PENETRATIONS OF REFRIGERANT PIPING

Section 1109.3 prohibits refrigerant piping from penetrating floors, ceilings or roofs. However, some exceptions to these conditions are:

a) penetrations connecting basement and first floor,

b) penetrations connecting top floor and a roof installation,

c) penetrations connecting adjacent floors (one floor up or down),

d) penetrations where the refrigerant concentration does not exceed that listed in Table 1102.3 for the smallest occupied rooms (Smallest occupied room is that not meeting the minimum volume requirements for the amount of refrigerant contained in the equipment, as shown in Table 1102.3 for the type of refrigerant used) through which refrigerant piping passes, and

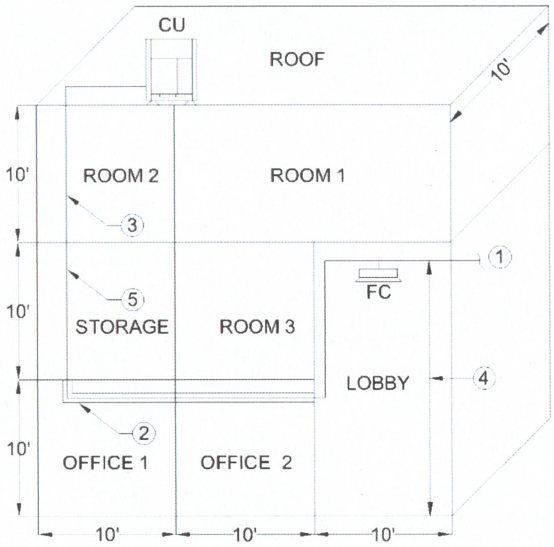
e) if the refrigerant concentration exceeds that listed in Table 1102.3, penetrations are allowed through the smallest occupied rooms as long as the portion of the piping within the room (i.e. inside the room or within the walls of the room) is enclosed in a gastight, fire-resistive duct or shaft. This requirement shall be exercised for all individual rooms that do not meet the minimum volume requirement for the amount of refrigerant contained in the equipment as shown in Table 1102.3.

Section 1109.3 also allows the pipe to run at the exterior wall of the building; however, since there are obstructions such as insulation, stud wall blocking etc. this option is not viable.

A prime example of a system where this problem would be encountered is a typical "split system" in a multi-story building where the condensing unit is located on the roof with fan-coil units located on the lower floors. A plan review should be conducted to ensure that the plan shows either that the refrigerant piping will not pass through the smallest occupied room, or that the piping will be enclosed in a gastight and fire-resistive duct or shaft.

Figure 1 below shows the above exceptions exercised for a multi-story building where the condensing unit is located on the roof with fan-coil units on lower floors.

REFRIGERANT SYSTEM INFORMATION
410A (R-32/125 (50/50)
50 LB CHARGE
MAX ALLOWABLE QUANTITY =
26 LB/1,000FT³ PER TABLE 1102.2 CMC



1. REFRIGERANT PIPING TO OTHER ROOMS
2. REFRIGERANT PIPING ENCLOSED IN AN APPROVED GASTIGHT, FIRE-RESISTIVE DUCT OR SHAFT
3. ENCLOSURE NOT REQUIRED BETWEEN TOP FLOOR AND A MACHINERY PENTHOUSE OR ROOF INSTALLATION
4. SHALL BE NOT LESS THAN 7.25' UNLESS THE PIPING IS AGAINST THE CEILING
5. ENCLOSURE NOT REQUIRED FOR UNOCCUPIED SPACES.

ROOM 1, ROOM 2, ROOM 3, AND STORAGE
NOT REQUIRED TO BE EVALUATED

LOBBY
VOLUME = (10' x 20' x 10') = 2,000FT³
LB/1,000FT³ = 50LB / (2,000FT³/1,000) = 25 LB/1,000FT³

OFFICE 1 AND OFFICE 2
VOLUME = 10' x 10' x 10' = 1,000FT³
LB/1,000FT³ = 50LB / (1,000FT³/1,000) = 50 LB/1,000FT³

Figure 1: Refrigerant Pipe Enclosure Multi-Level Example

Carlos Clayton
Chief Mechanical Inspector