate valves with one end mechanical joint, and one end flanged.

ii) Tapping valve interior waterway shall be a full-opening and capable of passing a full-sized shell cutter through the valve.

iii) Tapping valve shall be provided with a tapping-flange and flanged joint accessories.

iv) Tapping-flange shall have a raised face or lip designed to engage a corresponding recess in a tapping sleeve as defined in MSS SP-60.

v) Tapping-flanges shall conform to dimensions and drillings of ANSI B16.1, Class 125, ANSI/AWWA C110/A21.10.

vi) All tapping valves shall be interchangeable with multiple makes of tapping sleeves.

d) 2-inch Gate Valves

(Note: 2-inch Gate Valve materials specifications shall be equivalent to those listed herein for Gate Valves, except as alternately specified below.)

i) 2” Gate Valves shall be resilient seat, have push-on or threaded ends, and be manufactured in accordance with AWWA C-509.

ii) Valve Ends:

(1) Valve ends for push-on joint valves shall conform to AWWA C-111and shall be suitable for use with iron pipe size plastic pipe as well as iron pipe.

(2) Valve ends for threaded joint valves shall have female iron pipe connections compatible with N.P.T. threads as specified in AWWA C-800.

e) Plug Valves (16" and larger)

i) Valves shall be of the non-lubricated eccentric type and shall be furnished with end connections as shown on the plans. Flanges shall be per the ANSI B16.1 125 lb. standard. End-to-end length of flanged valves shall be per AWWA C517, Table 1. Mechanical joint ends shall be to the AWWA Standard C111-64. Mechanical joint gaskets shall be made of Ethylene Propylene Diene Monomer (EPDM) rubber. External nuts and bolts shall be 316 stainless steel (SS).

ii) Body shall be of ASTM 536, Grade 65-45-12, ductile iron (DI). Port area shall be 100% of standard pipe area. Valve port area shall meet or exceed standard pipe area per ASME/ANSI B36.10M. The body shall have minimal pooling designed specifically with a flushing side port to provide complete flushing of the valve every time it cycles. Port of valve shall be rectangular and of one design throughout the entire size range.

iii) Seats shall be rectangular ported, 1/8" thick welded overlay of not less than 95% pure nickel. Seat area shall be at least 1/2" wide and raised. The raised surface shall be completely covered with nickel to ensure that the plug face contacts only the nickel seat.

iv) Plug shall be one-piece castings of ASTM 536, Grade 65-45-12; ductile iron. The plug shall have a cylindrical seating surface eccentrically offset from the center of the shaft. Plug shall not contact the seat until at least 90% closed. The interference between the plug face and body seat, with the plug in the closed position, shall be externally adjustable in the field with the valve in the line under pressure. Plugs shall be faced with EPDM rubber. Spherical shaped plugs are not acceptable.

v) Bearings shall be sleeve type and made of sintered, oil impregnated permanently lubricated type 316 SS ASTM A743, Grade CF8M, Welded-In nickel seat. Non-metallic bearings shall not be acceptable.

vi) Packing shall be Polytetrafluoroethylene (PTFE) braided and multiple V-Ring with external adjustment, -20 to 450 Degree F. Packing gland shall permit inspection, adjustment or complete replacement of packing without disturbing any part of the valve or actuator assembly, except the gland follower. Non-adjustable packing or packing requiring actuator removal to replace the packing is not acceptable.

vii) Grit Excluders in the form of PTFE washers at the upper and lower journals shall be provided to prevent the entry of grit and foreign solids into the bearing areas.

viii) Shaft Seals shall be multiple V-ring type with a packing gland follower. Shaft seals shall be externally adjustable and repackable under pressure without removing the actuator or bonnet from the valve. All Flanged and MJ plug valves shall have an air gap between shaft packing and bottom of actuator for visual inspection, adjustment or complete replacement of packing without disturbing any portion of the valve or actuator except the packing gland follower. This valve shaft packing design must have been used successfully within the county for the past 10 years. Valves utilizing O-ring seals or non-adjustable packing shall not be acceptable.

ix) Pressure ratings shall be 150 psi to face of plug, tested per AWWA C504. Every valve shall be given a hydrostatic shell test and seat test, with test results being certified and to be provided upon request.

x) Worm Gears shall be constructed in accordance AWWA C517 and shall be IP68 rated continuous duty to 50 ft. Test certificates, signed by chief engineer of gear operator manufacturer, must be supplied showing full compliance to AWWA C517.

(1) Actuator type shall be G Series for 16" and MG series for 18" or larger, buriable worm gear with 2 inch square nut operator.

(2) Worm gear operators shall be enclosed in a ductile iron housing with outboard seals to protect the bearings and other internal components. The actuator shaft and the quadrant shall be supported on permanently deep-groove ball bearings. Input shaft and fasteners shall be made of stainless steel. Gears shall be efficiency optimized 3 stage gear reduction type. Worm gear operators shall be sized at full bidirectional at 150 psi.

(3) Externally adjustable open and closed position stops shall be provided. The adjustable closed position stop shall be used to set closing torque and provide adjustment to compensate for change in pressure differential or flow direction. Gears shall incorporate the use of a Rotorlok Device for backwinding protection to prevent undesired reverse rotation of the gear train at the extents (i.e. fully closed position) of travel when holding a residual applied torque.

(4) Gears shall have a two-year warranty from date of shipment and shall have a metal tag containing a serial number, ratio; number of turns shall be riveted to the gear for future identification. Gears shall be Rotork Model IW-RL-MD-RAW.

(5) Manual operators shall be provided with completely enclosed mounting brackets or adapters. The operators shall be equipped with adjustable stops to prevent over-travel in both the open and closed position with standard 2-inch square operating nuts with skirts as listed elsewhere herein, or with handwheel if for above ground service.

(6) All plug valves shall open by turning the operating nut or handwheel clockwise (open-right). Orient operators with horizontal plug shafts such that the plug rotates upward upon opening.

(7) Buried valves shall incorporate the use of an Aunspach Model D86 overtorq protector.

(8) All operator components between the operating nut and the adjustable stops shall be designed to withstand, without damage, an input torque of 300 pound-foot (lbf. ft). The operator shall also be able to apply output torque required to operate the valve under adverse conditions without exceeding input torque as allowed under AWWA Standard C517.

(9) Coating shall be 4-mils minimum Blue Epoxy Tnemec 141 (NSF Std. 61) on non-stainless steel interior/exterior surfaces. Interior/exterior standard surface prep (SP10) shall meet AWWA C550 standard.

(10) Valves shall be NSF/ANSI 372 certified lead-free and NSF/ANSI 61 certified for drinking water.

f) Insertion Valve (4" to 12")

Insertion valves shall:

i) be installed in live cast iron, ductile iron, C-900 PVC, and asbestos cement pipelines without requiring the shutdown of water flow through the pipe. The design should allow the insertion valve to be installed into an existing pressurized pipeline while maintaining constant pressure and service. Insertion valves provided shall be true resilient seat gate valves that will remain in the water distribution piping system after insertion. Insertion valves

must safely operate in balanced and unbalanced pressure situations – pressure equalization on the downstream (or upstream) side of the closed valve shall not be necessary to open the valve.

ii) be capable of pressure-tight assembly to the exterior of the pipe in which flow is to be stopped at working pressures up to 250 psi.

iii) have a ductile iron body, bonnet and wedge that provide strength and pressure ratings that meet or exceed the requirements of AWWA C-515 or C-509 Standards.

iv) open right (clockwise).

v) be capable of working on Cast/Grey Iron or Ductile Iron Class A B C and D, IPS PVC, C900 and C909 PVC, Steel, AC pipe diameters without changing either top or bottom portion of split valve body.

vi) be suitable for working pressures up to 250 psi. The pressure rating designation must be cast into the body of the insertion valve.

vii) have stuffing box, operating stem, and resilient wedge that are removable, repairable, and/or replaceable under pressure.

viii) have valve body that provides full mechanical protection of the pipe, and that is permanently restrained to the pipe.

ix) have a body of two-piece ductile iron casting manufactured to specifications of ASTM A536, latest revision, min. Grade 65-45-12, with 8-mil (min.) epoxy coating inside and out that meets or exceeds ANSI\AWWA C-550 Standards, and is certified to ANSI\NSF 61.

x) have a ductile iron wedge, fully encapsulated with EPDM rubber by high pressure and high temperature compression or injection mold process. There shall be no exposed iron. EPDM rubber shall be ANSI\AWWA NSF-61 certified.

xi) have a wedge that seats on the valve body and not on the pipe. The wedge shall be totally independent of the carrier pipe – it shall not come into contact with the carrier pipe or depend on the carrier pipe to create a seal.

xii) have a wedge that rides inside the body channels to maintain wedge alignment throughout its travel control, regardless of high- or low-flow pressure or velocity.

xiii) the wedge shall be symmetrical and seal equally well with flow in either direction.

xiv) have gate valve stem and wedge nut made of copper alloy in accordance with Section 4.4.5.1 of AWWA Standard C-515.

xv) have a 2” standard (square), NRS (non-rising stem) operating nut in accordance with ASTM A126, Class B.

xvi) have a NRS stem with integral thrust collar in accordance with Section 4.4.5.3 of AWWA Standard C-515. Two piece stem collars are not acceptable.

xvii) open and close through AWWA standard turns per inch.

xviii) have a triple O-ring stem seal with two O-rings located above and one O-ring located below the thrust collar.

xix) have mechanical joint (MJ) ends for connection of the valve to the pipeline.

xx) the stuffing box, operating stem and resilient wedge (complete bonnet and all moving parts) shall be removable, repairable and/or replaceable under pressure. So that, in the event the valve stem is broken or damaged, the bonnet can be removed under pressure.

xxi) All bolting materials shall meet or exceed the physical strength requirements of ASTM A307 with dimensions conforming to ANSI B18.2.1 (304 SS min.).

xxii) The sleeve shall be pressure tested prior to cutting the pipe, either through the use of the temporary knife gate installed on the valve body or through a blind flange installed on the valve body, to 150 psi.

xxiii) The tapping cutter shall extract the coupon from the cut pipeline.

xxiv) Restraint devices connecting the valve body castings to the pipe shall be split EBAA Mega-lug, or approved equal, with a working pressure rating of 350 psi. Gland body, wedges, and wedge-actuating components shall be cast from Grade 65-45-12 ductile iron material in accordance with ASTM A536. Torque-limiting twist-off nuts shall be included to ensure proper actuating of the gripping wedges. Restraint devices shall be listed by Underwriters Laboratories, and Approved by Factory Mutual

3. QUALITY CONTROL AND TESTING

a) Valve Boxes

i) All valve boxes shall be manufactured of Class 35 grey iron

b) *Gate and Tapping Valves*

i) The Gate Valve's resilient seat shall be bubble-tight against a 200-psi water working pressure and maintain zero leakage at all times.

ii) The wedge shall be bronze manufactured in accordance with ASTM B62. It shall be fully encapsulated with rubber molded in place and bonded in accordance with ASTM D429. The wedge rubber coating shall be ethylene propylene diene (EPDM) rubber. Rubber mechanically attached with screws rivets and similar fasteners shall not be acceptable.

c) 2-inch Gate Valves

i) Valves shall meet or exceed all testing requirements set forth in AWWA C-509

d) Plug Valve (16" and LARGER)

i) Supplier shall have been manufacturing eccentric plug valves for a period of at least ten (10) years. At the engineer's request, supplier shall provide a list of installations involving equipment of similar size and application.

ii) Each valve and actuator shall be assembled, adjusted and tested as a unit by the valve manufacturer. Manufacturer shall provide certified copies of reports describing the procedures and results of the test for each model and the torque rating of the actuator.

iii) Eccentric plug valves shall have a two-year warranty from date of shipment and at least 18 months from installation date. Manufacturer's name shall be cast into the body of valve and a metal tag containing a serial number shall be riveted to the valve for future parts identification.

e) Insertion Valve (4" to 12")

Valves shall meet or exceed test specifications as set forth in AWWA C-515, latest revision, excluding in Section 5.1 Testing: 5.1.13 (leakage test), and 5.1.2.3 (seat test).

4. MANUFACTURER

a) Valve Boxes

i) Valve box manufacturers shall have a domestic presence. Valve boxes shall be equal to or better than those made by Bingham & Taylor, Union Foundry, Sunshine Foundry, or Pipeline Components, Inc.

b) Gate Valve

i) Standard valves shall be domestically assembled and shall be Clow F-6100, U. S. Pipe Metroseal 250, AVK Series 25, Mueller Co. (2360 for 2"-12", 2361 for 14"-24"), American Flow Control Series 500 or Series 2500, Kennedy KenSeal 4571, or approved equal.

ii) Valves shall be domestically assembled and shall be equal to or better than Clow F-6136 OS&Y, U.S. Pipe Metroseal 250, or American Flow Control Series 2500-1.

c) Tapping Valves

i) Tapping valves shall be domestically assembled and shall be equal to or better than Clow F-6114, U. S. Pipe Metroseal 250, Mueller Co. (2360 for 2"-12", 2361 for 14"-24"), American Flow Control Series 500 or Series 2500, Kennedy KenSeal 7571, American AVK Series 25, or approved equal.

d) 2-inch Gate Valves

i) All valves shall be domestically assembled and shall be equal to or better than the following:

(1) Push-on end valves - Clow 6110 (for PVC)/6100 (for MJ); Waterous Series 500 - P.O.; AVK Series 45

(2) Threaded end valves - Clow 6103; Waterous Series 500; American Flow Control Series 2500; AVK Series 03

e) Plug Valve (16" and LARGER)

i) Valves shall be domestically assembled, DeZURIK 100 % Port Eccentric Plug Valve, PEF.

f) Insertion Valve

i) Insertion valves shall be domestically manufactured. Insertion valves shall be Team Industrial Services "Team InsertValve", or approved equal.

W-30 RESTRAINT DEVICES

1. GENERAL

This section includes all restraint devices on pipe to be owned and maintained by the City of Tampa Water Department. Requirements of this section apply to all restraint devices unless exceptions are shown or stated on the plans or specific provisions.

Mechanical restraint devices shall be used to restrain plain ends of ductile iron or PVC pipe to push-on, mechanical, or flange joints which meet ANSI/AWWA C-110/A21.10 and ANSI/AWWA C-111/A21.11, or to restrain joints on existing installed pipes.

2. PRODUCT

a) Ductile Iron Pipe Restraints

i) Push-on Joint pipe Restraint (for 4" - 36" pipe only)

(1) Restraint shall be produced by "locking gaskets" consisting of an EPDM rubber gasket with high-strength stainless steel locking elements vulcanized into the gasket, which when activated develop wedging action between the pairs of stainless steel elements spaced around the gasket.

(2) Shall withstand the following working pressures:

(i) 4" - 16" = min. 350 psi

(ii) >16" = min. 250 psi

(3) Restraint gaskets shall be UL Listed and FM approved.

ii) Flange Joint Restraint

(1) Shall attach to the plain end of a pipe by wedge screws to produce a flange which joins to an existing integral companion flange.

(2) Shall be constructed of ductile iron meeting ASTM A536 and manufactured in accordance with ANSI/AWWA C-110/A21.10 and C-111/A21.11.

(3) Shall meet ANSI/AWWA C-110/A21.10 and ANSI/AWWA C-111/A21.11, latest revisions.

(4) Flanges shall have bolt circle and bolt holes which match a Class 125 flange and are compatible with ANSI/AWWA C-115/A21.15.

(5) Gaskets shall be full faced and made of EPDM rubber.

(6) Shall withstand 250 psi working pressure.

iii) Mechanical Joint Restraint

(1) Restraint shall be provided with wedge action devices.

(2) Restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism (the lug) which, when activated, imparts multiple wedging actions against the pipe, thereby increasing its restraint on the pipe as the joint tries to separate. “Twist-off nuts” shall be used to ensure proper actuating of the restraining device.

(3) Follower glands shall be manufactured of ductile iron conforming to ASTM A536-80.

(4) Wedging lug and bolt shall be manufactured of ductile iron which has been heat-treated to a minimum hardness of 370 BHN.

(5) Glands shall be dimensioned such that they can be used with standard mechanical joints and have tee-head bolts conforming to ANSI/AWWA C-111/A21.11 and ANSI/AWWA C-153/A21.53, latest revision.

(6) Pipe restrained with retainer glands specified shall be capable of withstanding twice the rated pressure of the restraint device for five minutes with no leakage or movement.

(7) Wedge action restraints shall withstand the following working pressures:

(i) 4” - 16" = min. 350 psi

(ii) >16" = min. 250 psi

iv) Existing Pipe Joint Restraint

(1) Restraint shall be provided with wedge action mechanical devices.

(2) Split-restraint fittings for mechanical joints on existing pipe installations shall be segmented.

(3) Split-restraint fittings for existing pipe bell-and-spigot joints shall consist of a split restraint ring installed on the pipe barrel behind the bell.

(4) Restraint devices shall be ductile iron per ASTM A536, latest revision, min. Grade 60-42-12. Threaded rods shall be high strength low-alloy steel per ANSI/AWWA C-111/A21.11.

b) PVC Pipe Restraints

i) Push-on Joint Restraint is not approved for PVC pipe. New PVC pipe longitudinal installations requiring restraint shall be with PVC pipe manufactured to provide restraint when the pipe's bell-and-spigot is assembled (i.e., manufactured restrained joint PVC pipe, such as Eagle Loc 900 or Certa-Lok).

ii) Restraints connecting PVC pipe spigot ends to mechanical joint fittings and appurtenances shall be the following:

(1) Restraint provided shall be incorporated in the design of the follower gland and shall utilize multiple wedge segments acting against the pipe and increasing their resistance as the line pressure increases. The assembled joint shall maintain the maximum flexibility and deflection of all nominal pipe sizes after burial.

(2) Restraining gland, wedge segments, and actuating bolts shall be manufactured of high strength ductile iron conforming to the requirements of ASTM A536, Grade 65-45-12.

(3) Restraining rods & nuts shall be made of high strength, low alloy steel meeting AWWA/ANSI C111/A21.11 with minimum 65,000 psi tensile strength and 45,000 psi yield strength.

(4) Dimensions shall be compatible with standardized mechanical joints conforming to the requirements AWWA C111/ANSI A21.11 and AWWA C153/ANSI 21.53).

(5) Breakaway tops shall be incorporated in the design of the actuating bolts to visually ensure proper torque.

(6) The manufacturing of the actuating bolt must incorporate a quality control procedure deemed acceptable to positively assure precise and consistent operating torque of the breakaway top.

(7) Restraining devices shall have a working pressure rating of 235 psi and provide no less than a safety factor of 2:1.

(8) Restraint shall be FM approved in applicable sizes.

(9) Coating shall be with MEGA-BOND®, or an Alkyd paint.

iii) Restraints for existing push-on PVC pipe joints (bell-and-spigots) shall be the following:

(1) Restraint shall be provided by two split retainer rings having a series of machined (not "as cast") serrations that provide positive restraint and full support of the pipe wall. One split serrated clamping ring shall be installed on the spigot (plain end) pipe for connection to a second clamping ring to be located on the pipe barrel, immediately behind the gasketed bell, with necessary restraining rods and nuts connecting the bell ring to the gripping ring. Devices shall carry a minimum 2:1 safety factor.

(2) Manufactured of ductile iron conforming to ASTM A536, grade 65-45-12.

(3) Coated with MEGA-BOND®, or an Alkyd paint.

3. QUALITY CONTROL AND TESTING

When submitting for approval of restraint devices not listed in Section 4, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the restraint fittings may be rejected at the sole option of the City.

a) Ductile Iron Pipe Restraints

i) Coatings

(1) Flange Adapters shall be provided with painted "shop coat", or approved equal.

(2) Retainer glands shall be provided with a bituminous coat.

(3) Existing pipe push-on joint restraint fittings shall be provided with a bituminous coat.

ii) Burst pressure tests shall be performed as specified in ANSI/AWWA111/A21.11, latest revision.

b) PVC Pipe Restraints

i) Restraining devices shall meet or exceed all requirements of ASTM F1674 “Standard Test Method for Joint Restraint Products for Use with PVC Pipe”.

ii) Pipe restrained with retainer glands specified shall be capable of withstanding twice the rated pressure of the restraint device for five minutes with no leakage or movement.

4. <u>MANUFACTURER</u>

a) Ductile Iron Pipe Restraints

i) Ductile iron pipe push-on joint restraint devices shall be U.S. Pipe "Field-Lok” Gasket, American "Fast-Grip" Gasket, or approved equal.

ii) Ductile iron pipe flange joint restraint devices shall be approved, equal to, or better than EBAA Iron “Megaflange Series 2100” or “1000 EZ Flange”, or Ford Meter Box Company “Uni-flange Series 400-C”, or approved equal.

iii) Wedge action restraint for ductile iron pipe mechanical joints shall be equal to or better than EBAA Iron “Megalug, Series 1100”, Tyler/Union TUF Grip TLD, Sigma One-Lok Model SLD, or approved equal.

iv) Split, wedge-action restraints devices for restraint of existing pipe and fitting joints shall be approved, equal to, or better than EBAA Iron “Megalug, Series 1100SD or HD”, or approved equal.

b) PVC Pipe Restraints

i) Restraint of Existing PVC pipe bell-and-spigots, such as the Uniflange 1350C, Uniflange 1390C, Megalug 1600, Sigma PV-Lok Series PVP, or approved equal.

ii) Restraint of PVC pipe spigot-end to mechanical joint of fittings or valves, such as the Megalug 2000PV, Tyler/Union TUF Grip TLP, Uniflange 1300C, Sigma One-Lok Models SLC or PVM, or approved equal.

iii) Manufactured restrained joint PVC pipe shall be Eagle Loc 900, Certa-Lok, or approved equal.

W-40 BRASS FITTINGS

1. GENERAL

All brass fittings for service lines shall be included under this specification.

2. PRODUCT

a) All fittings shall be manufactured of brass, cast and machined in accordance with AWWA Standard C-800, latest revision.

b) All fittings shall perform in accordance with AWWA C-800, latest revision.

c) All brass fittings shall be made of a "No-Lead Brass", defined for this specification as brass alloy containing not more than one fourth of one percent (0.25% or less) total lead when used with respect to the wetted surfaces of the fitting, as defined by NSF/ANSI 61.

d) All fittings shall be certified as suitable for contact with drinking water in accordance with ANSI/NSF Standard 61, Drinking Water Components – Health Effects, Section 8. Certification shall be by an accredited certification organization or by a laboratory able to demonstrate that the NSF 61 lead testing protocol was followed.

e) All brass fittings shall comply with Florida Administrative Code (F.A.C.) 62-555 (latest revision), the Safe Water Drinking Act, as amended, and the U.S Environmental Protection Agency (E.P.A.).

f) All brass fittings shall be integrally stamped or cast with the manufacturer's name and a marking or trademark identifying that the fitting contains a "no lead" brass alloy (as defined herein), e.g., 'NL', 'EB2', or 'FED', etc.

g) Curb Stops & Meter Valves

i) All curb stops shall be full-port and have a flow passage area equivalent to the fitting outlet flow area.

ii) Curb stops shall be of the ball valve design with a full-port opening ball no less than 3/4-inch. ¾-inch curb stops shall be provided without padlock wings.

iii) 1-in. and larger curb stops shall be provided with padlock wings cast on stop body and operating tee cap to provide for locking the stop in closed position.

iv) Curb stops for use with copper or plastic service shall have an inlet connection with a pack-joint compression nut (w/ set screw) and an outlet connection with female iron pipe thread (FIP), or shall have an Inside Iron Pipe Thread (FIP) inlet connection and an Inside Iron Pipe Thread outlet connection.

v) Meter valves shall be of the ball valve design with a full-port opening ball no less than 3/4-inch. Meter valves shall be provided with padlock wings cast on stop body and operating tee cap to provide for locking the stop in closed position. Meter valves for use with copper or plastic service shall have an inlet connection with a compression joint and a swivel nut outlet connection, or shall have an Inside Iron Pipe Thread (FIP) inlet connection and an Inside Iron Pipe Thread outlet connection.

h) Corporation Stops

i) Corporation stops shall be of the ball valve design. Corporation stop inlet connection shall be the AWWA Taper thread. The outlet connection shall be CTS pack-joint (w/ set screw) for copper or plastic tubing.

i) Brass Fittings

i) Branch connections shall be brass construction with copper compression joint inlet and male iron pipe size outlets.

ii) Meter re-setters shall be designed for use with standard 5/8”x3/4" and 1” water meters. Re-setters shall be constructed from brass fittings conforming to the specifications herein, with copper riser pipes. An angle ball valve shall be provided on the inlet riser, saddle nuts and gaskets on inlet and outlet. Pipe connections shall be (nominal) male iron pipe size meter thread on both inlet and outlet.

iii) Threaded fittings

(1) Threaded brass fittings ("Fittings") provided shall be manufactured in accordance with ANSI B16.15, 125 lb.

(2) Fittings shall be of material conforming to ASTM B62 or B584.

(3) Threads on all fittings shall be N.P.T. in conformance with ANSI B1.20.3, right hand and shall be smooth, clean and true to form.

(4) Fittings shall be legibly cast or dye stamped such that the manufacturer's name, initial or other mark can be easily identified.

3. QUALITY CONTROL AND TESTING

a) Manufacturer shall provide a copy of a letter from NSF International (on NSF letterhead) documenting compliance with NSF/ANSI 61 Annex F.

b) Certification of the standards must be available and provided, if requested by the City. If requested, an Affidavit of Compliance to these standards and specifications shall be signed and submitted by an officer of the manufacturing firm.

When submitting for approval of brass fittings not listed, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If any of this documentation is omitted, the brass fittings may be rejected at the sole option of the City.

4. MANUFACTURER

a) Brass fittings and threaded brass fittings shall be domestically manufactured by Mueller Company, Ford Meter Box Company, A.Y. McDonald Mfg. Company, or approved equal.

b) Curb stops with compression nut inlet connection and female iron pipe thread (FIP) outlet connection:

i) FMBC: B41-333-378-NL (for ¾-in), B41-xxx-W-NL (for ≥1-in)

ii) A.Y. McDonald: 76102-22 (for ¾-inch), and 76102-22-W (for ≥1-inch)

iii) Mueller: P-2517(2 or 0)N (as applicable) or approved equal.

c) Curb stops with Inside Iron Pipe Thread (FIP) inlet connections and an Inside Iron Pipe Thread outlet connections shall be:

i) FMBC: B11-333-NL (for ¾-in), and B11-xxx-W-NL (for ≥1-in)

ii) A.Y. McDonald: 76101 (for ¾-in), and 76101-W (for ≥1-in)

iii) Mueller: B-20283N (for ¾-in), B-20200N (for ≥1-in), or approved equal.

d) Meter valves:

i) Angle meter valve: FBMC BA43W, Mueller P-24258N, A.Y. McDonald 4602B-22, or approved equal.

ii) Straight meter valve (compression x swivel): FBMC B43W, Mueller P-24351N, A.Y. McDonald 6101MW-22, or approved equal.

iii) Straight meter valve (FIP x swivel nut)): FBMC B13W, Mueller P-24350N, A.Y. McDonald 6100MW-22, or approved equal

e) Corporation stops for sizes 3/4" – 2" shall be:

i) FMBC FB-1000, A.Y. McDonald 4701B-22, Mueller P-25008N, or approved equal.

f) Branch connections shall be:

i) FMBC U48, Mueller P-15363N, A.Y. McDonald 08U2M, or approved equal.

g) Meter re-setters shall be:

i) FMBC VB40 Series, Mueller B-24118R, A.Y. McDonald Series 18, or approved equal.

W-41 MECHANICAL JOINT BOLTS-AND-NUTS

1. GENERAL

All mechanical joint bolts and nuts shall be manufactured in accordance with ANSI/AWWA C-111/A21.11, latest revision, and shall also adhere to the following specification.

2. PRODUCT

a) All mechanical joint bolts shall be a Tee-head design with hexagonal nuts. Dimensions shall be in accordance with ANSI/AWWA C-111/A21.11.

b) All bolts and nuts shall be manufactured of high-strength, low alloy steel in conformance with ANSI/AWWA C-111/A21.11 and ASTM A242, latest revisions.

c) All bolts shall be designed for internal and external threads to conform to ANSI/ASME B1.1 and B1.2. Thread form shall conform to the standards and dimensions of the coarse-thread series Unified Coarse (UNC); external threads shall be made in compliance with Class 2A limits, and internal threads shall be made in compliance with Class 2B limits. The Contractor is advised that various HDPE MJ adapters may require longer than standard bolts to complete the installation.

3. QUALITY CONTROL AND TESTING

When submitting for approval of mechanical joint bolts and nuts not listed in Section 4, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the mechanical joint bolts and nuts may be rejected at the sole option of the City.

4. MANUFACTURER

Mechanical joint bolts and nuts specified herein shall be domestically manufactured of Cor-Ten or approved equal by Birmingham Foundry, National Set Screw Corporation or approved equal.

W-42 OFFSETS

1. GENERAL

All ductile iron mechanical joint offsets shall be of ductile iron and manufactured in accordance with and ANSI/AWWA Standards C-110/A21.10 (or C-153/A21.53) and C-111/A21.11, latest revisions.

2. PRODUCT

a.) Ductile iron mechanical joint offsets shall have a minimum pressure rating of 350 psi.

b.) Joints shall be mechanical joints in accordance with C-111/A21.11, latest revision. All joint accessories shall be furnished with the fittings. Mechanical joint bolts and nuts shall be domestically manufactured of high-strength, low-alloy steel such as "Corten", "Usalloy", or "ACIPalloy". The follower gland shall be manufactured from ductile iron. The gasket shall be made of EPDM rubber.

c.) Mechanical Joint fittings furnished shall have either of the exterior coating and interior lining systems described below:

(1) Cement Mortar Lining: Fittings furnished shall have a standard thickness cement mortar lining and be seal coated in accordance with ANSI/AWWA C-104/A21.4, latest revision. Fittings shall be listed NSF or by an approved certifying agency as conforming to all requirements of ANSI/NSF 61 and shall have an asphalt exterior coating which conforms to ANSI/AWWA C-110/A21.53.

(2) Fusion-bonded epoxy: Fittings shall be coated inside and out with a minimum 8 mils of fusion-bonded epoxy, and be in conformance with the requirements of ANSI/AWWA C-116/A21.16 and AWWA C-550, latest revisions. Fittings shall be listed by an approved certifying agency as conforming to all requirements of ANSI/NSF 61.

3. QUALITY CONTROL AND TESTING

a) Ductile iron mechanical joint offsets shall meet or exceed pressure, hydrostatic and all other tests set forth in ANSI/AWWA C-110/A21.10 (or C-153/A21.53), latest revision.

b) Submit in duplicate notarized certificates of conformance that all tests and inspections performed on ductile iron mechanical joint offsets as required by the ANSI/AWWA standards C-110/A21.10 (or C153/A21.53) have been satisfied.

c) When submitting for approval of ductile iron mechanical joint offsets not listed in Section 4, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the ductile iron mechanical joint offsets may be rejected at the sole option of the City.

4. MANUFACTURER

Ductile iron mechanical joint offsets shall be manufactured by U.S. Pipe and Foundry Co., American Ductile Iron Pipe, Sigma, Tyler-Union, Union Foundry, or approved equal.

W-43 SOLID SLEEVES

(Ductile Iron, Compact, MJ)

1. GENERAL

Solid sleeves shall be used to join two plain ends of pipe or repair a damaged pipe.

2. PRODUCT

a.) Solid sleeve lengths shall be up to 24-inches. The solid sleeve shall be capable of having two plain ends of pipe inserted into opposite ends of the sleeve. The sleeve is then to be sealed to the pipe by a mechanical joint at each end of the sleeve.

b.) All sleeves shall be manufactured of ductile iron. Solid sleeves shall be manufactured in accordance with ANSI/AWWA Standard C-153/A21.53, latest revision. All sleeves shall be rated for a minimum working pressure of 350 psi.

c.) All solid sleeve sealing ends shall be mechanical joints in accordance with ANSI/AWWA C-111/A21.11, latest revision. All joint accessories shall be furnished with the fittings. All bolts and nuts shall be made of high-strength, low-alloy steel such as "Corten", "Usalloy", or "Acipalloy". The gasket shall be for a standard Mechanical Joint, in accordance with ANSI/AWWA C-111/A21.11, latest revisions, and be made of EPDM rubber. The follower gland shall be manufactured from ductile iron at least ASTM A536, Grade 70-50-05 in accordance with ANSI/AWWA C-111/ A21.11, latest revision

d.) All ductile iron compact solid sleeves shall be furnished with a standard thickness cement mortar lining and seal coating in accordance with AWWA Standard C-104, latest revision.

e.) Fittings shall have an exterior, asphaltic coating which conforms to ANSI/AWWA C-153/A21.53.

3. QUALITY CONTROL AND TESTING

a) All solid sleeves shall meet or exceed all testing requirements of ANSI/AWWA C-153/A21.53.

b) When submitting for approval of solid sleeves not listed in Section 4, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the solid sleeves may be rejected at the sole option of the City.

4. MANUFACTURER

All ductile iron mechanical joint solid sleeves shall be manufactured by U.S Pipe, Sigma, Tyler/Union, American Cast Iron Company, Clow, or approved equal.

W-44 COMPACT ANCHOR FITTINGS - DUCTILE IRON

1. GENERAL

Ductile Iron Compact Anchor Fittings ("Fittings") provided under this specification shall be manufactured in accordance with AWWA Standard C-153 and C-111, latest editions, and as specified herein. Joint accessories shall be provided with fittings.

2. PRODUCT

a) Tees

i) Both joints on the run of all anchor tees shall be mechanical joint in accordance with AWWA Standard C-111, latest edition.

ii) All mechanical joints shall be supplied with a joint accessories package (bolts, nuts and gasket) as part of the anchor fitting. MJ Gaskets shall be made of EPDM rubber formulated to resist chloramine degradation. All anchor fittings shall be compatible with mechanical joint connections in accordance with AWWA C-111, latest edition, and shall be capable of mechanical restraint so as to eliminate the need for additional thrust restraints.

iii) The standard anchor tee branch shall have an anchoring "plain end" which includes an integral or split follower gland, suitable for connecting to mechanical joint fitting meeting ANSI/AWWA C-111/A 21.11.

b) Anchor Elbow and Anchor Coupling

i) The Anchor x Anchor elbows and anchor couplings shall have for both ends anchoring "plain ends". These "plain ends" shall have integral or split follower glands, suitable for mechanical joint fittings meeting ANSI/AWWA C-111/A 21.11.

c) Joint Accessories

i) All T-head bolts and nuts for joints shall be domestically manufactured high-strength, low-alloy steel such as "Corten", "Usalloy," or "ACIPalloy."

ii) All joint accessories shall be furnished with anchoring fittings.

iii) All gaskets shall be EPDM rubber.

(1) All anchoring fittings shall be furnished with either: i) a standard thickness cement mortar lining seal coated in accordance with AWWA Standard C-104, latest edition, and an exterior, asphalt coating which conforms to ANSI/AWWA C-151/A21.51; or, ii) have factory-applied fusion bonded epoxy coatings both inside and outside, in accordance with AWWA C550.

(2) All fittings shall have a minimum pressure rating of 350 psi.

3. <u>QUALITY CONTROL AND TESTING</u>

a) All anchor fittings shall meet or exceed acceptance, performance and hydrostatic testing in accordance with AWWA Standard C-153 and C-111, latest editions.

b) When submitting for approval of ductile iron compact anchor fittings not listed in Section 4, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the ductile iron compact anchor fittings may be rejected at the sole option of the City.

4. <u>MANUFACTURER</u>

Ductile iron compact anchor fittings shall be manufactured by U.S. Pipe and Foundry Company, Clow, American Ductile Iron Pipe, McWane, Pipeline Components, Inc. or approved equal.

W-45 COMPACT MECHANICAL JOINT FITTINGS-DUCTILE IRON

1. GENERAL

   a) Ductile iron compact mechanical joint fittings shall be manufactured in accordance with ANSI/AWWA C-153/A21.53, latest revisions and the specifications stated herein. Fittings shall be listed by the National Sanitation Foundation (NSF) and shall conform to the requirements of NSF-61.

   b) Whenever the word "fitting" is used in this specification, it shall mean "Compact Ductile Iron Mechanical Joint Fitting".

2. PRODUCT

   a) For fittings larger than 16-inches physical and chemical properties shall be in accordance with ANSI/AWWA C153/A21.53, latest revision. The minimum working pressure for fittings shall be 350. The minimum wall thickness shall not be less than that of pressure class 350 ductile iron pipe.

   b) Joints shall be Mechanical Joint in accordance with ANSI/AWWA C111/A21.11 and C153/A21.53, latest revision, with exceptions noted herein. Mechanical Joint bolts and nuts shall be domestically manufactured of high-strength, low-alloy steel such as "Corten", "Usalloy", or "ACIPalloy". Joints requiring a shorter bolt than called for in ANSI/AWWA C111/A21.11 shall be supplied as required. Gaskets for mechanical joints shall be made of ethylene propylene diene (EPDM) rubber.

   c) Exterior Coating and Interior Lining

      Mechanical Joint fittings furnished shall have either of the exterior coating and interior lining systems described below:

      i) Cement Mortar Lining: Fittings furnished shall have a standard thickness cement mortar lining and be seal coated in accordance with ANSI/AWWA C-104/A21.4, latest revision. Fittings shall be listed by an approved certifying agency as conforming to all requirements of ANSI/NSF 61 and shall have an asphalt exterior coating which conforms to ANSI/AWWA C-153/A21.53.

      ii) Fusion-bonded Epoxy: Fittings shall be coated inside and out with fusion-bonded epoxy, and be in conformance with the requirements of ANSI/AWWA C-116/A21.16 and AWWA C-550, latest revisions. Fittings shall be listed by NSF or by an approved certifying agency as conforming to all requirements of ANSI/NSF 61.

3. QUALITY CONTROL AND TESTING

   a) All fittings specified herein shall meet or exceed all hydrostatic, performance, and acceptance tests in accordance with ANSI/AWWA C153/A21.53 latest revision.

   b) When submitting for approval ductile iron compact MJ fittings not listed in Section 4, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the ductile iron compact MJ fittings may be rejected at the sole option of the City.

4. MANUFACTURER

a) All manufacturers of ductile iron compact MJ fittings specified herein shall have a domestic presence. The fittings shall be manufactured by U.S. Pipe, Clow, Tyler/Union Pipe, American Ductile Iron Pipe, McWane, Pipeline Components, Inc., Sigma, Star Pipe, or approved equal.

W-46 DUCTILE IRON FITTINGS

1. GENERAL

This section includes all fittings to be owned and maintained by the City of Tampa Water Department. Requirements of this section apply to all fittings unless exceptions are shown or stated on the plans or specific provisions.

2. PRODUCT

a) All fittings shall be manufactured of ductile iron.

b) All fittings below grade shall be mechanical joint.

c) All mechanical joint bolts shall be a Tee-head design with hexagonal nuts, dimensioned in accordance with ANSI/AWWA C-111/A21.11.

d) All bolts and nuts shall be manufactured of high-strength, low alloy steel in conformance with ANSI/AWWA C-111/A21.11 and ASTM A242.

e) All fittings above grade shall be AWWA C110 flanges with a drilling that matches AWWA C115 and ANSI B16.1 class 125 flanges.

f) Minimum Working Pressure

i) Mechanical Joint = 350 psi

ii) Flanged Joint = 250 psi

g) Fitting shall be factory furnished with standard thickness cement lined interiors and asphaltic coated exteriors, or have fusion-bonded epoxy coating inside and out.

h) Anchor tee branches shall have an anchoring "plain end" which includes an integral or split follower gland, suitable for connecting to mechanical joint fitting meeting ANSI/AWWA C-111/A 21.11.

i) Anchor x Anchor elbows and anchor couplings shall have for both ends anchoring "plain ends". These "plain ends" shall have integral or split follower glands, suitable for mechanical joint fittings meeting ANSI/AWWA C-111/A 21.11.

j) Gasket material shall be made of EPDM rubber.

3. QUALITY CONTROL AND TESTING

a) Fittings shall be listed by the National Sanitation Foundation (NSF), or by an approved certifying agency as conforming to all requirements of ANSI/NSF 61.

b) All mechanical joint fittings shall meet or exceed ANSI/AWWA C153/A21.53 or ANSI/AWWA C110/A21.10

c) All flanged fittings shall meet or exceed ANSI/AWWA C110/C115/C153 and ANSI/ASME B16.1

d) Cement lining shall be in accordance with AWWA C104/A21.04
e) Asphaltic coatings shall meet or exceed ANSI/AWWA C110/A21.10

f) Fusion-bonded coating and lining shall conform with AWWA C-116 and AWWA C-550, and be listed by NSF (or by an approved certifying agency as conforming to all requirements of ANSI/NSF 61).

g) Gasket material shall be made of EPDM, in accordance with ANSI/AWWA C-111/A21.11, latest revisions. The follower gland shall be manufactured from ductile iron at least ASTM A536, Grade 70-50-05 in accordance with ANSI/AWWA C-111/ A21.11, latest revision

h) Mechanical joint bolts and nuts shall be manufactured in accordance with ANSI/AWWA C-111/A21.11. All bolts shall be designed for internal and external threads to conform to ANSI/ASME B1.1 and B1.2. Thread form shall conform to the standards and dimensions of the coarse-thread series Unified Coarse (UNC); external threads shall be made in compliance with Class 2A limits, and internal threads shall be made in compliance with Class 2B limits.

