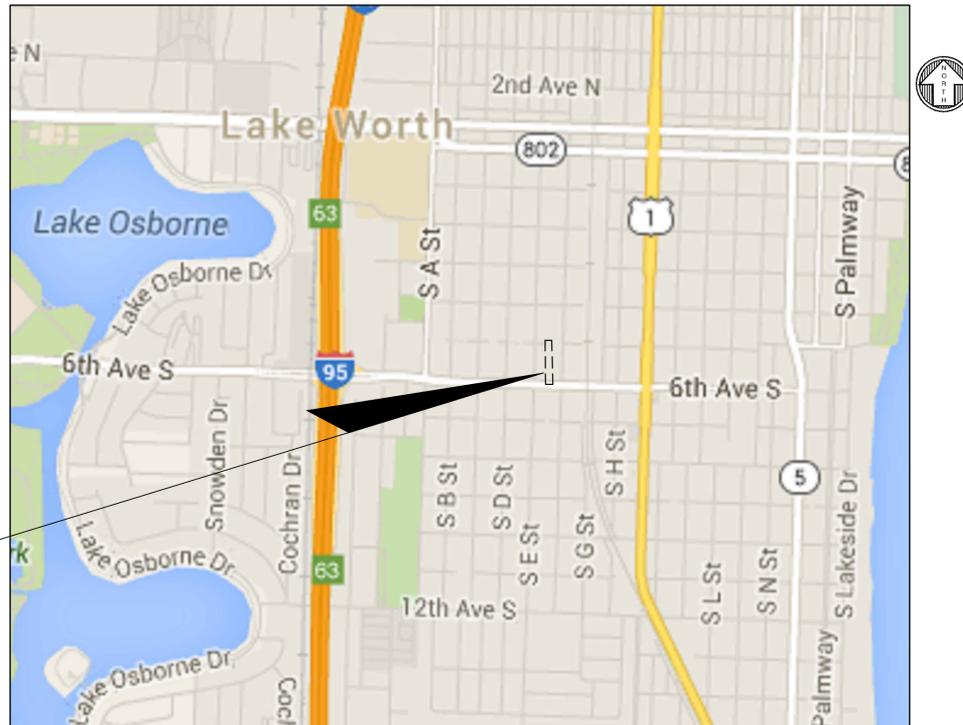


# WATER & SEWER REPLACEMENT FROM 5TH TO 6TH AVE. SOUTH IN ALLEY BETWEEN E & F ST.

## BID DRAWING SET

### CITY OF LAKE WORTH

### PALM BEACH COUNTY, FLORIDA



PROJECT LOCATION

LOCATION MAP

SECTION 28, TOWNSHIP 44, RANGE 43

PREPARED FOR:

## CITY OF LAKE WORTH

CITY COMMISSION

**PAM TRIOLO, MAYOR**  
**SCOTT MAXWELL, VICE MAYOR**  
**CHRISTOPHER McVOY**  
**ANDY AMOROSO**  
**RYAN MAIER**

Matthew J. Cigale  
Florida P.E. No. 74584

SHEET INDEX		
SHEET NO.	DESCRIPTION	REV
C-1	COVER SHEET	
C-2	GENERAL NOTES & SPECIFICATIONS	
C-3	WATER & SEWER PLAN	
C-4	WATER DETAILS	
C-5	WATER DETAILS	
C-6	SANITARY SEWER DETAILS	
C-7	SANITARY SEWER DETAILS	
C-8	TYPICAL SECTIONS	

REV. #	DESCRIPTION	DATE
1	COVER SHEET	

**CrAVEN • THOMPSON AND ASSOCIATES, INC.**  
ENGINEERS • PLANNERS • SURVEYORS  
3563 N.W. 53RD STREET, FORT LAUDERDALE, FLORIDA 33309  
FAX: (954) 739-6409 TEL.: (954) 739-6400  
FLORIDA LICENSED ENGINEERING, SURVEYING & MAPPING BUSINESS No. 271  
FLORIDA LICENSED LANDSCAPE ARCHITECTURE BUSINESS No. C000114

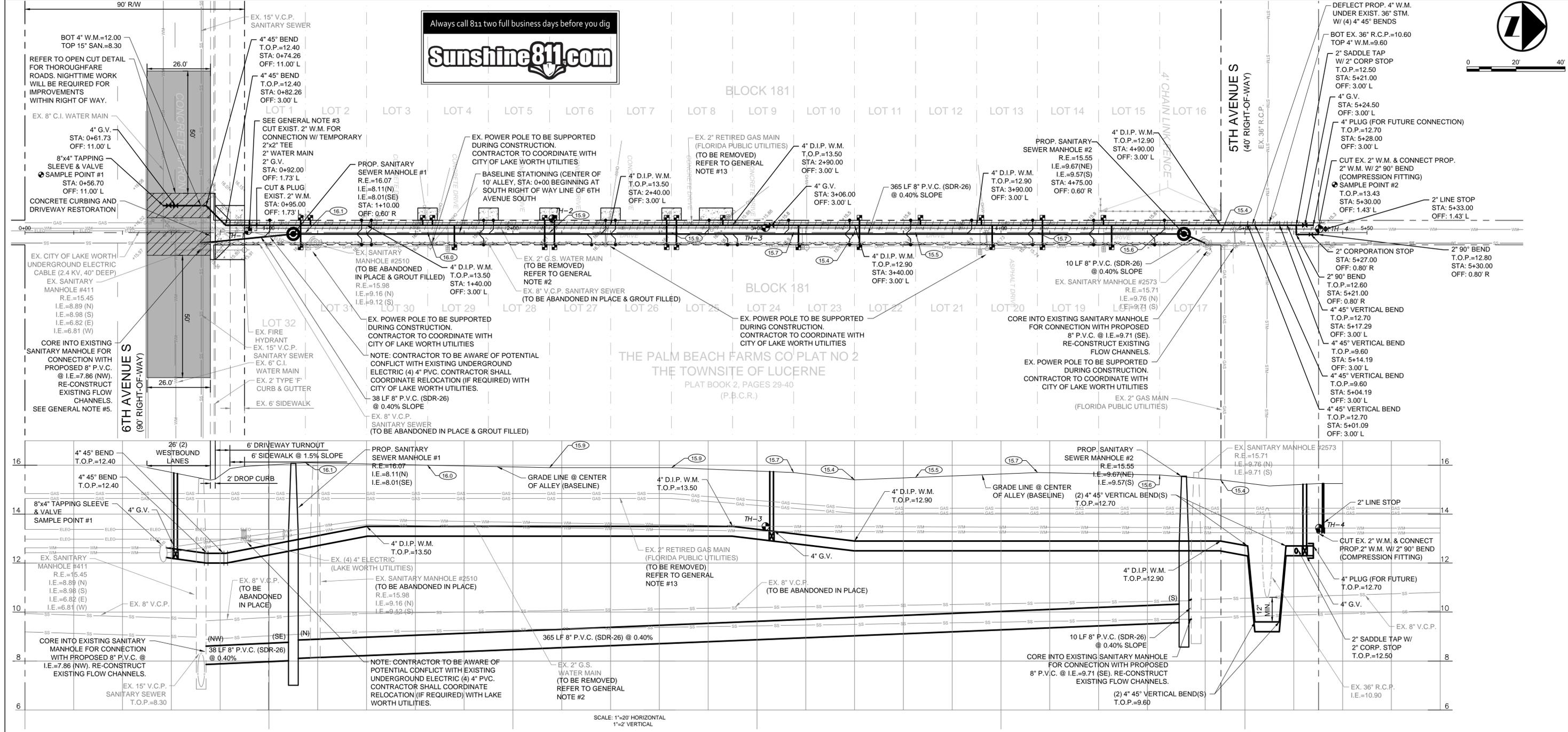
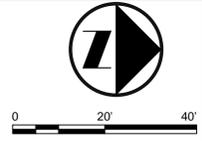


MATERIAL SHOWN HEREON IS THE PROPERTY OF CRAVEN THOMPSON & ASSOCIATES, INC. AND SHALL NOT BE REPRODUCED IN WHOLE OR IN PART WITHOUT PERMISSION OF CRAVEN THOMPSON & ASSOCIATES, INC. WRITING CRAVEN THOMPSON & ASSOCIATES, INC. COPYRIGHT © 2015

VERTICAL INFORMATION HEREON IS RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM (NAVD88).

