

Job Story:

CHALLENGE:

Minimize disruptive noise from rooftop air handler unit above auditorium and classrooms using only non-fibrous insulating materials.

SOLUTION:

Install fiber-free, elastomeric foam AP Coilflex duct liner with a .60 NCR.

Project:
Wesley Long Cancer Center

Location:
Greensboro, NC.

Engineering Firm:
Charlotte Engineers

Acoustical Engineering Firm:
Stewart Acoustical Consultants



Cancer Center Solves Low Frequency Noise Problems with Elastomeric Duct Liner

A lot will happen under the single rooftop of the new Wesley Long Cancer Center in Greensboro, NC. The 33,000 square foot addition to the Moses Cone Regional Cancer Center includes a business office, lobby/waiting area, admitting, phlebotomy lab, breast cancer treatment, exam areas, chemotherapy, and an auditorium and education classrooms. With so much occurring beneath one roof, noise was a major concern for Charlotte Engineers, LLP, the mechanical engineer for the project.

“Our main concern was the auditorium and classrooms which happened to be located below a large rooftop air handler unit (AHU),” said Michael Eaves, Project Manager for Charlotte Engineers.

According to Eaves, the supply air duct from the 30,000 cfm AHU would penetrate the ceiling right next to these spaces. Without special sound attenuation, noise would most certainly be a problem in these areas.

Stewart Acoustical Consultants (Raleigh, NC) was charged with finding an affordable solution to the problem. Neither the client nor the engineer wanted any fibrous insulating materials inside the duct. This led Stewart Acoustical to consider non-fibrous AP Coilflex elastomeric foam as a solution.

After close examination of the facility's mechanical design, Stewart Acoustical determined that low-mid frequency mechanical noise (in the range of 250 to 500Hz) was likely to be the greatest problem. This was largely because both the supply and return fans selected for the project had backward curved fan blades – that is, blades that are curved away from the direction of rotation.



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"If backward curved fans are used, noise is usually strongest in the 250-500 Hz range," said Noral Stewart, Principal Acoustical Consultant at Stewart Acoustical.

Fortunately, 500 Hz is the "sweet spot" for AP Coiflex's sound attenuation. In fact, Coiflex sound absorption exceeds the minimum specification for both Type I and Type II one-inch fiberglass up to 500 Hz and is much better at 500 Hz. These frequencies of 500 Hz and below are the most difficult to control.

Armacell product specialists and engineers had provided pertinent test data and worked closely with Stewart Acoustical to calculate the sound attenuation per foot in relation to duct size. This information was used to determine the needed length which fit the ducts. Thorough investigation and documentation were critical, as this would become part of the cancer center's final submission to the USGBC to achieve LEED Silver certification. Minimizing disruptive noise is an important part of achieving the Indoor Environmental Quality (IEQ) Credit in the LEED for Healthcare New Construction and Renovations. Most importantly, this investigation gave Stewart Acoustical the assurance they were seeking that the AP Coiflex elastomeric foam was, indeed, a suitable solution for the project.

Beyond Acoustics

AP Coiflex also makes for a cost-effective installation because it can be applied to the sheet metal duct via automated coiling equipment, bending into the corners of the duct simultaneously as the machinery forms the sheet metal box. No special hand application or cutting is required. And because AP Coiflex is fiber-free, formaldehyde-free, low in VOC's, and non-particulating, it meets many of the high Indoor Air Quality (IAQ) standards that healthcare facilities either require or desire.

AP Coiflex is also made with Microban® antimicrobial product protection for greater assurance against mold growth. Charlotte Engineers was careful to include anti-microbial protection as part of the specification for duct liner to help assure that the preference for AP Coiflex was upheld.

The product has become a "go to" solution for both Charlotte Engineers and Stewart Acoustical, particularly as facilities become increasingly concerned with IAQ.

"There are many situations when clients don't want fibrous duct liner and then we have to look at other options for sound attenuation. When this is the case, Armacell elastomeric foam products are a product that we will continue to use when appropriate, as other acoustical foams can be quite costly," said Stewart.

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