

Redi-Rock 28" (710 mm) Retaining Blocks

The Redi-Rock 28" (710mm) Retaining wall blocks are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended for use in the construction of dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock Retaining wall products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾	TOP	MIDDLE	BOTTOM	HALF TOP	HALF MIDDLE	HALF BOTTOM
HEIGHT (FRONT OF BLOCK)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)
HEIGHT (BACK OF BLOCK)	13 ± 3/16 (330 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	13 ± 3/16 (330 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)
LENGTH (FRONT OF BLOCK)	46 1/8 ± 1/2 (1172 ± 13)			22 13/16 ± 1/4 (579 ± 6)		
LENGTH (BACK OF BLOCK)	40 ± 1/2 (1016 ± 13)			16 13/16 ± 1/4 (427 ± 6)		
WIDTH	22 5/8 ± 1/2 (575 ± 13) FORM LINE TO BACK OF BLOCK AND ± 5 3/8 (136) FACE TEXTURE					
CONCRETE VOLUME	TOP	MIDDLE	BOTTOM	HALF TOP	HALF MIDDLE	HALF BOTTOM
LIMESTONE/COBBLESTONE FACE	±8.57 ft ³ (0.243 m ³)	±11.28 ft ³ (0.319 m ³)	±12.19 ft ³ (0.345 m ³)	±4.01 ft ³ (0.113 m ³)	±5.23 ft ³ (0.148 m ³)	±5.66 ft ³ (0.160 m ³)
LEDGESTONE FACE	±8.07 ft ³ (0.229 m ³)	±10.78 ft ³ (0.305 m ³)	±11.70 ft ³ (0.331 m ³)	±3.76 ft ³ (0.106 m ³)	±4.98 ft ³ (0.141 m ³)	±5.41 ft ³ (0.153 m ³)
SHIPPING/HANDLING WEIGHT ⁽²⁾	TOP	MIDDLE	BOTTOM	HALF TOP	HALF MIDDLE	HALF BOTTOM
LIMESTONE/COBBLESTONE FACE	± 1229 lb (557 kg)	± 1613 lb (732 kg)	± 1744 lb (791 kg)	± 573 lb (260 kg)	± 748 lb (339 kg)	± 809 lb (367 kg)
LEDGESTONE FACE	± 1158 lb (525 kg)	± 1542 lb (699 kg)	± 1672 lb (758 kg)	± 538 lb (244 kg)	± 713 lb (323 kg)	± 774 lb (351 kg)

⁽¹⁾ All dimensions are inches (mm).

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.

CONCRETE MIX PROPERTIES ⁽³⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ^(8,9)					0.15
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ^(10,12) (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹¹⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹¹⁾					35

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to order placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ Where used in high sulfate environments or where alkali-silica reactivity is an issue, water soluble chloride shall be limited to no more than trace amounts (from impurities in concrete-making components, not intended constituents.)

⁽¹⁰⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

(a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.

(b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.

(c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹¹⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

⁽¹²⁾ Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze/thaw durability in a detailed and current testing program.

