

Cornerstone Park High School Narrative

Our team began developing the Cornerstone Park High School design in November 2025. As we learned new aspects of the construction process during our ACE mentorship sessions, we directly applied what we learned about site selection and analysis, architectural design, structural engineering, MEP systems, sustainability strategies, and construction estimating and scheduling to our project. Working through these topics sequentially worked very well to give us a high-level view of what an actual construction project would look like from start to finish. Our result is a two-story, sustainably and efficiently designed 50,000 square foot high school in the heart of downtown Raleigh.

We chose the new construction project on 116 West Jones Street in Raleigh, an undeveloped lot within walking distance of the state Capitol and the Museum of Natural Sciences. The school's name, Cornerstone Park, is a reference to the building's location in the historic Capitol district of North Carolina and the critical role a school serves in the community. Although a downtown site means higher land costs and no existing structure to build from, it provided us with complete design freedom to integrate our sustainability goals from the start. This process allows for long-term simplicity in contrast to retrofitting sustainable structures around existing constraints. Given the school's prime location, Cornerstone Park students will benefit from having access to historical, government, and science-based sites all around them, not just in the classroom.

The building is oriented in an L-shape, with the classroom wing facing south, which provides natural light throughout the day. The L-shape also creates a shaded interior courtyard in the northwest area of the lot and serves as an outdoor classroom, amphitheater, and gathering space for students to spend time with nature while still productively learning.

The exterior is full brick and similar to the architecture of the Capitol district. The steel internal framework allows for large open spaces in the gym, auditorium, and cafeteria. These structural decisions evolved from the introduction to structural engineering session, where we learned how material selection affects span requirements, load paths, and cost.

During the session on sustainability, we learned that the most effective environmental decisions are made early enough to shape the entire structure. We aimed for LEED Gold certification with a planned path to net-zero in Phase 2. A geothermal HVAC system uses constant subsurface temperature to reduce heating and cooling loads compared to conventional systems, and can reduce energy costs by 70-80%. A green roof improves energy efficiency, manages stormwater, and reduces the urban heat island effect by reducing roof surface temperatures. A 40,000-gallon below-grade cistern collects rainwater and supports toilet flushing and irrigation, significantly reducing potable water consumption. Classroom shading fins and light sensors

automatically dim LED fixtures and reduce energy use, while infrared sensors in classrooms allow the ventilation system to only run when rooms are occupied.

The session on MEP engineering gave us a framework to approach building systems as a coordinated network. Electrical service and fiber internet enter the building from Jones Street to the north. Sanitary sewer and potable water connect at McDowell Street to the east. Stormwater drains into the cistern while overflow routes to the municipal storm drain at the curb. Tracing how each utility enters and exits the building and thinking through these connections as an integrated system was one of the most useful exercises of the project, despite mentors showing only the overarching techniques without touching on many intricacies.

We developed the schedule and budget using an estimating and scheduling template originally designed for a more complex project. We worked through each phase and item before scaling the estimates to match our scope. The final schedule occurs over 32 months, with 17 months for design, permitting, and procurement, and 15 months for construction and commissioning. The total budget is \$31,146,000 (~\$623 per square foot based on 2026 Raleigh market rates).

Every major space in the building is designed to serve more than one purpose. The auditorium acts as a lecture space and testing center. The cafeteria has movable furniture and a flexible partition so it can function as both a collaborative space and a dining hall. Designing for flexibility and multiple uses was a recurring theme in our ACE sessions, and it shaped how we envisioned every room in the building.

Cornerstone Park High School taught us that every decision in a construction project connects to the next. The common saying “location is everything” reflects this truth. The site drove the building structure. The building structure enabled the sustainability systems. The sustainability systems shaped the budget. Working through each discipline in sequence, from civil analysis to cost estimating, gave us a strong foundational understanding of how real projects are built and why the decisions made earliest carry the most weight. The building we arrived at is designed to perform efficiently, serve its community, and grow into a net-zero operation over time. Because of the design decisions we decided upon, teachers and administrators will be able to adopt a unique curriculum well-suited for the students.