

BY GEORGE VANGELATOS & CHUCK EYBERG

Prefabricated envelopes deliver flexibility to healthcare projects



What's In With Skin

When it comes to healthcare design, today's providers want reduced costs and shorter construction time while still seeking high-quality materials and design aesthetic. One option to explore is prefabricated exterior building envelopes. Especially when used in large hospital towers, prefabricated envelopes are made possible by contractor-integrated design teams working together to answer client objectives.

For example, take Torrance Memorial Medical Center's Lundquist Tower in California, which opened in 2014. The expansion tower was conceived to have several skin types with elegant detailing. The project team worked together to devise an offsite prefabricated skin, which achieved high-quality design and detailing

at a lower cost, and saved six months on the critical path of construction.

The development of the building envelope was accomplished through the "Design Assist" process, which included the architect and general contractor, as well as a structural engineer and specialty subcontractors. The envelope consisted of two distinct systems. A precast concrete panel system and glass/metal panel system. The precast concrete panel system was used on the southern exposure and the glass/metal panel system was used on the northern exposure of the tower. The southern exposure faced inward to the campus and the precast concrete was selected to blend the façade of the tower with the adjacent

buildings. The glass/metal panel system faced outward toward the community and a more contemporary "iconic" expression was desired for this exposure.

As the design progressed, the team provided valuable information on the detailing of various conditions, as well as alternative solutions that would achieve better results or best practices. Furthermore, the Design Assist team was able to provide input with respect to manufacturing and installation of the proposed design solution.

Avoiding delays with collaborative efforts

As the design team was preparing the design documents for agency approval, the Design Assist team was

WORKING AHEAD HMC Architects and McCarthy worked together to devise an offsite prefabricated skin for Torrance Memorial Medical Center's Lundquist Tower in California, which achieved high-quality design and detailing at a lower cost, and shaved six months off the construction process.

developing their shop drawings. The benefit of this collaborative effort is a single approval process for the building envelope in lieu of the deferred approval of the shop drawings during the construction phase. This avoided the potential schedule delay during the construction phase. With the single approval process, the Design Assist team was able to begin manufacturing the various components and assemble them into the finished panels earlier in the construction schedule.

The distinctive benefit of a

Torrance: David Wakely

panelized system, such as pre-cast concrete panels or glass/metal panels, is that fabrication can occur offsite and the finished product stored for a pre-determined installation date. Once installation is scheduled, the panels can be delivered to the site in the sequence of installation and erected in one continuous operation.

Rolling the dice on prefab exterior, bathrooms

Another example is the newly opened 214-bed Henderson Hospital in Nevada. The project team was challenged to deliver in record time, at a price far below any comparable benchmarks. A combination of offsite prefabricated patient bathrooms and onsite prefabricated and assembled exterior panelized skin, adapted from the casino tower industry, was instrumental in achieving high quality at low cost, with a 27-month construction schedule.

The hospital was the first and perhaps most critical piece of the new Union Village — an integrated medical community development. As such, it was held to both the local planning department standards, as well as the conditions established by the community. These included building design characteristics, materials and application, as well as glazing and opening proportions. In addition, local climate and energy requirements played a significant role in the building skin design.

A focused team, including designers, constructors, estimators, skin specialists, structural engineers and owner's representatives assessed several factors. First considered were types of materials. More than 13 different skin types and wall assemblies were reviewed. They ranged from concrete panels, block walls, curtainwalls, exterior insulation and finish system,

metal panels and stucco just to name a few.

Factors used to evaluate these included square-foot cost, install speed, structural impact, city and local design standards, flexibility in design, modularity, warranty, durability, skill of local labor force and LEED and energy performance. At this point, certain wall types began to yield more advantages, yet no single wall type stood out as a paramount option.

Concurrent to the material investigations, the team was receiving preliminary planning layouts of the building. To maintain an aggressive schedule, the decisions on the exterior construction had to be made well ahead of the completion of the planning and development of final elevations. The team also relied on conceptual estimates for percentages of glazing and set targets based on a value established by both the city's criteria and benchmarked hospitals. An 18 percent glazing target was set and assumptions made based on early planning as to how that would be distributed. This also helped to inform early energy analysis models prior to the completion of the design.

Final material selection considerations

The location, amount and distribution of glazing were not directly tied to the exterior material selection. However, it did play a significant role in the methods of assembly. For example, larger spans of glazing fared better with curtain-wall systems where smaller punched windows served panelized options best.

As it stands, in the final condition there was approximately 23,764 square feet of glazing, 35,797 square feet of low-rise skin and 65,739 square feet of skin at floors two through

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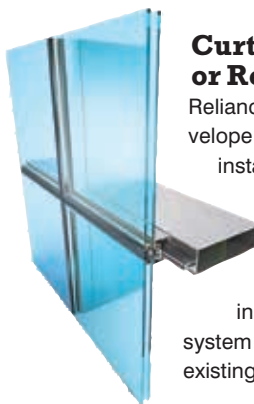


