

400-TON CHILLER AEROACOUSTIC REMEDIATION

Application Note



(Before)

A 400-ton, air cooled, rotary compressor, chiller was installed at a private school to service their new expansion. A location had been chosen to minimize noise impact on residential neighbors (Class 1 land use) and the school itself. However, intrinsic site topography aggravated chiller noise emissions, which exceeded the local noise ordinance, resulting in a legal action.

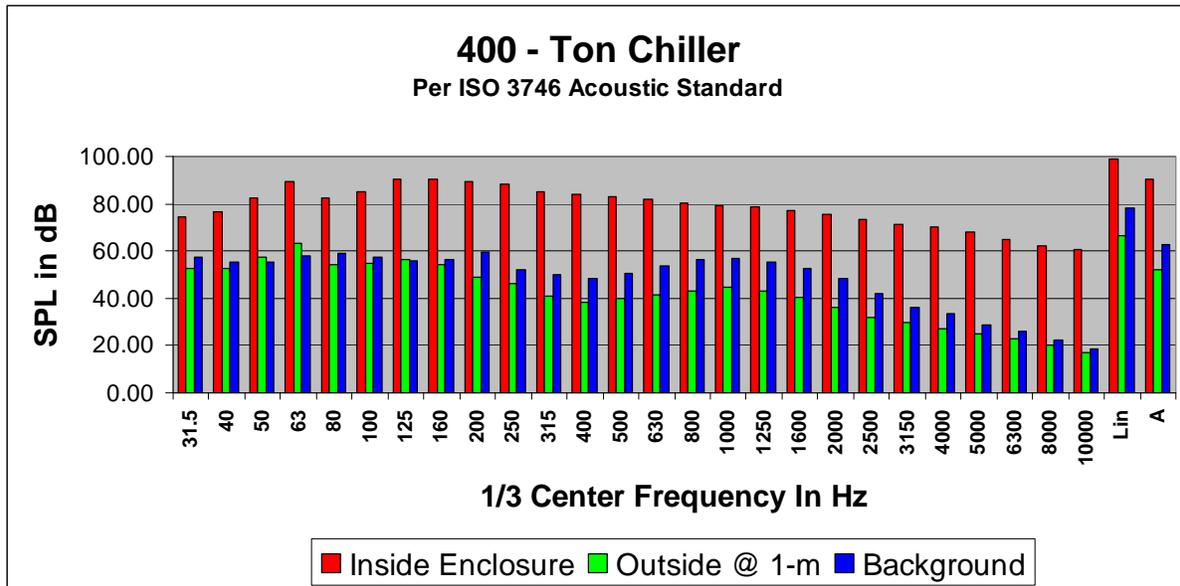
Prior to Aeroacoustic Engineering Consultants, LLC (AEC) involvement, a number of remediation schemes were considered including chiller relocation. A cantilevered acoustic barrier system was designed and estimated at well over **\$500,000** to fabricate and install!

Enter, AEC . . .



AEROACOUSTIC ENGINEERING CONSULTANTS, LLC

AEC-122704



Due to the questionable acoustic and aerodynamic performance projected for the cantilevered barrier, AEC was brought into the remediation project. Within two (2) weeks time, AEC had developed conceptual designs for a totally passive (no booster fans nor blowers) acoustic enclosure, accomplished aeroacoustic computer simulations including defacto site topography with all computer modeling under full thermal load and aerodynamic flow of nearly **270,000-SCFM** of air! From the iterative computer simulations, a design configuration was selected that would **guarantee the owner** a **minimum noise reduction of 30-dBA at 1-meter** distance from any silencer intake or discharge, all at far less cost than the acoustic barrier.

AEC provided the system design, acoustic hardware fabrication, installation supervision and **performance warrantee** for acoustics as well as chiller operating parameters. Actual installation was accomplished by the owners building contractor. The contractor had estimated a nominal five (5) days on site for installation. Actual installation was accomplished in **just five (5) hours** attributable to AEC's modular construction and precision fit up.

System acoustic performance (dynamic insertion loss or noise reduction) was tested at approximately **40-dBA at 1-meter distance** from the chiller enclosure. Increased power consumption and reduced cooling capacity was immeasurable. AEC aerodynamic design allows the addition of intake filters to reduce condenser coil fouling and subsequent maintenance. Reduced solar heat gain on chiller is expected to offset any losses attributable to minimal, aerodynamic static pressure!