

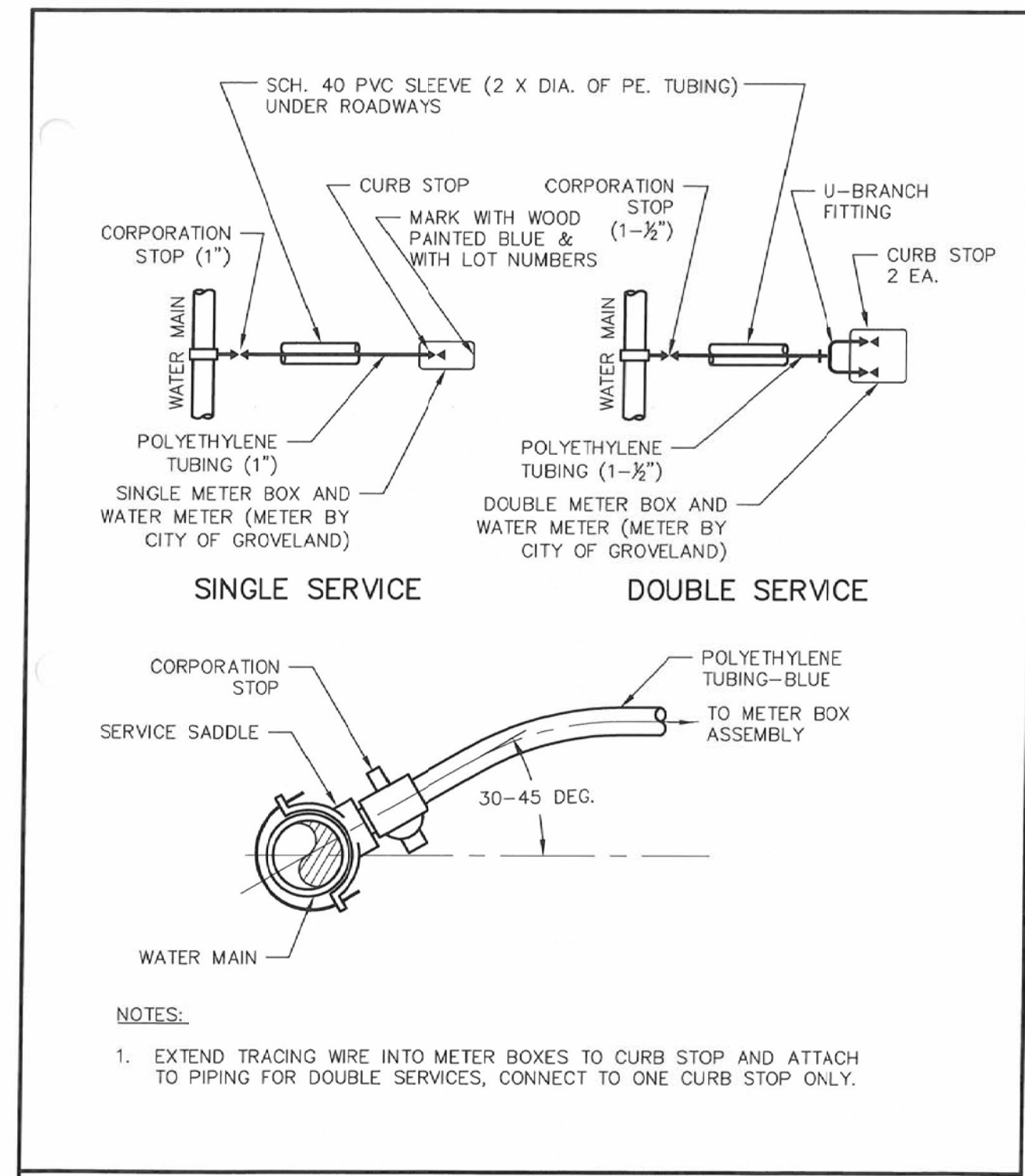
CITY OF GROVELAND STANDARD DETAILS: WATER

**COMBINATION TEMPORARY BLOWOFF AND SAMPLING DETAIL**

DATE: JULY 7, 2008  
SCALE: N.T.S.