4. MANUFACTURER

a) Ductile iron fittings shall be manufactured by U.S Pipe, Sigma, McWane, Tyler/Union, American Cast Iron Pipe Company, Clow, or approved equal.

b) Mechanical joint bolts and nuts shall be domestically manufactured of Cor-Ten or approved equal by Birmingham Foundry, National Set Screw Corporation, or approved equal.

W-47 FLANGED FITTINGS

(Standard Class 125)

1. GENERAL

All standard class 125 flanged fittings shall be manufactured in accordance with ANSI/AWWA Standard C-110/A21.10 and NAPF 200, latest revision.

2. PRODUCT

a) Standard class 125 flanged fittings shall have a minimum pressure rating of 250 psi. Flanges shall be round type, faced and drilled and shall conform to ANSI B16.1 for cast-iron or bronze pipe flange Class 125.

b) The joints shall be flanged in accordance with ANSI/AWWA C-110/A21.10 and NAPF 200, latest revision. All necessary hex-head bolts and nuts, and full-faced gaskets for each joint shall be furnished as a Flange Accessory Package and shall conform to ANSI B18.2.2; threads shall be manufactured in accordance with ANSI B1.1. Bolts and nuts shall be high-strength, low-alloy steel such as "Corten", "Usalloy", or "ACIPalloy". Bolt circle and bolt holes shall be drilled and faced to match American National Standard Institute (ANSI) B16.1, Class 125 Flanges.

c) All standard class 125 flanged fittings shall have a standard thickness cement mortar lining and shall be seal coated in accordance with AWWA Standard C-104, latest revision.

3. QUALITY CONTROL AND TESTING

a) All standard class 125 flanged fittings shall meet or exceed all test standards set forth in AWWA C-110.

b) When submitting for approval of standard class 125 flanged fittings not listed in Section 4, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the standard class 125 flanged fittings may be rejected at the sole option of the City.

4. MANUFACTURER

Standard class 125 flanged fittings shall be manufactured by U.S. Pipe and Foundry Co., American Ductile Iron Pipe, PCI, Tyler-Union, Sigma, or approved equal.

W-48 ELECTROFUSION SOLID COUPLINGS

1. GENERAL

Electrofusion solid couplings shall be used for joining similarly sized sections of HDPE pipe to one another. They will consist of one (1) electrofusion solid coupling.

2. PRODUCTS

a) The coupling shall be sized to fit 4" to 14" HDPE pipe or 1" or 2" CTS HDPE tubing.

b) The electrofusion coupling shall be an injection molded fitting designed and manufactured in accordance with ASTM F-1055 and shall meet all provisions of AWWA C906, latest revision. Resin used to produce the coupling shall be virgin, pre-blended resin with a cell classification of 445474C and a PPI listing of PE4710. The resin will comply with ASTM D 3350 and meet or exceed the requirements of NSF 61.

c) The electrofusion coupling shall incorporate as part of its design a constant 40 volt fusion coil for the purpose of joining the fitting onto the outer pipe wall.

d) Installation of the coupling shall utilize a reusable restraining device to hold the coupling in place during the fusion process

e) The electrofusion couplings shall be of no-leak design.

3. QUALITY CONTROL AND TESTING

When submitting for approval of electrofusion solid couplings not listed in Section 4, the Contractor shall include drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the tapping tee may be rejected at the sole option of the City.

4. MANUFACTURER

All electrofusion couplings shall be manufactured by Central Plastics Company of Shawnee, Oklahoma or approved equal.

W-49 ELECTROFUSION TAPPING TEES

1. GENERAL

Electrofused tapping tees shall be used for tapping water HDPE distribution pipe, tubing to provide a connection for customer's water meters, air release valve connections and temporary water quality sampling points. They shall consist of a single unit made of one (1) electrofusion self-tapping tee and one (1) electrofusion coupling.

2. PRODUCTS

a) The base section for each coupling shall be sized to fit 4" to 14" HDPE pipe or 2" HDPE tubing. The branch section for each coupling shall be sized to 1" or 2" CTS HDPE tubing.

b) The electrofusion self-tapping tee shall be an injection molded fitting designed and manufactured in accordance with ASTM F-1055 and shall meet all provisions of AWWA C906, latest revision. Resin used to product the electrofused tee shall be pre-blended, virgin resin with a cell classification of 445474C and a PPI listing of PE4710. The resin shall comply with ASTM D 3350 and meet or exceed the requirements of NSF 61.

c) The electrofusion self-tapping tee shall incorporate as part of its design a self-contained brass cutter that will retain the pipe coupon after tapping the pipe. It shall also incorporate a constant 40 volt fusion coil for the purpose of joining the fitting onto the outer pipe wall.

d) Installation of the self-tapping tee shall utilize a metal, reusable under clamp to hold the fitting in place until the electrofusion process is complete.

e) The tapping tee shall be of no-leak design.

3. QUALITY CONTROL AND TESTING

When submitting for approval of a tapping tee not listed in Section 4, the Contract shall include drawings and brochures that clearly indicate size, dimensions, weights performance standards, etc. If this documentation is omitted, the tapping tee may be rejected at the sole option of the City.

4. MANUFACTURER

All electrofusion tapping tees shall be manufactured by Central Plastics Company of Shawnee, Oklahoma or approved equal.

W-50 HDPE-MECHANICAL JOINT ADAPTERS

1. GENERAL

HDPE mechanical joint (MJ) adapters shall be used for joining HDPE pipe to ductile iron or cast iron MJ fittings, valves or PVC or ductile iron pipe. They shall consist of an HDPE spool piece with a raised or flange type area.

2. PRODUCTS

a) The HDPE-MJ adapter shall be sized to fit 4” to 14" HDPE pipe on one end and a DIP or CIP MJ fitting on the other.

b) The HDPE-MJ adapter shall be an injection molded fitting designed and manufactured in accordance with ASTM F-1055 and shall meet all provisions of AWWA C906, latest revision. Resin used to produce the HDPE-MJ adapter shall be pre-blended with a minimum cell classification of 445474C and a PPI listing of PE4710. The resin shall comply with ASTM D 3350 and meet or exceed the requirements of NSF 61.

c) The HDPE-MJ adapter shall have the capability to be attached to HDPE pipe by butt fusion or by the use of an electrofusion coupling.

d) The HDPE-MJ adapter shall be of a no leak design. No additional restraint shall be required when used in conjunction with a mechanical joint fitting and accessories.

e) The Contractor is advised that HDPE-MJ adapters may require longer bolts than normally accompany an MJ gland kit.

3. QUALITY CONTROL AND TESTING

When submitting for approval of HDPE-MJ adapters not listed in Section 4, the Contractor shall include drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the adapter may be rejected at the sole option of the City.

4. MANUFACTURER

All electrofusion HDPE-MJ adapters shall be manufactured by Central Plastics Company of Shawnee, Oklahoma, or approved equal.

W-51 ELECTROFUSION CORPORATION SADDLES

1. GENERAL

Electrofused corporation saddles shall be used for tapping HDPE water distribution pipe and tubing to provide water meter service lines, air release points and temporary connections for water quality sampling points. They will consist of a single unit made of one (1) injection molded fitting base and one (1) female threaded outlet ring.

2. PRODUCTS

a) The base section for each corporation shall be sized to fit 4” to 12" HDPE pipe or 2" HDPE tubing. The threaded outlet ring for each corporation shall be sized with tapered CC threads to fit a 3/4", 1", 1-1/2" or 2" brass corporations.

b) The electrofusion corporation saddle shall be an injection molded fitting base designed and manufactured in accordance with ASTM F-1055. Resin used to produce the electrofused tee shall be pre-blended virgin resin with a cell classification of 445474C and a PPI listing of PE4710. The resin will comply with ASTM D 3350 and meet or exceed the requirements of NSF 61.

c) The electrofusion corporation saddle shall incorporate as part of its design a brass 360 alloy threaded outlet that is restrained with a stainless steel 304 compression ring. It will also incorporate a constant 40 volt fusion coil for the purpose of joining the fitting onto the outer pipe wall.

d) Installation of the electrofusion corporation saddle shall utilize a metal, reusable under clamp for main sizes 2" through 6" to hold the fitting in place until the electrofusion process is complete. Installation of the electrofusion corporation saddle shall utilize a top loading fitting clamp for 8" main sizes to hold the fitting in place until the electrofusion process is complete.

e) The electrofusion corporation saddle shall be of no-leak design and shall be designed for use on DIP-sized pipe.

3. QUALITY CONTROL AND TESTING

When submitting for approval of an electrofusion corporation saddle not listed in Section 4, the Contractor shall include drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the electrofusion corporation saddle may be rejected at the sole option of the City.

4. MANUFACTURER

All electrofusion corporation saddles shall be manufactured by Central Plastics Company of Shawnee, Oklahoma or approved equal.

W-60 FIRE HYDRANT ASSEMBLY

1. GENERAL

This section includes all hydrants to be owned and maintained by the City of Tampa Water Department. Requirements of this section apply to all hydrant assemblies unless exceptions are shown or stated on the plans or specific provisions.

2. PRODUCT

a) Pipe

i) See *Ductile Iron Pipe* Specifications

b) Valve

i) See *Valve* Specifications

c) Fittings

i) See *Fittings* Specifications

d) Hydrant

i) Hydrants shall have a 5¼-inch main valve opening. The main valve shall be of compression-design and shall open against and closing with pressure. The hydrant shall comply with the requirements of Associates Factory Mutual Insurance Companies and have the "FM" symbol cast into the barrel. The hydrant shall be listed with Underwriter's Laboratories. Hydrants shall open by turning the operating nut counterclockwise.

ii) The hydrant shall be provided with a breakable traffic feature designed so that the nozzle section of the hydrant can be rotated a full 360 degrees. Break couplings shall be made of cast iron, epoxy coated steel, or forged stainless steel. The lower barrel and shoe shall be made of ductile iron, manufactured in accordance with AWWA C-502, latest revision.

iii) All hydrants shall have two 2½-inch bronze nozzles, 180 degrees apart, and one 4½-inch bronze nozzle. All nozzle centerlines shall be at the same elevation. Nozzle outlet threads to be National Standard fire hose coupling screw thread, as described in Appendix A of AWWA C-502. After being coated with an approved anti-seize compound as specified herein, hydrant nozzle shall thread or twist-lock into the hydrant nozzle section; a locking device secures the nozzle. Cast iron or ductile iron nozzle caps provided, with gaskets; nozzle cap nut configuration matches hydrant operating nut. Chains are not provided on nozzle caps.

iv) Hydrant design shall be such that removal of the seat valve drain mechanism, internal rod and all working parts can be accomplished through the top of the hydrant without disturbing the ground-line joint or nozzle section. The shoe inlet shall be mechanical joint, in accordance with AWWA C-111, latest revision. The interior of the shoe and (and upper and lower valves plates, if utilized in design) shall be epoxy-coated in accordance with AWWA C550, latest revision. Accessory kits shall be provided with MJ bolts and nuts and gasket. Mechanical

joint nuts and bolts to be manufactured of high-strength, low-alloy steel equal to or better than "Cor-Ten". Main valve gasket and mechanical joint (MJ) gasket made of EPDM.

v) All above-ground external bolts, studs, and nuts made of low-zinc bronze or stainless steel. Below-ground bolts, studs and nuts shall be made of high-strength, low-alloy steel as specified herein, or of stainless steel. When bolts are used at the break coupling, they shall not be frangible.

vi) Unless the operating rod is made of stainless steel, the rod shall be sheathed where it passes through a double O-ring seal, sealing the operating threads from the water in the hydrant at all times when the valve is in the open or closed position. Another O-ring shall prevent water from passing between the operating shaft and the sheath. Downward travel of the operating rod and valve assembly shall be controlled by a travel stop device (located in the bonnet only), to prevent the bottom of the main valve from making contact with the epoxy coating of the shoe. Travel stop devices located on the bottom of the operating rod are not acceptable. Bronze operating nuts shall be fully covered with a cast iron or ductile iron weather shield and shall have at least one anti-friction thrust washer to reduce the operating torque when opening the hydrant. The hydrant's bronze main valve seat ring shall thread into a bronze sub-seat or drain ring. The drain outlet for the hydrant shall be eliminated as part of the casting or machining process.

vii) Hydrant operating threads shall be lubricated with anti-seize compound paste upon assembly. Approved anti-seize compounds are Bostik Never-Seez food-grade (888-603-8558), or Permatex part #82448 (food-grade anti-seize compound). (877-376-2839), or MobilGrease FM102 (food-grade). Approval for other anti-seize compounds shall be requested in writing to the Tampa Water Department, accompanied with a Material Safety Data Sheet from the manufacturer of the compound for review. Anti-seize compound shall not contain any heavy metals.

viii) When the hydrant is tested for head-loss as described in AWWA C502, Section 5, latest revision, the maximum head–loss shall not exceed 2.5 psi when flowing at 1000 gpm through the 4 ½-inch nozzle.

ix) Hydrant coatings shall be as specified in AWWA C502 Section 4.02. Additionally, above-ground exterior hydrant coatings shall be minimum 4 mil Dry Film Thickness white primer coating, compatible with Porter high-grade enamel final paint to be applied in the field. Color will be specified by inspector.

x) If manufacturer uses locking keys to secure the lower barrel to the shoe, all locking keys to be fully coated with a Water Department approved anti-seize compound applied upon assembly

3. <u>QUALITY CONTROL AND TESTING</u>

a) Pipe

i) See *Ductile Iron Pipe* Specifications

e) Valve

i) See *Valve* Specifications

f) Fittings

i) See *Fittings* Specifications

g) Hydrant

i) The following shall be provided upon request of the Engineer:

(1) Certified affidavit from an officer of the manufacturer that hydrant conforms to AWWA C502, latest revision, and these specifications.

(2) Certified test results from an independent testing laboratory indicating that the hydrant conforms to Section 2.8 of this specification.

(3) Certification of Underwriter's Laboratories listing.

(4) Certification of compliance with Associates Factory Mutual Fire Insurance Companies specifications.

2) <u>MANUFACTURER</u>

a) Pipe

i) See *Ductile Iron Pipe* Specifications

b) Valve

i) See *Valve* Specifications

c) Fittings

i) See *Fittings* Specifications

d) Hydrant

i) Hydrants shall be assembled and tested in their entirety within the United States of America or its territories. The manufacturer of hydrants shall have continuously manufactured, catalogued, sold, and had in service the hydrants in the size proposed for a minimum of five years.

Hydrants shall be manufactured by American (Darling B-84-B 5¼), U.S. Pipe (Metro 250 M94, 5 ¼), Kennedy (Guardian K81-D, 5¼), American AVK (Series 2780, Nostalgic, 5¼), or approved equal.

<u>W-70 TAPPING SLEEVES</u>

(Steel, "O-Ring" Type)

1. <u>GENERAL</u>

Tapping sleeves (steel/"O-ring" type) shall be constructed of high strength steel and shall be manufactured in accordance with ASTM A285. Steel tapping sleeves shall be suitable for tapping ductile iron pipe, C-900 PVC pipe, and all pipe manufactured in accordance with ANSI A21 Standards, AWWA, and these specifications.

2. <u>PRODUCT</u>

a) All tapping sleeves (steel or “O-ring” type) shall be split sleeve design; one half shall contain the outlet hub, gasket and tapping flange; the other half shall form the back. A ¾” NPT test plug shall be provided on the outlet throat of the sleeve for pressure testing the sealed sleeve at 150 psi prior to tapping the pipe. All tapping sleeves shall allow a full-size cutting head to pass through the outlet of the hub.

b) All bolts and nuts joining the two halves of the sleeve shall be high strength, low alloy steel, such as Cor-Ten, in accordance with AWWA C-111, latest revision.

c) All tapping sleeve connection flanges shall be a Class 125 flanged joint, conforming to AWWA C207 Class D, ANSI 150 lb. with a counter bore per MSS SP-60 dimensions.

d) Tapping sleeves shall seal to the pipe by the use of a confined "O-ring” gasket around the tap opening between the sleeve and pipe or by a full circumferential gasket between the sleeve and pipe. Gasket shall be made of EPDM rubber.

e) All steel tapping sleeves shall be finished with fusion-bonded epoxy coating both inside and outside, in accordance with AWWA C-550, latest revisions.

3. QUALITY CONTROL AND TESTING

When submitting for approval tapping sleeves (“O-ring” type) not listed in Section 4, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc., which completely substantiates the tapping sleeves compliance with this specification. If this documentation is omitted, the tapping sleeves may be rejected at the sole option of the City.

4. MANUFACTURER

Tapping sleeve (steel/”O-ring” type) manufactures shall be domestically assembled. Tapping sleeves (steel/”O-ring” type) shall be manufactured by JCM 412, Smith Blair 622, Ford Meter Box FTSC, Dresser 610, Mueller H615, U.S. Pipe T9, or approved equal.

W-70 TAPPING SLEEVES

(Steel, "O-Ring" Type)

1. GENERAL

Tapping sleeves (steel/”O-ring” type) shall be constructed of high strength steel and shall be manufactured in accordance with ASTM A285. Steel tapping sleeves shall be suitable for tapping ductile iron pipe, C-900 PVC pipe, and all pipe manufactured in accordance with ANSI A21 Standards, AWWA, and these specifications.

2. PRODUCT

a) All tapping sleeves (steel or “O-ring” type) shall be split sleeve design; one half shall contain the outlet hub, gasket and tapping flange; the other half shall form the back. A ¾” NPT test plug shall be provided on the outlet throat of the sleeve for pressure testing the sealed sleeve at 150 psi prior to tapping the pipe. All tapping sleeves shall allow a full-size cutting head to pass through the outlet of the hub.

b) All bolts and nuts joining the two halves of the sleeve shall be high strength, low alloy steel, such as Cor-Ten, in accordance with AWWA C-111, latest revision.

c) All tapping sleeve connection flanges shall be a Class 125 flanged joint, conforming to AWWA C207 Class D, ANSI 150 lb. with a counter bore per MSS SP-60 dimensions.

d) Tapping sleeves shall seal to the pipe by the use of a confined "O-ring” gasket around the tap opening between the sleeve and pipe or by a full circumferential gasket between the sleeve and pipe. Gasket shall be made of EPDM rubber.

e) All steel tapping sleeves shall be finished with fusion-bonded epoxy coating both inside and outside, in accordance with AWWA C-550, latest revisions.

3. QUALITY CONTROL AND TESTING

When submitting for approval tapping sleeves (“O-ring” type) not listed in Section 4, include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc., which completely substantiates the tapping sleeves compliance with this specification. If this documentation is omitted, the tapping sleeves may be rejected at the sole option of the City.

4. MANUFACTURER

Tapping sleeve (steel/”O-ring” type) manufactures shall be domestically assembled. Tapping sleeves (steel/”O-ring” type) shall be manufactured by JCM 412, Smith Blair 622, Ford Meter Box FTSC, Dresser 610, Mueller H615, U.S. Pipe T9, or approved equal.

W-71 TAPPING SLEEVES

(Mechanical Joint)

1. GENERAL

Tapping sleeves (mechanical joint) shall be constructed of ductile iron. All tapping sleeves shall be suitable for tapping cast iron, ductile iron pipe, C-900 PVC pipe, and all pipe manufactured in accordance with ANSI A21 Standard, AWWA, and these specifications.

2. PRODUCT

a) Tapping sleeves shall be of the split sleeve design; one half shall contain the outlet hub, gasket, and tapping flange; the other shall form the back of the sleeve. A ¾" NPT test plug shall be provided on the outlet throat of the sleeve for pressure testing the sealed sleeve at 150 psi prior to tapping the pipe. All tapping sleeves shall allow a full-size cutting head to pass through the outlet of the hub.

b) Tapping sleeves shall be constructed of ductile iron and shall be manufactured in accordance with ASTM A536.

c) All bolts and nuts joining the two halves of the sleeve shall be high strength, low alloy steel, such as Cor-Ten, in accordance with AWWA C-111, latest revision.

d) Tapping sleeve connection flanges shall conform to AWWA C-110/ANSI B16.1 Class 125 with counter bore per MSS SP-60 dimensions.

e) Mechanical joint tapping sleeves shall form a mechanical joint at each end of the sleeve after bolting the halves together. The sleeve shall then be sealed to the pipe by assembling the mechanical joint using split gaskets and follower glands.

f) All ductile iron sleeves shall have an outside bituminous coating in accordance with AWWA C-110, latest revision.

g) End and side gaskets shall be made of EPDM rubber.

3. QUALITY CONTROL AND TESTING

When submitting for approval of tapping sleeves (mechanical joint) not listed in Section 4, of this specification include manufacturer drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the tapping sleeves (mechanical joint) may be rejected at the sole option of the City.

4. MANUFACTURER

Tapping sleeve (mechanical joint) shall be domestically assembled. Tapping sleeves (mechanical joint) shall be manufactured by U.S. Pipe Mechanical Joint Tapping Sleeve, Mueller Co. H-615, American Flow Control or approved equal.

W-80 METER SET ASSEMBLY

1. GENERAL

This section includes all meters to be owned and maintained by the City of Tampa Water Department. Requirements of this section apply to all meters unless exceptions are shown or stated on the plans or specific provisions.

2. PRODUCTS

a) Meter laterals

   i) See *HDPE Tubing* specification

b) Curb and Corporation Stop

   i) See *Brass Fittings* specification

c) Meter

   i) Shall be capable of operating at 150 psi

   ii) The unit of measure shall be in 100 Cubic Feet (ccf)

   iii) Shall have a life expectancy of 20 years

   iv) Shall be magnetic-driven, positive displacement meters of the flat nutating disc type

   v) All meters must be adaptable to a field programmable absolute encoder register without interruption of the customer's service.

   vi) All main case bolts shall be of 300 series non-magnetic stainless steel to prevent corrosion.

   vii) End connections for 1½" and 2" meters shall be either spud type in accordance with ANSI 1.20.1 or oval flange type with gaskets at the City's option.

   viii) Numerals on odometer shall be black on white background except for the two right most numerals which shall be white on black background.

   ix) Direct Read Standard Register

      (1) The register shall be of the straight reading sealed magnetic drive type and shall contain six (6) numeral wheels.

      (2) Registers must be hermetically sealed.

      (3) All direct reading register cups shall be copper to prevent corrosion and be covered with a high strength, impact resistant flat glass lens to prevent breakage.

      (4) The lens shall be positioned above the register box to allow for run-off of debris. The register lid shall overlap the register box to protect the lens.

      (5) Registers shall have a bronze or synthetic polymer register box enclosure with the manufacturer's serial number imprinted on top of a hinged reading lid.

      (6) All registers shall have the size, model and date of manufacture stamped on the dial face. The dial shall have a red center sweep hand and shall contain one hundred (100) equally divided graduations at its periphery.

      (7) The register must contain a low flow (leak detection) indicator with a 1:1 ratio to disc nutations to provide leak detection.

(8) Registers shall be secured to the maincase by means of a plastic tamper-proof seal to allow for inline service replacement. Register seal screws are only accepted when supplied with attached sealing wire to at least one bottom cap bolt with seal wire holes of not less than 3/32" in diameter.

(9) Registers shall be guaranteed for at least ten (10) years. All meters will be guaranteed for one year on material and workmanship.

x) Measuring Chamber

(1) The measuring chamber shall be of a two-piece snap-joint type with no fasteners allowed. The chamber shall be made of a non-hydrolyzing synthetic polymer.

(2) The control block shall be the same material as the measuring chamber and be located on the top of the chamber. The control block shall be located after the strainer.

(3) The measuring chamber outlet port shall be sealed to the maincase outlet port by means of an "O" ring gasket.

(4) The flat nutating disc shall be a single piece made from non-hydrolyzing synthetic polymer and shall contain a type 316 stainless steel spindle. The nutating disc shall be equipped with a synthetic polymer thrust roller located within the disc slot. The thrust roller head shall roll on the buttressed track provided by the diaphragm.

d) Meter Box & Covers

i) Water meter boxes ("Meter Boxes") and covers ("Covers) shall be manufactured in accordance with these specifications. Covers provided shall be designed to withstand incidental traffic or heavy traffic ("extra-heavy") loading.

ii) Meter boxes and covers provided shall be in accordance with City of Tampa Water Department "Standard Details" for meter boxes (see Std. Details 5.10A, 5.11A, 5.12A & 5.13).

iii) Meter boxes and covers provided for potable water service shall be black in color.

iv) Meter boxes and covers provided for reclaimed water (RCW) service shall be colored Pantone purple. Covers for RCW meter boxes shall include "NO BEBER", and the universal symbol for DO NOT DRINK [the glass with a line (or "x") through it].

e) Meter Boxes

i) Meter boxes shall be LLD- or HD-polyethylene of one-piece molded construction, with dimensions as shown in the referenced drawings. The boxes shall be designed to meet the requirements for AASHTO Incidental Traffic H-10 loading.

ii) All edges shall be clean and smooth for safety during handling. Exterior wall shall be of smooth finish, black in color, and have ultraviolet degradation protection properties for above ground storage (except reclaimed water meter boxes shall be purple). Interior wall shall be of smooth finish and black or white color (except reclaimed water meter boxes shall be purple).

iii) Meter boxes shall not exceed 25 lbs. in weight, shall have pre-cut pipe entry areas, and be designed to be securely stackable.

f) Meter Box Covers

Meter box covers shall:

i) be made of modified polyethylene or bulk molded compound composite material to prevent floating in high water conditions; be one-piece molded construction, with dimensions and lettering as shown in the referenced meter box Std. Detail drawings;

ii) be designed to meet the requirements for AASHTO Incidental Traffic H-10 loading;

iii) be "anti-float", demonstrated by having a specific gravity >1.0 gm/cm^3 (ASTM D792);

iv) include snap-lock pockets (slide mounts) on the underside to receive an AMR/AMI device endpoint. Snap-lock slot shall be of size sufficient to allow for a finger force install of an AMI transmitter, and pocket height shall be sufficient to allow a minimum 1/8" air gap;

v) include minimum #3 rebar or other tested and proven means of enabling magnetic location of the cover when it is buried;

vi) be sized to fit the appropriate Brooks Products, Inc., Orlando, Florida concrete meter boxes, numbers 36, 37, 66 and Dual H:

Description	¾" Dual	¾" or 1" Single	1½"-2" Single	Dual w/BFP
Meter Box Type	Dual H	#37	#66	13 x 24
Meter Box Cover	16-9/16" x 14-	18-1/8" x 11-1/4"	30-1/2" x 17-1/2"	13 ¾" x 23 ¼"

vii) Composite covers shall have a minimum coefficient of friction of >0.5 (ASTM 1028), to prevent pedestrian slip hazard.

viii) Polyethylene covers shall have a molded tread-pattern for skid resistance.

ix) **"**Extra-heavy" covers provided shall be designed to meet the requirements for AASHTO Full Traffic H-20 loading.

3. <u>QUALITY CONTROL AND TESTING</u>

a) Laterals

i) See *HDPE Tubing* specification

b) Curb and Corporation stop

i) See *Brass Fittings* specification

c) Meter

i) Brass shall meet SDWA Section 1417 lead free requirements and comply with NSF/ANSI Standard 61.

ii) Must provide documentation of compliance with NSF/ANSI Standard 61. Certification of meter compliance to the NSF performance standard shall be by NSF, UL, or any other ANSI-accredited laboratory.

iii) To ensure accuracy, each meter must be accompanied by a factory test tag certifying the accuracy at the flows required by AWWA C700.

iv) Markings on the upper portion of the casing shall be cast raised and shall indicate size, model, direction of flow, and NSF 61 certification.

v) Shall conform to AWWA Standard C700 (latest revision)

vi) Shall be manufactured in a ISO 9001 facility

d) Meter Box Cover

i) All covers must offer a minimum of a full 10-year warranty against defects, breakage, etc., under normal use conditions.

ii) All HDPE "standard" meter box covers shall be designed to meet the requirements for AASHTO Incidental Traffic H-10 loading. All HDPE "extra-heavy" covers shall meet the requirements for AASHTO Full Traffic H-20 loading.

iii) All covers shall have UL/FM approvals.

4. <u>MANUFACTURER</u>

a) Laterals

i) See *HDPE Tubing* specification

b) Curb and Corporation stop

i) See *Brass Fittings* specification

c) Meter

i) Meters and meter parts shall be manufactured, assembled, and tested within the United States. Manufacturers may be required to provide proof of where and what percentage of the meter register, chamber, and maincase is manufactured in the United States. Manufacturers shall have a minimum of fifteen (15) years of field and production experience with all sizes and models provided.

d) Meter Box & Covers

Water meter boxes and meter box covers provided shall be equal to or better than:

i) Meter Boxes:

(1) DFW Plastics, models: DFW37C-12-BODY; DFW39C-12-BODY; DFW1730CH-12-BODY; DFW 1324C-12-BODY (for RCW boxes, insert a 5 after the "C "or "CH" in the model name)

(2) 1015-12 Oldcastle Enclosure Solutions, models: CFXL (#36); 1118-12 BCFXL (#37); 1416-12 BCFXL (Dual); 1730-12 BCFXL (#66); 1324-12 BCFXL (Dual Meter & w/BFPs).

ii) Meter Box Covers:

(1) DFW Plastics, models: DFW37C-AF1EA TPA-LID; DFW39C-AF1EATPA-LID; DFW1730C-AF1EA TPA LID; DFW1324C-AF1EA TPA-LID (for DFW RCW covers, change the 1 to a 5 in the model name)

(2) Oldcastle Enclosure Solutions "Fibrelyte", models: FL9X (36), FL12 (37), FL1416 (Dual), FL36 (66), FL30 (Dual BFP)

W-90 BLOW-OFF ASSEMBLY

1. GENERAL

This section includes all blow-off assemblies to be owned and maintained by the City of Tampa Water Department. Requirements of this section apply to all blow-off assemblies unless exceptions are shown or stated on the plans or specific provisions.

Blow-off assemblies shall be used to remove sediments and stagnant water from non-looping or dead-end water lines.

2. PRODUCT

a) There are two approved Std. Construction Details for blow-off assemblies - one for four-inch and larger pipe, the second for two-inch pipe.

b) The Contractor shall furnish all parts for the complete assembly, including but not necessarily limited to gate valves, hydrant adapters, meter boxes, valve boxes, caps or plugs on the water main, a cap on the hydrant adapter, one MJ restraining device or MJ adapter for the cap or plug on the main and all related appurtenances.

c) The outlet shall have 2-1/2-inch fire hydrant threads and a cap.

d) Blow-Off Assembly for 4-Inch and Larger Pipe

i) Blow-off assembly shall connect to the end of the existing pipe through a tapped plug or cap. A two-inch corporation shall be threaded into the tapped cap/plug. Two-inch HDPE tube shall run from the two-inch corporation to a two-inch gate valve.

ii) The gate valve shall have a standard operating nut and have a standard valve box, brought to grade in conformance with the appropriate standard detail.

iii) Two-inch HDPE tubing shall run from the gate valve and terminate in 2-1/2-inch NST by 2-inch MIP brass hydrant adapter. The adapter shall have a threaded cap and shall be placed in a #37 meter box, set to grade.

e) Blow-Off Assembly for 2-Inch Pipe

i) A two-inch gate valve shall be installed on the two-inch pipe.

ii) The gate valve shall have a standard operating nut and have a standard valve box, brought to grade, in conformance with the appropriate standard detail.

iii) Two-inch HDPE tubing shall run from the gate valve and terminate in 2-1/2-inch NST by 2-inch MIP brass hydrant adapter. The adapter shall have a threaded cap and shall be placed in a #37 meter box, set to grade.

3. QUALITY CONTROL AND TESTING

None specified. The installation shall conform to the appropriate Standard Detail.

4. MANUFACTURER

None specified. The installation shall conform to the appropriate Standard Detail.

W-100 AIR RELEASE VALVE

1. GENERAL

This section includes all air release valves to be owned and maintained by the City of Tampa Water Department. Requirements of this section apply to all air release valves unless exceptions are shown or stated on the plans or specific provisions.

2. PRODUCT

a) The air release valve shall be of the float operated, compound leverage type, and be capable of automatically releasing accumulated air from a fluid system while that system is in operation and under pressure.

b) To ensure drip-tight shut off, a buna-n orifice button shall be used to seal the valve discharge orifice. The orifice diameter must be sized for use within a given operation pressure range to insure maximum discharge capacity.

c) Air release valves shall be provided with a vacuum check to prevent air from re-entering the system on negative pressure.

d) All internal trim metal subject to wetting shall be stainless steel. The float shall be of stainless steel construction and capable of withstanding a pressure of 1,000 p.s.i.

e) Air release valves shall be installed inside of a Charles Industries fiber optic pedestal (Part No. CP210-NLP), in accordance with Department Details 2.14 (Automatic Air Release Valve) and 2.15 (Pedestal for Automatic Air Release Valve), having a buried, split, square base with a low-profile above-grade dome.

3. QUALITY CONTROL AND TESTING

When submitting for approval of air release valve not listed in Section 4, the Contractor shall include drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the air release valve may be rejected at the sole option of the City.

4. MANUFACTURER

Air release valves shall be Val-Matic Valve and Manufacturing Corp. “Model No. 38VC”; APCO “Model 200, with vacuum check”, or approved equal. Pedestal shall be Charles Industries fiber optic pedestal (Part No. CP210-NLP).

W-110 LINE STOPS (4”-42”)

1. GENERAL

Line stops shall be used to isolate sections of water mains in order to keep customers in service during water main tie-ins, water main repairs and to compensate for broken valves. The water mains shall remain under pressure during the installation and use.

Line stops shall be constructed of ductile iron or stainless steel (carbon steel is acceptable subject to Engineer approval). All line stop bodies shall be suitable for tapping cast iron, asbestos cement pipe (12” and smaller), ductile iron pipe, C-900 PVC pipe, and all pipe manufactured in accordance with ANSI A21 Standard, AWWA, and these specifications. Line stops on asbestos cement pipe, on pipe greater than 8” and on pipe with taps the same size shall be mechanical joint.

Line stops (steel/”O-ring” type) shall be constructed of high strength steel and shall be manufactured in accordance with ASTM A285. Line stops shall be suitable for tapping ductile iron pipe, C-900 PVC pipe, and all pipe manufactured in accordance with ANSI A21 Standards, AWWA, and these specifications.

2. PRODUCT

a) Line stop fitting shall be full encirclement, pressure retention type split tee. It shall consist of two segments – an upper flange saddle plate and a lower saddle plate. All bodies shall have a ¾” NPT test plug to verify all seals are secure prior to tapping. Cover plate gasket shall be EPDM. Completion plug O-ring shall be EPDM. Gasket shall be molded from elastomer compounds that resist compression setting and are compatible with water in the 32 to 120 deg. F temperature range.

b) Line stop sleeve shall have a full-circle rubber gasket and a flanged outlet for bolting to the line stop tapping valve. Sealing may be accomplished by either split end gaskets and mechanical joint ends or a single rubber gasket around the tap opening.

c) Nuts-and-bolts shall be stainless steel.

d) Outlet flange shall be ductile iron, stainless steel, or machined from a 150 lb. forged steel flange (ASTM A181 or A105) or from pressure vessel quality steel plate (ASTM A285, Grade C), be flat-faced and drilled per ANSI B16.5

3. QUALITY CONTROL

a) Catalogs and manufacturer data shall be provided as required by the Engineer. The catalogs and maintenance data shall contain sufficient detail to serve as a guide in the line stop installation and the ordering of repair parts.

b) The Water Department may request samples of proposed line stops. Samples shall be supplied and/or returned to the Contractor at the Contractor's expense.

c) Failure to submit samples within 10 calendar days after the date of a written request shall result in rejection of that item.

d) The sleeves shall be rated at150 psi hydrostatic with a test pressure of 200 psi. And maintain zero leakage at all times.

4. MANUFACTURER

Line stops shall be domestically assembled equivalent to or better than Advanced Valve Technologies EZ Valve II, Hydra-Stop, JCM 440 Line Stop, or approved equal.

W-120 CASING SPACERS

1. GENERAL

Casing spacer sleeves shall be used to cradle carrier pipe through casing pipe.

2. PRODUCT

Casing spacer sleeves provided shall be either:

a) two-piece, 12-gauge stainless steel strap which is heat fused PVC coated. Sleeve runners shall be an ultra-high molecular weight polymer with high resistance to abrasion and sliding wear. Runners shall be 2-inch or 2-½ inch in height. Or,

b) projection type spacers composed of a single-piece HDPE strap providing constant projections around the entire circumference of the carrier pipe. The minimum number of projections to be provided around the circumference shall total the number of diameter inches of the carrier pipe. Manufacturer-provided double-backed tape shall be used to fasten the HDPE casing spacer strap tightly to the carrier pipe so that the spacers do not move during installation. Selection of spacer type and installation shall be in accordance with manufacturer's installation guidelines and recommendations.

c) Projection type spacers shall be ISO 9002 certified for strength and quality.

3. QUALITY CONTROL AND TESTING

When submitting for approval of a casing spacer not listed in Section 4, include manufacturer drawings/brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the casing spacer sleeves may be rejected at the sole option of the City.

4. MANUFACTURER

Casing spacer sleeves shall be Raci Spacers North America Inc "RACI Projection-type HDPE Casing Spacer", Cascade Manufacturing "CCS-450-1740" or "CCS-ER", PSI CG-2 series, or approved equal.

W-130 POLYETHYLENE ENCASEMENT

1. GENERAL

Polyethylene encasement shall conform to the requirements of ANSI/AWWA C-105/A21.5 Method A and shall be 8-mil thick. Polyethylene encasement shall be installed on all buried ductile iron pipe, fittings, valves, and appurtenances where shown on the drawings or as directed by the Water Department as dictated by field conditions. It shall be blue in color.

2. PRODUCT

The raw material used to manufacture polyethylene encasement shall be Type 1, Class A Grade E-1 in accordance with ASTM D-1248

The polyethylene encasement shall meet the following test requirements:

- Tensile Strength→1200 psi minimum
- Elongation→ 300% minimum
- Dielectric Strength→ 800 V/Mil thickness, minimum
- Thickness→ 0.008" (8-mils minimum nominal, with minus tolerance < 10% of nominal)
- Melt Index→ 0.4 maximum

3. QUALITY CONTROL AND TESTING

When submitting for approval polyethylene not listed in Section 4, manufacturer shall include drawings and brochures that clearly indicate size, dimensions, weights, performance standards, etc. If this documentation is omitted, the polyethylene may be rejected at the sole option of the City.

4. MANUFACTURER

All polyethylene encasement shall be domestically manufactured.

W-131 LOCATING (TRACER) WIRE & BOXES

1. GENERAL

All tracer wire installed shall be insulated, blue coated, solid UF (Underground Feeder per National Electric Code Article 339) copper tracer wires for water main location purposes by means of an electronic line tracer.

Curb stop boxes ("boxes") shall be provided to house the ends of tracer wires installed along a pipe and shall be installed directly over the pipe the wire is tracing. Tracer wire ends shall terminate in the curb stop box such that they can be accessed and charged to facilitate locating the buried pipe. Boxes installed in roadways shall be suitable for installation in areas subject to heavy vehicle traffic loading (be H-20 rated) and shall have cast iron rims. Boxes installed out of roadway or sidewalk shall be installed within reinforced concrete pads poured around valve boxes per the Standard Details, or in a separate 12"x12" (min.) x 6" reinforced concrete pad.

2. PRODUCT

a) Tracer wire for direct bury installations shall be approved insulated copper clad steel (CCS) wire. Wire insulation shall be minimum 30 mil high-density, high molecular weight polyethylene (HDPE) colored to meet the APWA color code standard for identification of buried utilities. Conductor must be at 21% minimum conductivity for locate purposes, and be able to withstand a minimum 450 lb. break load.

b) Sizes (gauges) for direct bury pipe tracer wire shall be as follows:

i) 16-in. and larger ductile iron pipe: 10 AWG

ii) PVC pipe: 12 AWG

iii) Long-side meter service line (direct bury and directional drilled): 12 AWG

iv) Tracer wire for directional drilled or bored-in pipe shall be approved insulated **10 AWG** copper clad steel wire insulated with 45 mil, high-density, high molecular weight polyethylene (HDPE), and rated for direct burial use at 30 volts minimum. Conductor must be at 21% minimum conductivity for locate purposes, and be able to withstand a minimum 1150 lb. break load.

v) Tracer wire for Pipe Bursting shall be approved insulated copper clad steel wire, insulated with a 50 mil, high-density, high molecular weight polyethylene (HDPE) insulation, and rated for direct burial use at 30 volts minimum. Conductor must be at 21% minimum conductivity for locate purposes, and be able to withstand a minimum 4700 lb. break load.

vi) Wire splices shall be with wire connectors suitable for buried service (i.e., be corrosion and moisture-proof).

vii) Stop boxes shall include locking lids lettered with "WATER" and shall be blue in color. All stop boxes shall be manufactured of high impact ABS plastic; cast iron roadway rims shall exceed ASTM A-48 Class 30. All stop boxes shall consist of a telescoping top and bottom section, with flared or square bottom to prevent settling or pull out of the box.

