Snoqualmie Pass Snow Shed

US SPEC Products: RA Grout
Contractor: Atkinson Construction
Date of Completion: August 2016

In March of 2013, the Federal Highway Administration (FHA) and Washington State Department of Transportation (WSDOT) approved the I-90 Snoqualmie Snow Shed Project. WSDOT awarded the project to Atkinson Construction. The project plans include taking the current snow shed down and installing highways designed to take drivers up and over engineered avalanche pathways. The job includes adding two lanes, smoothing out sharp corners, adding snow nets to protect the road from future avalanches and creating a route for animals to detour them from crossing the freeway. The project is set to be completed in the summer of 2016.

While building the highway, US SPEC’s RA Grout was used for anchoring steel dowels to stabilize the mountain. Holes were drilled horizontally into the mountain and the steel dowels (#9, #14 and #20) were put in place. The longest dowel that was grouted into place was measured at 100 feet long. Once the dowels were in place, a grout tube was inserted. The grout tube extended to the bottom of the hole; once in the hole the grout was then pumped in from the inside out.

The contractor on the job, Atkinson Construction, hoped to achieve high early strengths and ease of pumping into hard to reach areas. When asked why cement and water were not used, like most rock-anchors, it was said that cement was used on a previous section of the job and they had issues.

The job required the grout to have a compressive strength of 2,600 psi before workers could move on and blast next to the hole. This posed a problem. If the grout did not reach the required compressive strength, everything was slowed up. There was not much time to wait as workers were only on the job during warm months due to the high elevation and threat of snow during the winter. After only 24 hours, RA Grout was anchoring breaks over 5,000 psi, almost double the job requirement. This resulted in faster working time as workers were not stuck waiting for the grout to hit proper psi and could move onto other holes, quicker. The grout was mixed using a ChemGrout colloidal mixer. Proper mixing allowed RA Grout to be used to its highest potential.

The grout chosen also had to meet ASTM C-1107 and Acceptance Code 7050:

A. “Structural Post Tensioning: Visually verify that the grout has achieved initial set. Initial set shall be determined by making 3 grout cubes and documenting that the grout has set in a reasonable amount of time. Additionally, visually verify the grout material is less than 6 months old from date of manufacturer and that the water cement ratio is 0.45 or less.’

B. “Soils Nails and Ground Anchors: Acceptance is based on a satisfactory Compressive Strength Test Report required for test specimens made once per day. Additionally, visually verify the grout material is less than 6 months old from date of manufacturer and that the water cement ratio is 0.45 or less.”

It was the overall performance of the RA Grout that made it a popular product for the I-90 Snoqualmie Snow Shed Project.