

- NOTES:**
- DIRECT DRILL STAGING AREAS PROVIDED TO SHOW REPRESENTATIVE AREA ON EACH END OF GIVEN DRILL.
 - CONTRACTOR MAY CHOOSE TO MODIFY EXACT LOCATION OF STAGING AREA AND END POINTS, UPON WRITTEN AGREEMENT FROM OWNER/ENGINEER.
 - CONTRACTOR SHALL PROVIDE FULL CONTAINMENT STAGING AREA TO PROHIBIT MUD AND WATER FROM LEAVING THE WORK AREA.
 - CONTRACTOR SHALL ENSURE THAT FINAL VERTICAL AND HORIZONTAL ALIGNMENT BETWEEN PVC AND HDPE PIPE SECTIONS DO NOT DEFLECT FROM THE UPSTREAM PVC SECTIONS OF PIPELINE OR DOWNSTREAM HDPE SECTION.
 - STAGING AREA TO BE KEPT FREE OF DEBRIS AND RESTORED TO PRECONSTRUCTION CONDITIONS UPON COMPLETION. BARRICADES SHALL BE UTILIZED AROUND EXCAVATION SITES.
 - DRILLING SHALL BE IN A CONTROLLED MANNER TO ENSURE PROPER DRILLING AND PIPE SETUP. PIPE CONNECTIONS ON EACH END SHALL BE MADE UPON SUCCESSFUL PRESSURE TESTING OF THE HDPE PIPE SECTIONS. PRESSURE TESTING OF THE HDPE SHALL NOT INCLUDE ANY PVC SECTIONS, UNLESS NOT FEASIBLE WITH GIVEN PIPELINE ALIGNMENT OR CONNECTIONS.

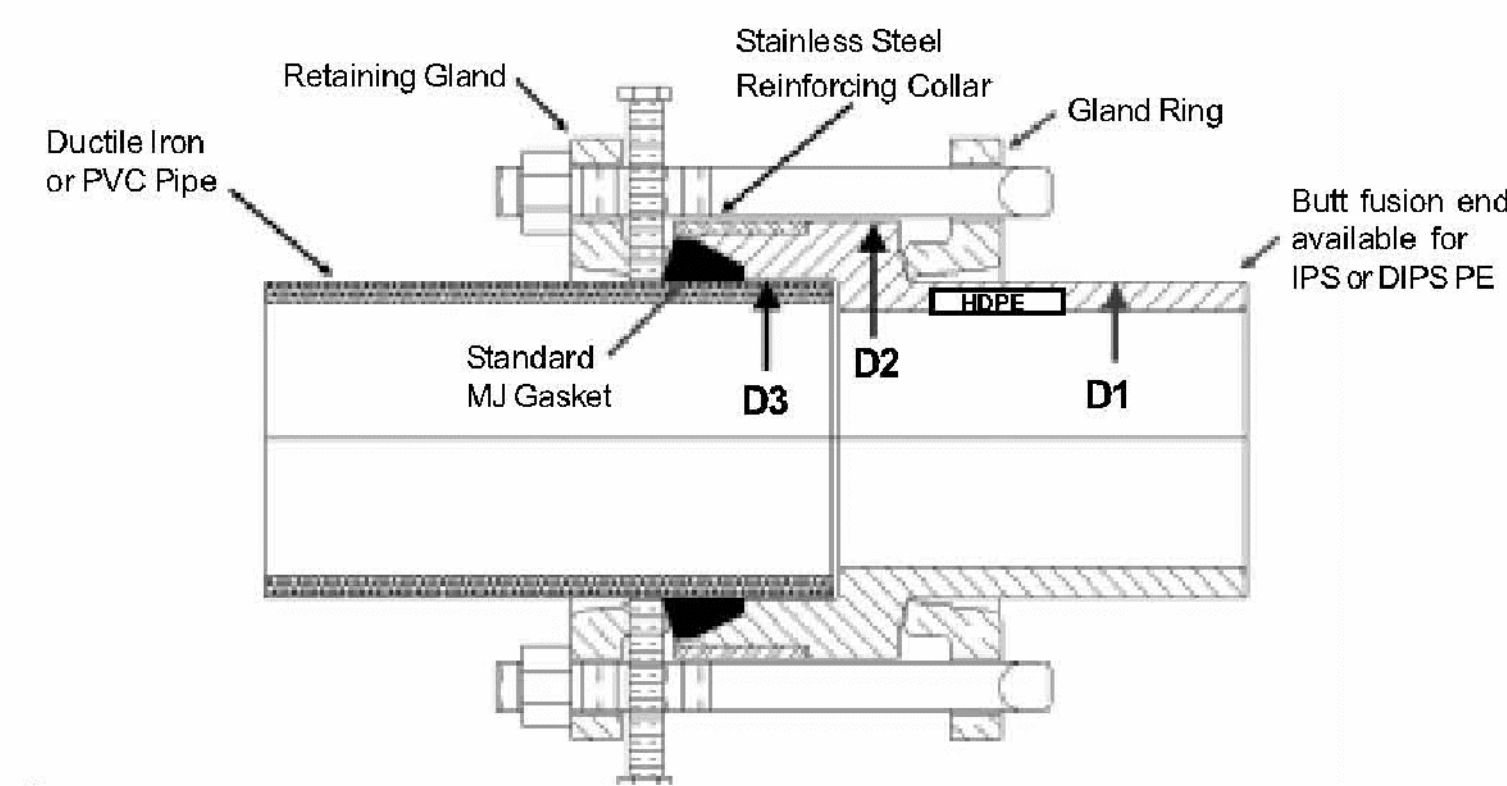
1 DIRECT DRILL STAGING AREA DETAIL
C-503 NO SCALE

