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# Sullivan, Connors & Associates

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## Land Surveying and Civil Engineering

Law Offices of William C. Henchy, P.C.  
165 Cranberry Highway  
Orleans, MA 02653

July 25, 2016

**Subject: Proposed Retaining Wall Design  
The Village at Sudbury Station**

Dear Attorney Henchy,

Please find the attached typical cut sheets for the proposed retaining walls to be utilized at "The Village at Sudbury Station." The walls are a precast modular block wall manufactured by RediRock. These walls typically allow for a gravity (unreinforced) wall option of up to 14 feet, and then reinforced options to greater heights. As presently proposed, the retaining wall height ranges from zero (at grade) to approximately 12.5 feet in the area of the old borrow pit along the western site boundary.

We understand there have been some concerns raised related to the proposed retaining wall shown along the westerly property line adjacent to the proposed wastewater leach fields. The proposed leach field will be designed with an impermeable barrier (geomembrane liner) located between the retaining wall and leach field. This barrier would extend from the top of the leach field down to at least one foot below the bottom of wall, and will prevent flow from the leach field from migrating toward the wall and creating hydrostatic pressure behind the wall. The barrier would be set approximately 10 feet from the leach field and 10 feet from the back of wall.

As shown on the typical cut sheets, the retaining wall would also be constructed with appropriate drainage behind the wall to prevent any surface flow or rainfall that may fall above the wall from collecting and creating unwanted hydrostatic pressure. The 10 foot setback from the back of wall to impermeable barrier would allow sufficient space to locate any required drainage aggregate and/or possible reinforcement.

In accordance with standard building code practice, the final design of any wall over four feet in height will be designed and certified by a registered structural engineer, and submitted for review and prior approval by the building inspector. Moreover, MassDEP will review and approve all plans in connection with approval of the general programmatic permit for the wastewater treatment plant to ensure structural stability and to ensure that all applicable wastewater requirements are met, particularly that there be no breakout of wastewater at the surface.

If you have any additional questions please contact our office at 508-393-9727.

Sincerely,  
Sullivan Connors & Associates, Inc.



Vito Colonna, PE





**REDI+ROCK<sup>®</sup>**

# DESIGN RESOURCE MANUAL



# Three Custom Textures, One Complete System

Redi-Rock is a complete retaining wall solution that looks good. Engineers love it because it combines solid engineering and aesthetics, which can be a hard combination to find.

Redi-Rock offers three face textures: Ledge stone, Cobblestone, and Limestone. Any block in the Redi-Rock arsenal can be produced in any texture, which means that you can create a complete solution for your next project. Retaining wall blocks, freestanding blocks, and columns are available in each of the three textures, allowing you to design an integrated, coordinated project that looks awesome. Because Redi-Rock is made from first-use, architectural grade precast concrete, the detail in texture and the durability are phenomenal.

Each Redi-Rock block is cast in one continuous pour using molds taken from actual stone. These molds are bolt-on attachments to the Redi-Rock steel forms which can be interchanged from form to form. This means that a Redi-Rock manufacturer can use a single form to make a Ledge stone gravity block one day and a Limestone PC block the next day by simply switching out a few parts and pieces! This comprehensive forming system allows your local Redi-Rock manufacturer to create a variety of blocks, resulting in a faster, more affordable finished product.

Redi-Rock blocks are also available in a variety of color options to match the natural stone in your local area. Contact your local Redi-Rock manufacturer for color options!



Ledge stone



Cobblestone



Limestone





## REDI-ROCK TEXTURE:

## COBBLESTONE

Large block retaining walls offer massive benefits, but what if you don't want a massive look in the finished wall? Now, you don't have to choose one or the other.

By choosing Redi-Rock Cobblestone texture, you'll get the best of both worlds—the structural capabilities of a large block retaining wall with a smaller-scale look. Each Cobblestone texture block has the

appearance of six smaller blocks on each face, and individual blocks are nearly indistinguishable in a finished wall. Each block is cast in a mold taken from real stone using wet-cast concrete—which gives walls a more natural finish while providing durability and strength.

Cobblestone blocks have the same massive dimensions, high quality, and ease of installation you expect

from Redi-Rock. Each block weighs one ton, allowing you to build tall gravity walls using Cobblestone blocks, and even taller walls with reinforcement.

Contact your local manufacturer for color options in you area!