**CITY PROJECT NO. LS 1605**  
**TASK ORDER NO. 7**  
**CTA PROJECT NUMBER:15-0006-001-05**

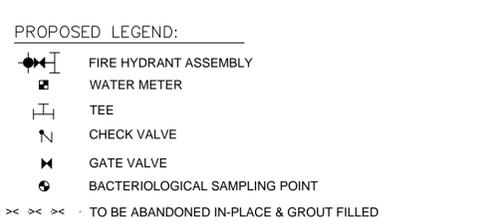
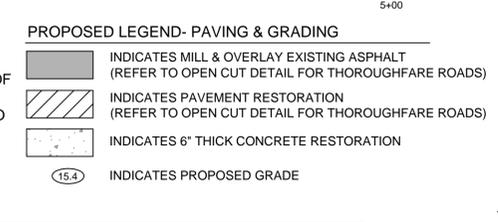




- GENERAL NOTES:**
- 1.) WATER AND SEWER SERVICE PROVIDED BY THE CITY OF LAKE WORTH.
  - 2.) THE REMOVAL OR ABANDONMENT OF EXISTING UTILITIES (WATER, SEWER, GAS, ETC.) SHALL BE COORDINATED WITH THE CONSTRUCTION, ENGINEER'S ACCEPTANCE, AND CERTIFICATION OF THE PROPOSED WATER SYSTEM. ALL EXISTING UTILITIES (WATER, SEWER, GAS, ETC.) AND DRAINAGE SERVICES MUST BE MAINTAINED BY THE CONTRACTOR THROUGHOUT THE ENTIRE DURATION OF CONSTRUCTION.
  - 3.) CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTING, COORDINATING & MAINTAINING TEMPORARY WATER MAIN AND TEMPORARY WATER SERVICES INCLUDING CONNECTING TEMPORARY WATER SERVICES TO EXISTING WATER METER. CONTRACTOR SHALL ADJUST TEMPORARY WATER MAIN AND SERVICES AS REQUIRED TO FACILITATE THE INSTALLATION OF PROPOSED WATER AND SANITARY SEWER IMPROVEMENTS.
  - 4.) CONTRACTOR SHALL COORDINATE THE SHUTDOWN OF EXISTING WATER SERVICE WITH THE CITY OF LAKE WORTH AND THE AFFECTED CITY RESIDENTS. OTHER THAN APPROVED SHUTDOWN HOURS BY THE CITY OF LAKE WORTH, EXISTING WATER SERVICE MUST BE MAINTAINED AND OPERATIONAL THROUGHOUT CONSTRUCTION.
  - 5.) SEWER FLOWS THRU EXISTING 15" SANITARY SEWER MAIN ARE SIGNIFICANT. PROPOSED CONNECTION TO EXISTING SANITARY MANHOLE WITHIN RIGHT OF WAY MAY REQUIRE BY-PASS PUMPING OR OTHER MEANS SHALL BE DETERMINED BY CONTRACTOR TO MAKE PROPOSED CONNECTION WHILE MAINTAINING SANITARY SEWER FLOWS THRU EXISTING 15" SANITARY SEWER MAIN. NIGHTTIME WORK WILL BE REQUIRED FOR IMPROVEMENTS WITH RIGHT OF WAY.
  - 6.) CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO STARTING THE WORK.

- 7.) CONTRACTOR IS REQUIRED TO OBTAIN PLUMBING PERMIT FROM CITY OF LAKE WORTH BUILDING DEPARTMENT FOR NEW WATER AND SEWER SERVICE ROUTING ON PRIVATE PROPERTY.
- 8.) CONTRACTOR IS RESPONSIBLE FOR COMPLETE RESTORATION OF EXISTING LANDSCAPING, SOD, DECORATIVE WALLS, FENCING, MAIL BOXES, ASPHALT, PAVERS, & CONCRETE DAMAGED DUE TO PROPOSED CONSTRUCTION ACTIVITIES IN OR OUT OF RIGHT OF WAY.
- 9.) CONTRACTOR TO ENSURE WATER SERVICE RECONNECTION PRIOR TO ABANDONMENT/ REMOVAL OF EXISTING WATER MAINS.
- 10.) PROPOSED METER BOX SYMBOL (M) INDICATES NEW WATER SERVICE W/ NEW METER BOX. CONTRACTOR SHALL READ & RECORD EXISTING METER READING. RELOCATE EXISTING METER TO NEWLY INSTALLED METER BOX AND WATER SERVICE.
- 11.) CONTRACTOR TO REMOVE VALVES AND VALVE BOXES FROM ALL ABANDONED AND/OR GROUT-FILLED WATER MAINS.
- 12.) EXISTING FIRE HYDRANTS DESIGNATED FOR REMOVAL SHALL BE SALVAGED AND DELIVERED TO THE CITY OF LAKE WORTH WATER UTILITIES SERVICES DEPARTMENT.
- 13.) CONTRACTOR SHALL CONTACT FLORIDA PUBLIC UTILITIES PRIOR TO THE REMOVAL OF EXISTING RETIRED GAS MAINS TO CONFIRM THAT THE GAS MAIN IS OUT OF SERVICE.

NOTE: PROPOSED WATER SERVICES AND SEWER SERVICES ARE SHOWN FOR INFORMATION ONLY. CONTRACTOR SHALL FIELD VERIFY ACTUAL LOCATIONS OF EXISTING WATER AND SEWER SERVICE LOCATIONS ON PRIVATE PROPERTY OR AT THE PROPERTY LINE PRIOR TO INSTALLATION OF NEW WATER AND SEWER SERVICE AT THE PROPOSED MAIN LINE. CONTRACTOR SHALL FIELD ADJUST PROPOSED MAIN LINE CONNECTIONS TO ACCOMMODATE EXISTING SERVICE(S). NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS WORK.



**TEST HOLE DATA**

INDICATES TEST HOLE SYMBOL AND LOCATION

TEST HOLE REPORT NO.	UTILITY FOUND	SIZE AS FOUND (IN.)	MATERIAL AS FOUND	GROUND ELEVATION	COVER ELEVATION	UTILITY / ELEVATION	COMMENTS
TH #1	ELECTRIC	4" 4"	PVC/GRAY	15.9	2.13	13.77	TOP OF PIPE
TH #2	GAS	2"	STEEL	16.2	1.36	14.84	TOP OF PIPE
TH #3	WATER	2"	STEEL	15.8	2.30	13.50	TOP OF PIPE
TH #4	WATER	2"	STEEL	15.2	1.77	13.43	TOP OF PIPE

**REVISIONS**

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE

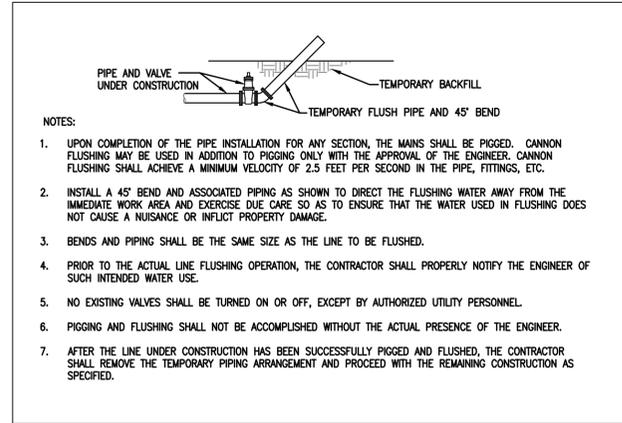
**Craven • Thompson and Associates, Inc.**  
 ENGINEERS • PLANNERS • SURVEYORS  
 3563 N.W. 33RD STREET, FORT LAUDERDALE, FLORIDA 33309  
 FAX: (854) 739-6409 TEL: (854) 739-6400  
 FLORIDA LICENSED ENGINEERING, SURVEYING & MAPPING BUSINESS No. 271  
 FLORIDA LICENSED LANDSCAPE ARCHITECTURE BUSINESS No. C000114

WATER & SEWER REPLACEMENT FROM 5TH TO 6TH AVE. SOUTH IN ALLEY BETWEEN E & F ST.  
 PREPARED FOR:  
 CITY OF LAKE WORTH

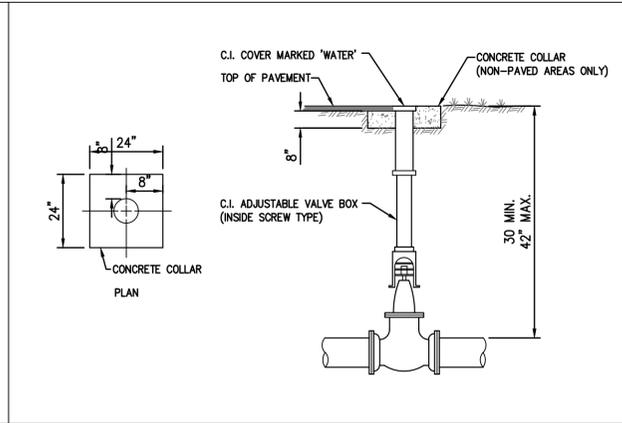
**WATER AND SEWER PLAN**  
 SHEET NO. C-3  
 Matthew J. Cigale  
 Florida P.E. No. 74584  
 CTA JOB No. 15-0006-001-05

R:\Engineering\2015\15-0006-001-Lake Worth Continuing Services\005-5th to 6th Water & Sewer- TO#7\Drawings\15-0006-001-05-WATER DET.dwg [C-4] Dec 01, 2015 1:44pm MCGALE

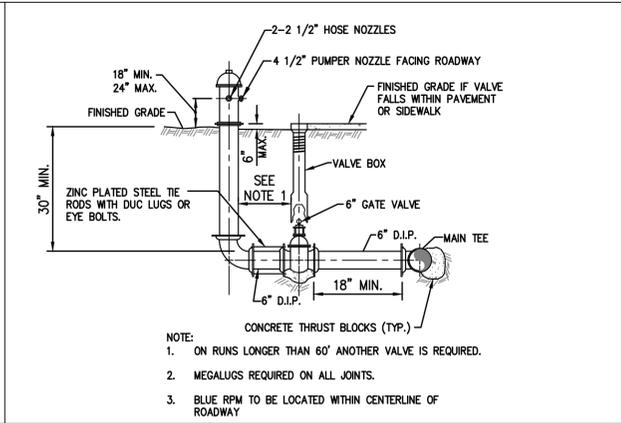
DATE: Dec 01, 2015 - 1:44pm R:\Engineering\2015\15-0006-001-Lake Worth Continuing Services\005-5th to 6th Water & Sewer- TO#7\Drawings\15-0006-001-05-WATER DET.dwg



