
Category: 9 – Best Building Project – GC (\$10M - \$40M)

Contractor: Swinerton Builders

Project Name: Denver Public Schools East Quad Campus

A School to Change Lives

Denver Public Schools (DPS) is the largest school district in Colorado, educating 91,000 students in 2015. Since the opening of Denver International Airport 20 years ago, much of the city's affordable housing growth has occurred in the area near the airport, with an additional 10,000 housing units expected to be constructed in coming years. According to DPS planning staff, these homes are projected to produce more than 8,000 students over the coming years. This population surge has created a reverse "Field of Dreams" situation where the families have come; now DPS must build schools to serve them, including the East Quad Campus (EQC).

With its inherent efficiencies, design-build stood alone as the most favorable option to meet EQC's strict opening date. ***DPS selected Swinerton Builders to lead an exceptional team to complete campus master planning, programming, design and construction in approximately 18 months, with design and construction overlapping for three of those months in a fast-track delivery mode.***

Phase I of EQC is home to 500 high school students who attend either KIPP or STRIVE, two renowned college-prep charter schools. The master plan developed by Swinerton design partner Eidos Architects is flexible in that, with minor modifications, the facility can triple in size to accommodate a 1,600-student high school. The current 71,166 SF building contains two 2-story classroom wings with small-group areas, connected to a competition-size gymnasium, cafeteria, athletic fields, and support facilities. With the area surrounding EQC built out to only 40% capacity, combined with Denver's economic and population growth, expansion needs came quickly so DPS contracted with the design-build team for Phase 2 - just as Phase I finished. Phase 2 is underway and will add 75,000 SF to the campus.

Entitlement Issues Threaten Progress

For DPS to build EQC, the District orchestrated a 16-acre land swap with the State Land Board and single-family housing developer Oakwood Homes. This land provides roads and utility infrastructure supporting the campus and planned residential development. DPS assigned Swinerton these off-site improvements as part of this contract.

Initially, Swinerton scheduled off-site roadwork to begin in December 2014 and finish in spring of 2015. With this duration, one superintendent could manage the off-site roadwork, on-site earthwork and foundations simultaneously. *However, the off-site work schedule slipped due to entitlement delays and extended City plan review times.*

To mitigate this delay, Swinerton added a superintendent to focus on the critical path off-site civil work to achieve a substantial completion by October 1, 2015. This superintendent *formulated a recovery schedule which included 6-day work weeks and creative shift work for connecting to an existing sanitary sewer located under a four-lane semi-truck thoroughfare.* Ultimately, Swinerton placed nearly one mile of roads and utilities ahead of schedule, in late September 2015. Entitlement delays impacted building construction also, and to alleviate this risk, Swinerton hired the Oakwood Homes excavating subcontractor to complete overlot grading of the DPS site since the subcontractor was already performing hundreds of acres of sitework on adjoining Oakwood property. *This move reduced the time required to begin building foundations by four weeks.*

Design-Build Forges Teamwork

Due to the fast-track schedule, the design-build team did not have the luxury of typical design time, a challenge the team overcame by working collectively to achieve project goals. The process focused on how to maintain the District's budget and provide the most value for each dollar spent. For example, teaming with a steel fabricator early in design allowed detailing work to parallel structural design progress. *This approach facilitated procurement and fabrication of 313 tons of structural steel to maintain the schedule.*

The collaborative nature of design-build, combined with the vast majority of team members having DPS experience, increased our ability to evaluate potential savings holistically, particularly for the structure and MEP systems.

An initial design called for the school to be located throughout separate structures to introduce a multi-building college campus atmosphere to students. This idea became cost prohibitive due to Denver Water's requirement to pay separate tap fees for each building as well as extra costs for additional building systems in a multi-building environment. The team changed the design so that the one building has a "main street" corridor which gives the impression of moving between different buildings while under one roof. ***This design saved approximately \$500,000 in tap fees alone and enhances campus security with one main point of entry and increased visibility across the campus.***

Built for Speed

Every system consideration focused on providing value to DPS under the umbrella of meeting the compressed schedule. ***During the proposal stage, the team determined that a dual track of building systems - structural steel and CMU - provided the best value for the timeframe by reducing construction by two months.*** The two educational wings, totaling 45,625 SF, are constructed of structural steel while the gymnasium and cafeteria areas are built of CMU. This approach enabled crews to work on different building structures concurrently to meet the schedule.

The MEP, structural steel and architectural disciplines used 3D BIM modeling from the start of design. Weekly meetings updated the model and identified existing design clashes. ***Because extensive BIM coordination took place during design, field activities encountered few clashes.*** Equipment prefabrication by the MEP design-build subcontractors helped reduce the project schedule by approximately 20% by eliminating most field coordination issues. The BIM model improved understanding and communication in owner and subcontractor meetings by illustrating upcoming scopes of work and schedule items, and known issues.

“I have been incredibly impressed with the collaboration and the product delivered by the Swinerton team, especially with the tight timeframe they were already under. But Swinerton knew what was at stake, and they made it happen.”