## REDI-ROCK TEXTURE: LIMESTONE

Redi-Rock Limestone texture creates an ideal look for projects that require a structural retaining wall that looks good. The massive, one-ton Limestone texture blocks feature six square feet (0.5 square meters) of face on each block, giving walls an impressive finished appearance.

Redi-Rock's Limestone face has been a mainstay in the large block

retaining wall industry since it was introduced. The texture on each block gives walls a natural look and is consistently chosen for projects where aesthetics are important. Redi-Rock is made of wet-cast concrete and the blocks are cast in molds taken from actual quarried limestone, providing more detailed texture, greater durability, and longer maintenance-free service life.

Redi-Rock Limestone blocks offer the massive dimensions, high quality, and ease of installation you've come to expect. At over one ton each, you can build tall gravity walls using Redi-Rock Limestone blocks, and even taller walls with reinforcement.

Contact your local manufacturer for color options!



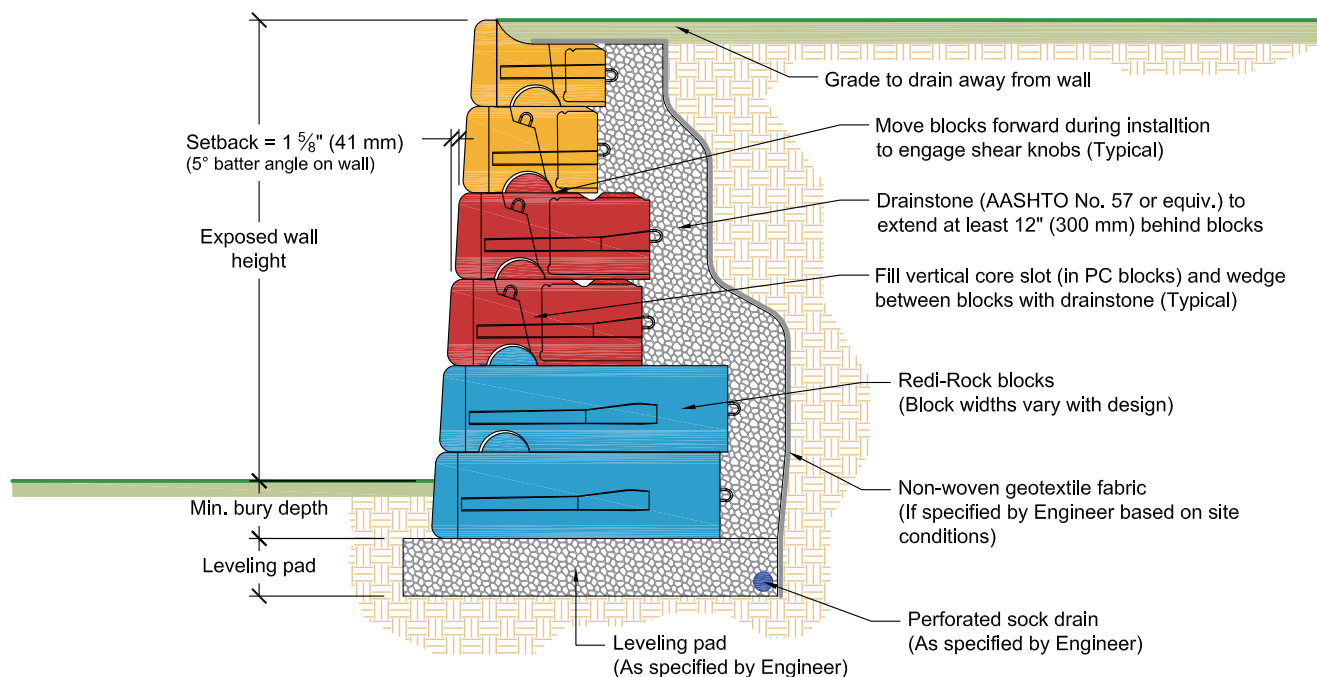
## STANDARD BATTER GRAVITY WALLS

## ALLOWABLE STRESS DESIGN

# Preliminary Height Guide

This preliminary height guide has been prepared showing Redi-Rock walls in a variety of assumed conditions. It is intended to give the specifier an idea of what block types are required and what heights are achievable with Redi-Rock in different applications. A combination of Redi-Rock 28" (710 mm), 41" (1030 mm), and 60" (1520 mm) wide blocks with the standard 5° wall batter are used to provide the most efficient cross-section available in the different conditions.

