IMPORTANT NOTICE

The design specifications for Redi-Rock® blocks suggest maximum installation heights under certain assumed conditions. These wall heights were calculated using the assumed material properties and loading conditions in the Design Resource Manual and will vary from location to location depending on the soil properties and terrain. Since soil conditions and topography vary greatly from site to site, an engineering analysis must be performed for each wall installation.

Because Redi-Rock International does not build the blocks or install the wall system, Redi-Rock International does not assume any responsibility regarding structural stability of any particular block or particular wall system. In addition, Redi-Rock International assumes no responsibility in connection with any injury, death, or property damage claim whatsoever whether asserted against a Leasor, Purchaser or others, arising out of or attributable to the operation of or products produced with Redi-Rock International equipment.

STANDARD BATTER GRAVITY WALLS

34° | DENSE WELL-GRADED SAND or SAND AND GRAVEL ................. 86
30° | FINE TO MEDIUM SAND or SILTY SAND ........................................ 91
28° | SILTY SAND or CLAYEY SAND .......................................................... 95
40° OVER 26° | CRUSHED STONE BACKFILL REPLACING SILTY OR CLAYEY SAND .......................................................... 99

STANDARD BATTER GRAVITY WALLS

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° (110 mm), 41° (160 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 wide 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 kN/m³ (18.85 kN/m²) or 130 kN/m³ (20.24 kN/m²), as noted for each section of this preliminary guide. Minimum factors of safety are 1.5 for sliding, 1.5 for overturning, 2.2 for bearing capacity, and 1.3 for global stability. Other factors of safety result in changes from the wall heights and block selections shown in this guide.
- No soil or hydrostatic loads were included in this preliminary guide.
- Leagstown 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 batter 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 must be verified in the final design for all specific conditions.
- The final 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 95% 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 (labeled) broad wall batter, and/or mechanically stabilized earth Redi-Rock walls. Redi-Rock products are manufactured by independently owned licensees. The material costs will vary between manufacturers. Contact your local manufacturer to determine what products are available for your job.
Preliminary Height Guide

**φ = 34° | DENSE WELL-GRADED SAND or SAND AND GRAVEL**

| LOAD CONDITION A | NO LIVE LOAD SURFACE, NO BACK SLOPE, NO TOE SLOPE | 87 |
| LOAD CONDITION B | 250 lb/ft² (12 kPa) LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE | 89 |
| LOAD CONDITION C | 1:2.5 BACK SLOPE, NO TOE SLOPE, NO LIVE LOAD SURCHARGE | 90 |

---

### LOAD CONDITION A

#### 2 BLOCK HIGH SECTION

- (2) 28" (710 mm) Blocks
- \( \phi = 34° \)

#### 3 BLOCK HIGH SECTION

- (3) 28" (710 mm) Blocks
- \( \phi = 34° \)

#### 4 BLOCK HIGH SECTION

- (4) 28" (710 mm) Blocks
- \( \phi = 34° \)

#### 5 BLOCK HIGH SECTION

- (5) 28" (710 mm) Blocks
- \( \phi = 34° \)

#### 6 BLOCK HIGH SECTION

- (6) 28" (710 mm) Blocks
- \( \phi = 34° \)

#### 7 BLOCK HIGH SECTION

- (7) 28" (710 mm) Blocks
- \( \phi = 34° \)

#### 8 BLOCK HIGH SECTION

- (8) 28" (710 mm) Blocks
- \( \phi = 34° \)

#### 9 BLOCK HIGH SECTION

- (9) 28" (710 mm) Blocks
- \( \phi = 34° \)

---

**Legend:**

- **28" (710 mm) BLOCK**
- **41" (1030 mm) BLOCK**
- **60" (1520 mm) BLOCK**

**SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.**
LOAD CONDITION C | 1:2.5 BACK SLOPE, NO TOE SLOPE, NO LIVE LOAD SURCHARGE

LOAD CONDITION B | 250 lb/ft² (12 kPa) LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

LOAD CONDITION C | 1:2.5 BACK SLOPE, NO TOE SLOPE, NO LIVE LOAD SURCHARGE
Preliminary Height Guide

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

### RETAINING WALLS GRAVITY

<table>
<thead>
<tr>
<th>φ = 30°</th>
<th>FINE TO MEDIUM SAND ☵ SILTY SAND</th>
</tr>
</thead>
</table>

