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CMHA

# WHICH SOFTWARE CAN BE UTILIZED FOR THE DESIGN OF SEGMENTAL RETAINING WALLS?

When seeking to design segmental retaining walls, there are several professional-grade software packages available. Each package contains different functionality and complies with the different design methodologies to different degrees. It is advisable for the designer to thoroughly review the software and understand any differences it may have with the standard design approaches. Here are some key details to consider when selecting the appropriate software for your project's needs:

## ENGINEERING DESIGN OF THE WALL:

Both gravity and reinforced walls must be designed to meet the specific requirements of the chosen method. Several design methods are available, depending on the nature of the project. For most residential and commercial walls, the Concrete Masonry & Hardscape Association (CMHA) (formerly NCMA) method is commonly used. Transportation projects may require the American Association of Highway and Transportation Officials (AASHTO) or Federal Highway (FHWA) methods, while some transportation agencies might have their specific approaches.

1. Generic Software Options for Design Methods:
   There are suitable software solutions to assist with the design based on widely available methods. For example, the CMHA 3rd edition design method has a nonproprietary companion software. Other nonproprietary software options are REA or Vespa. Alternatively, for AASHTO or FHWA methods, MSEW+ and Vespa are suitable options.
2. Proprietary Software Considerations:
   Proprietary software following chosen design methods are also suitable solutions. This vendor supplied software is already populated with system specific data and only analyzes the vendors proprietary products. This is typically supplied by the SRW System Supplier.

A complete segmental retaining wall design requires the evaluation of several forms of potential failure. This could include external stability (sliding, overturning and bearing capacity checks), internal stability (overstress, pullout, and international sliding checks), facial stability (crest toppling and connection checks) and possibly internal compound stability.

## GLOBAL STABILITY ANALYSIS:

In cases where an analysis of the wall's global stability is required, certain software programs can handle 2D global stability analysis effectively. Examples of such software include Slide2, Slope/W (2D analysis) or Slope3D (3D analysis), or ReSSA+. Designers can input all relevant wall conditions into these programs for analysis.

## LIMIT EQUILIBRIUM ANALYSIS:

This newest method uses slope stability to model the driving and stabilizing loads on a wall and it is usually used in very complicated projects. As of now, the only available software is ReSSA+.

It's important to note that currently, there is no single software solution that can handle the wall design, global stability analysis, and the limit equilibrium method. Therefore, a combination of appropriate software may be needed to address all aspects of a project effectively.

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## SOFTWARE MENTIONED IN THIS FAQ:

SRWall 4.0 from CMHA: ncma.org/software/srwall

MSEW+ and Ressa+ from Adama Engineering: geoprograms.com

REA Analysis from Race Engineering: rea-llc.com/technical/#software

Slide 2 from Rocscience: rocscience.com

SLOPE/W and SLOPE3D from GeoSlope: geoslope.com

Vespa from CTiSoftware: ctiware.com/vespa

Proprietary Software, contact your SRW supplier to find out if they have their own software

The list of software presented here is not intended as a CMHA endorsement nor it is all-inclusive. CMHA has not verified accuracy of calculations so the designer is encouraged to do so when selecting a software aid.

## ABOUT CMHA

The Concrete Masonry & Hardscapes Association (CMHA) represents a unification of the Interlocking Concrete Pavement Institute (ICPI) and National Concrete Masonry Association (NCMA). CMHA is a trade association representing US and Canadian producers and suppliers in the concrete masonry and hardscape industry, as well as contractors of interlocking concrete pavement and segmental retaining walls. CMHA is the authority for segmental concrete products and systems, which are the best value and preferred choice for resilient pavement, structures, and living spaces. CMHA is dedicated to the advancement of these building systems through research, promotion, education, and the development of manufacturing guides, design codes and resources, testing standards, and construction practices.