3. MANUFACTURER

Manufacturer shall be as indicated below or approved equal.

a) Tracer wire shall be:

   i) for direct bury pipe: Copperhead High Strength Tracer Wire, or Pro-Trace High-Flex Copper-clad Steel (HF-CCS) PE45

   ii) for directional drilled pipe: Copperhead SoloShot™ extra-high-strength copper-clad steel (EHS-CCS)

   iii) for pipe bursting: Copperhead Industries SoloShot™ *Xtreme*, 7x7 stranded Copper Clad Steel

b) Wire splices for tracer wire shall be: DBR Kit (by 3M), Snakebite (by Copperhead Industries)

c) Tracer wire boxes shall be: Bingham & Taylor Cathodic Protection Test Boxes (model P200NFG for non-roadway applications, P4HHD for roadway applications

W-140 ASPHALTIC CONCRETE

1. GENERAL

Follow the latest FDOT standards Road and Bridge Construction for all asphaltic concrete including but not limited to pay items 9205 & 9207.

2. QUALITY CONTROL AND TESTING

The Contractor will be responsible for providing copies of all necessary plant production tests. The Contractor will be responsible for retesting of any failed sections. The contractor is responsible for all materials testing in section W-171.

W-141 BASE MATERIAL

1. GENERAL

Follow the latest FDOT standards Road and Bridge Construction for all base material.

2. QUALITY CONTROL AND TESTING

The Contractor will be responsible for retesting of any failed sections. The contractor is responsible for all materials testing in section W-171.

W-150 CONCRETE

1. GENERAL

Follow the latest FDOT standards Road and Bridge Construction referencing section 346 for sidewalk, curb and gutter, driveways, and any other associated flat work.

2. QUALITY CONTROL AND TESTING

The Contractor will be responsible for retesting of any failed sections. The contractor is responsible for all materials testing in section W-171.

W-160 ROOT PRUNING

1. GENERAL

The Contractor shall make provisions for tree protection to the satisfaction of the Engineer prior to any excavation. All applicable site inspections by the Planning and Development Department, and permits, shall be obtained prior to commencing work.

The Contractor shall provide root pruning services as directed by the Engineer.

2. PERFORMANCE OF WORK

All root pruning shall be performed by a qualified, licensed tree professional as approved by the Engineer.

All roots designated to be removed shall be severed leaving a smooth, uniform section at the remaining root end to prevent root damage.

Root pruning shall be performed with a chain saw, Dosco root pruner, or equal, as approved by the Engineer.

Root pruning shall not occur within 6 feet of the base of the tree without guidance from Planning and Development Department staff, and no excavation shall occur inside the circumference of the root-pruned area.

W-170 RESTORATION

1. GENERAL

a) The various street surfaces disturbed, damaged, or destroyed during the performance of the work under this Contract shall be restored and maintained as shown, specified, and directed. Included in this classification are permanent pavement surfaces of all types, pavement bases, curb, curb and gutter, alleys, driveways, and sidewalks.

b) Service boxes, manhole frames and covers, and similar structures not conforming to the new work shall be set to established grade at the Contractor's expense, and no separate payment will be made therefor.

c) All portland cement and asphaltic concrete pavements shall be removed in rectangular sections with sawed vertical cuts, or to existing joints, or as directed by the Engineer. Asphaltic concrete pavements and concrete pavement shall be saw cut parallel perpendicular straight line or as directed by the Engineer. The edges shall be trimmed to which a roller may follow. Where reinforced concrete pavement is removed, one foot of existing reinforcement on each side of the excavation shall be left exposed and tied to the replaced reinforcing steel.

2. TEMPORARY RESTORATION

a) Upon completion of backfilling, the street or sidewalk surface damaged or destroyed shall be promptly placed in condition for safe temporary use. Temporary work shall be maintained in a suitable and safe condition for traffic and pedestrians until the permanent pavement is laid, or until final acceptance of the work.

b) Pavement surfaces shall be temporarily restored by placing thereon, to proper line, grade and transverse profile, a layer or layers of compacted base material, as specified, conforming to all requirements regarding configuration, thickness, and density as detailed in the Plans, specified, and directed by the Engineer.

c) Curbs, where possible, shall be temporarily reset in place, as part of the work of temporary restoration of pavement.

d) Damaged or destroyed sidewalks shall be temporarily restored, immediately upon placing of the backfill.

e) The temporary pavement shall be maintained by the Contractor and all holes and depressions filled until the permanent pavement is placed.

f) Crushed concrete or similar material placed in areas where the existing pavement is shell, limerock, crushed stone, or other similar material shall be classified as nonpermanent pavement, will not be measured for separate payment.

g) Temporary sand and asphalt wearing courses placed on base on which a permanent pavement surface will be constructed shall be incidental to the permanent pavement base work, and no separate payment will be made therefor.

h) Materials for temporary sidewalk surface shall be incidental to sidewalk replacement, and no separate payment will be made therefor.

3. REPLACEMNT OF CURB, CURB & GUTTER, SIDWALK & DRIVEWAYS

a) All permanent restoration of street curb or curb and gutter shall be of the same type and thickness as the curb or curb gutter which abuts. The grade of the restored curb and curb and gutter shall conform with the grade of the existing adjacent curb or curb and gutter.

b) Except as otherwise specified herein or detailed in the Plans, all permanent restoration of driveways and sidewalks shall conform to the manner of construction as originally placed and to the lines and grades as given by the Engineer. No patching of concrete driveway areas will be allowed between joints or dummy joints.

c) Where sidewalks are replaced, the replacement shall be the full width of the walk and minimum lengths shall be 60 inches. Restoration of adjacent lawn is incidental to sidewalk replacement, and no separate payment will be made therefor.

4. REPLACEMENT OF TRAFFIC MARKINGS & SIGNALIZATION LOOPS

a) The Contractor shall furnish all labor, equipment and materials to replace, test and maintain all traffic markings (temporary and permanent) and signalization loops removed or damaged by pipeline construction and appurtenance work as shown on the Plans, specified and directed by the Engineer.

b) The replacement of traffic markings (temporary and permanent), signalization loops and all appurtenant work shall be replaced by the Contractor in kind.

c) It shall be the Contractor's responsibility to field verify before construction begins all markings and signalization loops to be replaced.

d) All traffic markings and signalization loops shall conform to the Workmanship and Materials standards set forth in the latest edition of the Florida Department of Transportation Standard and Supplemental Specifications.

e) Payment for the replacement of temporary and permanent traffic markings, signalization loops and all appurtenant work shall be included in the unit bid price for Permanent Pavement Surface Replacement, Asphaltic Concrete, or as part of the Lump Sum price and no separate payment shall be made therefor.

W-171 CITY MATERIALS TESTING FREQUENCY

1. GENERAL

   a) Contractor is responsible for all testing.

2. TABLE

   a) Shows frequency by materials

Item	Test		Test Frequency
Embankment	Optimum Moisture/Maximum Dry Density of soil (proctor) as determined by AASHTO TI80.		Per Soil Type
	Density Test within Right-of-Way (R.O.W.).	98% of Maximum Dry Density as determined by AASHTO T180	One per 200' horizontally, in one-foot lifts (1)
	. Density Test Outside of R.O.W	95% of Maximum Dry Density as determined by AASHTO T180.	One per 200’ horizontally, in one-foot lifts (1)
	Gradation (Sieve Analysis) AASHTO T 27, T 11, ND T 89, ND T90.		Per Soil Type
Utility Trench Backfill – over pipelines and around structures from R.O.W. line to R.O.W. line	Optimum Moisture/Maximum Dry Density of soil by AASHTO T180.		Per Soil Type
	98% of Maximum Dry Density (proctor). Soil mix by AASHTO T180.		(1)(2)
Utility Trench Backfill – over	Optimum Moisture/Maximum Dry Density (proctor). Soil Mix by AASHTO T180.		Per Material Type

pipelines and around structures outside R.O.W. line	95% of Maximum Dry Density as determined by AASHTO T180.	(1)(2)
Stabilized Subgrade	Limerock Bearing Ratio (LBR) as per FM 5-515.	Per Soil Type
	Minimum 40 LBR.	Per Material Type (3)
	Minimum 20 LBR (For Soil Cement Only).	Per Material Type
	Subgrade to be used under soil cement shall have a minimum 20 LBR.	Per Material Type
	Moisture/Maximum Dry Density of soil (proctor). Proctor as per FM 5-515.	Per Material Type
	98% of Maximum Dry Density as determined by FM 5-515. No tolerance. Soil Cement - 97% of Maximum Dry Density as determined by AASHTO-T134. No tolerance	(3)(4)
Base (Other than soil cement or crushed concrete)	Limerock Bearing Ratio (FM 5-515). Minimum LBR 100.	Per Material Type/Per Source
	98% of Maximum Dry Density as determined by FM 5-515. No tolerance.	(3)(4)
Item	**Test**	**Test Frequency**
Superpave Asphalt	Mix Design	One per FDOT Approved type
	Temperature	(6)
	Maximum Specific Gravity (FM 1-T209)	One per day.
	Extraction/Gradation (FM5-563/FM 1-T030	
	Thickness. No core shall be less than the specified thickness.	Three cores per production day.
	Straightedge (FM 5-509)	(7)
	Bulk Specific Gravity (MF 1-T166) 90% of Lab Density for Local Roadways (Remove and Replace if not met); and 92% of Lab Density for Collectors and Arterials (Remove and Replace if not met).	(3) see Nuclear Density Testing
Item	**Test**	**Test Frequency**

Soil Cement Base	Mix Design	Per Material Type
	Moisture/Maximum Dry Density of soil (proctor) AASHTO T134	Per Material Type
	97% of Maximum Dry Density as determined by AASHTO T134. No tolerance.	(3)(4)
	Compressive Strength of Specimens	One set of three per material type daily
	Cores Thickness Test	(3)
Crushed Concrete Base	Gradation	Per Type of Material/Source (5)
	Abrasion per FM 1-T096	Per Type of Material/Source
	Limerock Bearing Ratio (LBR) as per FM 5-515. Minimum LBR 150.	Per Type of Material/Source
	98% of Maximum Dry Density as determined by FM 5-515. No tolerance.	(4)
Concrete	Temperature (ASTM C1064)	One per set of cylinders
	Slump (ASTM C143)	One per set of cylinders
	Air Content (ASTM C231 or C173 as applicable)	One per set of cylinders
	Compressive Strength Cylinders (ASTM C31 and C39)	One set of four (6x12) inch or one set of five (4x8) inch cylinders for 100 cubic yards or fraction thereof, per class of concrete. Tested as follows: 1 at 7 days, 2 at 28 days, and 1 as reserve tested 56 days is necessary. Three cylinders shall be tested at 28 days if 4x8 inch cylinders are used.

1) *Recommend testing methods: FM 1-T238, FM- T204, ASTM D6938, and ASTM D2937.*

2) *Tests shall be located no more than 200 feet apart. Tests shall be performed on each lift, except that tests shall not be further apart than one foot vertically. Field Densities shall be taken over all road crossings. Field Densities for Sanitary Lines shall be staggered to include results over service laterals. There shall be a minimum of one test series for each one foot of lift over pipeline between manholes. Tests around structures shall be spiraled in one-foot lifts. For all type pipe, fill to be compacted beneath the haunches using suitable tampers. For pipe less than 24 inches in diameter, backfill in appropriate lifts and test from the top of the pipe and every one foot vertically thereafter. For pipe 24 inches to 72 inches in diameter, backfill in appropriate lifts and test from the springline and every one-foot vertically thereafter. For pipe larger than 72 inches, tests shall begin one foot above the base of the trench.*

3) *Tests for base material shall be located no more than 200 feet apart. Tests for asphalt pavement shall be located no more than 500 feet apart. There shall be no less than one test per street. No core shall be less than specified minimum thickness. Nuclear Density Tests may be acceptable if approved by the City Engineer/Engineer of Record.*

4) *Testing for the subgrade and base compaction shall be located no more 200 feet apart and shall be staggered to the left, right, and on the centerline of the roadway. The City Engineer may reserve the right to sample and test any material utilized in the construction of the roadway. Testing shall be in accordance with the Testing Schedule and applicable City of Tampa Standard Specifications and latest FDOT Standard Specifications for Road and Bridge Construction. Inspection of the subgrade and base shall be conducted by the City Inspector, and shall be approved by the City Engineer/Engineer of Record prior to the base and asphalt construction respectively. Note: The City reserves the right to sample and test any material during construction.*

5) *Materials requirements as per latest FDOT Standard Specifications for Road and Bridge Construction*

6) *Continuous for the five first loads if the temperature is within the master range take a temperature measurement every five (5) loads thereafter or as directed by the Engineer.*

7) *For City local roads the straightedge test will be required only if requested by the City Engineer/Engineer of Record.*

C-1.00 GENERAL

The Contractor shall receive and accept the compensation provided in the Proposal and the Agreement as full payment for furnishing all materials and all labor, tools and equipment, for performing all operations necessary to complete the work under the Agreement, and also in full payment for all loss or damages arising from the nature of the work, or from any discrepancy between the actual quantities of work and quantities herein estimated by the Engineer, or from the action of the elements or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the Department.

It is the intent of these contract documents that any cost for which compensation is not directly provided by a bid item shall be prorated and included in the bid item for which they are required. Failure of the Contractor to follow this procedure shall be basis for rejection of his bid.

The prices stated in the Bid Proposal include all costs and expenses for taxes, labor, equipment, commissions, transportation charges and expenses, patent fees and royalties, labor for handling material during inspection together with any and all other costs and expenses for performing and completing the work as shown on the plans and specified herein. The basis of payment for any item at the unit price shown in the Proposal shall be in accordance with the description of that item in this Section.

No separate payment will be made for the following items; the cost of such work shall be included in the applicable contract pay items of work, including separate mobilization/ demobilization charges for compliance with FDEP or any other agency:

1. Clearing and grubbing;
2. Excavation, including necessary pavement/slab removal;
3. Shoring and sheeting as required by OSHA trench excavation safety standards unless specifically provided for in a pay item;
4. Dewatering and proper disposal of all water unless specifically provided for in a pay item;
5. Backfill and proper compaction, including suitable fill;
6. Grading;
7. Replacement or restoration of paved or unpaved roadways, grass and shrubbery plots outside of established pay limits;
8. Temporary facilities and controls during construction such as water/sanitary facilities, traffic control, informational signs and environmental protection, unless specifically provided for in a pay item;
9. Providing and maintaining silt barriers for drainage structures and silt fences for the duration of the project;
10. Removing and legally disposing of waste material due to construction, including but not limited to valve boxes that need to be removed from abandoned water mains;
11. Cleanup and restoring the job site to its original condition, which includes but is not necessarily limited to restoring the ground surface to its original grade;
12. Testing and placing system in operation, including re-mobilization for FDEP testing;
13. Any material and equipment required to be installed and used for the tests;

14. Maintaining the existing quality of service during construction, including flushing mains that are cleared but not put into service after bacteriological testing is complete;

15. Repair of sanitary sewer house laterals that were properly marked (see Specific Provision S-20.01)

16. Repair of water services damaged during construction;

17. Adjusting new or existing water meter boxes to grade which are affected by construction;

18. Appurtenant work as required for a complete and operable system;

19. Coordination with all Federal, State and Local agencies and utilities;

20. Cutting of existing or new pipe for purposes of abandonment or installation of new pipe, valves or fittings;

21. Tree trimming as required by the City of Tampa Parks Department or any other agency unless specifically provided for as a contract item;

22. Verification of pipe elevation as stated in Section 8 of the General Provisions and Section S-23.01 the Specific Provisions;

23. Repair of private irrigation systems damaged during construction;

24. Furnishing and installing suitable temporary fences, as directed by the Engineer, to adequately secure areas protected by a permanent fence when that permanent fence must be removed. The temporary fence shall remain in place until the permanent fence is replaced;

25. Furnishing and installing all HDPE MJ adapters, HDPE flanged adapters, HDPE electrofusion tapping tees, electrofusion corporation saddles or HDPE electrofusion couplings;

26. Maintaining red-line drawings of changes to construction plans, to be submitted for FDEP clearance;

27. Furnishing record drawings based on the redline drawings in AutoCAD 2015 or higher and one set of drawings on paper. The City will provide the AutoCAD plans used for the design. **Final Payment will not be made until As-built drawings are received.**

28. Furnishing and installing polyethylene encasement per Standard Detail 2.05 for all buried ductile iron pipe, all fittings and tapping sleeves.

The Contractor's attention is again called to the fact that the quotations for the various items of work are intended to establish a total price for completing the work in its entirety. Should the Contractor feel that the cost for any item of work has not been established by the Proposal or Contract Pay Items, he shall include the cost for that work in some other applicable bid item, so that his proposal for the project does reflect his total price for completing the work in its entirety.

The City shall have the option of making monthly partial payments on work that exceeds $100,000.00. Payment of these partial payment requests shall be for the approved and accepted amount of work that the Contractor has accomplished in the previous month. The approved amount of work is defined as that amount of work associated with an active work within the project which, in the opinion of the Engineer, is progressing at a satisfactory rate of completion. Satisfactory rate of completion is interpreted to mean that once project is started by the Contractor, the job must be actively pursued to include site preparation, utility and agency coordination, installation of all pipe and appurtenances, restoration, clean up, testing, disinfection, and final acceptance.

Following final payment by the City, the Contractor shall maintain the surface of the unpaved trenches, shrubbery, fences, sod, and other surfaces disturbed for a period of one (6) months thereafter and shall maintain the repaved areas, curbs, gutters and sidewalks, trees, if replaced by the Contractor, for one (1) year after acceptance. The cost of maintaining the restored areas is considered incidental to the cost of restoring the areas disturbed by the Contractor. These costs shall be prorated and included in the cost for the bid item for which it is required.

The quantities for payment under this Agreement shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the City, in accordance with the applicable method of measurement therefore contained herein. A representative of the Contractor shall witness all field measurements.

All work and materials shall be in accordance with the Workmanship & Materials specifications and Standard Details herein.

C-2.10 DUCTILE IRON AND PVC PIPE

The Contractor shall provide all labor, equipment, and materials to furnish and install ductile iron pipe or PVC pipe per provided pay item. All temporary materials not remaining in the ground after the completion of the disinfection and pressure testing shall remain the property of the Contractor.

Ductile iron or PVC pipe shall include, but may not be limited to:

1. Furnishing all construction layouts as outlined in Section S-14.01 and S-23.01;
2. Field locating all utilities to confirm horizontal and vertical location in areas of possible conflict;
3. Furnishing all labor equipment and materials to excavate the trench;
4. Maintaining the trench which shall include dewatering and sheeting and bracing as required by OSHA or as directed by the Engineer standards unless specifically provided for in a pay item;
5. Cleaning dirt and foreign material from within pipe and bell;
6. Beveling field-cut joints and pipe shorts;
7. Furnishing and installing EPDM gaskets for all DIP and PVCP;
8. Furnishing and installing Department approved pipe and any pipe shorts as part of the pipeline;
9. Furnishing and installing Department approved pipe in casing pipe when shown on the plans;
10. Installing push-on joint restraint gaskets for DIP as shown on the plans or as directed by the Engineer (furnishing push-on restraint gaskets will be compensated under appropriate pay items);
11. Furnishing and installing blue for polyethylene encasement per standard detail 2.05;
12. Furnishing and installing 2, 4,6, 8, 12, and 16-inch nominal diameter PVC pipe or 4, 6, 8, 12, 16, 20, 24, 30, 36, 42, or 48-inch nominal diameter ductile iron pipe at various depths;
13. Furnishing and installing 2-inch PVC fittings when necessary at various depths;

14. Furnishing and installing on all PVC pipe and fittings, a continuous double run of 14-gauge wire attached to the top of the pipe with duct tape. The wire shall be looped around each bell. There shall be no dead ends and the locator wire shall be brought into a separate curb stop box at every valve box;

15. Cleaning up and removing excess water main pipe and appurtenances;

16. Pressure testing the water main pipe;

17. Furnishing and installing temporary pipe short's valves and bends for full port flushing;

18. Furnishing and installing valve location protection devices per Standard Detail 3.05 whenever needed to keep valve locations visible;

19. Disinfecting the water main pipe and bacteriological testing;

20. Furnish and apply paint for any above ground or aerial crossing pipe and appurtenances. Paint to be high-grade enamel, OSHA blue for potable water or purple for reclaim water as directed by the Engineer;

21. Backfilling and compacting the trench;

22. Cleaning up and restoring the job site which shall include re-grading the terrain; and

23. Removing and legally disposing all waste materials.

Cover over pipe shall be defined as the vertical distance from the top of the pipe to the surface grade above the main. Trench depth shall be defined as the vertical distance from the bottom of the barrel of the pipe to the surface grade above the main.

Payment for connecting new water mains to existing water mains will be made utilizing the contract unit price for installing the fittings, polywrap, or valves used in the connection.

The cost to hydrostatically test and disinfect the ductile iron or PVC water mains shall be prorated and included in the pipeline construction unit prices. The prorated cost should include, but may not be limited to furnishing and installing all:

1. Material;

2. Labor;

3. Necessary pumps;

4. Recorder charts;

5. Gages (300PSIG limit, oil filled);

6. Chemicals;

7. Temporary valves;

8. Temporary plugs;

9. Sample taps, (including installation of brass dry main plugs after tap removal);

10. Blow off assemblies (including removal after disinfection is complete);

11. Dry main plugs;

Necessary to pressure test and disinfect various sizes and depths of ductile iron pipe or PVC pipe. Furthermore, no extra compensation shall be paid to the Contractor for:

1. Furnishing and installing brass, dry main plugs at the locations of all removed sample taps, or

2. Removing existing "end of line" or blow-off valves after the pipeline has been disinfected and prior to connecting the newly installed pipeline to the existing water main.

All temporary materials or materials not remaining in the ground after the completion of the disinfection and pressure testing shall remain the property of the Contractor.

The pipe quantities to be paid for under this section shall be based on the size and the horizontal distance in linear feet of ductile iron pipe, PVC pipe, or steel casing pipe measured along the top centerline of the pipe in place complete and acceptable to the Engineer.

Payment shall be made under:

Item No.	Description	Unit
2100	Furnish and install 4" ductile iron pipe (0-5' trench)	LF
2102	Furnish and install 6" ductile iron pipe (0-5' trench)	LF
2103	Furnish and install 6" ductile iron pipe (+5' trench)	LF
2104	Furnish and install 8" ductile iron pipe (0-5' trench)	LF
2106	Furnish and install 12" ductile iron pipe (0-5' trench)	LF
2107	Furnish and install 12" ductile iron pipe (+5' trench)	LF
2108	Furnish and install 16" ductile iron pipe (+5' trench)	LF

C-2.20 Pipe Installed via Horizontal Directional Drilling (HDD)

The contactor shall provide all material, equipment, transportation, tools, and labor to install the specified pipe using horizontal directional drilling (HDD) as a work method.

This section covers High Density Polyethylene (HDPE), Restrained Joint Integral Bell Certa-Lok® Poly-Vinyl Chloride (RJIB Certa-Lok® PVC) pipe, and TR Flex® Restrained Joint Ductile Iron pipe (TR Flex® RJ DIP) installed in accordance with the approved NASTT “HDD Good Practices Guideline”, latest edition. Pipe is intended for use as a pressure rated potable water delivery system.

The installation of watermain via HDD shall conform to the workmanship and materials specifications and the plans, unless specified otherwise. For installations not within the jurisdiction of the City, the HDD Contractor shall comply with regulations of the governing authority. Directional boring operations shall be performed within the right-of-way, permanent easements, temporary construction easements or access agreements with individual property owners.

The overall work for a complete installation shall include, but may not be limited to:

1. Furnish and install construction layout by a registered professional land surveyor;
2. Furnish the HDD Contractor's Experience Record for review;
3. Furnish the HDD's Contractor's work and bore plans for review,
4. Field locating all utilities to confirm horizontal and vertical location in areas of possible conflict;
5. Excavating the access pits;
6. Maintaining the pits which shall include dewatering and sheeting and bracing as required by OSHA or as directed by the Engineer;
7. Joining HDPE pipe sections by butt fusion or by furnishing and installing an appropriately sized HDPE electrofusion coupling;
8. Joining PVC pipe sections by inserting manufacturer provided spline into precision-machined grooves on the pipe in accordance with manufacturer recommendations;
9. Joining DIP pipe section in accordance with manufacturer's instruction and using manufacture provided locking segments and rubber retainers;
10. Furnishing and installing department approved restrained couplings, flexible elastomeric seals (O-rings), gaskets and pipe specific non-spray-on lubricant when applicable;
11. Pigging, cleaning or flushing the line to remove dirt, debris if directed by the engineer;
12. Furnishing and installing temporary valve, pipe shorts and bends to accomplish full port flushing of mains;
13. Furnishing and installing Department approved pipe and any pipe shorts as part of the pipeline;
14. Furnishing and installing at various depths by HDD: 4 thru 14-inch nominal diameter HDPE pipe and 2-inch HDPE tubing; 6 thru12-inch nominal diameter PVC; and 4 thru 36-inch diameter flexible restrained joint DI pipe
15. Furnishing and installing Trace Wire on all HDPE pipe, tubing, and PVC per City specification and as shown in the standard details;
16. Removing excess or ancillary water main pipe and/or appurtenances;
17. Installing miscellaneous appurtenances to complete the entire work as shown on the Contract Drawings,
18. Pressure testing the water main pipe;
19. Disinfecting the water main pipe;
20. Furnishing and installing push-on and mechanical joint restrainers on existing pipe as shown on the plans or as directed by the Engineer;
21. Backfilling and compacting the trenches or pits including re-grading the terrain;
22. Cleaning up and restoring the job site which shall include re-grading the terrain; and

23. Removing and legally disposing of all waste materials.

24. Providing acceptable Record Drawings of the directional drilled installation in accordance with the HDD Specifications.

Cover over pipe shall be defined as the vertical distance from the top of the pipe to the surface grade above the main. Trench depth shall be defined as the vertical distance from the bottom of the barrel of the pipe to the surface grade above the main.

Payment for connecting new water mains to existing water mains will be made utilizing the contract unit price for installing the tapping sleeves, restraints, fittings or valves used in the connection.

The cost to hydrostatically test and disinfect the water mains shall be prorated and included in the pipeline construction unit prices. The prorated cost should include, but may not be limited to furnishing and installing all: Material, labor, necessary pumps, recorder charts, gages (200 PSIG limit, oil filled), chemicals, temporary valves, temporary plugs, sample Taps (including furnishing and installation of brass dry main plugs in corporation saddles after sample tap removal), blow off assemblies (including removal after disinfection is complete, and dry main plugs installed in corporation saddles as necessary to pressure test and disinfect various sizes and depths of specified pipe. Furthermore, no extra compensation shall be paid to the Contractor for:

1. Furnishing and installing brass, dry main plugs in corporation saddles at the locations of all removed sample taps, or

2. Removing existing "end of line" or blow off valves after the pipeline has been disinfected and prior to connecting the newly installed pipeline to the existing water main.

All temporary materials or materials not remaining in the ground after the completion of the disinfection and pressure testing shall remain the property of the Contractor.

The pipe quantities to be paid for under this section shall be based on the size and the horizontal distance in linear feet of specified pipe measured along the top centerline of the pipe in place, complete and acceptable to the Engineer.

Payment shall be made under:

Item No.	Description	Unit
2216	F&I 16" TR Flex® RJ DIP w/TR Flex® fittings at various depths	LF

C-2.60 CUTTING & PLUGGING

The Contractor shall provide all labor, equipment and materials to cut and plug pipe as designed on the plans or as directed by the Engineer. To cut and plug pipe shall include, but may not be limited to:

1. Excavating and maintaining the trench;

2. Performing a minimum of two complete cuts of the pipe to facilitate the plugging.

3. Removing of pipe or appurtenances to allow for the installation of plugs on open ends of pipe;

4. Furnishing and installing grout to plug any abandoned open end(s) pipe;

5. Furnishing and installing cap(s) or plug(s) and restraints to adequately withstand a working pressure of 150 psi, on all in-service open end(s) of pipe;

6. Backfilling and compacting the trench;

7. Cleaning up and restoring the job site which shall include re-grading the terrain;

8. Removing and legally disposing of all waste materials.

Payment shall be made for each cut and plug accomplished and accepted by the Engineer.

Payment shall be made under:

Item No.	Description	Unit
2600	Cut and Plug 3" and smaller	EA
2601	Cut and Plug 4", 6" and 8" Pipe	EA
2602	Cut and Plug 10, 12, and 16” Pipe	EA

C-3.00 THRUST RESTRAINT

The Contractor shall provide for all labor, equipment and materials to completely furnish and/or install thrust restraint. The furnishing and installation of the thrust restraint shall include but not be limited to:

1. Excavating the trench;

2. Maintaining the trench that shall include dewatering and bracing and sheeting where required or as directed by the Engineer;

3. Furnishing and installing approved wedge action restraint fitting or flange joint restraints;

4. Furnishing and installing manufactured restrained joints;

5. Furnishing of approved push-on restraint EPDM rubber gasket-type restraining devices (gaskets with stainless steel locking segments vulcanized into the rubber) on new push-on ductile iron pipe;

6. Furnishing and installing approved restraining devices on proposed PVC push-on joint pipe;

7. Furnishing and installing approved restraining devices on joints of existing pipe;

8. Backfilling and compacting the trench;

9. Cleaning up and restoring the job site which shall include re-grading the terrain;

10. Removing and legally disposing of all waste materials.

Payment for installation of manufactured restrained joints shall be for each bell and spigot joint assembled.

No additional compensation shall be made to the Contractor for field poured concrete in excess of the amount detailed in the Technical Specification or Standard Details without approval by the Engineer.

Payment will not be credited for restraining devices installed in conjunction with fire hydrant installations. Payment for installation of thrusting restraints for fire hydrants and for pipe on fire hydrant leads is to be included in the price quoted for installation of fire hydrant assemblies.

Payment shall be made under:

Item No.	Description	Unit
3000	Furnish & install 4" wedge-action or flange restraints	EA
3001	Furnish & install 6" wedge-action or flange restraints	EA
3002	Furnish & install 8" wedge-action or flange restraints	EA
3003	Furnish & install 12" wedge-action or flange restraints	EA
3004	Furnish & install 16" wedge-action or flange restraints	EA
3071	Furnish 6-inch push-on restraint gaskets	EA
3073	Furnish 12-inch push-on restraint gaskets	EA
3074	Furnish 16-inch push-on restraint gaskets	EA

C-4.00 FITTINGS

The Contractor shall provide all labor and equipment to completely install plugs, caps, bends, sleeves, reducers, tees, crosses, and offsets. The installation of ductile iron fittings shall include, but not be limited to:

1. Excavating the trench;
2. Maintaining the trench which shall include dewatering and bracing and sheeting where required or as directed by the Engineer;
3. Furnishing and installing the appropriate fitting;
4. For HDPE pipe, furnishing and installing the appropriate HDPE mechanical joint adapters and back-up rings or mechanical joint glands;
5. Backfilling and compacting the trench;
6. Cleaning up and restoring the job site which shall include re-grading the terrain;
7. Removing and legally disposing of all waste materials.

Additional compensation shall not be made for restraining devices used in conjunction with hydrant installations. Payment will be made for the number of each size and type of fittings installed and incorporated into the piping system complete, working, and operating to the satisfaction of the Engineer.

Payment shall be made under:

Item No.	Description	Unit
4001	Furnish and install 4" bend, offset, sleeve or reducer w/ DIP, CIP or PVCP	EA

4005	Furnish and install 6" bend, offset, sleeve or reducer w/ DIP, CIP or PVCP	EA
4006	Furnish and install 6" tee w/ DIP, CIP or PVCP	EA
4007	Furnish and install 6" cross w/ DIP, CIP or PVCP	EA
4008	Furnish and install 8" plug or cap w/ DIP, CIP or PVCP	EA
4009	Furnish and install 8" bend, offset, sleeve or reducer w/ DIP, CIP or PVCP	EA
4013	Furnish and install 12" bend, offset, sleeve or reducer w/ DIP or CIP	EA
4017	Furnish and install 16" bend, offset, sleeve or reducer w/ DIP or CIP	EA
4018	Furnish and install 16" tee w/ DIP or CIP	EA
4019	Furnish and install 16" cross w/ DIP or CIP	EA

C-5.00 FIRE HYDRANTS

The Contractor shall provide all labor, equipment and specified materials to completely furnish and/or install standard fire hydrant assemblies on new and existing water mains as shown on the construction plans or as directed by the Engineer.

The "standard hydrant assembly" to be furnished is 10 LF or less of 6" DIP, hydrant elbow, and hydrant barrel extension and hydrant barrel as shown in Standard Detail 4.01. When agreed by the Engineer, an "alternate hydrant assembly" to be furnished is 7 LF or less of 6" DIP and a Gradelok offset fitting, hydrant elbow, hydrant barrel extension, and hydrant barrel as generally shown in Standard Detail 4.01. (Note that whenever a GRADELOK fitting is used with a fire hydrant installation, the standard 3' to 5' depth of bury required at the hydrant must be maintained.)

Hydrant assembly installation shall include, but may not be limited to:

1. Excavation of hydrant assembly trench;

2. Maintaining the trench that shall include dewatering, bracing and sheeting where required or as directed by the Engineer;

3. Anchoring the hydrant to existing or new main;

4. Furnishing and installing of up to and including ten (10) feet of 6-inch ductile iron pipe;

5. Removing any plugs, caps, restraining devices, etc. from existing water mains;

6. Furnishing and installing all mechanical thrust restraint beginning at the hydrant valve as required in the Technical Specifications or as directed by the Engineer;

7. Furnish and installing polyethylene encasement for all underground pipe and fittings;

8. Furnish and install hydrant in the plumb position with 4.5'clearance in the back and 7' clearance in the front and on each side from walls, poles and obstructions;

9. Furnishing and installing a concrete thrust collar around the barrel of the hydrant and 12" below grade as shown in standard detail 4.01;

10. Furnishing and installing of a concrete "support block" under each hydrant;

11. Furnishing and installing of a concrete support cradle under each hydrant tee on PVC mains;

12. Backfilling and compacting hydrant assembly trench;

13. Furnish high grade enamel OSHA yellow paint and paint hydrant barrel as required in the Technical Specifications;

14. Furnishing high grade enamel OSHA green paint and paint the hydrant bonnet;

15. Furnishing and installing one blue, reflective pavement marker (RPM) in the street adjacent to the hydrant at a location to be determined by the Engineer. The RPM shall meet or exceed all provisions of the Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, Section 706;

16. Pressure testing the hydrant assembly in conformance with these documents;

17. Backfilling and compacting the trench;

18. Cleaning up and restoring the job site which shall include re-grading the terrain;

19. Removing and legally disposing of all waste materials.

The Contractor shall do all things necessary to completely install a fire hydrant assembly in accordance with the Technical Specifications, Standard Details or as directed by the Engineer. Payment will be based on the number of hydrant assemblies incorporated into the pipeline system complete and working to the satisfaction of the Engineer. Payment for tees, valves, taps, fittings, and restoration will be made utilizing the appropriate contract bid item. Separate payment will be made for any 6-inch ductile iron pipe in excess of 10 feet connecting the hydrant gate valve to the hydrant.

In addition, it will be the Contractor's responsibility to determine the correct size (bury depth) of each hydrant installed so that the requirements of the Technical Specifications are satisfied. Any hydrant not installed to the proper grade shall be replaced with one of the correct size by the Contractor at his expense prior to final approval and acceptance.

Fittings required because of contractor convenience, (i.e. installed because the contractor elected to install a shallow bury hydrant) shall be furnished and installed at the contractor's expense.

Payment shall be made under:

Item No.	Description	Unit
5000	Furnish and install full std. fire hydrant assembly on new or existing mains	EA

C-5.20 FIRE HYDRANT (REMOVAL OF EXISTING)

The Contractor shall provide all labor, equipment, and material for removal and salvage of each existing fire hydrant assembly on an existing water pipeline. Hydrant removal and salvage includes, but may not be limited to:

1. Excavating the hydrant pit;

2. Furnish and install restraining devices anchoring the hydrant shut off valve to the pipeline tee;

3. Remove hydrant from hydrant lead;

4. Furnish & install thrust block (if required) behind cap or plug;

5. Remove hydrant protection post(s);

6. Backfilling and compacting the hydrant pit;

7. Cleaning up and restoring the job site which shall include re-grading the terrain;

8. Removing and legally disposing of all waste materials;

9. Transporting the removed hydrant without delay to the location designated by the Engineer or legally disposing the hydrant;

10. Unload the removed hydrant at the designated location.

Contractor shall be paid for each hydrant removed, salvaged, returned or disposed. All hydrants removed shall remain the property of the City unless otherwise directed by the Engineer. If the City opts not to remain the owner, the Contractor shall remove and properly dispose of the hydrant at his expense. The installation of the plug or cap and thrust block if required shall be paid for using the appropriate bid item.

Payment shall be made under:

Item No.	Description	Unit
5200	Remove and salvage hydrant	EA

C-6.00 VALVES

The Contractor shall provide all labor, equipment and materials to completely furnish and install 2-inch through 16-inch gate valves, 16-inch through 48-inch plug valves and 4-inch through 42-inch tapping valves including all accessories and incidentals. The valve installation shall include, but may not be limited to:

1. Excavating the trench;

2. Maintaining the trench that shall include dewatering and bracing and sheeting where required or as directed by the Engineer;

3. Furnish and install a gate valve in a mainline of DIP, CIP or PVCP with a valve box or a tapping valve on a tapping sleeve with a valve box;

4. Furnish and install a gate valve on HDPEP along with all associated HDPE mechanical joint adapters and appurtenances;

5. Backfilling and compacting the trench;

6. Furnishing, forming and pouring a 6-inch thick concrete pad around each valve box installed in non-paved areas;

7. Furnishing paint and painting valve cover;

8. Furnishing and installing or forming and pouring concrete support blocks under valves installed on PVC and HDPE pipeline;

9. Cleaning up and restoring the job site which shall include re-grading the terrain;

10. Removing and legally disposing of all waste materials.

Payment shall be made for the number of each size valve and valve box installed and incorporated into the piping system complete, working and operating to the satisfaction of the Engineer.

Payment shall be made under:

Item No.	Description	Unit
6001	Furnish and install 4" gate or tapping valve and box on DIP, CIP or PVCP	EA
6002	Furnish and install 6" gate or tapping valve and box on DIP, CIP or PVCP	EA
6003	Furnish and install 8" gate or tapping valve and box on DIP, CIP or PVCP	EA
6004	Furnish and install 12" gate or tapping valve and box on DIP or CIP	EA
6005	Furnish and install 16" gate or tapping valve and box on DIP or CIP	EA
6006	Furnish and install 16" plug valve and box on DIP or CIP	EA

C-6.10 **LINE STOPS**

The Contractor shall furnish all labor, equipment, tools and materials to install line stops on existing water mains.

The line stop installation shall include but is not limited to:

1. Excavating the trench;

2. Maintaining the trench that shall include dewatering and bracing and sheeting where required or as directed by the Engineer;

3. Furnishing and installing the line stop;

4. Furnishing and installing polywrap on line stop appurtenances remaining on the pipe after the line stop is removed;

5. Furnishing and installing reverse dead-man restraint with split wedge action restraints as shown in Standard 2.10A.

6. Compacting soil in trench around dead-man and line stop to a minimum 90% modified proctor density;

7. Excavating the trench to remove line stop;

8. Backfilling and compacting the trench;

9. Cleaning up and restoring the job site which shall include re-grading the terrain; and

10. Removing and legally disposing of all waste materials.

Payment shall be made under:

Item No.	Description	Unit
6102	F&I 6” Line Stop on Existing Water Main (0’-5’)	EA

Payment for reverse dead-man restraints shall be paid for under the appropriate items for split wedge action restraints and poured concrete thrust blocking. Restoration items shall be paid for under the appropriate item as needed.

C-7.00 TAPS

The Contractor shall provide all labor and equipment for installing tapping sleeves and making the appropriate full port tap complete and operable. The tapping sleeve installation shall include:

1. Excavating the trench;
2. Maintaining the trench that shall include dewatering and bracing and sheeting where required or as directed by the Engineer;
3. Furnishing and installing the tapping sleeve;
4. Pressure testing the tapping sleeve and valve;
5. Making the full port tap, up to and including 42";
6. Furnishing and installing mechanical joint tapping sleeves for size on size pipe taps or as directed by the engineer;
7. Furnishing, installing and sealing the tapping sleeve with blue polyethylene encasement of not less than 8 mils thick;
8. Backfilling and compacting the trench;
9. Cleaning up and restoring the job site which shall include re-grading the terrain;
10. Removing and legally disposing of all waste materials.