#### 2 BLOCK HIGH SECTION
- (2) 26" (710 mm) Blocks
- 0'-6" (162 mm) 0'-0" (192 mm)
- φ = 30°

#### 3 BLOCK HIGH SECTION
- (3) 26" (760 mm) Blocks
- 0'-6" (162 mm) 0'-0" (192 mm)
- φ = 30°

#### 4 BLOCK HIGH SECTION
- (4) 26" (710 mm) Blocks
- 0'-6" (162 mm) 0'-0" (192 mm)

#### 5 BLOCK HIGH SECTION
- (5) 26" (710 mm) Blocks
- (4) 41" (1030 mm) Black
- 0'-6" (162 mm) 0'-0" (192 mm)

#### 6 BLOCK HIGH SECTION
- (6) 26" (710 mm) Blocks
- (2) 41" (1030 mm) Blocks
- 0'-6" (162 mm) 0'-0" (192 mm)

#### 7 BLOCK HIGH SECTION
- (7) 26" (710 mm) Blocks
- (3) 41" (1030 mm) Blocks
- 0'-6" (162 mm) 0'-0" (192 mm)

#### 8 BLOCK HIGH SECTION
- (8) 26" (710 mm) Blocks
- (5) 41" (1030 mm) Blocks
- (3) 60" (1520 mm) Black
- 0'-6" (162 mm) 0'-0" (192 mm)

#### 9 BLOCK HIGH SECTION
- (9) 26" (710 mm) Blocks
- (4) 41" (1030 mm) Blocks
- (2) 60" (1520 mm) Black
- 0'-6" (162 mm) 0'-0" (192 mm)

**LOAD CONDITION B**  250 lb/ft² (12 kPa) LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

### RETAINING WALLS GRAVITY

<table>
<thead>
<tr>
<th>φ = 30°</th>
<th>FINE TO MEDIUM SAND ☵ SILTY SAND</th>
</tr>
</thead>
</table>

#### 2 BLOCK HIGH SECTION
- (1) 26" (710 mm) Block
- 0'-6" (162 mm) 0'-0" (192 mm)

#### 3 BLOCK HIGH SECTION
- (1) 26" (760 mm) Block
- (2) 41" (1030 mm) Block
- 0'-6" (162 mm) 0'-0" (192 mm)

#### 4 BLOCK HIGH SECTION
- (1) 26" (710 mm) Block
- (2) 41" (1030 mm) Block
- (1) 60" (1520 mm) Black

#### 5 BLOCK HIGH SECTION
- (1) 26" (710 mm) Block
- (3) 41" (1030 mm) Block
- (2) 60" (1520 mm) Black

#### 6 BLOCK HIGH SECTION
- (1) 26" (710 mm) Block
- (2) 41" (1030 mm) Block
- (3) 60" (1520 mm) Black

#### 7 BLOCK HIGH SECTION
- (1) 26" (710 mm) Block
- (3) 41" (1030 mm) Block
- (1) 60" (1520 mm) Block

**Legend:**

- 26" (710 mm) BLOCK
- 41" (1030 mm) BLOCK
- 60" (1520 mm) BLOCK

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

\[ \phi = 30^\circ \] FINE TO MEDIUM SAND or SILTY SAND

LOAD CONDITION C | 1 : 2.5 BACK SLOPE, NO TOE SLOPE, NO LIVE LOAD SURCHARGE

LOAD CONDITION B | 250 lb/ft\(^2\) (12 kPa) LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

LOAD CONDITION A | NO LIVE LOAD SURFACE, NO BACK SLOPE, NO TOE SLOPE

\[ \phi = 28^\circ \] SILTY SAND or CLAYEY SAND

Standard batter gravity walls
Assumed retained and foundation soils for this Section
Internal angle of friction
Unit weight
Cohesion

\[ \gamma = 120 \text{ lb/ft}^3 (18.6 \text{ kN/m}^3) \]
\[ c = 0 \text{ lb/ft}^2 (0 \text{ kPa}) \]

LOAD CONDITION A | NO LIVE LOAD SURFACE, NO BACK SLOPE, NO TOE SLOPE
LOAD CONDITION B | 250 lb/ft\(^2\) (12 kPa) LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE
LOAD CONDITION C | 1 : 2.5 BACK SLOPE, NO TOE SLOPE, NO LIVE LOAD SURCHARGE

