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HORIZONTAL BENDS			
PIPE DIA. (INCHES)	BEND (ANGLE)	RESTRAINED LENGTH (RL) (FT)	*DIP
24	11 1/2	-	-
	22 1/2	-	-
	45	-	-
	90	-	-
16	11 1/2	-	-
	22 1/2	-	-
	45	-	-
	90	-	-
12	11 1/2	-	-
	22 1/2	-	-
	45	-	-
	90	-	-
8	11 1/2	-	-
	22 1/2	-	-
	45	-	-
	90	-	-
6	11 1/2	-	-
	22 1/2	-	-
	45	-	-
	90	-	-
4	11 1/2	-	-
	22 1/2	-	-
	45	-	-
	90	-	-

TEES AND TAPPING SLEEVES												
PIPE DIA. (INCHES)	BRANCH DIA. (INCHES)	MINIMUM RESTRAINED LENGTH ALONG RUN (FT.)	MINIMUM RESTRAINED LENGTH ALONG BRANCH (FT.)	PVC	*DIP	PIPE DIA. (INCHES)	BRANCH DIA. (INCHES)	MINIMUM RESTRAINED LENGTH ALONG RUN (FT.)	MINIMUM RESTRAINED LENGTH ALONG BRANCH (FT.)	PVC	*DIP	
24"	24"	-	-	-	-	12"	12"	-	-	-	-	
	16"	-	-	-	-		8"	-	-	-	-	-
	12"	-	-	-	-		6"	-	-	-	-	-
	8"	-	-	-	-		4"	-	-	-	-	-
	6"	-	-	-	-		4"	-	-	-	-	-
16"	16"	-	-	-	-	6"	6"	-	-	-	-	
	12"	-	-	-	-		4"	-	-	-	-	-
	8"	-	-	-	-		4"	-	-	-	-	-
	6"	-	-	-	-		4"	-	-	-	-	-
	4"	-	-	-	-		4"	-	-	-	-	-

*ALL DIP JOINT-RESTRAINT CALCULATIONS ASSUME THE PIPE WILL BE WRAPPED IN POLYETHYLENE ENCASEMENT

ISSUED: 03/01/1994
DRAWN: EAM
APPROVED: XXX

DEPARTMENT OF PUBLIC UTILITIES STANDARD DETAIL
JOINT RESTRAINT DESIGN
FOR PVC AND DIP
HORIZONTAL BENDS AND TEES

REVISED: 06/08/2014
DRAWING NO.
G-11.1

VERTICAL OFFSETS					
PIPE DIA. (INCHES)	BEND (ANGLE)	LOWSIDE DEPTH (FT)	PVC		*DIP
			RESTRAINED LENGTHS RL1 (FT.) RL2 (FT.)	RESTRAINED LENGTHS RL1 (FT.) RL2 (FT.)	
24	45	4	-	-	-
		5	-	-	-
		6	-	-	-
		7	-	-	-
16	45	4	-	-	-
		5	-	-	-
		6	-	-	-
		7	-	-	-
12	45	4	-	-	-
		5	-	-	-
		6	-	-	-
		7	-	-	-
8	45	4	-	-	-
		5	-	-	-
		6	-	-	-
		7	-	-	-
6	45	4	-	-	-
		5	-	-	-
		6	-	-	-
		7	-	-	-
4	45	4	-	-	-
		5	-	-	-
		6	-	-	-
		7	-	-	-

*ALL DIP JOINT-RESTRAINT CALCULATIONS ASSUME THE PIPE WILL BE WRAPPED IN POLYETHYLENE ENCASEMENT

ISSUED: 03/01/1994
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DEPARTMENT OF PUBLIC UTILITIES STANDARD DETAIL
JOINT RESTRAINT DESIGN
FOR PVC AND DIP
VERTICAL OFFSETS

REVISED: 06/08/2014
DRAWING NO.
G-11.2

REDUCERS							
LARGE SIDE	SMALL SIDE	MINIMUM LENGTH TO RESTRAIN ON LARGE SIDE (FT)		LARGE SIDE	SMALL SIDE	MINIMUM LENGTH TO RESTRAIN ON LARGE SIDE (FT)	
		PVC	*DIP			PVC	*DIP
24"	16"	-	-	12"	8"	-	-
	12"	-	-		6"	-	-
	8"	-	-		4"	-	-
	6"	-	-		4"	-	-
	4"	-	-		4"	-	-
16"	12"	-	-	8"	4"	-	-
	8"	-	-		2"	-	-
	6"	-	-		2"	-	-
	4"	-	-		2"	-	-
	4"	-	-		2"	-	-

DEAD ENDS		
PIPE DIA. (INCHES)	PVC	*DIP
24"	-	-
16"	-	-
12"	-	-
8"	-	-
6"	-	-
4"	-	-

*ALL DIP JOINT-RESTRAINT CALCULATIONS ASSUME THE PIPE WILL BE WRAPPED IN POLYETHYLENE ENCASEMENT

ISSUED: 03/01/1994
DRAWN: EAM
APPROVED: XXX

DEPARTMENT OF PUBLIC UTILITIES STANDARD DETAIL
JOINT RESTRAINT DESIGN
FOR PVC AND DIP
REDUCERS AND DEAD ENDS

REVISED: 06/08/2014
DRAWING NO.
G-11.3

GENERAL NOTES:

