

## Category 5

### **Project Name: Broomfield Community and Recreation Center**

The city and county of Broomfield, Colorado, epitomizes a true sense of community - unifying its residents, guests, and visitors. For the suburb of Denver, having one centralized building to connect its diverse population was an essential goal for a new community center. A complex, multi-phased demolition and full rebuild of what was an aging and deteriorating recreation and senior center was critical to providing an expansive, updated facility. The owner's goal was to create a landmark that would connect not only the physical building to its existing city campus, but that was inclusive and welcoming to all generations in the community.

A design build solution incorporating precast concrete was selected for the Recreation Center half of the facility. The Recreation Center required a building material that provided durability, flexibility, efficiency, safety, and a façade to blend with the city and county's color and material pallet. Precast concrete was identified as the ideal and most efficient solution. Acknowledging the wide variety of amenities this center would make available; intense planning, maximized coordination and over-the-top attention to detail were essential to build a 60,000 square foot building with an accelerated construction schedule.

It goes without saying that precast concrete thrives in challenging situations. Initially, the concept was to build with load bearing masonry and steel for the structure's entirety. When a design partner reaches out, knowing with full confidence that precast can provide the required and oftentimes superior solution, it is always a conversation worth having. This was how and why precast was introduced to this project. When the owner and design team began to delve into the specific details and project goals, construction logistics and schedule - something faster, more efficient, and simply put, something better was needed. Enter precast concrete. The ultra-durable and quickly erected system was a perfect choice to cope with Colorado's extreme and uncertain winter season – compressing the project schedule, providing cost savings, and managing the tight jobsite access.

Essential to complementing the county's color pallet, the team created custom architectural mixes. The exterior of the natatorium and fitness center includes a Reckli - Columbia, wave-like form liner that hints at the interior aquatic space's use. Another goal was to drive indirect

sunlight into and through the warm pool and a sawtooth façade on the north elevation was the perfect feature. A custom, ribbed liner was used as an accent at the main entry and around the natatorium that picked-up the masonry detailing on the adjacent senior center. To ensure color consistency on the façade, acid etching was used on all of the architectural, precast concrete.

The vision was an open, true community and welcoming character, with great long span volumes for the community to gather. Unique to this structure, our team produced five different depths of double tee's, ranging from 40'-0" to 109'-0" in length, utilized as roofing and flooring. A well thought out and engineered solution allowed for a composition of varying roof heights from the natatorium to fitness center to gymnasium which developed into the quickest, safest, and most efficient result.

Above all, timing was everything. It is estimated that the decision to select a total precast solution reduced the overall project schedule by approximately two months – including unknown factors, Mother Nature being at the forefront, precast saved an additional month during the installation process.

The accelerated schedule precast could offer was impressive to say the least. A schedule can make and break a project, and, for this project, it was no different.

Utilizing a total precast solution allowed for key challenges to be minimized from the start, including unknown weather delays. With erection taking place in the brunt of Colorado's extreme winter, the team prepared accordingly. Although, no one would anticipate the unprecedented historic Bomb Cyclone and vicious winds, the team successfully managed weather impacts with thoughtful site management and logistics. Even with the harsh winter, the offsite precast concrete production enabled the schedule to stay on track. The owner stated it best, "In our world of increasing extreme weather events, precast concrete will always give your project a predictable outcome."

Scheduling the delivery of product took detailed planning to adhere with the city's guidelines and, due to the massive spans of the double tees, well mapped out delivery route and rapid installation provided the perfect recipe for success. To ensure the 109'-0" long double tees safely made it to the jobsite, as well as minimizing the impact to the neighborhood and surrounding community, the team coordinated off-hour delivery times and utilized stretch trailers.

Every successful project comes with its share of challenges, but ultimately, it's how a team faces adversity and comes together to create something truly special. From Colorado's extreme winters, strict city requirements to limited site access, precast weathered the storm and came out on top.

The state encompasses vast amounts of protected wetlands, and it is essential to protect these resources. With north project site limits just ten feet away from protected wetlands, it was an ongoing challenge. With diligent project team planning and communication, these areas were preserved and protected. Additionally, the Recreation Center's construction was required to limit disruption to the adjacent existing Senior Center as the facility continued its operations. The noise reduction and minimized air pollution compared to load bearing masonry construction was an additional benefit to the community. With coordination, a smooth installation was executed, avoiding all project boundaries, causing minimal impacts to the community as a whole.

While one known challenge was averted, a new one arose – the unpredictability of Colorado's winter weather played a starring role during the precast structural and façade erection. A trifecta of wind, below freezing temperatures and accumulating snow, and the 2019 Bomb Cyclone inevitably caused havoc. Ninety miles per hour winds and heightened safety concerns caused a three-day project halt. However, precast is produced off site, production continued in the plant which allowed for advanced planning and preparation for rapid product delivery to the site when the storm had passed. Once conditions were deemed safe, building components arrived just-in-time, playing an important role in allowing the project to quickly get back on track and eliminated additional schedule delays and other on-site conflicts.

Another challenge was the city and counties requirement to conceal exposed wiring – embedding all electrical, IT, and fire alarm conduits within the insulated precast walls. Each assembly was carefully placed within the precast bed prior to each pour, resulting in a clear and utility free appearance of the finished product.

To confidently provide a predictable building solution in which overall schedules are reduced and cost savings are recognized was an achievement.

Not only was precast concrete utilized to construct the core and shell of the building it also contributed to the mitigation of the site's highly expansive soils at the locker rooms. Excavation

of an additional 6 feet created a crawl space topped with 40” deep precast concrete double tee flooring. The heated area allowed for suspended, sloping plumbing, which let the soil naturally expand and not impact utilities. Precast eliminated the complex option of direct burying utilities, which prevents future disruption and protects the hanging piping, while providing convenient access for maintenance and repairs.

To design and build an energy efficient structure that exceeded ASHRAE 90.1 and International Energy Conservation Code requirements, insulated wall panels were used that had an R-Value of 17.4. Precast insulated wall panels do not contain voids or cavities where moisture can collect, in the inherently high humidity natatorium spaces, mold and mildew growth are not a concern. The insulated wall panels were reinforced with a carbon fiber grid system called C-GRID®. This allowed for thinner sections and reduced the weight of the enclosure system and foundation sizing while significantly improving the insulation value of the walls.

The structure also required an indoor running track. The high volume created by the long-span precast double tees and insulated walls in the multi-use gymnasium provided an additional benefit – this allowed integration of a Level 2, cantilevered, three-lane running track off the walls. The design and planning resulted in an energy efficient, low sound transmission, safe useful Recreation Center.

Designed to deliver comfort in all of the different spaces, insulated wall panels eliminated cold spots and provided a healthy and comfortable environment. The energy efficiency of precast concrete wall panels reduced energy usage and delivered superior insulation values for enhanced thermal efficiency.

The attention to detail, transparent communication and a highly knowledgeable project team is what drove overall success. Problem solving was key every step of the way from the ground up and the elaborate Community and Recreation Center speaks to that.

Broomfield’s new state of the art facility is more than just a place to congregate; it provides a safe and welcoming atmosphere to all residents, guests, and visitors. The goal of this project was more than to build a beautiful facility, it was to provide the most efficient, durable, and safe solution with a highly qualified team of experts – and precast was proud to be a part of the journey!







