SPRINKLER SYSTEM ARRANGEMENTS

SUPPRESSION SYSTEM TYPES & ARRANGEMENTS SERIES BY MEYERFIRE UNIVERSITY | FEBRUARY 2023

SUMMARY

Fire sprinkler systems can be arranged in three different ways: a tree system, looped system, or gridded system. A layout might be one or a combination of these arrangements.

Tree System

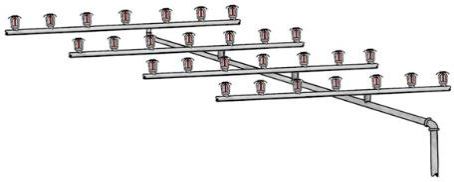
- The water supply (roots of a tree) feeds the express or feed main (the main trunk) to the cross main (if more than one trunk on the tree) which in turn feeds the branch lines (or the branches of the tree).
- Tree systems were the most common throughout the history of fire sprinkler systems. They are efficient. They're still common today for slim buildings, small buildings, or low-demand hazards. We'll talk about that in more detail later.

Looped Systems

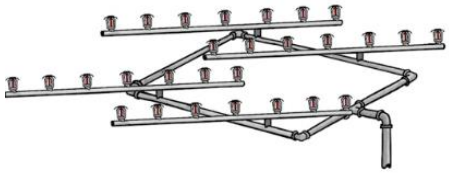
- Looped systems have multiple feed mains tied together at each end. Water in looped systems provide two paths deliver water to the branch pipe.
- Loop systems perform better hydraulically than a tree system, because looped mains each have to flow less water on each pipe in order to work, which causes less friction along the length of main.
- Dry and pre-action systems are allowed to be looped (but not gridded), so loop systems end up being more common for hydraulically-demanding dry and pre-action systems.

Gridded Systems

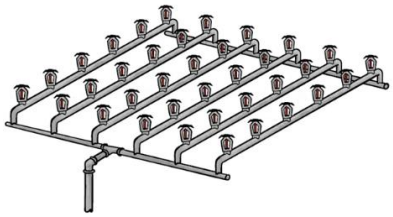
- A gridded system has parallel cross mains that are connected using the branch lines.
- When a sprinkler is activated, water is distributed more efficiently through each of the branch lines to the secondary cross main, and back through the branch line with the activated sprinkler.
- Gridded systems perform the best hydraulically, so they are common for demanding wet-pipe sprinkler systems or in very large wet-pipe systems.
- Dry and double-interlock pre-action systems are not allowed to be gridded.



Tree System



Looped System



Gridded System

CODE/STANDARD REFERENCES

NFPA 13 – 2022: Section 8.2.3.10 – Dry systems cannot be gridded

NFPA 13 – 2022: Section 8.3.2.7 – Double-interlock pre-action systems cannot be gridded

VIDEO LINK

www.meyerfire.com/university/different-sprinkler-system-arrangements

GET MORE LIKE THIS

This page is from MeyerFire University. Get updates & more here:
Join MeyerFire University | Course & Video Catalog | Video Library

PUBLISHED 2023 | NEXT UPDATE COMING 2026

MeyerFire University