



## Engineering Assumptions

The gravity wall and reinforced wall charts shown on the following pages are based on our understanding of the concepts and principles for the design of segmental retaining walls as described in the National Concrete Masonry Association (NCMA) *Design Manual for Segmental Retaining Walls, Second Edition*. The design calculations used to derive these charts are available upon request. These charts are not intended to be used for actual construction and all final designs for construction purposes must be performed by a registered professional engineer qualified to design segmental retaining wall structures, using the actual conditions of the proposed site. Many other design applications that are not specifically shown in these charts may also be possible. Contact your local engineer to determine the suitability of Rosetta Hardscapes blocks on unique sites.

### Assumed Criteria for Chart Calculations

- Soil friction angles ( $\Phi$ ) of 28°, 30°, and 34° as noted.
- **Global stability has not been considered.** It is recommended that a local engineer compute and apply all local conditions and factors, including global stability, to the site-specific wall design.
- Testing of the Rosetta Hardscapes block interface shear and connection between the Rosetta Hardscapes blocks and Paraweb 30 geosynthetic strap was completed by Bathurst, Clarabut Geotechnical Testing, Inc. Test reports are available upon request.
- Gravity wall sections were analyzed based on a 12" high x 5.5' long (0.305 m x 1.676 m) block.
- Interface shear values were based on the 12" high x 6' long (0.305 m x 1.829 m) block.
- Reinforced wall sections are designed with geogrid to provide the main soil reinforcement and individual Paraweb straps to hold the facing blocks into the reinforced soil mass.
- Paraweb strap lengths are calculated to hold a 12" high x 6' long (0.305 m x 1.829 m) block in place. The longest required strap is used on all blocks in a reinforced wall.

### Factors of Safety

Wall Sliding Resistance =	1.5
Wall Overturning =	1.5 – Non Reinforced, 2.0 - Reinforced
Wall Bearing Capacity =	2.0

### Material Assumptions

Unit Weight of Concrete =	145 pcf (22.8 kN/m <sup>3</sup> )
Minimum Concrete Compressive Strength =	4,000 psi (27.6 MPa)
Moist Soil Unit Weight =	120 pcf (18.9 kN/m <sup>3</sup> )

These assumptions were made to provide Rosetta Hardscapes LLC with an approximate retaining wall height. These wall heights were calculated using the assumed material properties and may vary from location to location depending on the soil properties. **For this reason, all final designs for construction purposes must be performed by a registered professional engineer qualified to design segmental retaining wall structures, using the actual conditions of the proposed site.**

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## Commercially Available Engineering Resources

NCMA Design Manual for Segmental Retaining Walls (SRW), 2<sup>nd</sup> Edition, National Concrete Masonry Association, 13750 Sunrise Valley Drive, Herndon, Virginia 20171-4662 (703) 713-1900  
Available at [www.ncma.org](http://www.ncma.org)

NCMA Design Software for Segmental Retaining Walls – SRWall  
SRW design for both conventional gravity and soil reinforced walls with simple geometry. Excludes overall stability analysis.  
Available at [www.ncma.org](http://www.ncma.org)

MSEW (Mechanically Stabilized Earth Walls) by ADAMA Engineering, Inc.  
MSEW will handle more complex loading and wall geometry, including tiered walls. MSEW follows AASHTO and FHWA guidelines.  
Available at [www.msew.com](http://www.msew.com)

ReSSA (Reinforced Soil Slope Analysis) by ADAMA Engineering, Inc.  
Global stability analysis to assess the rotation and translational stability of slopes.  
Available at [www.msew.com](http://www.msew.com)

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