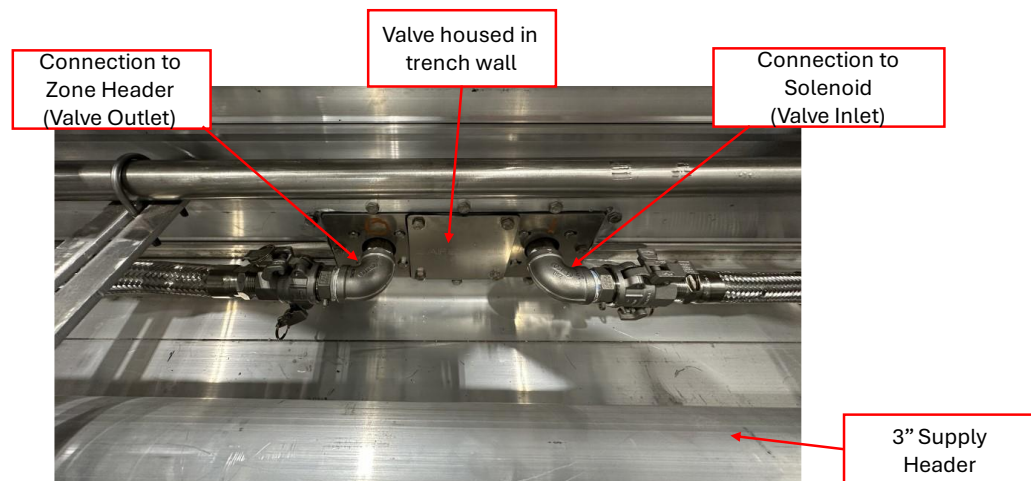


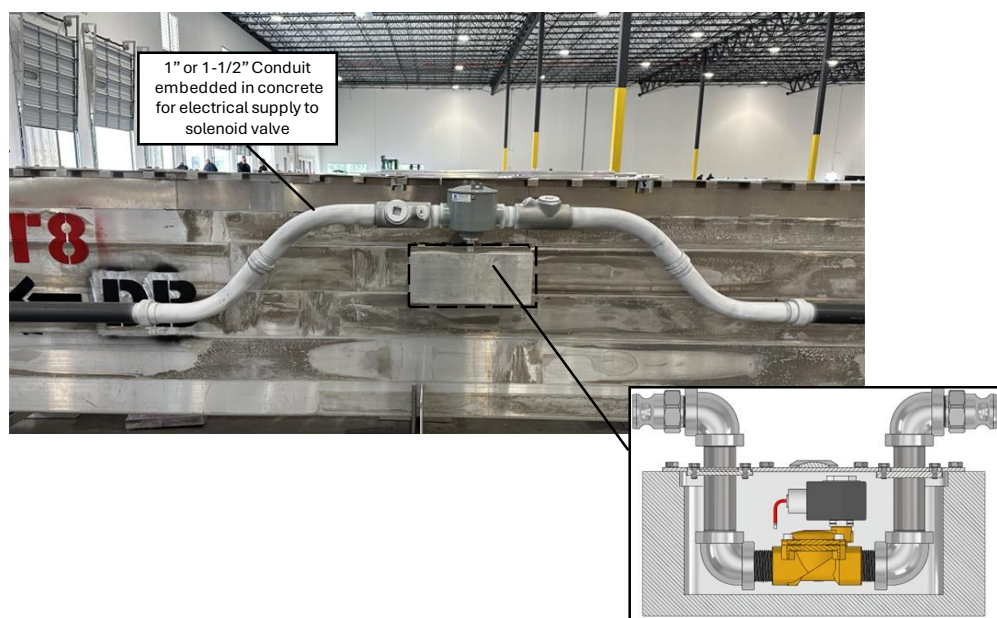
To whom it may concern:

Safespill has made a significant design change related to the supply method for flushing manifold systems. The following design brief provides details on the new design, discusses the pros and cons of this design change, and discusses the potential impact on system performance regarding compliance with Factory Mutual (FM) requirements.

Existing Design



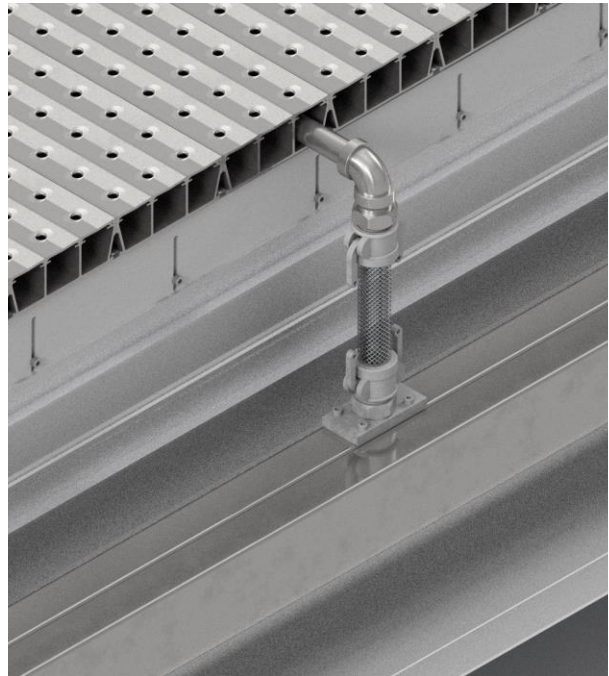
3" Supply Header is normally wetted up to solenoid valve for standard applications.
3" Supply Header is normally dry throughout for cold-weather applications.
Zone Header (Downstream of valve) is normally dry for all applications.