Redi-Rock 28" (710 mm) Retaining Blocks

DESIGN PROPERTIES

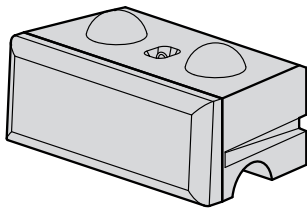
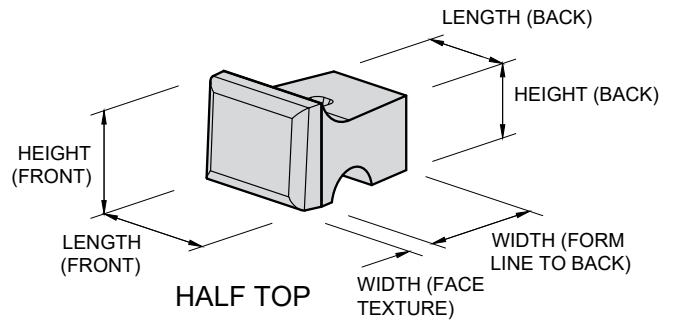
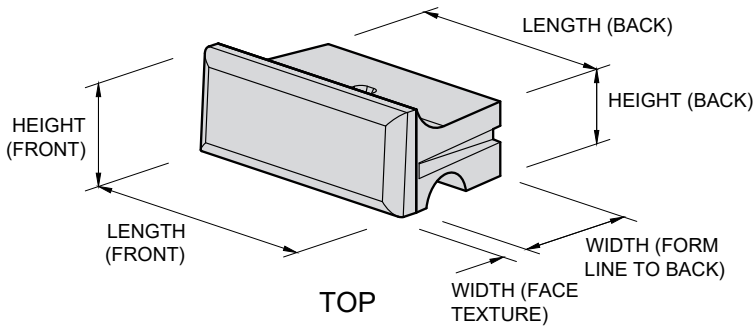
HORIZONTAL SETBACK / WALL FACE BATTER OPTIONS		BLOCK TO BLOCK INTERFACE SHEAR ⁽¹²⁾
10 inch (254 mm) KNOB	1 5/8 inch (41 mm) PER BLOCK COURSE (5.2° BATTER)	$V = 6,061 + N \tan 44^\circ \leq 11,276 \text{ lb/ft}$ ($88.4 + N \tan 44^\circ \leq 164.5 \text{ kN/m}$)
7 1/2 inch (190 mm) KNOB	3/8 inch (10 mm) PER BLOCK COURSE (1.2° BATTER)	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft}$ ($17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m}$)
6 3/4 inch (171 mm) KNOB	NO SETBACK (NO BATTER) ⁽¹¹⁾	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft}$ ($17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m}$)
INFILLED UNIT WEIGHT FOR WALL STABILITY CALCULATIONS ⁽¹³⁾		
LIMESTONE / COBBLESTONE BLOCKS		127 lb/ft ³ (2082 kg/m ³)
LEDGESTONE BLOCKS		122 lb/ft ³ (1954 kg/m ³)
MINIMUM CONSTRUCTION RADIUS ⁽¹⁴⁾		
CONCAVE CURVE		14 ft 6 in (4.42 m)
CONVEX CURVE		14 ft 6 in (4.42 m)

⁽¹¹⁾ Special consideration should be given to the design of vertical retaining walls subject to active lateral earth pressure.

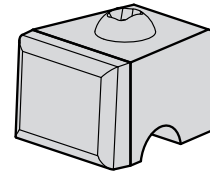
⁽¹²⁾ Values based on full scale testing performed in October 2011. Copies of the full test reports are available at www.redi-rock.com.

⁽¹³⁾ The infilled unit weights shown here are based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³) and an assumed soil unit weight of 100 lb/ft³ (1602 kN/m³). They 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.

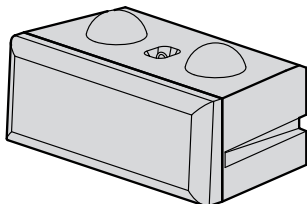
⁽¹⁴⁾ The minimum construction radius stated is applicable to both concave and convex curved retaining wall sections. Increases to this minimum radius are required to account for wall batter. Special consideration should be given to block selection, facing batter, and wall height when selecting the minimum radius for the final wall alignment.