Legend:
- 28" (710 mm) BLOCK
- 41" (1030 mm) BLOCK
- 60" (1520 mm) BLOCK

SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.
Preliminary Height Guide

**LOAD CONDITION A**

<table>
<thead>
<tr>
<th>Block Section</th>
<th>Height</th>
<th>Load</th>
<th>Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
<tr>
<td>4 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
<tr>
<td>6 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
<tr>
<td>3 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
<tr>
<td>5 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
<tr>
<td>7 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
</tbody>
</table>

**LOAD CONDITION B**

<table>
<thead>
<tr>
<th>Block Section</th>
<th>Height</th>
<th>Load</th>
<th>Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
<tr>
<td>4 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
<tr>
<td>6 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
<tr>
<td>3 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
<tr>
<td>5 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
<tr>
<td>7 BLOCK HIGH SECTION</td>
<td>4'6&quot; (1.37 m)</td>
<td>250 lb/ft² (12 kPa)</td>
<td>28°</td>
</tr>
</tbody>
</table>

**Legend:**

- 28" (710 mm) BLOCK
- 41" (1030 mm) BLOCK
- 60" (1520 mm) BLOCK

SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.
LOAD CONDITION A
| NO LIVE LOAD SURFACE, NO BACK SLOPE, NO TOE SLOPE

LOAD CONDITION B
| 250 lb/ft² (12 kPa) LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

LOAD CONDITION C
| 1:2.5 BACK SLOPE, NO TOE SLOPE, NO LIVE LOAD SURCHARGE

Legend:
- 26" (710 mm) BLOCK
- 41" (1030 mm) BLOCK
- 60" (1520 mm) BLOCK

SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.
Preliminary Height Guide

STD. BATTER GRAVITY WALLS

ALLOWABLE STRESS DESIGN

\[ \phi = 40^\circ \text{ over } 26^\circ \]  
CRUSHED STONE BACKFILL REPLACING SILTY or CLAYEY SAND

LOAD CONDITION B  
250 lb/ft\(^2\) (12 kPa) LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

2 BLOCK HIGH SECTION  
\[ \phi = 40^\circ \]  
150 Ib/ft \(^2\) (6 kPa)

0.4\( ^\circ \) (162 mm)  
0.4\( ^\circ \) (152 mm)

4 BLOCK HIGH SECTION  
\[ \phi = 40^\circ \]  
250 Ib/ft \(^2\) (12 kPa)

0.5\( ^\circ \) (152 mm)  
0.6\( ^\circ \) (152 mm)

6 BLOCK HIGH SECTION  
\[ \phi = 40^\circ \]  
250 Ib/ft \(^2\) (12 kPa)

0.8\( ^\circ \) (152 mm)  
1.0\( ^\circ \) (152 mm)

8 BLOCK HIGH SECTION  
\[ \phi = 40^\circ \]  
250 Ib/ft \(^2\) (12 kPa)

1.2\( ^\circ \) (152 mm)  
1.4\( ^\circ \) (152 mm)

LEGEND:

- 28\( ^\circ \) (710 mm) BLOCK
- 41\( ^\circ \) (1030 mm) BLOCK
- 60\( ^\circ \) (1520 mm) BLOCK

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

STD. BATTER GRAVITY WALLS

ALLOWABLE STRESS DESIGN

\[ \phi = 40^\circ \text{ over } 26^\circ \]  
CRUSHED STONE BACKFILL REPLACING SILTY or CLAYEY SAND

LOAD CONDITION C  
1:2.5 BACK SLOPE, NO TOE SLOPE, NO LIVE LOAD SURCHARGE

2 BLOCK HIGH SECTION  
\[ \phi = 40^\circ \]  
250 Ib/ft \(^2\) (12 kPa)

0.4\( ^\circ \) (152 mm)  
0.4\( ^\circ \) (152 mm)

4 BLOCK HIGH SECTION  
\[ \phi = 40^\circ \]  
250 Ib/ft \(^2\) (12 kPa)

0.4\( ^\circ \) (152 mm)  
0.4\( ^\circ \) (152 mm)

6 BLOCK HIGH SECTION  
\[ \phi = 40^\circ \]  
250 Ib/ft \(^2\) (12 kPa)

0.8\( ^\circ \) (152 mm)  
1.0\( ^\circ \) (152 mm)

8 BLOCK HIGH SECTION  
\[ \phi = 40^\circ \]  
250 Ib/ft \(^2\) (12 kPa)

1.2\( ^\circ \) (152 mm)  
1.4\( ^\circ \) (152 mm)