Payment shall be based on the number and size of tapping sleeves installed and incorporated into the piping system complete, working and operating to the satisfaction of the Engineer. Valves and valve boxes shall be paid for by the appropriate pay item.

Payment shall be made under:

Item No.	Description	Unit
7001	Furnish and install 6" tapping sleeve and tap	EA
7002	Furnish and install 8" tapping sleeve and tap	EA
7004	Furnish and install 16" tapping sleeve and tap	EA

C-8.10 METERED SERVICES TWO-INCH & LESS WITH PIPE WORK

The Contractor shall provide all labor, materials and equipment for the installation and/or transfer of 3/4" (single or dual service), 1", 1½", and 2" meters and 2" double detector check valves, as specified, and issued in conjunction with a pipeline project.

Meter service lengths (as described in the pay items) are defined as follows:

- 0-15' service line required from main to meter is up to 15' long
- +15-80' service line required is greater than 15', up to and including 80'
- +80-150' service line required is greater than 80', up to and including 150'

All water meters and double detector check valve assemblies will be furnished by the.

Meter service installation shall include, but may not be limited to:

1. Excavating and maintaining the trench;
2. Making the appropriate size tap;
3. When directed by the Engineer or as indicated in the standard details, furnish and install an appropriately sized steel, PVC or HDPE sleeve under paved areas for long-side meter service by open cut, horizontal directional drilling/directional bore or "moling" as directed by the Engineer or as indicated in the standard details;
4. For use on DIP, CIP or PVC, furnish and install the appropriate size and type of corporation stop, high density polyethylene, PVC pipe, any required service fittings, curb stop, meter box, and tail piece extension as designated by the Tampa Water Department's Technical Specifications. For use on HDPE pipe, furnish and install the appropriate size and type of electrofusion tapping tee or electrofusion corporation, HDPE tubing or pipe, any required service fittings, curb stop, meter box and tail piece extension as designated by the Tampa Water Department's Technical Specifications;
5. On all long-side HDPE service lines, furnishing and installing, two continuous 12 gauge wires along the top of the pipe, inside the sleeve. There shall be no dead ends and each locator wire shall be routed from the corporation to the meter box. Connections between wire ends shall be made using an approved connections at each end as shown in the standard details;
6. Installation of the appropriate sized, furnished, meter or transferring an existing meter to the new service line;
7. Relocating existing meters and/or adjusting existing meters to grade;
8. Backfilling and compacting of all excavations;
9. Clean-up and return the job site to its original condition which includes but is not limited to restoring the elevation of surface to its original grade;
10. Removing and legally disposing of all waste materials.

Payment shall be made for each meter service furnished and installed, and accepted by the Engineer. Any restoration required shall be compensated in accordance with the restoration pay items in the Contract.

Payment shall be made under:

Item No.	Description for Services on PVCP, DIP, OR CIP	Unit
8100	Furnish, tap, & install 3/4" or 1" meter service (0-15', HDPE)	EA
8101	Furnish, tap, & install 3/4" meter service (+15-80', HDPE)	EA

C-9.20 PAVEMENT AND MOT

The Contractor shall provide all labor, equipment and materials to remove and restore pavement and pavement bases that were cut and removed during the course of the pipeline construction. Pavement and pavement base restoration shall include roadways, driveways, parking lots, etc. Under this section, payment shall be made for:

1. Furnishing, placing, grading, and compacting approved lime rock base;
2. Furnishing, placing, grading, and compacting approved crushed concrete base;
3. Furnishing, placing, grading, and compacting approved asphalt base course, ABC-3 or Superpave Type B-12.5;
4. Furnishing, placing, grading and compacting approved "Type S-1"or "Superpave Type SP-12.5" asphaltic concrete surface course;
5. Furnishing, placing, grading and compacting to full depth approved "Type S-1" or "Superpave Type SP-12.5" asphaltic concrete surface course;
6. Restoring 6" thick concrete driveway;
7. Furnishing and installing brick pavement;
8. Installing brick pavement;
9. Furnishing and installing Thermo Striping;
10. Furnishing, placing, and grading Type S-III or Superpave "Type SP-9.5" asphaltic concrete overlay;
11. Mechanical milling of 1-inch of existing asphalt including proper disposal of the milled material;
12. Mobilization required for mechanical milling operations;
13. Furnishing and installing traffic loops as specified and directed by the Engineer;
14. Furnishing and installing signalization loops as specified and directed by the Engineer;
15. Furnishing Traffic Control Officer (Off-Duty Law Enforcement);
16. Furnishing and installing work zone signs;

17. Furnishing and installing traffic control devices to right-of-way permit requirements;

18. Removing, transporting and disposing of pavement, concrete curb, asphaltic curb and other items removed during construction;

19. Cleaning up and restoring the job site which shall include re-grading the terrain;

20. Removing and legally disposing of all waste materials.

All surface restoration shall be as directed by the Engineer or the regulatory agency having jurisdiction over the roadway. All areas requiring pavement restoration shall be saw cut prior to construction pavement removal. The costs to mechanically saw cut pavement joints are considered incidental to pavement restoration and should be included in the cost.

Asphalt shall be measured for payment based the number of tons of asphalt furnished and installed. All pavement, concrete curb, asphaltic concrete curb or other items removed during the course of pipeline construction shall be disposed of by the Contractor in a manner satisfactory to the Department. The cost of removal and disposal associated with all items shall be included in the assigned restoration item.

City street pavement shall be in accordance with of Tampa's PAVEMENT/RIGHT OF WAY RESTORATI REQUIREMENTS – REV-2009 guidelines. See Technical specification T4.07.

Bricks shall be replaced in accordance with the of Tampa's Vitrified Brick Replacement (Revised 4/27/2009 guidelines. See Technical Specifications T4.08.

Mobilization shall only be paid for milling operations and shall only be paid once per job site unless otherwise approved in advance by the Engineer. Milling shall be made in thickness increments of one inch and shall include proper disposal of the milled material.

The Contractor shall furnish all labor, materials and equipment, necessary to replace and maintain complete the traffic signalization loops as specified and directed by the Engineer. The work includes all saw-cutting of pavement, placement of loop wires and lead-in cables, non-metallic wire hold downs, wire identification tags and sealants, splicing and termination strips, testing and all other work incidental to the installation of a signalization loop complete in place. All signalization loops shall conform to the requirements of the latest edition of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. Payment for traffic signalization loops will be made at the appropriate contract item unit price per signalization loop installed.

The Contractor shall be compensated for any thermoplastic striping required based on the striping sub-contractor's invoice for work done for a given work order, plus 10% OH&P.

The Contractor shall be compensated for any maintenance of traffic required for a given work order based on the MOT sub-contractor's invoice for a given work order (corroborated by count records the Contractor shall provide to the Engineer daily) plus 10% OH&P.

Asphalt restoration quantities shall be paid per square-yard per inch.

Payment shall be made under:

Item No.	Description	Unit
9200	Furnish, place, and compact lime rock base	CY

9205	Furnish and install asphalt concrete surface Superpave Type SP-12.5	SY-IN
9207	Furnish, place and grade Superpave Type SP-9.5 asphaltic concrete overlay	SY-IN
9208	Mobilization to perform milling operations	EA
9209	Mechanical milling of asphalt roadways in 1-inch increments	SY-IN

C-9.30 ROADSIDE RESTORATION

The Contractor shall provide for all labor, equipment and materials to restore the roadside areas disturbed during the course of the pipeline construction. Under this section, payment shall be made for:

1. Restoring typical concrete curb and gutter including stabilization of sub-base and installation of curb pads;

2. Restoring stone or pre-cast curb;

3. Furnishing and placing asphaltic concrete curb;

4. Remove and restoring 4-inch thick concrete sidewalk, including applicable sidewalk ramps;

5. Restoring concrete hexagon block sidewalk;

6. Restoring the roadside areas with approved sod. Restoring the roadside area and ditch bottoms and sides with sod shall include furnishing, grading, and placing the sod;

7. Restoring the roadside areas with approved sprig and seed. Restoring the roadside area with sprig and seed shall include furnishing, grading, placing, fertilizing, mulching, sprigging and seeding.

8. Furnishing and installing detectable warnings walking surfaces as directed by Engineer. The detectable warning surface will conform to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, current edition. The detectable warnings shall be installed in conformance with FDOT Standard Indexes 304 and 310 or in conformance with the requirements of the right-of-way regulatory agency with responsibility of the affected right-of-way. (Payment for curb and sidewalk associated with pedestrian access ramps will be made under the appropriate sidewalk and curb pay items.)

9. Cleaning up and restoring the job site which shall include re-grading the terrain;

10. Removing and legally disposing of all waste materials.

Sidewalk and curb replacement pay quantities shall have maximum limits as specified in these documents, as shown the plans or as directed by the Engineer. All linear foot units shall be measured along the curb line. In all cases, the sod or seed placed is to conform in kind to the existing at the particular location.

Permanent fence agreed to be removed or disturbed for water or stormwater main construction shall be replaced in-kind, to match existing, subsequent to construction. Fence restoration shall be coordinated with the property owner and the City, and shall be to the satisfaction of the Engineer. Compensation for permanent fence restoration shall be based on the fencing sub-contractor’s invoice plus 15% OH&P; or if restoration is executed by Contractor, in accordance with Specific Provision 4.05.

Payment shall be made under:

Item No.	Description	Unit
9300	Furnish and install Type “D” concrete curb	LF
9307	Furnish and install 4" thick concrete sidewalk	SY
9309	Grade and sod roadside, ditch bottoms and sides - Bahia	SY
9310	Grade and sod roadside, ditch bottoms and sides – St. Augustine	SY

C-9.40 GROUTING ABANDONED PIPE

The Contractor shall provide all labor and material necessary to grout abandoned pipes in place including but not limited to taps, caps, plugs, pipes, valves and fittings necessary to complete the work in a manner acceptable to the Engineer. Under this section, payment shall be made for:

1. Excavating the trench;
2. Maintain the trench;
3. Furnishing and installing the appropriate fittings necessary to inject and blow-off the grout in a manner acceptable to the Engineer;
4. Completely filling the designated pipe with an approved grout material;
5. Removing injection and blow-off pipes and fitting and plugging tapped plugs and caps;
6. Removing excess concrete from the trench;
7. Backfilling and compacting the trench.
8. Cleaning up and restoring the job site which shall include re-grading the terrain;
9. Removing and legally disposing of all waste materials.

Restoration shall be paid separately under the appropriate pay item.

Payment shall be made under:

Item No.	Description	Unit
9400	Grout abandoned pipe	CY

C-9.50 INCIDENTALS

The Contractor shall provide all labor, equipment and material for reinforced concrete construction and repairs, replacement of various sizes of vitrified clay sanitary sewer pipes, and repair of sanitary laterals hit but that were improperly marked

("improperly", as defined in the SSOCOF "Damage Prevention Guide" and Chapter 556, F.S. See Specific Provision S-20.01.).

Reinforced concrete construction can include concrete pads, concrete vault walls, ditch pavement, headwalls, manholes, inlets, shocks pads, concrete "dead-man" restraints, etc.

The Contractor shall provide all labor, equipment and materials for professional quality video photography documentation of the preconstruction site condition along the proposed pipeline route.

Under this section, payment shall be made for:

1. Furnishing, forming and placing 3,000 psi concrete with reinforcement as required;

2. Furnishing and replacement of standard sand cement rip-rap in reinforced cloth or paper bags;

3. Restoring sanitary sewer service lines (laterals) by furnishing and installing the necessary C-900, DR 18 green PVC pipe and flexible couplings, in accordance with City Wastewater Department requirements <Pay Item No. 9504>;

4. Replace or restore 4", 6", 8" or 10" vitrified clay sanitary sewer pipes (sewer main lines - not laterals) found parallel with and too close to proposed water mains to avoid being compromised by the water construction, with C-900, DR 18 green PVC pipe and flexible couplings, in accordance with City Wastewater Department requirements <Pay Item No. 9502 and 9503>

5. Furnishing professional quality video photography of pre-construction site conditions along proposed pipeline route as specified in these contract documents and as required.

6. Backfilling and compacting the excavation;

7. Cleaning up and restoring the job site which shall include re-grading the terrain;

8. Removing and legally disposing of all waste materials.

Payment shall be made under:

Item No.	Description	Unit
9500	Furnish, form, place reinforced concrete	CY
9505	Furnish video photography	LF

C-9.91 VALVE BOX, VAULT & MANHOLE ADJUSTMENT OR REMOVAL

The Contractor shall provide all labor, equipment, and materials to remove, replace, and/or adjust valve boxes, vaults or manholes. Valve box, vaults, and manhole adjustment shall include, but may not be limited to:

1. Excavating existing valve box, vault or manhole.

2. Determining if existing material is reusable, if not, provide new Water Department approved material;

3. Furnishing and installing the appropriate cast iron riser for valve boxes and manholes;

4. Constructing any traffic bearing structure required to make the adjustment;

5. Setting the valve box, vault or manhole top flush to proposed grade or as directed by the Engineer;

6. Backfilling and compacting the excavation;

7. Cleaning up and restoring the job site which shall include re-grading the terrain;

8. Removal and disposal of all waste materials.

The valve box, vault or manhole adjustment shall be paid for per each valve box, vault or manhole adjusted and backfilled to meet future grades or as directed by the Engineer. Conditions of the adjustments to vaults and manholes shall be based the location of the vault whether traffic bearing or not.

Payment shall be made under:

Item No.	Description	Unit
9910	Valve Box Adjustment or Removal	EA

C-9.95 PROJECT SIGN

Project signs shall be furnished for each project as directed by the engineer. The Contractor shall furnish and install a project sign which conforms to the Standard Detail at a location directed by the Engineer at least five (5) working days in advance of the start of construction. The will provide the neighborhood decal. The unit price will include the cost of all labor, equipment and materials to furnish and install a new sign or to re-letter and install a sign previously used elsewhere under this contract. The re-lettering shall involve the project description, total cost, scheduled completion date and supplemental project description. In either case, the price shall also include the cost to remove and properly store or dispose of the sign after the work has been completed and accepted by the Engineer. The area which the sign was placed shall be restored to original condition. This restoration shall be included in the cost of the sign.

The Contractor will furnish and install a new sign for each project or shall re-letter and install a sign used a previous project.

Payment shall be made under:

Item No.	Description	Unit
9950	Furnish and install a new sign as directed by the Engineer	EA

C-9.97 AS-BUILT SURVEY

The as-built survey shall be submitted by the Contractor to the Engineer. Payment shall include all labor, tools, materials, and equipment to complete the as-built survey in accordance with S-40.01.

Payment will be based on linear footage, as measured along the centerline of the installed pipeline.

Payment shall be made under:

Item No.	Description	Unit
9970	As-Built Survey Installed Pipeline	LF

C-9.98 CONTIGENCY ALLOWANCE

The contingency allowance shall be used by the City of Tampa as directed by the Engineer. Payment shall be made as a lump sum to pay for furnishing and installing items not listed in the Contract. Contractor shall provide an invoice listing the items and quantities along with the lump sum price. The Engineer may request a cost estimate for a contingency item from the Contractor prior to construction.

Payment shall be made under:

Item No.	Description	Unit
9980	Contingency Allowance	LS

C-10.00 MOBILIZATION/DEMOBILIZATION

The Contractor shall furnish all equipment, labor, and materials necessary to mobilize his forces as necessary to perform all the work under this Contract. Work under this section includes permits, bonding and insurance; construction stakeout and as-built documentation; transportation, and otherwise movement of all personnel, equipment, supplies, materials and incidentals to and from the project site; establishment of temporary offices, buildings, safety equipment and first aid supplies, sanitary and other facilities; and all other preconstruction expense necessary for the start of the work, excluding the cost of construction materials, to be constructed under this Contract as shown on the Plans and directed by the Engineer.

Payment for mobilization/demobilization will be made at the appropriate Contract Lump Sum Price and based on an incremental basis such that:

a) Payment of 45% of the applicable lump sum price shall be made for the preparatory work and operations in mobilizing for the beginning work on the project.

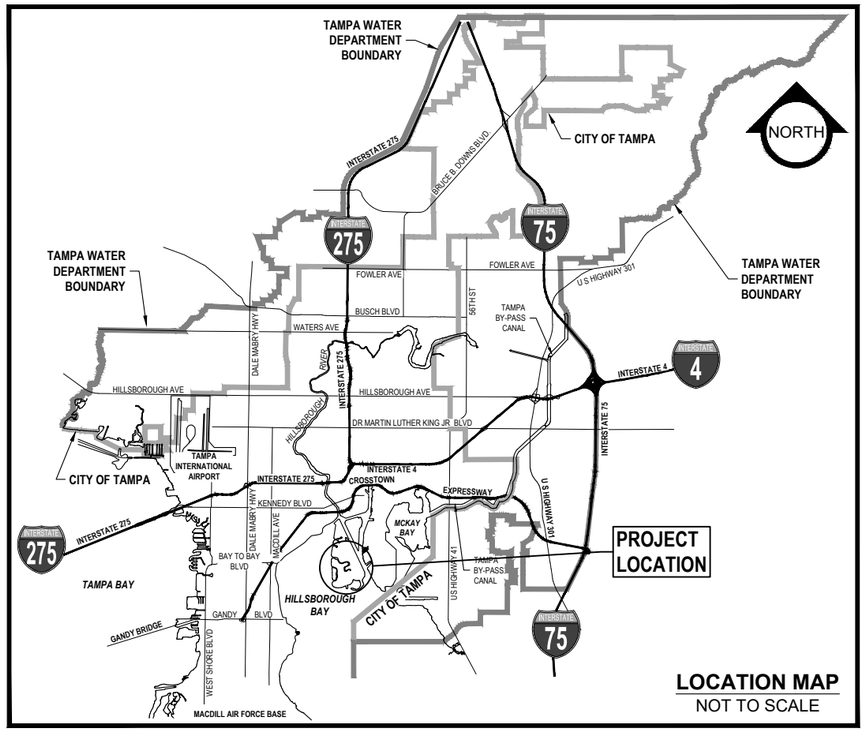
b) Payment of the remaining 55% shall be made for finalization of the project, including demobilization, contract closeout documents, removal of field office, and final site clean-up. Retainage requirements as stated in the General Conditions shall apply to this pay item.

Payment for mobilization/demobilization will be made on an incremental basis in accordance with the following:

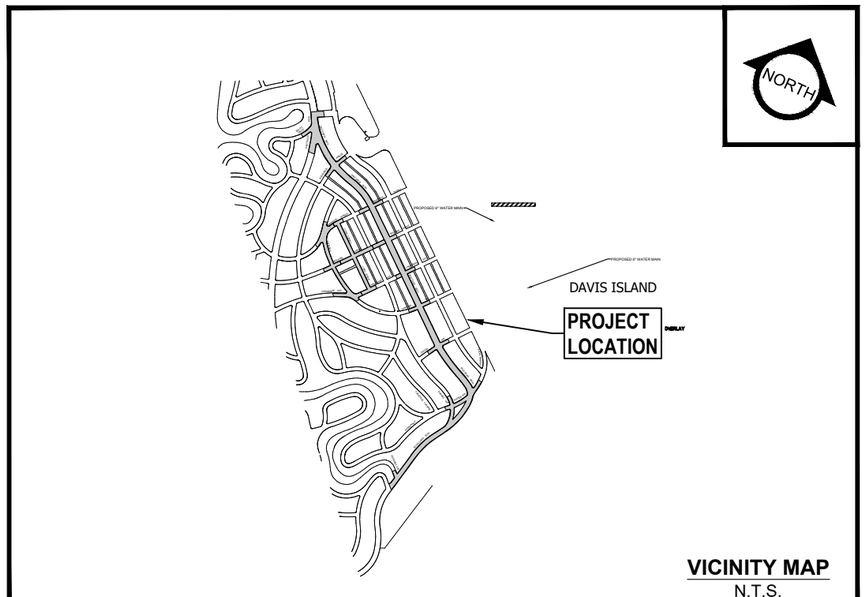
Percent of Original Contract Amount Earned :		5	10	25	100
Allowable Percent of the Lump Sum Price for the Item:	25	50	75	100	

Payment shall be made under:

Item No.	Description	Unit
10000	Mobilization/Demobilization	LS



LOCATION MAP
NOT TO SCALE



VICINITY MAP
N.T.S.

© GOOGLE

City of Tampa Florida

Water Department

PLANS FOR:

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

TAMPA WATER DEPARTMENT
WORK ORDER NO. :

WTR-18-0001

INDEX

	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES, SPECIFIC NOTES & LEGEND
3	KEY SHEET
4-23	PLAN AND PROFILE SHEETS
24-31	DETAILS

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

RORY A. JONES LICENSE No. 79453 STATE OF FLORIDA PROFESSIONAL ENGINEER

PERMITS			
■ CITY	☐ COUNTY	☐ STATE	■ DEP
CONTRACTOR: DALLAS 1			

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

COVER SHEET

City of Tampa Florida Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 01 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg, Jan 09, 2020 - 7:11am

CITY OF TAMPA NOTES

GENERAL

1. ALL WATER WORK FOR THE CITY OF TAMPA (CITY) SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT'S TECHNICAL SPECIFICATIONS, CONSTRUCTION DETAILS, AND THE TAMPA WATER DEPARTMENT TECHNICAL MANUAL (LATEST EDITION). IN THE EVENT OF A DISCREPANCY, THE MOST STRINGENT CRITERIA SHALL APPLY.
2. THE CONTRACTOR SHALL NOT TAP ANY WATER MAIN WITHOUT A CITY INSPECTOR PRESENT. THE CONTRACTOR SHALL PROVIDE NOTICE TO THE CITY INSPECTOR AT A MINIMUM OF 5 WORKING DAYS PRIOR TO NECESSARY WORK AND COORDINATE PERFORMANCE OF TAP WITH THE CITY INSPECTOR.
3. NORMAL WORKING HOURS SHALL BE WEEKDAYS FROM 7:30 AM TO 4:00 PM UNLESS OTHERWISE APPROVED BY THE ENGINEER/ INSPECTOR.
4. ELEVATION INFORMATION SHOWN ON THESE PLANS IS REFERENCED TO N.A.V.D. 1988 UNLESS OTHERWISE STATED.
5. CONSTRUCTION OF WATER FACILITIES SHALL BE COORDINATED WITH THE WATER DEPARTMENT PRIOR TO THE START OF THE CONSTRUCTION. CONTRACTOR TO CONTACT CITY OF TAMPA CONTRACT ADMINISTRATION DEPARTMENT @ 813-635-3432 TO COORDINATE/SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE CITY FOR REVIEW OF INSTALLATION TECHNIQUES AND PROCEDURES A MINIMUM OF 10 WORKING DAYS PRIOR TO THE PLANNED CONSTRUCTION.
6. EXISTING UTILITIES, BUILDINGS, GROUND ELEVATIONS, AND OTHER FEATURES ARE SHOWN ACCORDING TO THE BEST INFORMATION AVAILABLE. ALL CONDITIONS, DIMENSIONS, AND QUANTITIES AFFECTING REQUIRED WORK SHALL BE VERIFIED BY CONTRACTOR BEFORE BEGINNING WORK OR ORDERING MATERIALS.
7. VALVES ON EXISTING PUBLIC WATER MAINS TO BE OPERATED BY CITY PERSONNEL ONLY.
8. ALL PROPOSED WATER LINES SHALL BE MANUFACTURED AND INSTALLED PER THE STANDARDS OF THE AMERICAN WATER WORKS ASSOCIATION (AWWA) AS PRESCRIBED BY FAC-62-555.320.
9. SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED BY THE CITY FOR ALL PROPOSED ITEMS. ALL SUBMITTALS AND SHOP DRAWINGS SHALL BE HIGH QUALITY PDF DOCUMENTS.
10. THE CONTRACTOR IS RESPONSIBLE FOR RESTRAINING ALL EXISTING PIPE NECESSARY TO MAINTAIN A SAFE CONSTRUCTION AREA AND PERFORM THE WORK SHOWN IN THE PLANS. EXISTING PIPE REQUIRING RESTRAINTS SHALL UTILIZE EXTERIOR BELL RESTRAINTS.
11. THE CONTRACTOR SHALL DEWATER ANY EXCAVATION OR TRENCH TO MAINTAIN A SAFE WORK ENVIRONMENT AND TO ABIDE BY AWWA INSTALLATION STANDARDS. DEWATERING IS AT THE EXPENSE OF THE CONTRACTOR.
12. REMOVAL AND RELOCATION OF ALL STREET OR TRAFFIC SIGNS SHALL BE APPROVED THROUGH THE TRAFFIC ENGINEERING DIVISION, DEPARTMENT OF PUBLIC WORKS, CITY OF TAMPA, AND HILLSBOROUGH COUNTY TRAFFIC, FLORIDA DEPARTMENT OF TRANSPORTATION, CITY OF TEMPLE TERRACE OR OTHER APPLICABLE PERMITTING AGENCY.

PERMITS

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY RIGHT-OF-WAY PERMITS AND ROADWAY CLOSURES ASSOCIATED WITH THE WORK SHOWN IN THE PLANS.
2. IN ORDER TO OBTAIN ROADWAY CLOSURES OR RIGHT-OF-WAY PERMITS, AT MINIMUM, THE CONTRACTOR MUST SUBMIT DETAILED MAINTENANCE OF TRAFFIC (MOT) PLANS ALONG WITH APPLICATIONS TO THE APPROPRIATE AGENCY. THE MOT(S) SHALL CONFORM TO APPLICABLE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) DRAWINGS (MOST CURRENT EDITION). THE GOVERNING AGENCIES MAY REQUIRE ADDITIONAL INFORMATION AND DICTATE SPECIFIC WORK TIME DURING NON-PEAK TRAFFIC HOURS.

PIPE CLEARANCES

1. ALL WATER MAINS SHALL HAVE A MINIMUM COVER OF 36 INCHES AND SHALL MAINTAIN A MINIMUM OF THREE (3) FEET HORIZONTAL SEPARATION FROM OTHER UTILITIES, EXCEPT STORM, SANITARY, AND GAS, WHICH SHALL MAINTAIN TEN (10) FEET HORIZONTAL SEPARATION, UNLESS OTHERWISE NOTED.
2. WATER MAIN SHALL CROSS ABOVE OTHER PIPES. WHEN WATER MUST BE BELOW, PROVIDE 12" MINIMUM VERTICAL SEPARATION UNLESS OTHERWISE NOTED.
3. CENTER ONE FULL JOINT OF PIPE UNDER/OVER ALL SANITARY, STORM, OR RECLAIMED PIPE CROSSINGS.

MATERIAL

1. ALL VALVES SHALL BE RIGHT HAND OPEN.
2. POLYWRAP ALL DUCTILE IRON PIPE (D.I.P) FITTINGS AND APPURTENANCES.
3. ALL HARDWARE SHALL BE 304 STAINLESS STEEL, UNLESS OTHERWISE NOTED.
4. ALL BELOW GROUND BENDS SHALL BE MECHANICAL JOINT (MJ).
5. RESTRAIN ALL JOINTS AND FITTINGS.
6. CONCRETE THRUST BLOCKS SHALL NOT BE USED TO PROVIDE THRUST RESTRAINT. RESTRAINT OF PUSH-ON DIP (OTHER THAN FOR FITTINGS & VALVES) SHALL BE WITH APPROVED PUSH-ON "GRIPPER-TYPE" RESTRAINTS. FITTINGS AND VALVES SHALL BE CONNECTED TO PIPE WITH MEGALUGS, OR APPROVED EQUAL.
7. ALL POTABLE WATER SERVICE LATERAL, AIR RELEASE VALVES, AND TEMPORARY SAMPLE POINTS SHALL BE CONSTRUCTED OF BLUE SDR-9 HIGH DENSITY POLYETHYLENE (HDPE) TUBING. ALL HDPE TUBING SHALL BE INSTALLED WITHIN A CASING AS DEFINED IN THE SPECIFICATIONS AND DETAILS.

TESTING

1. ALL COMPONENTS OF THE WATER SYSTEM, INCLUDING FITTINGS, HYDRANTS, CONNECTIONS, AND VALVES SHALL BE PROPERLY PRESSURE TESTED, WITNESSED AND ACCEPTED BY THE CITY. PRESSURE TESTS TO BE PERFORMED IN ACCORDANCE WITH WATER DEPARTMENT SPECIFICATIONS. CONTRACTOR TO NOTIFY THE ASSIGNED CITY INSPECTOR A MINIMUM OF THREE (3) WORKING DAYS IN ADVANCE OF PERFORMING TESTS. CONTRACTOR SHALL PRESSURE TEST WATER MAINS AT A MINIMUM OF 150 PSI FOR A PERIOD OF 2 HOURS IN ACCORDANCE WITH AWWA C600-87 STANDARDS. THE CONTRACTOR SHALL MAKE ALL NECESSARY APPLICATIONS AND ARRANGEMENTS.
2. ALL SAMPLE, PRESSURE TEST, AND CHLORINATION POINT PIPING SHALL BE COMPLETELY REMOVED PRIOR TO FINAL ACCEPTANCE. THE CORPORATION STOP SHALL BE CLOSED AND PLUGGED AT THE MAIN.
3. CONTRACTOR SHALL PERFORM CHLORINATION AND HIRE INDEPENDENT FIRMS TO CONDUCT BACTERIOLOGICAL TESTING AS DEFINED IN F.A.C. 62-555.340. CONTRACTOR TO SUPPLY THE CITY WITH AS-BUILTS AND SAMPLE RESULTS NECESSARY TO OBTAIN DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) CLEARANCES.

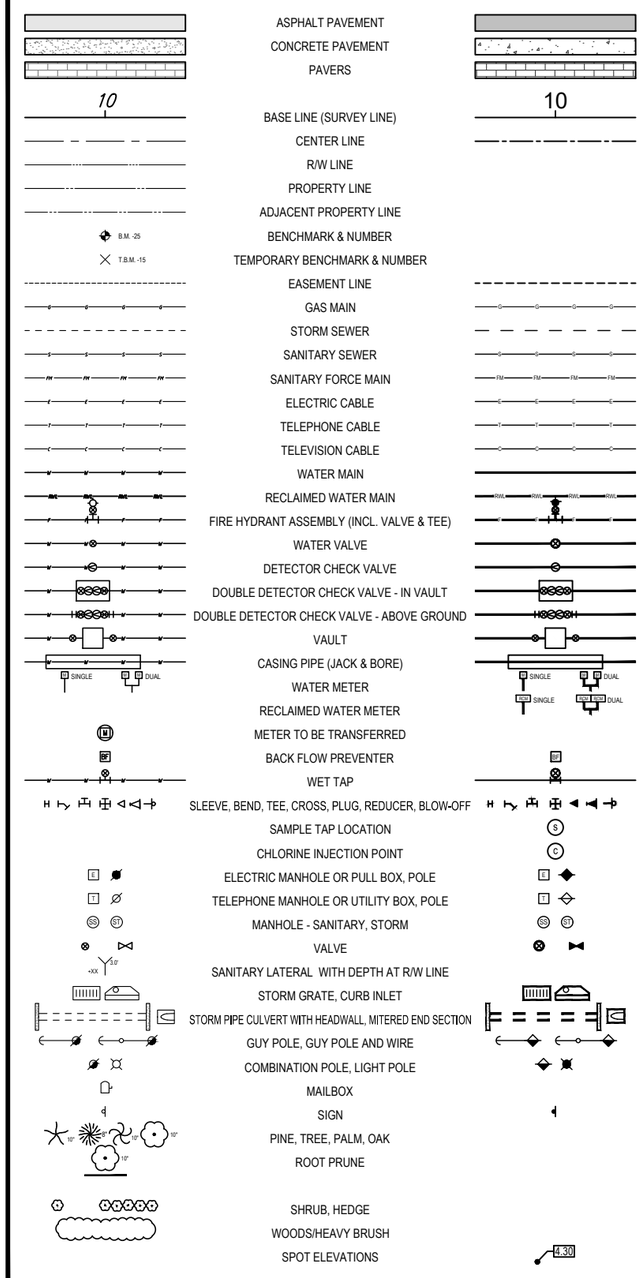
RESTORATION

1. ROADWAY RESTORATION SHALL BE IN CONFORMANCE WITH CORRESPONDING JURISDICTION'S LATEST STANDARDS.
2. DISTURBANCE TO ANY PROPERTY, PUBLIC OR PRIVATE, SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION.
3. THE CONTRACTOR SHALL RECONSTRUCT PAVEMENT ADJACENT TO THE GUTTERS AND AT STREET INTERSECTION TO OBTAIN SATISFACTORY DRAINAGE TO THE INLETS FROM THE INTERSECTING STREETS. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL DETERMINE THE FLOW OF WATER ALONG A STREET, DOCUMENT WHERE STANDING WATER IS PRESENT.

PROJECT SPECIFIC NOTES

1. ALL DIRECTIONAL DRILLING SHALL FOLLOW BEST PRACTICES AS OUTLINE IN THE 4TH EDITION OF NASTT'S HORIZONTAL DIRECTIONAL DRILLING (HDD) GOOD PRACTICES GUILDLINES.
2. CONTRACT SHALL COORDINATE WITH LOCAL BUSINESSES TO MINIMIZE OR ELIMINATE CINFLICTS OR DISRUPTIONS, WHICH MAY UNCLUDE BUT IS NOT LIMITED TO , WORKING DURIING NON-STANDARD HOURS OR EXPEDITING CONSTRUCTION/RESTORATION.

LEGEND



RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

GEN NOTES-LEGEND-KEY FIELD

City of Tampa Florida Water Department

100% PLANS

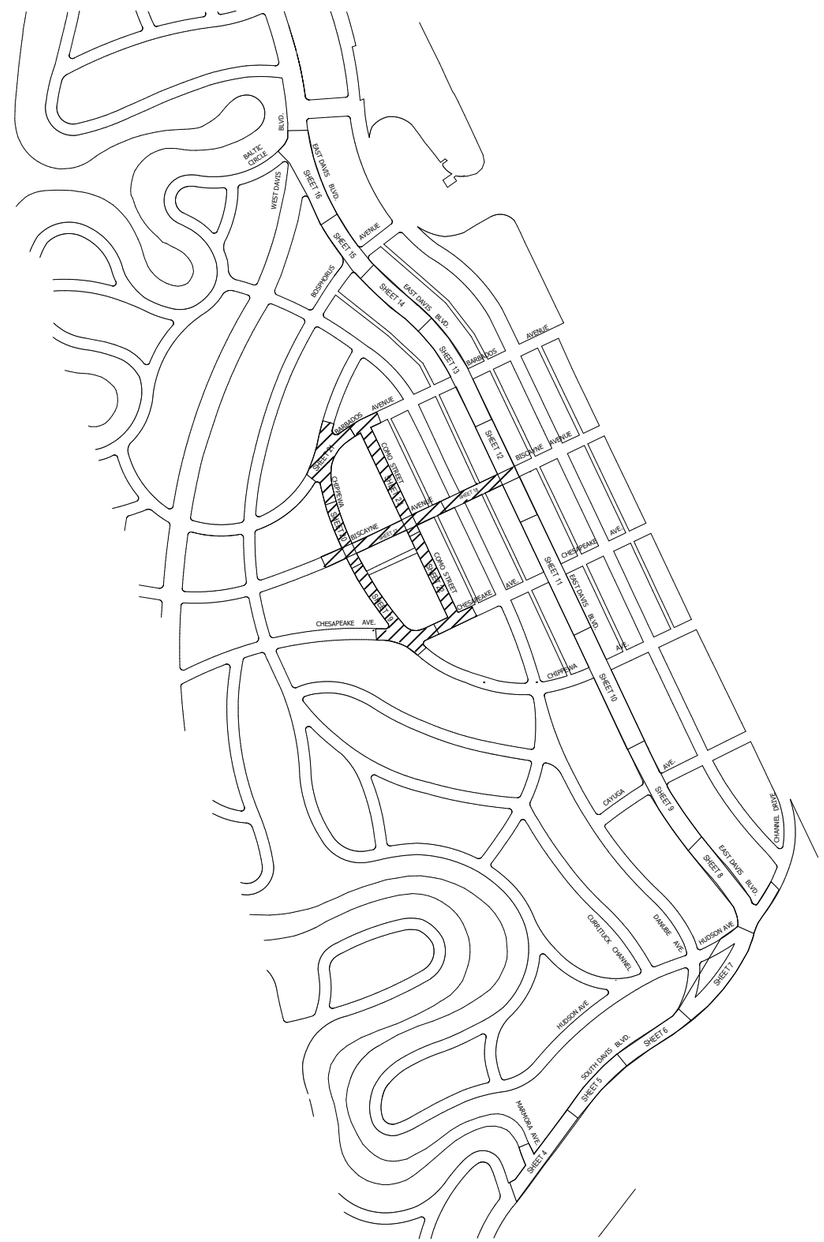
WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 02 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg Jan 09, 2020 - 7:12am

DAVIS ISLAND



NORTH

SEC.25-T29S-R18E

0 25' 50'

SCALE - HORIZONTAL

0 2.5' 5'

SCALE - HORIZONTAL

MILL & OVERLAY

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

KEY SHEET

City of Tampa Florida
Water Department

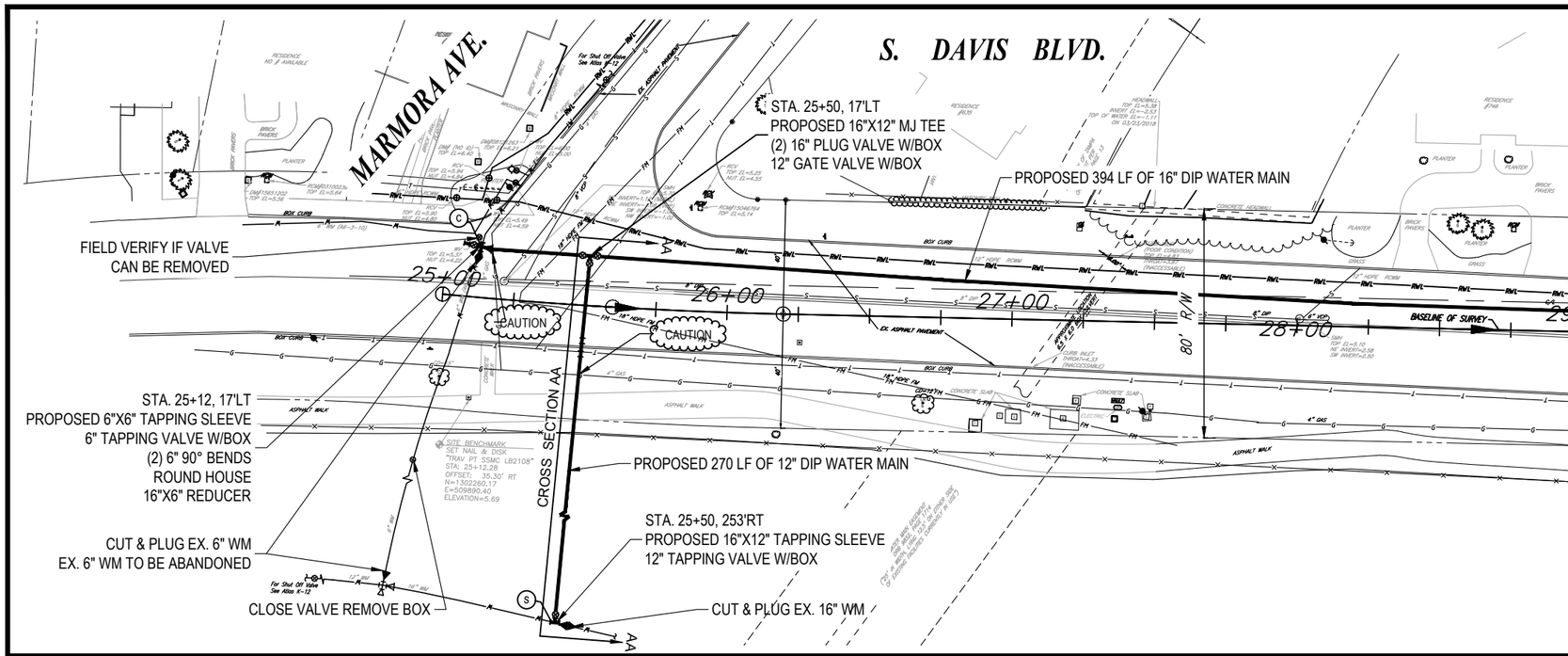
100% PLANS

WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 03 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg Jan 09, 2020 - 7:12am