- FLUSHING LOCATIONS ARE TO BE PROPOSED BY CONTRACTOR AND APPROVED BY ECSD.
- UPON COMPLETION OF THE PIPE INSTALLATION FOR ANY SECTION, THE MAIN SHALL BE CANNON FLUSHED TO REMOVE DIRT AND ANY OTHER FOREIGN MATTER.
- INSTALL A TEMPORARY 45° BEND AND ASSOCIATED TEMPORARY PIPING AS SHOWN TO DIRECT THE FLUSHING WATER AWAY FROM THE IMMEDIATE WORK AREA AND EXERCISE DUE CARE SO AS TO ENSURE THAT THE WATER USED IN FLUSHING DOES NOT CAUSE A NUISANCE OR INFLECT PROPERTY DAMAGE.
- BENDS AND PIPING SHALL BE THE SAME SIZE OR LARGER AS THE LINE BEING FLUSHED.
- PRIOR TO THE ACTUAL LINE FLUSHING OPERATION THE CONTRACTOR SHALL PROPERLY NOTIFY ECSD INSPECTOR OF SUCH INTENDED WATER USE.
- NO EXISTING VALVE SHALL BE OPERATED, EXCEPT BY AUTHORIZED CITY PERSONNEL.
- FLUSHING SHALL NOT BE ACCOMPLISHED WITHOUT THE ACTUAL PRESENCE OF THE ECSD INSPECTOR.
- AFTER THE LINE UNDER CONSTRUCTION HAS BEEN SUCCESSFULLY FLUSHED, THE CONTRACTOR SHALL REMOVE THE TEMPORARY PIPING ARRANGEMENT AND PROCEED WITH THE REMAINING CONSTRUCTION AS SPECIFIED.
- ALL PIPING SHALL BE MECHANICALLY RESTRAINED IN ACCORDANCE WITH CITY STANDARDS.
- IF REQUIRED BY ECSD, WATER SHALL MAINS SHALL BE CLEANED BY PIGGING.
- CONTRACTOR WILL INSTALL A PRESSURE GAUGE AT OR NEAR THE FILL AND FLUSH LOCATION AND MAINTAIN A MINIMUM PRESSURE OF 40 PSI AT ALL TIMES. THE FILL VALVE WILL BE OPENED AND CLOSED SLOWLY TO AVOID RAPID PRESSURE CHANGES IN THE WATER SYSTEM.
- CONTRACTOR IS CAUTIONED THAT GOVERNING AGENCIES OR UTILITIES MAY HAVE REGULATIONS LIMITING OR PROHIBITING DISCHARGE INTO SEWERS, SURFACE WATERS, CANALS, DITCHES AND OTHER CONVEYANCES/RETENTION AREA. ALL COMPLIANCE WITH GOVERNING AGENCIES REQUIREMENTS (INCLUDING PERMITTING, IF REQUIRED) IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- CANNON FLUSHING TO PROCEED AFTER HEALTH DEPARTMENT CLEARANCE IS RECEIVED.

ISSUED: 03/01/1994
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DEPARTMENT OF PUBLIC UTILITIES STANDARD DETAIL
CANNON FLUSHING

REVISED: 06/08/2014
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G-11.4

SEWER NOTES:

- THE MINIMUM DEPTH OF COVER OVER D.I.P. SANITARY SEWER GRAVITY OR FORCE MAINS IS 30". THE MINIMUM DEPTH OF COVER OVER PVC SANITARY SEWER OR FORCE MAINS IS 36".
- ALL CONNECTIONS TO EXISTING MAINS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- LEAKAGE TESTS AND ALIGNMENT (LAMPING) TESTS SHALL BE PERFORMED ON ALL NEW SEWER LINES UP TO THE CONNECTION POINT WITH THE EXISTING SEWER SYSTEM. THESE TESTS SHALL BE REQUESTED AND PAID FOR BY THE CONTRACTOR.
- LAMPING TESTS SHALL BE PERFORMED ON GRAVITY SEWERS FROM MANHOLE TO MANHOLE UP TO AND INCLUDING THE POINT OF CONNECTION TO THE EXISTING SEWER SYSTEM.
- LEAKAGE TESTS SHALL BE PERFORMED ON ALL SEGMENTS OF A GRAVITY SEWER SYSTEM, INCLUDING SERVICE LATERALS AND MANHOLES, FOR A CONTINUOUS PERIOD OF NO LESS THAN 2 HOURS. AT THE END OF THE TEST, THE TOTAL MEASURED LEAKAGE SHALL NOT EXCEED 100 GALLONS PER INCH OF PIPE DIAMETER PER MILE PER DAY FOR ANY SECTION OF THE SYSTEM, WITH ZERO ALLOWABLE LEAKAGE FOR LATERALS AND MANHOLES. AN EXFILTRATION OR INFILTRATION TEST SHALL BE PERFORMED WITH A MINIMUM POSITIVE HEAD OF 2 FEET ON THE SECTION BEING TESTED.
- FORCE MAINS SHALL BE PRESSURE-TESTED IN ACCORDANCE WITH RULE 62-555.330 (FAC). THE PRESSURE TEST SHALL CONSIST OF HOLDING A TEST PRESSURE OF 150 PSI ON THE PIPELINE FOR A CONTINUOUS PERIOD OF 2 HOURS THE MAXIMUM ALLOWABLE LEAKAGE SHALL BE DETERMINED BY THE FOLLOWING FORMULA:
$$L = 5 \times D \times \sqrt{P}$$

148,000

WHERE:
L = ALLOWABLE LEAKAGE FOR SYSTEM IN GALLONS PER HOUR
D = PIPE DIAMETER IN INCHES
P = LENGTH OF LINES IN LINEAL FEET
P = AVERAGE TEST PRESSURE IN PSI
- CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING CONFLICTS WITH FORCE MAINS PLACED AT MINIMUM COVER. IN CASE OF CONFLICT, FORCE MAIN SHALL BE LOWERED TO PASS UNDER CONFLICTS WITH 12" MINIMUM SEPARATION FROM WATER MAINS AND 6" MINIMUM SEPARATION FROM OTHER UTILITIES. NO ADDITIONAL PAYMENT SHALL BE DUE TO CONTRACTOR FOR LOWERING THE MAIN OR THE ADDITIONAL FITTINGS USED THEREON.
- WHenever it is necessary, in the interest of safety, to brace the sides of a trench, the contractor shall furnish, put in place and maintain such sheeting or bracing as may be necessary to support the sides of the excavation to ensure personnel safety, and to prevent movement which can in any way damage the work or endanger adjacent structures. The contractor shall be solely responsible for the sequence, methods and means of construction, and for the implementation of all OSHA and other safety requirements.

