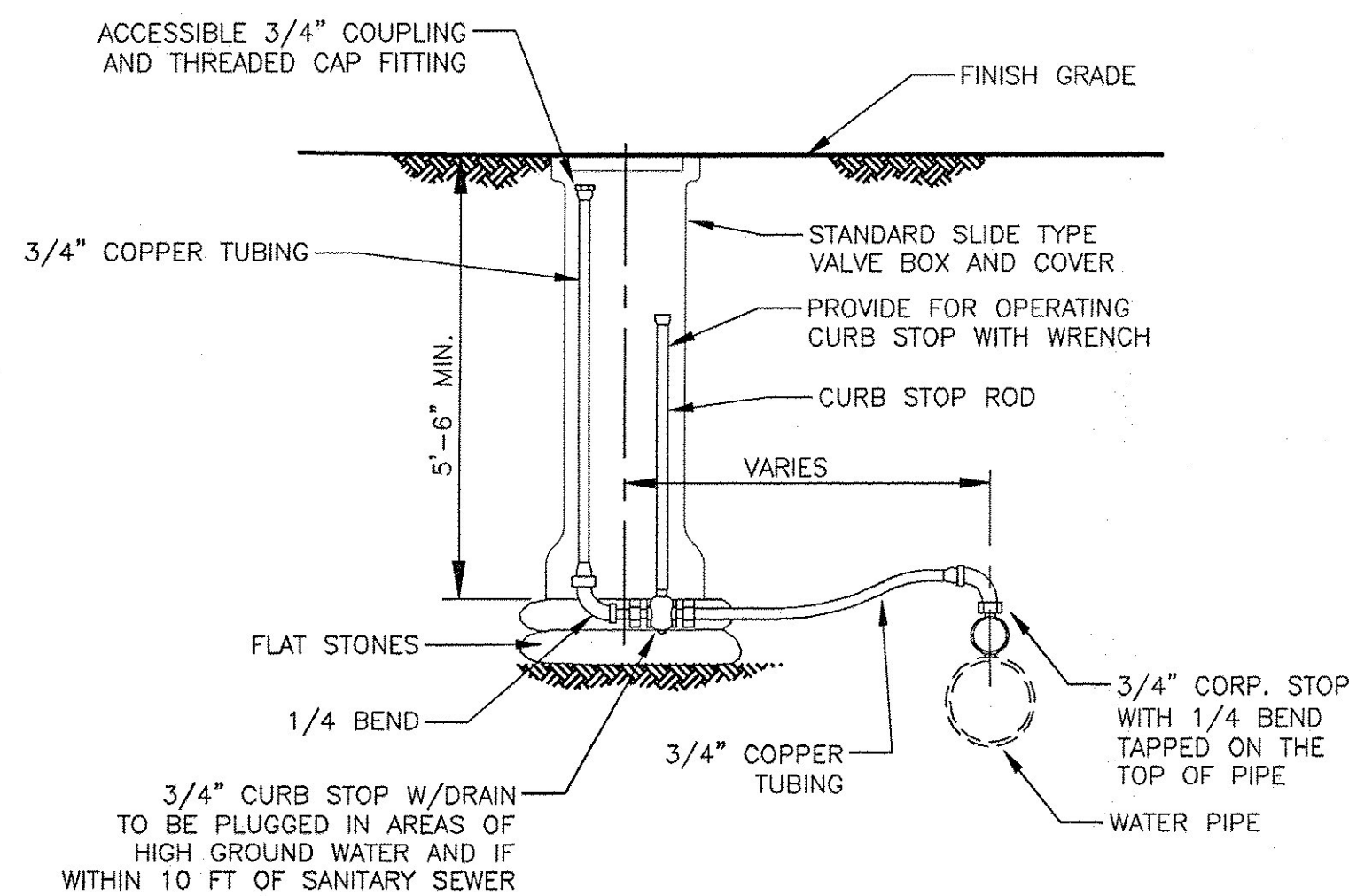


- BEDDING - EXCAVATE BELOW PIPE AND REFILL ONLY WHEN SPECIFICALLY ORDERED. MATERIALS AND COMPACTION AS SPECIFIED.
- HAUNCHING - FROM INVERT OF PIPE TO SPRINGLINE OF PIPE. HAND PLACE AND HAND TAMP TO REMOVE ALL VOIDS FROM UNDER PIPE. MATERIAL AND COMPACTION AS SPECIFIED.
- BLANKET - FROM SPRINGLINE TO 12\"/>

