



RESEARCH NOTES HIGHWAY DIVISION RESEARCH SECTION

1174 CHEMEKETA STREET NE. SALEM, OREGON 97310 503-378-2318

RSN 86-4

ROCKFALL UNDER CONTROL

Rocks falling from a steep cut slope near Detroit Dam, 40 miles east of Salem, presented a hazard to motorists. To control rocks falling from the uneven slope, the Geotechnical Group of the Highway Division designed a modified rockfall catch fence.

Freeze/thaw cycles, moisture, erosion, and traffic vibrations can cause rocks to loosen from a slope. Once they lose support, it is only a matter of time before gravity sends the rocks tumbling down the slope to the highway. Sometimes widening the ditch is all it takes to absorb their fall. However, when this isn't possible, chain link fencing is draped over the slope, or catch fences are installed at the bottom of particularly high slopes.

A catch fence is wire screening, usually chain link fencing, suspended from a wire rope. The wire rope passes through eye bolts in the top of fence posts. As rocks roll down a slope, they are slowed by hitting the screen. They are then channeled under the screen, down the slope, to a ditch. Catch fences are normally used on uniform slopes. At the Detroit Dam site, however, the slope was non-uniform.

To compensate for the non-uniform slope, the standard catch fence design was modified in three ways: rock bolts anchored the fence posts where jack hammering a standard 3-foot hole would have been too costly and difficult; a triple twist (Gabion [TM] type) wire mesh was used for the screen instead of chain link fencing; and the screen length was as long as 50 feet (instead of a standard 15 feet) because the top of the catch fence was located at a break in the slope.

All modifications proved quite successful on this project. The rock bolt anchoring system provided speedy installation and will make replacing posts damaged by rocks quick and easy. Unlike chain link fencing, the wire mesh didn't ravel when cut, due to its triple twist feature. The extra long length of wire mesh was not secured directly to the slope, but allowed to hang freely from the wire rope. A cable attached at the bottom of the screen enabled it to be lifted, releasing accumulated rock for removal. Had screening draped over the entire slope, without the catch fence, rocks could have collected at the break in the slope, possibly tearing down the screen.

Should you need information on controlling rocks on a non-uniform slope contact the Research Section or the Geotechnical Group, Oregon Department of Transportation, and ask for:

"MODIFIED ROCKFALL CATCH FENCE MAYFLOWER CREEK - DETROIT DAM, Experimental Feature Interim Report" by Larry Pierson, Geotechnical Geologist, Oregon State Highway Division, July 1986; OR 84-01.

SUMMARIES AND ABSTRACTS OF CURRENT HIGHWAY RESEARCH