ISSUED: 03/01/1994
DRAWN: EAM
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DEPARTMENT OF PUBLIC UTILITIES STANDARD DETAIL
SANITARY SEWER MAIN
CONSTRUCTION NOTES

REVISED: 06/08/2014
DRAWING NO.
S-01

NOTES:

- INVERT CHANNELS TO BE CONSTRUCTED FOR SMOOTH FLOW WITH NO OBSTRUCTIONS.
- SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS PROVIDING SMOOTH FLOWS.
- CHANNELS FOR FUTURE CONNECTIONS (STUBS) SHALL BE CONSTRUCTED FILLED WITH SAND & COVERED WITH 1" OF MORTAR.
- WHEN FLOW LINE DEFLECTS MORE THAN 45°, A DROP OF 0.10' IS REQUIRED.

ISSUED: 03/01/1994
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APPROVED: XXX

DEPARTMENT OF PUBLIC UTILITIES STANDARD DETAIL
MANHOLE FLOW PATTERNS

REVISED: 06/08/2014
DRAWING NO.
S-02

NOTES:

- SHOP DRAWINGS SHOWING ALL DIMENSIONS, INCLUDING CONCRETE REINFORCEMENT AND BUOYANCY, SHALL BE SUBMITTED TO THE CITY PRIOR TO INSTALLATION.
- THE BOTTOM SLAB SHALL BE CAST MONOLITHICALLY WITH THE LOWER WALL SECTION TO A MINIMUM OF 3' ABOVE SLAB BASE.
- NO CONSTRUCTION JOINTS ARE ALLOWED BELOW ELEVATION +2.00 NAVD. ABOVE ELEVATION +2.00 NAVD CONSTRUCTION JOINTS ARE ALLOWED, IF ADEQUATE JOINTS WITH KEY-WAYS AND WATER STOPS ARE PROVIDED. SUBMIT SHOP DRAWINGS OF JOINT DETAILS TO THE ENGINEER FOR APPROVAL.

ISSUED: 03/01/1994
DRAWN: EAM
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DEPARTMENT OF PUBLIC UTILITIES STANDARD DETAIL
STANDARD PRECAST MANHOLE

REVISED: 07/18/2018
DRAWING NO.
S-03

NOTES:

- SHOP DRAWINGS SHOWING ALL DIMENSIONS, INCLUDING CONCRETE REINFORCEMENT AND BUOYANCY, SHALL BE SUBMITTED TO THE CITY PRIOR TO INSTALLATION.
- THE BOTTOM SLAB SHALL BE CAST MONOLITHICALLY WITH THE LOWER WALL SECTION TO A MINIMUM OF 3' ABOVE SLAB BASE.
- NO CONSTRUCTION JOINTS ARE ALLOWED BELOW ELEVATION +2.00 NAVD. ABOVE ELEVATION +2.00 NAVD CONSTRUCTION JOINTS ARE ALLOWED, IF ADEQUATE JOINTS WITH KEY-WAYS AND WATER STOPS ARE PROVIDED. SUBMIT SHOP DRAWINGS OF JOINT DETAILS TO THE ENGINEER FOR APPROVAL.

ISSUED: 03/01/1994
DRAWN: EAM
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DEPARTMENT OF PUBLIC UTILITIES STANDARD DETAIL
DROP MANHOLE

REVISED: 07/18/2018
DRAWING NO.
S-04

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445 24TH STREET, SUITE 200, VERO BEACH, FL 32960
PHONE: 772-794-4100
WWW.KIMLEY-HORN.COM
REGISTRY NO. 35106

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OAKWOOD SOUTH
RETAIL SHOPPING
CENTER

