

SILENCER APPLICATION SOLUTIONS

See Project Solution Sheet (PS#)

Primary Ref.: 4-1,2,3,4

Secondary Ref.: 2-3

PROBLEM:

Duct Breakout Noise.

◆ Many designers only consider the most obvious noise path: from the fan, down the duct to the diffusers or return openings. Many other noise paths are often overlooked. The most problematic path is noise breaking out of the duct into the occupied space. From Vibro-Acoustics' experience, breakout noise is now the most critical path in more than 50% of supply systems.

◆ Roof-top unit duct connections are a typical example. Low frequency noise breaks out of the duct to the space below and is generally much more of a problem than the noise that travels further down the duct and out the diffusers.

◆ Ducts penetrating mechanical equipment room (MER) walls adjacent to occupied spaces are other sources of breakout or break-in noise.

SOLUTION:

Proper Silencer Location

◆ Silencer location is critical when trying to minimize breakout noise. The silencer should be located close enough to the noise source to ensure the noise is attenuated before it has a chance to break out of the duct. In mechanical rooms, silencers are often located at the MER wall to also attenuate duct break-in noise from high noise level equipment.

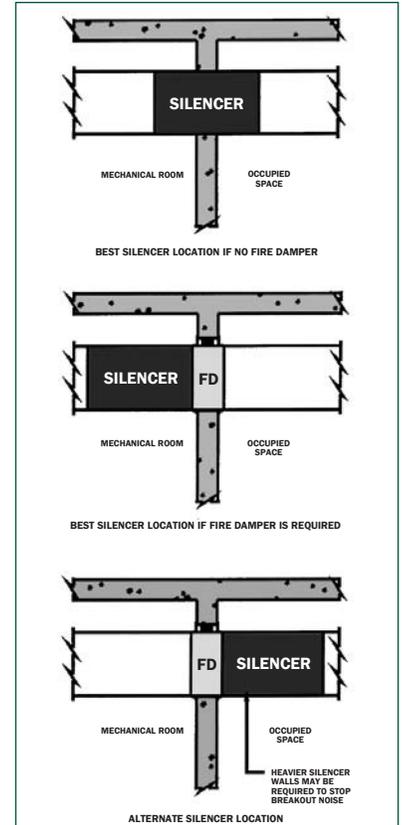
◆ When given the opportunity, Vibro-Acoustics will analyze the system effects and recommend the proper silencer location to minimize breakout noise.

High Transmission Loss (HTL)

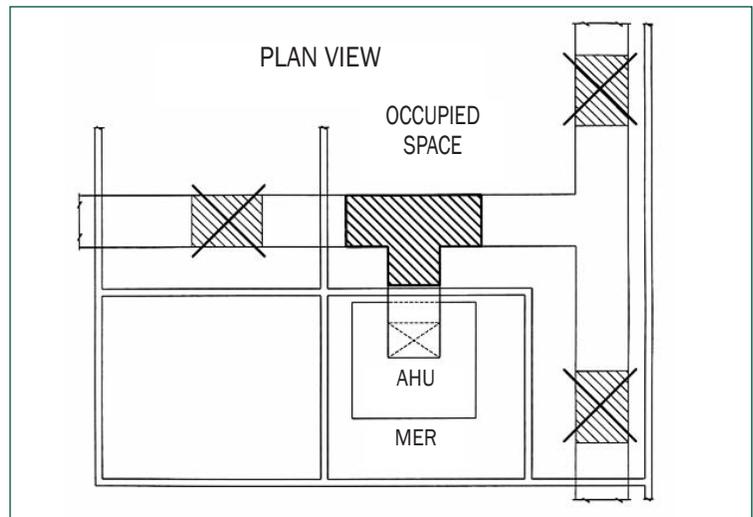
◆ If a silencer needs to be located over a critical space, the addition of mass/stiffness to the silencer's outer walls is highly effective. This will minimize the noise breaking out of the silencer before it has a chance to be attenuated.

Vibro-Acoustics provides silencers with a range of High Transmission Loss (HTL) casings to meet the varying system requirements. (See SS7)

◆ Vibro-Acoustics can also supply HTL ductwork for installation between a noise barrier (e.g. MER wall) and the silencer.



Considerations for silencer location.



Straight silencers were originally located in straight duct runs well away from the noise source to minimize aerodynamic system effects. However, this placement would allow the noise to break-out of the duct over occupied space before it could be attenuated by the silencers.

Solution: T-Elbow silencer with HTL casing contains the noise at the source.