SILENCER APPLICATION SOLUTIONS

See Project Solution Sheet (PS#)
Primary Ref.: 3-1, 2, 3, 4
Secondary Ref.: 1-1, 2-2, 4-3

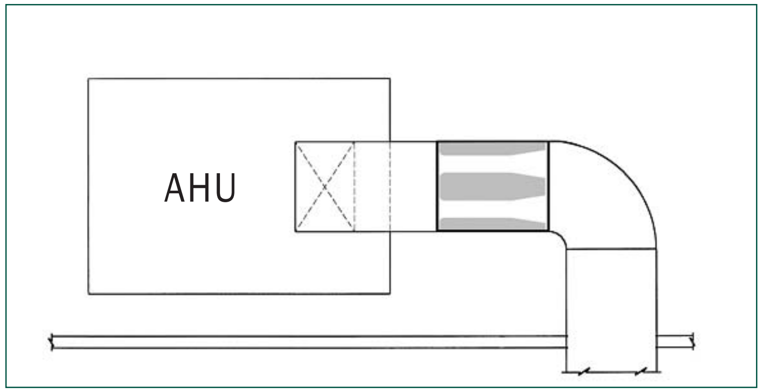
PROBLEM:
Insufficient Straight Duct

◆ Duct layouts are far from ideal in real life applications. Real life systems quite often do not have the recommended space required for straight silencers.

◆ Silencers located in close proximity (three to five duct diameters) to fans, elbows, plenums, fittings, etc. will result in an increase in silencer pressure drop and airflow generated noise due to aerodynamic system effects.

◆ ASHRAE recommends: Straight silencers should be located at least three duct diameters from a fan, coil, elbow, branch takeoff or other duct element; consider elbow silencers when space is limited.

◆ The ASTM E-477 silencer test code specifies a minimum of five diameters of straight duct on the silencer inlet and ten diameters on the outlet to maintain ideal airflow conditions.



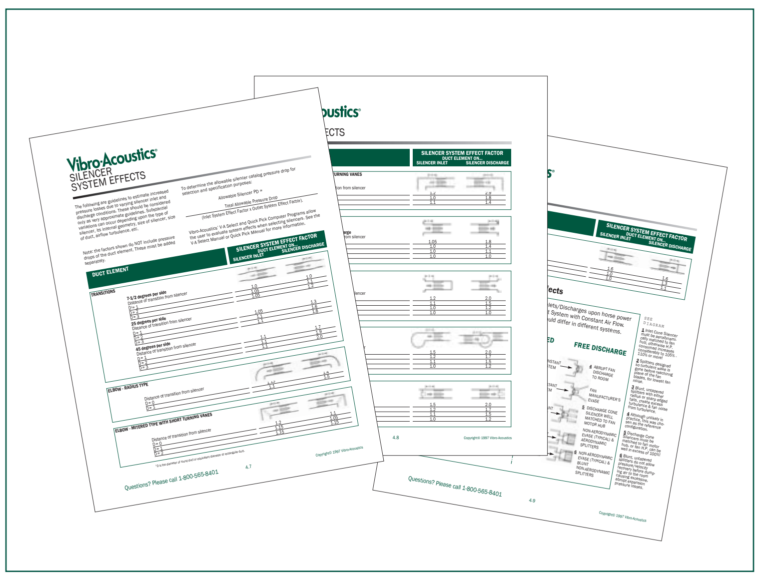
Straight silencer within three diameters of fan and close-coupled to radiused elbow results in excessive pressure drop due to aerodynamic system effects.

SOLUTION:
Evaluate System Effects

◆ All Vibro-Acoustics silencer pressure drop (PD) ratings are reported based on ideal inlet and outlet conditions per the ASTM E-477 test standard. The chart on page 4.19 shows corrections or adjustments needed for silencer pressure drop and generated noise if located in non-ideal configurations.

◆ Determine if the Total Silencer PD is more than has been allowed in the system design (in most cases the Total Silencer PD should not exceed 0.35"). Total Silencer PD = Catalog Rating (Silencer PD per ASTM E-477) + System Effects.

◆ Vibro-Acoustics' Quick Pick and V-A Select computer programs allow the user to enter the silencer's inlet and discharge conditions. Aerodynamic system effects are taken into account in the silencer selection process.



Silencer System Effects found in the Selection/Specification section.

continued next page...

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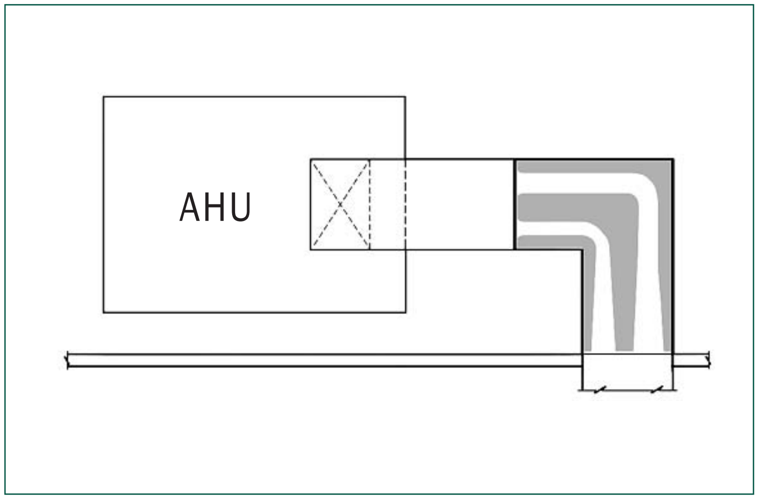
Select Appropriate Product

◆ Use straight silencers whenever the Total Silencer PD is within the system requirements.

◆ Vibro-Acoustics has developed silencers for real life applications such as when the ASHRAE recommended straight duct lengths do not exist. The design of Elbow Silencers, T-Silencers, Y-Silencers, Transitional Silencers and combinations such as Transitional Elbow Silencers all take system ductwork configurations into account to minimize aerodynamic system effects. Silencers can be provided to fit into the system; the system needs not be re-designed to fit the silencers

◆ When given the opportunity, Vibro-Acoustics will evaluate the system effects, select the appropriate silencer type and recommend the optimal silencer location for each system.



Elbow Silencer replaces straight silencer and duct elbow combination. Acoustic splitters help aerodynamically turn the air. Aerodynamic system effects are minimized resulting in substantial energy savings and more system capacity.