

**Project Progress:**

1. The following papers were accepted in peer-reviewed journals and/or are now in press:

Miyata, Y. and Bathurst, R.J. 2012. Measured and predicted loads in steel strip reinforced c- $\phi$  soil walls in Japan, *Soils and Foundations*, Vol. 52 No. 1 (in press)

Ezzein, F. and Bathurst, R.J. 2011. A transparent sand for geotechnical laboratory modeling, *ASTM Geotechnical*

<i>Project Title</i> <b>SPR-3(072) Strength and Deformation of Mechanically Stabilized Earth (MSE) Walls at Working Loads and Failure</b>		<i>Agmt./Task No.</i> <b>SPR-3(072)</b>	<i>Item No.</i>	<i>Agency Bgt. No.</i>
<i>Research Agency</i> <b>Royal Military College of Canada</b>		<i>Start Date</i> <b>12/1/99</b>	<i>Estimated Completion</i> <b>04/30/04</b>	<i>Revised Completion</i> <b>12/31/11</b>
<i>Principal Investigator(s)</i> <b>Richard Bathurst</b>		<i>Technical Contact</i> <b>Tony Allen (360) 709-5450</b>		
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<i>Funding Source</i> <b>WA, NY, ID, CA, WY, ND, MN, OR, AZ, AK</b>		<i>Schedule Status</i> <input type="checkbox"/> On schedule <input checked="" type="checkbox"/> On revised schedule <input type="checkbox"/> Ahead of schedule <input type="checkbox"/> Behind schedule		
<i>Research Area</i> <b>Geotechnical</b>				
<i>Original Estimated Cost</i> <b>\$360,104</b>	<i>Revised Cost</i> <b>\$690,000</b>	<i>% Funds Expended</i> <b>100%</b>	<i>% Work Completed</i> <b>99%</b>	
<i>Objective</i> <b>Develop a design procedure for the internal stability of MSE walls, especially those reinforced with geosynthetics.</b>				

*Testing Journal* (in press)

Bathurst, R.J., Miyata, Y. and Konami, T. 2011. Limit states design calibration for internal stability of multi-anchor walls, *Soils and Foundations* Vol.51 No.6 (in press)

Miyata, Y., Bathurst, R.J. and Konami, T. 2011. Evaluation of two anchor plate capacity models for MAW systems, *Soils and Foundations* Vol.51 No.5 (in press)

Bathurst, R.J., Huang, B. and Allen, T.M. 2011. Load and resistance factor design (LRFD) calibration for steel grid reinforced soil walls, *Georisk* (in press)

Bathurst, R.J., Hatami, K. and Alfaro, M.C. 2011 Geosynthetic-reinforced soil walls and slopes - seismic aspects, (S.K. Shukla Ed.): *Geosynthetics and Their Applications*, (2011) Thomas Telford Ltd., London, UK, 61 p (in press).

2. The following papers were published:

Bathurst, R.J., Huang, B. and Allen, T.M. 2011. Interpretation of installation damage testing for reliability-based analysis and LRFD calibration, *Geotextiles and Geomembranes*, Vol. 29, No. 3, pp. 323-334

Miyata, Y., Bathurst, R.J., Konami, T. and Dobashi, K. 2010. Influence of transient flooding on multi-anchor walls, *Soils and Foundations*, Vol. 50, No. 3, pp. 371-382.

Huang, B., Bathurst, R.J., Hatami, K. and Allen, T.M. 2010. Influence of toe restraint on reinforced soil segmental walls, *Canadian Geotechnical Journal*, Vol. 47, No.8, pp. 885-904.

3. The following papers were submitted (or resubmitted) to journals for publication:

Bathurst, R.J., Huang, B. and Allen, T.M. Interpretation of laboratory creep testing for reliability-based analysis and load and resistance factor design (LRFD) calibration, *Geosynthetics International*

Bathurst, R.J., Huang, B. and Allen, T.M. Load and resistance factor design (LRFD) calibration for geogrid pullout limit state using the AASHTO Simplified Method, *ASCE Journal of Geomechanics*

Huang, B., Bathurst, R.J. and Allen, T.M. Load and resistance factor design (LRFD) calibration for steel strip reinforced soil walls, *ASCE Journal of Geotechnical and Geoenvironmental Engineering*

4. The following papers were written, published or accepted for publication in forthcoming conferences:

Ezzein, F. and Bathurst, R.J. 2011. Development of a geosynthetic pullout test apparatus with transparent granular soil, 2011 *Pan-Am CGS Geotechnical Conference*, Toronto, Canada

Miyata, Y., Bathurst, R.J. and Konami, T. Influence of Model Accuracy on Load and Resistance Factor Calibration of Multi-anchor Walls, *IGSR 2011*, June 2011, Munich, Germany

Miyata Y., Hirakawa D., Tada T., Konami T. and Bathurst R.J. 2011. ICT-field observation system for LRFD calibration of reinforced soil walls. *Annual Japanese Geotechnical Conference*, 2 p, (in Japanese)

**New Period Proposed Activity:**

1. Funding for the project was fully expended 31 December 2010.

2. Continue with large-scale transparent soil pullout box testing.

3. Continue with development of numerical database that will be used to fill in data gaps for further refinement of the K-stiffness Method.