Merit Award—Greater than $75 Million

SALT LAKE CITY PUBLIC SAFETY BUILDING, SALT LAKE CITY, UTAH

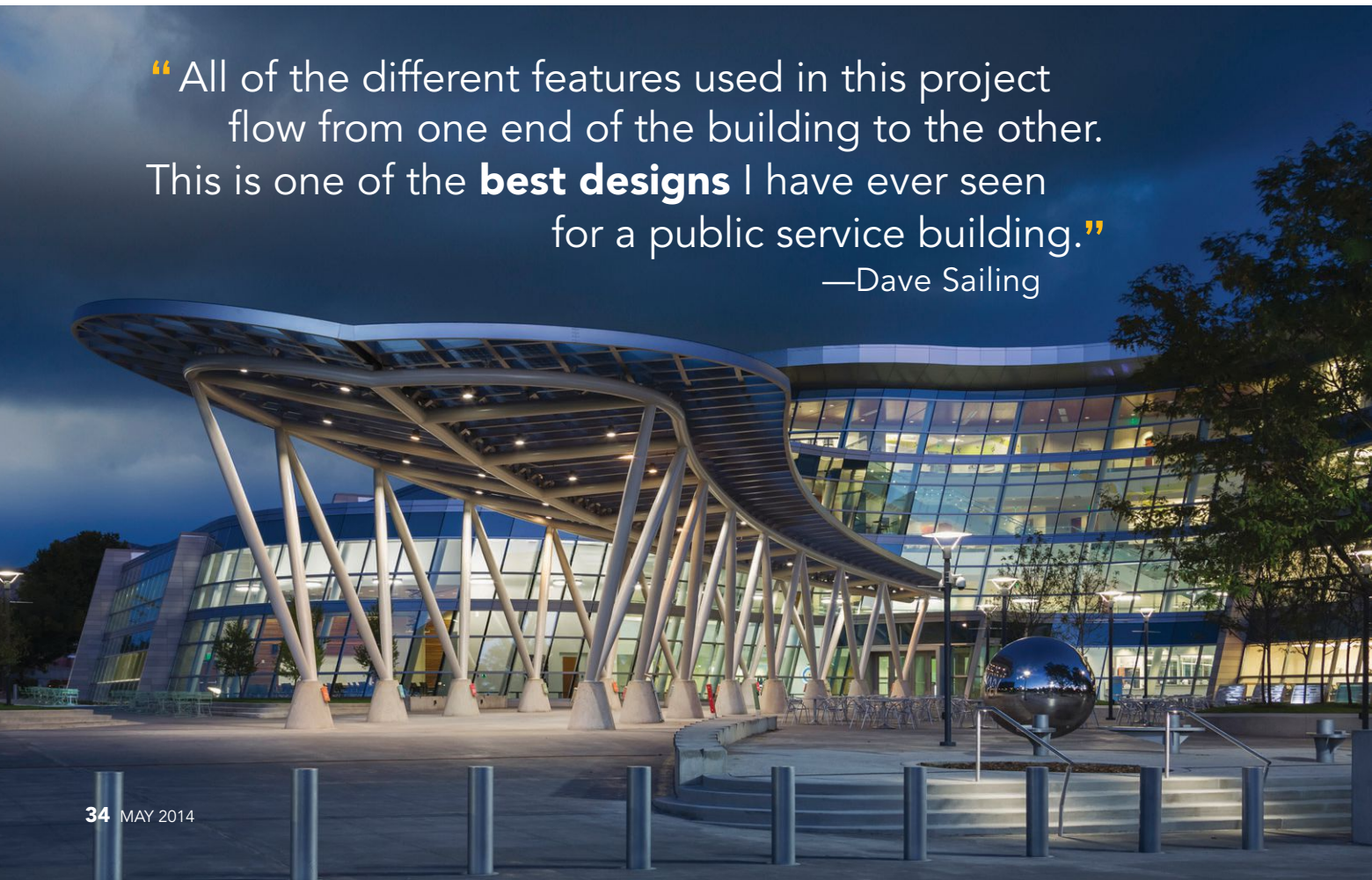
Salt Lake City made a bold statement locating its new Public Safety Building as part of the Salt Lake City Civic Center. The building is an emblematic statement inviting the public to use and explore its plazas, spatially complex lobby and transparent meeting rooms to interact with police and fire administration in open dialogue and action.

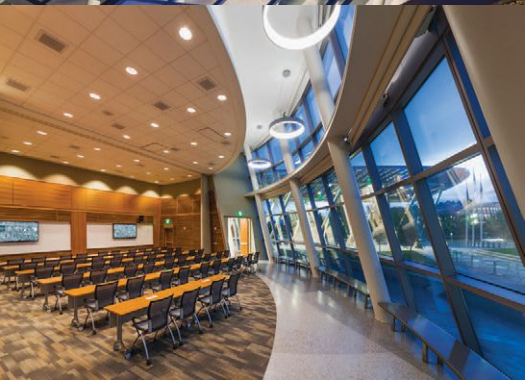
The building houses the city's police, fire and emergency management departments. The 172,000-sq.-ft project was designed to achieve the city's goals of providing an open and inviting public safety facility that will remain operational after a maximum credible earthquake (2,500 year return period), provide a high level of security to its staff and operate as a net zero energy building and sustainable site; the building is slated for a LEED Platinum rating and is the first net zero public safety building in the U.S.

Key to the ultimate design solution was an iterative non-linear dynamic analysis and design procedure to arrive at a structural design capable of meeting the seismic requirements of the project within the budget. The structural system ultimately selected is comprised of a steel moment frame with viscous dampers that act like shock absorbers. All building components are designed to meet rigorous non-structural seismic standards, allowing building equipment and systems to function after the maximum credible earthquake.

Upon selecting a system, the team then proceeded with an iterative evaluation procedure to model the structure using special three-dimensional non-linear dynamic response history analyses to verify the required performance of the structure. Seven suites of site-specific scenario ground motions were used to verify the required operational performance in accordance with ASCE-41 criteria. The team was then able to deliver a structural steel frame that was designed to resist the highest level of design seismic risk with the required high-performance objective. They were also able to provide blast resistance by employing SidePlate connections that ensure frame continuity and resistance to progressive collapse after a bomb attack.

The seismic/blast requirements for the building resulted in an elegant structure that presented a unique challenge for the mechanical, electrical, plumbing and fire protection routing. The complexity of the structure, coupled with the sheer volume of piping necessary to feed the buildings central plant and equipment, made building information modeling (BIM) an absolute necessity. BIM was implemented during the design phase to locate and design beam penetrations—a vital component to the mechanical design— that would meet the strict seismic/blast requirements of the project. During the construction phase, BIM ensured all the piping, duct and conduit would fit within the allotted space without the need to lower ceilings. Typically, a 14-ft, 6-in. floor-to-floor height would be more than adequate to fit equipment and piping. However, the size of structure substantially reduced the amount of available space. By working through clashes prior to construction, the team was able to avoid costly rework in the field and as a result, eliminated schedule delays.





Owner
Salt Lake City Corporation, Salt Lake City

Owner's Representative
MOCA Systems, Salt Lake City

Architects
GSBS Architects, Salt Lake City
MWL Architects, Phoenix

Structural Engineers
Dunn Associates, Salt Lake City
Holmes Culley, San Francisco

General Contractor
Okland Construction, Salt Lake City

Steel Team

Fabricator and Erector
SME Steel Contractors, Inc., West Jordan, Utah (AISC Member/AISC Certified Fabricator/Advanced Certified Steel Erector)

Detailer
SNC Engineering, Inc., Compton, Calif. (AISC Member)

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