LEGEND:

- 28\( ^\circ \) (710 mm) BLOCK
- 41\( ^\circ \) (1030 mm) BLOCK
- 60\( ^\circ \) (1520 mm) BLOCK

SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.
XL HOLLOW-CORE RETAINING BLOCK GRAVITY WALLS

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 52" (1320 mm), 73" (1830 mm), and 96" (2440 mm) XL blocks combined with 18" (457 mm) high Redi-Rock 28" (716 mm), 41" (1000 mm), and 60" (1520 mm) wide blocks are used to provide the most efficient cross-section variable 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 those 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 four different soil types, three different load conditions, and with six different block sizes to give an indication of the performance of Redi-Rock walls. Redi-Rock walls are not limited to these conditions. Specific wall sections can be designed for different soil and loading conditions.
- Unit weight of soil is assumed to be 120 lb/ft³ (18.95 kN/m³) or 120 lb/ft³ (22.4 kN/m³) as noted for each section of this preliminary guide. Minimum factors of safety are 1.5 for sliding, 1.5 for overturning, 2.5 for bearing capacity, and 1.5 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.

The 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.

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.
XL HOLLOW-CORE RETAINING BLOCK GRAVITY WALLS

Preliminary Height Guide

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

**Redi-Rock Design Resource Manual V20**

---

**Legend:**

- 28" (710 mm) BLOCK
- 41" (1030 mm) BLOCK
- 60" (1520 mm) BLOCK
- 52" (1320 mm) XL BLOCK
- 72" (1830 mm) XL BLOCK
- 96" (2440 mm) XL BLOCK

---

**SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.**
XL HOLLOW-CORE RETAINING BLOCK GRAVITY WALLS

Preliminary Height Guide

φ = 34°  DENSE WELL-GRADED SAND or SAND AND GRAVEL

LOAD CONDITION B  250 lb/ft² (12 kPa) LIVE LOAD SUNCHARGE, NO BACK SLOPE, NO TOE SLOPE

6.0'-FOOT (1.83 m) HIGH SECTION
(2) 28' (710 mm) Blocks
(1) 52' (1320 mm) XL Block

φ = 34°

7.5'-FOOT (2.29 m) HIGH SECTION
(2) 28' (710 mm) Blocks
(1) 52' (1320 mm) XL Block

φ = 34°

9.0'-FOOT (2.74 m) HIGH SECTION
(3) 28' (710 mm) Blocks
(1) 41' (1050 mm) Block
(1) 52' (1320 mm) XL Block

φ = 34°

10.5'-FOOT (3.20 m) HIGH SECTION
(2) 28' (710 mm) Blocks
(1) 52' (1320 mm) XL Block

φ = 34°

12.0'-FOOT (3.66 m) HIGH SECTION
(3) 28' (710 mm) Blocks
(1) 41' (1050 mm) Block
(1) 52' (1320 mm) XL Block

φ = 34°

13.5'-FOOT (4.11 m) HIGH SECTION
(2) 28' (710 mm) Blocks
(1) 52' (1320 mm) XL Block

φ = 34°

15.0'-FOOT (4.57 m) HIGH SECTION
(3) 28' (710 mm) Blocks
(1) 62' (1520 mm) XL Block

φ = 34°

16.5'-FOOT (4.99 m) HIGH SECTION
(3) 28' (710 mm) Blocks
(1) 52' (1320 mm) XL Block

φ = 34°

18.0'-FOOT (5.49 m) HIGH SECTION
(3) 28' (710 mm) Blocks
(1) 62' (1520 mm) XL Block

φ = 34°

19.5'-FOOT (5.94 m) HIGH SECTION
(3) 28' (710 mm) Blocks
(1) 72' (1830 mm) XL Block

φ = 34°

Legend:

= 28' (710 mm) BLOCK
= 41' (1050 mm) BLOCK
= 52' (1320 mm) XL BLOCK
= 60' (1520 mm) BLOCK
= 72' (1830 mm) XL BLOCK
= 96' (2440 mm) XL BLOCK

SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.
XL HOLLOW-CORE RETAINING BLOCK GRAVITY WALLS

### ALLOWABLE STRESS DESIGN

**Preliminary Height Guide**

#### LOAD CONDITION B

<table>
<thead>
<tr>
<th>Height</th>
<th>1:2 Back Slope, No Toe Slope, No Live Load Surcharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.0'-8&quot; (6.46 m)</td>
<td>Block Height</td>
</tr>
<tr>
<td>1.0'-0&quot; (0.305 m)</td>
<td>Block Width</td>
</tr>
<tr>
<td>1.0'-0&quot; (0.305 m)</td>
<td>Block Depth</td>
</tr>
<tr>
<td>2.0'-8&quot; (0.64 m)</td>
<td>Block Height</td>
</tr>
<tr>
<td>1.0'-0&quot; (0.305 m)</td>
<td>Block Width</td>
</tr>
<tr>
<td>1.0'-0&quot; (0.305 m)</td>
<td>Block Depth</td>
</tr>
</tbody>
</table>

**Legend:**

- **28" (710 mm) BLOCK**
- **41" (1030 mm) BLOCK**
- **52" (1320 mm) XL BLOCK**
- **72" (1830 mm) XL BLOCK**
- **96" (2440 mm) XL BLOCK**

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

---

**XL HOLLOW-CORE RETAINING BLOCK GRAVITY WALLS**

**Preliminary Height Guide**

#### LOAD CONDITION C

<table>
<thead>
<tr>
<th>Height</th>
<th>1:2 Back Slope, No Toe Slope, No Live Load Surcharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5'-0&quot; (2.29 m)</td>
<td>Block Height</td>
</tr>
<tr>
<td>1.0'-0&quot; (0.305 m)</td>
<td>Block Width</td>
</tr>
<tr>
<td>1.0'-0&quot; (0.305 m)</td>
<td>Block Depth</td>
</tr>
<tr>
<td>2.5'-0&quot; (0.76 m)</td>
<td>Block Height</td>
</tr>
<tr>
<td>1.0'-0&quot; (0.305 m)</td>
<td>Block Width</td>
</tr>
<tr>
<td>1.0'-0&quot; (0.305 m)</td>
<td>Block Depth</td>
</tr>
</tbody>
</table>

**Legend:**

- **28" (710 mm) BLOCK**
- **41" (1030 mm) BLOCK**
- **52" (1320 mm) XL BLOCK**
- **72" (1830 mm) XL BLOCK**
- **96" (2440 mm) XL BLOCK**

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

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Preliminary Height Guide

** φ = 34° | Dense Well-Graded Sand or Sand and Gravel**

**LOAD CONDITION C**

- 18.5-foot (5.63 m) High Section
  - (5) 24" (610 mm) Blocks
  - (1) 26" (660 mm) XL Block
  - (1) 72" (1830 mm) XL Block
  - (1) 96" (2440 mm) XL Block

** φ = 30° | Fine to Medium Sand or Silty Sand**

**XL hollow-core retaining block gravity walls**

<table>
<thead>
<tr>
<th>Assumed retained and foundation soils for this Section</th>
<th>SECTION 2 OF 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW, SP, SM</td>
<td></td>
</tr>
</tbody>
</table>

**Internal angle of friction**

- $\phi = 30^\circ$

**Unit weight**

- $\gamma = 120$ lb/ft$^3$ (18.8 kN/m$^3$)

**Cohesion**

- $c = 0$ lb/ft$^2$ (0 kPa)

---

**Legend:**

- 24" (610 mm) BLOCK
- 41" (1030 mm) BLOCK
- 62" (1320 mm) XL BLOCK
- 72" (1830 mm) XL BLOCK
- 96" (2440 mm) XL BLOCK

SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.
**XL Hollow-Core Retaining Block Gravity Walls**

**Preliminary Height Guide**

**Load Condition B** | 250 lb/ft² (12 kPa) Live Load Surcharge, No Back Slope, No Toe Slope

### φ = 30° | Fine to Medium Sand or Silty Sand

**6.0-Foot (1.83 m) High Section**
- (2) 24" (110 mm) Blocks
- (1) 52" (130 mm) XL Block

**12.0-Foot (3.66 m) High Section**
- (3) 28" (70 mm) Blocks
- (1) 52" (130 mm) XL Block

**15.0-Foot (4.50 m) High Section**
- (3) 28" (70 mm) Blocks
- (1) 52" (130 mm) XL Block

**18.0-Foot (5.40 m) High Section**
- (3) 28" (70 mm) Blocks
- (1) 52" (130 mm) XL Block

### φ = 30° | Fine to Medium Sand or Silty Sand

**7.5-Foot (2.29 m) High Section**
- (2) 24" (110 mm) Blocks
- (1) 52" (130 mm) XL Block

**10.5-Foot (3.10 m) High Section**
- (2) 24" (110 mm) Blocks
- (1) 52" (130 mm) XL Block

**13.5-Foot (3.95 m) High Section**
- (2) 28" (70 mm) Blocks
- (1) 52" (130 mm) XL Block

**Legend:**
- 28" (110 mm) Block
- 41" (103 mm) Block
- 52" (130 mm) XL Block
- 72" (1830 mm) XL Block
- 90" (2440 mm) XL Block

**SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.**
# Preliminary Height Guide

## φ = 30°  
### FINE TO MEDIUM SAND or SILTY SAND

### LOAD CONDITION C  
1 : 2.5 BACK SLOPE, NO TOE SLOPE, NO LIVE LOAD SURCHARGE

#### 6.0-FOOT (1.83 m) HIGH SECTION
1. **28" (710 mm) Blocks**  
   - (1) 52" (1320 mm) XL Block  
   - (1) 72" (1830 mm) XL Block

#### 7.5-FOOT (2.29 m) HIGH SECTION
1. **28" (710 mm) Blocks**  
   - (1) 52" (1320 mm) XL Block  
   - (1) 72" (1830 mm) XL Block

#### 9.0-FOOT (2.74 m) HIGH SECTION
1. **28" (710 mm) Blocks**  
   - (1) 52" (1320 mm) XL Block  
   - (1) 72" (1830 mm) XL Block

#### 10.5-FOOT (3.20 m) HIGH SECTION
1. **28" (710 mm) Blocks**  
   - (1) 52" (1320 mm) XL Block  
   - (1) 72" (1830 mm) XL Block  
   - (1) 96" (2440 mm) XL Block

#### 12.0-FOOT (3.66 m) HIGH SECTION
1. **28" (710 mm) Blocks**  
   - (1) 52" (1320 mm) XL Block  
   - (1) 72" (1830 mm) XL Block  
   - (1) 96" (2440 mm) XL Block

---

### φ = 28°  
### SILTY SAND or CLAYEY SAND

**XL hollow-core retaining block gravity walls**

<table>
<thead>
<tr>
<th>SECTION 3 OF 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM, SC</td>
</tr>
</tbody>
</table>

**Internal angle of friction**

- \( \phi = 28° \)

**Unit weight**

- \( \gamma = 120 \text{ lb/ft}^3 \) (18.8 kN/m\(^3\))

**Cohesion**

- \( c = 0 \text{ lb/ft}^2 \) (0 kPa)

---

**Legend:**

- 28" (710 mm) BLOCK
- 52" (1320 mm) XL BLOCK
- 72" (1830 mm) XL BLOCK
- 96" (2440 mm) XL BLOCK

---

SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.
**XL HOLLOW-CORE RETAINING BLOCK GRAVITY WALLS**

**Preliminary Height Guide**

<table>
<thead>
<tr>
<th>φ = 28°</th>
<th>SILTY SAND or CLAYEY SAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE</td>
<td></td>
</tr>
</tbody>
</table>

**LOAD CONDITION A**

- **9.0'-FOOT (2.74 m) HIGH SECTION**
  - (5) 24" (610 mm) Blocks
  - (1) 62" (1320 mm) XL Block
  - φ = 28°

- **10.5'-FOOT (3.20 m) HIGH SECTION**
  - (5) 24" (610 mm) Blocks
  - (2) 41" (1040 mm) Blocks
  - (1) 62" (1320 mm) XL Block
  - φ = 28°

- **12.5'-FOOT (3.66 m) HIGH SECTION**
  - (5) 24" (610 mm) Blocks
  - (2) 41" (1040 mm) Blocks
  - (1) 72" (1830 mm) XL Block
  - (1) 72" (1830 mm) XL Block
  - φ = 28°

- **13.5'-FOOT (4.11 m) HIGH SECTION**
  - (5) 24" (610 mm) Blocks
  - (2) 41" (1040 mm) Blocks
  - (1) 72" (1830 mm) XL Block
  - φ = 28°

- **15.0'-FOOT (4.57 m) HIGH SECTION**
  - (5) 24" (610 mm) Blocks
  - (2) 41" (1040 mm) Blocks
  - (1) 72" (1830 mm) XL Block
  - (1) 72" (1830 mm) XL Block
  - φ = 28°