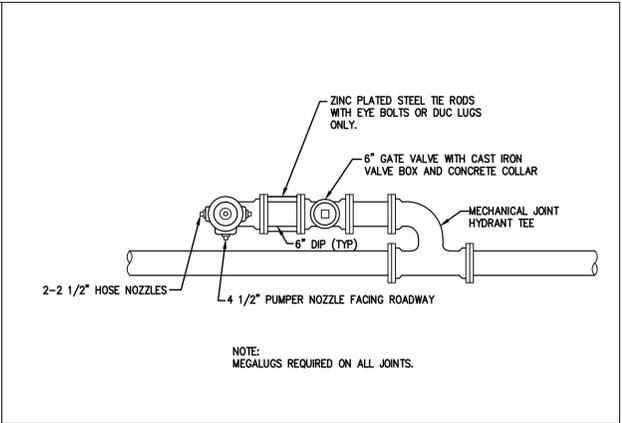
PIGGING AND CANNON FLUSHING



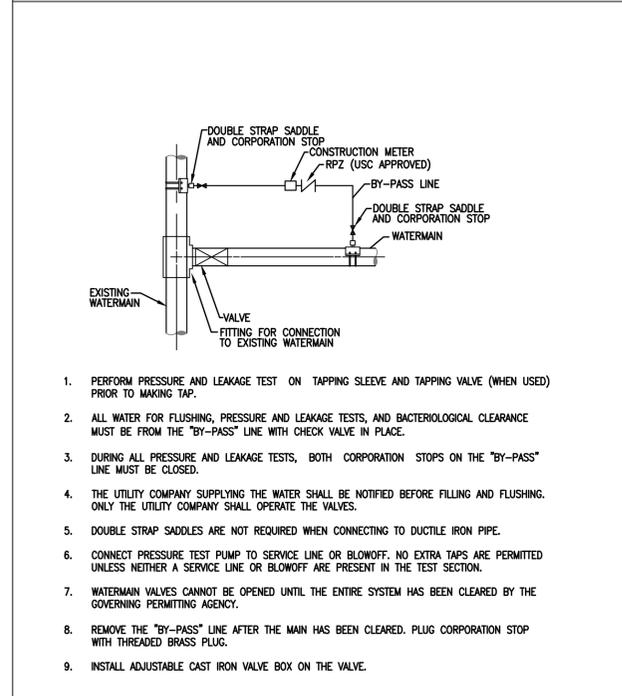
VALVE SETTING



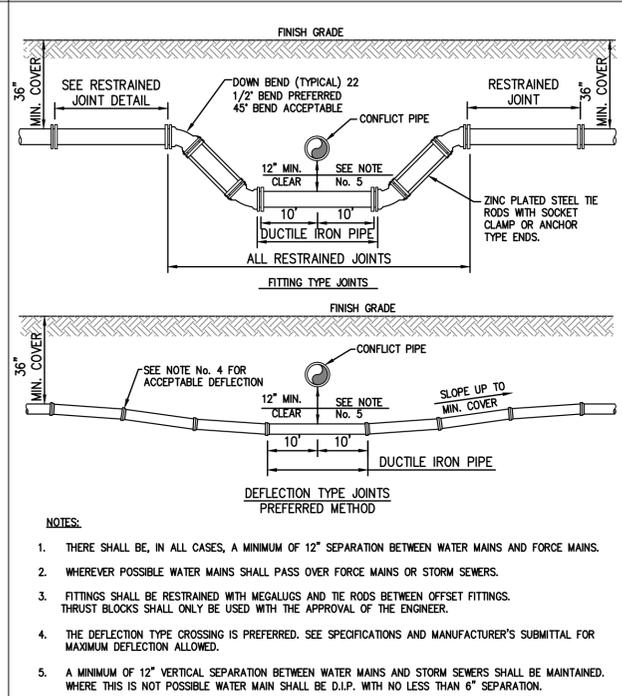
FIRE HYDRANT INSTALLATION



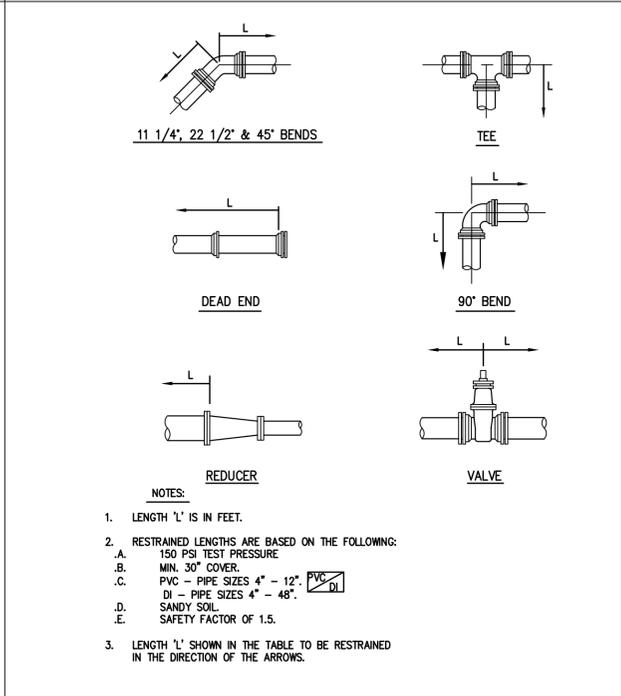
FIRE HYDRANT INSTALLATION PARALLEL TO WATERMAIN



DOUBLE VALVE CONNECTION



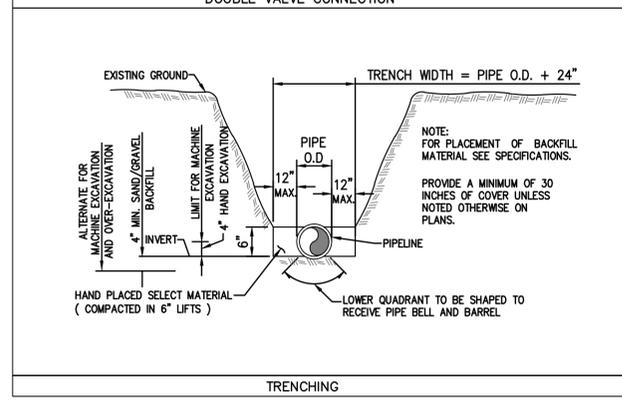
PRESSURE PIPE CONFLICT



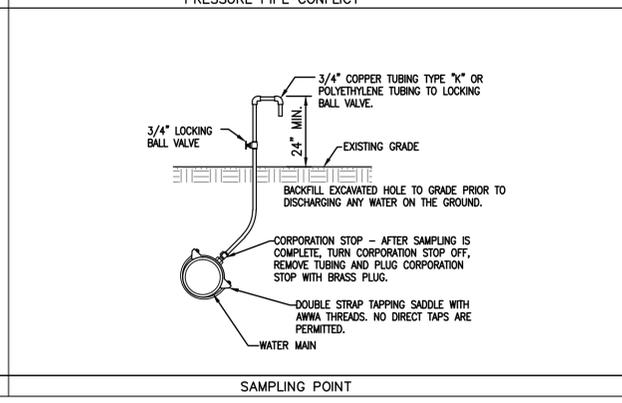
RESTRAINED PIPE JOINTS

FITTING TYPE	PIPE SIZE															
	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"	48"		
90° HORIZ. BEND	17	24	33	43	54	66	79	93	107	122	138	154	171	188		
45° HORIZ. BEND	17	24	33	43	54	66	79	93	107	122	138	154	171	188		
22.5° HORIZ. BEND	3	4	5	6	7	8	9	10	11	12	14	16	18	19		
11.25° HORIZ. BEND	2	3	4	5	6	7	8	9	10	11	13	15	17	18		
45° VERT. OFFSET	19	27	37	48	60	73	87	102	117	133	150	167	185	203		
22.5° VERT. OFFSET	5	7	9	11	13	15	17	19	21	23	27	32	37	41		
11.25° VERT. OFFSET	3	4	5	6	7	8	9	10	11	12	14	16	18	21		
DEAD END AND INLINE VALVE	46	65	85	106	128	151	175	200	226	253	281	310	340	370		
TEE (BRANCH RESTRAINT)	14"x	1	1	1	1	1	1	1	1	1	1	1	1	1		
	16"x	1	1	1	1	1	1	1	1	1	1	1	1	1		
	18"x	1	1	1	1	1	1	1	1	1	1	1	1	1		
	20"x	1	1	1	1	1	1	1	1	1	1	1	1	1		
	24"x	1	1	1	1	1	1	1	1	1	1	1	1	1		
	30"x	1	1	1	1	1	1	1	1	1	1	1	1	1		
	36"x	1	1	1	1	1	1	1	1	1	1	1	1	1		
	42"x	1	1	1	1	1	1	1	1	1	1	1	1	1		
	48"x	1	1	1	1	1	1	1	1	1	1	1	1	1		
	REDUCER (LARGER PIPE RESTRAINT)	14"x	1	1	1	1	1	1	1	1	1	1	1	1	1	
		16"x	1	1	1	1	1	1	1	1	1	1	1	1	1	
		18"x	1	1	1	1	1	1	1	1	1	1	1	1	1	
20"x		1	1	1	1	1	1	1	1	1	1	1	1	1		
24"x		1	1	1	1	1	1	1	1	1	1	1	1	1		
30"x		1	1	1	1	1	1	1	1	1	1	1	1	1		
36"x		1	1	1	1	1	1	1	1	1	1	1	1	1		
42"x		1	1	1	1	1	1	1	1	1	1	1	1	1		
48"x		1	1	1	1	1	1	1	1	1	1	1	1	1		