WATER MAIN TYPICAL TRENCH DETAIL

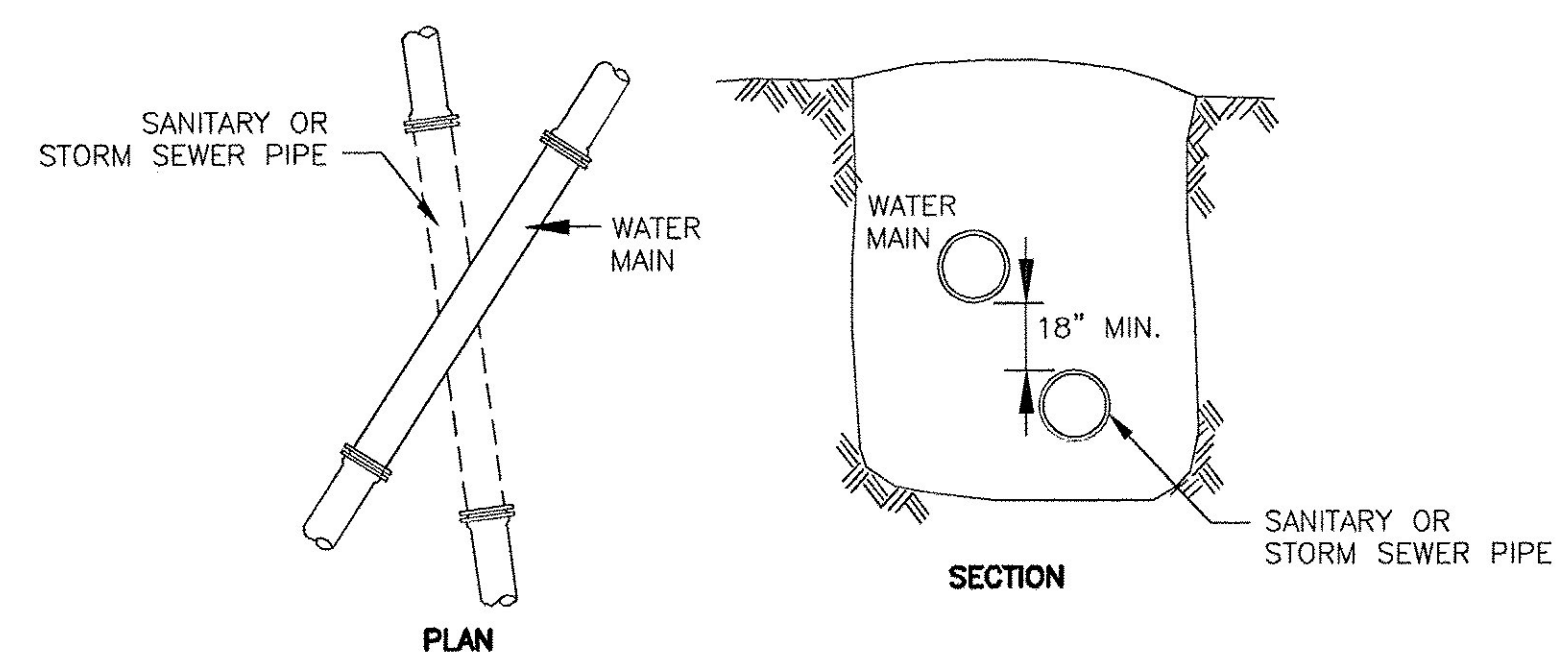
NOT TO SCALE

- NOTES:**
- REFER TO VTRANS STANDARDS FOR PAVEMENT THICKNESS REQUIREMENTS.
 - REFER TO THE SPECIFICATIONS FOR COMPACTION AND SPECIALTY MATERIALS FOR BLANKET, HAUNCHING, BEDDING, AND GRAVELS.
 - NORMALLY, EXCAVATED MATERIAL FROM THE TRENCH CAN BE USED AS COMMON FILL BACKFILL AND COMPACTED AS NECESSARY TO ACHIEVE COMPLIANCE WITH THE SPECIFICATIONS. IF IN THE OPINION OF THE ENGINEER, THE EXCAVATED MATERIAL WHEN REMOVED IS TOO WET TO BE USED AS BACKFILL TO ACHIEVE THE MINIMUM SPECIFIED COMPACTION, MATERIAL MEETING THE COMMON FILL SPECIFICATION WILL BE FURNISHED AND INSTALLED WITH NO ADDITIONAL CHARGE TO THE OWNER.
 - IF THE EXCAVATED MATERIAL BECOMES TOO WET DUE TO WEATHER CONDITIONS OR DUE TO IMPROPER HANDLING PROCEDURES AND CANNOT BE REUSED FOR BACKFILL, THE MATERIAL SHALL BE SUFFICIENTLY DRIED OR MIXED WITH DRY MATERIAL TO OBTAIN PROPER MOISTURE CONTENT AT NO ADDITIONAL CHARGE TO THE OWNER.
 - TRENCH WIDTH SHALL BE SUFFICIENT TO ALLOW PIPE TO BE LAID AND JOINED PROPERLY AND FOR PLACEMENT AND COMPACTION OF BEDDING. TRENCH SUPPORT SHALL BE ADEQUATE TO PERMIT SAFE ACCESS BY INSPECTOR FOR COMPACTION SAMPLES.
 - WHERE PIPE IS INSTALLED IN GRAVEL SHOULDER OR IN GRAVELED ROAD, GRAVEL SUBBASE MATERIAL AND COMPACTION SHALL BE AS SPECIFIED.



