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HOLLOW CORE RETAINING BLOCKS

Infill Weight Calculations

R-5236HC 52" HOLLOW CORE RETAINING BLOCK WITH CRUSHED STONE INFILL

INFILLED UNIT WEIGHT CALCULATIONS

CONCRETE

*Design Unit Weight = 143 pcf (2,291 kg/m²)*

LEDGESTONE FACE TEXTURE

Average Volume (Vc) 23.29 cft (0.66 m³) (From CAD Model)
Concrete Block Weight (Wc) 23.29 cft x 143 pcf = 3,331 lbs (1,511 kg)
Average Center of Gravity (COGc) 29.0 in (737 mm) (From CAD Model)

INFILL

*Design Unit Weight = 100 pcf (1,502 kg/m²)*

Material considered as Infill includes the crushed stone between adjacent blocks and in the hollow cores within the blocks.

Volume (Vs) 22.88 cft (0.65 m³) (From CAD Model)
Infill Soil Weight (Ws) 22.88 cft x 100 pcf = 2,288 lbs (1,038 kg)
Center of Gravity (COGs) 20.0 in (507 mm) (From CAD Model)

DESIGN VOLUME & CENTER OF GRAVITY

52 in x 46.125 in x 36 in = 49.97 cft
(1.321 m x 1.172 m x 0.914 m = 1.415 m³)
COG = (29.0 in (3,331 lbs) + 20.0 in (2,288 lbs)) / (3,331 lbs + 2,288 lbs) = 25.34 in (644 mm)

INFILLED UNIT WEIGHT

LEDGESTONE FACE TEXTURE

\[ \gamma_{\text{INFILL}} = \frac{(3,331 \text{ lb} + 2,288 \text{ lb})}{49.97 \text{ cft}} = 112.4 \text{ pcf} \]

\[ ((1,511 \text{ kg} + 1,038 \text{ kg}) / 1.415 \text{ m}^3 = 1,801 \text{ kg/m}^3) \]

NOTE: The infilled unit weights shown here are reference values. Several factors can cause the unit weights of both concrete and infill soil to vary. The designer should use sound engineering judgement when assigning an infilled unit weight value for analysis. For overturning analyses, AASHTO recommends limiting the infill soil weight to 80% of its theoretical maximum.
INFILLED UNIT WEIGHT CALCULATIONS

**CONCRETE**

- Design Unit Weight = 143 pcf (2,291 kg/m³)

**LEDGESTONE FACE TEXTURE**

- Average Volume (Vc) = 29.10 cft (0.82 m³) (From CAD Model)
- Concrete Block Weight (Wc) = 29.10 cft x 143 pcf = 4,162 lbs (1,888 kg)
- Average Center of Gravity (COGc) = 39.9 in (1,013 mm) (From CAD Model)

**INFILL**

- Design Unit Weight = 100 pcf (1,502 kg/m³)

Material considered as Infill includes the crushed stone between adjacent blocks and in the hollow cores within the blocks.

- Volume (Vs) = 36.29 cft (1.03 m³) (From CAD Model)
- Infill Soil Weight (Ws) = 36.29 cft x 100 pcf = 3,629 lbs (1,646 kg)
- Center of Gravity (COGs) = 30.0 in (762 mm) (From CAD Model)

**DESIGN VOLUME & CENTER OF GRAVITY**

- 72 in x 46.125 in x 36 in = 69.19 cft
  (1.829 m x 1.172 m x 0.914 m = 1.959 m³)
- COG = (39.9 in (4,162 lbs) + 30.0 in (3,629 lbs))/(4,162 lbs + 3,629 lbs) = 35.26 in (896 mm)

**INFILLED UNIT WEIGHT**

**LEDGESTONE FACE TEXTURE**

\[ \gamma_{\text{INFILL}} = (4,162 \text{ lb} + 3,629 \text{ lb}) / 69.19 \text{ cft} = 112.6 \text{ pcf} \]
\[ (1,888 \text{ kg} + 1,646 \text{ kg}) / 1.959 \text{ m}^3 = 1,804 \text{ kg/m}^3 \]

