	<b>CITY OF AUSTIN FIRE DEPARTMENT-FIRE MARSHAL'S OFFICE</b> <b>FIRE PROTECTION ENGINEERING SECTION</b>	
	<b>AFD Clarification on Insulated Sprinkler Chase Design Requirements</b>	
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This document is intended to provide design professionals the most recent Austin Fire Department (AFD) clarification of the below referenced standard section(s) related to horizontal insulated sprinkler piping chases installed across open breezeways/corridors, primarily in multifamily buildings. More specifically, these requirements apply to a sprinkler main located within the ceiling cavity of an unconditioned corridor that supplies two or more dwelling units.

**REFERENCES**

NFPA 13 – 2019 Edition, Section 16.4.1.3 and Section 16.4.1.5

**BASIC REQUIREMENTS**

AFD feels that the best method of protecting sprinkler pipes from freezing is to install piping in interior chases, heated areas, utilize dry pipe systems, heat tracing or a listed anti-freeze as indicated in the respective subsections of 2019 edition of NFPA section 16.4.1. It is recognized that the above are not a comprehensive solution in all cases and the options noted in section 16.4.1.3 and 16.4.1.5 will need to be utilized as a solution. Moving forward, AFD will require the following for each of these sections.

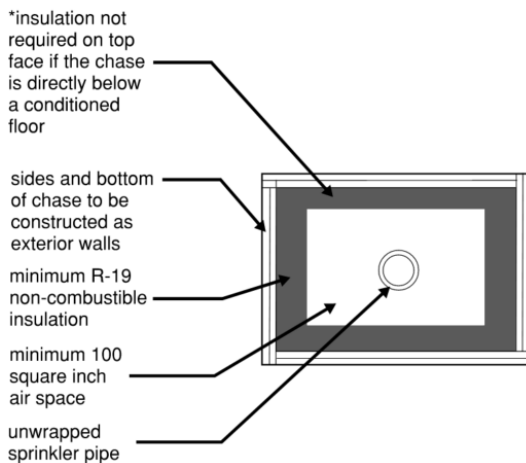
**NFPA 13, § 16.4.1.3** states that where ‘aboveground water-filled supply pipes, risers, system risers, or feed mains pass through open areas, cold rooms, passageways, or other areas exposed to temperatures below 40°F (4°C), the pipe shall be permitted to be protected against freezing by insulating coverings, frostproof casings, or other means of maintaining a minimum temperature between 40°F...’ For chases with spans less than 10 feet, insulated coverings will be required to meet the following:

- Have an open area of no less than 100 square inches to the adjacent above ceiling space to one unit. The open side of the chase will communicate with the tempered air in the interstitial space above the dwelling units and by definition will be considered an indirectly heated space. The 100 square inch open area shall be maintained throughout

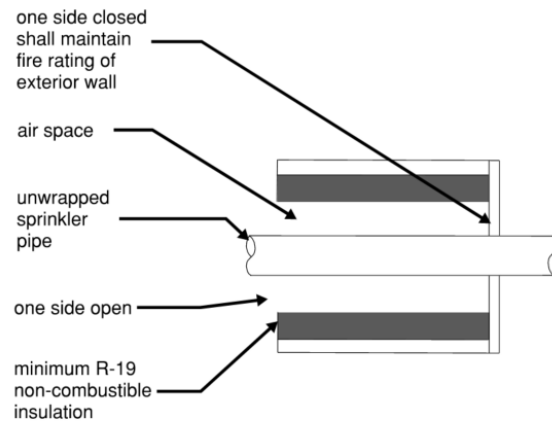
the length of the chase.

- Insulation shall be non-combustible.
- The opposite side of the chase will be required to be fire-stopped to maintain the fire rating of the exterior wall as required by the International Building Code.
- The insulated chase shall have a clear span no more than 10 feet.
- The sides and bottom of the chase will be considered exterior walls and will need to be constructed as such.
- The top, bottom and sides of the insulated chase shall have insulation with a minimum insulating value of R-19. The insulated material shall be constructed in a way that it will not sag or drop over time and must be able to maintain the manufacturer specified thickness.
- The chase shall have no changes in direction.
- The chase shall only contain fire sprinkler piping.
- No insulation (e.g. armafex or similar product) is required on the water-filled piping. This is derived on the definition of indirectly heated space from the International Energy Conservation Code (IECC). The pipe shall not be wrapped in insulation.

The following illustration is a graphical representation of the requirements listed above:



**INSULATED CHASE SECTION**  
\*for chases with clear span less than 10 ft.  
\*chase shall not change direction



**INSULATED CHASE ELEVATION**  
\*for chases with clear span less than 10 ft.  
\*chase shall not change direction

When this design option is utilized, the architectural plans submitted for building plan review shall include a detail indicating the insulation type, construction of the chase, and overall dimensions (LxWxH) of the chase. Development Services Department (DSD) Building Inspectors will reference this detail on the approved building plans to inspect the installation.

**NFPA 13, § 16.4.1.5** states 'Water-filled piping shall be permitted to be installed in areas where the temperature is less than 40°F (4°C) when heat loss calculations performed by a professional engineer verify that the system will not freeze.' When the insulated chase spans more than 10

feet or has a clear opening of less than 100 square inches, heat loss calculations shall be required. Heat loss formulas or computer modeling software may be utilized from an established and industry-accepted source. These methods shall be clearly identified in the design. Calculations shall be sealed by an engineer and shall include all design conditions, including temperature and heat loss assumptions, as well as comprehensive output data.

The design parameters for heat loss calculations shall be as follows:

- The interior heated space shall have a design temperature of 40 deg F.
- The exterior ambient temperature shall be 20 deg F which is based on the ASHRAE Fundamentals Handbook dry bulb minimum mean under extreme annual design conditions for Austin/ Bergstrom, TX. This information may also be obtained using the [ASHRAE Climatic Conditions website](#).
- The temperature in which the water in the pipe will freeze is 32 deg F.
- A duration of 35 hours is assumed based on the ASHRAE Fundamentals Handbook/Climatic Conditions website.
- The submitted design will be required to prove the amount and type of insulation will prevent freezing of the water filled pipe given the above-stated conditions.

Heat loss calculations can also be submitted with an accompanying design in place of the insulated chase outlined in the previous section for spans less than 10 feet.

If AFD deems that calculation methods are impractical, required temperature monitoring may be considered as an alternate solution.

### **Inspection Requirements for Engineered Designs**

Prior to the fire final inspection, the designing professional engineer shall provide a signed and sealed concurrence letter/report to the AFD fire reviewer who originally approved the automatic sprinkler plans. This letter/report must indicate they have inspected the insulated chase and attest that it has been constructed and installed as designed. Within the letter/report, the engineer shall provide the insulated chase detail, insulation data sheets, pictures of the installation, and the originally sealed calculations. Lastly, an administrative hold shall be placed on the fire protection system permit to ensure this letter is provided to AFD.

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