From: George Machan, Cornforth Consultants
Sent: Sunday, December 31, 2017 9:18am
To: YVOEM, WSDOT, WGS, Old Castle Materials
Subject: AK Anderson Quarry landslide - blasting option

This email responds to a question raised during daily emergency management conference calls asking if blasting could be used to control and expedite the landslide to minimize impacts.

We are experienced with blasting, as well as attempts at blasting in landslide areas. We recommend against blasting at this landslide because 1) potential for adverse effects to I-82 and nearby properties/buildings, 2) high risk to drillers/blasters when working on the actively moving landslide, and 3) the impracticality of drilling/blasting a 200+ ft deep, 4 million cubic yard landslide.

Blasting in normal conditions is typically effective in layers 30-40 ft thick. Controlled portions are done in small segments at a time. To blast 1 million cubic yards, let alone 4 million cubic yards (estimated slide volume), would take many months. Any explosives that could be inserted into the slide mass in the next 4 weeks would be too small for the size of the landslide and therefore would be ineffective trying to achieve the objectives. Let alone the time needed to design and implement a safe and effective blast for the extreme size of a specialized blast effect.
Not only impractical, the landslide would be extremely difficult and dangerous to drill and blast.

During blasting, high gas pressures are created which flow into open fissures, rock joints and fractures. These gas pressures act in all directions and can cause uncontrollable displacements, particularly in weakest zones. And stronger zones might not break or react. Flyrock can occur, propelling rocks over 100s of ft. High pressures can act on the slip zone, further reducing stability and increasing the rate of movement, which would be the intent in a controlled blasting; however, it can also increase the degree of risk above the current monitored condition, which would not be the intent.

In addition, safety risks at the landslide are high and include the potential for fissures to open near and under people and equipment working on the slide, for irregular ground subsidence and slumping/raveling to occur, for personnel to become injured, for escape routes to become inaccessible.

In our opinion, we consider the use of blasting for this landslide to be dangerous and impractical.

Regards, George

George Machan, P.E. | Senior Associate Engineer
Main 503-452-1100 | Direct 971-222-2058 | Mobile 503-703-4677
gmachan@cornforthconsultants.com | www.cornforthconsultants.com
CORNFORTH CONSULTANTS, INC.