

Ventilated Facades: DTI Brings European Solution to the Heartland



Oakton Community College ventilated facade system. Porcelain tile color corresponds to the brick exteriors of surrounding campus buildings.

DTI of Illinois installed one of the first exterior porcelain tile ventilated facades (also called a rain screen system) in the Chicago area two years ago. The 1st Bank and Trust in Skokie was a highly publicized installation and served as a blueprint in best practices in the installation of the new ventilated façade systems.

With this successful installation under his belt, DTI President Brian Castro was ready for more and earlier this year, took on a second project involving the installation of Marazzi's rain screen system to a newly erected 3-story building on the campus of Oakton Community College in Des Plaines. After erecting the aluminum substructure that forms the backbone of rain screen systems, DTI's installation crews installed almost 13,000sf of 24" x 48" porcelain tiles. At its peak, the project required up to eight team members on site, some working on the ground and others on movable man lifts, and involved tools not commonly found on tile installation sites such as drills, rivet guns and drilling/coring machines. DTI's crews were already familiar with these tools and the mechanics of attaching the substructure to the building and installing the large format tile cladding to the substructure from

their work on the 1st Bank project. But because the height of the Oakton building required the use of mechanical lifts, the crews received additional safety training and certification in the use of the man lifts before the installation began.

According to Castro, the biggest challenge on the Oakton project was attaching the substructure to the building. "We ran into the same



Vertical rails are attached to clips welded to the building's steel girders.

issue with our 1st Bank project so this wasn't entirely unexpected," he said. He attributes the attachment challenges to the system's European origin. "Rain screen systems originated in Europe where the older buildings are primarily constructed of brick or cement block, both of which provide substantial support for anchoring the systems to the building. But construction here in the United States typically uses lighter weight newer construction materials that make it more difficult to attach the vertical clips directly to the building's exterior walls."

When the project involves working with exterior walls made of gypsum or other light weight material, the attachment issue is typically addressed in two ways. One solution is to drop Halfen plates into concrete when the building's foundation is poured. These plates, embedded in concrete, support the weight of the substructure and tile cladding as the system builds from the ground up. Another solution is to weld the vertical clips to the building's steel girders. But as Castro pointed out, "it's a stretch for someone trained as a tile installer to weld the clips to steel and it

can cause confusion with the architect and general contractor and even friction among the other building trades". In the case of the Oakton project, Castro contracted with a local metal workers company to weld the clips to the steel which he had not accounted for in either his bid or project timeline. Fortunately neither severely impacted either aspect of the project.



Open joints contribute to the system's self-ventilating features.

Once the clips are attached and the vertical rails are installed, the building's exterior is

wrapped with a water barrier. Then, a fire retardant fiberglass insulation is installed which is followed by the installation of the horizontal rails. With the aluminum sub-structure now complete, a 1.5"-2" air cavity is created between the insulation and



With water barrier and insulation in place, final steps are installing the horizontal rails and large format porcelain tiles.

the porcelain tile cladding. The final step is attaching the large format porcelain tiles to the horizontal rails and bringing them into alignment using special adjusting brackets attached to the back of the tile. Unlike a traditional tile installation where the joints are filled with grout, rain screen joints are left open and, along with the air cavity, contribute to the self-ventilating features of the rain screen systems. Jerry Joyce, Commercial Sales Director for Marazzi USA, says that this self ventilation offers many benefits in terms of energy efficiency by creating a "chimney effect" where heat is drawn up and away from the building, keeping the interior cooler during warm weather months. The system also prevents

interior heat from escaping during cold weather and the constant movement of air inside the cavity discourages insects from taking up residence. "Depending on the wall design, insulation thickness and other factors, you're going to see energy savings of 20% or more after the installation of a rain screen system," he said. The system moves the building's insulation to its exterior walls, reducing interior condensation and preventing the development of mold. And because porcelain lends itself to a wide range of design colors and features, the cladding can be manufactured to achieve a variety of appearances. In the case of Oakton, the porcelain tile was matched to the brick color of surrounding campus buildings. Other benefits to the use of porcelain tile cladding as compared to masonry or stone are porcelain's resistance to atmospheric effects, its easy cleaning properties, lighter weight and low life cycle cost.

The Oakton project is scheduled for final completion this November. Despite the many benefits of the rain screen systems, Castro cautions that they present sometimes unexpected challenges. "Every building is unique and we learn something new on each installation," he said. "The key to a successful outcome is continually addressing the adjustments that are necessary to a system that is

constantly adapting to the requirements of our domestic construction process, from the building's design to placement of the final tile." He credits his skilled BAC installation crews and Marazzi's project support team for staying ahead of most issues and quickly resolving others as they arose.

DTI of Illinois has been providing quality union tile installation throughout the Chicago area and surrounding suburbs since 1956 and specializes in the installation of ceramic, quarry, stone and detectable warning tiles in commercial applications. DTI's expert management team and installation crews have amassed a lengthy portfolio of superior installations that includes the Boeing Corporation World Headquarters, Museum of Science and Industry, Soldier Field, Palmer House Hotel, Local 150 Apprenticeship Training Facility, University of Chicago and Illinois Benedictine University. DTI received TCAA's Trowel of Excellence certification in 2009.

Completed installation of rain screen system delivers beauty and energy efficiency.

