KEYSTONE® RETAINING WALL SYSTEMS
WALL DESIGN/ESTIMATING

Broadstone® Series
Retaining Wall Units

Note: Product availability, face finish, and dimensions vary by manufacturer. Please contact local Keystone product representative for availability.
KEYSTONE® RETAINING WALL SYSTEMS
GRAVITY WALL DESIGN/ESTIMATING CHART
BROADSTONE® SERIES

TYPICAL GRAVITY WALL SECTION
1.8˚-2.4˚ Batter

<table>
<thead>
<tr>
<th>6&quot; BROADSTONE UNITS</th>
<th>BACKSLOPE</th>
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</thead>
<tbody>
<tr>
<td>SOIL TYPE</td>
<td>Level</td>
</tr>
<tr>
<td>Sand/Gravel (ɸ=34˚ &amp; Ɣ=120 PCF)</td>
<td>3.00’</td>
</tr>
<tr>
<td>Silty Sand (ɸ=30˚ &amp; Ɣ=120 PCF)</td>
<td>2.5’</td>
</tr>
<tr>
<td>Silt/Lean Clay (ɸ=26˚ &amp; Ɣ=120 PCF)</td>
<td>2.00’</td>
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MAXIMUM TOTAL HEIGHT

<table>
<thead>
<tr>
<th>8&quot; BROADSTONE UNITS</th>
<th>BACKSLOPE</th>
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<tbody>
<tr>
<td>SOIL TYPE</td>
<td>Level</td>
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<tr>
<td>Sand/Gravel (ɸ=34˚ &amp; Ɣ=120 PCF)</td>
<td>2.67’</td>
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<tr>
<td>Silty Sand (ɸ=30˚ &amp; Ɣ=120 PCF)</td>
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</tr>
<tr>
<td>Silt/Lean Clay (ɸ=26˚ &amp; Ɣ=120 PCF)</td>
<td>2.00’</td>
</tr>
</tbody>
</table>

MAXIMUM TOTAL HEIGHT

GRAVITY WALL HEIGHT LIMITS
Broadstone Wall Units

NOTES:

- Wall design height is total top to bottom height excluding caps.
- Minimum wall embedment is 6 inches for reasonably level toe slope condition.
- Leveling pad is 6” thick crushed stone base.
- Analysis based on Coulomb earth pressure analysis per NCMA Design Manual, 3rd Ed.
- Assumed soil design properties shown in chart.
- No additional surcharges considered in design charts other than slopes listed.
- All backfill material to be compacted to 95% Standard Proctor Density.
- See wall construction manual and specifications for all details pertaining to wall design, drainage, and installation.
NOTES:

- Wall design height is total top to bottom height excluding caps.
- Minimum wall embedment is 6 inches or 10% Height for reasonably level toe slope condition.
- Leveling pad is 6" thick crushed stone base.
- Analysis based on Coulomb earth pressure analysis per NCMA Design Manual, 3rd Ed.
- Assumed soil design properties shown in reinforcement charts.
  Soil properties assumed the same for reinforced, retained, and foundation zones.
- No surcharge (landscaping), 100 psf live load, and 3H:1V backslope conditions considered.
- Geogrid soil reinforcement long term design strength, LTDS = 1800 plf minimum.
- Reinforcement lengths provided are the full length of reinforcement in principal strength direction placed perpendicular to wall face.
- All backfill material to be compacted to 95% Standard Proctor Density.
- See wall construction manual and specifications for all details pertaining to wall design, drainage, and installation.
- Perform site specific engineering as required for any permit requirements.
Preliminary Design/Estimating Charts
Sand/Gravel Soil - $\phi = 34^\circ$, $\gamma = 120$ pcf

**KEY**
- Soil Reinforcement Level & Length
- Min. Reinforcement LTDS = 1800 plf

**CASE I**
- Design Height
- Reinforcement Not Required
- Reinforced Soil Type

**CASE II**
- Design Height
- Reinforcement Not Required
- Reinforced Soil Type

**CASE III**
- Design Height
- Reinforcement Not Required
- Reinforced Soil Type

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**Design Height**

- 2.0'
- 3.0'
- 4.0'
- 5.0'
- 6.0'
- 7.0'

**Soil Reinforcement Level & Length**

- Min. Reinforcement LTDS = 1800 plf

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**CASE I**

- Design Height
- Reinforcement Not Required
- Reinforced Soil Type

**CASE II**

- Design Height
- Reinforcement Not Required
- Reinforced Soil Type

**CASE III**

- Design Height
- Reinforcement Not Required
- Reinforced Soil Type

---

**Project:** BROADSTONE 6" UNITS

**Title:** DESIGN / ESTIMATING CHARTS

<table>
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<tr>
<th>Designed By:</th>
<th>Checked By:</th>
<th>Scale:</th>
<th>Revision:</th>
<th>Date:</th>
<th>Drawing No:</th>
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<td>ps</td>
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<td>1</td>
<td>5/2020</td>
<td>3 of 8</td>
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4444 West 78th Street, Minneapolis, MN 55435
www.keystonewalls.com
Preliminary Design/Estimating Charts
Silty Sand Soil - $\phi = 30^\circ$, $\gamma = 120$ pcf

CASE I

CASE II

CASE III

Design Height

Reinforcement Level & Length

Min. Reinforcement LTDS = 1800 plf
Preliminary Design/Estimating Charts
Silty Sand Soil - $\phi = 30^\circ$, $\gamma = 120$pcf

**CASE I**
Level, No Surcharges

**CASE II**
Level, 100 psf Surcharges

**CASE III**
Level, 100 pcf Surcharges

Key:
- Soil Reinforcement Level & Length
- Min. Reinforcement LTDS = 1800 plf

Reinforcement:
- Not Required

Design Height:
- 1.33'
- 2.67'
- 4.00'
- 5.33'
- 6.67'
- 8.0'

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Keystone Wall Systems
4444 West 78th Street, Minneapolis, MN 55435
www.keystonewalls.com

Project: BROADSTONE 8" UNITS
Title: DESIGN / ESTIMATING CHARTS

Design By: dt
Checked By: ps
Scale: none
Revision: 1
Date: 5/2020
Drawing No: 7 of 8