W-8

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 8502 Hidden River Parkway, Suite 200  
 Tampa, Florida 33637 (813) 977-8005



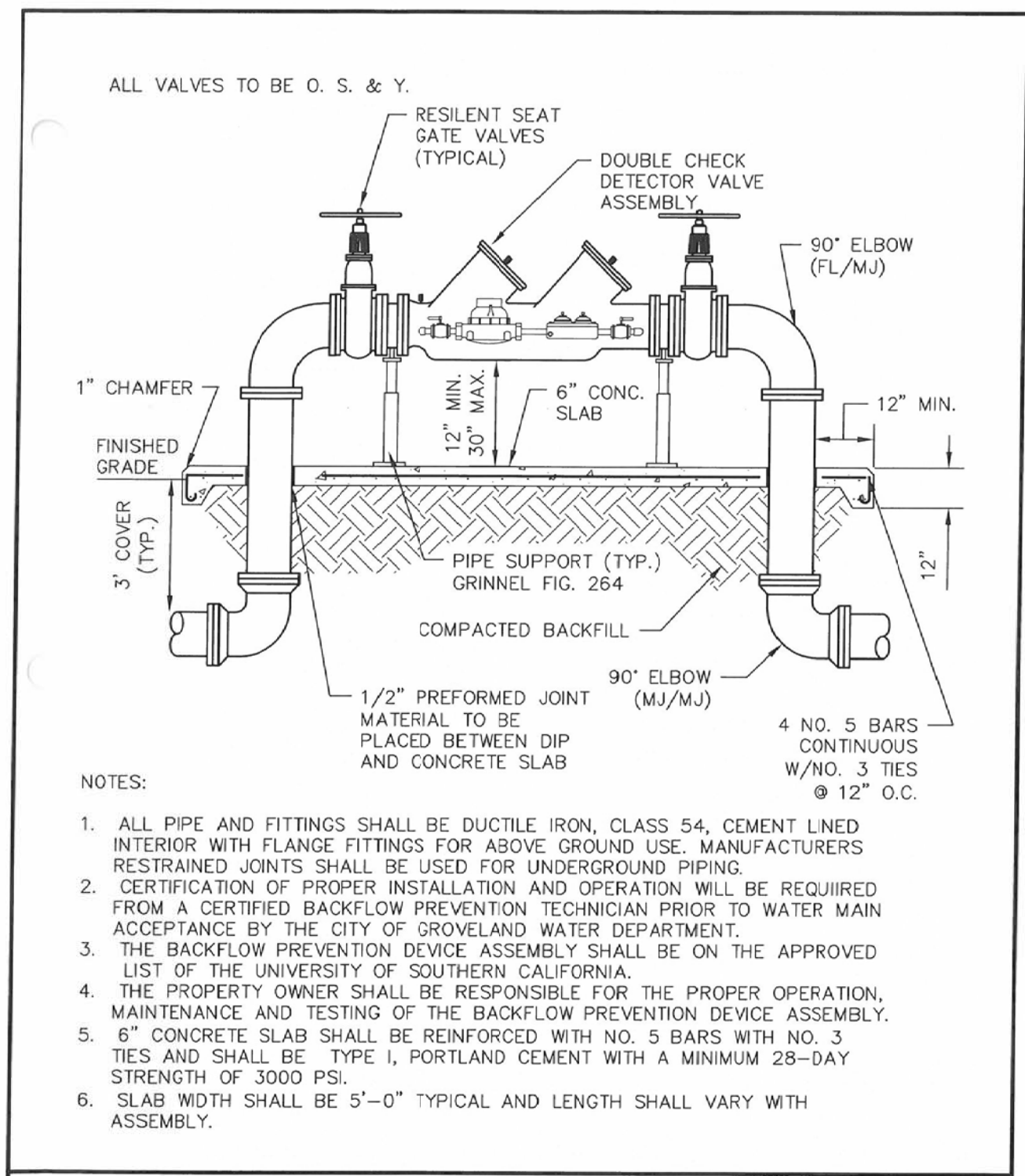
CITY OF GROVELAND STANDARD DETAILS: WATER

**WATER SERVICE CONNECTION DETAIL**

DATE: JULY 7, 2008  
SCALE: N.T.S.

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CITY OF GROVELAND STANDARD DETAILS: WATER

**BACKFLOW PREVENTION DEVICE FOR FIRE SERVICE ONLY DOUBLE CHECK DETECTOR VALVE ASSEMBLY (4" AND LARGER PIPE)**

DATE: JULY 7, 2008  
SCALE: N.T.S.

W-12

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CITY OF GROVELAND STANDARD DETAILS: WATER

**PIPE RESTRAINT SCHEDULE**

DATE: JULY 7, 2008  
SCALE: N.T.S.

