United McGill Corporation

solutions

Finding ways to better serve our customers
and solve their problems.

number 3

Using our engineering resources and experience to help provide duct systems that meet exacting standards.

ACOUSTI-k27® double-wall, insulated ductwork is used to convey air from 28 rooftop air handling units.

Many construction projects have special requirements that present problems to HVAC engineers and contractors. A key to meeting these requirements is finding the right products and services. Often, the best supplier is the one with the resources and experience to help solve a wide range of problems.

One project with special requirements was a research and manufacturing facility for Becton Dickinson Diagnostic Instrument Systems (BDDIS) in Sparks, Maryland. BDDIS is a division of Becton Dickinson and Company, a worldwide manufacturer of diagnostic systems and disposable medical devices for the health care industry. The 370,000-square-foot building needed 34 air handling systems, both supply and exhaust. Much of the duct was to be exposed, so the owners insisted on using round and flat oval duct because of concerns about the ductwork's appearance. Acoustical requirements were to be met without using lined duct, but thermal requirements called for double-wall, insulated duct to be run from the 28 rooftop air handling units.

For the exposed duct on the roof, United McGill helped design special connectors that provide adequate reinforcement while maintaining a smooth exterior surface.

United McGill's involvement with the project began long before any products were supplied. The air handling systems were designed by Fluor Daniel, one of the largest engineering firms in the country. For the design work, they used United McGill's UNI-DUCT® program. The PC-based UNI-DUCT® program provides state-of-the-art, computer-aided design of both supply and exhaust duct systems. It uses the static regain method enhanced by the total pressure design method to design balanced duct systems with low initial and operating costs.

Marshall Seymore, senior HVAC engineer at Fluor Daniel, compares UNI-DUCT® to other design programs, "I've used another static regain program before. It wasn't nearly as good. It wasn't even close. I like to know exactly what's happening in a system. And UNI-DUCT® tells me that. It gives me more fittings and the flexibility to change duct sizes and static pressure."

United McGill worked with Fluor Daniel's engineers during the design stage of the project. One of the first benefits to be realized was low initial material cost. The UNI-DUCT® program balanced the system by reducing duct sizes. This reduced the total amount of sheet metal used and the total material cost of the system. The possibility of using rectangular duct was considered, but the round UNI-DUCT® system was less expensive.

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The UNI-DUCT® program proved valuable in other ways too. As is often the case on large jobs, design changes were being made up to the last minute. When the function or size of a room was changed, its airflow requirements had to be revised. According to Seymore, "I had a situation where we already had the ductwork on the jobsite, and an area served by a particular air handling unit was changed. With UNI-DUCT® it's simple to go back and evaluate the impact on the air distribution system. I did the work in less than an hour. Before, something like that would have really thrown us into a tailspin."

Another benefit was the acoustical analysis provided by the UNI-DUCT® program. Don Waller, senior HVAC engineer at Fluor Daniel, explains, "Acoustics was a real concern. UNI-DUCT® gave us acoustical data that told us what the noise levels were in the system. That was a real benefit of the program. With that data we were able to make some adjustments in our duct sizing in order to get the noise levels down."

Perhaps the biggest design problem involved the aluminum ductwork located on the building's roof. Double-wall, insulated duct was being used to provide thermal control for these outdoor runs of duct. With diameters ranging from 28 to 48 inches, flanged connections were needed to meet rigidity standards. But because this duct was exposed outside the building, the owner wanted it to have a smooth appearance. No connector existed that would fill the bill.

United McGill offered to help design a special connector for the application. The first step was to use flanges to connect the inner liners of the duct. With standard double-wall duct, the outer shells and insulation would have made it difficult to bolt the flanges together. To allow room

The UNI-DUCT® computer program used the static regain method to design the building's round and flat oval duct systems with low material costs.

United McGill's factory-fabricated duct and fittings were a big part of the reason that the duct systems have less than 1 percent leakage.

to bolt the flanges, the outer shells and insulation were cut shorter than the liners, leaving an 8-inch gap at each connection. Once the inner liners were connected, the open area around the flanges was filled with insulation. Then the newly designed connector was applied to the outer shells. A 12-inch-wide piece of aluminum was used to cover the 8-inch gap between the outer liners. Gasketing was installed where the aluminum cover overlapped the duct. To complete the connection, a 1-inch-wide draw band was placed around each gasketed end of the cover and pulled tight.

Stromberg Sheet Metal Works, Inc. was faced with a tight installation schedule for the duct systems. Any delays would have meant lost time for them and for the other trades working on the building. United McGill's dependable delivery helped keep the project on schedule.

The special connector designed for the exposed ductwork on the roof worked well. It proved easy to install, taking no more time than standard connectors would have. The slip-fit connections used throughout the rest of the building were also easy to work with. According to John Topper, Stromberg's project manager, "This job would have been a Cadillac in any other building. Requirements exceeded what we normally have to do. We met those requirements without any extra effort on our part. One reason was the quality of the duct."

The quality of United McGill's factory-fabricated ductwork really showed up during leak testing. All of the building's duct systems were pressure tested at less than 1 percent leakage. In some cases the leakage was too low to measure. According to Marshall Seymore of Fluor Daniel, "The United McGill spiral duct passed all the leak tests with flying colors. The duct was very tight. It didn't leak."

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