

Energy Savings To Bank On:

CHARLESTON NATIONAL BANK REDUCES INSTALLATION COSTS BY 40 PERCENT, PROVIDES INDIVIDUAL TEMPERATURE CONTROL WITH THERMA-FUSER INSTALLATION

CHARLESTON, West Virginia — Charleston National Bank had temperature control problems on two below-grade floors. An initial estimate to remedy the situation came in at \$550,000, but was reduced to approximately \$350,000. A major source of savings was the substitution of **Therma-Fuser** VAV diffusers for VAV boxes resulting in a savings of \$10.10 per sq. ft. On one floor alone, cost was reduced from \$12.25 to \$2.15 per sq. ft.

"In addition to significant cost reductions, a survey of employees indicated that the new heating/cooling system was a great success," says Ted Zachwieja, director of Engineering Services for TAG Architects and Engineers, who handled the retrofit.

Upgrading Conventional VAV

The Charleston National Bank is a 17-story office building in Charleston, West Virginia, a city whose temperatures plummet well below freezing in the winter, and soar to the upper 80's and 90's in the summer.

The bank's constant volume air system was successful in most of the building. However, the two floors—totalling 45,000 sq. ft.—that were located below grade presented major problems. Employees complained of wildly fluctuating temperatures and uncomfortable working conditions.

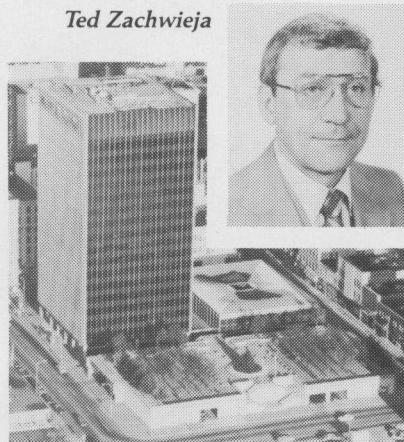
Part of the problem arose from the fact that the space was used for a variety of purposes. Partitions were constantly moved to create different workspaces to accommodate current use. The constant air volume system simply could not handle the changes.

TAG Architects & Engineers was called in to remedy the situation. "We designed a system using standard VAV boxes, with cost per box running \$880," says Zachwieja. "However, the bank simply didn't want to spend that kind of money. So, we took a close look at Acutherm products. We had used **Therma-Fuser** units in a previous installation. However, that installation was small. We weren't sure

how the units would work in a larger environment."

After several meetings with Acutherm representative Rick Beane, who explained what the units would and would not do, it was decided to install two or three **Therma-Fuser** CW units as a test run. The results were so successful, that TAG substituted 200 **Therma-Fuser** units for the originally specified VAV boxes, reducing costs by approximately \$10 per sq. ft. in the 19,000 sq. ft. where the units were used.

Ted Zachwieja



Charleston National Bank

The Installation

The below grade floors currently house administrative offices and data processing departments. All floors are interior, with no windows. "We simply fit the units into one of the 2 X 4 spaces in the lay-in ceiling, and connected it to the ducting. As a result, both time and money were saved on the initial installation," says Zachwieja.

Perhaps one of the trickiest areas to handle was the safety deposit box cubicle, which has seven foot ceilings. "I was leery of putting a unit there," says Zachwieja. "However, the owner insisted that it would work. And, it did."

The original plan called for a single VAV box to serve a zone consisting of three or four separate areas. Cooling is provided by a central chiller, and heating by a central gas-fired boiler. Air is moved via interior air handling units controlled by return air thermostats.

The revised plan simply called for installing the **Therma-Fuser** with the existing air handling units. No modifications were required.

The **Therma-Fusers** were connected to the main ducting system with 10" ducting and Acutherm R-rings.

Most of the original ducting, which is rectangular galvanized metal with an interior lining, was retained. The layout of the ducting is unusual. A vertical supply duct splits, with one branch continuing horizontally to the right. Static pressure is handled via a bypass damper in the return air plenum.

The other branch, running to the left, becomes a horizontal loop. The loop configuration was used because the return air plenum space in that part of the building could not be used. A static pressure controller was installed several feet after the split. The static pressure range is less than 2" in the system. Balancing dampers are located in various parts of the ductwork to balance the air system, and have required no maintenance.

After a full season of operation, TAG surveyed the employees working on the subterranean levels. All agreed that it was a 100 percent improvement over the old heating and cooling system.

In fact, the installation has been so successful, that Charleston National Bank is considering upgrading three more floors in the office tower to **Therma-Fusers**. Eventually, management would like to use the units throughout the building.

"I was really pleased to see that **Therma-Fusers** will work effectively to control temperature in large areas," says Zachwieja. "And, the Bank is really pleased that its employees are happy and more productive because of a more comfortable work environment."



2000 Powell Street, Suite 1290
Emeryville, California 94608
(415) 428-1064