Grant Erwin, Principal, KIPP Montbello Collegiate High School

Built for Safety

This project sustained zero lost-time incidents during more than 82,000 man-hours. Fall protection considerations for structural steel and CMU installation remained in focus due to the accelerated work pace to meet schedule, combined with these trades performed in elevated work zones. Swinerton conducted 500 safety orientations, 264 pre-task planning sessions and 52 safety audits.

Even though the 18-acre site provided plenty of room for a safe, tidy and organized site, it is adjacent to an active E-12 school campus and accessed easily by crossing a dry creek bed which runs between the two sites. This proximity to an operating school campus warranted extra safety precautions to ensure the safety of their students, teachers, visitors and staff. We strictly enforced DPS’s policy for no unauthorized contact between construction workers and students.

While construction safety remained paramount, the design-build team also took into consideration the safety of building users once occupied. Triple pane windows line corridors, supplying natural lighting and the impression that one is outside when going from one place to the other – an outcome of the “main street” corridor design. ***The windows also enhance school safety operations with clear lines of visibility for teachers, campus supervisors and security.*** The 108 triple pane windows make for a more comfortable environment by providing a higher energy efficiency rating while saving the district approximately \$18,000 per year in energy costs. Sun shades, strategic switching of light fixtures and motorized shades maximize daylight harvesting and help control heat gain.

“This school is a life changer for me, my classmates and the community.” EQC student

Dedicated as Regis F. Groff Campus in honor of the school teacher, politician, and the second African-American elected to the Colorado State Senate, ***EQC houses two charter high schools within a 21st Century Learning Environment that prepare students for sustainable futures.*** STRIVE and KIPP have a strong following of families wanting a decidedly college-preparation focused educational environment for their children. Both schools sought facilities in the neighborhood to continue to educate middle school students advancing on to high school. Providing value beyond building, Swinerton contributed to the Groff Family Foundation to help fund scholarships for STRIVE AND KIPP students.

While the District did not establish specific goals for disadvantaged firm participation, inclusivity was a major consideration for award. Swinerton proposed to DPS with seven diverse firms (S/M/DBE) on our team because we believed in their skills for this type of work; our firms’ existing relationships on previous education and design-build projects only bolstered teaming efforts. ***During construction, Swinerton exceeded its internal goal of 34% subcontractor participation by disadvantaged firms.***

Like many urban school districts, DPS struggles with gang problems. For this reason, extreme sensitivity went into selecting the colors highlighted throughout the school. Orange provides a pop of color and increases feelings of happiness when contrasted with neutral grays. Green is the easiest color on human eyes and creates a sense of security and inspiration. Teal opens communication and fosters emotional balance.

As the class of 2019 entered EQC’s hallways for the first time in January, excitement lingered in the air as students and teachers experienced hallways decorated with inspirational quotes. As they found their way to new classrooms, they received a glimpse into their futures courtesy of a 21st Century Learning Environment – ***a safe place full of community pride, delivered on time and under budget due to design-build principles.*** DPS pledged 21st Century schools to their families, and with Swinerton’s help, DPS has delivered on that promise.



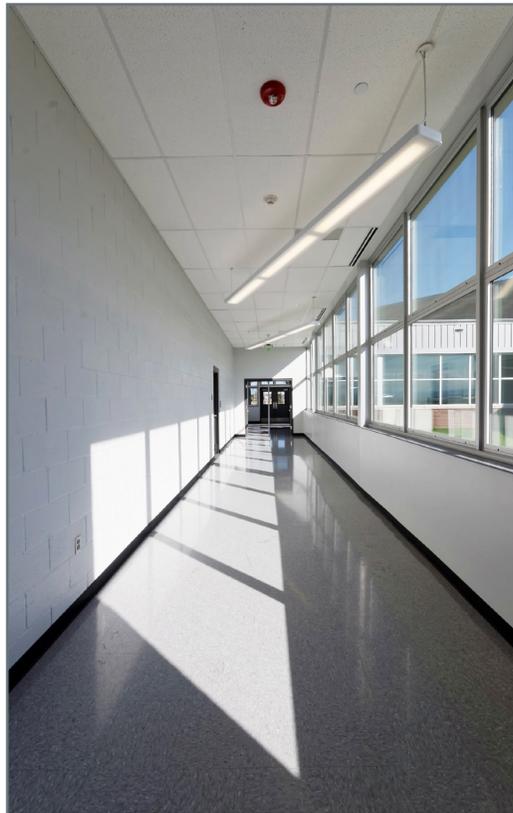
The new East Quad Campus provides high schools for both KIPP and STRIVE charter schools and is located west of Denver International Airport in one of Denver's fastest growing areas for affordable housing. The design reflects a 21st Century Learning Environment for 500 students.



The slow entitlement process for a 16-acre land swap threatened the schedule. Swinerton built the project using phased bid packages to give the architect the most time to design and used Building Information Modeling to detect and resolve constructability issues.



By using two different building types for building areas - structure steel and CMU - construction crews were able to work simultaneously on separate areas of the building to help enhance the already-tight project schedule.



The classroom environment reflects the workplace these students will likely face in the next decade. Extensive use of windows floods hallways with natural light and allows school employees and security to monitor students for safety.



Color selection was a major consideration for this project to lessen the impact of gang influence. The use of orange, teal and green were deliberate to foster an environment of learning, respect, community and safety.