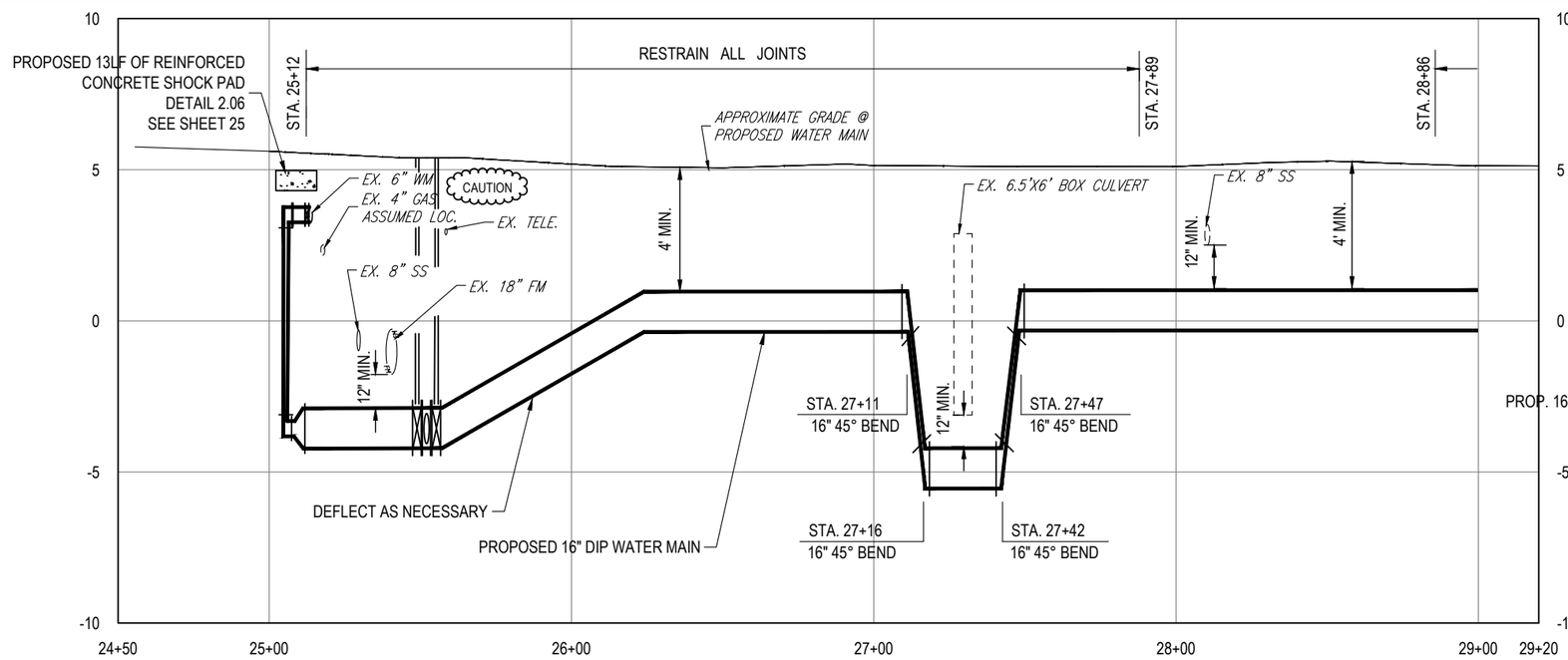


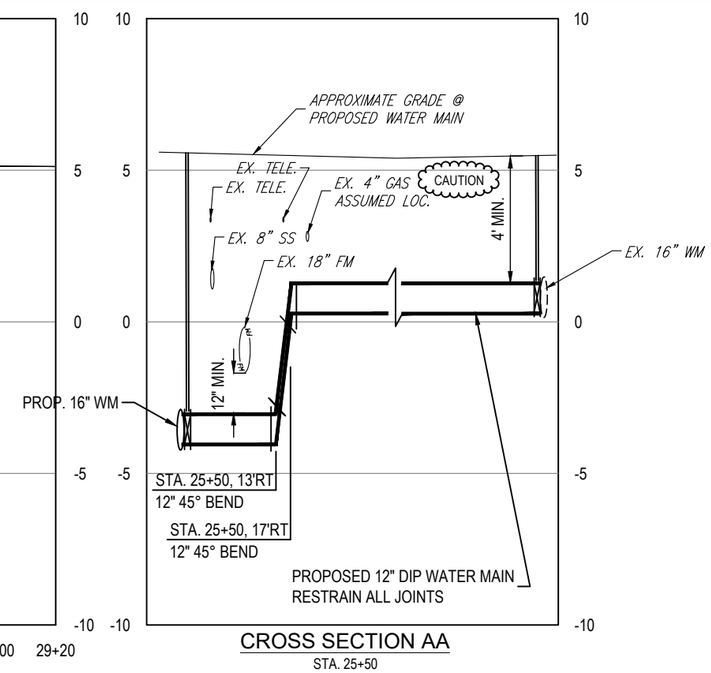
MATCHLINE - STA. 29+00
SEE SHEET 05

S25-T29S-R18E

0 25' 50'
SCALE - HORIZONTAL

0 2.5' 5'
SCALE - HORIZONTAL





CROSS SECTION AA
STA. 25+50

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

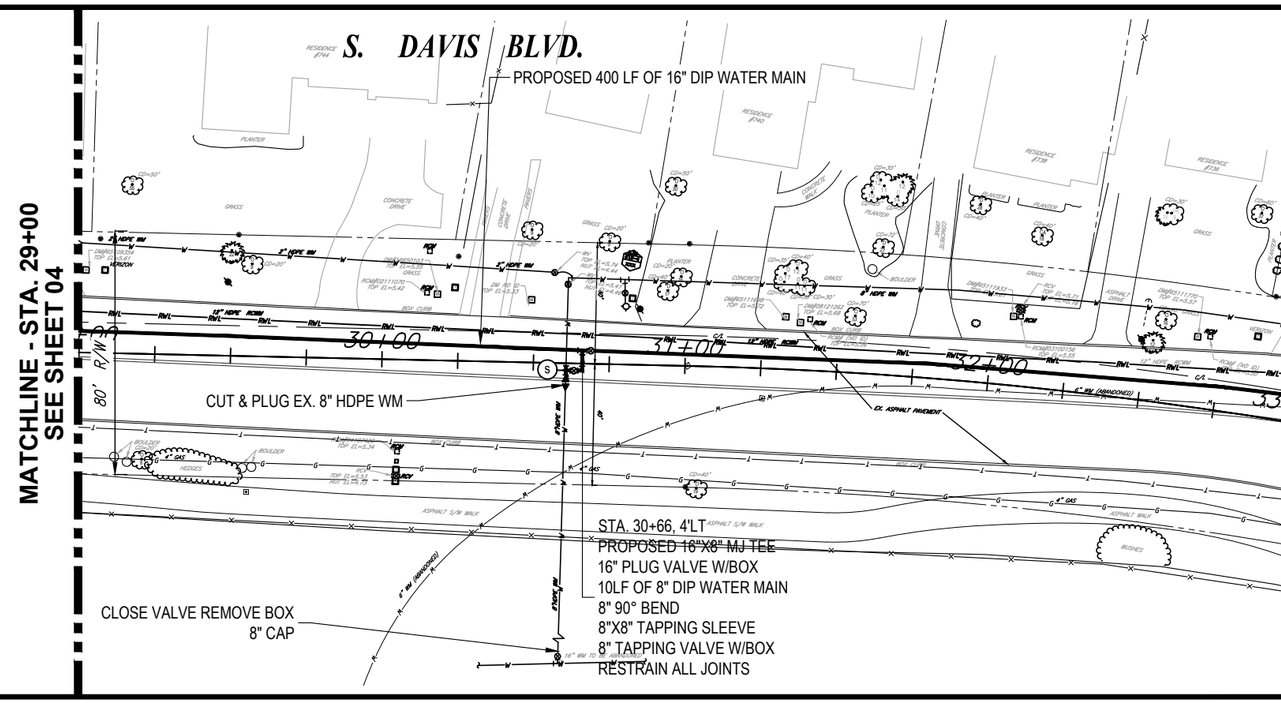
DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

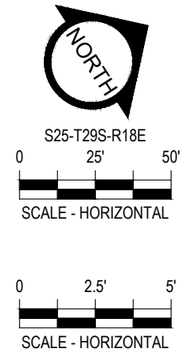
PLAN & PROFILE

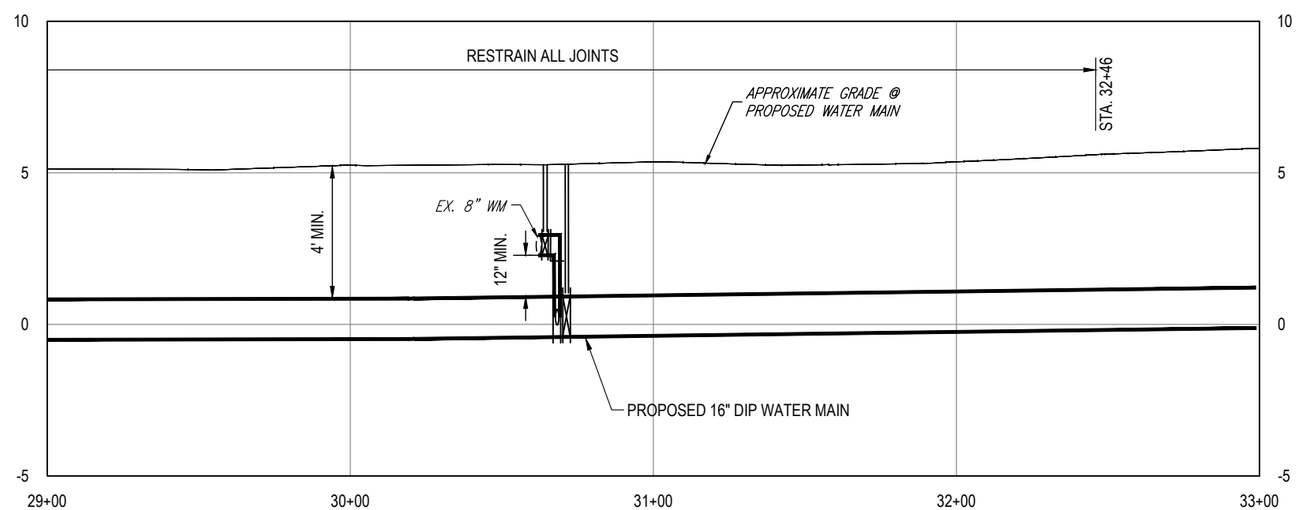
City of Tampa Florida
Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 04 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg, Jan 09, 2020 - 7:12am







RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

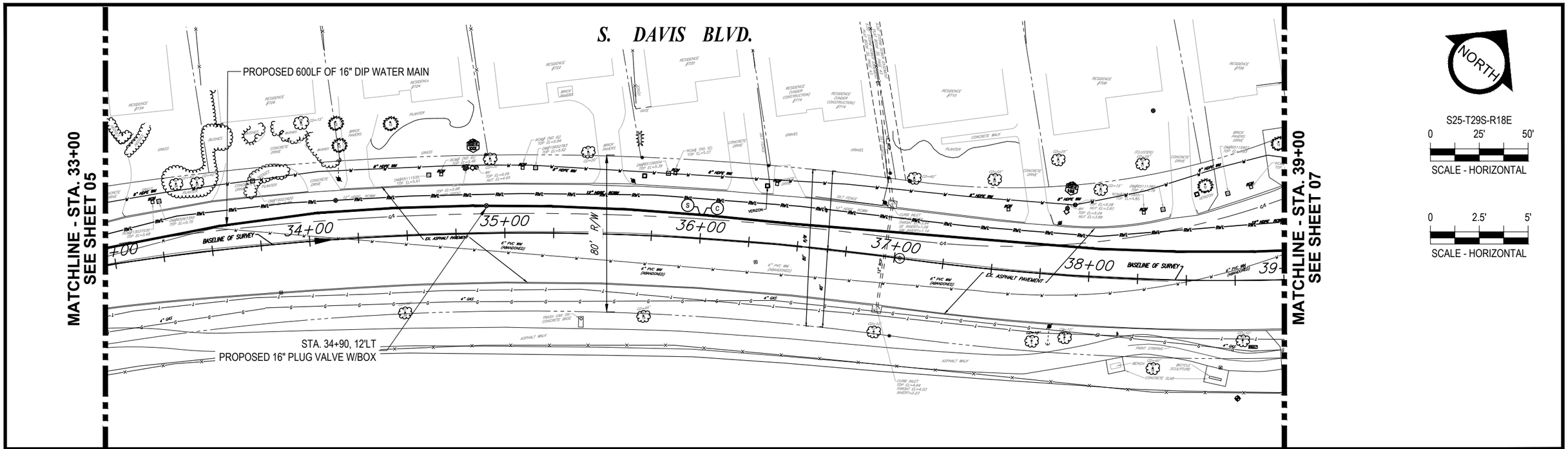
DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

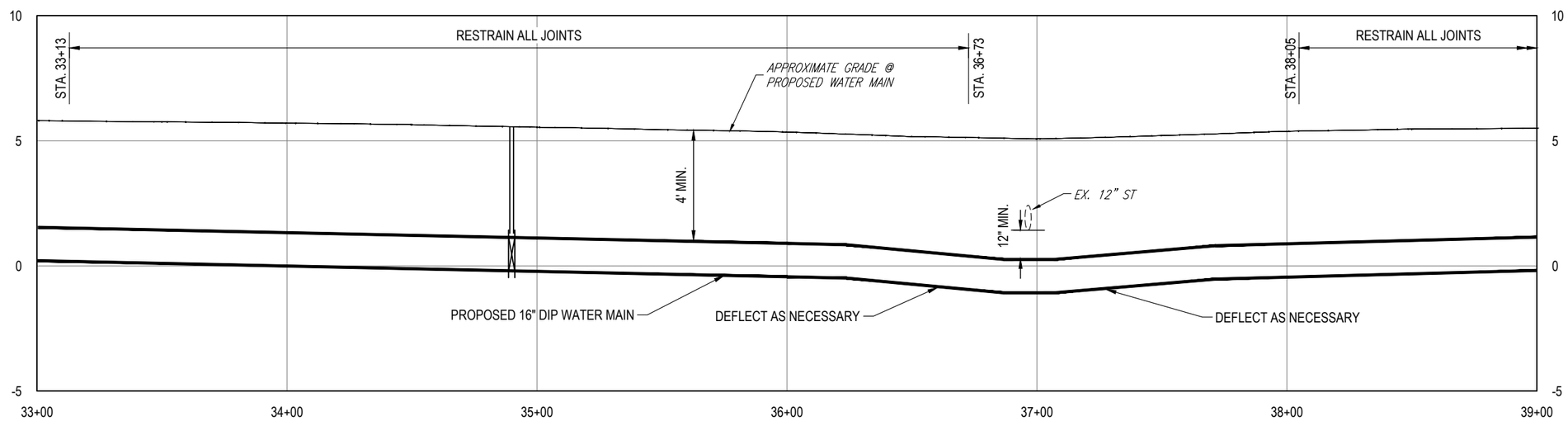
PLAN & PROFILE

City of Tampa Florida
Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 05 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg Jan 09, 2020 - 7:12am





RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

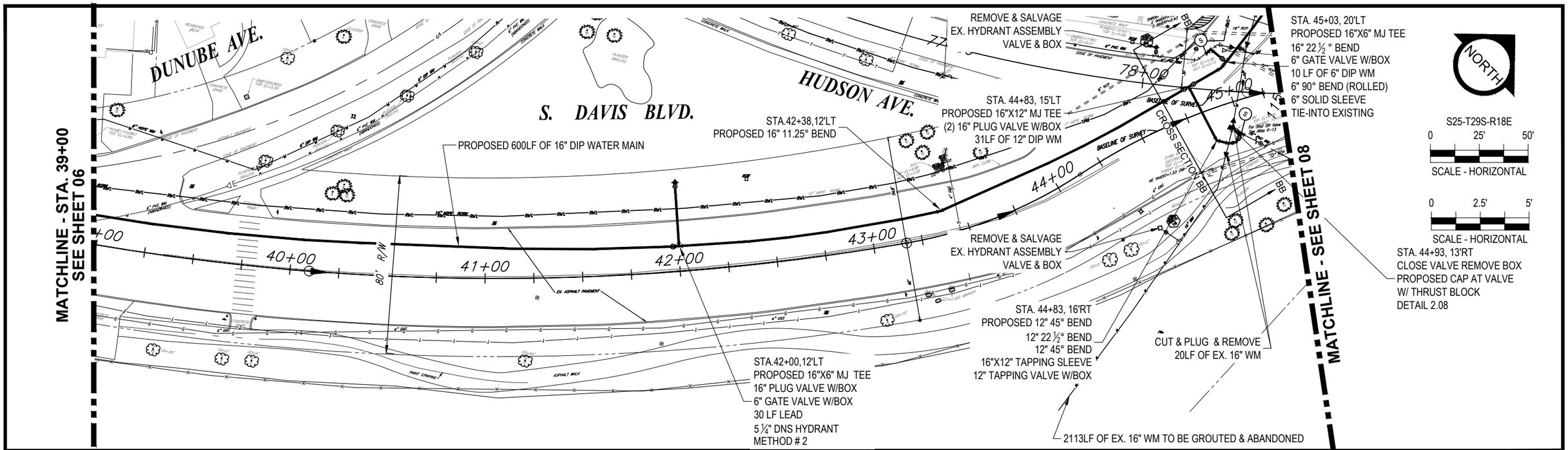
100% PLANS

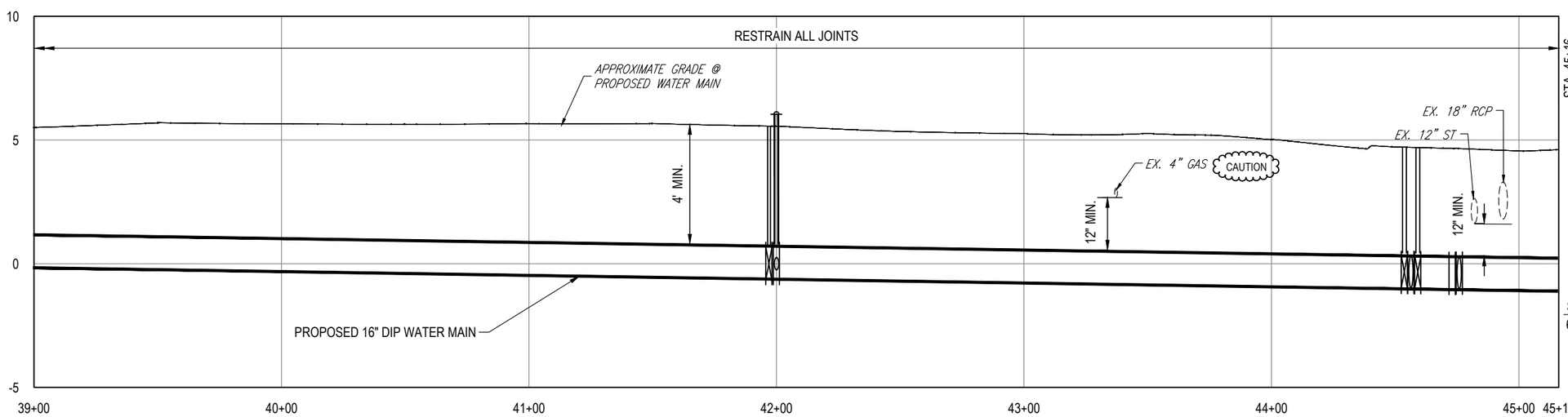
WORK ORDER NO. WTR-18-0001

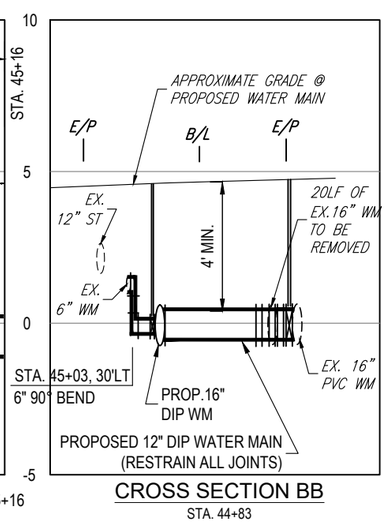
RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 06 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg Jan 09, 2020 - 7:13am







CROSS SECTION BB
STA. 44+83

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

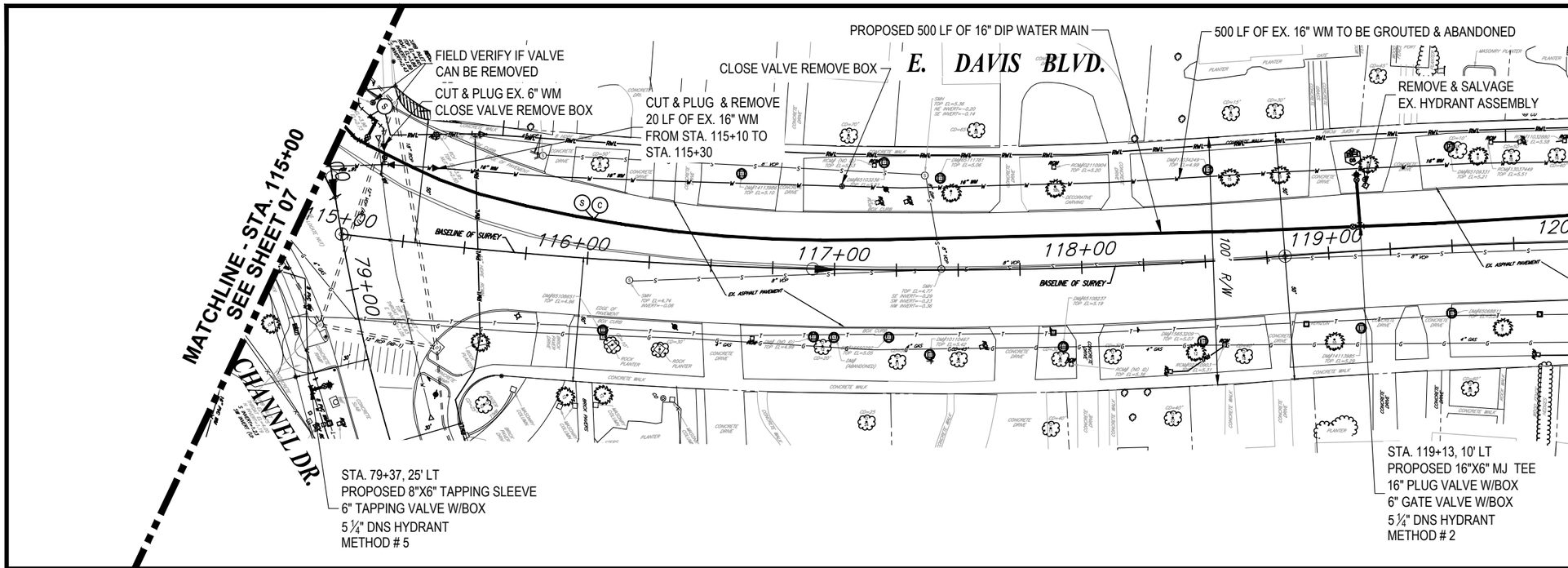
DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 07 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg Jan 09, 2020 - 7:13am



NORTH

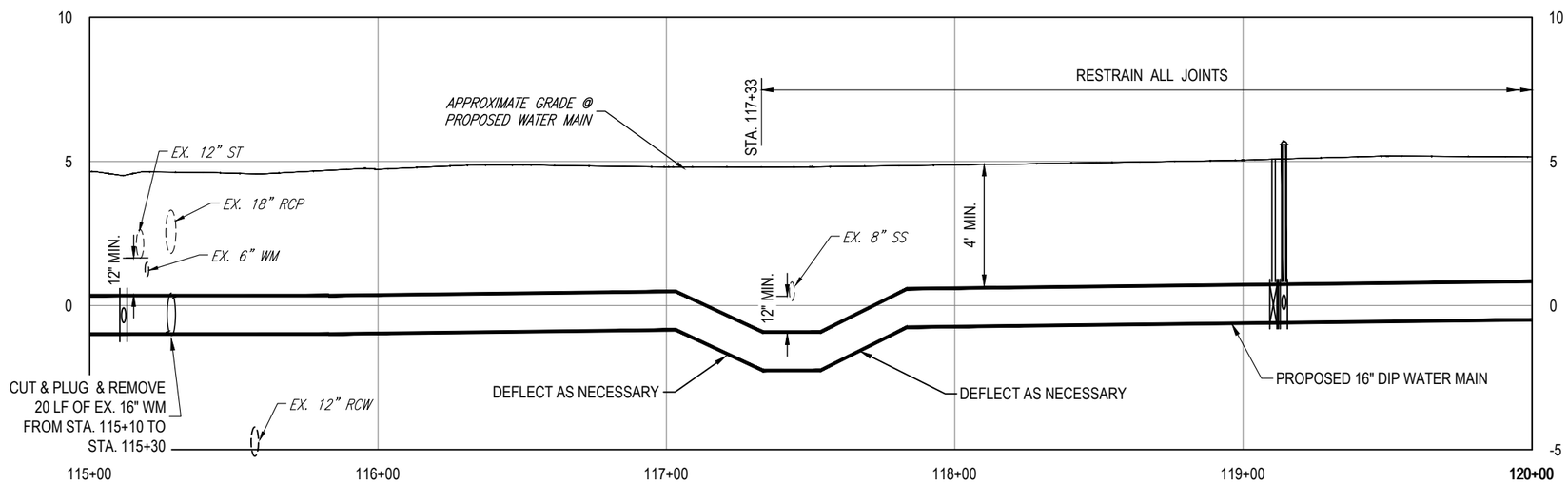
S25-T29S-R18E

0 25' 50'

SCALE - HORIZONTAL

0 2.5' 5'

SCALE - HORIZONTAL



RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

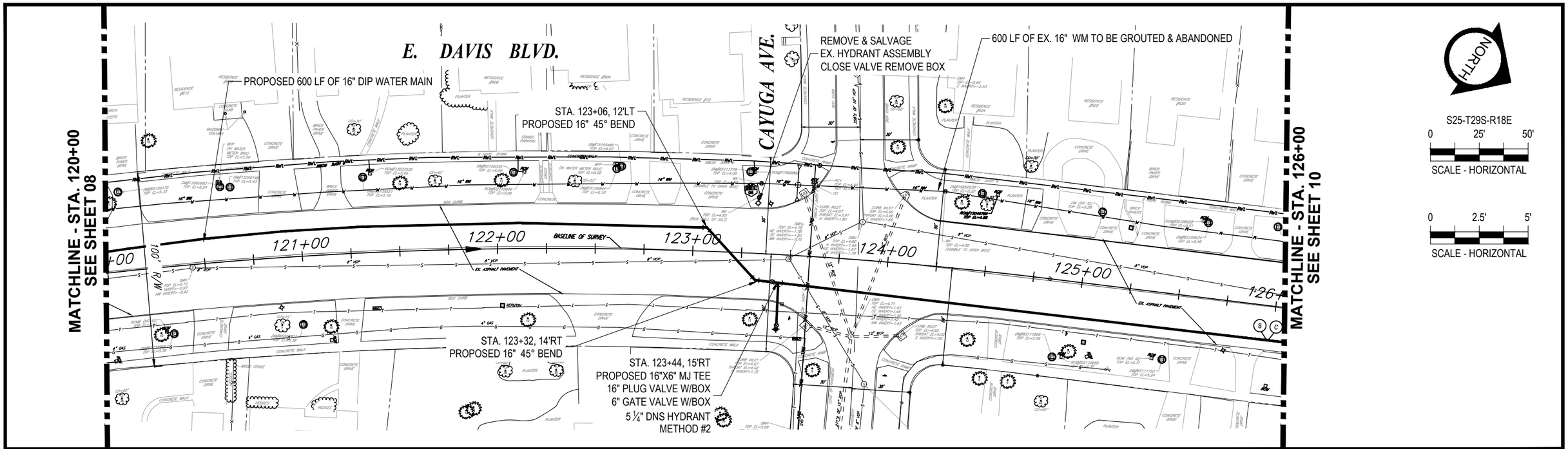
100% PLANS

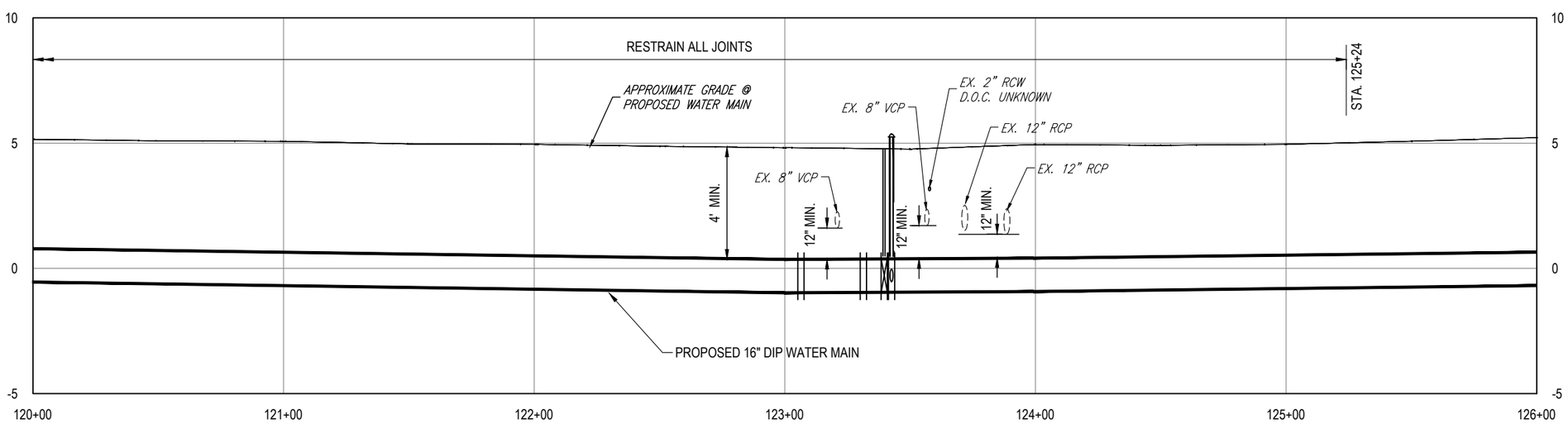
WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 08 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg Jan 09, 2020 - 7:13am





RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

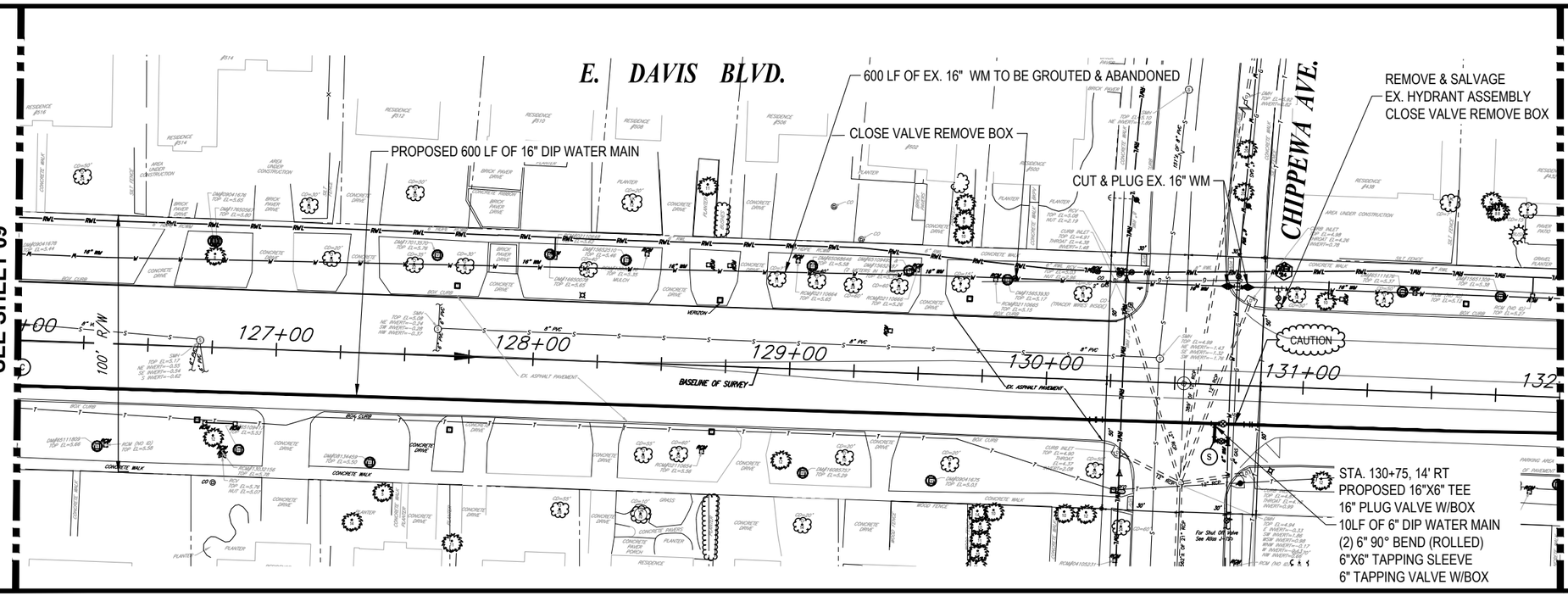
DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

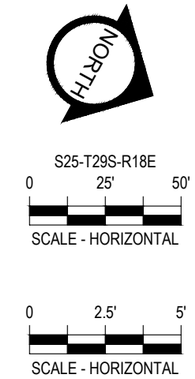
PLAN & PROFILE

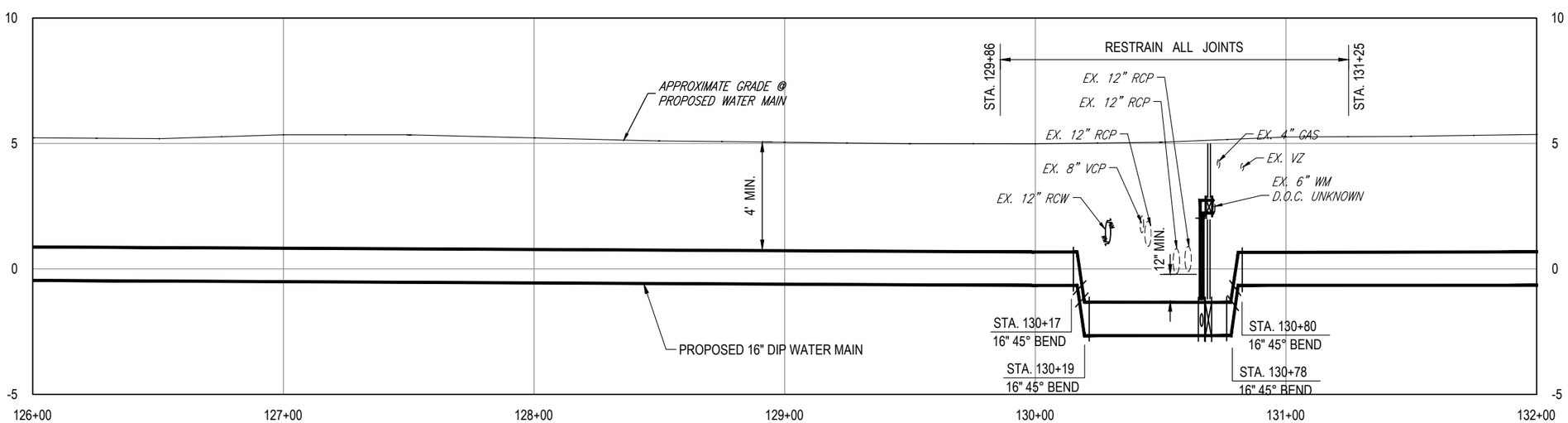
City of Tampa Florida
Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 09 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg Jan 09, 2020 - 7:13am







RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED	NPP
DRAWN	JDM
CHECKED	RAJ
DATE	03/05/2019

DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

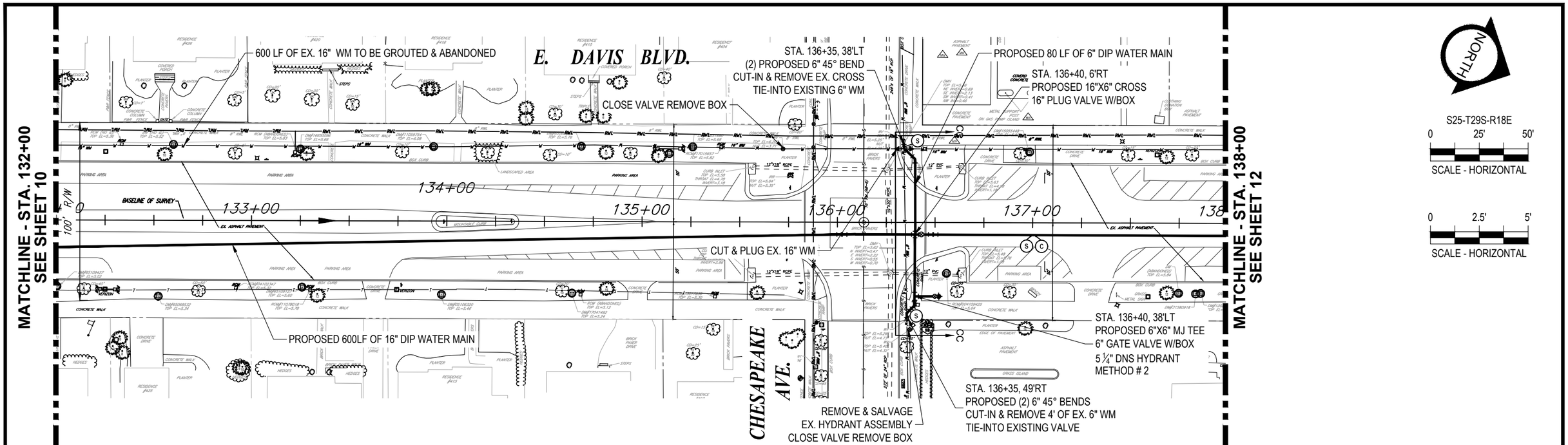
100% PLANS

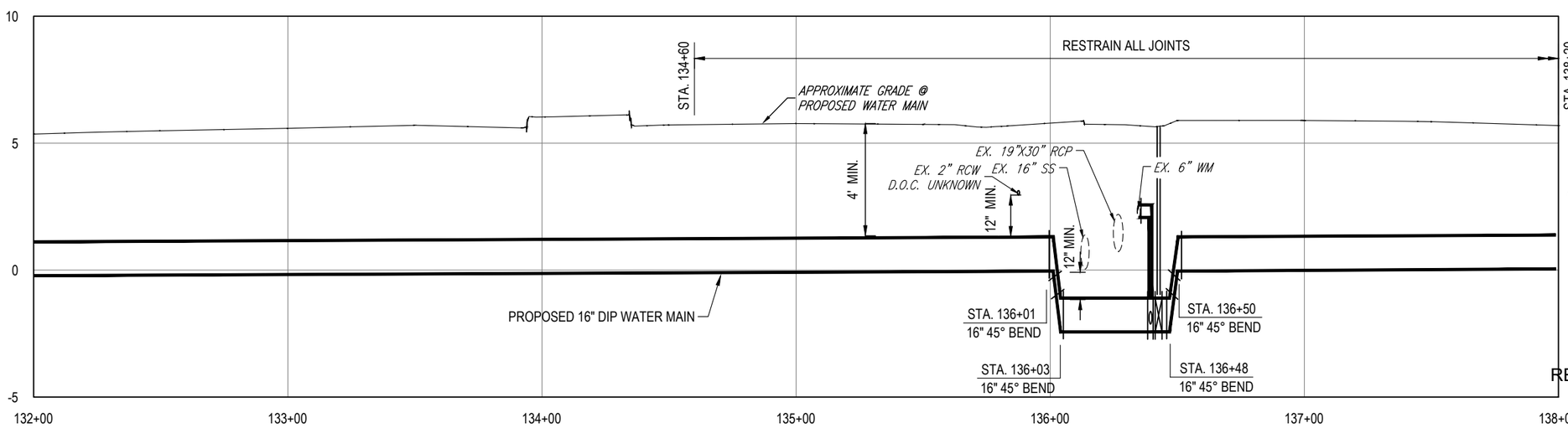
WORK ORDER NO. WTR-18-0001

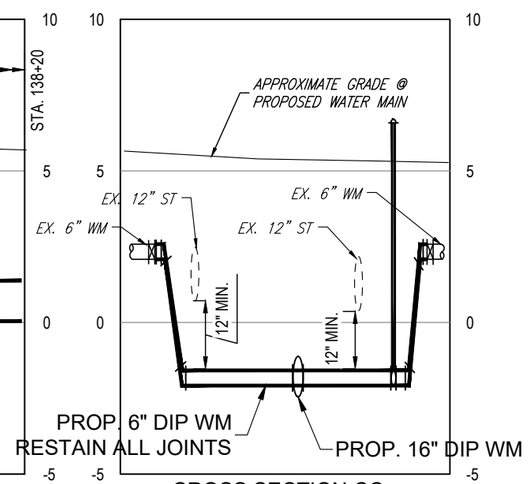
RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 10 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg Jan 09, 2020 - 7:14am







