



BYU Shear Wall, Rexburg, Idaho

The project consisted of a sixteen-inch thick precast concrete radiused shear wall nearly 96'-0" tall and over 400 linear feet long. In response to the high seismic location, the wall's initial design called for the use of cast-in-place. Using emulative design practices with wet joints for connections, the wall was converted to precast concrete. Because of the thickness of the panels, a voided precast panel system with prestressed super columns was used. The shear wall also served as an exterior wall and was clad with architectural precast panels reinforced with carbon fiber mesh.

Precasting the 23 single-piece columns and 300 panels accommodated factors that hindered cast-in place construction: the large number of openings, extreme winter weather conditions, and the installation of a large volume of concrete in those weather conditions. Construction of the precast system was completed in ten weeks, a savings of over seven months as compared to the cast-in-place schedule. The auditorium shear wall is the first wall of this magnitude and with this innovative design to be constructed in this region.

Project Facts:

Project Value: \$162,862,634
Market Segment: Higher Education
Building Type: Auditorium, gymnasium
Products Used: Precast panels, prestressed super columns, and architectural panels



Project Design Team:

Owner: Brigham Young University, Rexburg, ID
General Contractor: Okland Construction, Salt Lake City, UT
Architect of Record: FFKR Architects, Salt Lake City, UT
Engineer of Record: Tanner Smith Barfus & Associates, Centerville, UTU



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The walls were cast in a vertical battery mold to prevent movement of the voids and give form finish to both sides. Casting integral openings into the panels allowed for a single-unit design to reduce the number of pieces needed. Fewer walls decreased casting and crane time for a more efficient structure.



An extensive bracing system was designed to support the wall until the wet joints were completed and reached the required strength. Cables were used to restrain all in-plane forces on the wall during construction.



Once the columns were erected and braced, installation of the 16" thick precast voided wall system began. These unique wall pieces contained voids to reduce their weight, allowing larger pieces to be shipped and erected. For a scale of reference, the back wall was set at a 266'-3" radius.



The conversion from cast-in-place to precast saved both construction time and costs. The cast-in-place design may have required an onsite concrete plant due to the project location and the availability of concrete. Utilizing a precast solution, the owner saved what could have been a large expense for this plant mobilization.