FITTING -		PIPE SIZE (INCHES)								
		4	6	8	10	12	16	18	20	24
90 BEND:	H	23	33	43	51	60	76	83	90	104
	VU	10	14	18	21	25	31	34	37	43
	VD	6	8	11	13	16	20	22	24	28
45 BEND:	H	22	30	40	48	56	72	80	87	102
	VU	5	7	8	10	12	15	17	18	21
	VD	3	4	5	6	7	10	11	12	14
22.5 BEND:	H	10	15	19	23	27	35	38	42	49
	VU	2	3	4	5	6	7	8	9	10
	VD	2	3	4	5	6	7	8	9	10
11.25 BEND:	H	2	3	4	5	6	7	8	9	10
	VU	2	3	4	5	6	7	8	9	10
PLUGS:	H	52	73	96	115	136	174	193	211	246
	VU	52	73	96	115	136	174	193	211	246

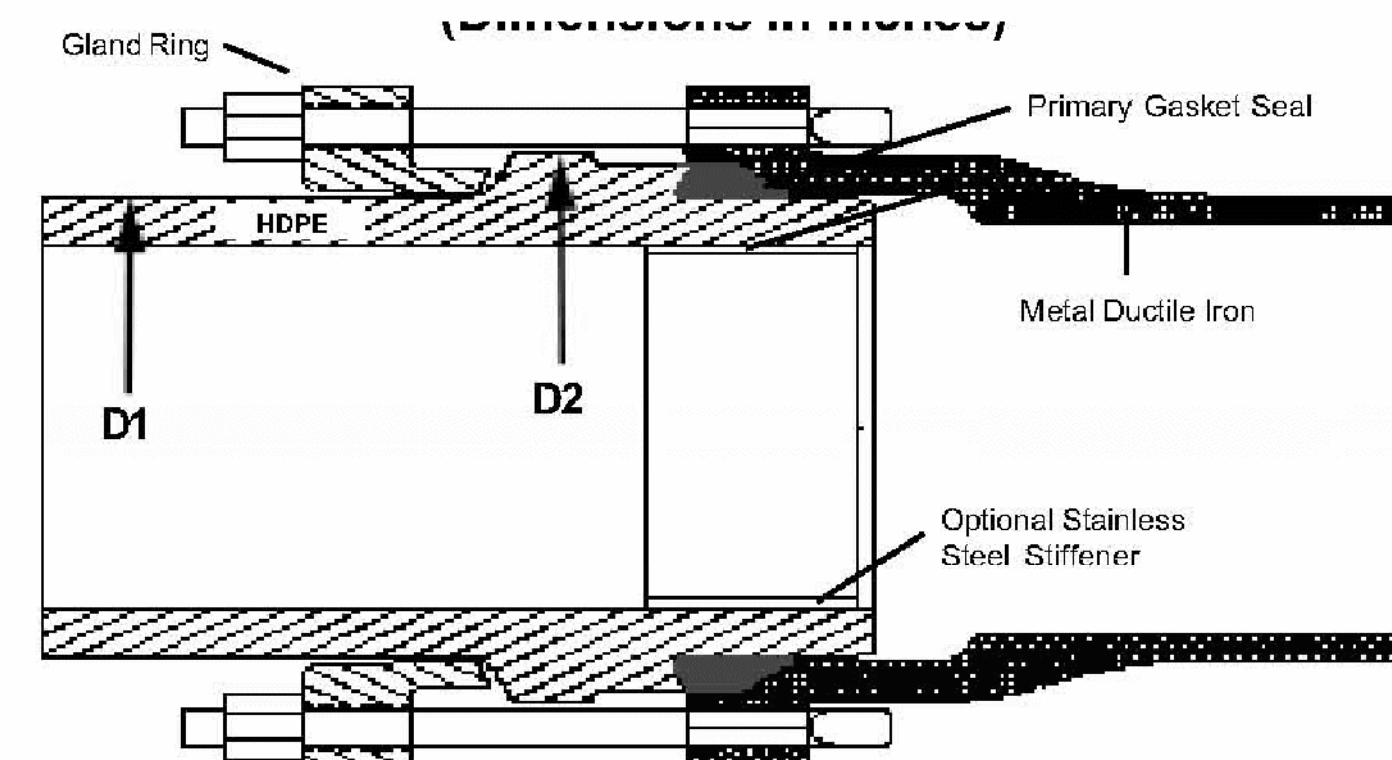
ABBREVIATIONS: H=HORIZONTAL, VU=VERTICAL UP, VD=VERTICAL DOWN.