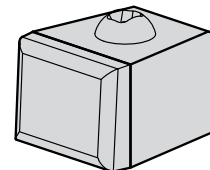
MIDDLE



HALF MIDDLE



BOTTOM



HALF BOTTOM

Redi-Rock 41" (1030 mm) Retaining Blocks

The Redi-Rock 41" (1030mm) Retaining wall blocks are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended for use in the construction of dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock Retaining wall products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾	TOP	MIDDLE	BOTTOM	HALF TOP	HALF MIDDLE	HALF BOTTOM
HEIGHT (FRONT OF BLOCK)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)
HEIGHT (BACK OF BLOCK)	13 ± 3/16 (330 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	13 ± 3/16 (330 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)
LENGTH (FRONT OF BLOCK)	46 1/8 ± 1/2 (1172 ± 13)			22 13/16 ± 1/4 (579 ± 6)		
LENGTH (BACK OF BLOCK)	36 5/8 ± 1/2 (930 ± 13)			13 9/16 ± 1/4 (344 ± 6)		
WIDTH	35 5/8 ± 1/2 (892 ± 13) FORM LINE TO BACK OF BLOCK AND ± 5 5/8 (136) FACE TEXTURE					
CONCRETE VOLUME	BOTTOM	MIDDLE	BOTTOM	HALF MIDDLE	HALF MIDDLE	HALF BOTTOM
LIMESTONE/COBBLESTONE FACE	±12.22 ft ³ (0.346 m ³)	±16.14 ft ³ (0.457 m ³)	±17.06 ft ³ (0.483 m ³)	±5.38 ft ³ (0.15 m ³)	±7.14 ft ³ (0.202 m ³)	±7.58 ft ³ (0.214 m ³)
LEDGESTONE FACE	±11.73 ft ³ (0.332 m ³)	±15.65 ft ³ (0.443 m ³)	±16.56 ft ³ (0.469 m ³)	±5.14 ft ³ (0.15 m ³)	±6.90 ft ³ (0.195 m ³)	±7.33 ft ³ (0.208 m ³)
SHIPPING/HANDLING WEIGHT ⁽²⁾	MIDDLE	BOTTOM	HALF MIDDLE	HALF MIDDLE	HALF BOTTOM	
LIMESTONE/COBBLESTONE FACE	± 1748 lb (793 kg)	± 2309 lb (1047 kg)	± 2439 lb (1106 kg)	± 770 lb (350 kg)	± 1022 lb (463 kg)	±1083 lb (491 kg)
LEDGESTONE FACE	± 1677 lb (760 kg)	± 2237 lb (1015 kg)	± 2368 lb (1074 kg)	± 735 lb (333 kg)	± 987 lb (448 kg)	± 1048 lb (475 kg)

⁽¹⁾ All dimensions are inches (mm).

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.

CONCRETE MIX PROPERTIES ⁽³⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ^(8,9)					0.15
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ^(10,12) (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹²⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹²⁾					35
ALKALI-AGGREGATE REACTIVITY MITIGATION PER ACI 201					

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to order placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ Where used in high sulfate environments or where alkali-silica reactivity is an issue, water soluble chloride shall be limited to no more than trace amounts (from impurities in concrete-making components, not intended constituents.)

⁽¹⁰⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

- (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- (c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹¹⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

⁽¹²⁾ Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze/thaw durability in a detailed and current testing program.

Redi-Rock 41" (1030 mm) Retaining Blocks

DESIGN PROPERTIES

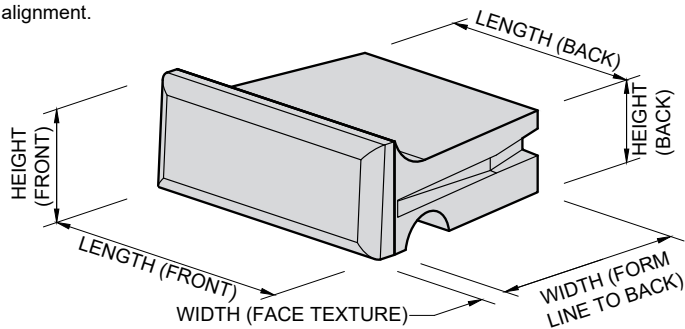
HORIZONTAL SETBACK / WALL FACE BATTER OPTIONS		BLOCK TO BLOCK INTERFACE SHEAR ⁽¹³⁾
10 inch (254 mm) KNOB	1 5/8 inch (41 mm) PER BLOCK COURSE (5.2° BATTER)	$V = 6,061 + N \tan 44^\circ \leq 11,276 \text{ lb/ft} (88.4 + N \tan 44^\circ \leq 164.5 \text{ kN/m})$
7 1/2 inch (190 mm) KNOB	3/8 inch (10 mm) PER BLOCK COURSE (1.2° BATTER)	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft} (17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m})$
6 3/4 inch (171 mm) KNOB	NO SETBACK (NO BATTER) ⁽¹²⁾	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft} (17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m})$
INFILLED UNIT WEIGHT FOR WALL STABILITY CALCULATIONS ⁽¹⁴⁾		
LIMESTONE / COBBLESTONE BLOCKS		130 lb/ft ³ (2082 kg/m ³)
LEDGESTONE BLOCKS		126 lb/ft ³ (2018 kg/m ³)
MINIMUM CONSTRUCTION RADIUS ⁽¹⁵⁾		
CONCAVE CURVE		14 ft 6 in (4.42 m)
CONVEX CURVE		14 ft 6 in (4.42 m)

⁽¹²⁾ Special consideration should be given to the design of vertical retaining walls subject to active lateral earth pressure.

