



Transportation Aviation

Client

US Army Corps of Engineers
Los Angeles District

95th Air Base Wing
Air Force Material Command

Location

Edwards AFB, California, USA

Main Base Runway Replacement, Edwards AFB

The purpose for the Main Base Runway Replacement project is to reconstruct the Main Runway pavements that were constructed in 1952. As these pavements are more than 50 years old, they have reached the end of their serviceable life.

CH2M HILL provided the complete design for both runways and all associated airfield work, and is also the managing partner in the construction joint venture.

To reconstruct the main base runway, the CH2M HILL team constructed a Temporary Runway, located 2,500 feet north of the Main Runway. The Temporary Runway is 12,000 feet long and 200 feet wide. The pavements on the Temporary Runway are designed for a 2 year design life, as this runway will be abandoned after the Main Runway replacement is completed.

Using the Pavement-Transportation Computer Assisted Structural Engineering software program (PCASE) enabled us to optimize the pavement design section by replacing sub-base with locally available aggregates to increase the base course thickness and meet strength and longevity requirements. This design innovation simplified construction by eliminating the need for one supplier/ subcontractor and the additional task of placing a different subgrade material when building the runway. Our design concept matched the existing runway shoulder elevations as nearly as possible and maintained a relatively constant pavement cross slope. The new profile and cross section was optimized for operational requirements of the aircraft using the runway and economical use of materials needed for the construction along with sound constructibility. As the existing lights on the main runway were located within the affected 5 foot area, they were removed and new base cans, transformers, conduit, and cables were installed in the same locations. The existing light fixtures were removed, stored, and reused after the new system is installed. The existing Glide Slope and Localizer remained operational during the reconstruction of the Main Base Runway. Precision-approach path indicator light housing assemblies were installed on the east end of the temporary runway along with runway end identifier lights.

The temporary runway paving lanes are 33.33 feet wide, providing three paving lanes on each side of the centerline for the 200-foot total width. A longitudinal doweled construction joint was installed at the edge of each paving lane and a dummy contraction joint was sawed longitudinally in the centre of each paving lane at a spacing of 16.67 feet. The transverse joints are dummy contraction joints and saw cut at 18-foot spacings to produce a slab 16.67 feet by 18.00 feet. The BAK-12 (barrier arresting kit) from each end of the existing Main Base Runway was relocated to the temporary runway to provide full operation capabilities during Main Base Runway reconstruction. Underdrain trenches placed along the edge of the full-strength runway pavement will collect subsurface drainage from both the full-strength runway pavement and the asphalt shoulders. The concrete flexural strength used for the pavement design analysis is 700 pounds per square inch at 90 days from placement.