MINIMUM LENGTH OF PIPE (IN FEET) REQUIRED TO BE RESTRAINED ON EACH SIDE OF A VALVE OR FITTING FOR SANDY SOILS (SW, SP, SM, SC)

PIPE TYPE	PIPE SIZE	90° BEND	45° BEND	≤22.5° BEND	TEE OR CROSS	VERTICAL OFFSET <sup>a</sup>		REDUCER <sup>b</sup>	VALVE	DEAD END
						LOW	HIGH			
P V C  P I P E	≤4	18	18	18	18	18	22	36	18	52
	6	24	18	18	18	18	30	38	36	73
	8	31	18	18	18	18	40	69	36	96
	10	37	18	18	18	18	48	93	54	115
	12	43	18	18	18	18	56	99	54	136
	14	49	20	18	18	18	64	101	72	155
	16	55	23	18	18	18	72	103	72	174
	18	60	25	18	36	20	80	104	72	192
	20	65	27	18	36	21	87	105	72	211
	24	75	31	18	36	25	102	134	90	246
30	88	37	18	36	29	122	185	90	295	
D U C T I L E  I R O N	≤4	18	18	18	18	18	18	18	18	33
	6	20	18	18	18	18	19	35	36	47
	8	26	18	18	18	18	25	44	36	61
	10	31	18	18	18	18	30	60	54	73
	12	37	18	18	18	18	36	63	54	86
	14	41	18	18	18	18	41	64	72	98
	16	46	19	18	36	18	46	66	72	111
	18	51	21	18	36	18	51	66	72	122
	20	56	23	18	36	18	56	67	72	134
	24	64	27	18	36	21	65	85	90	156
30	75	31	18	36	25	78	118	90	188	

CITY OF GROVELAND STANDARD DETAILS: WATER

**PIPE RESTRAINT SCHEDULE**

DATE: JULY 7, 2008  
SCALE: N.T.S.

W-14A

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PIPE THRUST RESTRAINTS: MECHANICAL RESTRAINERS SHALL BE INSTALLED AS REQUIRED TO PROPERLY RESTRAIN ALL PIPING SYSTEMS. AT A MINIMUM, RESTRAINERS SHALL BE PROVIDED ON ALL BELOW-GRADE VALVES AND FITTINGS AND AT THE REQUIRED NUMBER OF PIPE JOINTS IN EACH DIRECTION. REQUIRED LENGTHS OF RESTRAINED PIPE SHALL BE AS SHOWN IN PIPE RESTRAINT SCHEDULES BELOW.

**BASIS OF SCHEDULES**

- TEST PRESSURE 150 PSIG
- MINIMUM PIPE DEPTH 3 FEET
- TYPE 3 LAYING CONDITION
- FACTOR OF SAFETY = 2.0

A "LOW" REPRESENTS THE MINIMUM LENGTH OF PIPE (IN FEET) REQUIRED TO BE RESTRAINED ON THE LOW SIDE OF THE VERTICAL OFFSET, WHICH IS TYPICALLY DOWNSTREAM OF THE OFFSET FITTING. "HIGH" REPRESENTS THE MINIMUM LENGTH OF PIPE (IN FEET) REQUIRED TO BE RESTRAINED ON THE HIGH SIDE OF THE VERTICAL OFFSET, WHICH IS TYPICALLY UPSTREAM OF THE OFFSET FITTING. REQUIRED RESTRAINED LENGTHS ASSUME AN OFFSET ANGLE # 45°.

B DISTANCE REPRESENTS THE LINEAR FEET OF LARGE DIAMETER PIPE UPSTREAM OF THE REDUCER REQUIRED TO BE RESTRAINED. RESTRAIN SMALL DIAMETER PIPE AT REDUCER AT A MINIMUM. IF THERE IS AN UNOBSTRUCTED RUN DOWNSTREAM OF THE REDUCER (I.E. SMALL DIAMETER PIPE) OF AT LEAST 2.5 TIMES THE REQUIRED LENGTH OF LARGE DIAMETER PIPE TO BE RESTRAINED, THEN RESTRAINT IS REQUIRED ONLY AT THE REDUCER FITTING. IF SMALL END OF REDUCER IS MORE THAN THREE PIPE SIZES SMALLER THAN LARGE END, CONSULT ENGINEER FOR REQUIRED LENGTH TO BE RESTRAINED.