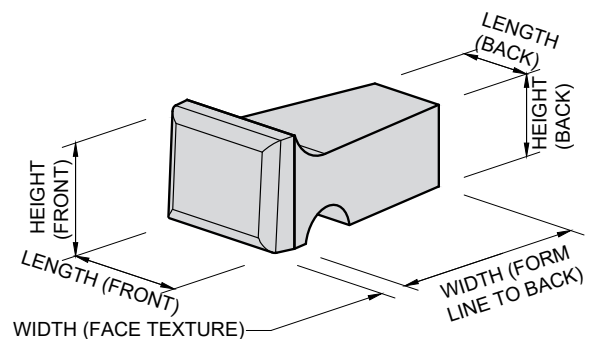
⁽¹³⁾ Values based on full scale testing performed in October 2011. Copies of the full test reports are available at www.redi-rock.com.

⁽¹⁴⁾ The infilled unit weights shown here are based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³) and an assumed soil unit weight of 100 lb/ft³ (1602 kg/m³). They 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.

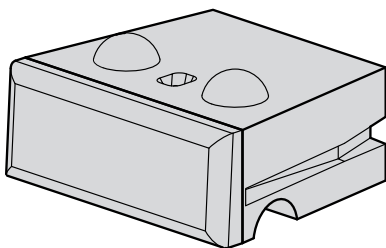
⁽¹⁵⁾ The minimum construction radius stated is applicable to both concave and convex curved retaining wall sections. Increases to this minimum radius are required to account for wall batter. Special consideration should be given to block selection, facing batter, and wall height when selecting the minimum radius for the final wall alignment.



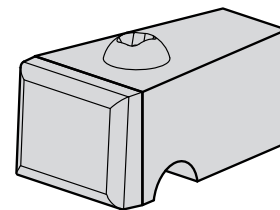
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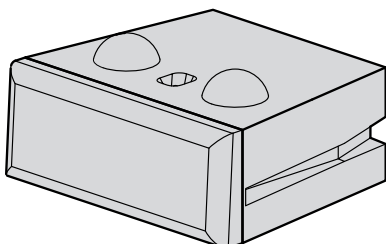
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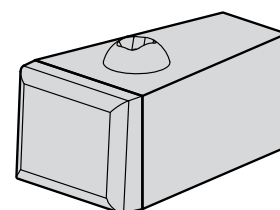
MIDDLE