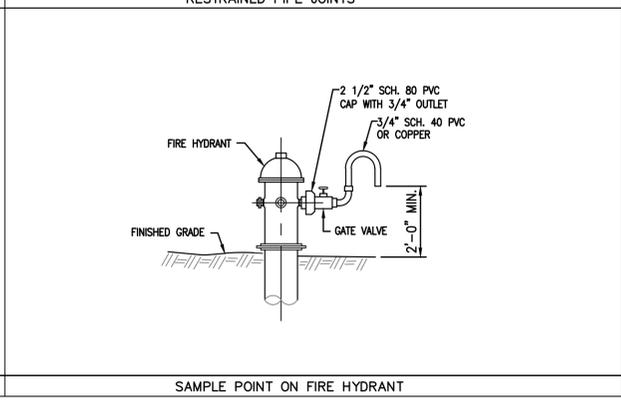
MECHANICAL THRUST RESTRAINT - MINIMUM PIPE LENGTHS



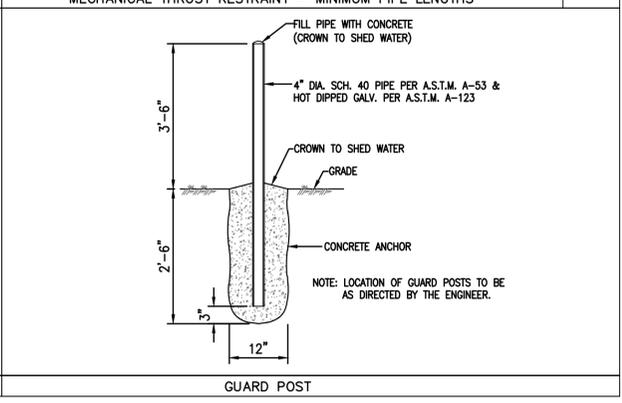
TRENCHING



SAMPLING POINT



SAMPLE POINT ON FIRE HYDRANT



GUARD POST

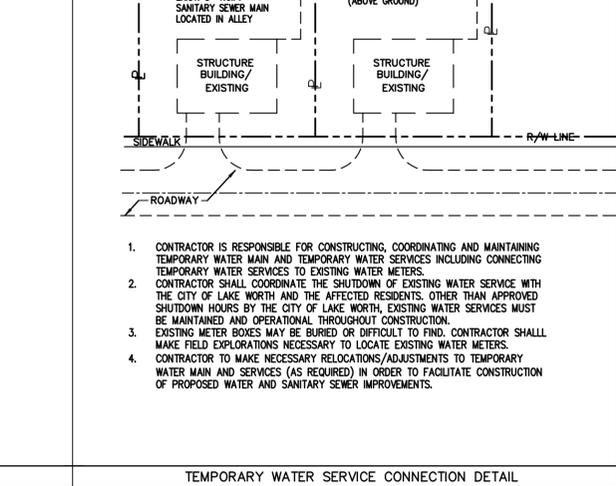
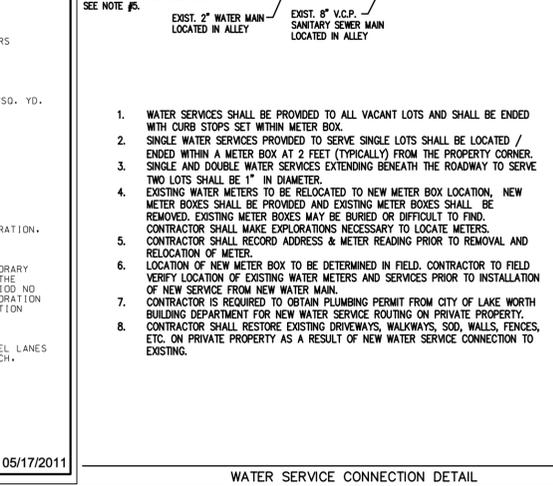
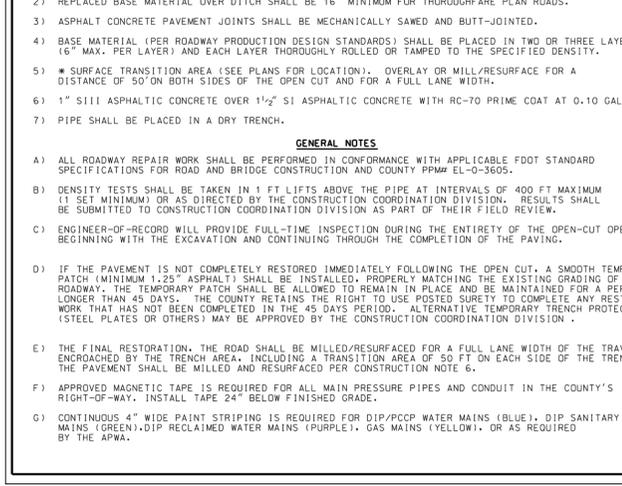
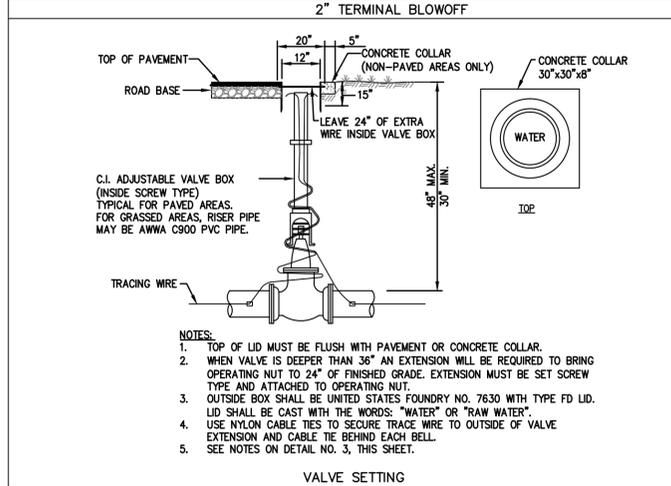
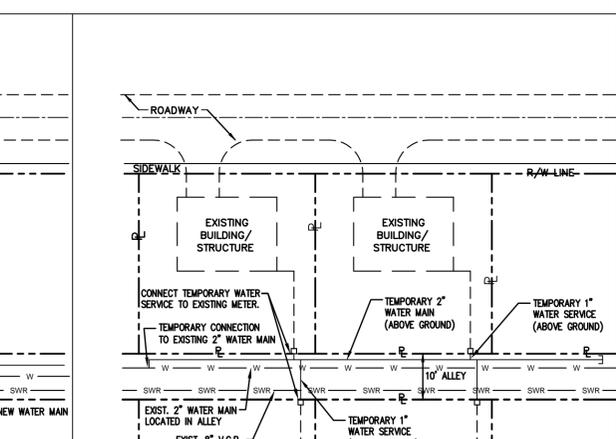
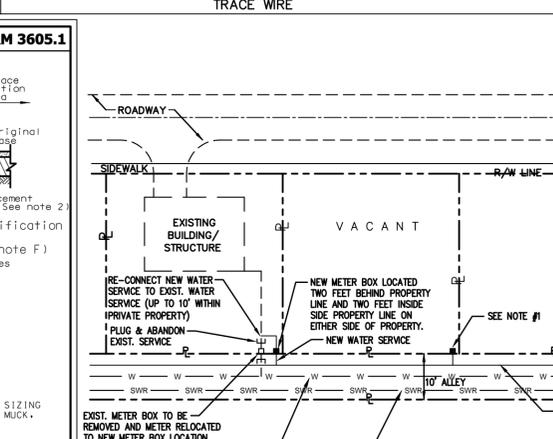
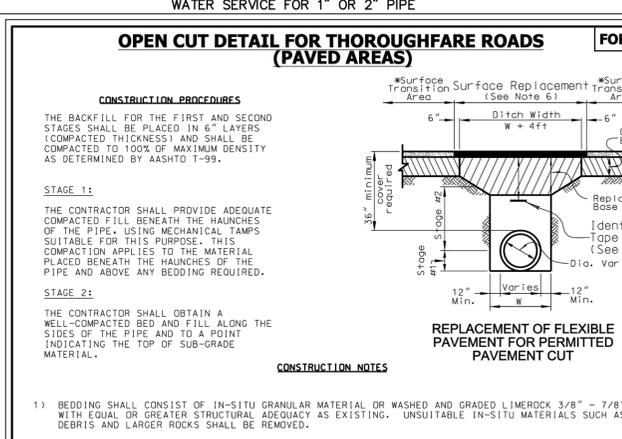
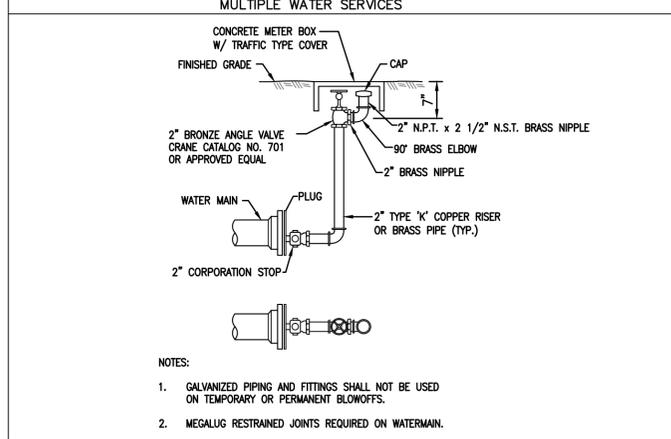
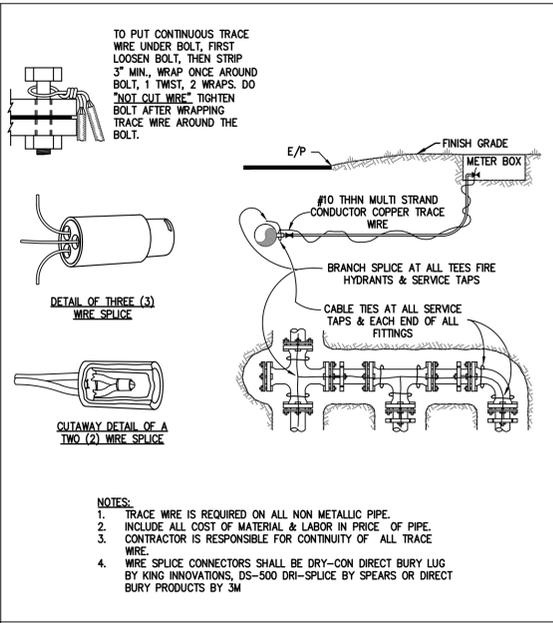
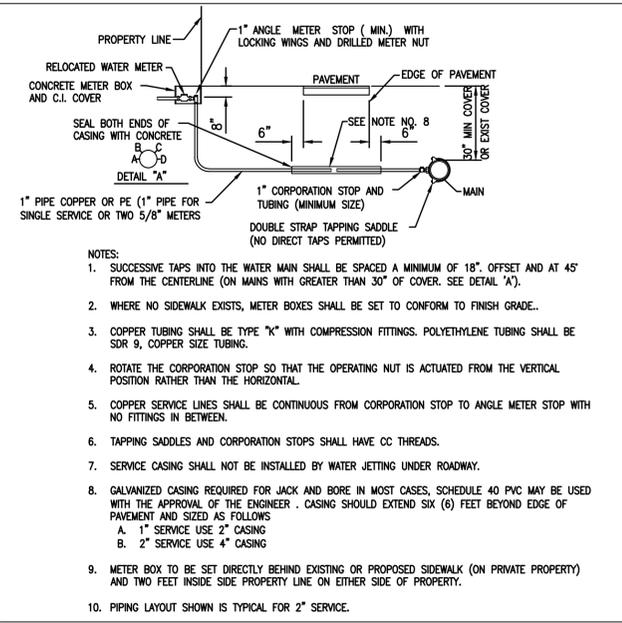
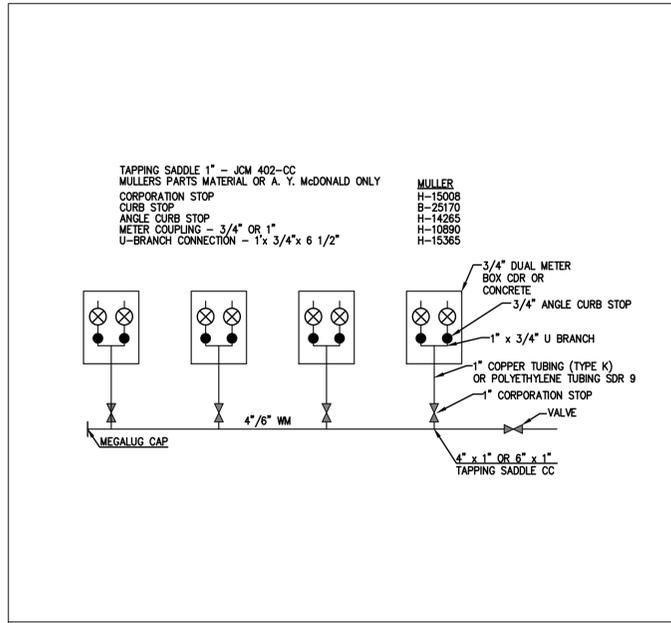
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE