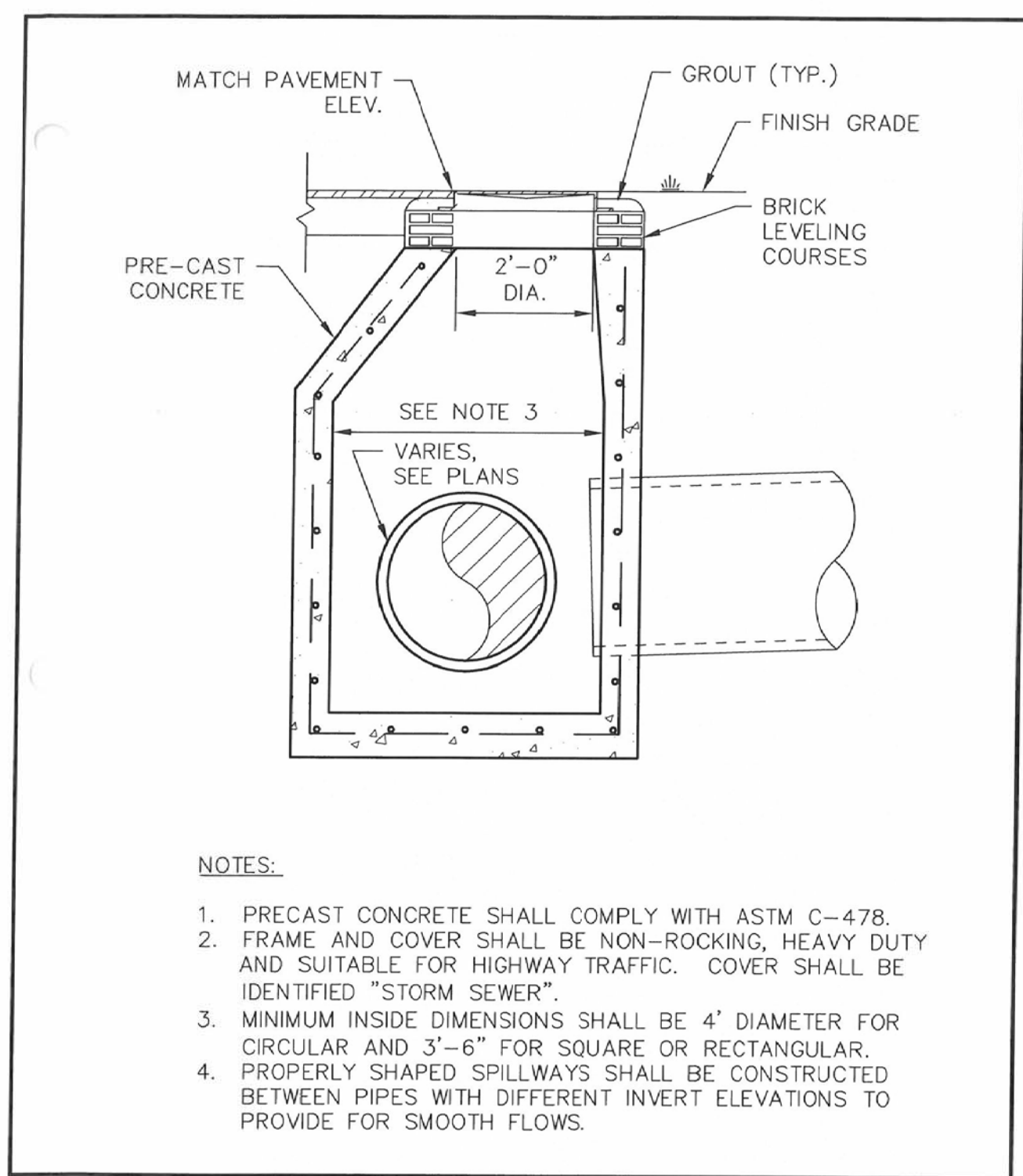
CITY OF GROVELAND STANDARD DETAILS: WATER

