Project Spotlight

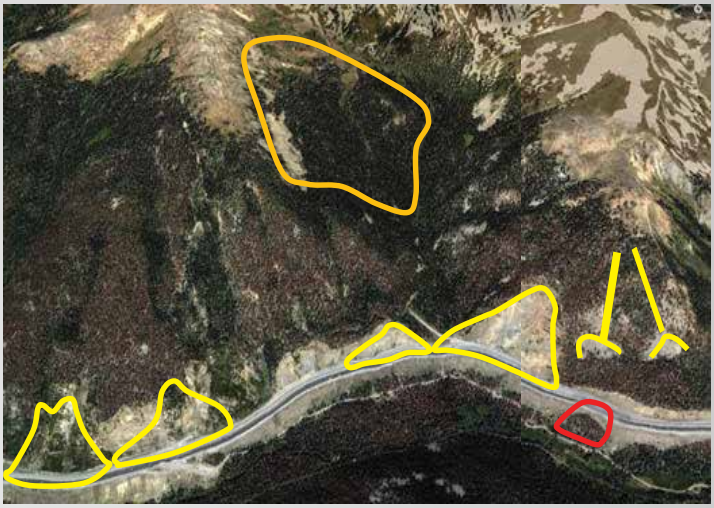
I-70 Roadway Settlement Mitigation
Summitt County,CO

Owner: Colorado Dept. of Transportation

Engineer: Colorado Dept. of Transportation

Background Information

Interstate 70 is built on a landslide mass 500-700 feet wide and 250 feet high that undergoes regular movement, causing significant settlement to the roadway, on the order of 3-6 inches a year. The settlement cause depressions in the roadway resulting in the traffic problems for motorists. CDOT typically needs to overlay new asphalt when the settlement reaches more than 1-2 inches which results in overlay maintenance annually, sometimes multiple times a year. CDOT was looking for a settlement mitigation plan that would reduce the need for annual/multi-annual overlays.



Map of I-70 showing location of landslide features, and slide scars from original construction

Project Details

Annual overlay operations had increased the thickness of the asphalt to more than 6 feet in areas which added to the over-burden on the slide materials. The critical goals were filling void spaces below the highway, reduction of dead load, and proper slope drainage. These goals were met with a settlement mitigation plan utilizing drilled shafts filled with low-density cellular concrete. More than 300, 5-foot diameter caissons were drilled at 10 -20 feet deep at 10 feet on center. The caissons were filed with a 36-39 pcf low-density cellular concrete with a 2-inch slump and minimum strength of 80 psi. The cellular concrete was foamed on site using Aerix Industries AERLITE-iX foaming agent and a self-contained trailer wet batch system.

Construction of the EB lanes in 2012

Aerix Added Value

The ability to design the cellular concrete to produce a 2-inch slump was a technological breakthrough. Typical cellular concrete is very fluid. The stiffer material enabled the contractor to fill the caissons in one continuous lift instead of having to let smaller lifts cure before pouring another lift. Placing the material in lifts up to 20 feet expedited the schedule in an already tight construction window. The mobility of the material allowed it to flow into intersected void spaces, providing some additional ground improvement below the road surface that will be beneficial to future slide stabilization efforts. The material will also not be cause for concern with disposal should excavation occur in the future.

36-39 pcf low-density cellular concrete with a 2" slump and minimum strength of 80 psi placed in single li□s of up to 20'

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