**CRAVEN • THOMPSON AND ASSOCIATES, INC.**  
ENGINEERS • PLANNERS • SURVEYORS  
3563 N.W. 33RD STREET, FORT LAUDERDALE, FLORIDA 33309  
FAX: (854) 739-6409 TEL.: (854) 739-6400  
FLORIDA LICENSED ENGINEERING, SURVEYING & MAPPING BUSINESS No. 271  
FLORIDA LICENSED LANDSCAPE ARCHITECTURE BUSINESS No. C000114

WATER & SEWER REPLACEMENT FROM 5TH TO 6TH AVE. SOUTH IN ALLEY BETWEEN E & F ST.  
PREPARED FOR:  
CITY OF LAKE WORTH

**WATER DETAILS**



DATE: Oct 01, 2015 11:59am R:\Engineering\2015\15-0006-001-Lake Worth Continuing Services\006-5th to 6th Water & Sewer - TO\7\Drawings\15-0006-001-05-WATER DET.dwg

REVISIONS			
DATE	BY	DESCRIPTION	DESCRIPTION

DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE

**CRAVEN • THOMPSON AND ASSOCIATES, INC.**  
**ENGINEERS • PLANNERS • SURVEYORS**  
 3563 N.W. 53RD STREET, FORT LAUDERDALE, FLORIDA 33309  
 FAX: (854) 739-6409  
 FLORIDA LICENSED ENGINEERING, SURVEYING & MAPPING BUSINESS No. 271  
 FLORIDA LICENSED LANDSCAPE ARCHITECTURE BUSINESS No. C000114

