

<i>Project Title</i> SPR-3(077) Wiremesh and Cable Mesh Slope Protection		<i>Agmt./Task No.</i> T1804/03	<i>Item No.</i> 00-901	<i>Agency Bgt. No.</i>
<i>Research Agency</i> Washington State University		<i>Start Date</i> 3/1/00	<i>Estimated Completion</i> 12/31/02	<i>Revised Completion</i>
<i>Principal Investigator(s)</i> Dr. Balasingam Muhunthan		<i>Technical Contact</i> Steve Lowell		
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<i>Funding Sources</i> PA, NH, NY, CA, NC, OR, WY, WA, ID, AZ, AK, B.C.		<i>Schedule Status</i> <input checked="" type="checkbox"/> On schedule <input type="checkbox"/> Ahead of schedule <input type="checkbox"/> On revised schedule <input type="checkbox"/> Behind schedule		
<i>Original Estimated Cost</i> \$183, 514	<i>Revised Cost</i>	<i>% Funds Expended</i> 85%	<i>% Work Completed</i> 90%	
<i>Objective</i> Develop new design criteria for wiremesh and cable mesh slope protection systems that take into account longer and higher slopes, higher anchor loads, and snow loads.				

Progress in the current Quarter:

A draft report summarizing all of the advances registered by the project towards developing new design criteria was completed. The research and technical personnel at the Washington State Department of Transportation first reviewed it. The investigators have sent the revised report for input from the Technical Advisory Committee. As part of the report, the following items were completed in the current quarter:

- The new snow load model was verified on three additional drapery systems in Washington State and one in Nevada. Two of the systems in Washington failed during the winter period 2002 and the one in Nevada failed in winter of 2000. The analysis showed that anchor capacity was exceeded in these cases. It has been found that much lower anchor spacing than ones used in the current design are needed to ensure stability under snow loads. This was the case with the third system that continued to perform well in Washington. New design charts for anchor spacing with depth of snow have been developed.
- The FE analysis has been verified with field tests. It was then used to study the effect of installation conditions on the state of stress and strain on anchors and in the mesh. FE was also used to study effect of snow loads and interface friction between the ground and mesh on anchor capacity and stresses within the mesh.

Summary of Activities Expected to be Performed Next Quarter:

A two-day research meeting with the TAC has been scheduled in late January in Seattle to discuss the draft report. It is planned to use the meeting as a forum to elicit comments on each of the new contributions made to quantify overall and local stability of drapery systems. The meeting will also discuss the format of the final set of design guidelines to be prepared for use by the agencies. FE analyses will be extended to consider impact of falling rocks on mesh.

The research had repeatedly shown that the stability of the drapery system is critically dependent on the performance of anchors. This is especially true in the case of snow loads. Therefore, it was decided to examine in detail the performance of the different types of anchors used by the States on a full-scale load-testing program. A proposal to this effect had been submitted to TAC for their input and approval. The testing program will be finalized during the January meeting in Seattle. It is hoped to conduct the anchor load tests in the next quarter.