



PIPE RESTRAINT REQUIREMENTS

Originator: **RCS**

Standards Approval:
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Rev #:	Revision Description:
1	2019 UPDATES

TABLE: PIPE RESTRAINT REQUIREMENTS FOR DUCTILE IRON PIPE AT A 1.5 SAFETY FACTOR, POLYETHYLENE WRAPPED PIPE IN POORLY GRADED SAND OR GRAVEL AT 250 PSI PRESSURE

HORIZONTAL AND VERTICAL UP BENDS – REQUIRED RESTRAINED LENGTH FOR EACH SIDE OF BEND

	11.25°	22.5°	45°	90°
6-INCH DUCTILE IRON	8 FT	8 FT	17 FT	39 FT
8-INCH DUCTILE IRON	8 FT	11 FT	21 FT	50 FT
10-INCH DUCTILE IRON	8 FT	13 FT	25 FT	59 FT
12-INCH DUCTILE IRON	8 FT	14 FT	29 FT	69 FT

VERTICAL DOWN BENDS – REQUIRED RESTRAINED LENGTH FOR EACH SIDE OF BEND

	11.25°	22.5°	45°	90°
6-INCH DUCTILE IRON	15 FT	28 FT	58 FT	138 FT
8-INCH DUCTILE IRON	18 FT	36 FT	74 FT	178 FT
10-INCH DUCTILE IRON	22 FT	44 FT	90 FT	215 FT
12-INCH DUCTILE IRON	26 FT	51 FT	105 FT	252 FT

STRAIGHT TEES – REQUIRED RESTRAINED LENGTH FOR TEE BRANCH

6-INCH DUCTILE IRON	98 FT
8-INCH DUCTILE IRON	139 FT
10-INCH DUCTILE IRON	173 FT
12-INCH DUCTILE IRON	211 FT

REDUCED BRANCH TEES – REQUIRED RESTRAINED LENGTH FOR TEE BRANCH

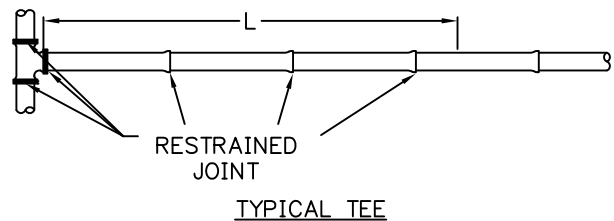
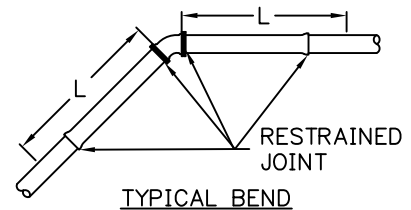
8X6X8-INCH DUCTILE IRON	85 FT
10X6X10-INCH DUCTILE IRON	71 FT
10X8X10-INCH DUCTILE IRON	128 FT
12X6X12-INCH DUCTILE IRON	56 FT
12X8X12-INCH DUCTILE IRON	118 FT
12X10X12-INCH DUCTILE IRON	165 FT

REDUCERS – REQUIRED RESTRAINED LENGTH FOR LARGER PIPE

8X6-INCH DUCTILE IRON	75 FT
10X6-INCH DUCTILE IRON	132 FT
10X8-INCH DUCTILE IRON	73 FT
12X6-INCH DUCTILE IRON	183 FT
12X8-INCH DUCTILE IRON	134 FT
12X10-INCH DUCTILE IRON	74 FT

DEAD ENDS – REQUIRED RESTRAINED LENGTH

6-INCH DUCTILE IRON	138 FT
8-INCH DUCTILE IRON	178 FT
10-INCH DUCTILE IRON	215 FT
12-INCH DUCTILE IRON	252 FT



NOTES

- MECHANICAL JOINTS SHALL BE RESTRAINED WITH MEGALUGS OR EQUAL. TYTON JOINTS SHALL BE RESTRAINED WITH FIELD LOK GASKETS OR EQUAL. MECHANICAL JOINT RESTRAINTS SHALL BE COATED WITH FUSION BONDED POLYESTER, OR ZINC & EPOZY COATING. EBAA MEGABOND, ROMAC ROMABOND, OR APPROVED EQUAL
- ADHERE TO THE RESTRAINED JOINT REQUIREMENTS IN THE TABLE, OR AS RECOMMENDED BY THE MANUFACTURER IF MORE STRINGENT.
- RESTRAINED JOINTS ARE REQUIRED ON ALL JOINTS WHEN THE DUCTILE IRON MAIN IS INSTALLED IN A CASING PIPE.
- RESTRAINED JOINTS ARE REQUIRED ON ALL PIPES LESS THAN 8- FEET IN LENGTH.
- RESTRAINED JOINTS ARE REQUIRED ON TEE BRANCHES AND ON TEE RUNS.
- RESTRAINED JOINTS ARE REQUIRED ON ALL FITTINGS UNLESS THRUST BLOCKING IS APPROVED BY DISTRICT.
- WHEN USING BARE DUCTILE IRON PIPE THE RESTRAINED LENGTH IN THE TABLE FOR TEES, DEAD ENDS AND REDUCERS MAY BE MULTIPLIED BY 0.5.
- WHERE BENDS REQUIRE TWO FITTINGS AS SHOWN ON CONTRACT DRAWINGS, LENGTH OF PIPE WITH RESTRAINED JOINTS SHALL BE FOR THE NEXT ANGLE GREATER THAN THE SUM OF THE ANGLES FORMED BY THE FITTINGS BUT NOT GREATER THAN FOR A 90° BEND.