Historical center of Bastogne

Close to the Luxembourg border, the Historical Center of Bastogne in the Belgian city of Bastogne was built as a joint effort between the United States and Belgium commemorating the infamous Battle of Ardennes, also known as the Battle of the Bulge, in 1944/45. Together with the nearby Memorial du Mardasson, the Historical Center of Bastogne celebrates the support from U.S. troops and remembers the numerous casualties sustained in the battle.

The center showcases weapons and uniforms, and depicts stories from the battle and World War II, attracting thousands of visitors from across the globe annually.

In Spring 2013, the center will re-open as the Bastogne War Museum beside the Memorial du Mardasson providing visitors with a new space to learn about the battles within the region.

The City of Bastogne hired local Wallonian construction company Wust Corporation, part of the BESIX Group, to lead the construction of the new museum space and restore the star-shaped historical center.

The Challenge

Initially, the project only included the construction of two new buildings designed to complement the existing building. The Historical Center of Bastogne, a large wooden framed structure in the shape of an American star with a slate roof, was considered well insulated by officials. However, when drilling into the walls of the star-shaped structure to connect the new and existing buildings together, contractors discovered serious problems due to the poor insulation that had been previously installed.

Upon drilling into the walls of the center, contractors had discovered that there was no vapor barrier nor air seal. The insulation that had been installed was a traditional fibreglass material. Furthermore, the slate roof was not breathable. The underside of the roof had been covered in PVC plastic.

The climate in the Ardennes region of Belgium, France and Luxembourg fluctuates with humid summers and temperatures often plummeting to -20°C (-4°F) in winter. As a result of the Ardennes climate together with the construction of the historical center, the contractors were faced with abundant condensation, mold as well as rot at the bottom of the wooden frame structure. The rotting frame would lead to a stability problem, a problem that officials were not expecting and knew they had to address quickly.
City officials and contractors sought to eliminate the condensation, mold and stability concerns by consulting Icynene distributor, DELHEZ SYSTEMES S.A.

Delhez Systemes also had to find a solution that did not require the roof to be completely renovated since officials had stipulated that the roof would not be replaced.

**The Solution**

Delhez Systemes were challenged to find a solution and met with officials from the City of Bastogne, engineers and architects to ensure every problem was addressed. The team also had to ensure they could sufficiently address the non-breathable roof. The team at Delhez presented Icynene for consideration.

Delhez had studied the problem areas with a variety of scenarios and proposed the best available solution. Icynene's open-cell, light-density LD-C-50 spray foam insulation was chosen as the ideal solution for the historical center.

As a light-density, open-cell spray foam, LD-C-50 is a soft, flexible material that maintains an air seal throughout the seasonal changes. As a vapor permeable material, it also supports bi-directional drying of assemblies.

The lightweight, air-tight and healthy insulation solution proved ideal for the historical center and was successfully applied by Delhez' local Icynene contractor, WLS. The application took around four days and was applied throughout the building, with some areas reaching 20 meters high.

Icynene’s open-cell, light-density LD-C-50 spray foam insulation was chosen as the ideal solution for the historical center due to its flexibility and vapor permeability.

For further information, contact your local licensed Icynene dealer.

One month after the application, lightning struck the historical center during a thunderstorm, causing the center's wooden frame to ignite. The fire burned the wooden frame but was slowed down by the Icynene airtight insulation, which does not propagate flames, thereby limiting the damage caused to the building and to its frame. The spray foam insulation managed to slow down the fire and was able to keep all of its physical properties. Firefighters, as well as officials and engineers, were pleasantly surprised at the insulation's qualities.

Once the damage was repaired by the lead contractor, Icynene contractors resprayed the fire damaged area with LD-C-50.

**The Result**

Following application of Icynene’s LD-C-50, the historical center is now a well insulated and air-tight building. Right-sized mechanical ventilation systems will be installed to ensure that visitors to the center, as well as employees, are comfortable throughout the seasons. The probability of condensation leading to mold and rot is now minimized, ensuring that the historical center’s structure and frame remain sound over the long term.

City officials and Wust engineers were not only surprised by the spray foam’s qualities following the fire but were impressed with the ease of the insulation’s application. The professionalism, cleanliness and knowledge from Icynene contractor, WLS, was also acknowledged by city officials and Wust contractors.

Construction continues at the site with the opening of the new Bastogne War Museum scheduled to occur in Spring 2013 with more than 400 artifacts and interactive exhibitions.