



## Beaudin Ganze designs Aspen Art Museum's systems

by Jennifer Hayes

Hidden in a glass box are the systems essential to the operation of the new Aspen Art Museum.

Beaudin Ganze Consulting Engineers Inc. designed the museum's building systems – a delicate balance in accommodating the sensitive environment of the largely glass-box building and Aspen's cold and dry conditions.

"We sought to maintain a comfortable indoor climate while accommodating rigid quality constraints," said Dan Koelliker, project manager at Beaudin Ganze. "Given the size of this building, the very large gallery spaces and high-altitude Aspen environment, we made use of creative concepts to maintain the integrity of the building envelope."

The 33,000-square-foot Shigeru Ban-designed building at 637 E. Hyman Ave., at the corner of Hyman and South Spring Street in downtown Aspen, features a unique glass and geometric exterior design, rooftop garden and expansive interior gallery space.

With the museum consisting of multiple zones from critically conditioned exhibit galleries to conventional offices to workshops to café, the design team took a "big picture" approach to balancing the differing requirements for climate control and sustainable building systems, according to Beaudin Ganze.

Some of the solutions incorporated into the design included wrapping the galleries in a "thermos." Buffering the most sensitive art display areas with less critical spaces progressively relaxes the humidity tolerance ranges. Beaudin Ganze noted the cascade effect achieves the humidification criteria of the galleries without expending unnecessary energy and cost to maintain the same levels elsewhere.

Beaudin Ganze reported other solutions included:

- Air dry "sweating" glass: By blowing warm air over cold glass exterior walls, the potential for condensation is alleviated. The technique brings the cold outdoor surfaces into balance with the warm, humid interior air, and eliminates potential for water droplets to form. Automated temperature sensors provide spot control, further conserving energy as they monitor appropriate tolerance ranges for differently regulated areas.

- Recycling "waste heat": By redirecting excess heat to the non-critical building perimeter and exterior snowmelt areas, the art galleries are protected from overheating in the well-insulated, sealed building envelope. Chilled water provides cooling systems to the galleries year round in lieu of natural ventilation (allowing outdoor air in), which would compromise indoor air quality standards in critical areas.

- Balancing the cooling system with crowd flow: Shifting the cooling load between galleries at times of special events keeps humidity and heat levels in check, which otherwise would be raised through a crowd's collective breathing and body warmth. By "starving" unpopulated galleries, pulling cool air away and into the event gallery, appropriate climate levels are maintained.

- Design yacht-like maintenance: Similar to a yacht in which equipment is tucked away in tight spaces, the museum's maintenance room is "tricky." Electronic modeling revealed how to design a close fit for the fundamental systems. Quick-release devices on ductwork, for example, allow staff to remove those sections to get behind to the primary piping for heat and water.

The original design was by Shigeru Ban with the local architect of record being Basalt-based Cottle Carr Yaw Architects, which retained BGCE. Turner Construc-



Dan Koelliker

*A view from inside the museum of the lattice screen covering the exterior glass wall.*

tion Co., in conjunction with Summit Construction, built the facility.

Additional design features for the four-story structure include a grand staircase along the South Spring Street side of the building, which allows for "natural" blending of the outdoor and indoor spaces of the museum, a "moving room" glass

elevator that animates the northeast corner of the AAM where Spring and Hyman meet, a woven exterior screen, a rooftop structure that will allow the building to remain a transparent facility marrying interior and exterior spaces, and a rooftop sculpture terrace facing Ajax Mountain.▲