HALF MIDDLE



BOTTOM



HALF BOTTOM

Redi-Rock 41" (1030 mm) wide, 9" (230 mm) Setback Retaining Blocks

The Redi-Rock 9" (230mm) Setback Retaining wall blocks are machine-placed, wet-cast, precast modular block units manufactured from first-purposed, non-reconstituted concrete and intended for use in the construction of dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock Retaining wall products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾	MIDDLE	BOTTOM	HALF MIDDLE	HALF BOTTOM
HEIGHT (FRONT OF BLOCK)	$18 \pm \frac{3}{16}$ (457 ± 5)	$18 \pm \frac{3}{16}$ (457 ± 5)	$18 \pm \frac{3}{16}$ (457 ± 5)	$18 \pm \frac{3}{16}$ (457 ± 5)
HEIGHT (BACK OF BLOCK)	$18 \pm \frac{3}{16}$ (457 ± 5)	$18 \pm \frac{3}{16}$ (457 ± 5)	$18 \pm \frac{3}{16}$ (457 ± 5)	$18 \pm \frac{3}{16}$ (457 ± 5)
LENGTH (FRONT OF BLOCK)	$46 \frac{1}{8} \pm \frac{1}{2}$ (1172 ± 13)		$22 \frac{1}{16} \pm \frac{1}{4}$ (579 ± 6)	
LENGTH (BACK OF BLOCK)	$36 \frac{5}{8} \pm \frac{1}{2}$ (930 ± 13)		$13 \frac{1}{16} \pm \frac{1}{4}$ (344 ± 6)	
WIDTH	$35 \frac{1}{8} \pm \frac{1}{2}$ (892 ± 13) FORM LINE TO BACK OF BLOCK AND $\pm 5 \frac{3}{8}$ (136) FACE TEXTURE			
CONCRETE VOLUME	MIDDLE	BOTTOM	HALF MIDDLE	HALF BOTTOM
LIMESTONE/COBBLESTONE FACE	$\pm 16.21 \text{ ft}^3$ (0.459 m ³)	$\pm 17.13 \text{ ft}^3$ (0.48 m ³)	$\pm 7.20 \text{ ft}^3$ (0.20 m ³)	$\pm 7.63 \text{ ft}^3$ (0.22 m ³)
LEDGESTONE FACE	$\pm 15.72 \text{ ft}^3$ (0.445 m ³)	$\pm 16.63 \text{ ft}^3$ (0.47 m ³)	$\pm 6.96 \text{ ft}^3$ (0.20 m ³)	$\pm 7.39 \text{ ft}^3$ (0.21 m ³)
SHIPPING/HANDLING WEIGHT ⁽²⁾	MIDDLE	BOTTOM	HALF MIDDLE	HALF BOTTOM
LIMESTONE/COBBLESTONE FACE	$\pm 2319 \text{ lb}$ (1051 kg)	$\pm 2449 \text{ lb}$ (1111 kg)	$\pm 1030 \text{ lb}$ (467 kg)	$\pm 1092 \text{ lb}$ (495 kg)
LEDGESTONE FACE	$\pm 2247 \text{ lb}$ (1019 kg)	$\pm 2378 \text{ lb}$ (1078 kg)	$\pm 995 \text{ lb}$ (451 kg)	$\pm 1057 \text{ lb}$ (479 kg)

⁽¹⁾ All dimensions are *inches (mm)*.

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291kg/m³). Actual weights will vary.

CONCRETE MIX PROPERTIES ⁽³⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ⁽⁸⁾					0.015
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ^(9, 11) (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹⁰⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹⁰⁾					35
ALKALI-AGGREGATE REACTIVITY MITIGATION PER ACI 201					

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to order placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

- (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- (c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹⁰⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

⁽¹¹⁾ Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze/thaw durability in a detailed and current testing program.

Redi-Rock 41" (1030 mm) wide, 9" (230 mm) Setback Retaining Blocks

DESIGN PROPERTIES

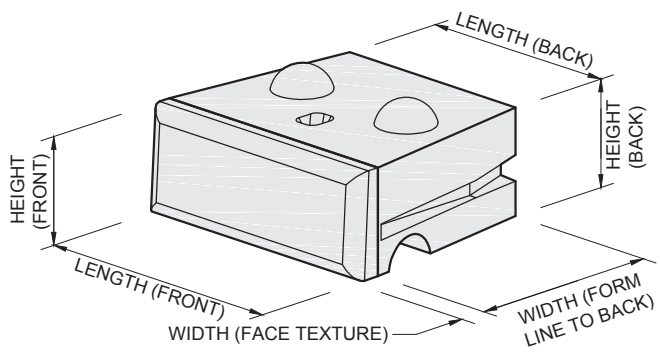
HORIZONTAL SETBACK / WALL FACE BATTER OPTIONS		BLOCK TO BLOCK INTERFACE SHEAR ⁽¹³⁾
10 inch (254 mm) KNOB	1 5/8 inch (41 mm) PER BLOCK COURSE (5.2° BATTER)	$V = 6,061 + N \tan 44^\circ \leq 11,276 \text{ lb/ft} (88.4 + N \tan 44^\circ \leq 164.5 \text{ kN/m})$
7 1/2 inch (190 mm) KNOB	3/8 inch (10 mm) PER BLOCK COURSE (1.2° BATTER)	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft} (17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m})$
6 3/4 inch (171 mm) KNOB	NO SETBACK (NO BATTER) ⁽¹²⁾	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft} (17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m})$
LIMESTONE / COBBLESTONE BLOCKS		128 lb/ft ³ (2082 kN/m ³)
LEDGESTONE BLOCKS		125 lb/ft ³ (2018 kN/m ³)
MINIMUM CONSTRUCTION RADIUS ⁽¹⁵⁾		
CONCAVE CURVE		14 ft 6 in (4.42 m)
CONVEX CURVE		14 ft 6 in (4.42 m)