Several assumptions have been made in preparation of the guide. They are listed in the notes below. If these assumptions do not match the wall section under consideration, block selections and achievable heights may vary from the sections shown in this guide. All wall sections for construction must be designed by a registered Professional Engineer using the actual conditions of the site.



## Notes:

This preliminary guide has been prepared for three different soil types, three different load conditions, and with three different width blocks to give an indication of the performance of Redi-Rock walls. A wall batter of 5° was used for this preliminary guide. **Redi-Rock walls are not limited to these conditions.** Specific wall sections can incorporate different block setbacks and can be designed for different soil and loading conditions.

Unit weight of soil is assumed to be 120 lb/ft<sup>3</sup> (18.85 kN/m<sup>3</sup>) or 130 lb/ft<sup>3</sup> (20.4 kN/m<sup>3</sup>) as noted for each section of this preliminary guide.

Minimum factors of safety are 1.5 for sliding, 1.5 for overturning, 2.0 for bearing capacity, and 1.3 for global stability. Other factors of safety will result in changes from the wall heights and block selections shown in this guide.

No seismic or hydrostatic loads were included in this preliminary guide.

Ledgestone texture PC blocks were used to prepare this preliminary guide. Wall heights and block selections for other textures and blocks may vary.

A solid block without the vertical core slot was used for the bottom block on all wall sections shown.

Independent barrier design at the top of the wall must be performed for site specific conditions. Barrier requirements may result in changes to available wall heights and block selections from those shown in this guide.

**Wall stability needs to be verified in the final design for site-specific conditions.**

The wall design shall address both internal and external drainage and shall be evaluated by the Professional Engineer who is responsible for the final wall design.

Backfill material to be compacted to 90% modified proctor density (ASTM D1557).

All Redi-Rock International Wall System Specifications and installation recommendations should be followed.

Construction oversight should be provided on all walls to ensure proper construction according to your detailed design drawings.

Not tall enough? Greater wall heights are achievable with select backfill, increased wall batter, and/or mechanically stabilized earth Redi-Rock walls.

Redi-Rock products are manufactured by independently owned, licensed manufacturers. Product offerings will vary between manufacturers. Contact your local manufacturer to determine what products are available for your job.

These block selection and height guides were prepared by Redi-Rock International for estimating and conceptual design purposes only. All information is believed to be true and accurate; however, Redi-Rock International assumes no responsibility for the use of these preliminary guides for actual construction. Determination of the suitability of each preliminary guide is the sole responsibility of the user. **Final designs for construction purposes must be performed by a registered Professional Engineer, using the actual conditions of the proposed site.**



## STANDARD BATTER GRAVITY WALLS

## ALLOWABLE STRESS DESIGN

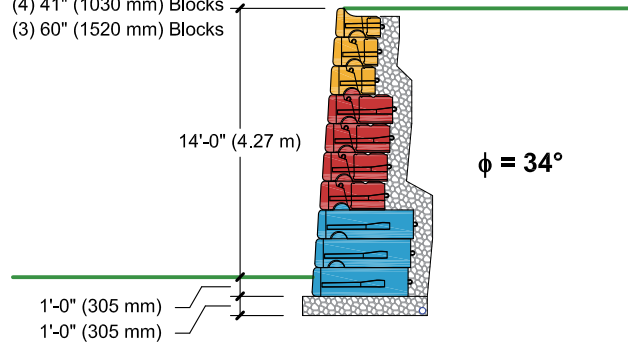
# Preliminary Height Guide

$\phi = 34^\circ$  | DENSE WELL-GRADED SAND or SAND AND GRAVEL

**LOAD CONDITION A** | NO LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

## 10 BLOCK HIGH SECTION

(3) 28" (710 mm) Blocks  
(4) 41" (1030 mm) Blocks  
(3) 60" (1520 mm) Blocks



**WANT TO DO MORE? REDI-ROCK WALL ALLOWS YOU TO:**

- Incorporate one or more rows of Planter blocks.
- Incorporate one or more rows of 9" (230 mm) Setback blocks.
- Use Limestone or Cobblestone face blocks.
- Use a different infill stone.
- Evaluate an expanded range of soils or loading conditions.
- Include seismic loads.
- Include water (hydrostatic loads).

