RIVER TRAINING
Product: Gabions, Gabion Mattresses, Wire Enclosed Riprap and Geotextile

Problem
Due to a massive wildfire in 2011 called the Las Conchas Fire 156,000 total acres were burned in the Jemez Mountains including 16,587 acres of the Santa Clara Pueblos watershed area above the dwellings of the pueblo.

The Santa Clara Pueblo is located in Rio Arriba County, New Mexico. In the 2000 census, the population was 980, although an estimated 3,800 reside on the reservation. The Santa Clara Pueblo was established about 1550 and is a member of the Eight Northern Pueblos. The pueblo is on the Rio Grande, between Ohkay Owingeh (formerly San Juan Pueblo) to the north and San Ildefonso Pueblo to the south.

In 2012 and 2013 floods of 5,000 to 9,000 cubic feet per second developed above the pueblo due to the monsoon style rains that develop annually in late summer. The floods overwhelmed the 4 old earthen dams that had protected the pueblo for generations resulting in deep scouring of the soils in the canyon’s stream as well as heavy deposition of silt where the canyon fans out above the pueblo. The outflow of silt also impeded travel on a state road near the pueblo as well as adding large quantities of silt into the Rio Grande River.

Solution
The pueblo asked FEMA for help in mitigating the floods. FEMA asked the US Army Corps of Engineers (USACE) to design a solution to the flooding. The USACE designed three sediment dams to mitigate the flooding by reducing velocities of the runoff as well as trapping sediments in basins below the drop structures.

In December 2014 the USACE let two of the three structures with the provision that they be completed by the end of June, the historical start of the monsoon season in New Mexico. The design for the structures started with a base of 6" bedding material and an 8 ounce geotextile and then two layers of 18" galvanized gabion mattress to form a base for the gabion drop structure as well as the floor for the sediment basin. Gabions then were placed to form a 6 foot high dam to retain sediment with a notch placed to allow the normal stream flow to run unimpeded.

Client:
USACE/ PUEBLO OF SANTA CLARA

Main contractor:
MILCON CONSTRUCTION- SAN ANTONIO, TEXAS

Designer:
USACE, ALBUQUERQUE DISTRICT

Products used:
GABIONS, GABION MATTRESSES, GEOTEXTILE

Date of construction
FEBRUARY 2015 TO MARCH 31, 2016 (ESTIMATED)
Lastly, wire enclosed riprap mattresses were designed to prevent erosion caused by possible flanking of the dam structure on the upstream and downstream sides. The mattresses were staked with 3” X 3” steel angle iron to prevent the mattresses from sliding since they are on a very steep slope.

The first two dams were completed on time and to the USACE approval.

The third sediment dam started construction in September, 2015 and is still under construction at the time this was written.

Typical Sectional Drawings