⁽¹²⁾ Special consideration should be given to the design of vertical retaining walls subject to active lateral earth pressure.

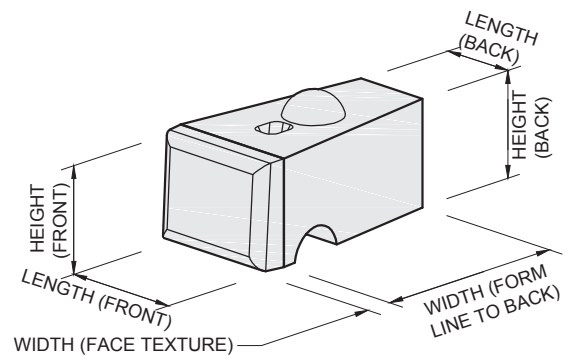
⁽¹³⁾ Values based on full scale testing performed in October 2011. Copies of the full test reports are available at www.redi-rock.com.

⁽¹⁴⁾ The infilled unit weights shown here are based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³) and an assumed soil unit weight of 100 lb/ft³ (1602 kg/m³). They 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.

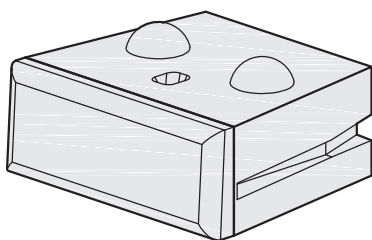
⁽¹⁵⁾ The minimum construction radius stated is applicable to both concave and convex curved retaining wall sections. Increases to this minimum radius are required to account for wall batter. Special consideration should be given to block selection, facing batter, and wall height when selecting the minimum radius for the final wall alignment.



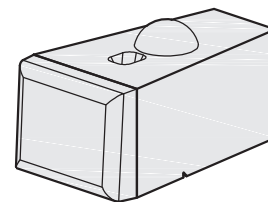
MIDDLE



HALF MIDDLE



BOTTOM



HALF BOTTOM

Redi-Rock 28" (710 mm) & 41" (1030 mm) Positive Connection (PC) Retaining Blocks

The Redi-Rock 28" (710mm) & 41" (1030mm) Positive Connection retaining wall blocks are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended for constructing dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock Retaining wall products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾	TOP - 28" (710)	MIDDLE - 28" (710)	BOTTOM - 28" (710)	TOP - 41" (1030)	MIDDLE - 41" (1030)	BOTTOM - 41" (1030)
HEIGHT (FRONT OF BLOCK)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)
HEIGHT (BACK OF BLOCK)	13 ± 3/16 (330 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	13 ± 3/16 (330 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)
LENGTH (FRONT OF BLOCK)	46 1/8 ± 1/2 (1172 ± 13)			46 1/8 ± 1/2 (1172 ± 13)		
LENGTH (BACK OF BLOCK)	40 ± 1/2 (1016 ± 13)			36 5/8" ± 1/2 (930 ± 13)		
WIDTH	22 5/8 ± 1/2 (575 ± 13) PLUS ± 5 3/8 (136) FACE TEXTURE			35 1/8 ± 1/2 (892 ± 13) PLUS ± 5 3/8 (136) FACE TEXTURE		
CONCRETE VOLUME	TOP - 28" (710)	MIDDLE - 28" (710)	BOTTOM - 28" (710)	TOP - 41" (1030)	MIDDLE - 41" (1030)	BOTTOM - 41" (1030)
LIMESTONE/COBBLESTONE FACE	±8.16 ft ³ (0.231 m ³)	±10.62 ft ³ (0.301 m ³)	±11.34 ft ³ (0.321 m ³)	±11.38 ft ³ (0.322 m ³)	±15.19 ft ³ (0.430 m ³)	±15.92 ft ³ (0.451 m ³)
LEDGESTONE FACE	±7.67 ft ³ (0.217 m ³)	±10.12 ft ³ (0.287 m ³)	±10.85 ft ³ (0.307 m ³)	±10.88 ft ³ (0.308 m ³)	±14.69 ft ³ (0.416 m ³)	±15.42 ft ³ (0.437 m ³)
SHIPPING/HANDLING WEIGHT ⁽²⁾	TOP - 28" (710)	MIDDLE - 28" (710)	BOTTOM - 28" (710)	TOP - 41" (1030)	MIDDLE - 41" (1030)	BOTTOM - 41" (1030)
LIMESTONE/COBBLESTONE FACE	± 1167 lb (529 kg)	± 1518 lb (689 kg)	± 1622 lb (736 kg)	± 1627 lb (738 kg)	±2172 lb (985 kg)	± 2276 lb (1032 kg)
LEDGESTONE FACE	± 1096 lb (497 kg)	± 1447 lb (656 kg)	± 1551 lb (703 kg)	± 1556 lb (706 kg)	± 2101 lb (953 kg)	± 2205 lb (1000 kg)

