



Government Facilities

Client

Colorado Army National Guard (COArNG)

Location

Buckley AFB, CO, USA

"The modeling software was an excellent tool in defining and refining all aspects of this aviation project to our leadership, our aviators, our facilities, and our maintenance staff."

*Mr. Bob Datson, Architect
Department of Military and
Veterans Affairs*


Building Information Modeling (BIM) for Army Aviation Support Facility

The Army Aviation Support Facility (AASF) will represent the newest addition to an Army National Guard campus at Buckley Air Force Base in Colorado. It is being constructed adjacent to the existing AASF and Armory and includes site and airfield upgrades that will impact all three buildings. Though the existing AASF building will remain onsite, the operation and maintenance functions will be transferred to the new facility. CH2M HILL performed the design and provided construction support services through November 2006.

The new AASF includes a 115,000-square-foot primary maintenance and operations facility (a 65,000-square-foot hangar for Chinook and Blackhawk helicopters, 25,000 square feet of shop/storage space, and 25,000 square feet for administration and flight operations). Also included are two unheated storage facilities, a 65,000-square-yard aircraft parking apron, and an extended access road with public parking and an historic aircraft display area.

When the COArNG awarded this design task in September 2003, they required a completed 35 percent design by year-end to meet funding deadlines. To meet this goal, CH2M HILL completed the 10 percent Concept Design in just 2 months—from mid-September to mid-November. During this time, key discipline leads visited five similar Aviation Support Facilities; Boise, Idaho; Salt Lake City, Utah; Rapid City, South Dakota; Helena, Montana; and Pendleton, Oregon, to research their operations. The team observed work process flows at each facility and engaged the users to discuss which design features improved maintenance utility and user ergonomics. This information was shared during the project team chartering session and design charettes. A detailed project plan was prepared and executed to meet the aggressive delivery of the preliminary design. The detailed Concept Design facilitated the completion of the 35 percent design package by year end 2003, in less than 3 months. Also, project estimators reviewed the initial government budget and provided the needed information to obtain a congressional add for additional funding raising the project cost from \$25.9M to \$31.4M.

The design team provided added value by using an integrated and interoperable building information model (BIM). Use of this model improved coordination during design among building disciplines, increased design understanding through 3D visualizations and walk-throughs, and allowed increased opportunities to explore options while using advanced calculations and computations. This modeling effort also included experimentation with structural analysis software that tied the structural engineering to the model production. Determining the best options for structural, lighting, and HVAC design required significant evaluation, and a BIM offered the best method of accurately examining the most options without exceeding the budget. All building modeling activities were conducted using a set of fully interoperable tools, delivering the most value to the client, contractor, and project team.



Key Project Elements

The new facility includes flight operations, administrative, and support space for the more than 55 full-time and 400 National Guard unit personnel and a high bay maintenance hangar to simultaneously accommodate four CH-47 Chinook and six UH-60 Blackhawk aircraft. Allied shops and avionics, production, maintenance, and quality control functions, along with equipment, parts, maintenance, and storage rooms, are located adjacent to the hangar bay.

The aircraft parking apron is large enough to accommodate the entire based fleet and includes rigid paving, tie down pads, ground support equipment storage, hover lanes, aircraft wash facilities, exterior lighting, fire protection, and security fencing. The building's land-side is landscaped with integrated anti-terrorist force protection elements directing pedestrians to a prominent entrance area.

Administrative areas, including space for pilots, instructors, flight operations, flight engineers, and other administrative and support functions are located within the primary facility. Aviation Life Support Equipment administration and support is located adjacent to the administrative area outside of the hangar floor. The primary facility also includes locker rooms, break and assembly space, fitness facilities, toilets, showers, and mechanical/electrical/telecom space.

The building, which was completed in less than 550 days, is expected to be a high-performance, low-cost, and environmentally sustainable building, with a project goal of achieving a LEED®-certified Silver rating.