MANUAL AIR RELEASE DETAIL

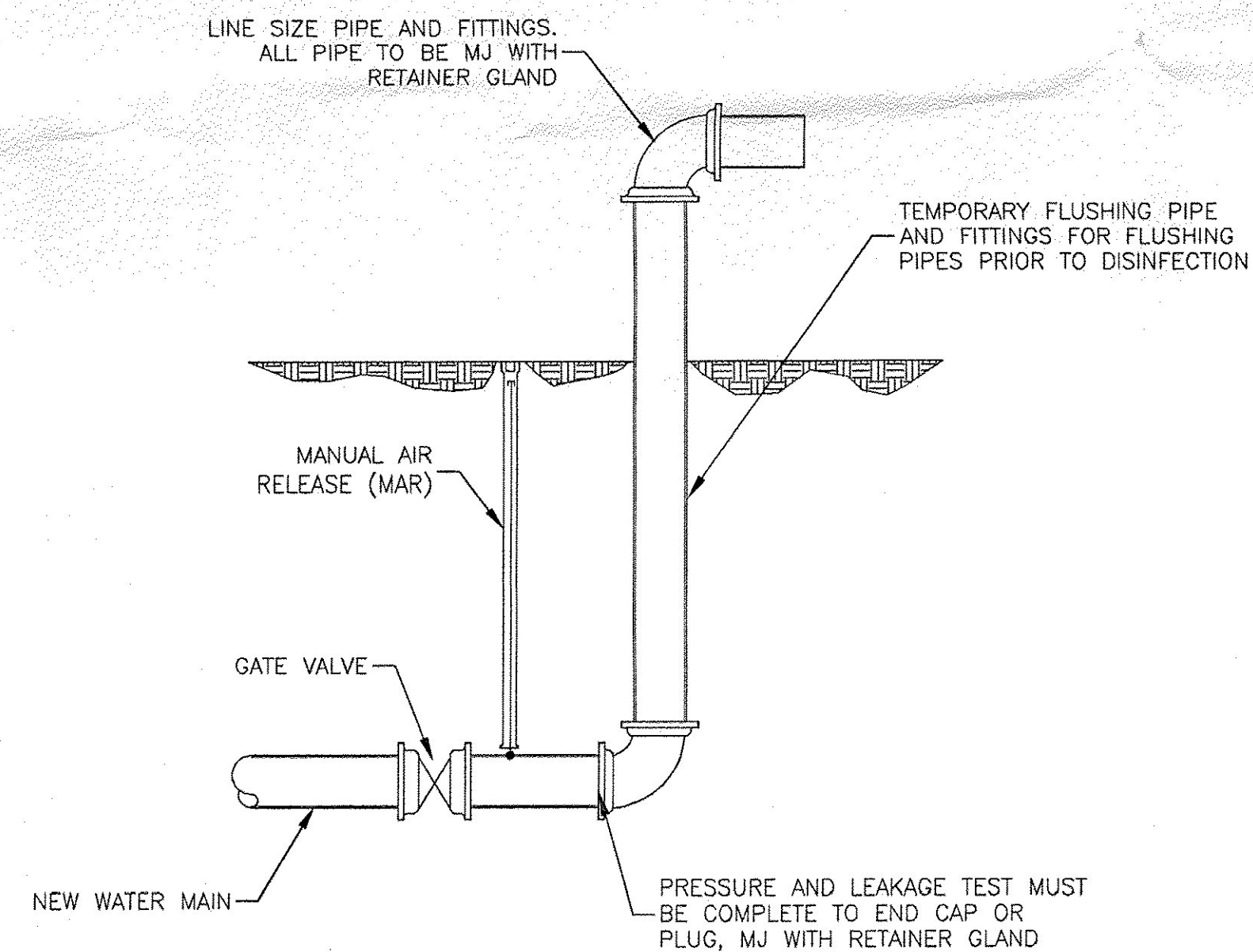
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- NOTES:**
- PARALLEL INSTALLATION:** WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED MANHOLE OR SANITARY OR STORM SEWER. THIS DISTANCE CAN BE REDUCED TO 5 FEET FOR STORM SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
 - CROSSINGS:** WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SANITARY OR STORM SEWER. THIS SHALL BE THE CASE WHERE THE WATER MAIN IS EITHER ABOVE OR BELOW THE SEWER. AT CROSSINGS, ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE. IF THE SEWER MAIN IS OVER THE WATER MAIN, THE FIRST SEWER PIPE JOINTS ON EACH SIDE OF THE WATER MAIN MUST BE CONCRETE ENCASED. SPECIAL STRUCTURAL SUPPORT FOR THE WATER AND SEWER PIPES MAY BE REQUIRED. WATER MAINS SHALL NOT PASS THROUGH SEWER MANHOLES OR BE SUBMERGED IN BASINS CONTAINING SEWAGE OR OTHER GROSSLY CONTAMINATED OR HAZARDOUS MATERIAL.
 - EXCEPTION:** THE ENGINEER MUST SPECIFICALLY APPROVE ANY VARIANCE FROM THESE REQUIREMENTS WHEN IT IS IMPOSSIBLE TO OBTAIN THE SPECIFIED SEPARATION DISTANCES.