- NOTES:**
- FOR TEE OR REDUCER FITTINGS SUBMIT RESTRAINED JOINT LENGTH CALCULATIONS TO TOWN ENGINEER FOR REVIEW AND APPROVAL, USING THE ASSUMPTIONS LISTED.
 - RESTRAINED JOINT LENGTH FOR WATER MAINS BASED ON TEST PRESSURE OF 150 PSI. CALCULATIONS WERE MADE USING EBAA IRON SOFTWARE (AVAILABLE AT WWW.EBAA.COM) AND THE FOLLOWING ASSUMPTIONS: GRANULAR MATERIAL (GM) SOIL TYPE, TRENCH TYPE 3, BURY DEPTH OF 3 FT AND SAFETY FACTOR OF 2.
 - RESTRAINED JOINTS SHALL BE USED ON ALL JOINTS FROM ANY MAIN TEE TO ANY FIRE HYDRANT ASSEMBLY.
 - TRUST BLOCKS WILL NOT BE ACCEPTED ON NEW PIPE, UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEER.

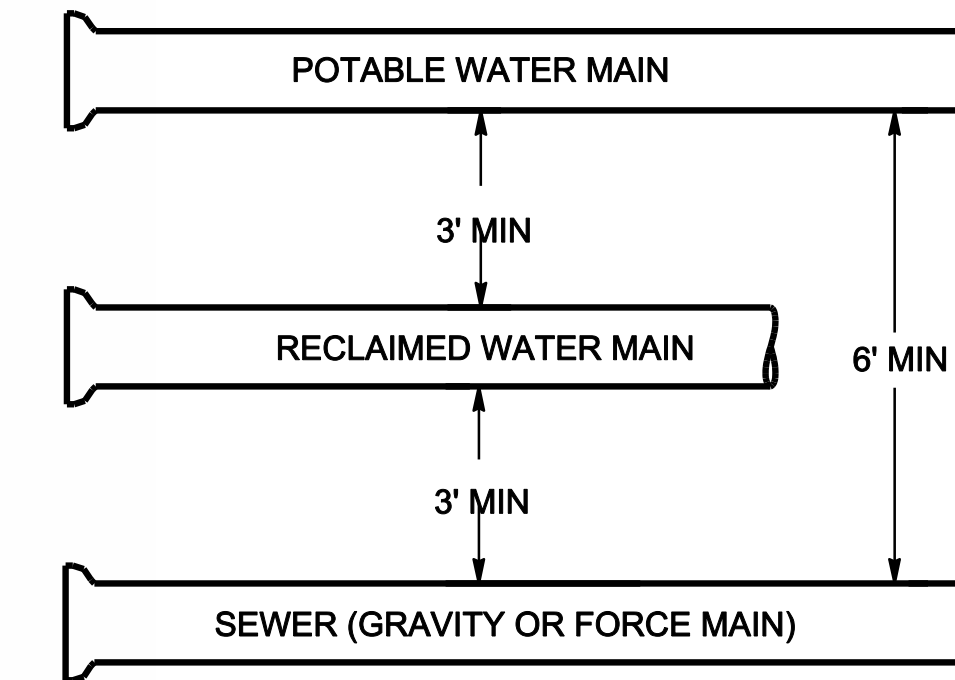
2 WATER MAIN RESTRAINED JOINT TABLE
C-503 NO SCALE



