

## PROJECT PROFILE

F-22 Squadron Operations Facility & 6-Bay Aircraft Hangar

F-22 Weapons Loading Crew Training Hangar

Anchorage, Alaska

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Architect:  
Faulkenberry Architects

Repair Contractor:  
QuakeWrap

Structural Engineer:  
Schneider Structural Engineers

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F-22 SQUADRON OPERATIONS FACILITY & 6-BAY AIRCRAFT HANGAR



F-22 WEAPONS LOADING CREW TRAINING HANGAR

“Schneider Structural Engineers is a critical member of our Davis team. They bring energy and innovation to structural engineering.” — Josh Pepperd, Davis Constructors & Engineers, Inc.

These two F-22 squadron support facilities are the first on Elmendorf Air Force Base to be designed with the latest in seismic resisting technology — the buckling-restrained braced-frame (BRBF) system. BRBF consists of manufactured diagonal bracing members installed in conventional structural steel frames. This system provides a greater level of reliability and function in a major seismic event and offers greater economy and flexibility of design than conventional steel bracing systems.

The squadron operations facility is a 42,400-square-foot, three-story steel structure with offices, lockers, briefing/assembly areas and specialty spaces for training and weapons storage. This portion of the structure required progressive collapse analysis. Adjoining the squadron operations facility, the column-free 37,700-square-foot, 6-bay aircraft hangar will house six F-22 fighter jets and is equipped with overhead crane and fall protection systems. The 18,200-square-foot, single-story weapons loading hangar will be used for hands-on training of crews to load munitions on the F-22.

The combined cost of these fast-track design/build projects is \$50.1 million.

### SEISMIC TECHNOLOGY PROTECTS F-22 JETS

- Alaska frequently has strong earthquakes, including the largest ever recorded in North America in 1964. Protecting a fleet of F-22 fighter jets and the airmen who maintain them is essential. Our engineers recommended buckling-restrained braced-frame (BRBF) technology, a system that exceeds seismic code performance requirements through increased ductility (energy absorption) over conventional systems.



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Facility &  
6-Bay Aircraft  
Hangar

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Loading Crew  
Training Hangar

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- The BRBF system proved to be cost effective for both projects — allowing our engineers to reduce the number of bracing elements and to design the frames with smaller members than with traditional systems. Material savings were achieved in the frame columns, beams and foundations. Fewer bracing connections and smaller gusset plates resulted in less material and field labor, especially welding.
- In Alaska, winters are long and construction seasons are limited. Our engineers submitted accurate fast-track structural plans that were nearly complete early in the design process. This enabled the contractor to procure the structural steel and start on the foundations while the architects were still developing the design. For example, for the weapons loading hangar, the design schedule required structural plans be completed and submitted just 25 days after the Notice to Proceed, and our engineers were able to deliver.
- Our engineers used three-dimensional engineering analysis software, which assisted the contractor in expediting material order and delivery. Because the structural steel was to be fabricated in the lower 48 states, then barged to Anchorage, it was essential for our engineers to accurately design the steel very early in the process, so the contractor could procure the steel package before the structural design was complete.
- For the weapons loading hangar, our drafting staff used building information modeling (BIM) software to produce the structural construction drawings and to coordinate the design with the other disciplines. By developing a three-dimensional model in collaboration with the architects, we were able to identify and resolve conflicts in real time, resulting in fewer design modifications during construction.
- Fast-track design/build projects require intense collaboration. Our senior staff communicated daily with the design team and contractor to manage the projects and assure the information flow necessary to maintain the fast-paced schedules.
- This team of architects, contractors and structural engineers is pre-qualified through the Multi-Award Task Order Contract (MATOC).

*“The Schneider Structural Engineers team consistently provides the highest quality service and finished design solution. We look forward to every chance to work with them.”*

*— Josh Pepperd, Davis Constructors & Engineers, Inc.*