CROSS SECTION CC
STA. 136+40

RORY A. JONES, P.E. CITY OF TAMPA WATER DEPT. 306 E. JACKSON ST., 5E TAMPA, FLA. 33602 P.E. #79453	REV NO.	DATE	DESCRIPTION	BY
	.	.	.	.
	.	.	.	.
	.	.	.	.
	.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

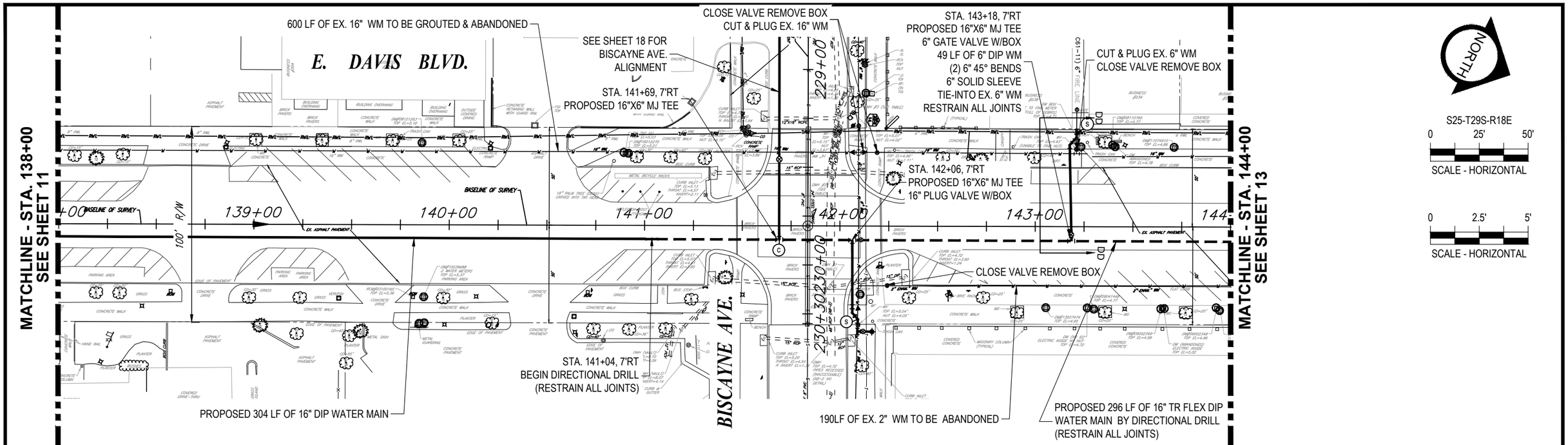
DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

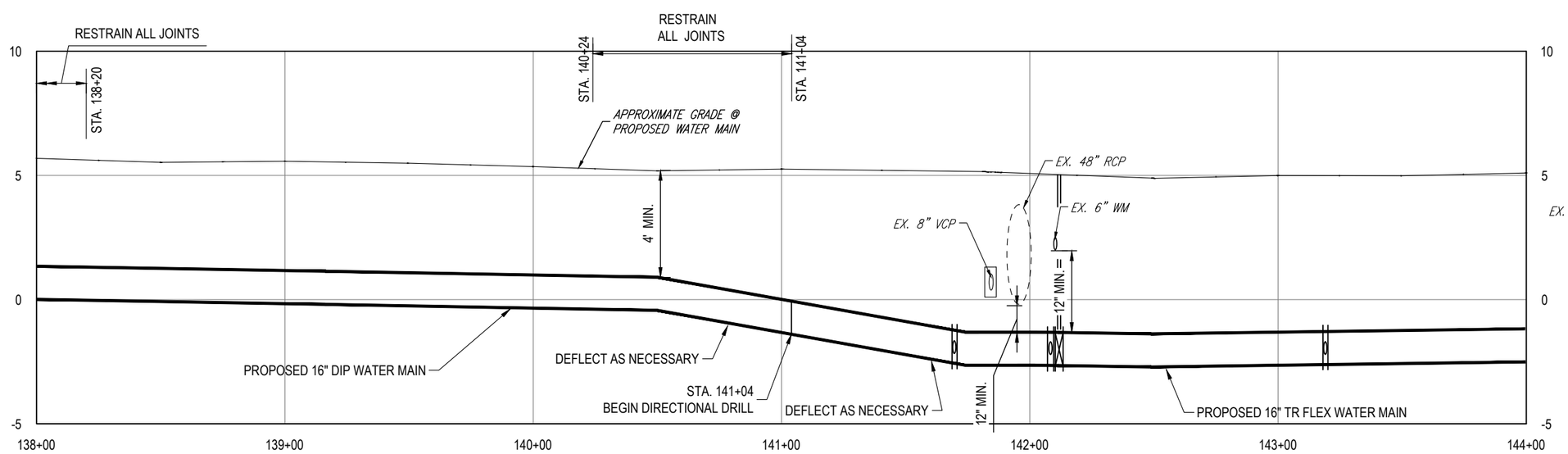
PLAN & PROFILE

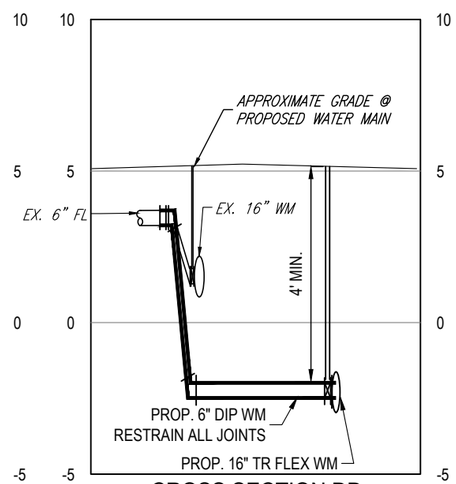
City of Tampa Florida
Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 11 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg Jan 09, 2020 - 7:14am







CROSS SECTION DD
STA. 143+18

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

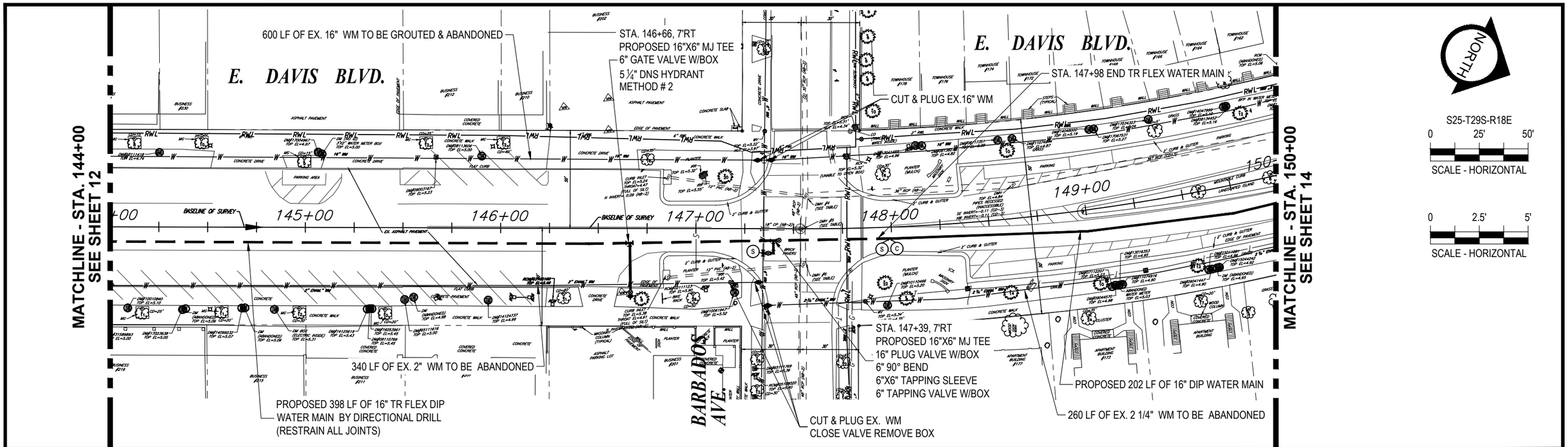
100% PLANS

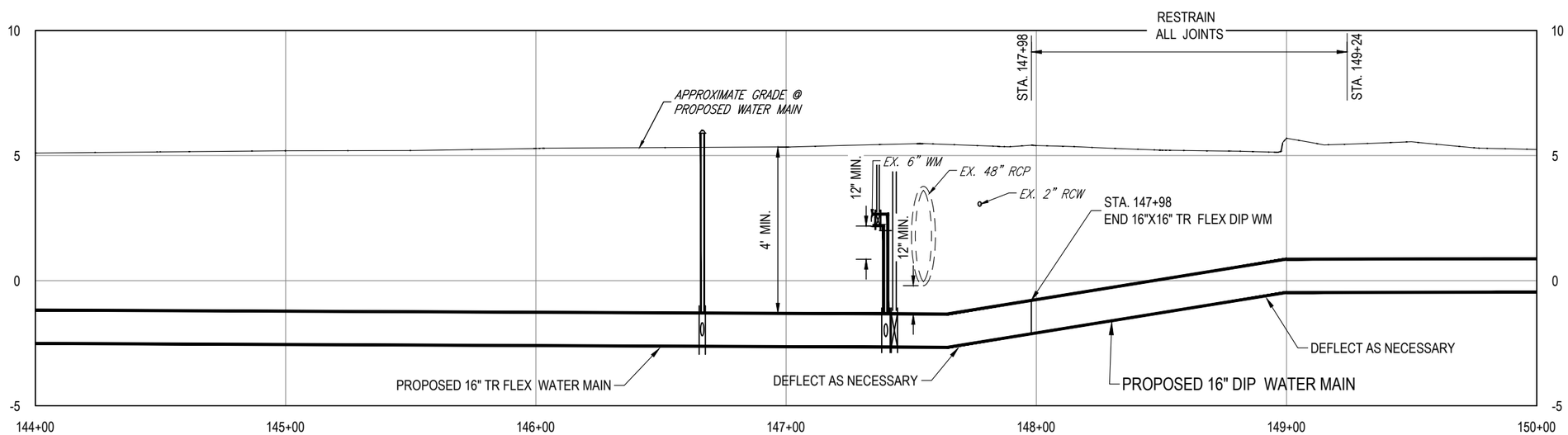
WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 12 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg, Jan 09, 2020 - 7:14am





RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

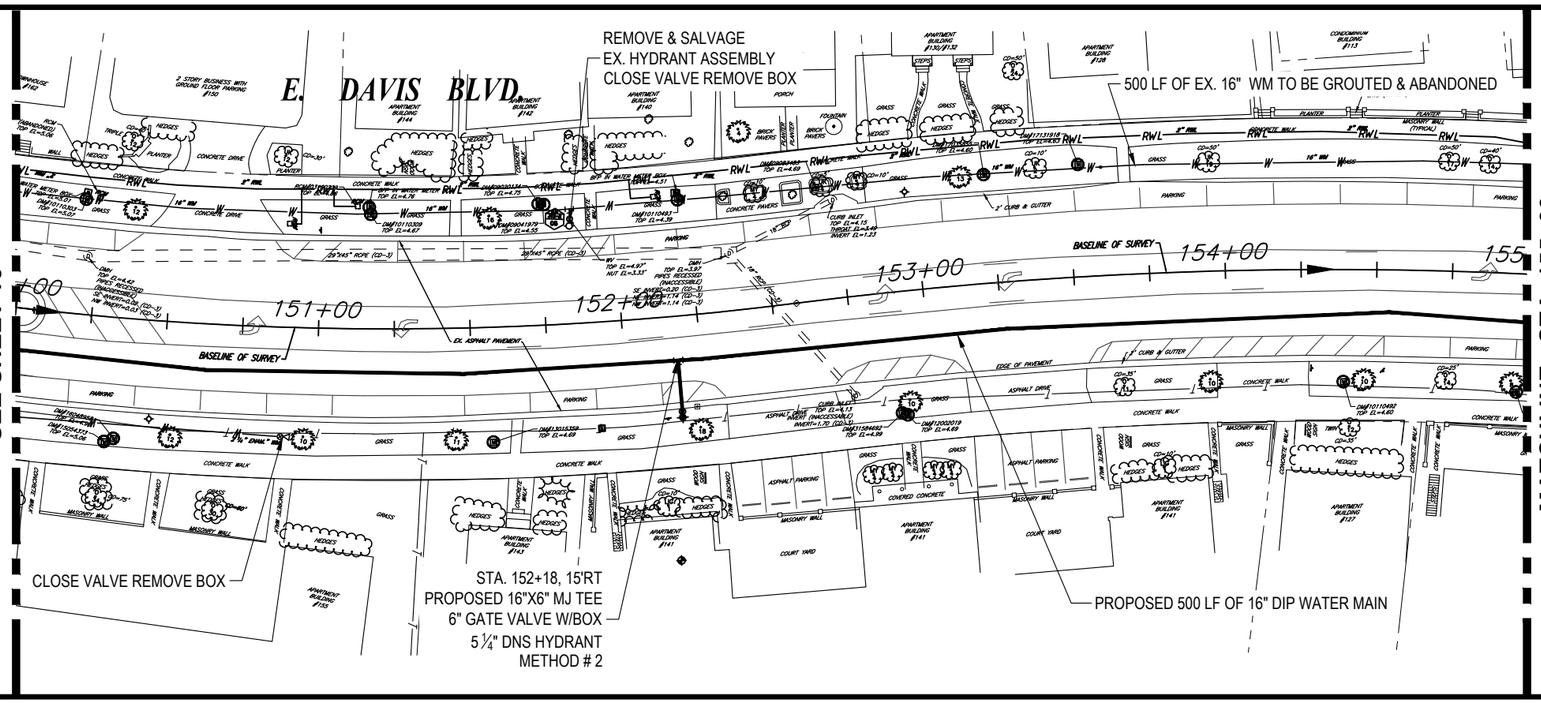
DAVIS ISLAND WATER MAIN REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 13 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg Jan 09, 2020 - 7:16am



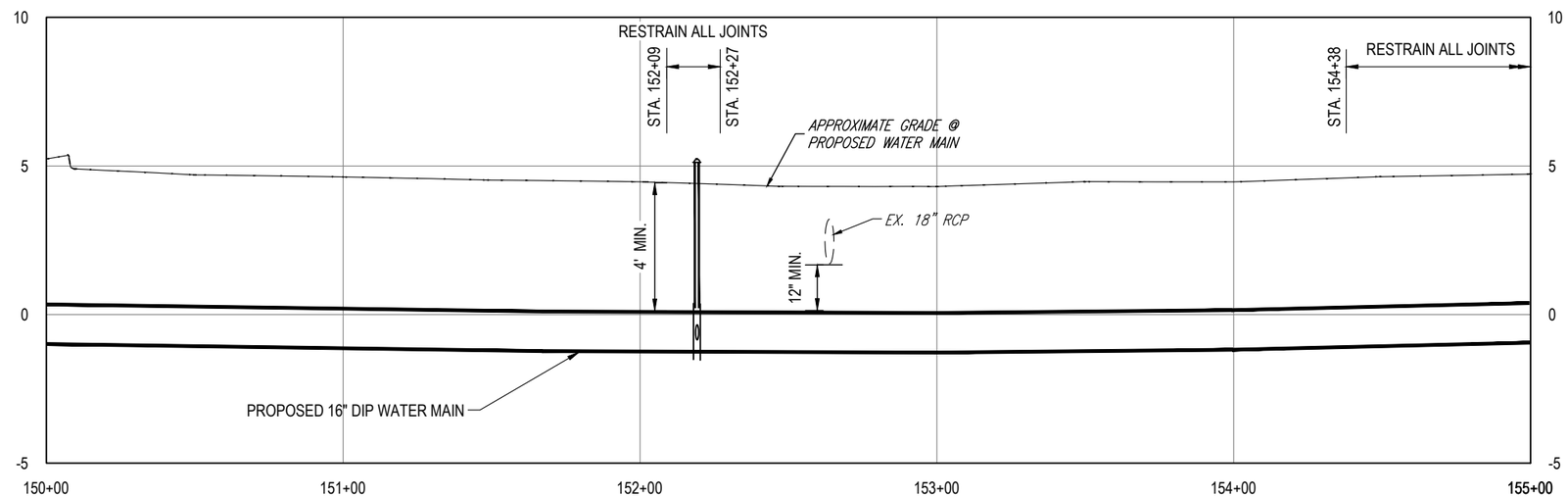
S25-T29S-R18E

0 25' 50'

SCALE - HORIZONTAL

0 2.5' 5'

SCALE - HORIZONTAL



RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

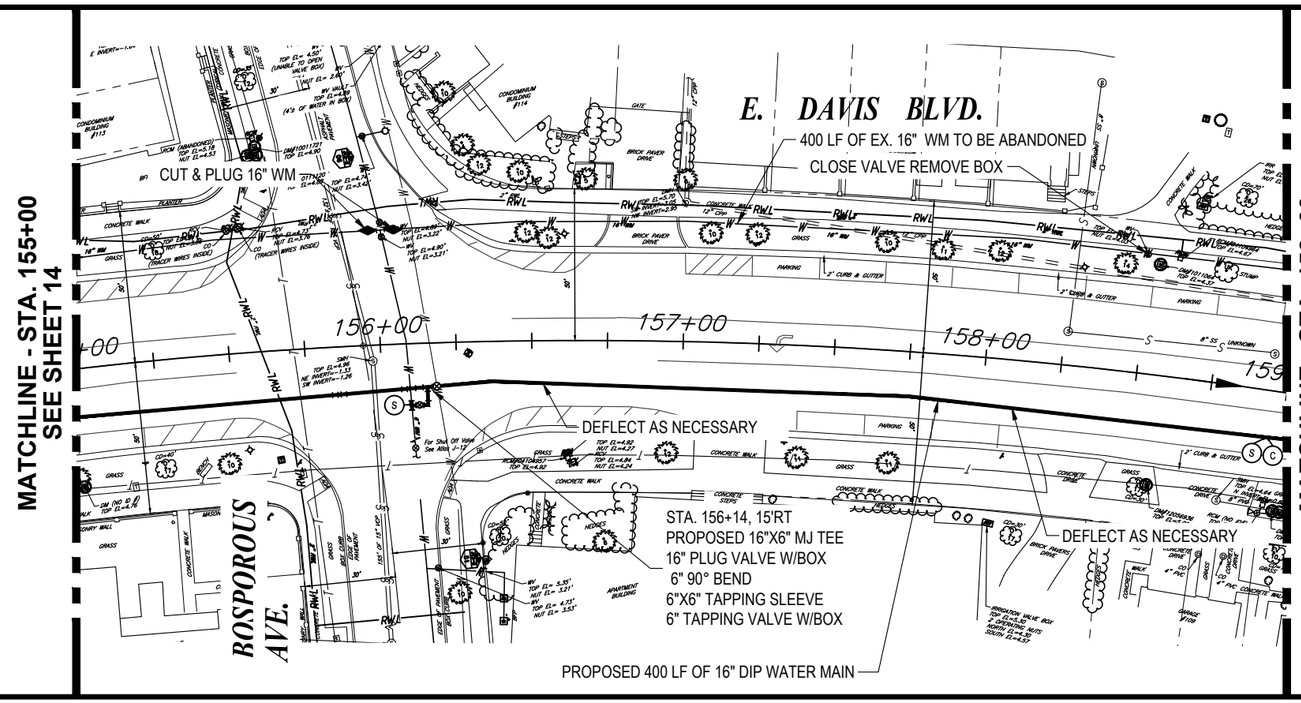
100% PLANS

WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 14 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg, Jan 09, 2020 - 7:16am



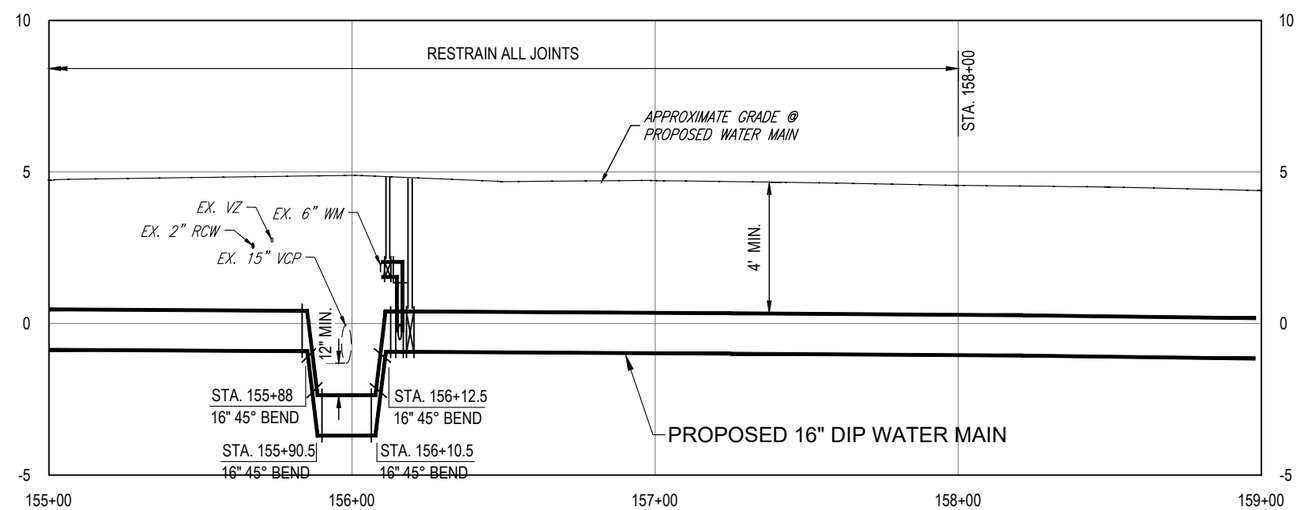
S25-T29S-R18E

0 25' 50'

SCALE - HORIZONTAL

0 2.5' 5'

SCALE - HORIZONTAL



RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

100% PLANS

WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 15 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg, Jan 09, 2020 - 7:17am

MATCHLINE - STA. 159+00
SEE SHEET 15

233 LF OF EX. 16" WM TO BE GROUTED & ABANDONED

CUT & PLUG EX. 16 " WM

STA. 161+16, 18'RT
PROPOSED 16"X6" MJ TEE
6" GATE VALVE W/BOX
5 ¼" DNS HYDRANT
METHOD # 2

STA. 589+63, 29'LT
16"X16" TAPPING SLEEVE
16" TAPPING VALVE W/BOX

W. DAVIS AVE.

BALTIC CIR.

E. DAVIS BLVD.

REMOVE & SALVAGE
EX. HYDRANT ASSEMBLY
CLOSE VALVE REMOVE BOX

CLOSE VALVE REMOVE BOX

PROPOSED 380 LF OF 16" DIP WATER MAIN

STA. 161+84, 17'RT
PROPOSED 16" 45° BEND
16"X6" MJ TEE
6" GATE VALVE W/BOX
22 LF 6" DIP WM
6" 45° BEND (ROLLED)
6" SOLID SLEEVE
TIE INTO EX. 6" WM

REMOVE & SALVAGE
EX. HYDRANT ASSEMBLY
CLOSE VALVE REMOVE BOX

CLOSE VALVE REMOVE BOX

286 LF OF EX. 6" WM TO BE ABANDONED

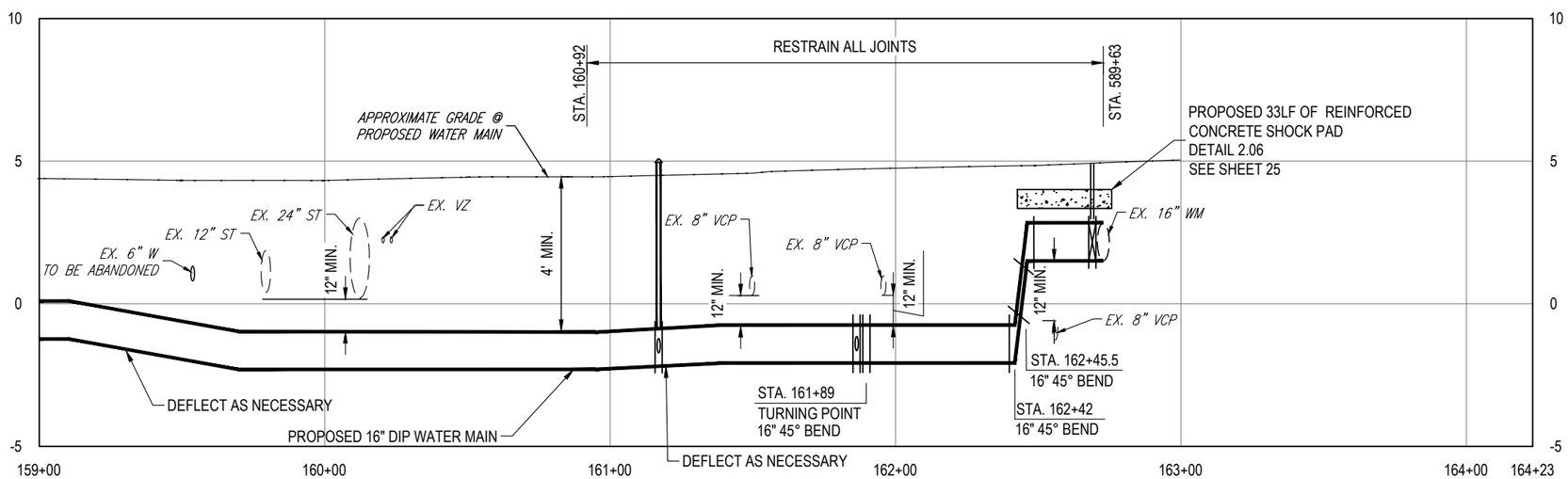
CUT & PLUG EX. 6 " WM

NORTH

S25-T29S-R18E

0 25' 50'
SCALE - HORIZONTAL

0 2.5' 5'
SCALE - HORIZONTAL



RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

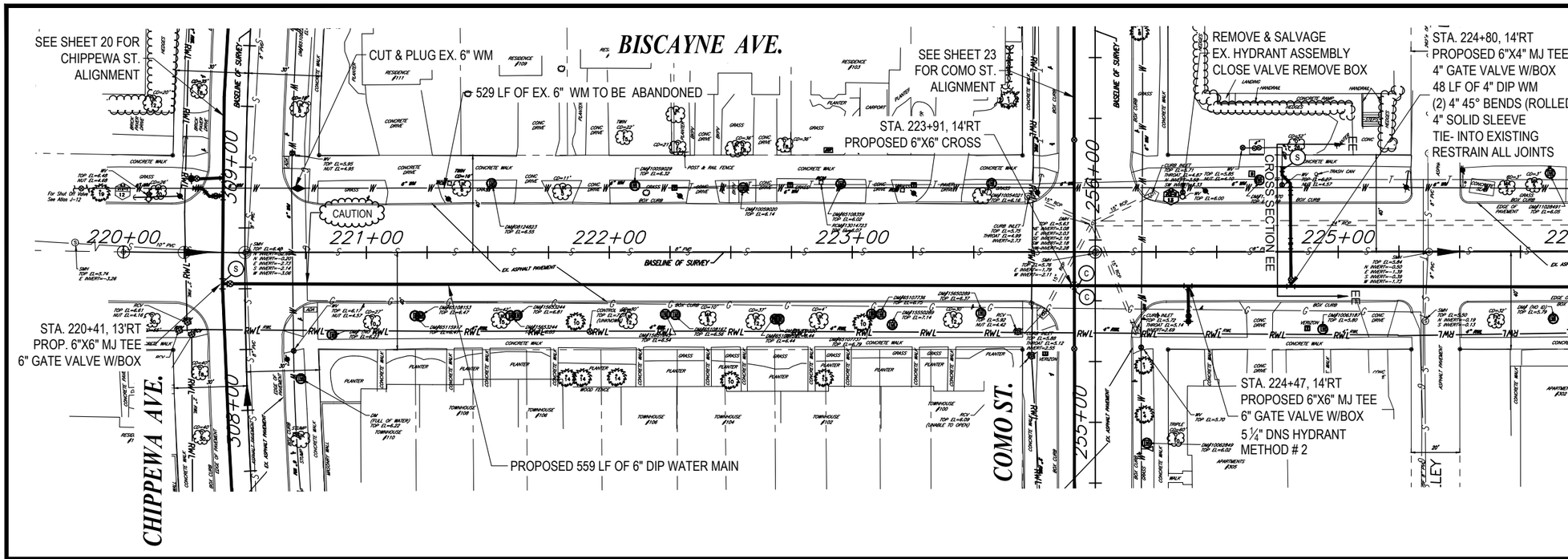
DAVIS ISLAND WATER MAIN REPLACEMENT CIP

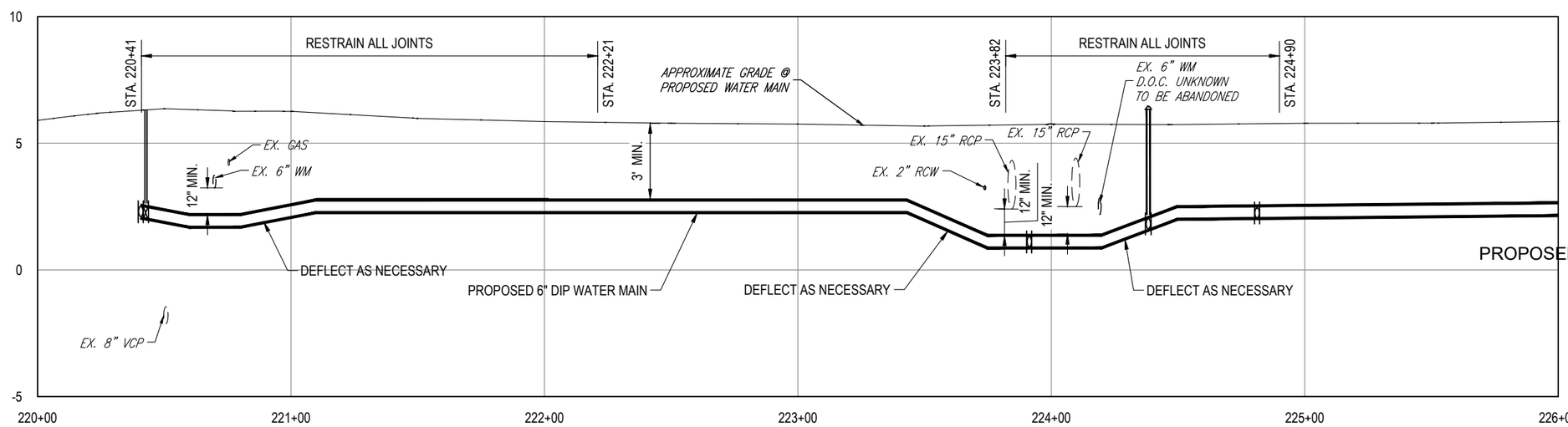
PLAN & PROFILE

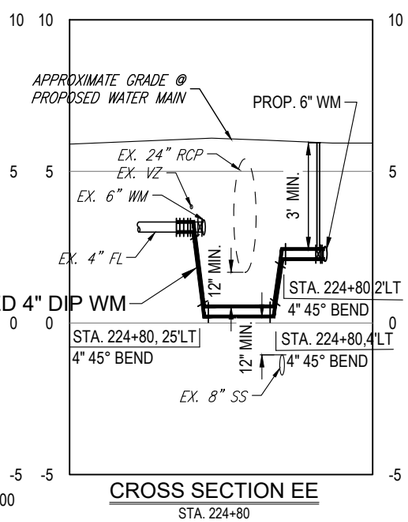
City of Tampa Florida
Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 16 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg, Jan 09, 2020 - 7:17am







CROSS SECTION EE
STA. 224+80

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

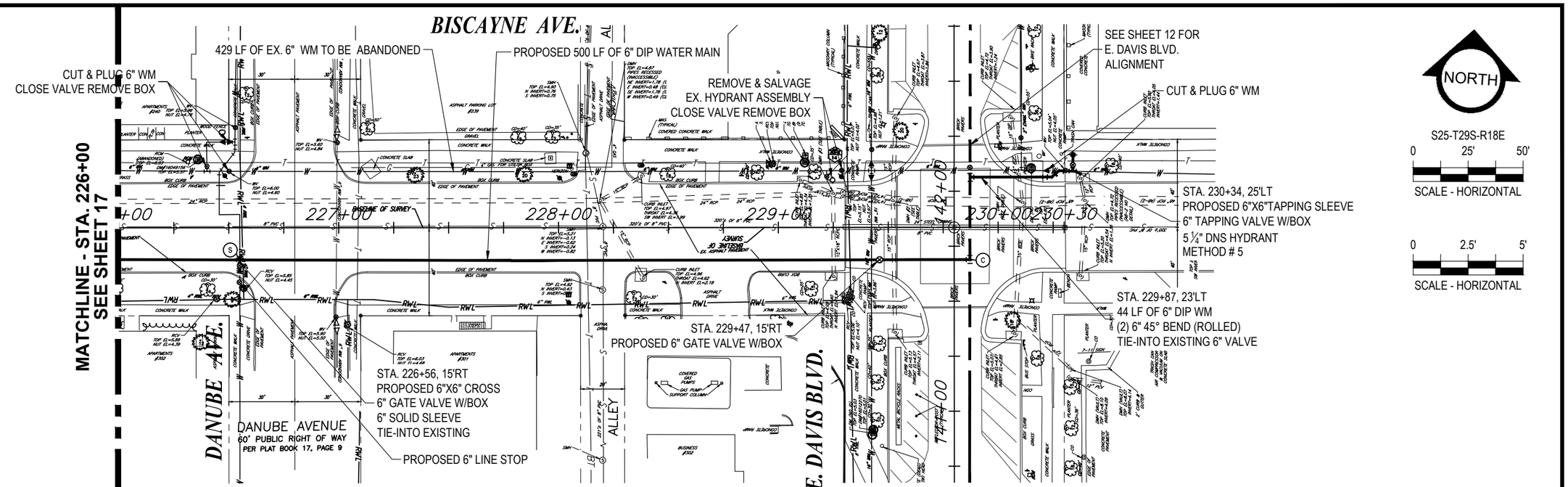
DAVIS ISLAND WATER MAIN REPLACEMENT CIP

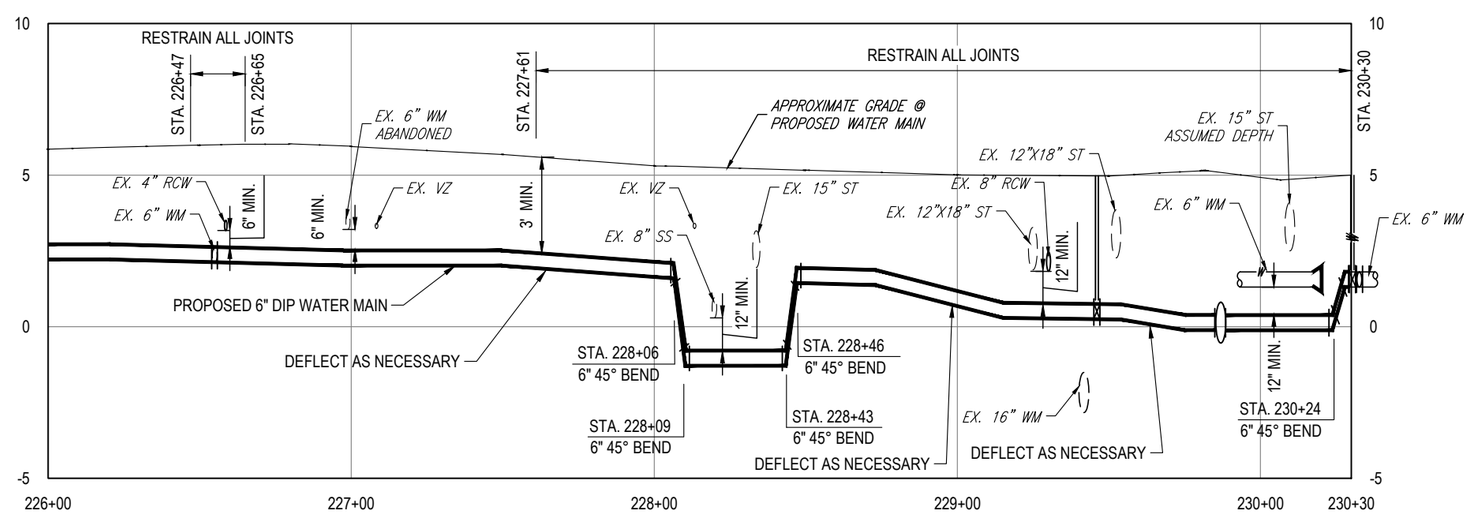
PLAN & PROFILE

City of Tampa Florida
Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 17 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg, Jan 09, 2020 - 7:17am





RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

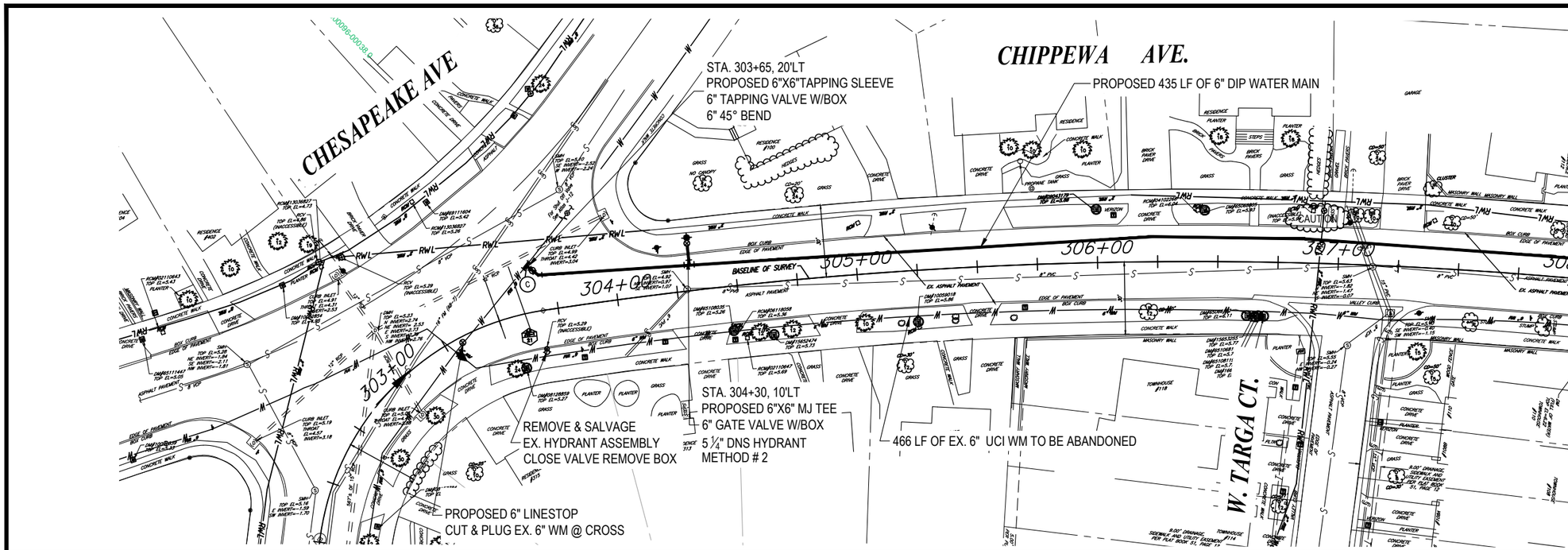
100% PLANS

WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 18 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg, Jan 09, 2020 - 7:18am