WATER & SEWER REPLACEMENT FROM 5TH TO 6TH AVE. SOUTH IN ALLEY BETWEEN E & F ST.  
 PREPARED FOR:  
 CITY OF LAKE WORTH

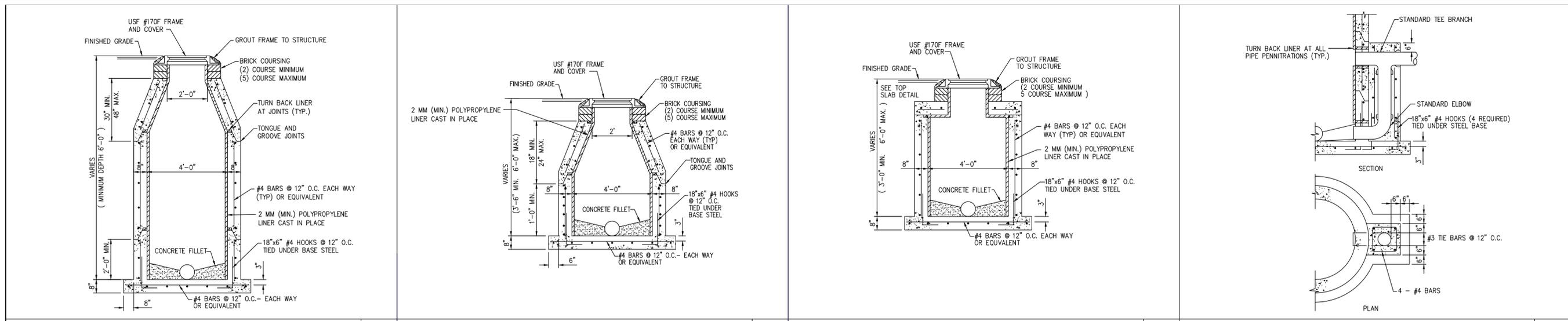
# WATER DETAILS

SHEET NO.  
**C-5**

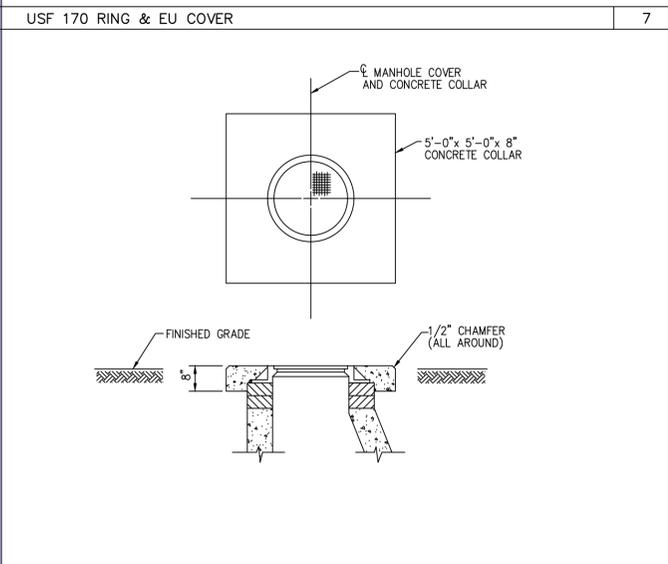
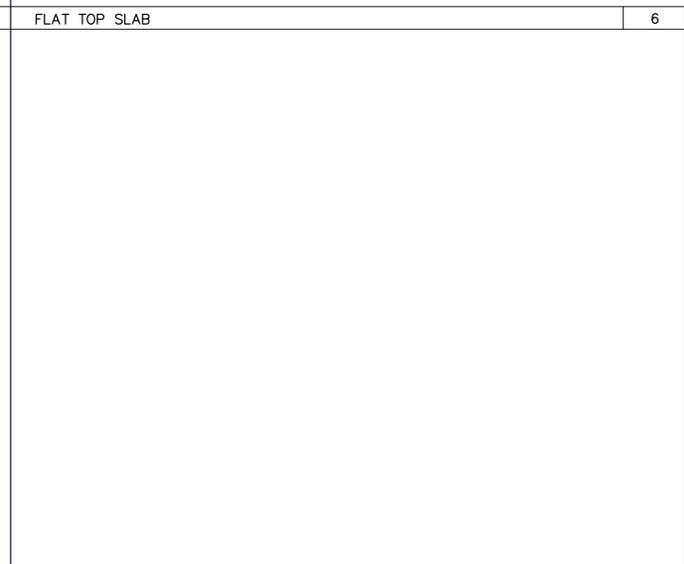
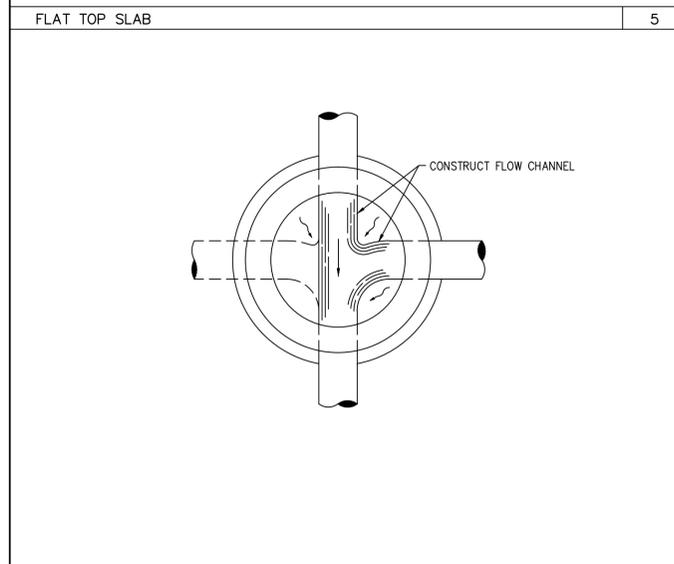
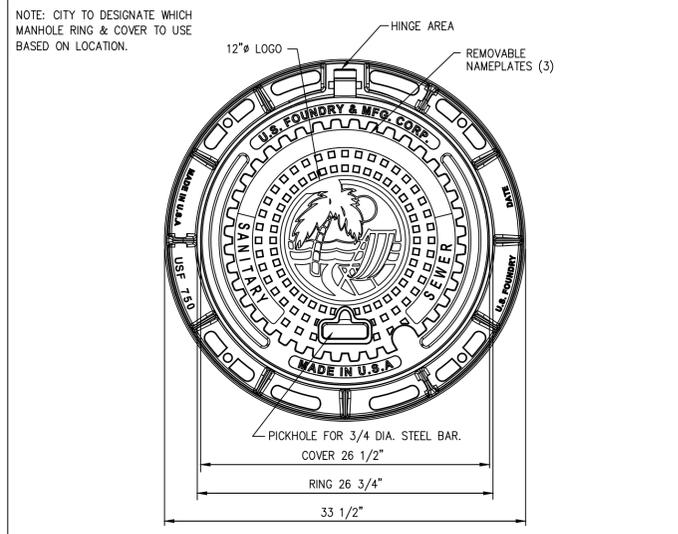
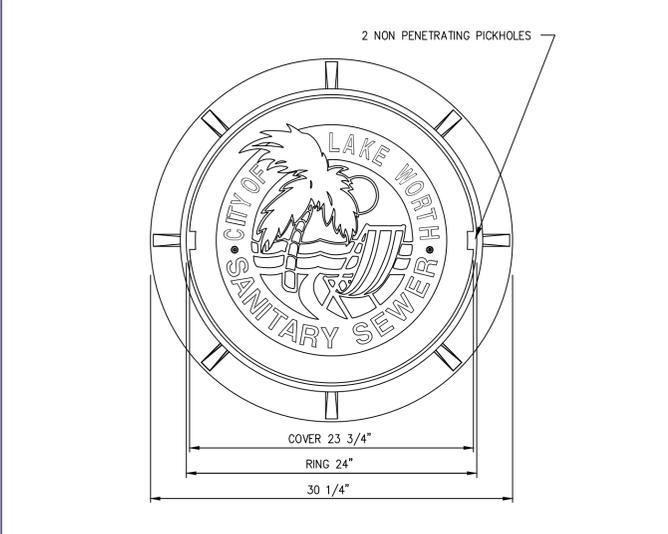
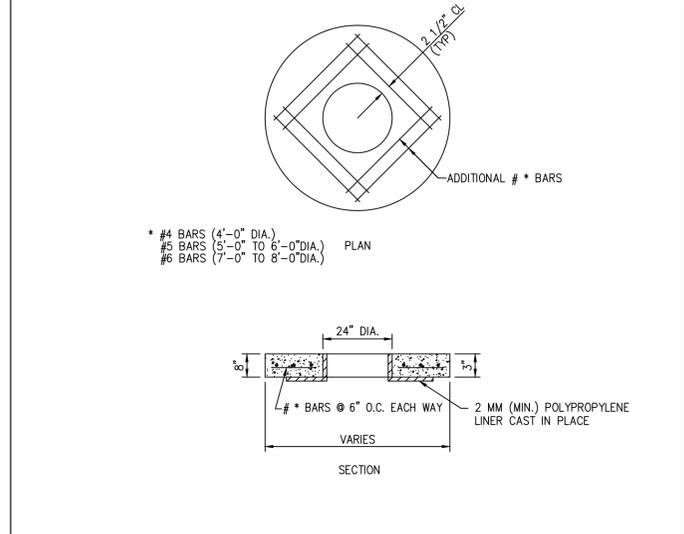
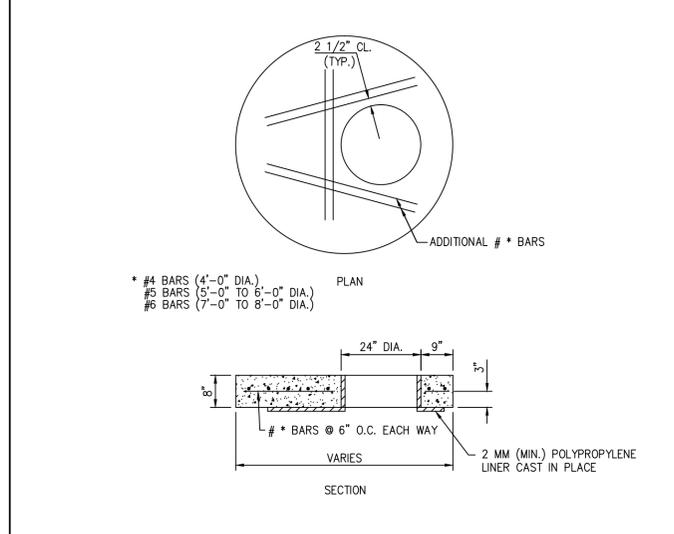
Matthew J. Cigale  
 Florida P.E. No. 74584

CTA JOB No. 15-0006-001-05

R:\Engineering\2015\15-0006-001-Lake Worth Continuing Services\005-5th to 6th Water & Sewer- TO#7\Drawings\15-0006-001-05-SSDETAILS.dwg [C-6] Oct. 01, 2015 12:45pm MCGALE