**NOTE:** The infilled unit weights shown here are reference values. Several factors can cause the unit weights of both concrete and infill soil to vary. The designer should use sound engineering judgement when assigning an infilled unit weight value for analysis. For overturning analyses, AASHTO recommends limiting the infill soil weight to 80% of its theoretical maximum.
**INFILLED UNIT WEIGHT CALCULATIONS**

**CONCRETE**

*Design Unit Weight* = 143 pcf (2.291 kg/m³)

**LEDGESTONE FACE TEXTURE**

- Average Volume (Vc) = 33.83 cft (0.96 m³) (From CAD Model)
- Concrete Block Weight (Wc) = 33.83 cft x 143 pcf = 4,837 lbs (2,194 kg)
- Average Center of Gravity (COGc) = 55.3 in (1,405 mm) (From CAD Model)

**INFILL**

*Design Unit Weight* = 100 pcf (1,502 kg/m³)

Material considered as Infill includes the crushed stone between adjacent blocks and in the hollow cores within the blocks.

- Volume (Vs) = 54.63 cft (1.55 m³) (From CAD Model)
- Infill Soil Weight (Ws) = 54.63 cft x 100 pcf = 5,463 lbs (2,478 kg)
- Center of Gravity (COGs) = 40.7 in (1,034 mm) (From CAD Model)

**DESIGN VOLUME**

96 in x 46.125 in x 36 in = 92.25 cft
(2.438 m x 1.172 m x 0.914 m = 2.612 m³)

COG = (55.3 in (4,837 lbs) + 40.7 in (5,463 lbs)) / (4,837 lbs + 5,463 lbs) = 47.57 in (1,208 mm)

**INFILLED UNIT WEIGHT**

**LEDGESTONE FACE TEXTURE**

\[ \gamma_{\text{INFL}} = \frac{(4,837 \text{ lb} + 5,463 \text{ lb})}{92.25 \text{ cft}} = 111.7 \text{ pcf} \]

\[ (2,194 \text{ kg} + 2,478 \text{ kg}) / 2.612 \text{ m}^3 = 2,161 \text{ kg/m}^3 \]

**NOTE:** The infilled unit weights shown here are reference values. Several factors can cause the unit weights of both concrete and infill soil to vary. The designer should use sound engineering judgement when assigning an infilled unit weight value for analysis. For overturning analyses, AASHTO recommends limiting the infill soil weight to 80% of its theoretical maximum.
**RETAILING BLOCKS**

**Reinforcing Steel**

**R-5236HC 52” (1,320 mm) Hollow Core Retaining Block**

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### 3D VIEW

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### BAR DIAGRAM

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### BAR SCHEDULE

<table>
<thead>
<tr>
<th>BAR*</th>
<th>DIMENSIONS</th>
<th>LENGTH/BAR</th>
<th>NO. BARS</th>
<th>TOTAL LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2'-8&quot; (813 mm)</td>
<td>2'-8&quot; (0.81 m)</td>
<td>10</td>
<td>26'-8&quot; (8.13 m)</td>
</tr>
<tr>
<td>B</td>
<td>3'-6&quot; (1067 mm) 2'-0 3(\frac{3}{8})&quot; (629 mm) 1'-8 1(\frac{3}{8})&quot; (527 mm) 1'-4 1(\frac{3}{8})&quot; (413 mm)</td>
<td>11'-9&quot; (3.58 m)</td>
<td>2</td>
<td>23'-6&quot; (7.16 m)</td>
</tr>
</tbody>
</table>