⁽¹⁾ All dimensions are inches (mm).

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.

CONCRETE MIX PROPERTIES ⁽³⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ⁽⁸⁾					0.015
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ^(9, 11) (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹⁰⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹⁰⁾					35
ALKALI-AGGREGATE REACTIVITY MITIGATION PER ACI 201					

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to order placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

(a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.

(b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.

(c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹⁰⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

⁽¹¹⁾ Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze/thaw durability in a detailed and current testing program.

Redi-Rock 28" (710 mm) & 41" (1030 mm) Positive Connection (PC) Retaining Blocks

DESIGN PROPERTIES

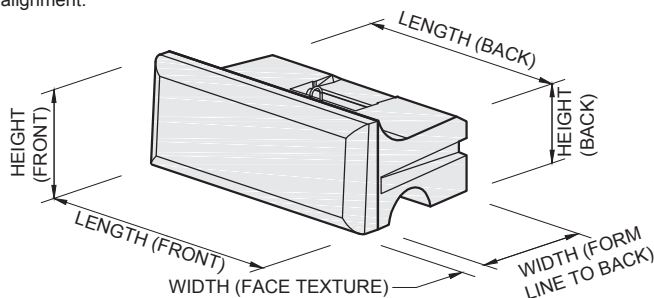
HORIZONTAL SETBACK / WALL FACE BATTER OPTIONS		BLOCK TO BLOCK INTERFACE SHEAR ⁽¹³⁾
10 inch (254 mm) KNOB	1 5/8 inch (41 mm) PER BLOCK COURSE (5.2° BATTER)	$V = 6,061 + N \tan 44^\circ \leq 11,276 \text{ lb/ft}$ ($88.4 + N \tan 44^\circ \leq 164.5 \text{ kN/m}$)
7 1/2 inch (190 mm) KNOB	3/8 inch (10 mm) PER BLOCK COURSE (1.2° BATTER)	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft}$ ($17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m}$)
6 3/4 inch (171 mm) KNOB	NO SETBACK (NO BATTER) ⁽¹²⁾	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft}$ ($17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m}$)
INFILLED UNIT WEIGHT FOR WALL STABILITY CALCULATIONS ⁽¹⁴⁾		
LIMESTONE / COBBLESTONE BLOCKS		28" (710) POSITIVE CONNECTION UNIT: 125 lb/ft ³ (2000 kg/m ³) 41" (1030) POSITIVE CONNECTION UNIT: 126 lb/ft ³ (2018 kg/m ³)
LEDGESTONE BLOCKS		28" (710) POSITIVE CONNECTION UNIT: 120 lb/ft ³ (1921 kg/m ³) 41" (1030) POSITIVE CONNECTION UNIT: 123 lb/ft ³ (1970 kg/m ³)
MINIMUM CONSTRUCTION RADIUS ⁽¹⁵⁾		
CONCAVE CURVE		14 ft 6 in (4.42 m)
CONVEX CURVE		14 ft 6 in (4.42 m)

⁽¹²⁾ Special consideration should be given to the design of vertical retaining walls subject to active lateral earth pressure.