CITY OF HOLLYWOOD

UTILITY DETAILS

FL

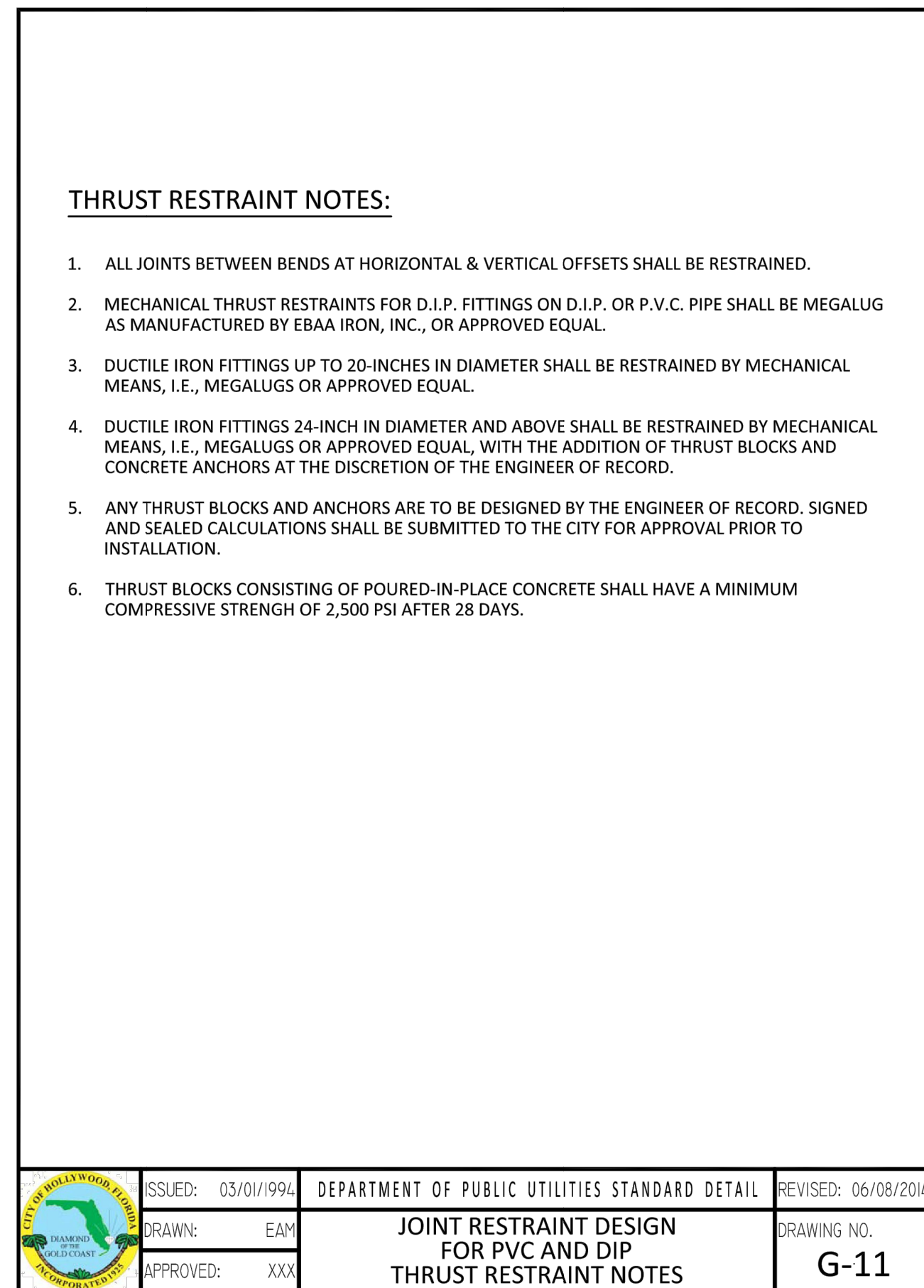
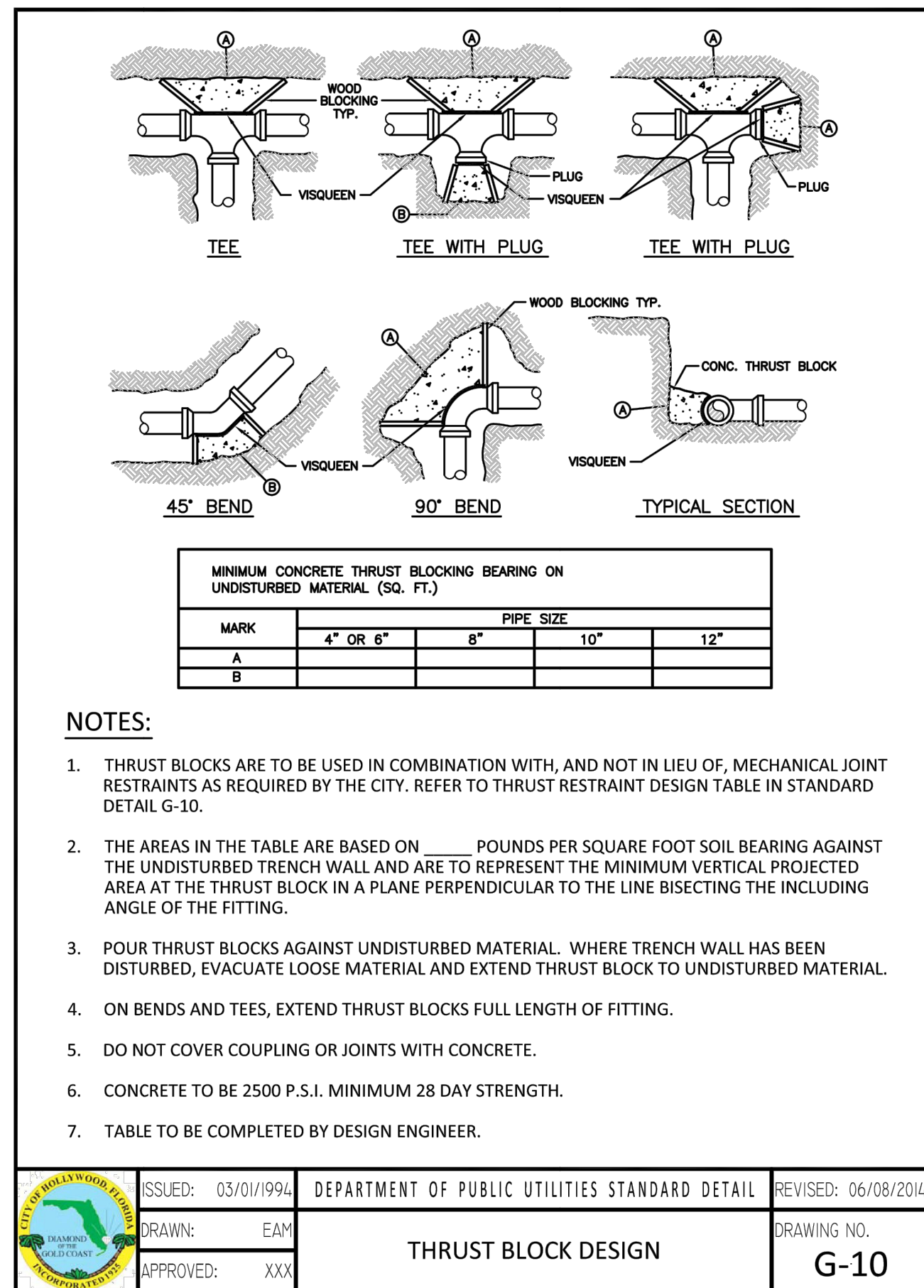
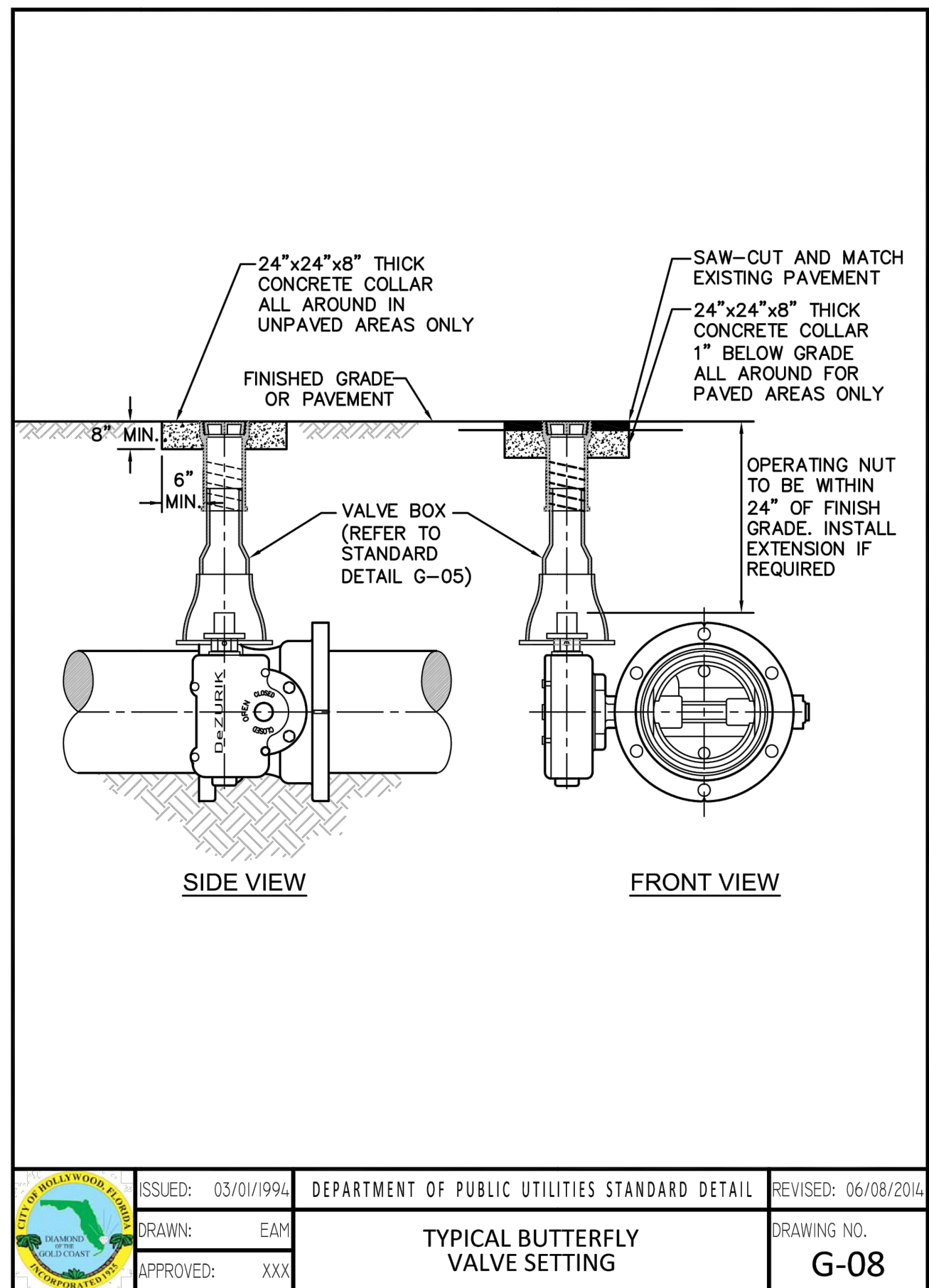