**PIPE RESTRAINT SCHEDULE**

DATE: JULY 7, 2008  
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W-14C

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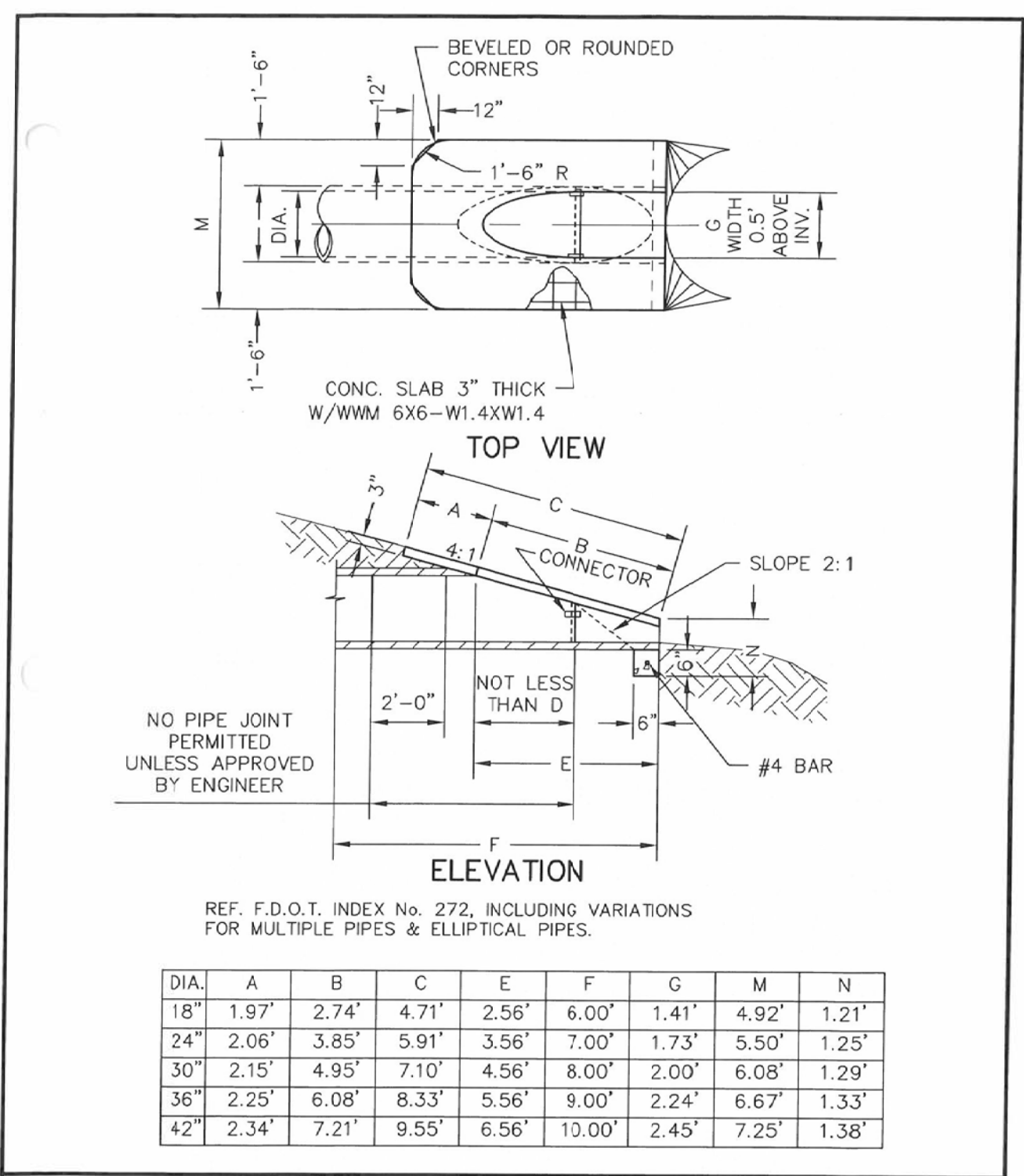
CITY OF GROVELAND STANDARD DETAILS: STREET & DRAINAGE

**STORM SEWER MANHOLE**

DATE: JULY 7, 2008  
SCALE: N.T.S.

D-8

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CITY OF GROVELAND STANDARD DETAILS: STREET & DRAINAGE

**MITERED END SECTION**

DATE: JULY 7, 2008  
SCALE: N.T.S.

D-9

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PROJECT:

**FRESENIUS KIDNEY CARE**

**DIALYSIS CLINIC**

CLERMONT WEST

LOCATION:

(ADDRESS TO BE ASSIGNED)  
 N.W.Q. OF C.R. 565A & S.R. 50  
 GROVELAND  
 LAKE COUNTY, FL 34736

DEVELOPER:

**DOUGLAS C. McNAB,**  
 ARCHITECT

8148 OLD FEDERAL ROAD  
 MONTGOMERY, AL 36117  
 TEL (334) 271-3015

ENGINEER:

**FORESITE**  
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FL CA 26115  
 Foresite Group, Inc.  
 10150 Highland Manor Dr.  
 Suite 210  
 Tampa, FL 33610

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 w | www.fg-inc.net

SEAL:

REVISIONS

REVISIONS	DATE

PROJECT MANAGER: BK  
 DRAWING BY: JEC  
 JURISDICTION: CITY OF GROVELAND, FL  
 DATE: 19 MAY 2016

TITLE:

**CITY OF GROVELAND DETAILS**

SHEET NUMBER: C-7.3

SCALE:

JOB/FILE NUMBER: 865.001