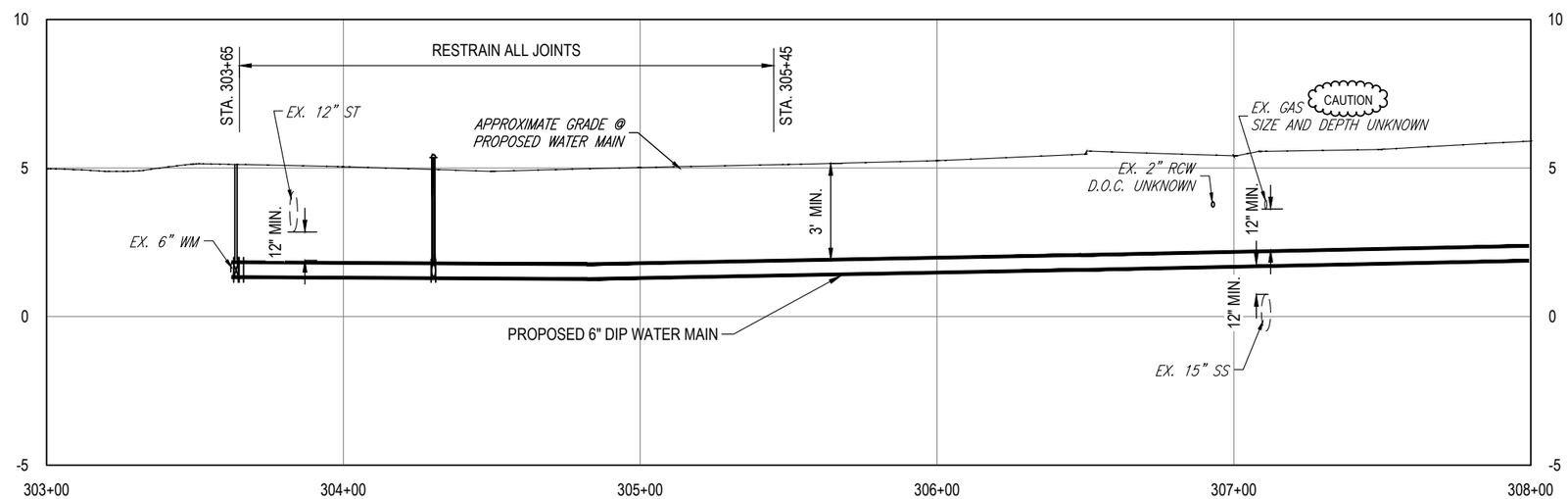
MATCHLINE - STA. 308+00
SEE SHEET 20

NORTH

S25-T29S-R18E

0 25' 50'
SCALE - HORIZONTAL

0 2.5' 5'
SCALE - HORIZONTAL



RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

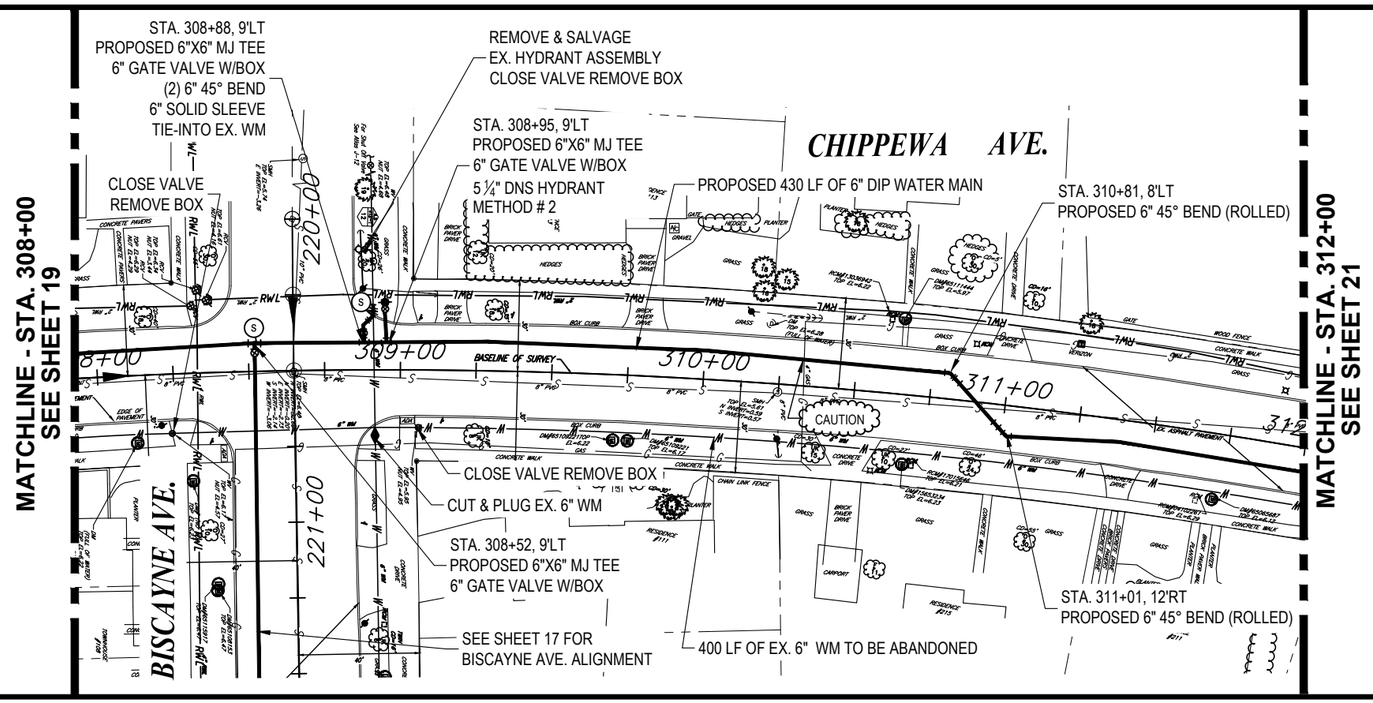
DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 19 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg, Jan 09, 2020 - 7:18am



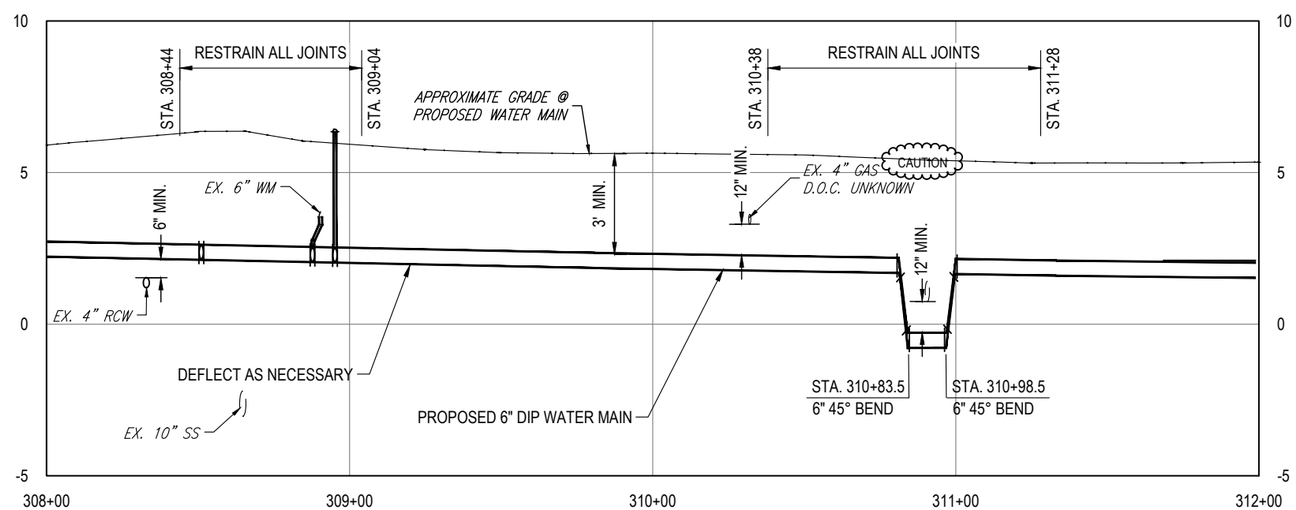
S25-T29S-R18E

0 25' 50'

SCALE - HORIZONTAL

0 2.5' 5'

SCALE - HORIZONTAL



RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

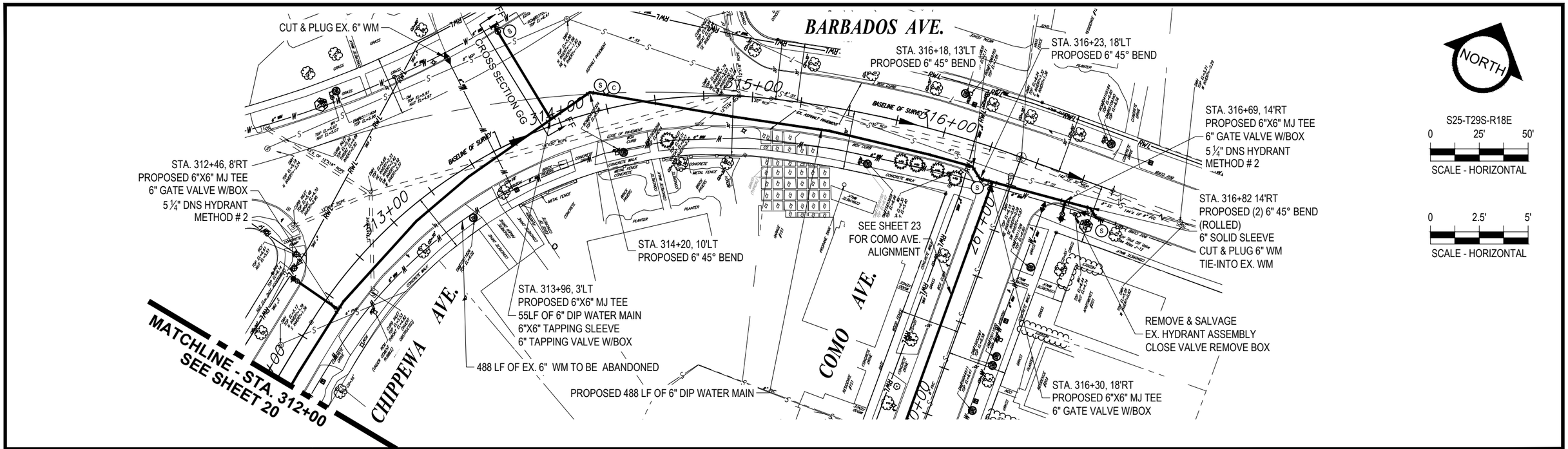
100% PLANS

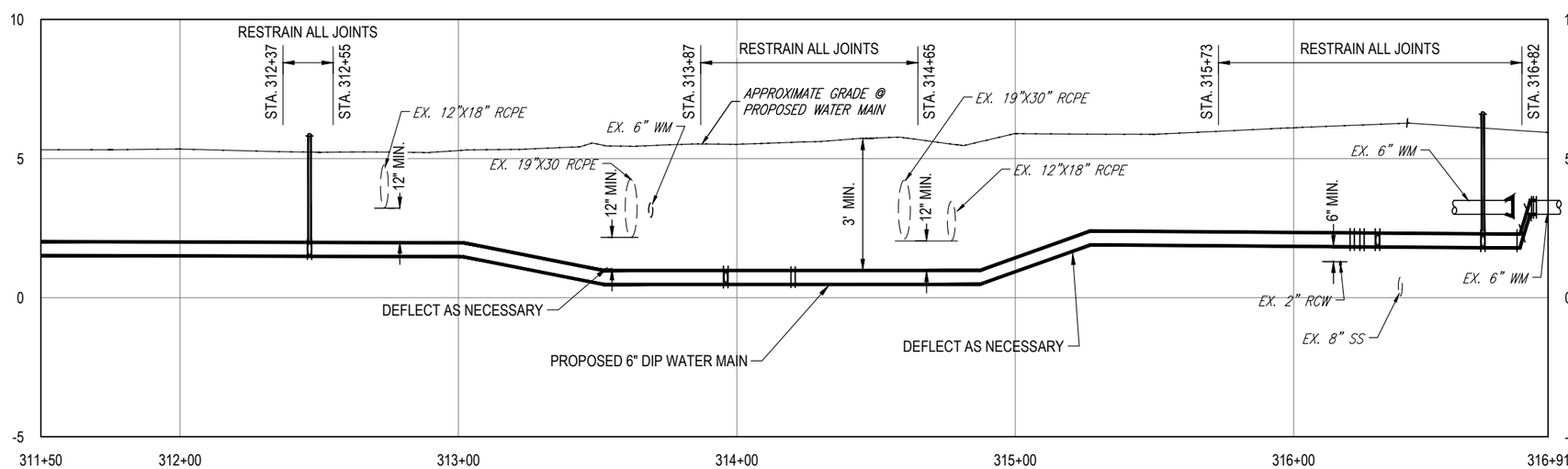
WORK ORDER NO. WTR-18-0001

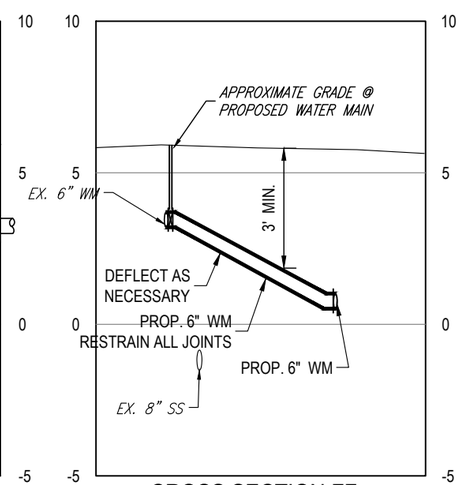
RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 20 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg, Jan 09, 2020 - 7:19am



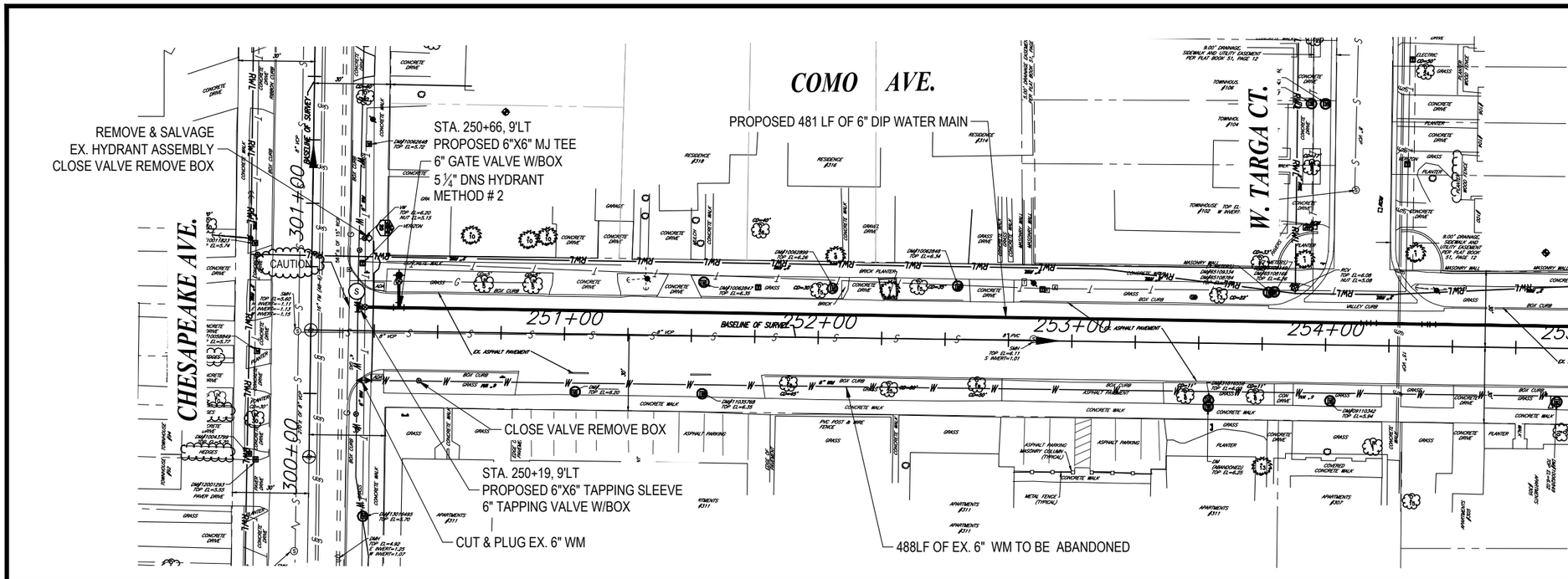




CROSS SECTION FF
STA. 313+96

RORY A. JONES, P.E. CITY OF TAMPA WATER DEPT. 306 E. JACKSON ST., 5E TAMPA, FLA. 33602 P.E. #79453	REV NO.	DATE	DESCRIPTION	BY	DESIGNED NPP DRAWN JDM CHECKED RAJ DATE 03/05/2019	DAVIS ISLAND WATER MAIN REPLACEMENT CIP PLAN & PROFILE	City of Tampa Florida Water Department	100% PLANS WORK ORDER NO. WTR-18-0001 RECORD DRAWING NO. ATLAS PAGE J-12 SHEET 21 OF 31
	.	.	.	.				
	.	.	.	.				
	.	.	.	.				
	.	.	.	.				

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg, Jan 09, 2020 - 7:19am



MATCHLINE - STA. 255+00
SEE SHEET 23

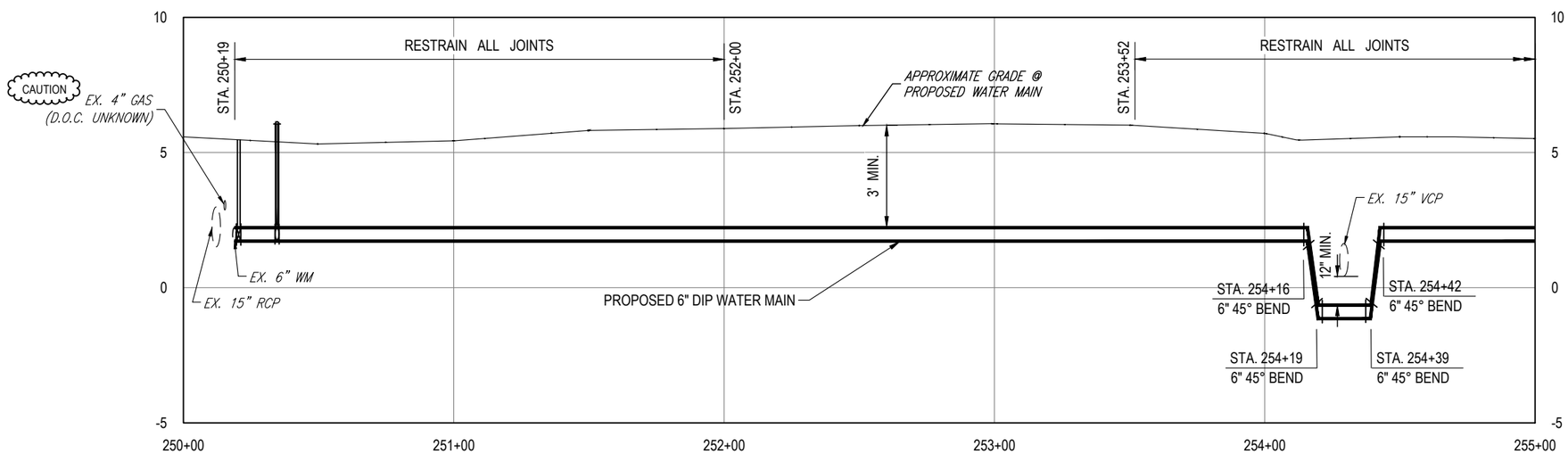
S25-T29S-R18E

0 25' 50'

SCALE - HORIZONTAL

0 2.5' 5'

SCALE - HORIZONTAL



RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

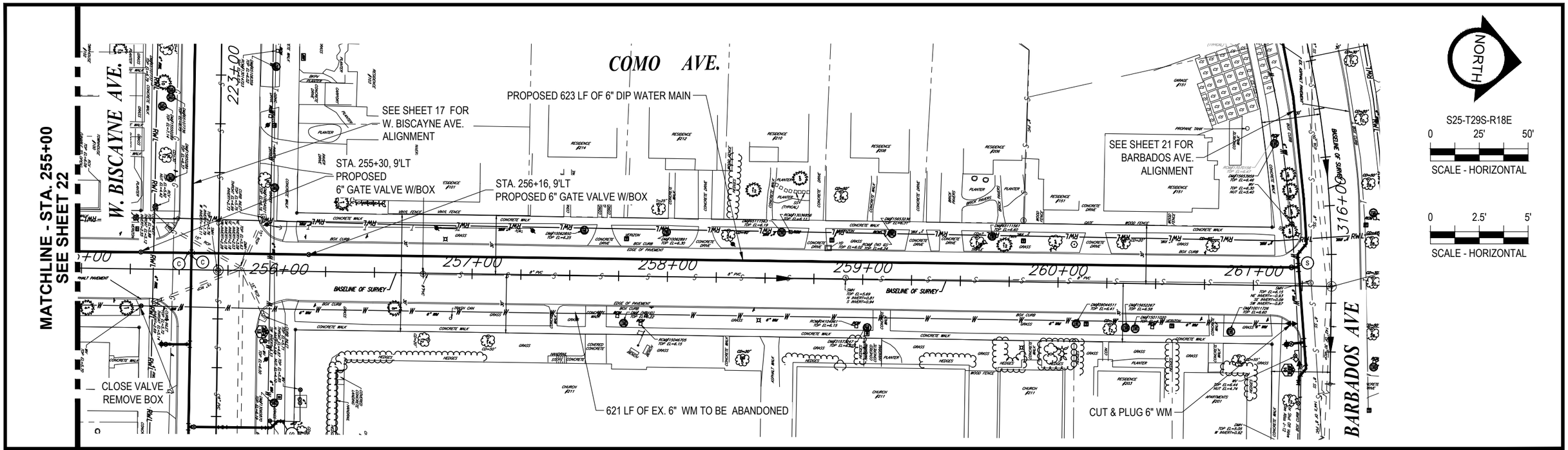
100% PLANS

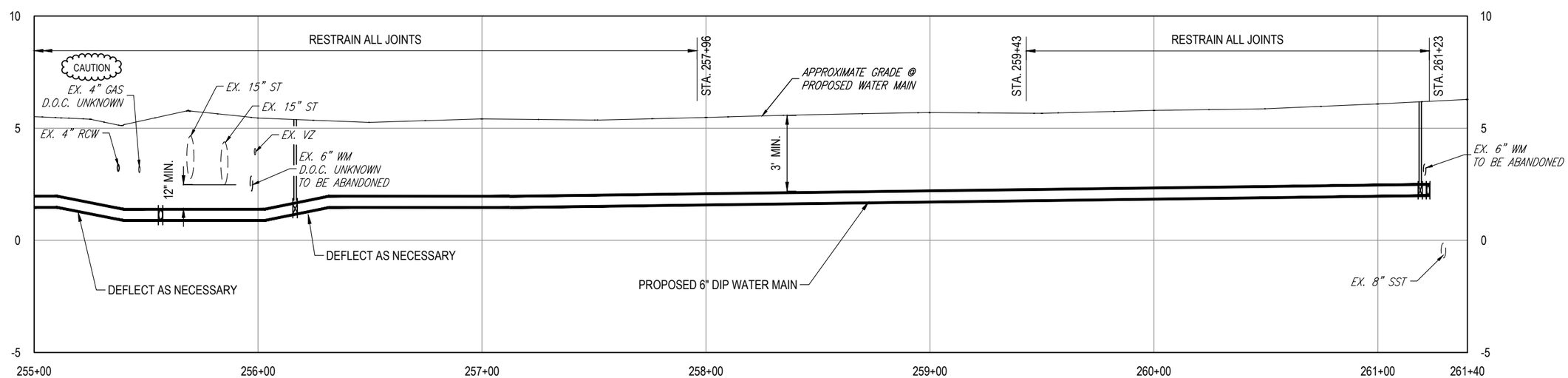
WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 22 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg, Jan 09, 2020 - 7:19am





RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

PLAN & PROFILE

City of Tampa Florida
Water Department

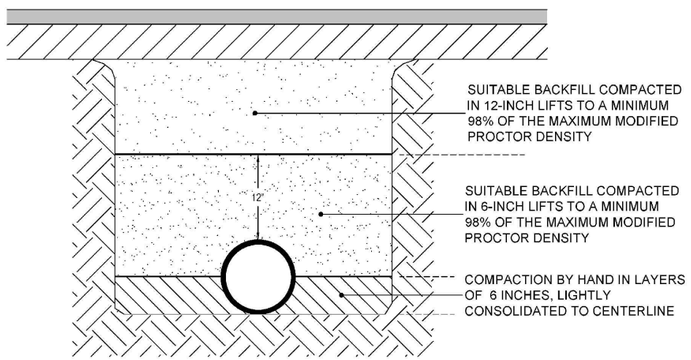
100% PLANS

WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 23 OF 31

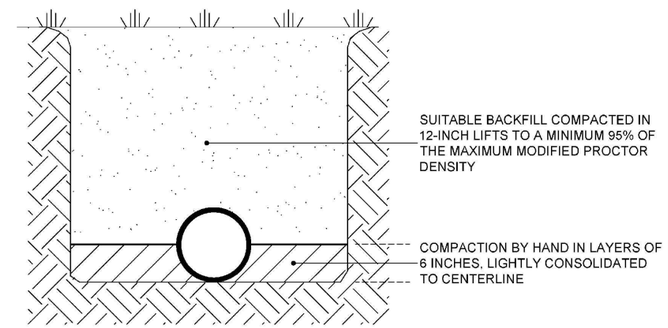
K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001-2.dwg, Jan 09, 2020 - 7:20am



NOTES:

1. TYPE 2 TRENCH IS DEFINED AS A FLAT-BOTTOM TRENCH. LIGHTLY CONSOLIDATE BACKFILL TO CENTERLINE OF PIPE.
2. THIS STANDARD SHALL BE UTILIZED IN THE ABSENCE OF SPECIFIC STANDARDS. THE STANDARD OF THE AGENCY CONTROLLING THE RIGHT-OF-WAY SHALL GOVERN UNLESS OTHERWISE DIRECTED BY CITY ENGINEER.
3. SUITABLE BACKFILL SHALL BE DEFINED AS MATERIAL FREE FROM CINDERS, ASHES, REFUSE, CLAY, ORGANIC MATTER, BOULDERS, ROCKS OR STONES, OR OTHER MATERIAL THAT IN THE OPINION OF THE CITY ENGINEER IS UNSUITABLE.
4. NON-PERVIOUS AREAS SHALL MEAN ANY CONCRETE OR ASPHALT CURB, SIDEWALK, TRAIL, DRIVEWAY, OR ROADWAY.

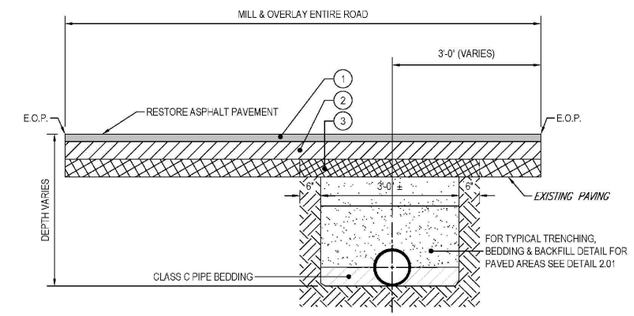
City of Tampa Florida Water Department	LAST REVISION JAN 2018	TRENCHING, BEDDING AND BACKFILL DETAIL FOR NON-PERVIOUS (PAVED) AREAS	2.01A



NOTES:

1. TYPE 2 TRENCH IS DEFINED AS A FLAT-BOTTOM TRENCH. LIGHTLY CONSOLIDATE BACKFILL TO CENTERLINE OF PIPE.
2. THIS STANDARD SHALL BE UTILIZED IN THE ABSENCE OF SPECIFIC STANDARDS. THE STANDARD OF THE AGENCY CONTROLLING THE RIGHT-OF-WAY SHALL GOVERN UNLESS OTHERWISE DIRECTED BY CITY ENGINEER.
3. SUITABLE BACKFILL SHALL BE DEFINED AS MATERIAL FREE FROM CINDERS, ASHES, REFUSE, CLAY, ORGANIC MATTER, BOULDERS, ROCKS OR STONES, OR OTHER MATERIAL THAT IN THE OPINION OF THE CITY ENGINEER IS UNSUITABLE.
4. NON-PAVED AREA IS A PERVIOUS AREA. IF ANY PART OF THE TRENCH IS WITHIN A CONCRETE OR ASPHALT CURB, SIDEWALK, DRIVEWAY, OR ROADWAY, THEN STANDARD DETAIL 2.01 APPLIES.

City of Tampa Florida Water Department	LAST REVISION JUL 2018	TRENCHING, BEDDING, AND BACKFILL DETAIL FOR PERVIOUS (NON-PAVED) AREAS	2.02



PAVEMENT LAYERS (SEE SPECIFICATIONS)

1. TYPE SP 9.5 ASPHALT (1") MILL & OVERLAY
2. TYPE SP 9.5 OR SP 12.5 ASPHALT (2")
3. CRUSHED CONCRETE BASE (8")

(ASPHALT)

NOTES:

1. PAVEMENT SHALL BE MECHANICALLY SAWED.
2. THE NEW BASE MATERIALS SHALL BE EITHER OF THE SAME TYPE AND COMPOSITION AS THE MATERIALS REMOVED OR OF EQUAL OR GREATER STRUCTURAL ADEQUACY. BASE, INSTALLED TO A THICKNESS OF THE EXISTING BASE OR 8" WHICHEVER IS GREATER. CRUSHED CONCRETE BASE SHALL FOLLOW FDOT STANDARD SPECIFICATIONS FOR RECYCLED CONCRETE AGGREGATES, LATEST EDITION. LAYER COEFFICIENT (SN) SHALL BE 0.18 WITH LIMEROCK BEARING RATIO (LBR) 150 OR GREATER. GRADATION AND SIZE REQUIREMENTS SHALL CONFORM TO FDOT LATEST SPECIFICATIONS.
3. THE SURFACE COURSE WITHIN THE TRENCH LIMITS SHALL BE FDOT TYPE SP 9.5 OR SP 12.5 WITH A THICKNESS EQUAL TO THE EXISTING OR 2", WHICHEVER IS GREATER. LIFT TO BE $\frac{3}{4}$" MIN. AND 1 $\frac{1}{2}$" MAX. FOR SP 9.5 AND 1 $\frac{1}{4}$" MIN. TO 3" MAX. FOR SP 12.5.
4. FOR COLLECTOR/ARTERIALS ROADS, 1" MILL AND OVERLAY 10' IN EACH DIRECTION OF THE TRENCH AND FULL WIDTH OF THE LANE. FOR RESIDENTIAL ROADS, 1" MILL AND OVERLAY 10' IN EACH DIRECTION OF THE TRENCH AND FULL WIDTH OF THE ROAD (CURB TO CURB). FDOT TYPE SP 9.5 ASPHALT SHALL BE USED. LIFT TO BE $\frac{3}{4}$" MIN. AND 1 $\frac{1}{2}$" MAX.

City of Tampa Florida Water Department	LAST REVISION JAN 2018	TRENCHING, BEDDING AND BACKFILL DETAIL FOR NON-PERVIOUS (PAVED) AREAS	2.01B

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

WTR-18-0001 DETAILS - SHEET 24

City of Tampa Florida Water Department

100% PLANS

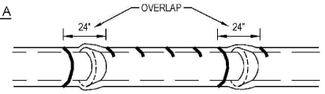
WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 24 OF 31

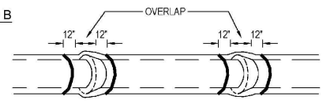
K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001 Details.dwg Jan 09, 2020 - 7:20am

METHOD A



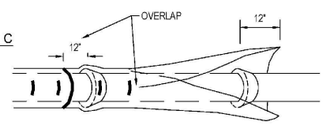
POLYETHYLENE TUBE IS CUT INTO LENGTHS APPROXIMATELY TWO FEET LONGER THAN THE PIPE SECTION AND PLACED AROUND IT. AFTER THE PIPE JOINT IS ASSEMBLED, THE POLYETHYLENE TUBE IS MADE TO OVERLAP THE JOINT AND THE OVERLAP SECURED IN PLACE. SINCE THE TUBE IS CONSIDERABLY LARGER THAN THE BARREL OF PIPE, IT IS MADE TO FIT SNUGLY BY FOLDING OVER AT THE TOP AND SECURING WITH TAPE EVERY 24" ALONG THE PIPE SECTION.

METHOD B



POLYETHYLENE TUBE IS CUT ONE FOOT SHORTER THAN THE LENGTH OF THE PIPE SECTION. AFTER PLACEMENT OF THE PIPE, IT IS FOLDED AND SECURED SNUGLY OVERALL. A THREE FOOT LENGTH OF POLYETHYLENE TUBE PLACED OVER THE END OF THE PRECEEDING SECTION IS THEN PULLED IN PLACE OVER THE JOINT AFTER ASSEMBLY AND SECURED.

METHOD C

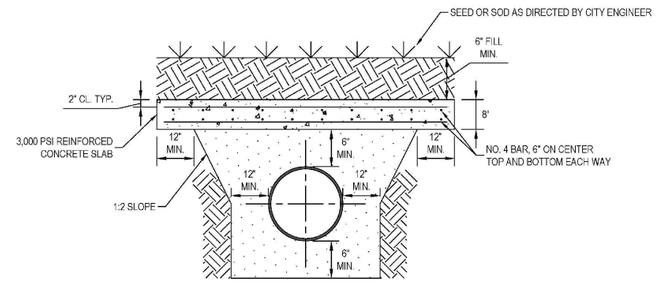


POLYETHYLENE SHEET IS CUT TO A LENGTH TWO FEET LONGER THAN THE PIPE SECTION. THE SHEET IS WRAPPED AROUND THE PIPE SO THAT IT OVERLAPS CIRCUMFERENTIALLY OVER THE TOP QUADRANT OF THE PIPE, THEN SECURED. AFTER JOINT ASSEMBLY, THE SURPLUS LENGTH OF POLYETHYLENE FILM IS SECURED AROUND THE JOINT, PROVIDING AN OVERLAP OF EACH JOINT. TAPE AT EACH JOINT AND AT 3' INTERVALS IN BETWEEN.

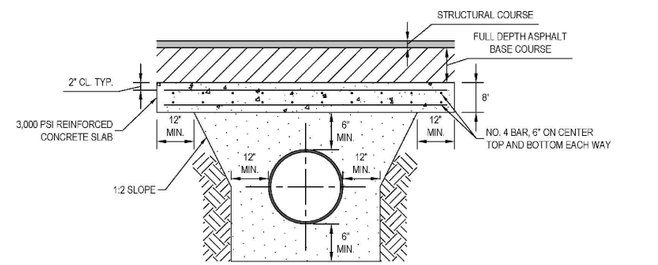
NOTES:

1. USE BLUE POLYETHYLENE FILM AND TAPE ONLY.
2. POLYETHYLENE FILM SHALL BE A MINIMUM OF 8 MIL. THICKNESS.
3. SPIRAL WRAP NOT REQUIRED WITH POLYWRAP.

City of Tampa Florida Water Department	LAST REVISION JUL 2018	POLYETHYLENE ENCASEMENT INSTALLATION DETAIL	2.05



GRASSED SECTION

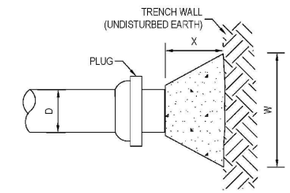


ROADWAY SECTION

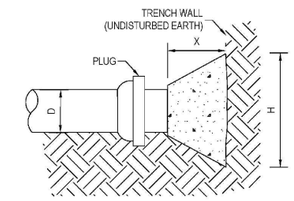
NOTES:

1. STRUCTURAL COURSE AND BASE COURSE REQUIREMENT SHALL BE ESTABLISHED BY THE AGENCY HAVING JURISDICTION.
2. SHOCK PADS FOR MAINS TOO SHALLOW FOR THE ABOVE CONFIGURATION SHALL BE DESIGNED ON A CASE-BY-CASE BASIS.

City of Tampa Florida Water Department	LAST REVISION JUL 2018	REINFORCED CONCRETE SHOCK PAD (FOR COVER LESS THAN 2.5')	2.06



PLAN VIEW



SECTION

DIMENSIONS OF THRUST BLOCKS FOR GOOD SOIL								
	SIZE (D)	4"	6"	8"	12"	16"	20"	24"
PLUG	THRUST (LBS.)	3,439	7,104	12,223	26,002	45,180	69,624	99,330
	BEARING AREA ($FT.^2$)	2.58	5.33	9.17	19.50	33.89	52.22	74.50
	CONCRETE ($YDS.^3$)	0.042	0.126	0.285	0.891	1.811	3.005	4.594
	H (FT.)	1.3	1.9	2.5	3.6	4.8	5.9	7.0
	W (FT.)	2.0	2.8	3.7	5.4	7.1	8.9	10.6
	X (FT.)	1.0 MIN.	1.4 MIN.	1.9 MIN.	2.7 MIN.	3.0 MIN.	3.0 MIN.	3.0 MIN.

NOTES:

1. CONCRETE SHALL BE KEPT AT SUFFICIENT DISTANCE FROM JOINT FOR REMOVAL OF ALL JOINT ACCESSORIES INCLUDING BOLTS.
2. ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED SOIL.
3. THIS TABLE SHOWS THE MINIMUM SIZE THRUST BLOCKS FOR SOIL BEARING PRESSURE OF 2000 PSF AND AN INTERNAL PRESSURE OF 190 PSI. COVER TO T.O.P. IS 3 FEET FOR 12" AND SMALLER MAINS; 4 FEET FOR 16" AND LARGER MAINS.
4. PLUGS SHALL BE COMPLETELY POLYWRAPPED PRIOR TO POURING THRUST BLOCKS.

WARNING - POOR AND WET SOIL (SILTY SOILS, CLAY, MUCK AND PEAT) WILL REQUIRE LARGER THRUST BLOCKS.

City of Tampa Florida Water Department	LAST REVISION JUL 2018	THRUST BLOCKS FOR PLUGS	2.08

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

WTR-18-0001 DETAILS - SHEET 25

City of Tampa Florida Water Department

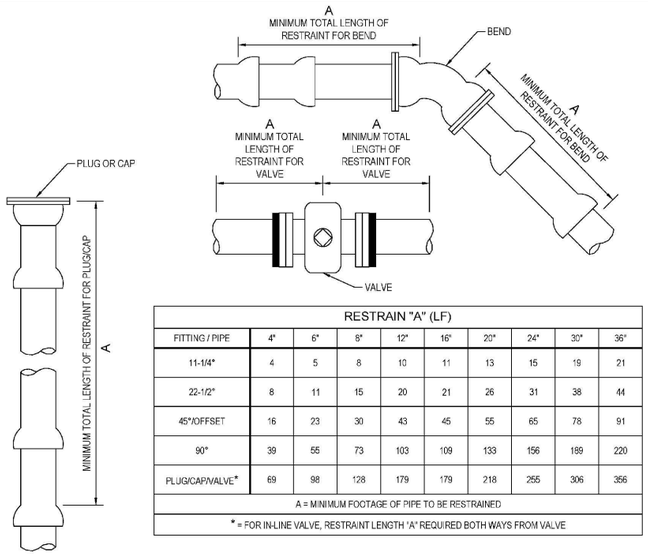
100% PLANS

WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 25 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001 Details.dwg, Jan 09, 2020 - 7:20am

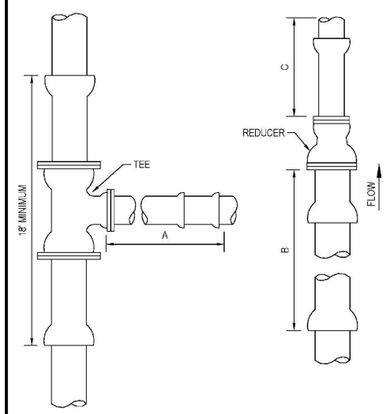


RESTRAIN "A" (LF)									
FITTING / PIPE	4"	6"	8"	12"	16"	20"	24"	30"	36"
11-1/4*	4	5	8	10	11	13	15	19	21
22-1/2*	8	11	15	20	21	26	31	38	44
45*/OFFSET	16	23	30	43	45	55	65	78	91
90*	39	55	73	103	109	133	156	189	220
PLUG/CAP/VALVE*	69	98	128	179	179	218	255	306	356
A = MINIMUM FOOTAGE OF PIPE TO BE RESTRAINED									
* = FOR IN-LINE VALVE, RESTRAINT LENGTH 'A' REQUIRED BOTH WAYS FROM VALVE									

NOTES:

1. THIS TABLE IS BASED ON:
   a. MAXIMUM TEST PRESSURE OF 190 PSI
   b. LAYING CONDITION TYPE 2 (SEE DETAILS 2.01 AND 2.02)
   c. POOR SOIL CONDITIONS
   d. USING D.I.P.
   e. 3 FEET OF COVER FOR 12" AND SMALLER MAINS; 4 FEET OF COVER FOR 16" AND LARGER MAINS
   f. HORIZONTAL BENDS ONLY - ENGINEER TO SUBMIT CALCULATIONS FOR VERTICAL RESTRAINTS
2. "RESTRAINED" PIPE SHALL BE MANUFACTURED RESTRAINED JOINT PIPE, PUSH-ON JOINT PIPE RESTRAINED W/GASKET-TYPE "GRIPPER RESTRAINTS", OR MECHANICAL JOINT PIPE RESTRAINED BY MEGALUG (OR APPROVED EQUIVALENT).
3. ANY ADDITIONAL FITTINGS WITHIN THE RESTRAINED SECTION SHALL BE RESTRAINED ACCORDINGLY.

