Mechanical Restraints

Bends, tees, dead ends, valves, and all reducers shall be supported from separation by mechanical restraints. There must be no unrestrained joints within a sufficient distance from the fitting to provide the necessary earth support and frictional resistance. This distance must be calculated by accepted engineering methods, such as the calculative methods provided by the Ductile Iron Pipe Research Association (DIPRA). The following assumptions need to be made for restraint design for water lines requiring restraints:

1. Assume a Type 5 laying condition per Standard Detail WA-3.3.
2. Provide what soil designation was used in the calculations.
3. Use a design pressure of 200 psi.
4. Use a safety factor of 1.5.
5. Model tees and crosses as 90° bends. Required restrained length shall be used for all three legs of tee or four legs of the cross.
6. Restraint lengths need to be listed on the water plan sheet of the engineering plans.

Note: The above assumptions are based on the DIPRA program.

MECHANICAL RESTRAINTS					PLAN #
THE CITY OF BATTLE GROUND	CITY OF BATTLE GROUND APPROVED	REVISIONS:	DATE:	DRAWN:	DESIGNED:
		1	4/16/07	JMH	MCH
	5/9/07				WA-3.2
	CITY ENGINEER DATE				

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