4 IPS AND DIPS BELL MJ ADAPTER DETAIL
C-503 NO SCALE



5 DIPS AND IPS MJ ADAPTER DETAIL
C-503 NO SCALE

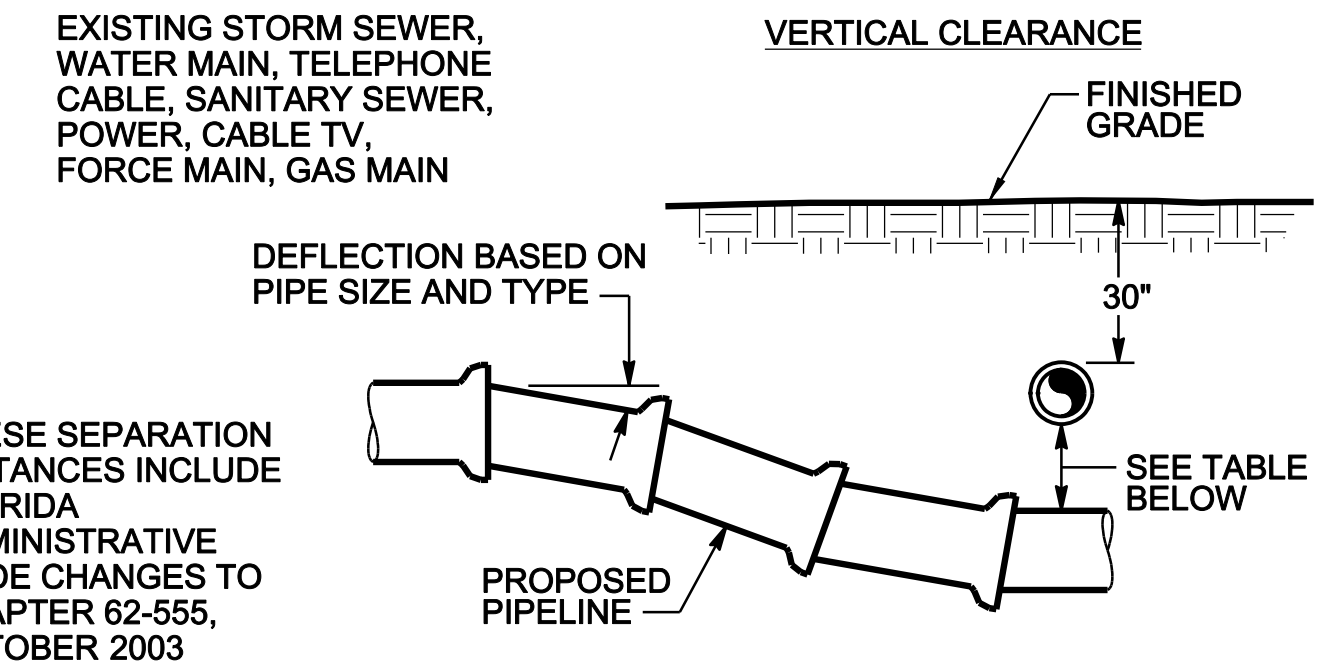


MINIMUM HORIZONTAL SEPARATION DISTANCES (FT)
(OUTSIDE OF PIPELINE TO OUTSIDE OF PIPELINE)

	WATER MAIN	FORCE MAIN	SANITARY SERVICE	REUSE MAIN	STORM WATER	OTHER UTILITIES (TELEPHONE, CABLE, ETC.)
WATER MAIN	3	6	6	3	3	3
FORCE MAIN	6	3	3	3	3	3
SANITARY SEWER	6	3	3	3	3	3
REUSE MAIN	3	3	3	3	3	3
STORM WATER	3	3	3	3	3	3
OTHER UTILITIES	3	3	3	3	3	3

