

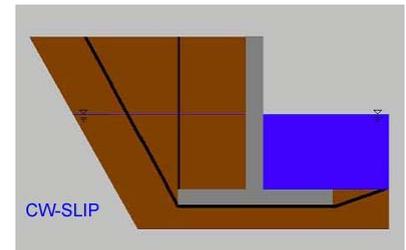


**US Army Corps  
of Engineers®**  
Engineer Research and  
Development Center

# Soil-Structure Interaction for Seismic Evaluation of Earth-Retaining Lock & Cantilever Structures

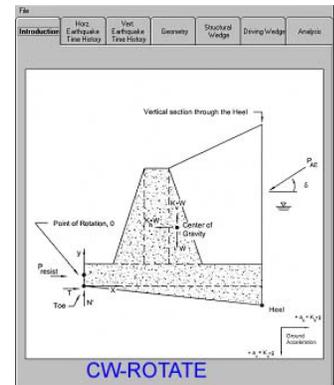
**Description** There are no computer codes and only limited simplified Corps engineering methodologies available for use by District Engineers in the design of new retaining walls or in the seismic analysis of a wide variety of existing retaining walls, e.g., navigation walls retaining earth, spillway walls at earth dams or earth retaining flood walls.

**Issue** The Corps is in need of more realistic engineering procedures and corresponding, PC-based, user-friendly software to perform cost-effective evaluations and/or designs of earth retaining structures at navigation projects that allow for permanent wall deformations which may result during seismic design events. Software provisions based on sound seismic engineering principles are needed for retaining walls that (a) slide or (b) rotate during earthquake shaking and for (c) massive concrete retaining walls constrained to rocking.



**Users** District engineers will use this new engineering methodology and software for the seismic evaluation/design of a variety of types of earth retaining structures.

**Products** Two PC-based computer programs with Graphical Users Interfaces (GUI) are in development. CW-SLIP extends the static CTWALL design using an engineering procedure for the seismic design of various retaining wall types that slide during earthquake shaking. CW-ROTATE is based on engineering technology developed by this work unit for the analysis of retaining walls that are restrained to rotation or rotation/sliding.



**Benefits** These analytic procedures and corresponding software will save engineering time and can result in more cost effective sizes of retaining structures in seismic environments.

**Corps Program** Navigation Systems Research Program, Mr. Charles E. “Eddie” Wiggins, Program Manager.

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**Partners** Information Technology Laboratory; Coastal and Hydraulics Laboratory.