

Immersed in the grand beauty of the Rocky Mountains, this project combines mountain charm and luxurious living in a highly sought-after vacation destination. This project added five additional mixed-use structures to service the current residents and the ski base area.

Erected at a challenging mountain jobsite, the buildings had strict seismic design requirements and had to be delivered in tight time frames despite unpredictable winter weather. The designer chose a total-precast concrete solution using emulative design techniques to meet all of these challenges. The emulative design cut 24 months from the original cast-in-place construction timeline, while netting the owner extensive cost savings. The design also met all seismic requirements and allowed the architect to incorporate higher ceilings without making the building taller.

FAST-TRACK ERECTION

Extensive coordination among the design, engineering, general contractor, and precast concrete producer teams was necessary to meet the rigorous project requirements with minimal disruption to residents and visitors throughout the design, delivery, and construction of the buildings. The team also had to work out extremely complex framing geometry and shallow floor plates in the residential units to ensure stringent height requirements were met.

The project's precast concrete scope had 4613 premanufactured components, including retaining walls, hollow-core flat slabs, double tees, spandrels, uninsulated monolithic shear/shaft walls, columns, shallow beams, a short V-shaped wall, soffit beams, and bidirectional balcony slabs. In total, 16,900 yd³ of concrete were shipped in 1342 truckloads from Colorado Springs, Colo., to the ski resort, and erected over a 12-month period. The largest piece weighed 86,000 lb.

Precast concrete was used for 96 unique balcony elements, many with drastically different geometries. The balconies required bidirectional prestressing of many members, followed by post-tensioning of the cantilevered slab to resolve negative moments.

To meet the aggressive timeline, the project team facilitated a fast-track schedule over four seasons, battling extreme temperatures and several severe freeze/thaw cycles. The off-site production of precast concrete components limited the negative impact of weather on the construction cycle.

The end result of the project is a beautiful and durable solution that meets extreme seismic activity requirements. Additionally, all the structures met or exceeded International Energy Conservation Code guidelines, ensuring the community and its residents will be able to meet stringent energy-efficiency requirements. ●

PROJECT TEAM:

OWNER: Yellowstone Club, Big Sky, Mont.

PCI-CERTIFIED PRECAST CONCRETE PRODUCER: Stresscon Corp., Colorado Springs, Colo.

PRECAST CONCRETE SPECIALTY ENGINEER: FDG, Arvada, Colo.

ARCHITECT: Hart Howerton, San Francisco, Calif.

ENGINEER OF RECORD: Nishkian Menninger, San Francisco, Calif.

GENERAL CONTRACTOR: G.E. Johnson Construction Company, Colorado Springs, Colo.

PCI-CERTIFIED ERECTOR: EnCon Field Services, Denver, Colo.

PROJECT COST: \$312 million

PROJECT SIZE: 485,716 ft²



Mixed-Use Building

YELLOWSTONE CLUB

BIG SKY, MONTANA

KEY PROJECT ATTRIBUTES

- Emulative design shortened the original cast-in-place construction timeline by 24 months.
- Almost 17,000 yd³ of concrete were shipped in 1342 truckloads from Colorado Springs, Colo., to Big Sky, Mon.
- All structures met or exceeded International Energy Conservation Code guidelines.

PROJECT AND PRECAST CONCRETE SCOPE

- Build five total-precast concrete mountain-side buildings.
- The project included 4565 precast concrete components.
- The project was completed in just 12 months.

Photo: Stresscon Corp.