- **16.0'-FOOT (4.83 m) HIGH SECTION**
  - (5) 24" (610 mm) Blocks
  - (2) 41" (1040 mm) Blocks
  - (1) 72" (1830 mm) XL Block
  - (1) 72" (1830 mm) XL Block
  - φ = 28°

**Legend:**
- 28" (710 mm) BLOCK
- 41" (1040 mm) BLOCK
- 60" (1520 mm) BLOCK
- 62" (1320 mm) XL BLOCK
- 72" (1830 mm) XL BLOCK
- 96" (2440 mm) XL BLOCK

SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.
XL HOLLOW-CORE RETAINING BLOCK GRAVITY WALLS

Preliminary Height Guide

Load Condition B | 250 lb/ft² (12 kPa) LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

**6.0-FOOT (1.83 m) HIGH SECTION**
(2) 28" (710 mm) Blocks
(1) 32" (810 mm) XL Block

\[ \theta = 28^\circ \]

\[
\begin{align*}
0.06" (1.62 mm) & \quad 1.00" (25.4 mm) \\
\end{align*}
\]

\[ 250 \text{ lb/ft}^2 (12 \text{ kPa}) \]

---

**7.5-FOOT (2.29 m) HIGH SECTION**
(2) 28" (710 mm) Blocks
(1) 32" (810 mm) XL Block

\[ \theta = 28^\circ \]

\[
\begin{align*}
0.06" (1.62 mm) & \quad 1.00" (25.4 mm) \\
\end{align*}
\]

\[ 250 \text{ lb/ft}^2 (12 \text{ kPa}) \]

---

**9.0-FOOT (2.74 m) HIGH SECTION**
(3) 28" (710 mm) Blocks
(1) 32" (810 mm) XL Block

\[ \theta = 28^\circ \]

\[
\begin{align*}
0.06" (1.62 mm) & \quad 1.00" (25.4 mm) \\
\end{align*}
\]

\[ 250 \text{ lb/ft}^2 (12 \text{ kPa}) \]

---

**10.5-FOOT (3.20 m) HIGH SECTION**
(2) 28" (710 mm) Blocks
(1) 32" (810 mm) XL Block

\[ \theta = 28^\circ \]

\[
\begin{align*}
0.06" (1.62 mm) & \quad 1.00" (25.4 mm) \\
\end{align*}
\]

\[ 250 \text{ lb/ft}^2 (12 \text{ kPa}) \]

---

**12.0-FOOT (3.66 m) HIGH SECTION**
(3) 28" (710 mm) Blocks
(1) 32" (810 mm) XL Block

\[ \theta = 28^\circ \]

\[
\begin{align*}
0.06" (1.62 mm) & \quad 1.00" (25.4 mm) \\
\end{align*}
\]

\[ 250 \text{ lb/ft}^2 (12 \text{ kPa}) \]

---

**13.5-FOOT (4.11 m) HIGH SECTION**
(2) 28" (710 mm) Blocks
(2) 32" (810 mm) Blocks
(1) 32" (810 mm) XL Block

\[ \theta = 28^\circ \]

\[
\begin{align*}
0.06" (1.62 mm) & \quad 1.00" (25.4 mm) \\
\end{align*}
\]

\[ 250 \text{ lb/ft}^2 (12 \text{ kPa}) \]

---

**Legend:**

- 28" (710 mm) BLOCK
- 41" (1040 mm) BLOCK
- 60" (1520 mm) BLOCK
- 52" (1320 mm) XL BLOCK
- 72" (1830 mm) XL BLOCK
- 96" (2440 mm) XL BLOCK

See notes and recommended details at start of Preliminary Height Guide.
### PRELIMINARY HEIGHT GUIDE

**Load Condition C**

1:2.5 Back Slope, No Toe Slope, No Live Load Surcharge

#### 4.5-Foot (1.37 m) High Section

- (1) 28" (710 mm) Block
- (1) 60" (1520 mm) XL Block

#### 7.0-Foot (2.13 m) High Section

- (1) 28" (710 mm) Block
- (1) 60" (1520 mm) Block
- (1) 18" (440 mm) XL Block

#### 9.0-Foot (2.74 m) High Section

- (1) 28" (710 mm) Block
- (1) 72" (1830 mm) XL Block
- (1) 18" (440 mm) XL Block

