"We couldn't afford to be...

redoing sections of the insulation."

Clockwise from top left: The Thomas F. Eagleton Courthouse (center) rises 567 feet (173 meters) above the St. Louis skyline; More than 250,000 sq. ft. (23,226 sq. meters) of Knauf Duct Wrap was used to insulate ducts as large as 9' (2.74 m) wide; Duct wrap was applied to medium– and low–velocity ducts downstream of the air handlers.

Knauf gets favorable verdict at

EAGLETON COURTHOUSE

Gliding slowly down the mighty Mississippi on the Delta Queen, an authentic paddlewheel steamboat, visitors to St. Louis are quickly ushered back into history. One can almost sense the anticipation Lewis and Clark might have felt as they were outfitted here for their historic journey into the Louisiana Territory back in 1804. Nearly 200 years later, the city ranks fifth in the U.S. for the number of Fortune 100 corporations who call it home. The last century of this grand city's development is literally reflected in the stainless steel curves of one of the nation's best-known monuments to the pioneer spirit: the Gateway Arch.

That spirit is carried on in both form and function by a sparkling new addition to the St. Louis skyline, the Thomas F. Eagleton Federal Building and U.S. Courthouse. Monumental in scale but inviting in design, the building presents a picturesque backdrop as it rises nearly 600 feet above the hills that gently slope back from the Mississippi. At its pinnacle stands a glittering dome clad in stainless steel, a silent tribute to the venerable Arch. Yet the facility is pioneering in its own way, representing the first major project of the U.S. Government's General Services Administration (GSA) to be designed and built in System International (soft metric) units.

Towering 29 stories above the city (plus four below) and covering 5.5 acres on the ground, the unique project presented ample construction and communication challenges due to scale alone. Add to that the tenant fit-out design modifications that occurred during construction, and subcontractors had to be flexible and fast and get the job done right and on schedule. For the insulation contractors on the job, the solution was external duct wrap and pipe insulation from Knauf Fiber Glass.

Exposed chilled water return piping (left) from the rooftop cooling towers was insulated to conserve energy and heat traced to prevent freezing; Elbows and transitions for roof drain conductors (right) were insulated with Proto® PVC fitting covers.

Judicious SYSTEM DESIGN

The heart of the mechanical systems for the building is underground, in the basement. Every other level above ground contains air handlers dedicated to individual levels and/or specific occupied areas. The decentralized design allows maintenance work to be performed on virtually any level without disrupting cooling or heating to the entire building.

Steam (about 600°F/316°C) for hot water heating and humidification is provided by Tri-Gen St. Louis, through an underground city loop. Chilled water (approximately 55°F/13°C) for cooling is provided by four chillers, with a total cooling capacity of 2800 tons, in the basement mechanical room. Return water cycles through two large cooling towers located under the dome on the roof. Because of exposure to outdoor air, heat tracing is required on selected piping to prevent freezing in winter months. Mechanical piping also includes glycol lines for cooling of computer rooms and kitchen refrigeration units.

Knauf 1000°F Fiber Glass Pipe Insulation was used for all insulated plumbing and mechanical piping. Domestic hot and cold water lines, roof drain conductors and waste piping, ranging in diameter from 1/2" (12.7 mm) to 6" (152.4 mm), were insulated in 1" (25.4 mm) and 2" (50.8 mm) thicknesses. Insulation for heating hot water, chilled water, glycol, steam, condensate, heated fuel oil (for emergency generators) and condenser water piping, which ranged in diameter from 2" (50.8 mm) to 10" (254 mm), was 1" (25.4 mm) to 3" (76.2 mm) thick. Emergency generator exhaust piping, which runs from the generator on the 29th floor to the top of the dome, required 5" (127 mm) thick insulation for personnel protection.

Ductwork reflects the enormous scale of the project in its size as well, ranging from 4" (101.6 mm) round and 6" x 6" (152.4 mm x 152.4 mm) rectangular low-velocity supply trunks to ducts large enough to walk in (6' x 6' [1.83 m x 1.83 m] and 4' x 9' [1.22 m x 2.74 m]). Knauf Insulation Board was used to insulate the external side of air intake ducts up to the main air handling units, then Knauf Duct Wrap was used from the air handlers to the fan terminal units (FTUs) and on low-velocity round duct downstream of the FTUs. Knauf Insulation Board was also used on the exterior of large plenums and exposed ductwork in equipment rooms.

Knauf Duct Wrap is used to insulate supply ducts servicing upper-level courtrooms.