City of Tampa Florida Water Department | LAST REVISION JUL 2018 | RESTRAINED JOINT STANDARD FOR BENDS, PLUGS, CAPS, AND VALVES | 2.11

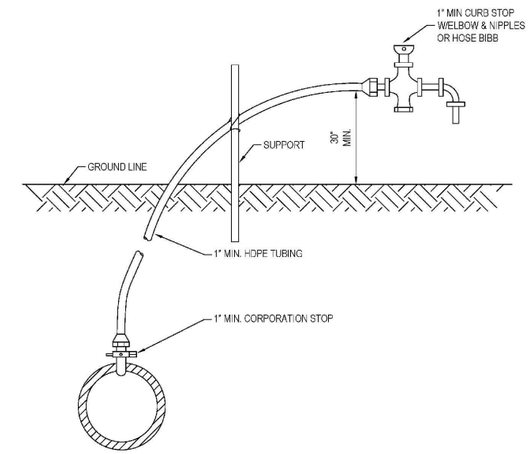


FITTING SIZE	RESTRAIN (LF)		UNRESTRAINED STRAIGHT RUN (LF)
	TEE "A"	REDUCER "B"	REDUCER "C"
4x4	31	*	*
6x4	14	50	74
6x6	60	*	*
8x4	A.T.	91	178
8x6	48	54	70
8x8	90	*	*
12x4	A.T.	155	455
12x6	24	130	260
12x8	71	95	144
12x12	143	*	*
16x6	A.T.	151	401
16x8	34	130	265
16x12	96	76	103
16x16	148	*	*
20x6	A.T.	195	659
20x8	18	180	461
20x12	85	136	233
20x16	139	76	96
20x20	186	*	*
24x6	A.T.	236	971
24x8	A.T.	224	700
24x12	74	188	391
24x16	130	139	215
24x20	180	76	93
24x24	224	*	*
30x6	A.T.	293	1534
30x8	A.T.	283	1130
30x12	56	255	678
30x16	118	216	426
30x20	169	168	260
30x24	215	108	138
30x30	275	*	*
36x6	A.T.	345	2230
36x8	A.T.	336	1660
36x12	38	314	1030
36x16	104	283	689
36x20	159	244	466
36x24	206	195	306
36x30	269	108	133
36x36	326	*	*
A.T. = RESTRAINT REQUIRED AT TEE ONLY. * = NOT APPLICABLE			

NOTES:

1. THIS TABLE IS BASED ON:
   a. MAXIMUM TEST PRESSURE OF 190 PSI
   b. LAYING CONDITION TYPE 2 (SEE DETAILS 2.01 AND 2.02)
   c. POOR SOIL CONDITIONS
   d. USING D.I.P.
   e. 3 FEET OF COVER FOR 12" AND SMALLER MAINS; 4 FEET OF COVER FOR 16" AND LARGER MAINS
   f. HORIZONTAL BENDS ONLY - ENGINEER TO SUBMIT CALCULATIONS FOR VERTICAL RESTRAINTS
2. RESTRAINT FOR REDUCERS: IF "C" STRAIGHT RUN OF PIPE DOWNSTREAM OF REDUCER NOT AVAILABLE, THE RESTRAIN "B" UPSTREAM OF REDUCER.
3. "RESTRAINED" PIPE SHALL BE MANUFACTURED RESTRAINED JOINT PIPE, PUSH-ON JOINT PIPE RESTRAINED W/GASKET-TYPE "GRIPPER RESTRAINTS", OR MECHANICAL JOINT PIPE RESTRAINED BY MEGALUG (OR APPROVED EQUIVALENT).
4. ANY ADDITIONAL FITTINGS WITHIN THE RESTRAINED SECTION SHALL BE RESTRAINED ACCORDINGLY.

City of Tampa Florida Water Department | LAST REVISION JUL 2018 | RESTRAINED JOINT STANDARD FOR TEES AND REDUCERS | 2.12A



NOTES:

1. WATER OUTLET SHALL BE HELD UP OFF THE GROUND SO AS NOT TO INTERFERE WITH THE SAMPLING PROCESS.
2. CORPORATION STOP TO BE REMOVED AND BRASS PLUG INSTALLED IN TAPPED MAIN AFTER OPERATION.

City of Tampa Florida Water Department | LAST REVISION JUL 2018 | TEMPORARY SAMPLE TAP INSTALLATION W/DI, CI, OR PVC PIPE | 2.18A

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

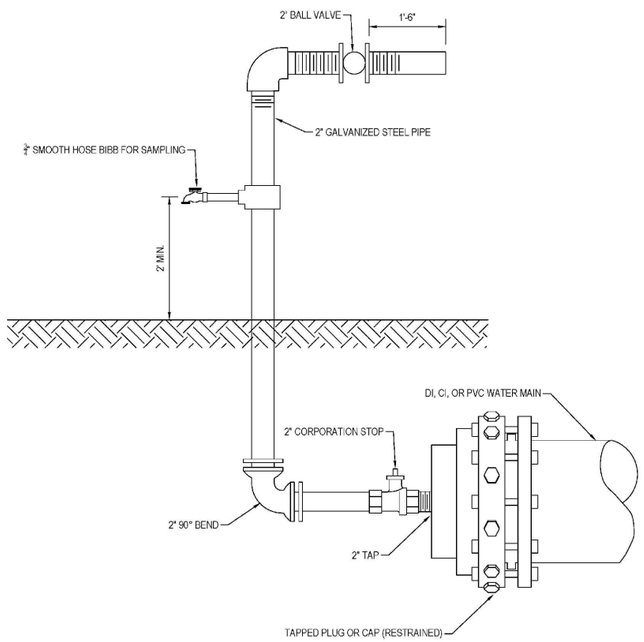
DAVIS ISLAND WATER MAIN REPLACEMENT CIP

WTR-18-0001 DETAILS - SHEET 26

City of Tampa Florida Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 26 OF 31

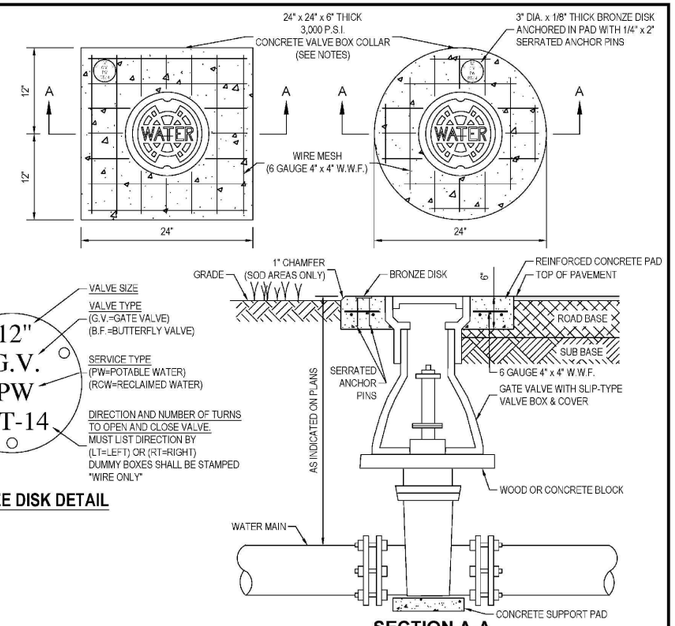
K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001 Details.dwg Jan 09, 2020 - 7:20am



NOTES:

1. FOR DEAD-END MAINS, SAMPLE TAP TO BE INSTALLED ON A 2" TAPPED CAP/PLUG.
2. FLUSHING/SAMPLING ARRANGEMENT TO BE REMOVED AFTER DISINFECTION OF MAIN LINE.
3. AFTER OPERATION COMPLETE, INSTALL BRASS PLUG AT CORPORATION STOP.

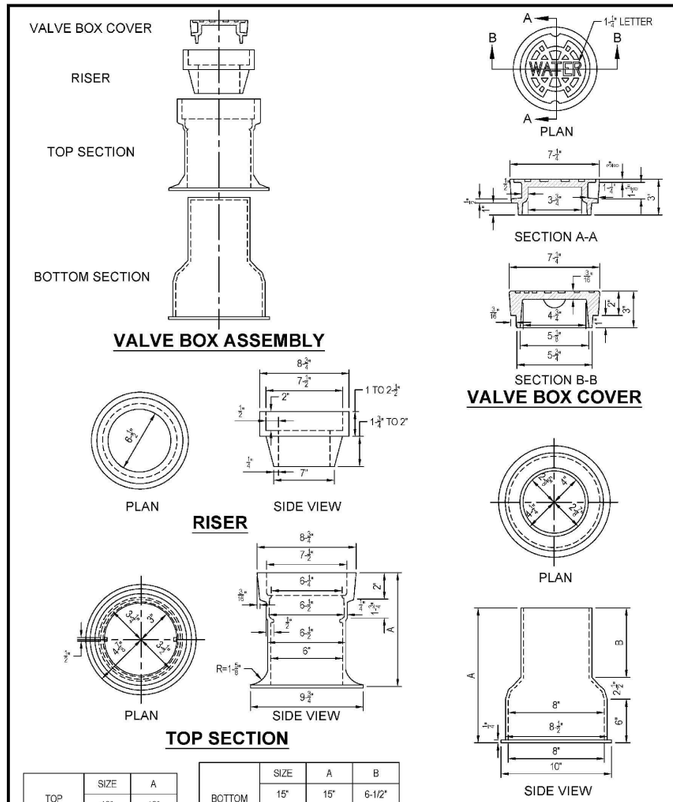
City of Tampa Florida Water Department	LAST REVISION JUL 2018	TEMPORARY SAMPLE TAP INSTALLATION FOR END OF LINE W/DI, CI, OR PVC PIPE	2.19A



NOTES :

1. CIRCULAR OR SQUARE CONCRETE PAD REQUIRED FOR ALL VALVE BOX INSTALLATIONS.
2. CAST IRON VALVE BOXES SHALL BE FIRMLY SUPPORTED AND CENTERED AND PLUMB OVER THE OPERATING NUT OF THE VALVE. VALVE BOX COVER SHALL BE FLUSH WITH THE SURFACE OF THE FINISHED PAVEMENT, OR GRADE OR AT SUCH OTHER LEVEL AS MAY BE DIRECTED BY THE DEPARTMENT.
3. "BLUE" WATER VALVE LOCATE MARKERS REQUIRED FOR ALL VALVE INSTALLATIONS.
4. EMBED BRONZE VALVE INFO DISK INTO CONCRETE VALVE BOX COLLAR.
5. ALL MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST T.W.D. APPROVED MATERIAL SPECIFICATIONS.
6. IF VALVE IS LOCATED WITHIN A SIDEWALK CONCRETE COLLAR MAY BE ELIMINATED AND DISK SET FLUSH DIRECTLY IN SIDEWALK.
7. BRONZE DISK REQUIRED FOR ALL VALVES AND DUMMY BOXES.

City of Tampa Florida Water Department	LAST REVISION JUL 2018	VALVE INSTALLATION W/VALVE BOX & PAD FOR DI OR CI PIPE	3.01



TOP SECTION	SIZE	A
	10"	10"
	16"	16"

BOTTOM SECTION	SIZE	A	B
	15"	15"	6-1/2"
	24"	24"	15-1/2"
	36"	36"	27-1/2"

City of Tampa Florida Water Department	LAST REVISION JUL 2018	VALVE BOX, SLIP TYPE	3.04

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

WTR-18-0001 DETAILS - SHEET 27

City of Tampa Florida Water Department

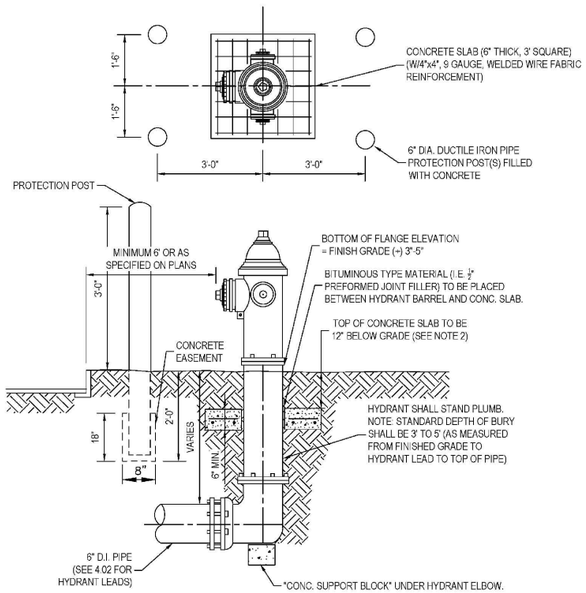
100% PLANS

WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 27 OF 31

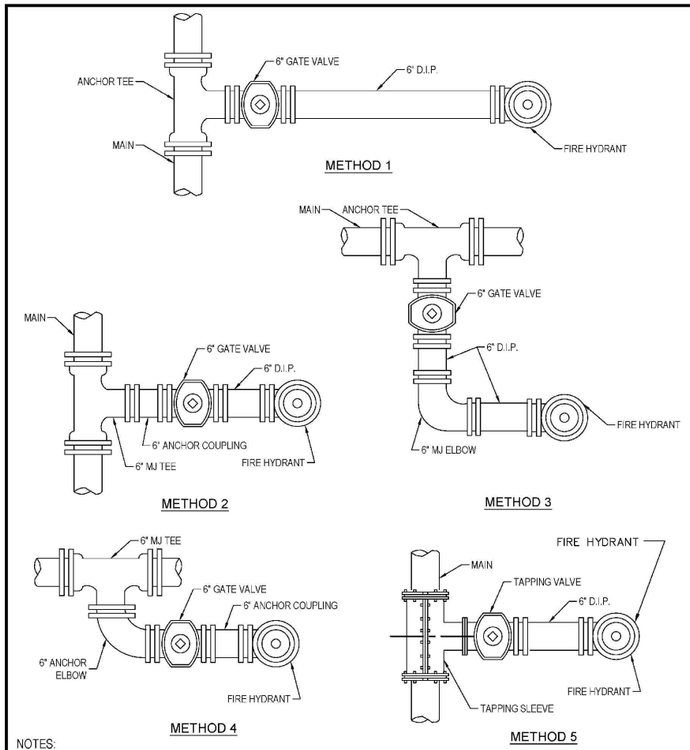
K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001 Details.dwg Jan 09, 2020 - 7:20am



NOTES:

1. FIRE HYDRANT BARREL ABOVE THE GROUND LINE SHALL BE PAINTED WITH A HIGH-GRADE ENAMEL PAINT, FEDERAL SAFETY YELLOW (OSHA APPROVED), AND THE HYDRANT BONNET SHALL BE PAINTED OSHA GREEN.
2. CONCRETE SLAB MAY BE ELIMINATED IN AREAS WHERE HYDRANT IS SET IN SIDEWALK AND SIDEWALK HAS BEEN INSTALLED PRIOR TO FINAL ACCEPTANCE OF THE HYDRANT.
3. THRUST RESTRAINT FOR HYDRANT:
   a) HYDRANT SHALL BE FIRMLY SUPPORTED UNDER ELBOW IN ALL METHODS BY SUPPORT BLOCK
   b) ALL BACKFILL SHALL BE THOROUGHLY COMPACTED UNDER SUPPORT BLOCK AND UNDER THRUST COLLAR
   c) ALL HYDRANT LEADS SHALL BE RESTRAINED BY MEGALUGS OR EQUIVALENT MECHANICAL RESTRAINTS
4. PROTECTION POSTS ARE REQUIRED WHEN HYDRANT IS LESS THAN 6 FEET FROM EDGE OF PAVEMENT, OR AS DIRECTED BY THE ENGINEER.
5. FOR PVC MAINS, INSTALL CONCRETE SUPPORT BLOCK UNDER ALL HYDRANT TEES.

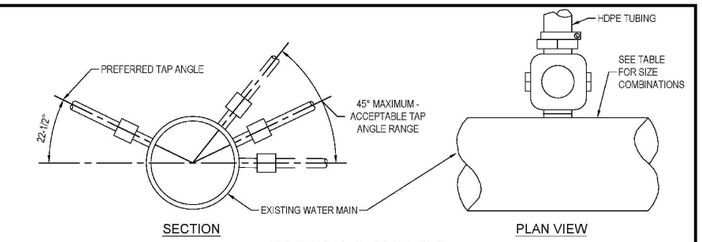
City of Tampa Florida Water Department	LAST REVISION JUL 2018	FIRE HYDRANT INSTALLATION	4.01



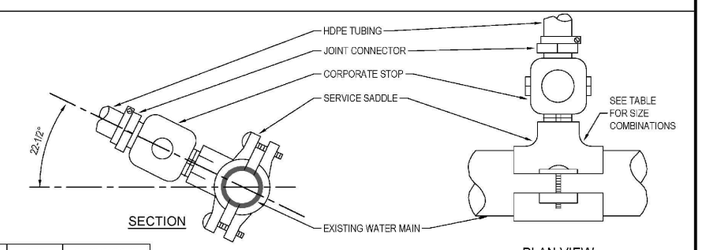
NOTES:

1. VALVE SHALL BE SET IN ACCORDANCE WITH DETAIL 3.01. FOR HYDRANT SET, SEE DETAIL 4.01.
2. ALL VALVES SHALL BE ANCHORED TO BRANCH OF TEE ON ALL HYDRANT INSTALLATIONS.
3. ALL HYDRANT LEADS SHALL BE RESTRAINED BY MEGALUGS OR EQUIVALENT.
4. FOR PVC MAINS, INSTALL CONCRETE SUPPORT BLOCK UNDER HYDRANT TEES.

City of Tampa Florida Water Department	LAST REVISION JUL 2018	FIRE HYDRANT METHODS OF INSTALLATION	4.02



DIRECT TAP DETAIL



SADDLE TAP DETAIL

PIPE	SIZE	CORP. TAP SIZE	
		1"	2"
DI/CI	12"	DT	DT
	8"	DT	SS
	6"	DT	SS
	4"	SS	SS
PVC	2", 2-1/2"	SS	NA
	8", C-900	SS	SS
	6", C-900	SS	SS
	2"-SDR21	SS	NA
OTHER*	12"	SS	SS
	10"	SS	SS
	8"	SS	SS
	6"	SS	SS
	4"	SS	NA
	3"	SS	NA
	2", 2-1/2"	SS	NA

LEGEND
DT- DIRECT TAP CAN BE ALLOWED SS- SERVICE SADDLE IS REQUIRED NA- NOT ALLOWED
*ASBESTOS CEMENT, STEEL, GALVANIZED IRON PIPE, NON STD PVC, ETC.

City of Tampa Florida Water Department	LAST REVISION JUL 2018	TAPPING DETAIL FOR 3/4", 1", 1-1/2" & 2" W/DI, CI, OR PVC PIPE	5.01A

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

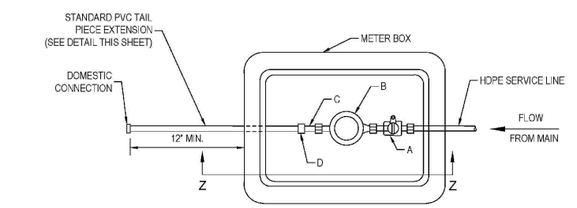
DAVIS ISLAND WATER MAIN REPLACEMENT CIP

WTR-18-0001 DETAILS - SHEET 28

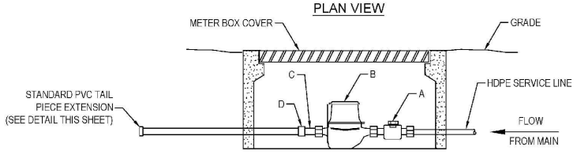
City of Tampa Florida Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 28 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001 Details.dwg Jan 09, 2020 - 7:20am

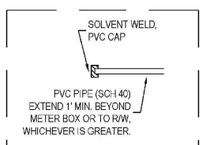


PLAN VIEW



SECTION Z-Z

METER INSTALLATION PARTS LIST	
ITEM	DESCRIPTION
A	HDPE CJ X METER, SWIVEL NUT (CURB STOP)
B	METER
C	BRASS METER COUPLING
D	*PVC FIP X WELD COUPLING

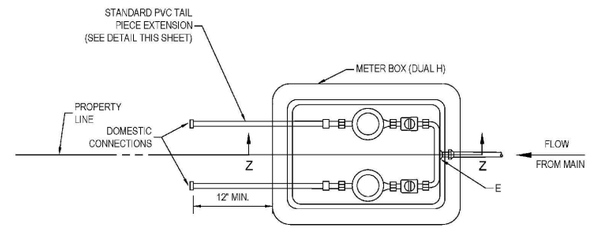


STD. TAIL PIECE EXTENSION

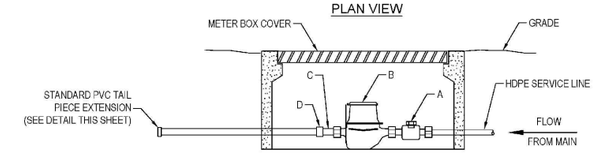
* ALL PVC PIPE AND FITTINGS SHALL BE SCH 80 EXCEPT FOR STANDARD TAIL PIECE SECTION WHICH WILL BE SCH 40.

NOTE: PARTS LIST IS FOR STANDARD INSTALLATION; ACTUAL PARTS REQUIRED MAY VARY AS DIRECTED BY THE ENGINEER.

City of Tampa Florida Water Department	LAST REVISION JUL 2018	SINGLE METER SET DETAIL 3/4", 1", 1-1/2", 2"	5.02

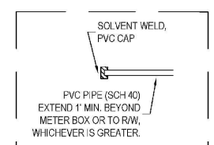


PLAN VIEW



SECTION Z-Z

METER INSTALLATION PARTS LIST	
ITEM	DESCRIPTION
A	FIP CURB X METER, SWIVEL NUT (CURB STOP)
B	METER
C	METER COUPLING
D	*PVC FIP X WELD COUPLING
E	MIP X HDPE CJ BRANCH COUPLING

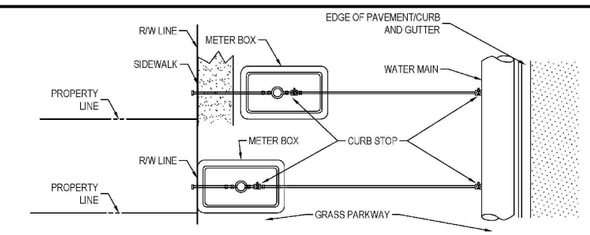


STD. TAIL PIECE EXTENSION

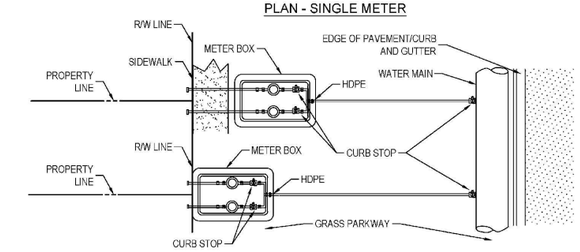
* ALL PVC PIPE AND FITTINGS SHALL BE SCH 80 EXCEPT FOR STANDARD TAIL PIECE SECTION WHICH WILL BE SCH 40.

NOTE: PARTS LIST IS FOR STANDARD INSTALLATION; ACTUAL PARTS REQUIRED MAY VARY AS DIRECTED BY THE CITY ENGINEER.

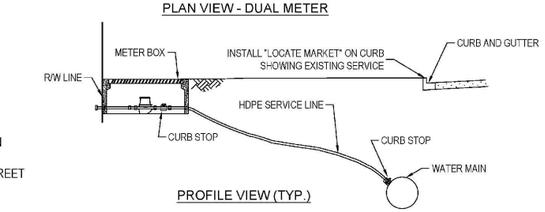
City of Tampa Florida Water Department	LAST REVISION JUL 2018	DUAL METER SET DETAIL 3/4" & 1"	5.03



PLAN - SINGLE METER



PLAN VIEW - DUAL METER



PROFILE VIEW (TYP.)

DO NOT INSTALL METER WITHIN SIDEWALK. WHEN SIDEWALK EXISTS, INSTALL METER ON STREET SIDE OF SIDEWALK OR WHERE DIRECTED BY CITY ENGINEER.

SINGLE METER SIZE (INCHES)	SERVICE LINE SIZE (INCHES) (0-15')
3/4	1
1	1
1 1/2	2
2*	2

* LINE SIZE APPLICABLE FOR DCCVA

DUAL METER SIZE (INCHES)	SERVICE LINE SIZE (INCHES) (0-15')
3/4	2
1	2
1 1/2	N/A
2*	N/A

(FEET REFER TO DISTANCE FROM WATER MAIN TO METER)

City of Tampa Florida Water Department	LAST REVISION JUL 2018	SINGLE & DUAL METERED SERVICE - SHORT SIDE 3/4", 1", 1-1/2" & 2"	5.04A

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

DAVIS ISLAND WATER MAIN REPLACEMENT CIP

WTR-18-0001 DETAILS - SHEET 29

City of Tampa Florida Water Department

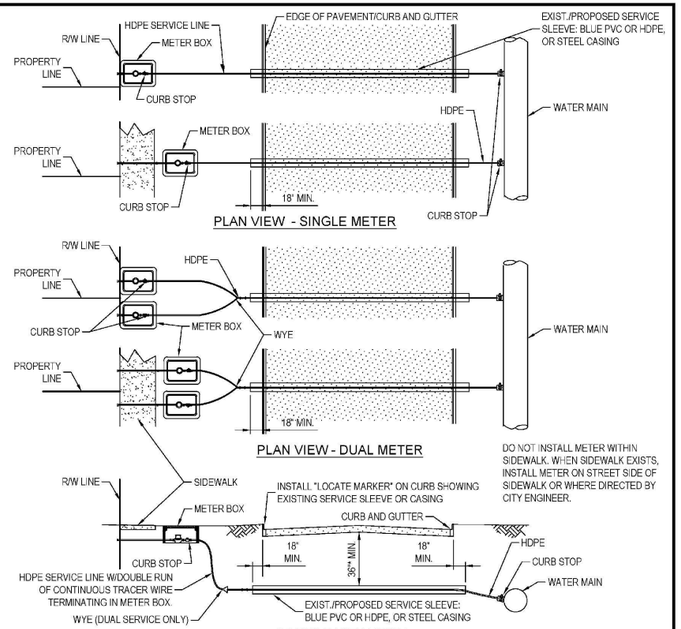
100% PLANS

WORK ORDER NO. WTR-18-0001

RECORD DRAWING NO.

ATLAS PAGE J-12 SHEET 29 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001 Details.dwg, Jan 09, 2020 - 7:20am



DO NOT INSTALL METER WITHIN SIDEWALK. WHEN SIDEWALK EXISTS, INSTALL METER ON STREET SIDE OF SIDEWALK OR WHERE DIRECTED BY CITY ENGINEER.

CASING SPECIFICATION:
1. IF PUSHED-SCH 40 STEEL PIPE (MIN.)
2. IF LAYED IN OPEN TRENCH-SCH 40 STEEL PIPE OR SCH 80 PVC SOLVENT WELD PIPE.

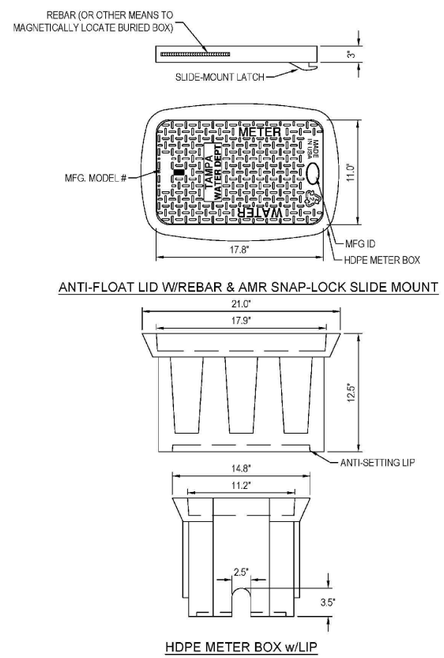
SINGLE METER SIZE (INCHES)	SERVICE LINE SIZE (INCHES)		CASING SIZE (INCHES)
	(15'-80')	(80'-150')	
3/4	1	2	2 / 4
1	1	2	4
1 1/2	2	2	4
2**	4" D.I.P.	4" D.I.P.	12

(FEET REFER TO DISTANCE FROM WATER MAIN TO METER)

* OR GREATER, IF REQUIRED BY ROW CONTROLLING AGENCY
** LINE SIZES APPLICABLE FOR 2" DDCV

DUAL METER SIZE (INCHES)	SERVICE LINE SIZE (INCHES)		CASING SIZE (INCHES)
	(15'-80')	(80'-150')	
3/4	2	2	4
1	2	4" D.I.P.	4 / 12
1 1/2	N/A	N/A	N/A
2*	N/A	N/A	N/A

City of Tampa Florida Water Department	LAST REVISION JUL 2018	SINGLE & DUAL METERED SERVICE - LONG SIDE 3/4", 1", 1-1/2" & 2"	5.05A



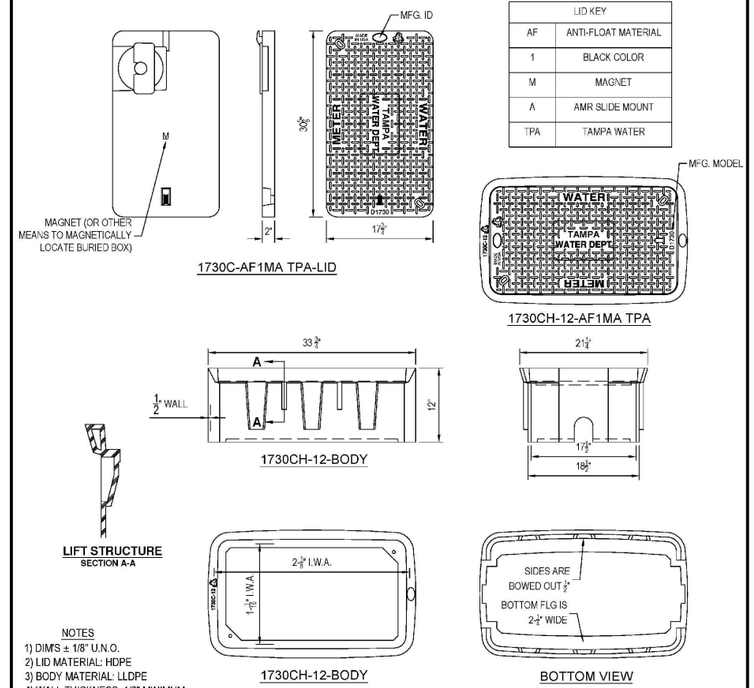
#37 HDPE METER BOX W/COVER

N.T.S.

City of Tampa Florida Water Department	LAST REVISION JUL 2018	3/4" OR 1" SINGLE SERVICE HDPE METER BOX	5.10

BODY KEY	
H	HEAVY WALL, $\frac{1}{2}$"

LID KEY	
AF	ANTI-FLOAT MATERIAL
1	BLACK COLOR
M	MAGNET
A	AMR SLIDE MOUNT
TPA	TAMPA WATER



NOTES
1) DIM'S ± 1/8" U.N.O.
2) LID MATERIAL: HDPE
3) BODY MATERIAL: LLDPE
4) WALL THICKNESS: 1/2" MINIMUM
5) I.W.A. = INSIDE WORK AREA.
6) SNAP LOCK POCKET WILL RECEIVE AMR/AMI DEVICE ENDPOINT. SNAP LOCK SLOT IS 1.80" ± .015" TO ALLOW FOR A FINGER FORCE INSTALL. POCKET HEIGHT IS 15/16" FOR MIN 1/8" AIR GAP.

#66 HDPE METER BOX W/COVER

N.T.S.

City of Tampa Florida Water Department	LAST REVISION JUL 2018	1-1/2" & 2" SINGLE SERVICE HDPE METER BOX	5.12

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

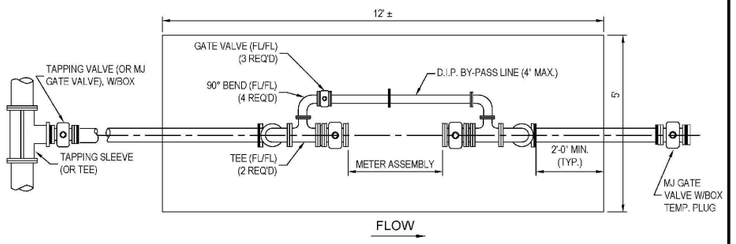
DAVIS ISLAND WATER MAIN REPLACEMENT CIP

WTR-18-0001 DETAILS - SHEET 30

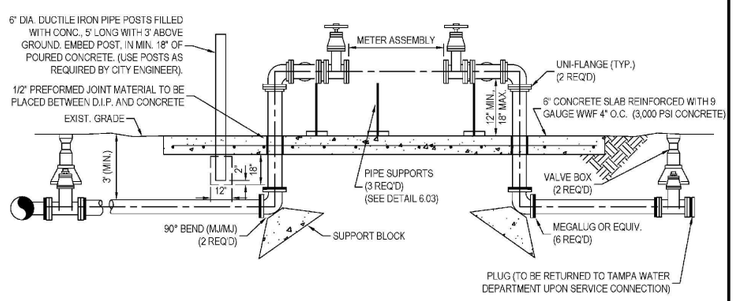
City of Tampa Florida Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 30 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001 Details.dwg Jan 09, 2020 - 7:21am

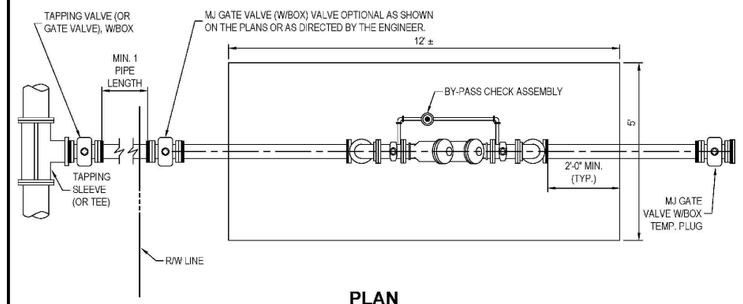


PLAN

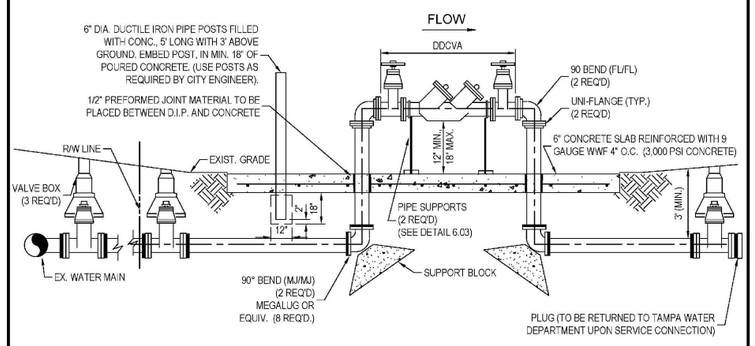


PROFILE

City of Tampa Florida Water Department	LAST REVISION JUL 2018	ABOVE GROUND LARGE METER ASSEMBLY (3" OR LARGER)	6.01

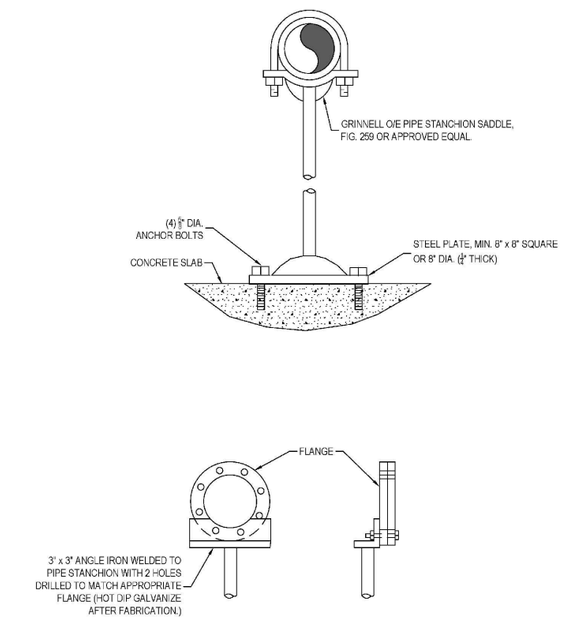


PLAN



PROFILE

City of Tampa Florida Water Department	LAST REVISION JUL 2018	ABOVE GROUND DOUBLE DETECTOR CHECK VALVE ASSEMBLY	6.02A



City of Tampa Florida Water Department	LAST REVISION JUL 2018	PIPE SUPPORTS FOR ABOVE GROUND DDCVA	6.03

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED NPP
DRAWN JDM
CHECKED RAJ
DATE 03/05/2019

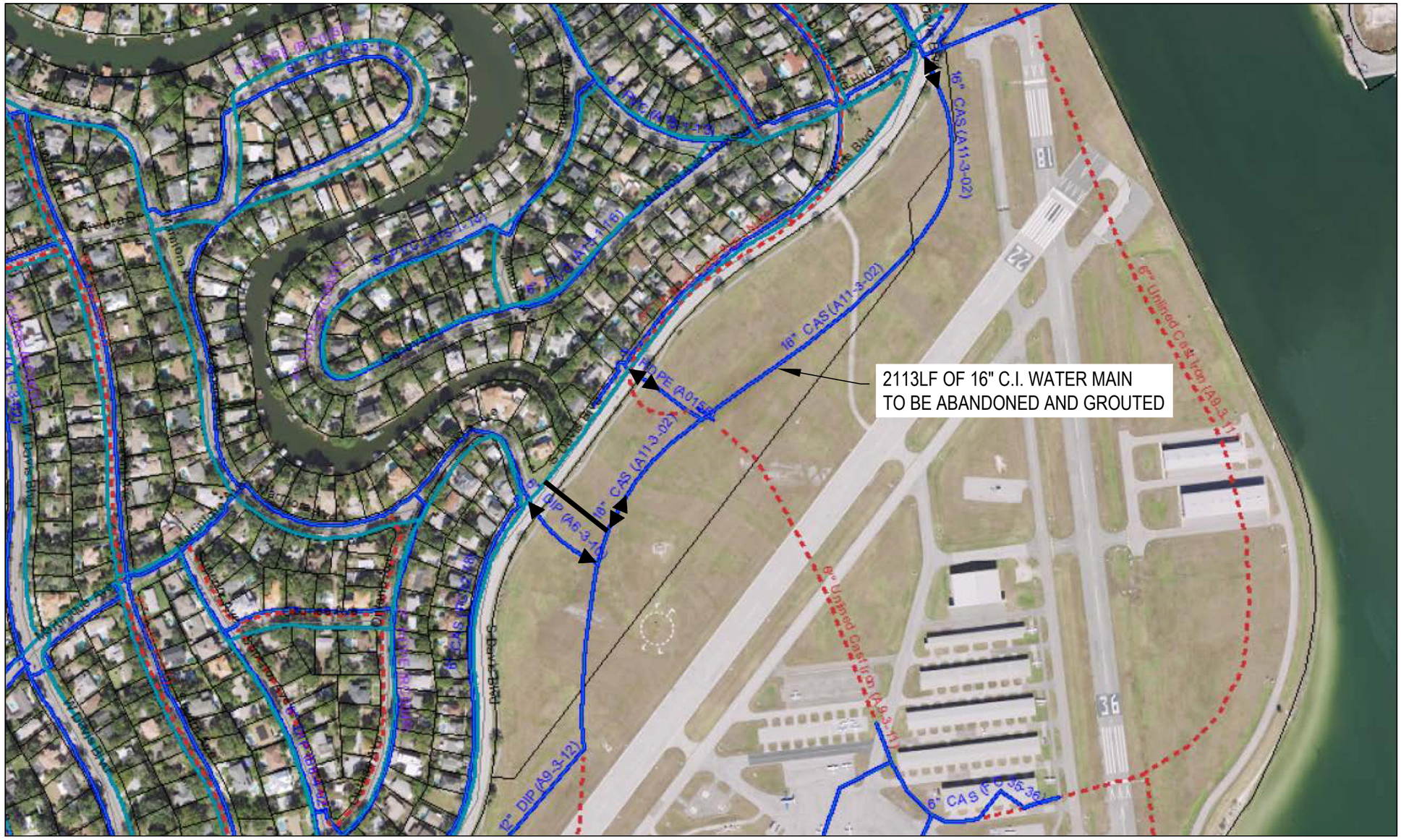
DAVIS ISLAND WATER MAIN REPLACEMENT CIP

WTR-18-0001 DETAILS - SHEET 31

City of Tampa Florida Water Department

100% PLANS
WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 31 OF 31

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001 Details.dwg, Jan 09, 2020 - 7:21am



LEGEND

◀ ▶ CUT & PLUG

Davis Island Airport

RORY A. JONES, P.E.
CITY OF TAMPA WATER DEPT.
306 E. JACKSON ST., 5E
TAMPA, FLA. 33602
P.E. #79453

REV NO.	DATE	DESCRIPTION	BY
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

DESIGNED _____
DRAWN _____
CHECKED _____
DATE _____

DAVIS ISLAND WATER MAIN
REPLACEMENT CIP

EXHIBIT 1

City of Tampa Florida
Water Department

WORK ORDER NO. WTR-18-0001
RECORD DRAWING NO.
ATLAS PAGE J-12 SHEET 01 OF 1

K:\Projects\WTR\FY18\WTR-18-0001 Davis Island Water Main Replacement\02-Design\Drawings\01-Dwg\02-Sheets\2018\WTR-18-0001.dwg Jan 21, 2020 - 9:42am