STANDARD MANHOLE 1 SHALLOW MANHOLE 2 SHALLOW MANHOLE 3 DROP CONNECTION 4



- NOTE: CITY TO DESIGNATE WHICH MANHOLE RING & COVER TO USE BASED ON LOCATION.
1. REINFORCING STEEL ON ALL CONCRETE STRUCTURES SHALL HAVE A MINIMUM COVER OF 3 INCHES.
  2. BRICK COURSING ON MANHOLES SHALL BE PLASTERED WITH 1/2 INCH CEMENT MORTAR ON THE INSIDE AND OUTSIDE FACES.
  3. THE DISTANCES AND CONTROLS SHOWN ON THE DRAWINGS REFER TO THE CENTERLINE OF THE MANHOLES.
  4. COAT EXTERIOR AND INTERIOR SURFACES OF MANHOLES WITH TWO COATS (1ST COAT RED, 2ND COAT BLACK-8 MILS EACH COAT) OF AGRU SUREGRIP, KERNEOS SEWPERCOAT OR EQUAL APPROVED BY THE ENGINEER. PROVIDE A MINIMUM DRY FILM THICKNESS OF 16 MILS. APPLY IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. INTERIOR COATING SHALL BE FIELD APPLIED AFTER FINAL LAMPING AND REVIEW BY THE ENGINEER.
  5. STEPS ARE REQUIRED IN MANHOLES GREATER THAN 3 FEET IN DEPTH. STEPS SHALL BE SPACED 16 INCHES ON CENTER AND SHALL BE POLYPROPYLENE PLASTIC COATED NO.3 AS MANUFACTURED BY MA INDUSTRIES, INC. OR EQUAL APPROVED BY THE ENGINEER.
  6. PVC FORCE MAIN PIPE SHALL BE WRAPPED WITH WIRE FOR LOCATING PURPOSES. A 14 GAUGE, THIN INSULATED, SOLID COPPER WIRE SHALL BE LAID IN THE PIPE TRENCH CONTINUOUS FROM VALVE BOX TO VALVE BOX. WIRE SHALL BE WRAPPED TWO TIMES AROUND EACH JOINT OF PIPE AND EXTENDED INSIDE EACH VALVE BOX TO ENABLE LOCATION DEVICES TO BE ATTACHED WITHOUT DIGGING UP THE VALVE BOX - WIRE CONNECTIONS SHALL BE MADE WITH COMMERCIAL CONNECTORS AND SEALED AGAINST MOISTURE WITH SCOTCH E-Z SEAL NO.2200 ELECTRICAL INSULATING PAD WITH VINYL BACKING.
  7. DROP CONNECTIONS ON MANHOLES ARE REQUIRED WHENEVER AN INFLUENT SEWER IS LOCATED 2 FEET OR MORE ABOVE THE MAIN INVERT CHANNEL.
  8. CAST IRON MANHOLE COVERS SHALL HAVE THE WORD 'SANITARY' CAST IN THEM IN RAISED LETTERS.

MANHOLE BOTTOM FOR TWO OR MORE INFLUENT LINES 9 CONCRETE COLLAR (REQUIRED WHEN MANHOLE IS OUT OF PAVEMENT) 11 GENERAL NOTES 12

Matthew J. Cigale  
Florida P.E. No. 74584

CTA JOB No. 15-0006-001-05

REVISIONS						DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CHECKED BY			CHECKED BY		
						SUPERVISED BY:					

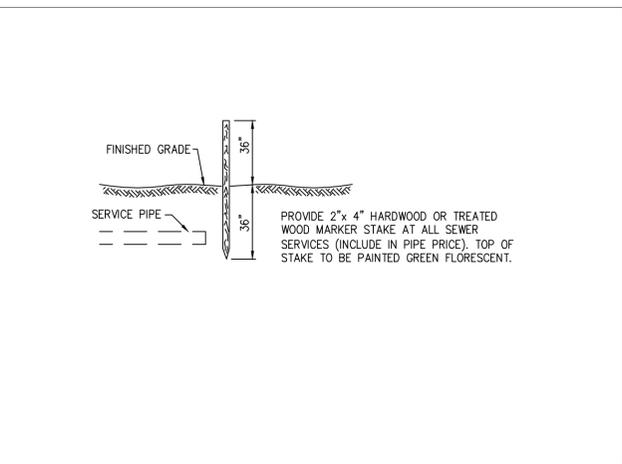
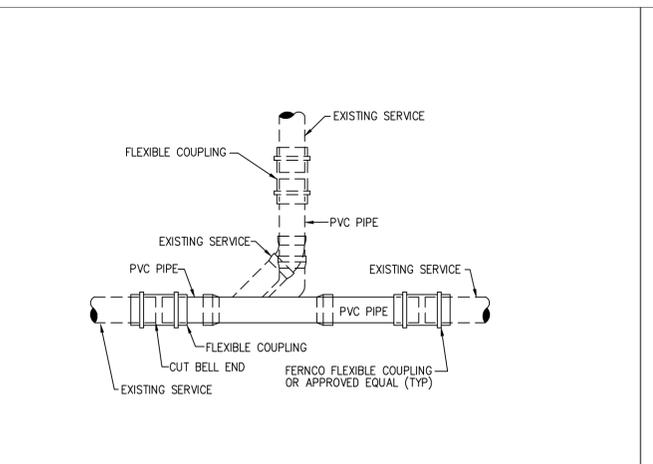
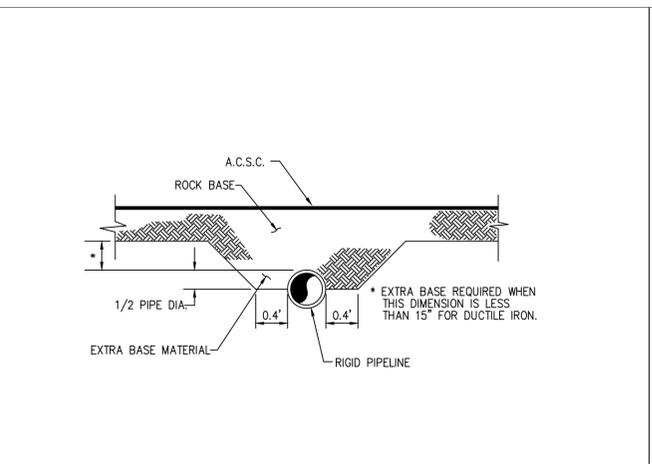
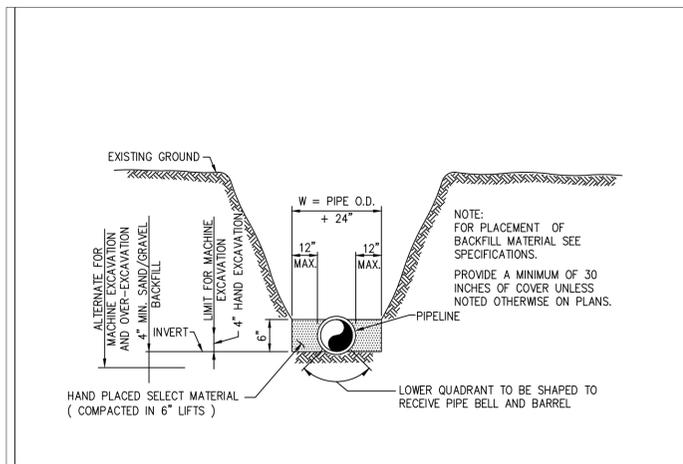
**Craven • Thompson and Associates, Inc.**  
ENGINEERS • PLANNERS • SURVEYORS  
3563 N.W. 53RD STREET, FORT LAUDERDALE, FLORIDA 33309  
FAX: (854) 739-6409 TEL.: (854) 739-6400  
FLORIDA LICENSED ENGINEERING, SURVEYING & MAPPING BUSINESS NO. 271  
FLORIDA LICENSED LANDSCAPE ARCHITECTURE BUSINESS NO. C000114

WATER & SEWER REPLACEMENT FROM 5TH TO 6TH AVE. SOUTH IN ALLEY BETWEEN E & F ST.  
PREPARED FOR:  
CITY OF LAKE WORTH

**SANITARY SEWER DETAILS**

SHEET NO.  
**C-6**

R:\Engineering\2015\15-0006-001-Lake Worth Continuing Services\005-5th to 6th Water & Sewer- TO#7\Drawings\15-0006-001-05-SSDETAILS.dwg [C-7] Dec 10, 2015 4:02pm MCGALE

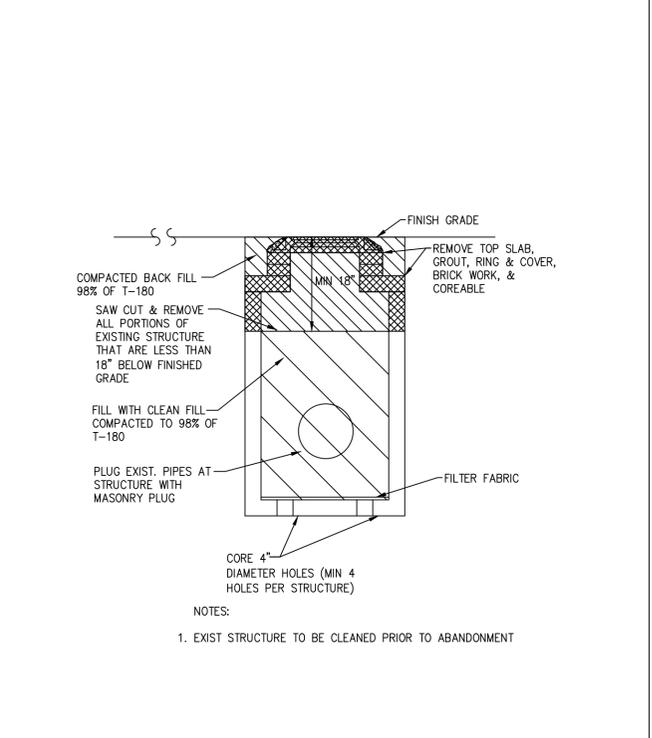
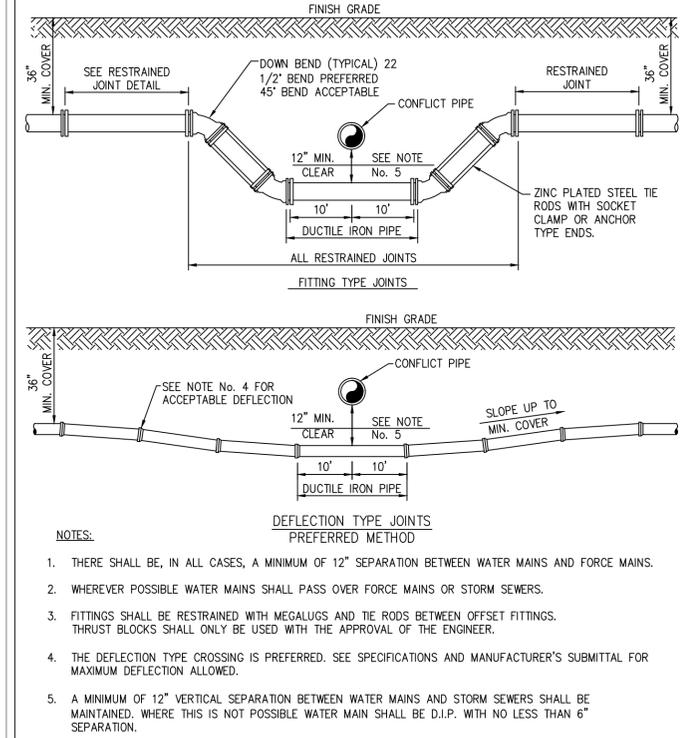