In total, the Eagleton building has 225,000 lineal ft. (68,581 m)—more than 42 miles—of plumbing and mechanical system piping, 150,000 feet (45,720 m) of which was insulated. More than 250,000 sq. ft. (23,226 sq. m) of Duct Wrap and 85,000 sq. ft. (7,897 sq. m) of Insulation Board were required for the project. The insulation was supplied by Brauer Supply (St. Louis).

Witnessing
REAL TIME SAVINGS

Phase I construction (below-grade parking and the 27-floor concrete core) began on the Thomas Eagleton building in July 1994. The Phase II build-out is scheduled to be completed near the end of 1999, with the GSA and the federal courts to take occupancy early in 2000. The two insulation contractors, ABW (plumbing insulation) and Thornburgh Insulation (HVAC insulation) had up to 25 people working on the job site at one time.

"It may only take 30 seconds to redo one section, but... on a job this size, that adds up to a lot of time and money."

The job was challenging not only in its size, but also in the flexibility it required, according to Sherry Wilhite, owner of ABW. "There were a lot of changes from the original plans during the job," she says. "Entire walls were moved, which obviously affected both the plumbing and the HVAC plans. But on a job this large, we had to keep to schedule—even with the changes—so we didn't hold up the other subcontractors. It required us to keep moving quickly."

One of the most challenging parts of the job was insulating the vertical piping in the mechanical shafts that ran uninterrupted for the entire height of the building, plumbing on one side of the building and HVAC piping on the other. The crews had to work while they were suspended over the chases in hanging boxes known as "spiders." It was critical to have pipe insulation that matched up in size, end to end, had secure jacketing, and was easy to "notch out" to fit around fittings and joints. Plus, since the vertical chases were covered with drywall early on, workers needed the assurance that a quick rub down of the insulation's longitudinal lap would hold it securely. Redoing their work later on was not an option.

Knauf Pipe Insulation provided a solution in several ways, according to Thornburgh project foreman Tony Mohr. "Knauf's insulation is more rigid than other types, so when you scribe your piece of material, just what you cut comes out. With other products, the whole thing comes out. It's really aggravating and it wastes time. The other thing is that sealing Knauf's lap is faster. You don't have to pull up a lap that's already glued down: You just rub Knauf's lap down and it stays secure. So Knauf's product is less time-consuming and you have less waste. And we've never had any problem with the lap coming up."

While the amount of time saved on each piece of insulation may have seemed small, it added up to big time savings on a job the size of the Eagleton building, according to Chris Thornburgh, owner of Thornburgh Insulation. "We've been really happy with the Knauf material. I'd hate to have our crews complaining about digging out the material. It may only take 30 seconds to redo one section, but think about how many thousands of valves, hangers and other obstructions there are on a job this size. That adds up to a lot of time and money." Thornburgh adds that clear labeling of sizes on Knauf's product and a special arrangement by Brauer Supply and Knauf to deliver truckloads of material directly to the job site simplified logistics and helped them keep the job on schedule. "With Knauf's ability to warehouse large quantities of product and to ship in one to two days," adds Dave Camden, Brauer's insulation manager, "we were able to more easily accommodate the fast track nature of this job."

Another time saver for Thornburgh was insulation that was easy to handle, with jacketing that was tightly adhered, according to installer Ralph Hopes. "The most important thing in my job is to have a product that's easy to manage, easy to cut and easy to put on," he says. "Knauf is a lot easier to work with. The insulation board is nice and firm and cuts real well. The pipe insulation is easier to cut and it's the right fit because the ends of pieces match up. The jacketing's nice, too. With some insulations, the paper moves on you. Then, when you go to get an accurate measurement, the paper's off center. That makes a big difference, especially when you have to paint [mastic] the ends up. With the Knauf insulation, the jacket doesn't shift. It's a good quality product."

Knauf 1000° Pipe Insulation covered 150,000 feet (45,720 m) of plumbing and mechanical system piping.

Prominence in
FORM AND FUNCTION

The imposing design of the Thomas F. Eagleton building (named for the former senator from Missouri) was intended by architectural firm Hellmuth, Obata and Kassebaum (St. Louis) to reflect the court's judicial significance. The building's actual height is 567' (173 m), only 13' (3.96 m) shorter than the tallest building in St. Louis and approaching the stature of the Gateway Arch, towering nearby at 630' (192 m). The facility will house the main offices for the Eighth Circuit of the U.S. Courts, U.S. District Courts, Magistrate Courts, Bankruptcy Court, Special Proceedings Court, Tax Court and U.S. Marshal Service, U.S. Attorney, U.S. Probation, U.S. Trustee and GSA offices.