*All bars #4, ASTM A615 Grade 60 (13 mm, 420 mPa)
Notes:
1. All bar shall comply with ASTM A615, Grade 60 (13 mm, 420 MPa).
2. Tie all bar intersections.
3. Maintain concrete cover of no less than 1 inch (25 mm) over all reinforcing steel. Actual cover varies.
**REINFORCING STEEL**

**R-7236HC 72” (1,830 mm) Hollow Core Retaining Block**

### BAR SCHEDULE

<table>
<thead>
<tr>
<th>BAR</th>
<th>DIMENSIONS</th>
<th>LENGTH/BAR</th>
<th>NO. BARS</th>
<th>TOTAL LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2'-8&quot; (813 mm)</td>
<td>2'-8&quot; (0.81 m)</td>
<td>12</td>
<td>32'-0&quot; (9.75 m)</td>
</tr>
<tr>
<td>B</td>
<td>5'-1½&quot; (1562 mm)</td>
<td>14'-10&quot; (4.52 m)</td>
<td>2</td>
<td>29'-8&quot; (9.04 m)</td>
</tr>
<tr>
<td></td>
<td>2'-0&quot; ½&quot; (629 mm)</td>
<td>1'-6 ½&quot; (470 mm)</td>
<td>1</td>
<td>29'-8&quot; (9.04 m)</td>
</tr>
<tr>
<td></td>
<td>1'-3 ½&quot; (387 mm)</td>
<td>14'-10&quot; (4.52 m)</td>
<td>2</td>
<td>29'-8&quot; (9.04 m)</td>
</tr>
</tbody>
</table>

*All bars #4, ASTM A615 Grade 60 (13 mm, 420 mPa)*
Notes:
1. All bar shall comply with ASTM A615, Grade 60 (13 mm, 420 MPa).
2. Tie all bar intersections.
3. Maintain concrete cover of no less than 1 inch (25 mm) over all reinforcing steel. Actual cover varies.
**BAR SCHEDULE**

<table>
<thead>
<tr>
<th>BAR*</th>
<th>DIMENSIONS</th>
<th>LENGTH/BAR</th>
<th>NO. BARS</th>
<th>TOTAL LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2'-8&quot; (813 mm)</td>
<td>2'-8&quot; (0.81 m)</td>
<td>14</td>
<td>37'-4&quot; (11.38 m)</td>
</tr>
<tr>
<td>B</td>
<td>7'-1/2&quot; (2172 mm) 2'-0 2/3&quot; (629 mm) 1'-4&quot; (406 mm) 1'-2&quot; (356 mm)</td>
<td>18'-8&quot; (5.69 m)</td>
<td>2</td>
<td>37'-4&quot; (11.38 m)</td>
</tr>
</tbody>
</table>

TOTAL: 74'-8" (22.76 m)

*All bars #4, ASTM A615 Grade 60 (13 mm, 420 mPa)
**Notes:**

1. All bar shall comply with ASTM A615, Grade 60 (13 mm, 420 MPa).
2. Tie all bar intersections.
3. Maintain concrete cover of no less than 1 inch (25 mm) over all reinforcing steel. Actual cover varies.
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**52" (1320 mm) XL BLOCKS**

Note: Upper row of block shown in color, with cut-out at shear groove location to illustrate engagement with and location of shear knobs on underlying row (shown in gray).

**Odd Row**

- 52" (1320 mm) XL block (typ.)
- 90° corner blocks (two blocks stacked)
- Generally align texture of corner blocks with top half of adjacent XL blocks
- Trimming shear knobs with concrete chop saw may be required for proper alignment
- Cut lift hooks after setting block, as required

**Even Row**

- 52" (1320 mm) XL block (typ.)
- Generally align texture of corner blocks with top half of adjacent XL blocks
- 90° corner blocks (two blocks stacked)
- Trimming shear knobs with concrete chop saw may be required for proper alignment

52" (1320 mm) XL BLOCKS

Trimming shear knobs with concrete chop saw may be required for proper alignment

Generally align texture of corner blocks with top half of adjacent XL blocks

Odd Row

Even Row

Note: Upper row of block shown in color, with cut-out at shear groove location to illustrate engagement with and location of shear knobs on underlying row (shown in gray).
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72" (1830 mm) XL BLOCKS

Note: Upper row of block shown in color, with cut-out at shear groove location to illustrate engagement with and location of shear knobs on underlying row (shown in gray).

