

Category:06-Best Building Project-Specialty Contractor (\$6-10M)

Subcontractor: Stresscon

Project Name: CSU Stadium

Builders of Colorado State University's dramatic new, on campus stadium capitalized on precast concrete stadium components to rapidly complete the structure within an extremely aggressive building schedule.

Targeted for LEED Gold certification, the \$220.1 million facility has a capacity of 41,200 people, including 10,000 designated student seats, 148 outdoor club seats, 879 indoor club seats, 22 luxury suites each seating 16 people, and 43 loge boxes each seating 4 to 6 people. A 360-degree concourse around the stadium and large open patio space provide unobstructed views of the playing field. A plaza on one side of the building provides landscaped space for year-round events.

The project includes an 82,000 ft² academics/advising and alumni center, a seven-level structure for the University's football operations, luxury boxes, a hall of fame and the press box. Amenities consist of an 11,600 ft² Stadium Club, 112 concession stands, a 1,200-person hospitality area, training room, expanded tailgating options, a 50-ft by 84-ft high-definition video scoreboard and sound system, and high-quality WI-FI. The stadium is ADA compatible with premium seating ADA options and access. There is 78,000 ft² of covered concourse space.

Horizontal bands of precast fascia panels, glass, metal and Colorado sandstone help blend the stadium into the surrounding campus architecture.

A pressing concern of the university was to have the new stadium ready for the opening day of football in August, 2017. The incentive for accelerating construction was significant: a \$1 million penalty for every game that the football team could not play in the new stadium in the 2017 season. Under a Construction Manager at Risk delivery method, the project broke ground in September 2015. With a 20-month construction schedule, the project has remained on budget and on time.

The stadium design team proposed two alternate riser systems: precast/prestressed concrete riser units and sandwich plate metal slab terraces and risers.

To encourage the use of the precast system, the PCI Mountain States Region (PCIMS) sent a lengthy letter to the CSU President and to the stadium design team. The letter suggested that the design team consider life cycle costs vs. first cost for each system and estimated that the SPS metal riser system would have a cumulative maintenance cost of \$1,750,000 more than the precast system. It was also noted that precast concrete risers in outdoor stadium applications have been used for decades with typical life spans of 50-75+ years, are inherently fire resistive, feature vibration and acoustic characteristics, and would be produced and serviced locally.

Thanks to these life cycle cost advantages, safety benefits, quality characteristics and long-term durability the precast stadium solution was selected.

The stadium team used precast for a two-fold advantage: known for its durability and ‘plastic’ nature it can take nearly any form with the proper steel reinforcement, and it also advances the speed of construction since the precast can be manufactured off site in controlled conditions prior to construction and then trailered to the site for immediate assembly.

The new stadium’s lower bowl includes precast rakers, treads and risers on cast-in-place columns. The fascia or spandrel panels around the stadium are also precast. The upper bowl consists of precast treads and risers on structural steel framing. The tower element in the west stands is composed of structural steel.

Field walls on the structure’s west side are precast. On the south side, the lower bay of the bowl is actually on grade and utilizes cast-in-place walls. Above these are precast walls. The playing field sits six feet below street level.

The stadium has a radial grid, so every bay is slightly different from the one adjacent to it. This required extensive production planning by the precaster. In addition, Stresscon helped in doing pre-pours on the cast-in-place lower bowl section to ensure proper locations for embeds and ledges. Careful coordination was also required on the upper bowl between precast and structural steel.

Stresscon started manufacturing precast components in two plants in January 2016, averaging nine pieces a day. Working ten hours a day, six days a week and utilizing two cranes, erection took less than five months and completed two weeks early. 4D modeling and an elaborate system of mock-

ups was used by the building team to assist construction. It's believed that the CSU facility qualifies as the fastest built college stadium in the country.









