One-Pipe Steam Systems and Zoning

Before we zone a one-pipe steam system, we need to know where, why, and how a one-pipe steam system should be zoned.

I use the term "should be" because thousands of buildings built since the early 1900s were fitted with a one-pipe steam system. Building types can range from a one-family bungalow through high-rise apartment houses. Some larger properties have a footprint that may be 500 feet long by 200 feet wide and as high as 12 stories. One-pipe steam systems can range from simple piping, as shown in the drawings in this book, to extremely complex piping designs.

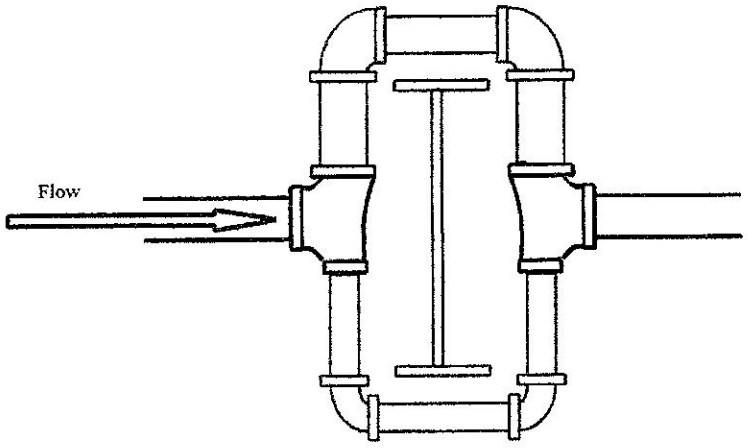
Extremely complex systems have multiple boilers with a main steam header in the boiler room, where separate steam mains are piped to different wings of the building. Each wing of the building will have its own steam supply main, multiple steam risers, condensate return piping, and, of course, master vent and radiator vent valves.

Piping systems in very large buildings can have steam mains with multiple elevation changes, condensate drips, dry and wet returns, or combinations of all of the above. To confound matters, obstructions can cause the designer to use jump overs in return and steam piping where overhead beams, doors, windows, and stairs are in the path of the piping.

Installing jump overs is a simple solution that deals with obstructions. The jump over is an alternate method of handling air and condensate. The jump over can eliminate the need to install a drip trap station or an additional condensate pump with piping, and sometimes, it will eliminate the need for the remote condensate pump.

Jump Over for a Steam Main
Steam and Air Flows Over the Top of the Obstruction, Condensate Drops Below

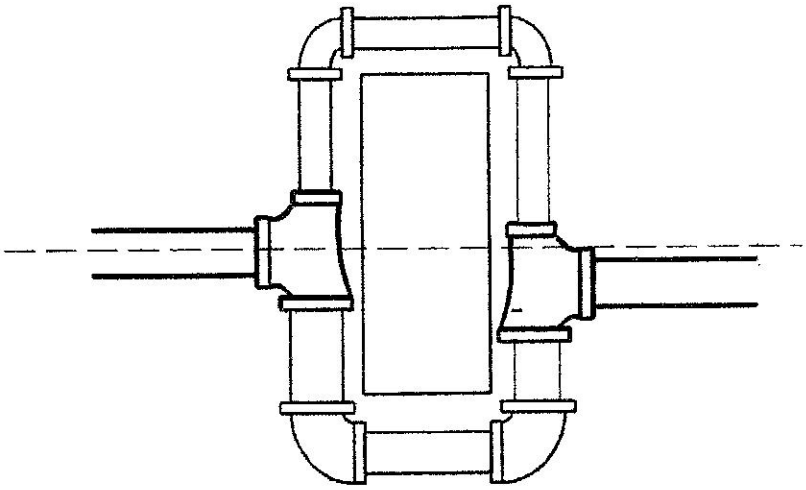
Steam Main Jumps Over Beam. Condensate Flows Under Beam



Condensate Piping

Jump over path for air is ½ the line size and no less than 1-inch pipe.

The center of the outlet side is ½ inch lower than the inlet side of the jump over.



Steam Main and a Structural Obstruction