

St. Louis Emergency Center ...continued



Photo Credit: Debbie Franke Photography

understand what would be required and appropriate trades to be coordinated effectively. Tremco provided clear, three-dimensional, sequenced details to help guide the installing contractors while aiding the design and construction team to address any challenges which might be encountered before construction.

BOLD, BEAUTIFUL AND ENDURING

Building what would be considered by many to be a fortress was a challenge in and of itself. Adding daylight and views compounded the challenge. The final requirement was to design a facility that would be an asset to the residential community in which it was situated. Enhancements were also made to the property, extending the park setting with walking trails and sustainable landscaping elements while preserving the security of the facility.

“We tried to give everyone the best of all worlds,” stated Mayfield. “We addressed the seismic guidelines, the anti-terrorism and impact guidelines, and the enhanced environmental guidelines to be able

to withstand a tornado while still providing a good quality of life for those working in the facility. The final piece was to design a facility that would be compatible with its surroundings.”

The cast-in-place concrete, single-story administrative structure with interior steel framing and a concrete deck is wrapped with a brick veneer to soften the 27-foot height of the main technological component of the building. A mosaic of metal panels in three different colors is designed to add movement and texture to the tall, 300-foot long façade of the main building.

No matter what St. Louis County may encounter going forward, residents may be assured that its new communications system will continue to operate 24 hours a day, seven days a week, through disaster or tragedy even if it has lost all outside power. At all other times, it will be a very pleasant place to work.



St. Louis Emergency Center

Challenge: KEY EMERGENCY COMMUNICATIONS CENTER DESIGN REQUIREMENT: QUALITY OF LIFE, SAFETY, AND UNINTERRUPTABLE EFFICIENCY

In today’s world, mission critical facilities not only need to withstand Mother Nature’s worst, but they need to provide protection from terrorist attacks as well. Public safety departments need to be able to communicate quickly with each other and stay in operation for extended periods without any support from the outside through extreme conditions. While doing all this, facilities must also provide a reasonable quality of life for occupants. Providing all this is no small order.

September 11, 2001, drew attention and a sense of urgency to the lack of compatibility within communications systems used by emergency responders. At the time, there were 50 different communications systems in St. Louis County alone. Reflecting on the events of that day, plans called for the emergency communications system for St. Louis County in Ballwin, MO to be consolidated and expanded to include adjacent counties and establishing an 800 MHz trunked radio network and systems data center. This radio system would ensure better management of incidents through the rapid sharing of information among firefighters, EMS, policemen, hospitals, public works and other groups. St. Louis County took the opportunity to bring together the 911 dispatching center, emergency



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St. Louis Emergency Center ...continued



Winco tornado and impact testing: Winco architectural-grade pre-glazed windows, incorporating Tremco's Spectrem 2 Silicone Sealant and 440 Tape, were tested for tornado and impact resistance.

communications center and emergency management section all under one roof to further enhance the communications channels. These functions had been housed in separate facilities with no connection to other participants in the emergency communications process. Two of the facilities were not secure and one was located in a nuclear fallout shelter which was well past its useful life. To make matters worse, this area is a high seismic zone.

Daily operations for these units typically require 60 people to function efficiently. This expands to 200 during activations to prepare and manage before, during and after an event such as the tornado that hit Joplin in 2011. One-third of the facility is operational 24/7. The 911 side of the operation is notorious for its stress level, answering almost 800,000 calls annually by 2012, according to the county police

department's Bureau of Communications. Occupants of the new facility needed to feel confident that they had the security provided by the bunker while finally having access to daylight and to have the opportunity to walk outside to green space for a buffer from the tension of the work environment. Beyond the occupant needs, the facility needed to fit into a residential community without being offensive.

MISSION-CRITICAL DEMANDS PUT SPOTLIGHT ON BUILDING ENCLOSURE PERFORMANCE

Based on their extensive mission-critical expertise, the county selected Ross & Baruzzini to design this complex and extremely demanding facility. Their experience with the multi-faceted requirements of airport operations centers and other critical facilities in locations around the world, including the Middle East provided the background to respond to the challenges of the new facility.

As the lead architect, Jason Mayfield remarked, "We tried to give the occupants of this facility the best of all worlds. Everyone in the facility has access to windows and views. While we had to design the facility to withstand Mother Nature's worst, we needed the building's occupants not to feel like they were in a bunker."

The 31,600-square-foot facility features strategically placed windows in the exterior wall, including windows in the 27-foot tall north wall to provide natural light and views. Winco architectural-grade pre-glazed window systems were utilized to provide the required tornado and impact resistance. The facility is designed to withstand 180-mph winds with an impact from a 15-pound 2x4 traveling at 100 miles per hour. To meet code requirements throughout the years, Winco Windows has continually developed products able to meet ever more rigorous demands to ensure the protection of buildings and their occupants from natural or man-made disasters. They even built their own live blast test chamber and cannon to test newly-developed window systems because none existed when these high-performance windows were first being developed. Tremco Spectrem® 2 Silicone Sealant and Tremco 440 Tape are incorporated in their design.

"For specialized, larger and custom applications such as this, we require a significant amount of compatibility testing and technical support from the sealant manufacturers we work with," remarked Kurtis Suellentrop, technical sales engineer at Winco. "We had a conference call early on with the architect, glazing contractor, Tremco and all the key participants in the project. All the trades had to work together and provide their input before the shop drawings were done. The transition between the trades as the windows were installed was critical. Coordination of the steps, when they were done and who was responsible was of particular importance to decrease the potential for any gaps that would potentially allow moisture intrusion."