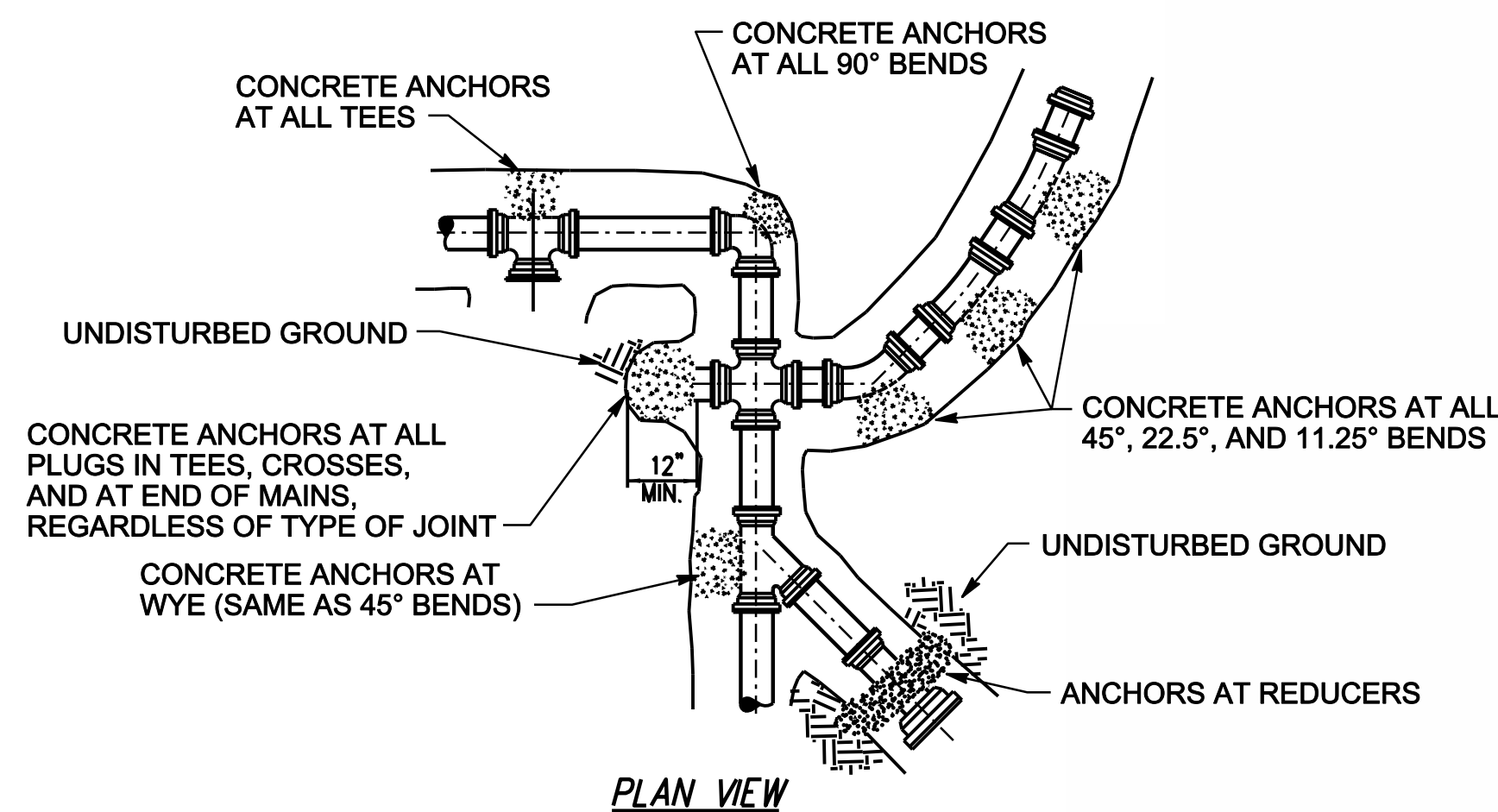
- NOTES:**
- MAXIMUM JOINT DEFLECTION SHALL BE 90% OF MANUFACTURER'S RECOMMENDATION.
 - WHERE EVER POSSIBLE, THE STRATIGRAPHY OF UTILITIES SHALL PLACE SANITARY SEWER AND SEWER FORCE MAINS BELOW RECLAIMED MAINS AND BELOW WATER MAINS, RESPECTIVELY. WHERE WATER MAINS ARE ABOVE GRAVITY SEWERS OR WASTEWATER FORCE MAINS, A VERTICAL CLEARANCE OF 6 INCHES IS ACCEPTABLE.
 - ACCEPTABLE VARIANCES:
 - WHERE HORIZONTAL SEPARATION CANNOT BE MAINTAINED, C900 DR14 PVC PIPE SHALL BE USED FOR ONE OF THE PIPELINES.
 - WHERE VERTICAL CLEARANCE CANNOT BE MAINTAINED, ONE FULL LENGTH OF DUCTILE IRON PIPE OR DR14 C900 PIPE SHALL BE INSTALLED CENTERED AT THE POINT OF CONFLICT.
 - WHERE 36" MINIMUM DEPTH OF COVER CANNOT BE MAINTAINED, SPECIAL PROTECTION OR PIPE MATERIAL UPGRADE MAY BE REQUIRED, AT THE DISCRETION OF THE CITY.
 - NO WATER PIPE SHALL PASS THROUGH, OR COME IN CONTACT WITH ANY PART OF A SANITARY MANHOLE OR STORMWATER STRUCTURE.