TRENCHING 1

EXTRA BASE MATERIAL FOR SHALLOW PIPES IN ROADWAYS 2

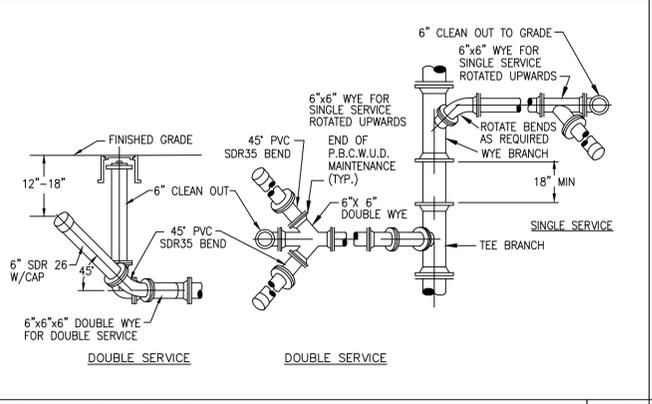
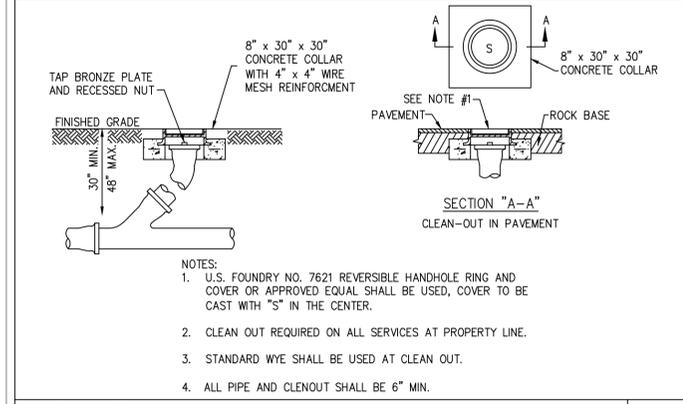
PIPE SECTION REPLACEMENT 3

MARKER STAKE 4



PRESSURE PIPE CONFLICT 6

EXISTING STRUCTURE ABANDONMENT



CLEAN OUT 9

TYPICAL WASTEWATER SERVICE CONNECTION 10

DATE		BY		DESCRIPTION	

DESIGNED BY	CHECKED BY	SUPERVISED BY	NAME	DATE	DRAWN BY	CHECKED BY

NAME	DATE	NAME	DATE

**Craven • Thompson and Associates, Inc.**  
 ENGINEERS • PLANNERS • SURVEYORS  
 3563 N.W. 53RD STREET, FORT LAUDERDALE, FLORIDA 33309  
 FAX: (854) 739-6409 TEL: (854) 739-6400  
 FLORIDA LICENSED ENGINEERING, SURVEYING & MAPPING BUSINESS No. 271  
 FLORIDA LICENSED LANDSCAPE ARCHITECTURE BUSINESS No. C000114

WATER & SEWER REPLACEMENT FROM 5TH TO 6TH AVE. SOUTH IN ALLEY BETWEEN E & F ST.  
 PREPARED FOR:  
 CITY OF LAKE WORTH

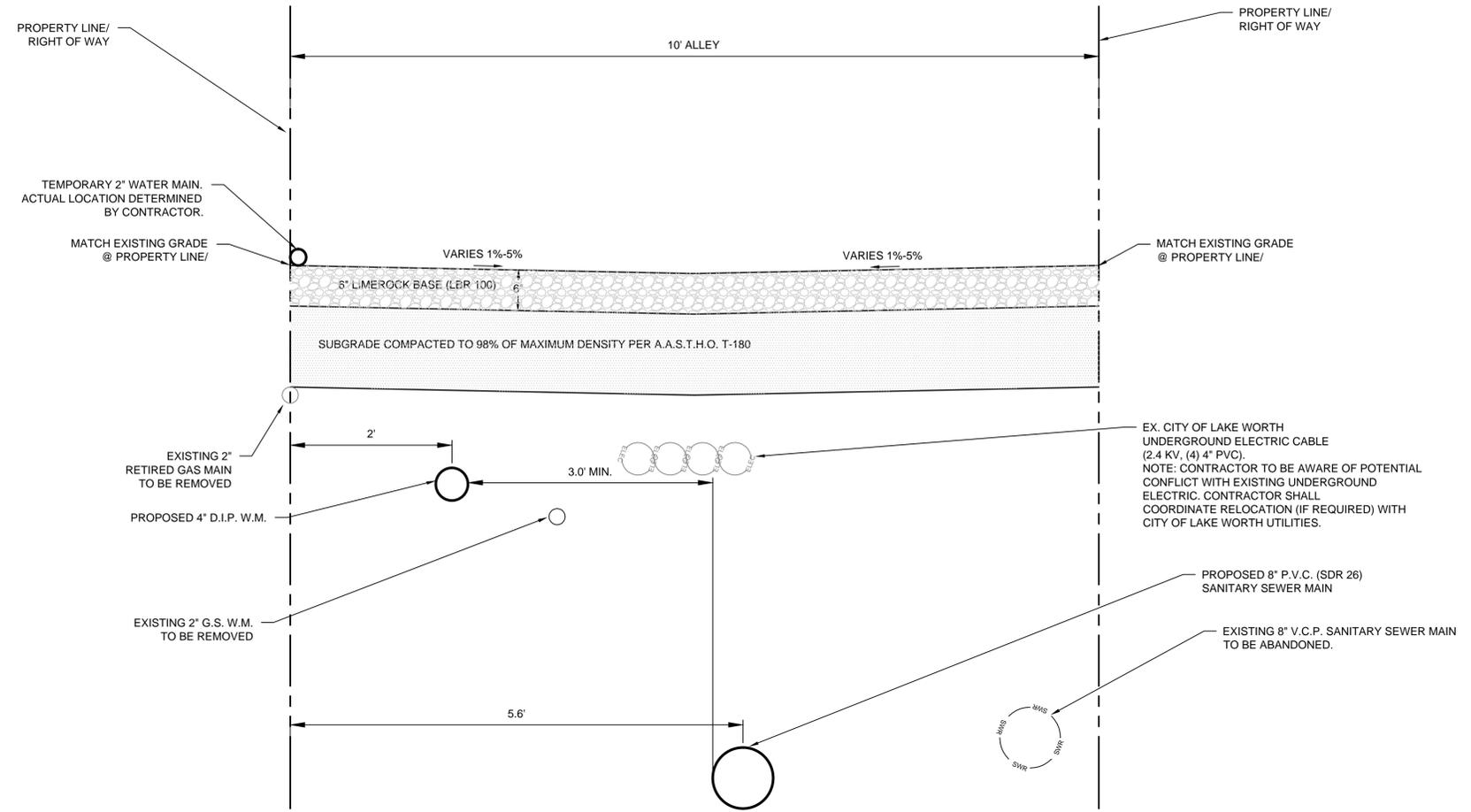
# SANITARY SEWER DETAILS

SHEET NO.  
**C-7**

Matthew J. Cigale  
 Florida P.E. No. 74584

CTA JOB No. 15-0006-001-05

R:\Engineering\2015\15-0006-001-Lake Worth Continuing Services\005-5th to 6th Water & Sewer- TO#7\Drawings\15-0006-001-05-XSECTION.dwg [C-8] Nov 10, 2015 10:36am MCIGALE



# TYPICAL ALLEY SECTION

SCALE: N.T.S.

Matthew J. Cigale  
Florida P.E. No. 74584

CTA JOB No. 15-0006-001-05

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE
CHECKED BY			CHECKED BY		
SUPERVISED BY:					

**CRAVEN • THOMPSON AND ASSOCIATES, INC.**  
**ENGINEERS • PLANNERS • SURVEYORS**  
 3563 N.W. 53RD STREET, FORT LAUDERDALE, FLORIDA 33309  
 FAX: (954) 739-6409 TEL: (954) 739-6400  
 FLORIDA LICENSED ENGINEERING, SURVEYING & MAPPING BUSINESS No. 271  
 FLORIDA LICENSED LANDSCAPE ARCHITECTURE BUSINESS No. C000114

WATER & SEWER REPLACEMENT FROM 5TH TO 6TH AVE. SOUTH IN ALLEY BETWEEN E & F ST.  
 PREPARED FOR:  
 CITY OF LAKE WORTH

TYPICAL SECTIONS

SHEET NO.  
**C-8**