

Case Study

Noise Control in “Downtown” Philadelphia

Noise is often times a consideration when mechanical equipment is in operation. Particularly, when it is being generated next to upscale townhouses! A prominent Philadelphia corporation chose Systech Design to solve their noise control challenge in a crowded city block where seven-story factories were being converted to residences.

A 500 KW standby diesel generator needed to be installed for an emergency backup tunnel lighting system and space was limited. The room enclosed diesel engine radiated heat and it needed to be exhausted from the roof of the building, while at the same time, the noise levels produced by the engine, 106 dBA, needed to be reduced to acceptable criteria at the street level.

An engineering study was awarded to Systech to provide a solution to the building ventilation requirement to keep the generator set cool while maintaining less than 78 dBA noise levels within the surrounding neighborhood. The building housing the generator was an old brick structure, three stories high, with the generator located on the second floor. Space for ducting was at a premium and less than 36" of clearance was available between the generator cooling fan and the exterior wall.

Systech selected two sets of industrial grade, motor operated dampers for supply air, which were located on the first floor, below the generator and facing pedestrian walkways. An exhaust air flow of 44,000 cfm of cooling air for the generator was channeled from the first floor, through the generator room and exited the roof through a 54" square opening. A high velocity, low pressure loss FRP back draft damper was employed to control building heat loss. On the roof, an acoustical elbow, a 53" diameter direct drive vane axial fan, acoustical flex connections and discharge silencer completed the exhaust system. Systech provided a vibration isolated turning vane to direct the generator fan discharge upward toward the exhaust opening. For interior noise control, composite sound absorbing panels were hung in the concrete generator room to lower the reflective noise produced by the generator set.

Systech completed the project with a motor control center having a variable frequency drive to command the fan speed level.

An 8-hour generator commissioning run was conducted at the completion of the project with all design criteria successfully met.



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