### XL HOLLOW-CORE RETAINING BLOCK GRAVITY WALLS

**Allowable Stress Design**

**ϕ = 28°**

Silty Sand or Clayey Sand

---

**ϕ = 40° Over 26°**

 Crushed Stone Backfill Replacing Silty or Clayey Sand

<table>
<thead>
<tr>
<th>Wall Type</th>
<th>Section 4 of 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL hollow-core retaining block gravity walls</td>
<td>GW, GP</td>
</tr>
<tr>
<td>Assumed soil backfill / retained soil for this Section</td>
<td>Internal angle of friction</td>
</tr>
<tr>
<td></td>
<td>θ = 40°</td>
</tr>
<tr>
<td>Unit weight</td>
<td>γ = 130 lb/ft³ (20.4 kN/m³)</td>
</tr>
<tr>
<td>Cohesion</td>
<td>c = 0 lb/ft² (0 kPa)</td>
</tr>
<tr>
<td>Assumed native / foundation soil for this Section</td>
<td>Internal angle of friction</td>
</tr>
<tr>
<td></td>
<td>θ = 26°</td>
</tr>
<tr>
<td>Unit weight</td>
<td>γ = 120 lb/ft³ (18.8 kN/m³)</td>
</tr>
<tr>
<td>Cohesion</td>
<td>c = 0 lb/ft² (0 kPa)</td>
</tr>
</tbody>
</table>

* This analysis assumes native material is removed to a 1:1 slope or flatter from the back of the proposed retaining wall blocks and replaced with compacted crushed stone.

---

**Legend:**

- 28" (710 mm) BLOCK
- 41" (1040 mm) BLOCK
- 60" (1520 mm) BLOCK
- 52" (1320 mm) XL BLOCK
- 72" (1830 mm) XL BLOCK
- 96" (2440 mm) XL BLOCK

SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.
XL HOLLOW-CORE RETAINING BLOCK GRAVITY WALLS

Preliminary Height Guide

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

<table>
<thead>
<tr>
<th>Height</th>
<th>Design Parameters</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.5' (3.20 m)</td>
<td>40° over 26°</td>
<td>1'2&quot; (305 mm)</td>
</tr>
<tr>
<td>12.5' (3.80 m)</td>
<td>40° over 26°</td>
<td>1'2&quot; (305 mm)</td>
</tr>
<tr>
<td>15.5' (4.70 m)</td>
<td>40° over 26°</td>
<td>1'2&quot; (305 mm)</td>
</tr>
<tr>
<td>18.5' (5.50 m)</td>
<td>40° over 26°</td>
<td>1'2&quot; (305 mm)</td>
</tr>
<tr>
<td>19.5' (5.90 m)</td>
<td>40° over 26°</td>
<td>1'2&quot; (305 mm)</td>
</tr>
</tbody>
</table>

Legend:
- 20" (510 mm) BLOCK
- 41" (1030 mm) BLOCK
- 52" (1320 mm) XL BLOCK
- 72" (1830 mm) XL BLOCK
- 90" (2440 mm) XL BLOCK

SEE NOTES AND RECOMMENDED DETAILS AT START OF PRELIMINARY HEIGHT GUIDE.
Preliminary Height Guide

\[ \phi = 40^\circ \text{ over } 26^\circ \]

**LOAD CONDITION C**

- 7.5-FOOT (2.29 m) HIGH SECTION
  - (2) 28" (710 mm) Blocks
  - (1) 41" (1050 mm) Block
  - (1) 52" (1320 mm) XL Block

- 10.5-FOOT (3.20 m) HIGH SECTION
  - (2) 28" (710 mm) Blocks
  - (1) 41" (1050 mm) Block
  - (1) 52" (1320 mm) XL Block
  - (1) 72" (1830 mm) XL Block

- 13.5-FOOT (4.11 m) HIGH SECTION
  - (2) 28" (710 mm) Blocks
  - (1) 41" (1050 mm) Block
  - (1) 52" (1320 mm) XL Block
  - (1) 72" (1830 mm) XL Block
  - (1) 96" (2440 mm) XL Block

\[ \phi = 40^\circ \]

**CRUSHED STONE BACKFILL REPLACING SILTY or CLAYEY SAND**

Legend:

- = 28" (710 mm) BLOCK
- = 41" (1050 mm) BLOCK
- = 52" (1320 mm) XL BLOCK
- = 72" (1830 mm) XL BLOCK
- = 96" (2440 mm) XL BLOCK

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