

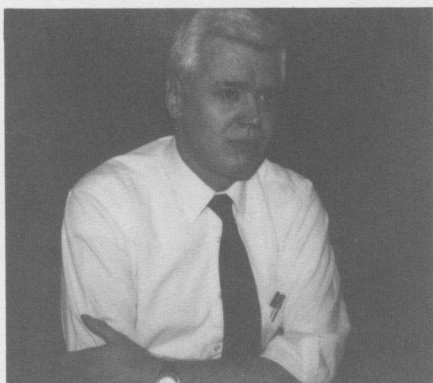
30 Year Old Low Pressure Duct System Serves Over 900 Zones in Philadelphia's Largest Bank

PSFS Converts Old Newspaper Building into Energy Efficient Operations Center

PHILADELPHIA, Pennsylvania—

An unusual building formerly housing the Philadelphia *Bulletin* newspaper is now the Operations Center for PSFS, Philadelphia's largest bank. The engineering conversion, directed by the Kling-Lindquist Partnership, Inc., has been successful and economical, according to Bob Murphy, the Project Engineering Manager heading the changeover team.

A special VAV diffuser from Acutherm was a major contributor toward keeping costs down. "In order to retain most of the old ductwork, we needed a VAV diffuser that would function well in a low-pressure environment," says Murphy. "If we had replaced the ductwork, it would have cost approximately \$350,000 more, in addition to installation costs."



Bob Murphy

Acutherm's Therma-Fuser™ units met all of the engineers' performance specifications for the job.

Feasibility study

Before PSFS purchased its new home in 1982, Kling-Lindquist did an extensive feasibility study to determine whether the building could accommodate the bank's operating requirements. A big plus was the fact that the third floor had been designed to carry 300 pounds per square foot so that it could accommodate the newspaper's massive linotype machines. This also meant that it could easily hold the bank's computers with no additional support.

One of the problems faced by the King-Lindquist team was keeping mechanical system costs down. This was difficult because the building had outdated mechanical equipment, which had been installed in 1955. Careful inspection revealed that the only salvageable parts of the system were the chilled water piping, steam piping, and part of the main ductwork.

However, the ductwork couldn't be saved unless the other HVAC system components could work under low pressure conditions, and most VAV units require at least medium pressure in the ductwork to be operational. The team decided to test three low-pressure VAV devices by installing one in each of three offices. The units were tested for three weeks, during which time the design team also checked with personnel at other installations on performance of the three units.

The final results showed that the Therma-Fuser VAV diffusers could be installed for approximately 93 cents per sq. ft., while the closest competitor required \$1.10 per sq. ft. This resulted in installation cost savings of at least \$58,000. In addition, operating costs are lower because the units don't require compressed air to open and close the blades.

Metamorphosis: From Newspaper to Bank

The new PSFS Operations Center is a concrete and steel structure a city block long. From the surface, there appear to be two buildings, one of four stories, the other one and a half stories, with railroad tracks running between them. However, the structures are joined underground, with one and two stories, respectively, below grade. The columns supporting the Amtrak rail lines are located in the middle of the building.



PSFS Operations Center

There is very little glass, and most windows face north and south, which helped simplify the heating and cooling systems.

Of a total 590,000 sq. ft., Kling-Lindquist has now remodeled 490,000, primarily the five story tower and the one and a half stories above grade in the old press building. Because the original ceilings in the press building were 34 feet high, the architects were able to add a mezzanine level.

Cooling is provided by 16 air-handling chilled-water units located throughout the building. There are also two 500-ton chillers in the basement and

two 500-ton cooling towers on the roof.

The original steam heating was converted to hot water heating by using the 125 pounds district steam through a heat exchanger to provide hot water.

The distribution system for the heating and cooling of the office areas is the low pressure ductwork, featuring a main duct on each floor, with branches running to diffusers. Parts of the main distribution ducts were retained, while smaller ducts were eliminated and replaced to meet the requirements imposed by the new office arrangements.

The old diffusers were replaced with over 900 Therma-Fuser units. Static pressure controllers are located between the units and the fans, with one controller per five diffusers.

The units are designed to vary air flow and to maintain temperatures to within two degrees of the setting. A temperature sensing and control element within the unit contains a thermal compound that expands in temperatures between 70-80 degrees Fahrenheit, causing a shaft to extend and open the four perimeter diffusion blades. As the room cools, the sensing mechanism retracts, closing the blades and stopping air entry.

Benefits

In addition to cost efficiencies, the use of Therma-Fuser VAV diffusers provided several other benefits. Quick and easy installation helped meet stringent deadlines. Future remodeling and expansion costs can also be controlled.

Renovation and expansion usually means reworking for the heating and cooling diffusers, which can be costly. PSFS still has approximately 100,000 sq. ft. left to upgrade, which may mean personnel shifts in the future. Further use of Therma-Fuser units would enable the design team to meet the client's need for minimal cost.

And those are savings you can bank on.



1766 Sabre Street
Hayward, CA 94545
(510) 785-0510
FAX: (510) 785-2517