FOAMGLAS®

CAPITOL VISITOR CENTER - WASHINGTON, D.C.

PROJECT PROFILE

Subterranean U.S. Capitol Visitor Center Opens, Featuring Unique HVAC System Challenges

For more than two centuries, the U.S. Capitol Building has been an international symbol of the United States' representative form of democracy, and the number of visitors continually grows. In light of this, and the post 9/11/2001 realities of the world, Congress recognized the need for added space and educational amenities while also providing greater safety and security.

In August 2002, construction began on the 580,000 square-feet Capitol Visitor Center (CVC) which features three levels and is located underground beneath the east plaza of the Capitol to preserve the appearance of the Capitol and the tree-lined grounds originally designed by Frederick Law Olmstead in 1874. The CVC opened to the public in December 2008 and provides a welcoming and educational environment for visitors to learn about the House and the Senate and the legislative history and process in general.

The CVC was designed to create an atmosphere of free and open access and can comfortably accommodate about 4,000 people at one time. It features many amenities including a 530-seat restaurant, two gift shops, three auditoriums, exhibition hall, 26 restrooms and more. A unique feature of the underground facility is that visitors can view the Capitol Dome through two grand skylights, before embarking on guided tours of the Capitol Building.

Underground HVAC Service System Provides Comfort and Security for Many
While the high-pressure steam and chilled water lines that run underneath the streets of Washington, D.C. are designed to provide heating and cooling to comfort employees and visitors to the CVC, the selection of the insulation system that protects and enables the system to operate at optimum efficiency provides comfort and security—mostly piece of mind—to those responsible for its operation.

A precast concrete tunnel, totaling approximately 1,000 feet long, connects the CVC to the tunnel network served by the U.S. Capitol Power Plant, located five city blocks away. Steel piping carries the steam and chilled water to provide heating and cooling for the facility. The piping is installed on a galvanized steel supports and includes: 16"-diameter chilled water lines operating at 44ºF, 3"- to 6"-diameter steam condensate lines, and 12"- to 14"-diameter high-pressure steam lines operating at 150 psig. The designers specified FOAMGLAS® cellular glass insulation manufactured by Pittsburgh Corning in thicknesses from 2" thick on the chilled water lines to up to 4" thick on the steam lines.

Engineering Design & Specification:

James Posey Associates, Inc. - Baltimore, Md.

Insulation Contractor:

Advanced Specialty Contractors - Elkridge, Md.

Insulation Distributor/ Fabricator:

Specialty Products and Insulation Co. - Lancaster, Pa.

The insulation was installed in two-foot-long sections, joints butted together and covered with jacketing. The insulation system was also used for fittings, elbows and sleeves for through-wall fire stops.

The insulation for the project was fabricated and supplied by Specialty Products and Insulation Co., Lancaster, Pa., and the installation contractor was Advanced Specialty Contractors, Elkridge, Md.

Design Challenges to Ensure Optimal Operation
Because the entire piping system is underground in tunnels, there were design challenges for both the immediate and long-range future operation of the system.

According to Denny White, Mechanical Project Manager at Baltimore, Md.-based James Posey Associates, Inc., "Seepage of water is normal in any type of underground structure, and because of this and the hot, humid environment of Washington, D.C. in the summer, we needed the insulation system be waterproof and act as a vapor barrier for thermal endurance."

He added that D.C. often gets significant thunderstorms and it's inevitable that water will enter the tunnel system. In fact, he said water was dripping into the tunnel from the street surfaces and the ground itself causing minor puddles in the tunnels before the CVC building even opened.

"When moisture drips on the piping system, it will find its way into the insulation," said White. "Once that happens, the thermal insulation dynamics of most insulation materials are lost. But, with FOAMGLAS® insulation, the material itself is totally impermeable to water or water vapor, making it the only product we will specify for use on underground systems."

Another consideration for using the high-performance FOAMGLAS® insulation system was personnel safety. White added, "People will be working in those tunnels, and if the insulation system fails on the steam pipelines, the piping surfaces will reach unsafe temperatures for workers."

FOAMGLAS® insulation was chosen because it is all glass, and it cannot absorb moisture, ensuring long-term thermal efficiency and protection against corrosion and other failures. Additionally, because of its composition, it cannot burn and won't contribute to flame or smoke spread, an important factor for any building occupied by people.

The system will be dynamic and move as pressure and temperatures change. FOAMGLAS® insulation has a totally reversible coefficient of thermal expansion/contraction, which is similar to that of mild steel. This ensures that it won't swell, warp, shrink or otherwise distort.

White concluded, "We've successfully used FOAMGLAS® insulation on many jobs for two decades and know the insulation will outlast the pipes they protect. The bottom line is that it just flat out performs and gives us and the building's operators peace of mind knowing they won't have to worry or, worse yet, shut down the facility because there was an insulation failure."

FOAMGLAS®

Pittsburgh Corning USA
(Corporate Headquarters)
800 Presque Isle Drive
Pittsburgh, PA 15239
Telephone: 724-327-6100
Fax: 724-387-3807

www.foamglas.com