Project Title	*Agmt./Task No.*	*Item No.*	*Agency Bgt. No.*
SPR-3(072) Strength and Deformation of Mechanically Stabilized Earth (MSE) Walls at Working Loads and Failure	**SPR-3(072)**		
Research Agency	*Start Date*	*Estimated Completion*	*Revised Completion*
Royal Military College of Canada	**12/1/99**	**04/30/04**	**12/31/08**
Principal Investigator(s)	*Technical Contact*		
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Funding Source	*Schedule Status*		
WA, NY, ID, CA, WY, ND, MN, OR, AZ, AK	☐ On schedule ☐ Ahead of schedule ☒ On revised schedule ☐ Behind schedule		
Research Area			
Geotechnical			

Original Estimated Cost	*Revised Cost*	*% Funds Expended*	*% Work Completed*
$360,104	**$690,000**	**65%**	**75%**

Objective

Develop a design procedure for the internal stability of MSE walls, especially those reinforced with fabrics.

Project Progress:

1. Wall 13 - the second full-scale reinforced soil wall of Phase 5 testing at RMC has been constructed. This wall was constructed with a silty-sand backfill corresponding to a non-select backfill. The facing is wrapped and corresponds to Wall 4 (with sand backfill) in previous Phase 1-4 testing. More than 300 instruments are being used to monitor its performance. The structure is now under surcharge loading to record its performance under serviceability conditions and under surcharge load levels taken to collapse.

2. A paper is in press with the journal Ground Improvement that investigates the accuracy of the current Coherent Gravity Method for steel reinforced soil walls. This paper clearly identifies the influence of backfill strength and compaction on reinforcement loads in these structures and contains practical recommendations for design engineers.

3. The new modified K-stiffness Method has been verified against an extended database of case studies and a paper is now in review with the journal Geosynthetics International. Our project database now includes 42 case studies. Many of the new case studies are from unpublished Japanese research reports that have only recently been made available.

4. A sophisticated constitutive soil model (Lade's model) has been implemented in our FLAC numerical code and verified against RMC test walls. A paper is in review with the ASCE Journal of Geotechnical and Geoenvironmental Engineering that demonstrates the influence of soil model on wall performance. This paper will be the keystone reference paper for future journal papers by providing background validation to the use of our FLAC model to carry out parametric analyses to extend our physical database to a wider range of wall types, reinforcement layers and types, different soils etc. Three papers have or will shortly appear in conferences using this new code.

New Period Proposed Activity:

Loading of Wall 13 will be completed by the end of the calendar year. Data analysis and reports for Wall 12 and 13 in Phase 5 will be completed by the end of the April 2008. Construction of Wall 14 (Phase 5) is scheduled for next spring.

Data from the Phase 1-4 RMC wall test is being reduced and will show that the current modified K-stiffness method is very accurate for the prediction of reinforcement loads. A paper is in progress that demonstrates the influence of soil surcharging on wall reinforcement loads within the context of the K-Stiffness Method.

Now that the FLAC numerical code for wall modeling has been finalized and verified. Conference papers will be expanded and submitted to peer-reviewed journals. A report will be available to the TAC by the end of next summer.

We have now reduced all data from the RMC test walls related to connection performance and expect to produce a paper on the influence of wall type on connection loads by the end of the next quarter.