SANITARY AND/OR STORM SEWER PIPE AND WATER MAIN CROSSING DETAIL

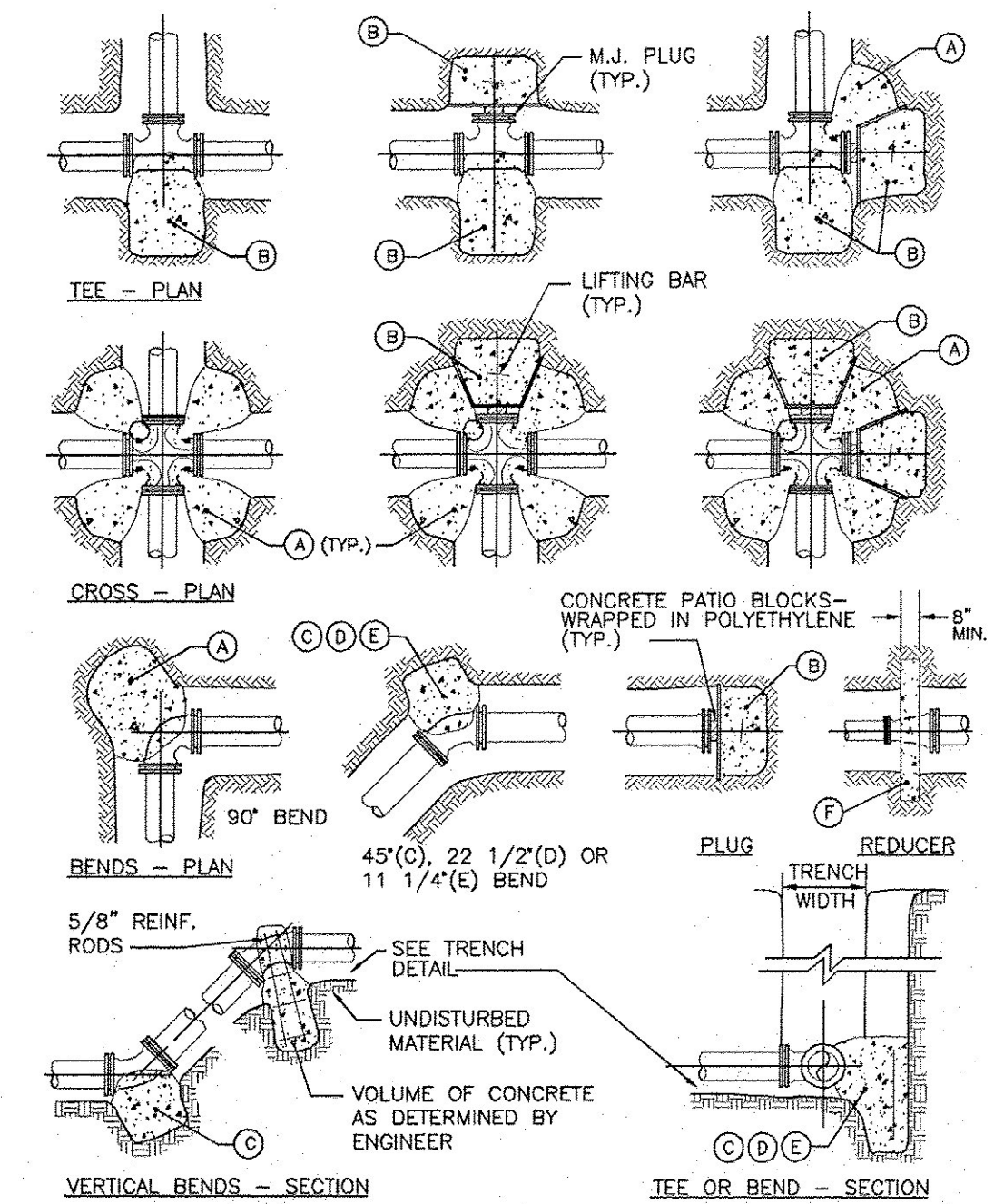
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TEMPORARY FLUSHING CONNECTION

SCALE: NOT TO SCALE

- NOTES:**
- MINIMUM FLUSHING VELOCITY IS 3 FEET PER SECOND.
 - CONTRACTOR TO ENSURE ALL FLUSHING WATER IS CONTROLLED IN ACCORDANCE WITH CONSTRUCTION GENERAL PERMIT AND DECHLORINATED PRIOR TO DISCHARGE.



THRUST BLOCK SCHEDULE											
SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL											
REACTION TYPE	PIPE SIZE										
	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	
TEST PRESSURE = 200 PSI	A	5.12	10.58	18.19	27.37	38.71	52.00	67.26	84.47	103.64	147.87
	B	3.62	7.48	12.87	19.35	27.37	36.77	47.56	59.73	73.29	104.56
	C	2.77	5.72	9.85	14.81	20.95	28.14	36.40	45.72	56.09	80.03
	D	1.41	2.92	5.02	7.55	10.68	14.35	18.56	23.31	28.60	40.80
	E	0.71	1.47	2.52	3.79	5.37	7.21	9.32	11.71	14.37	20.50
F	-	3.86	9.25	15.73	23.75	29.29	40.08	46.86	53.93	77.19	