[Download the software at redi-rock.com](https://www.redi-rock.com)

## Legend:



= 28" (710mm) BLOCK



= 41" (1030 mm) BLOCK

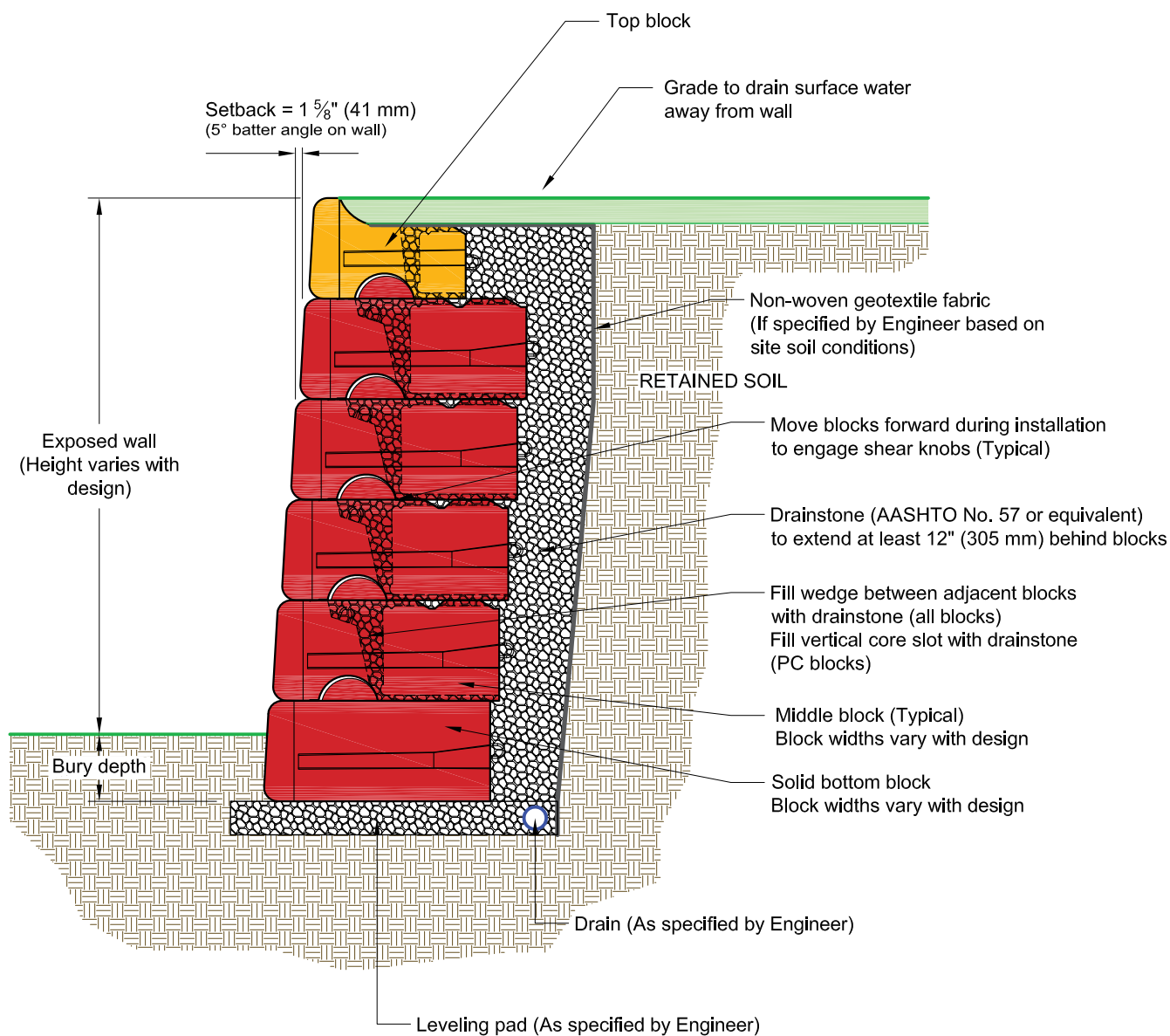


= 60" (1520 mm) BLOCK

**SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.**



## Typical Gravity Wall Section



This drawing is for reference only. Determination of the suitability and/or manner of use of any details contained in this document is the sole responsibility of the design engineer of record. Final project designs, including all construction details, shall be prepared by a licensed professional engineer using the actual conditions of the proposed site.