6 UTILITY CONFLICT DETAILS
C-503 NO SCALE

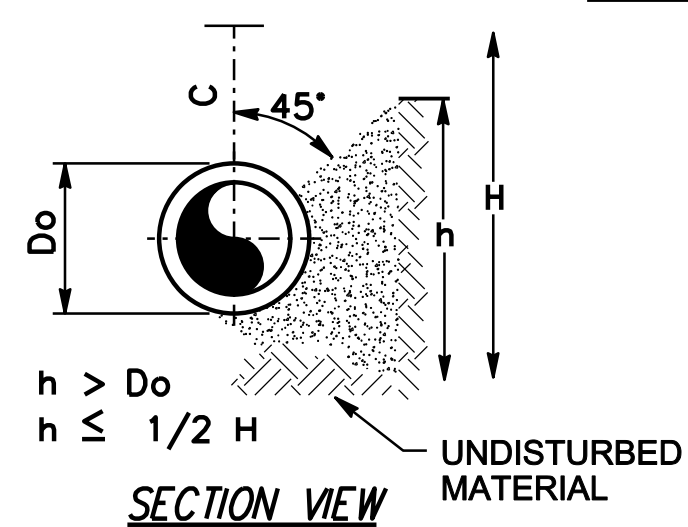


MINIMUM VERTICAL SEPARATION DISTANCES (IN)
(OUTSIDE OF PIPELINE TO OUTSIDE OF PIPELINE)

	WATER MAIN	FORCE MAIN	SANITARY SERVICE	REUSE MAIN	STORM WATER	OTHER UTILITIES (TELEPHONE, CABLE, ETC.)
WATER MAIN	6	12	12	6	6	6
FORCE MAIN	12	6	6	6	6	6
SANITARY SEWER	12	6	6	6	6	6
REUSE MAIN	6	6	6	6	6	6
STORM WATER	6	6	6	6	6	6
OTHER UTILITIES	6	6	6	6	6	6



PLAN VIEW



PIPE SIZE	DEAD END	HORIZONTAL BEND				
		90° ELBOW	45° ELBOW	22.5° ELBOW	11.25° ELBOW	
4"	2	3.0	2.0	2.0	2.0	
6"	3	5.0	3.0	2.0	2.0	
8"	6	8.0	4.5	2.0	2.0	
10"	9	12.0	7.0	3.0	3.0	
12"	12	16.0	9.0	5.0	4.0	
16"	21	30.0	16.0	10.0	8.0	

- NOTES:**
- BEARING AREAS ARE BASED ON AN ALLOWABLE SOIL BEARING PRESSURE OF 2000 lbs./sq.ft. AND MAY BE VARIED BY THE ENGINEER IF OTHER SOIL CONDITIONS ARE ENCOUNTERED. BEARING AREAS SHALL BE CALCULATED ON AREAS OF UNDISTURBED GROUND IN CONTACT WITH THRUST RESTRAINT.
 - PLASTIC SHEET SHALL BE USED BETWEEN THRUST BLOCK AND PLUGS, BOLTS, OR HUBS. CONCRETE ANCHORS ARE REQUIRED ON TAPPING SLEEVES WHERE THE BRANCH IS EQUAL TO SIZE RUN.
 - THRUST BLOCKS SHALL BE POURED IN DRY TRENCH.
 - CONCRETE SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

3 THRUST RESTRAINT/THRUST BLOCK DETAIL
C-503 NO SCALE

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UPGRADE POTABLE WATER TRANSMISSION MAIN
 TOWN OF LONGBOAT KEY, SARASOTA COUNTY, FLORIDA
 TYPICAL PIPING AND EQUIPMENT INSTALLATION DETAILS III