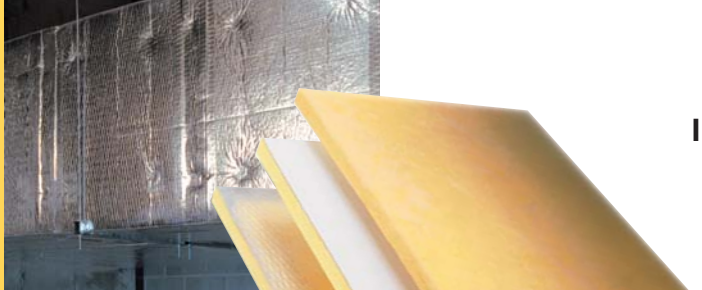
The center section of the building (see back cover) is the court tower, comprised of a bundle of shafts, each of which serves a particular function. Mechanical system piping and plumbing, for example, is housed in concrete shafts that run from the below-ground mechanical rooms all the way to the roof.

Towering 29 stories above the city and covering 5.5 acres on the ground, the unique project presented ample challenges due to scale alone.

Flanking the base of the tower are five-story wings on the north and south. These help anchor the tower to the site and provide greater capacity at lower levels for clerk and support functions. In total, the building will provide 1,038,645 square feet (96,396 sq. m) for its various judicial and U.S. Government functions.

1000° PIPE INSULATION

DUCT WRAP



INSULATION BOARD

PROJECT PROFILE

- **Facility:** Thomas F. Eagleton Federal Building and U.S. Courthouse, St. Louis
- **Size:** 567 ft. (173 m) tall, 29 stories above ground, 4 underground, 1,038,645 ft.² (96,396 m²) gross area, 5.5 acres (1 1/2 blocks)
- **Cost:** $190 million
- **Specifications:** System International (soft metric) units
- **Building Owner:** U.S. Government, General Services Administration
- **Design Architect:** Hellmuth, Obata & Kassebaum (St. Louis)
- **General Contractor:** Morse Diesel International (New York)
- **Construction Manager:** CRSS Constructors (Denver)
- **Mechanical Contractor:** Corrigan (St. Louis)
- **Insulation Contractors:** Thornburgh Insulation ABW Insulation
- **Insulation Distributor:** Brauer Supply
- **Knauf Products:**
  - 1000° Pipe Insulation 150,000 lineal feet (45,720 lineal meters)
  - Duct Wrap 250,000 ft.² (23,226 m²)
  - Insulation Board 85,000 ft.² (7,897 m²)
  - Proto PVC Fitting Covers

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Top, left to right: Contractors needed pipe insulation that could be quickly "notched out" in order to keep up with a "fast track" schedule; Duct sizes ranged from 4" (101.6 mm) round to 4' x 9' (1.22 m x 2.74 m) rectangular; Insulation helped prevent heat gain and condensation on chilled water pipes (55°F/13°C supply). Right: The facility's center court section is flanked by five-story administrative wings to the north and south.

Persuading the JURY

The time savings also enabled both ABW and Thornburgh to focus more on the challenging logistical aspects of the job. "When you have 34 floors to work on, sometimes communication isn't the greatest," says Johnny Thornburgh, who acted as project superintendent for Thornburgh during most of the job. "You have to be surveying the job constantly and coordinating with all the other crafts. If you can't react to situations in a timely manner, it's going to cost you big time later. And that affects your profit margins. We couldn't afford to be messing around and redoing sections of the insulation."

Sherry Wilhite of ABW adds that, while the finished look of the job may be important to the insulation contractors, getting done on schedule so other crafts can move forward may be even more important to everyone else. "Our mission is to get the job done well and on time," she explains. "We can't hold up any of the other crafts. That's why saving time on a job of this size is critical."

After working on the Eagleton building for more than two years, both ABW and Thornburgh have had plenty of time to evaluate how Knauf products could impact their efficiency levels. It's fitting that a U.S. Courthouse would provide the setting for them to render a favorable verdict.

Federal Courthouse Testifies To Knauf Quality

Thomas F. Eagleton U.S. Courthouse, St. Louis, Mo.

KNAUF

Field Bulletin

Knauf insulation saves contractors time on 29-story project.

This is my insulation.™