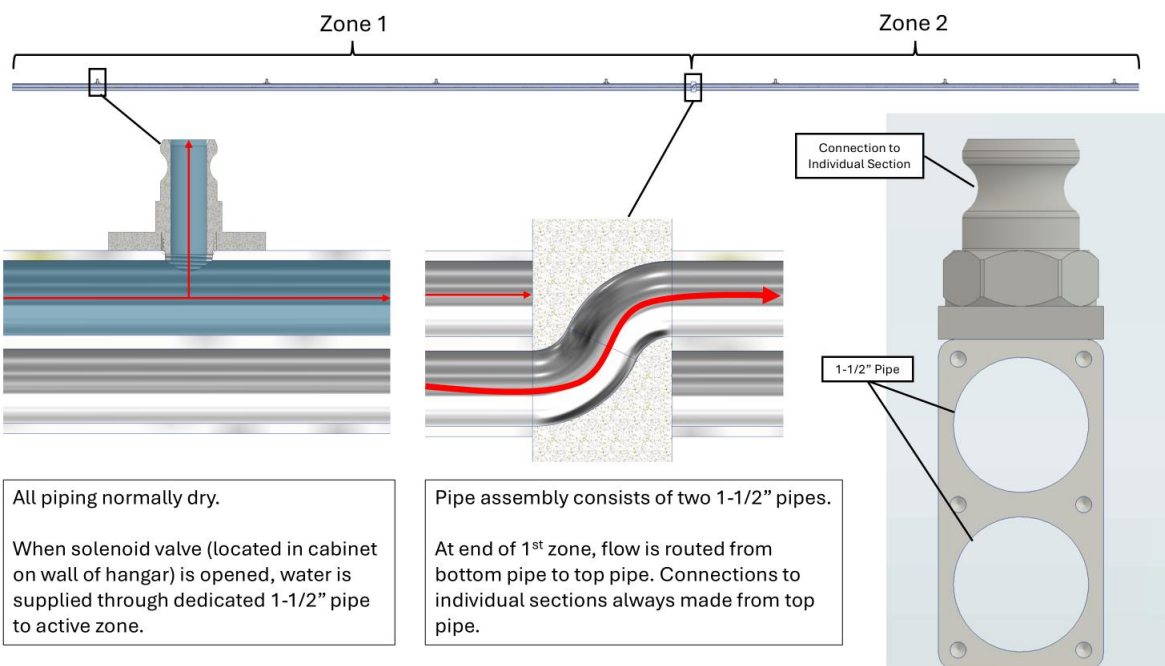
New Design



Solenoid Valves located outside of trench, housed in cabinet mounted on hangar wall.



Multiple pipe assemblies routed through trench with each pipe connected directly to flushing manifolds in the associated zone.



Pros and Cons

Advantages of the new design:

- **Reduced infrastructure complexity:** The revised layout eliminates the need for extensive conduit and cable routing through concrete, simplifying installation and reducing overall project labor and cost.
- **Improved maintenance accessibility:** Relocating valves aboveground into cabinets provides improved access for inspection and maintenance, compared to previously embedded installations within the trench walls.
- **Cold-climate standardization:** The new dry-pipe configuration, using automatic drain valves (e.g., Tyco AD-2 or equivalent), provides a standardized design that can also be utilized for cold-weather applications.

Primary trade-off:

- **Waterflow delay:** A startup delay is introduced due to the dry-pipe layout. This is inherent in the design but has been quantified compared to the existing design as follows:

Additional Waterflow Delay for Most Remote Zone

- Total pipe length:
 - 300 ft of 1-1/2" Sch. 40 in trench
 - Total Pipe Volume:
 - 1-1/2": 4.24 ft³ or 31.7 gallons
 - Flow rate from booster pump: 200 gpm
 - **Estimated delay:** ~9.5 seconds
-

Compliance with FM Requirements

FM does not mandate a specific time requirement between liquid detection and the delivery of flushing water. Neither FM Datasheet 7-93 nor FM Approval Standard 6090 provide guidance on this topic. However, FM has reviewed and approved dry-pipe designs in past projects and evaluates these requirements on a case-by-case basis.

In previous reviews, FM has indicated that the flushing system is not considered critical to the fire protection performance of the flooring system. This conclusion was supported by full-scale fire testing, in which a large volume of ignitable liquid was released and ignited without flushing water. Although the resulting pool fire persisted slightly longer, it remained effectively contained.

This fire test is shown in the linked video below and the results are discussed in the linked test report titled “FMEA Test Report”.

<https://safespill.com/fire-test-videos/> - See “FMEA 3 – Deactivated Flushing Manifold”

[Failure Mode and Effects Analysis](#)

Questions?

Please direct all questions related to this design change to Kyle Giubbini, Lead Product Engineer at Safespill: kyleg@safespill.com