- NOTES:**
- THRUST RESTRAINT IS REQUIRED FOR ALL TEES, BENDS, REDUCERS, CAPS, PLUGS, OR CROSSES.
 - POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
 - ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
 - PLACE CONCRETE PATIO BLOCKS IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCK.
 - PRE-FORMED AND PRE-POURED THRUST BLOCKS ARE NOT ACCEPTABLE.
 - THE USE OF A MECHANICAL JOINT RESTRAINT SYSTEM DOES NOT REDUCE THE REQUIREMENTS SHOWN IN THIS DETAIL.
 - ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE OR BUILDING PAPER PRIOR TO INSTALLATION OF CONCRETE RESTRAINT.
 - IF THREADED ROD IS USED, IT SHALL BE ANSI A242 F150 PIPE RESTRAINT NUTS TO MATCH AWWA C111.
 - SIZES FOR REDUCERS SHOWN ARE BASED ON THE SMALLEST AVAILABLE RUN SIZE FOR A GIVEN PIPE SIZE.
 - INSTALL LIFT HOOKS INTO THRUST BLOCKS AT END CAPS AND PLUGS.
 - TEST PRESSURE TO BE 200 PSI MIN. AT LOW END OF THE TEST SECTION. SQUARE FEET OF CONCRETE THRUST BLOCKING FOR OTHER TEST PRESSURES IS DIRECTLY PROPORTIONAL TO THE ABOVE TABLE. FOR INSTANCE, AT 300 PSI TEST PRESSURE, THE NUMBERS SHOWN IN THE ABOVE TABLE ARE MULTIPLIED BY 1.5. SEE BELOW FOR EXAMPLE CALCULATION.
 - THRUST BLOCK AREA IS BASED ON A SOIL BEARING STRENGTH OF 1500 LBS/SF AND A SAFETY FACTOR OF 1.5. MULTIPLY THE BEARING AREA FROM ABOVE (WITH CONSIDERATION OF TEST PRESSURE) AND MULTIPLY BY THE FOLLOWING FACTORS TO DETERMINE BEARING AREA REQUIRED FOR VARIOUS SOIL CONDITIONS:

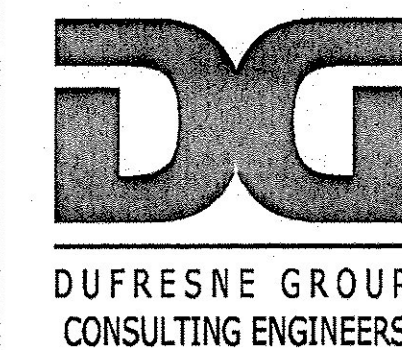
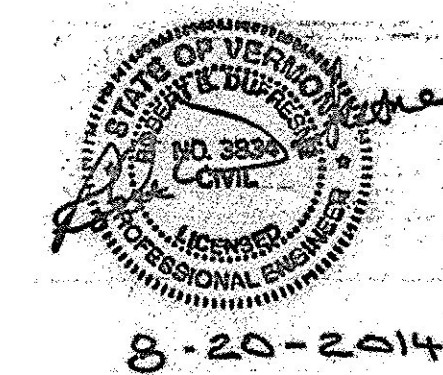
SOIL TYPE	BEARING CAPACITY (LB/SF)	FACTOR
SOFT CLAY	1,000	1.50
SILT	1,500	1.00
SANDY SILT	3,000	0.50
SAND	4,000	0.38
SANDY GRAVEL	5,000	0.30
SANDY CLAY	6,000	0.25
GRAVEL W/ ROCK	7,000	0.21
HARD CLAY	9,000	0.17

EXAMPLE: AN 8-INCH 90° BEND IN SANDY GRAVEL SOILS. TEST PRESSURE OF 200 PSI. AREA REQUIRED = 18.19SF x 1 x 0.30 = 5.46SF

THRUST BLOCK DETAILS AND NOTES

NOT TO SCALE

DE: P:\Barr\17\City of Barre\1415011 - Road 14\Drawn\Water Main\2014\Water Main.dwg Aug 21, 2014 - 11:05am



PROJECT NAME: BARRE TOWN WATER MAIN RELOCATION
 PROJECT NUMBER: STP SCR(10)
 FILE NAME: PLOT DATE: 8/20/14
 PROJECT LEADER: K UPMAL DRAWN BY: B.L. BAKER
 DESIGNED BY: B.L. BAKER CHECKED BY: R.E. DUFRESNE
 WATER DETAILS SHEET 2 OF 2