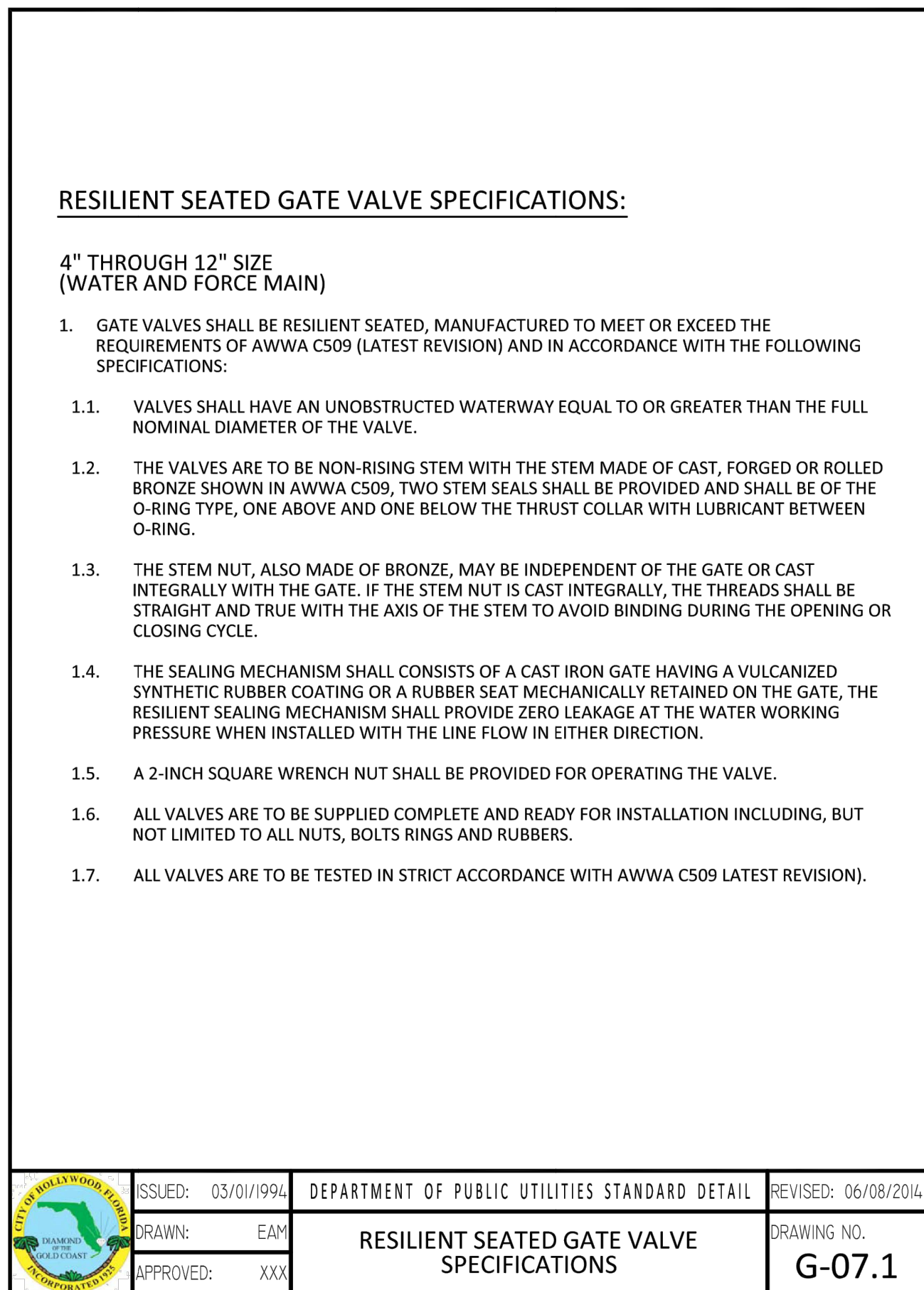
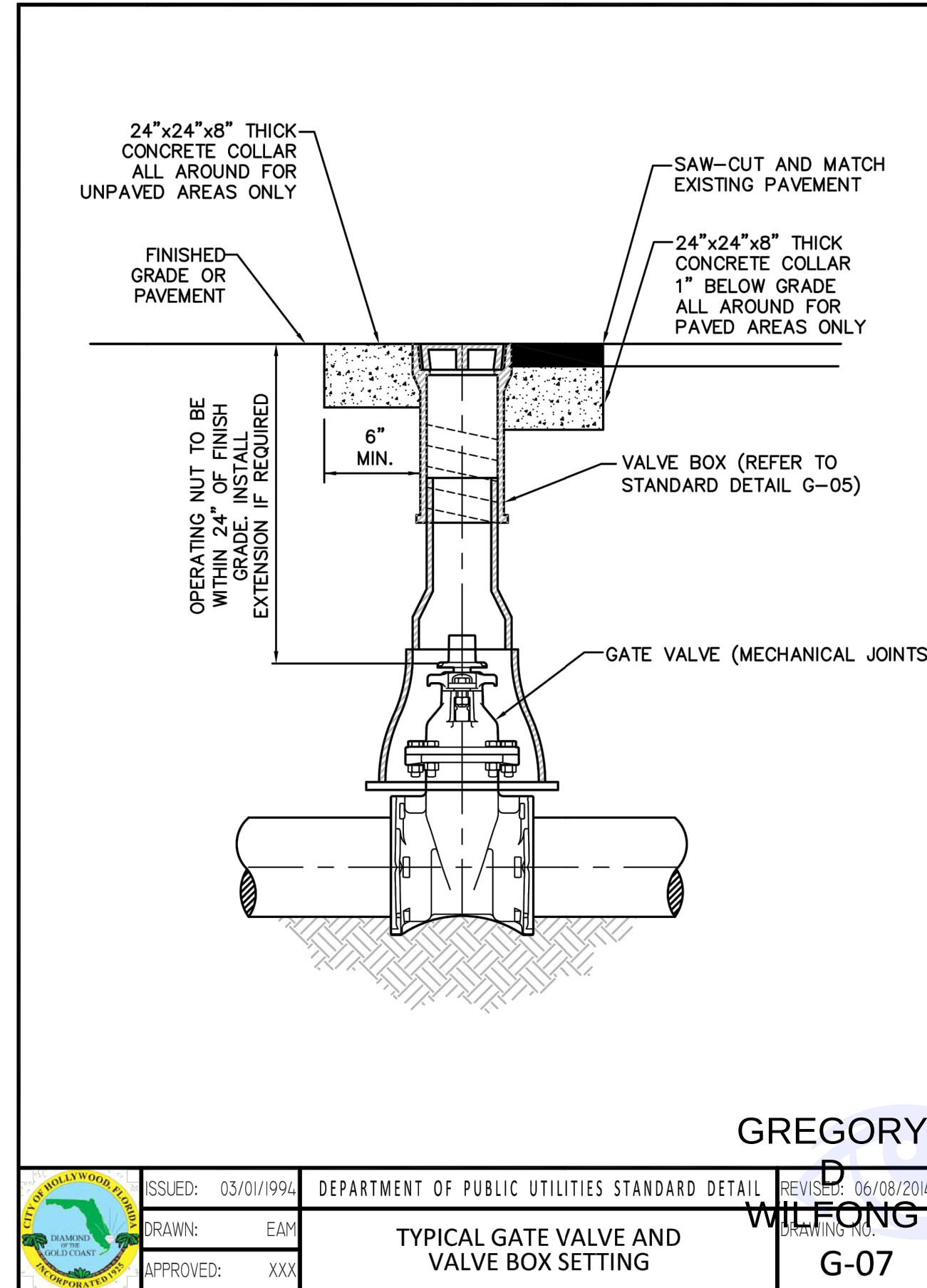
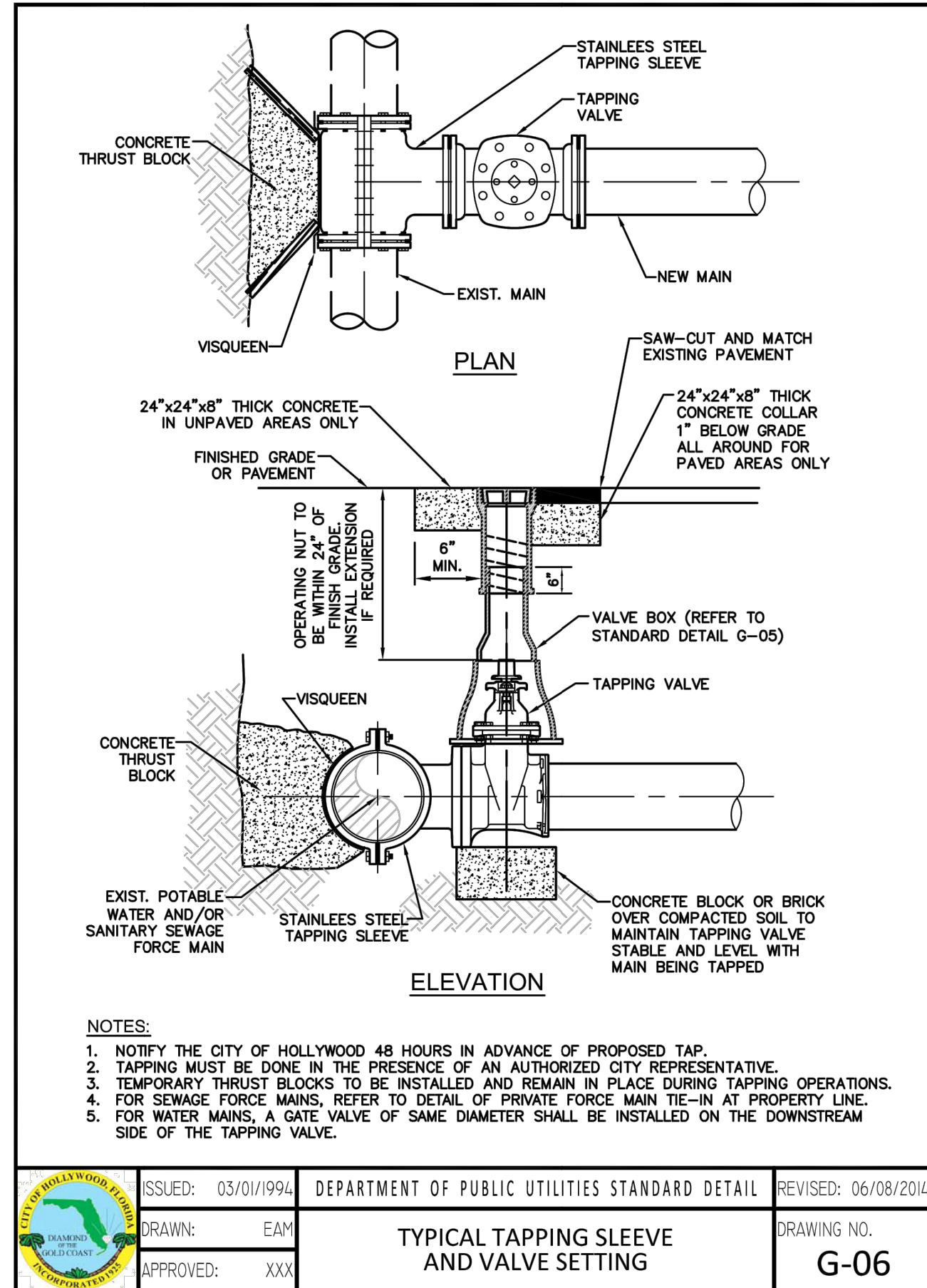
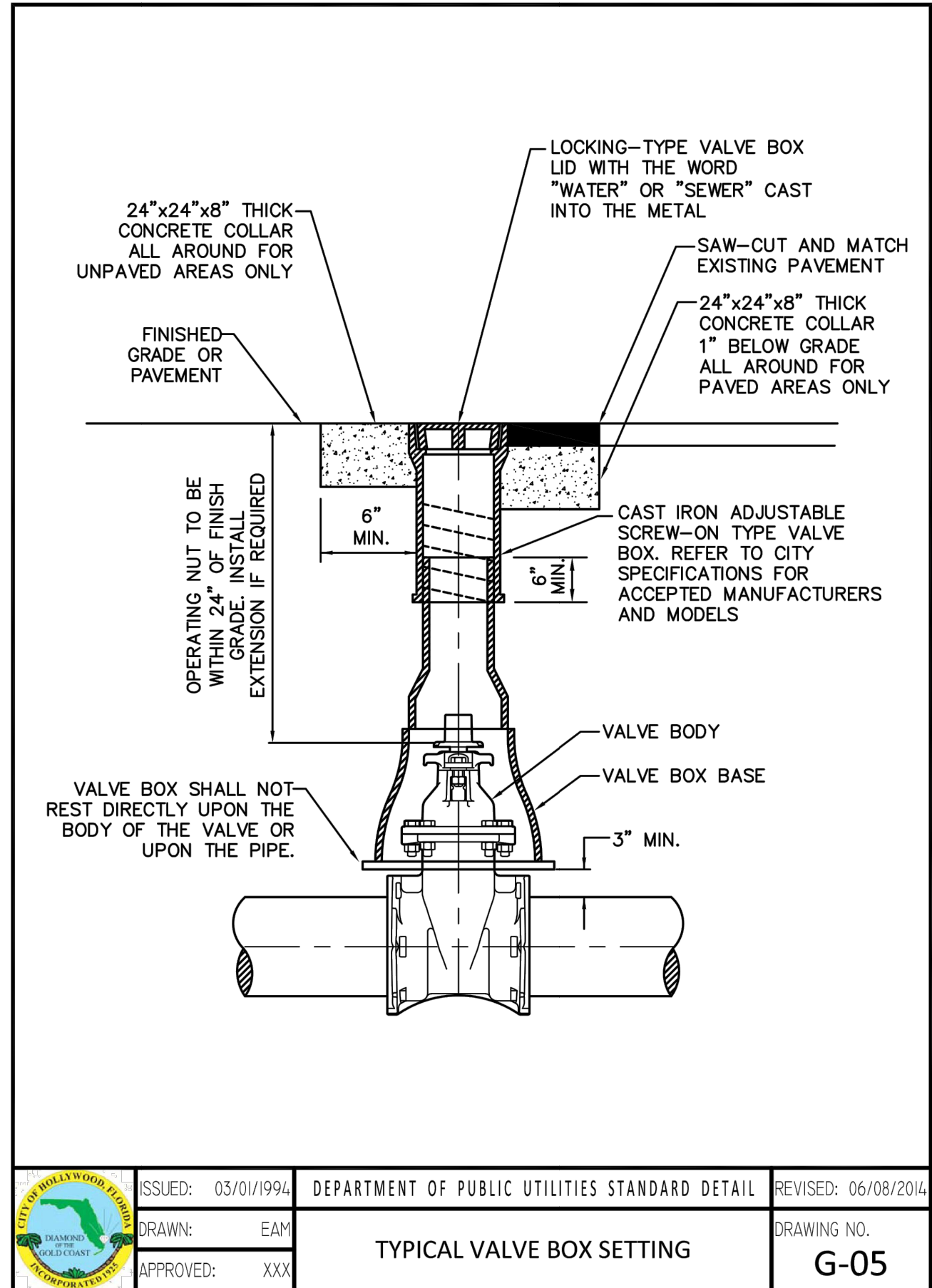