Odd Row

Cut lift hooks after setting block, as required

Even Row

Trimming shear knobs with concrete chop saw may be required for proper alignment

Generally align texture of corner blocks with top half of adjacent XL blocks

XL 90-Degree Outside Corner Detail

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XL 90-Degree Outside Corner Detail

Two 18" (457 mm) high 28" (710 mm)-series blocks

Two 18" (457 mm) high freestanding corner blocks

72" (1830mm) XL blocks
36" (914 mm) high (typ.)

Second row

Two 18" (457 mm) high freestanding corner blocks

First row

52" (1320 mm) XL block

Two 18" (457 mm) high freestanding corner blocks

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96" (2440 mm) XL BLOCKS

Note: Upper row of block shown in color, with cut-out at shear groove location to illustrate engagement with and location of shear knobs on underlying row (shown in gray).

96" (2440 mm) XL block (typ.)

28" (710 mm) retaining blocks (two blocks stacked)

90° corner blocks (two blocks stacked)

Trimming shear knobs with concrete chop saw may be required for proper alignment

Generally align texture of corner blocks with top half of adjacent XL blocks

Odd Row

Cut lift hooks after setting block, as required

96" (2440 mm) XL block (typ.)

52" (1320 mm) XL block (typ.)

Trimming shear knobs with concrete chop saw may be required for proper alignment

90° corner block (two blocks stacked)

Generally align texture of corner blocks with top half of adjacent XL blocks

Even Row

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INSIDE CORNER | INTERLACED OPTION

Note: Upper row of block shown in color, with cut-out at shear groove location to illustrate engagement with, and location of, shear knobs on underlying row (shown in gray).

72" (1830 mm) block shown to illustrate concept. Concept applies to other XL block sizes.

Interlace alternating rows at corner

XL block (typ.)

Ensure block is fully supported by compacted base material underneath.

Trim shear knobs with concrete chop saw to allow for proper alignment or align underlying course such that knob lines up with groove.

1\(\frac{1}{2}\)" gap due to face texture. Gap may be reduced by trimming texture and/or edge. Place geotextile drainage material at face.

Odd Row

Interlace alternating rows at corner

Even Row

XL block (typ.)

1\(\frac{1}{2}\)" gap due to face texture. Gap may be reduced by trimming texture and/or edge. Place geotextile drainage material at face.

Trim shear knobs with concrete chop saw to allow for proper alignment or align underlying course such that knob lines up with groove.

Ensure block is fully supported using compacted base material

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INSIDE CORNER | INTERLACED OPTION

XL block (typical)

Rear View

Front View

72" (1830 mm) block shown to illustrate concept. Concept applies to other XL block sizes.

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Note: Upper row of block shown in color, with cut-out at shear groove location to illustrate engagement with, and location of, shear knobs on underlying row (shown in gray).

72" (1830 mm) block shown to illustrate concept. Concept applies to other XL block sizes.

1\(\frac{1}{2}\)" gap due to face texture. Gap may be reduced by trimming texture and/or edge. Place geotextile drainage material at face.

Trim texture or offset upper 60-inch (1520 mm) block to split gap created by XL face texture. Place non-woven geotextile fabric between adjacent blocks at face.

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INSIDE CORNER | ABUTTED OPTION

Two 18-inch (457 mm) high, 60-inch (1520 mm) half-blocks

XL block (typical)

Abut this wall segment against adjacent segment

Build this wall segment first

Front View

Rear View

72" (1830 mm) block shown to illustrate concept. Concept applies to other XL block sizes.

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