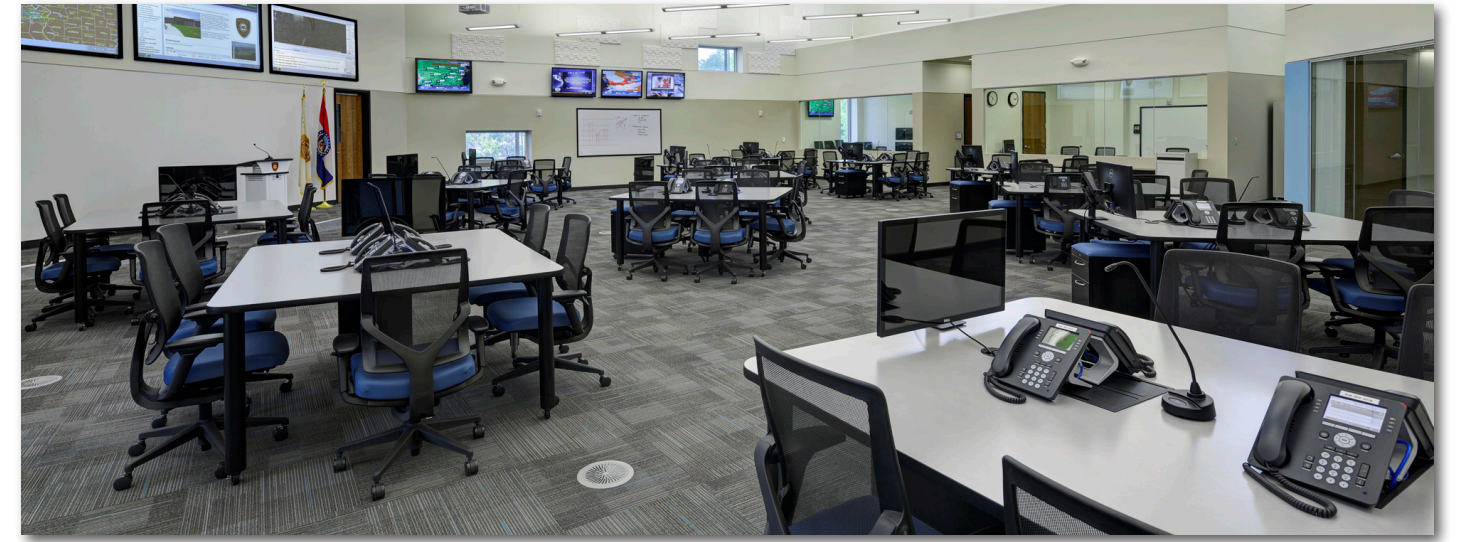


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Understanding the operational requirements, it was critical to make the enclosure as monolithic as possible. "We wanted to wrap the building with materials from one manufacturer," noted Jason Mayfield, project architect for Ross & Baruzzini. "The fewer people involved, the better so we don't have to worry about compatibility." Assigning responsibility for components to a single-source where feasible helps maintain control, eliminate risk, and facilitate the process. It also helps ensure the appropriate solution (and application sequence) is specified and eliminates any gaps that may be left to guesswork or interpretation down the line.

Tremco's ExoAir® 120 Fluid-Applied Air & Vapor Membrane serves as the foundation for the air barrier system, providing a monolithic, seamless membrane which ensures continuous integrity without gaps. ExoAir® 110 Self-Adhered Air & Vapor Membrane is used as a transition membrane into door and window openings. To achieve a holistic, continuous system throughout the building enclosure, Tremco's Proglaze® ETA Engineered Transition Assembly was incorporated to span the critical gap from the window to wall assembly.

Proglaze® ETA Engineered Transition Assemblies are turnkey, engineered solutions for critical connections throughout the building enclosure which provide visible assurance of a secure, continuous seal without voids. Consisting of pre-engineered, Alodine finished aluminum and silicone materials that are mechanically and/or attached with Spectrem® 1 Silicone Sealant to window and/or wall structural framing, these assemblies provide a more secure, durable connection and seal. These innovative solutions absorb thermal and

seismic movement and wind-loading stresses to the buildings' façade, providing a stressless connection, less dependent upon contractor skill and attention.

Transforming a building into a high-performance environment requires continuity at all the interfaces throughout the building envelope. These connections must be able to withstand maximum wind loads, and building movement from thermal, seismic and moisture content changes, deflection, and creep. The dynamic joints in building design such as joints within floors and walls, which allow for building movement, are particularly demanding connectivity points. Joints and the materials that are used to seal them must be flexible, durable and able to span irregular or unsupported joints while supporting the same air pressures as the air barrier material without rupture or displacement.

"The Proglaze ETA assembly took away much of our concern about the facility's ability to withstand a tornado, respond to seismic issues and meet anti-terrorism guidelines," commented Mayfield. Tremco has tested the Proglaze ETA system to well in excess of 200 mph wind speeds to provide proven, documented performance. Testing has also included the ExoAir Air Barrier System to evaluate performance of the building envelope as well as the performance of components and wall assembly. Consequently, ALL components of the system are subject to the same performance criteria required for the entire system.

A mockup was built on-site to validate the design intent and constructability. Collaboration at the design stage allowed critical details and transitions to be clearly drawn to enable contractors to