



Memorandum

UTAH DEPARTMENT OF TRANSPORTATION GEOTECHNICAL DIVISION

DATE: June 20, 2011

TO: Shane Marshall, PE – UDOT Region 3 Director

FROM: Dave Fadling, PG, PE - UDOT Senior Geologist

CC: John Njord, PE – UDOT Executive Director
Carlos Braceras, PE – UDOT Deputy Director
Randy Park – UDOT Project Development Director
Bob Westover, PE – UDOT Region 3 District Engineer
Carmen Swanwick, PE - UDOT Chief Structural Engineer
Keith Brown, PE – UDOT Chief Geotechnical Engineer
Steve Bowman, PG – Utah Geological Survey
Jerry Steglich – Daggett County Commissioner

SUBJECT: Site Visit June 9, 2011
Brown Park Road – Jesse Ewing Canyon
Federal Aid Project STP-1364(4)15

At the request of Daggett County Commissioner Jerry Steglich, UDOT Geotechnical Division senior geologist Dave Fadling visited Browns Park Road to observe reports of a rock slide affecting the road. The purpose of the site visit was to provide a source of opinion and guidance with respect to stabilization.

Observations

At about project Station 396+00 a rock slide was observed that extends to the top of the cut slope (Photo 1). The slide debris reportedly blocked the all of the southbound and part of the northbound lanes earlier in the week. The slide is about 150 ft and 50 ft wide at the base and crest of the cut slope, respectively. The slide materials consist of dark red-brown shale/mudstone and sandstone. Near the head scarp rock appeared highly fractured and broken into gravel and cobble-size pieces. Lower on the slope, large blocks of rock were visible in the slide debris and a bedding plane discontinuity appeared to daylight on the slide rupture surface near the right flank (Photos 2 and 3). The dip and dip direction of the discontinuity ranged from 30 to 40 degrees and 58 to 70 degrees, respectively. Measurements of slope inclinations with a hand-held clinometer were made at about 30 degrees (1.7H:1V) on the unaffected natural slope adjacent to the north of the slide. The cut slope adjacent to the south of the slide was measured at about 45 degrees (1H:1V) on the upper $\frac{3}{4}$ of the slope and about 60 degrees (0.5H:1V) on the lower $\frac{1}{4}$ to the slope. A 20-inch-diameter Questar natural gas pipeline is located about 100 ft horizontal distance back from the top of the rock cut slope.



Photo 1. Rock slide at approximately Station 396+00 blocking southbound lane.



Photo 2. Facing slide with displaced block below in-place rock with apparent discontinuity intersecting cut slope surface.



Photo 3. Close up of bedding plane discontinuity in mudstone dipping at 30 to 40 degree to the northeast (58 to 70 degrees bearing).



Photo 4. Scarp and sunken grade (down to lower left) in pavement near toe of rock slide at about Station 397+00.

A scarp and slightly sunken grade is visible in the pavement at about Station 397+00 (Photo 4) and a companion scarp was observed about 225 ft to the north. It appears that a waste dump was constructed on the downhill side of the road between about Station 394+50 and 397+00. The scarps and sunken grade appears to correspond to the approximate limits of the waste dump; however, tension cracks are visible in the pavement for an additional 250 ft beyond the northern edge to about Station 392+00 (Photo 5). It is not clear if movements above and below the road are related.



Photo 5. Facing south at about Station 392+00. Tension crack in foreground and waste dump in background.

Preliminary Conclusions and Recommendations

Based on preliminary observations, it appears that the most feasible method of stabilizing the rock slide is to cut the slope back to a flatter inclination. Because of the potential for decreasing stability, removal of the rock slide material above the road is not recommended until a design slope can be established. The design civil engineer (Civil Science) and geotechnical engineer (American Geotechnics) should be consulted to determine the slope geometry and quantities for the repair of the cut slope.

The cracks in the pavement should be monitored to obtain additional information about the magnitude and rate of movement below the road. If movement continues, additional explorations and studies would be necessary to develop a design for stabilization.

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Please contact me if you have any questions or need additional information.

A handwritten signature in cursive script that reads "Dave Fadling".

Dave Fadling, PG, PE
Senior Geologist
UDOT Geotechnical Division

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