Air, Vapor Barrier Meets Fire Code Approvals

Carlisle SynTec Systems has introduced VapAir Seal MD, an air and vapor barrier for direct-to-metal-deck applications. Historically, the roofing industry has had very few options for effective direct-to-metal-deck air and vapor barriers that meet fire code approvals. VapAir Seal MD offers the following features and benefits: high puncture and tear resistance, a heavy-duty SBS adhesive, a reinforced composite aluminum surface and large, 460-square-foot rolls with a user-friendly poly-release backing. The barrier is certified by UL, complies with FM 4470 Class 1 and can help mitigate roofing concerns like condensation from humidified internal air that is common in medical facilities. **ID#100**

Vapor-Permeable Membrane Durable, Contains Low VOCs

Ideal for exterior insulation and finish system hospital projects, the new StoGuard Gold Coat TA is a trowelable, vapor-permeable air barrier membrane. It is troweled directly onto vertical above-grade wall sheathing and concrete masonry. It also functions as a waterproof air barrier when combined with StoGuard joint and rough opening treatment. In addition, it's waterproof, structural, seamless, durable and contains low VOCs. **ID#101**



Curtainwall System Fit for New Construction or Retrofit Installations

Reliance Cassette Curtain Wall from Oldcastle BuildingEnvelope is a four-sided structurally glazed system that allows the installer to shop glaze the infill onto "cassette frames" using structural glazing tape or structural silicone.

These pre-glazed frames are taken to the field and applied to a structural grid of standard Reliance or Reliance-SS curtainwall framing, providing a four-sided structurally glazed appearance. This system can be used in either new construction or retrofit onto existing Reliance or Reliance-SS installations. **ID#102**



Insulfoam Introduces Platinum GPS Insulation

Insulfoam recently introduced its Platinum graphite polystyrene insulation. GPS is a new class of insulation made with BASF's Neopor, a rigid foam that integrates high-purity graphite into the polymer matrix. The result is insulation with insulating R-values that increase as the temperature de-

creases. Easily recognized by its silver/gray color, Insulfoam Platinum GPS insulation offers similar performance as extruded polystyrene insulation, but is more affordable, and with stable long-term R-values and exceptional vapor permeability, making it a breathable insulation. **ID#103**

Insulated Backup Panel Integrates with Rainscreen Panels, Exterior Cladding

Engineered with Centria's Advanced Thermal and Moisture Protection technology, MetalWrap insulated composite backup panel is the ultimate barrier system, providing long-term performance in a

single, easy-to-install component. The system integrates with all of Centria's back-ventilated metal rainscreen panels and virtually any type of exterior cladding. The combination creates multiple layers of protection, with the panel forming a continuous air, water, vapor and thermal barrier for the ultimate rainscreen wall system. The rainscreen systems are backed with a 10-year Weathertight warranty when any Centria cladding panel is used with MetalWrap for enhanced performance assurance. **ID#104**



Lighter-Weight, Authentic NewBrick Expands Options for Design

Dryvit Systems, Inc. has launched a new brick product that can dramatically increase brick installation productivity and provide new options for architects, contractors and building owners who wish to include brick as part of a new or renovated building's exterior cladding.

At 1/12th the weight of traditional clay brick, NewBrick is a lightweight insulated brick product coated with a specially formulated finish. It matches clay brick's classic size and appearance, but meets today's building challenges. **ID#105**



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four. With material options reviewed, the team considered the following before making any final selections:

- » Should the exterior be panelized or framed in place?
- » Which system will meet owner conditions of satisfaction for modularity?
- » How does each system interact with one another?
- » Which system(s) will allow the building to be enclosed in the shortest duration?

The team concluded that multiple options could be combined to meet the aesthetic, cost, LEED and schedule requirements and, depending on the location and desired characteristics, various options were better suited. For the low-rise or base of the building, a concrete masonry wall offered the best cost, best durability and fit well with Union Village aesthetics. This gave the design



NOT A GAMBLE Taking cues from the casino tower industry, the IPD team for Henderson Hospital in Nevada incorporated onsite prefabricated and assembled exterior panelized skin to deliver cost savings and high quality in 27 months.

a strong and well-grounded foundation that related visually to local materials. Where large glazed areas were required, integrated glass storefront systems were integrated between the CMU walls. These areas were focused at large public spaces. To break down spans of solid wall around the building, sections of blue tile were added instead of adding more

glass and cost. On the upper portions of the tower, where weight was more significant and smaller punched window openings more appropriate — an EIFS wall performed best.

In lieu of framing the walls in place, a panelized approach was used. This was a more expensive option but had significant benefits. According to KHS&H, the EIFS contractor, even though it was a few dollars more per square foot, which was going to cost approximately \$200,000 more to panelize, the \$300,000 saved in six weeks less of

general conditions resulted in \$100,000 in savings and a desirable reduction in construction duration. This eliminated the need for scaffolding and, by enclosing the structure sooner, had a significant impact on the interior finish schedule — an additional cost and time savings.

As the demand for faster, high-quality design at a lower cost continues, so does the trend toward Design-Assist, Design-Build and Integrated Project Delivery methods. With architects and contractors working together early in the design process, prefabricated skin options for aesthetics and detailing become possible. And that's a trend that definitely bodes well for clients.

George Vangelatos, AIA, LEED AP BD+C, EDAC, is a principal and health-care practice leader at HMC Architects. Chuck Eyberg, AIA, LEED AP BD+C, is a principal at HMC Architects.

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