

INFRASTRUCTURE CATEGORY WINNER

DAVIS BARRACKS CHILLER PLANT WALL

Thorcon Shotcrete and Shoring - Shotcrete Contractor

DAVIS BARRACKS CHILLER PLANT WALL - WEST POINT, NY

In 2015 the U.S. Army Corps of Engineering began construction on the Davis barracks at West Point. The \$172,000,000 barracks is a state-of-the-art facility and built to house 650 cadets. The building encompasses nearly of 300,000 square feet.

The barracks is located on the side of a mountain, immediately below the cadet chapel - a famous landmark. The site for the barracks posed numerous challenges which included the removal of 285,000 tons of granite for the building foundations. Between 2015 and 2017 during the construction over 60 feet of granite from the mountain side was removed. The wall behind the barracks was exposed to a combination of sun, along with freezing and thawing that made the rock weathered and brittle. This created the need for an engineered solution that would prevent environmental damage and increase stability for this immense wall face. An elaborate sculpted shotcrete system was the answer.

Shotcrete placement was the primary component for the Davis Barracks Chiller Plant Wall. Sculpted shotcrete was selected by the designers to stabilize and manage environmental deterioration of the newly blasted wall face directly next to the newly constructed Davis Barracks while aesthetically looking like a natural rock face. Shotcrete was the optimal choice with the high aesthetic requirements and challenging site conditions. Shotcrete could efficiently achieve the appearance of natural rock despite the irregular wall face, wall heights up to 120 ft and with an overall 700 ft length. Additionally, there was limited access between wall face and barracks buildings with a little as 40 ft in some areas. These requirements and site characteristics made sculpted shotcrete the only viable solution.

Drains were placed on the rock face to drain the seasonal groundwater that would seep through the rock. Rock bolts were used to help tie the new shotcrete wall to the existing rock. The shotcrete placement required careful attention to surface preparation, reinforcement placement and then shooting to get adequate thickness for the wall. Multiple manlifts were used by various members of the crew for ready access to the tall rock faces. Once placed the shotcrete artisans carved and colored the shotcrete surface. They carved in all the nooks and crannies to make the shotcrete look like a natural rock face with varying colors and faults. Using quality, high strength, durable shotcrete solved the problem of a deteriorating in situ rock, controlled moisture coming through the rock, and yielded a final appearance that meet or exceeded to look of the original rock.

