

Case Study:
Nashville, Tennessee

Construction Type:
Commercial Retrofit

Behind the Building:

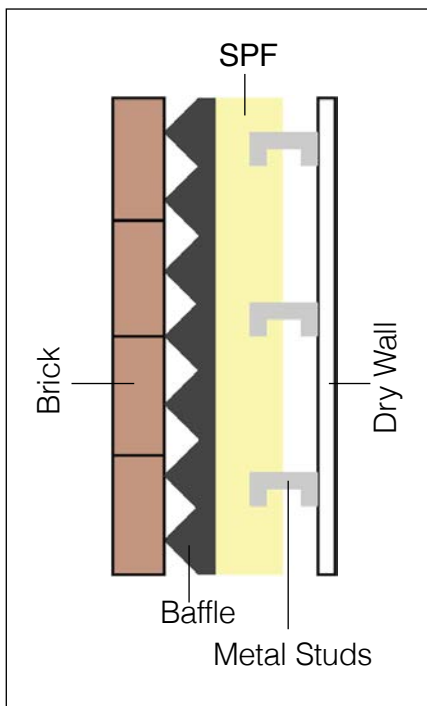
SPF Contractor: Insulation Solutions of Tennessee

Construction Type: Steel stud w/brick veneer

Climate Zone: 4

Dollars & Common Sense:

- The sprayable nature of SPF allows it to go where other building materials can't
- SPF creates an excellent air barrier
- Closed cell SPF can be utilized for lightweight structural enhancement



Renovated wall assembly

SPF Enables Timely, Cost-Effective Renovations



During the recent renovation of the Gaylord Opryland Resort and Convention Center, spray polyurethane foam (SPF) was used in two different applications to solve unique problems. The first involved insulating a number of guest room walls with CertainTeed's CertaSpray® Closed Cell Foam Insulation. The second utilized the structural properties of CertaSpray Closed Cell Foam Insulation to create a new bar and lounge in the Cascades Atrium.

Exterior Wall Renovation

Renovation of some of the guest rooms required the removal of both the fiberglass insulation and the exterior fiberglass-mat faced gypsum board sheathing, leaving exposed brick. Replacing the exterior sheathing would have required removal and replacement of the brick, an expensive proposition. Rather, the general contractor Insulation Solutions of Tennessee developed the idea to use closed cell SPF with a baffle system.

The baffle system provided an air gap for the drainage plane, while serving as a surface for spraying and transferring loads on the brick back to the studs. The baffle was test sprayed prior to installation to ensure it would have good adhesion. Two inches of closed cell SPF were then applied directly onto the baffle system. The adhesion and structural rigidity of the foam solidified the wall system and added strength. SPF provided a thermal insulation of R-13 and served as the air barrier. Finally, the wall system was finished on the interior with drywall.



The Falls Bar during the construction phase with the use of SPF.



The Falls Bar close up of waffle grid using SPF.

Cascade Atrium's Foundation Renovation

The renovation of the Gaylord Opryland's Cascade Atrium also features closed cell SPF. The new bar and lounge, known as The Falls Bar, presented some unique challenges. In designing this area, the general contractor found the existing concrete foundation would be unable to support the bar's weight. Polystyrene was considered, but there were concerns over it settling under the weight of the structure.

"With assistance from CertainTeed's Building Science Group, the team became convinced that the closed cell SPF would be able to support the dead load and anticipated live loads of the bar area," said Lionel Rossignol, product manager, CertainTeed Insulation. "Additionally, its use would significantly reduce the dead load upon the existing concrete pad."

The foundation was designed as a waffle grid of concrete channels with SPF in between. To form the channels for the concrete, expanded polystyrene (EPS) boards were covered with polyethylene sheeting, one of the few materials SPF will not adhere to. The boards were cut to form the grid in the foundation, into which concrete was poured. This process required significant detailed labor work to deal with the curved structure and all the pipes and conduit running in the foundation. Once the EPS board grid was formed, 14 inches of closed cell SPF was sprayed into the grid pattern in multiple passes of two to two-and-a-half inches each. Spraying passes too thick can cause the foam to overheat from the exotherm and can cause the foam to become dimensionally unstable.

Once satisfied that the foam was of acceptable quality, the polyethylene sheeting-covered EPS boards were removed leaving a waffle grid of channels. Concrete was then poured into the channels to complete the structure. The result was a lighter weight foundation for the new bar and lounge that did not require the existing concrete base to be replaced.

Conclusion

The two jobs totaling 64,000 building feet (bdft) were completed during July and August 2010. CertaSpray closed cell SPF was critical in addressing two difficult situations that otherwise would have required costly, time-consuming solutions.

Huntsman
10003 Woodloch Forest Drive
The Woodlands, Texas 77380
281-719-4602
sprayfoam@huntsman.com

www.huntsman.com/sprayfoam

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