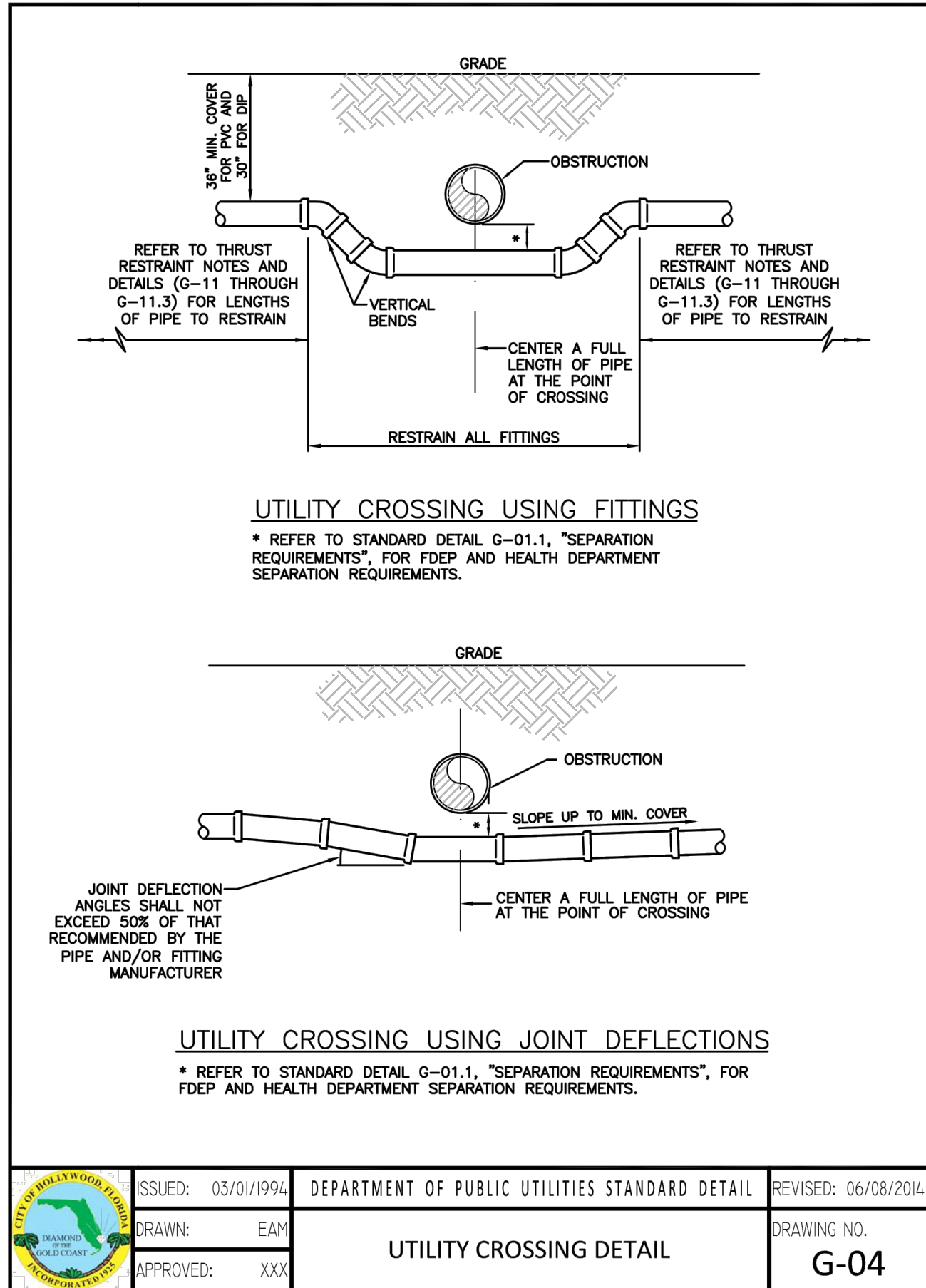
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C-406

NO.

REVISIONS

DATE

BY

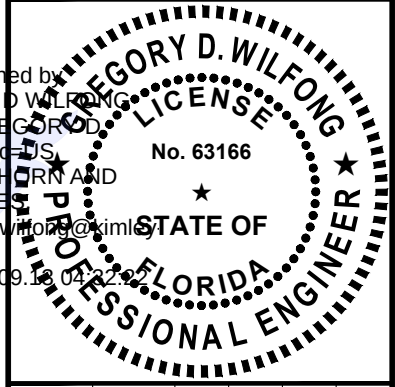


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445 24TH STREET, SUITE 200, VERO BEACH, FL 32960
PHONE: 772-794-4100
WWW.KIMLEY-HORN.COM REGISTRY NO. 35106



KHA PROJECT 147507131	DATE 9/3/2024
SCALE AS SHOWN	DESIGNED BY SHB
DRAWN BY SHB	CHECKED BY GDW

UTILITY DETAILS

OAKWOOD SOUTH RETAIL SHOPPING CENTER

CITY OF HOLLYWOOD
FL

SHEET NUMBER
C-405