

Case Study



The information in this case study is reprinted from the American Cyanamid AM-9 technical manual. AM-9 was American Cyanamid's acrylamide grout product. Avanti's AV-100 Chemical Grout matches the chemical formulation, usage and performance of AM-9.

Title: Grouting River Bed for Dam Corewall Construction

Location: Malpaso Dam, Chiapas, Mexico

Owner: Government of Mexico

Grouting Contractor: Solum, Geotecnia, S.A.

PROBLEM:

A high earth-fill dam was being constructed across the Grijalva River. After diversion of the river, seepage was still occurring through the riverbed sands. When the core area was excavated to bedrock, a pool was formed. Pumps could not dry out the area. A similar excavation was made upstream, forming a second pool. Pumping this second pool also proved ineffective in drying out the core wall area.

SOLUTION:

A concrete cap, about three meters wide by two meters thick by eight meters long, was poured on the dike separating the two pools. This dike could then be grouted to shut off the water flow. As cement would not penetrate the medium to fine sand in the dikes, chemical grouting was required.

APPLICATION:

A three-row grout pattern of twenty-three holes was laid out, making maximum use of holes previously drilled for cement grouting. Outer rows and distances between holes in these rows were intended to be one meter. Grout pipes were placed by water jetting through holes drilled in the concrete cap. Since the depth of jetting was limited, it was necessary to treat some holes several times, each treatment stage being deeper than previous stages. The grouting sequence was selected to provide physical confinement of possible grout flow channels in the center row.

Average depth of hole from bottom of concrete cap to bedrock was about two meters. Take was kept to a maximum of 25 gallons per vertical foot of hole, wherever stage grouting was possible. AM-9 solution was pumped at 5 to 10 gpm, and grouting pressures were generally low, less than 50 psi. Pressures were higher in the center row of holes, reaching 175 psi on one occasion. Gel times were generally between 45 seconds and 1 ½ minutes, but were reduced to 5 to 10 seconds whenever open grout channels were encountered.

A total of 2,215 gallons of AM-9 Chemical Grout were placed during a total of 51 hours of working time with only 5 ½ hours of actual grouting time.

RESULTS:

After completion of grouting, all seepage had been shut off. The core wall area was pumped dry, and construction of the core wall could continue.