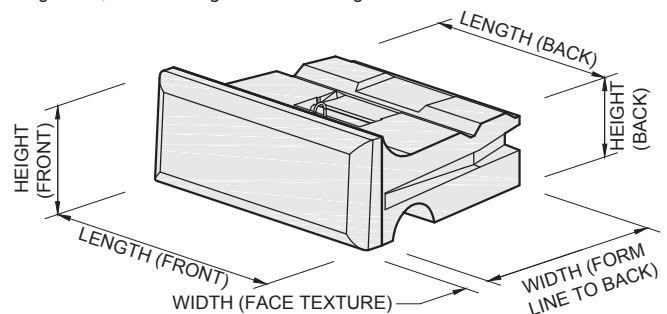
⁽¹³⁾ Values based on full scale testing performed in October 2011. Copies of the full test reports are available at www.redi-rock.com.

⁽¹⁴⁾ The infilled unit weights shown here are based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³) and an assumed soil unit weight of 100 lb/ft³ (1602 kg/m³). They 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.

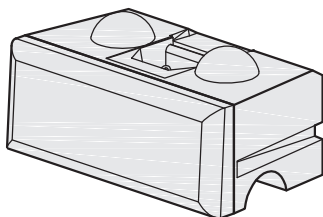
⁽¹⁵⁾ The minimum construction radius stated is applicable to both concave and convex curved retaining wall sections. Increases to this minimum radius are required to account for wall batter. Special consideration should be given to block selection, facing batter, and wall height when selecting the minimum radius for the final wall alignment.



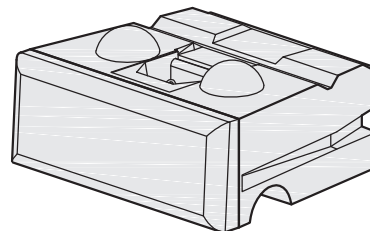
28" (710 mm) TOP



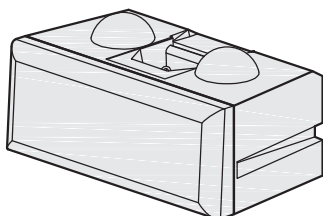
41" (1030 mm) TOP



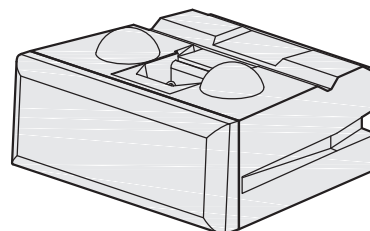
28" (710 mm) MIDDLE



41" (1030 mm) MIDDLE



28" (710 mm) BOTTOM



41" (1030 mm) BOTTOM

Revised 032315

Redi-Rock 60" (1520 mm) Retaining Blocks

The Redi-Rock 60" (1520mm) Retaining wall blocks are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended for constructing dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock Retaining wall products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾	MIDDLE	BOTTOM	HALF MIDDLE	HALF BOTTOM
HEIGHT (FRONT OF BLOCK)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)
HEIGHT (BACK OF BLOCK)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)
LENGTH (FRONT OF BLOCK)	46 1/8 ± 1/2 (1172 ± 13)		46 1/8 ± 1/2 (1172 ± 13)	
LENGTH (BACK OF BLOCK)	31 3/8 ± 1/2 (797 ± 13)		8 3/8 ± 1/2 (231 ± 13)	
WIDTH	54 5/8 ± 1/2 (1387 ± 13) PLUS ± 5 3/8 (136) FACE TEXTURE		54 5/8 ± 1/2 (1387 ± 13) PLUS ± 5 3/8 (136) FACE TEXTURE	
CONCRETE VOLUME	MIDDLE	BOTTOM	HALF MIDDLE	HALF BOTTOM
LIMESTONE/COBBLESTONE FACE	± 23.00 ft ³ (0.651 m ³)	± 23.90 ft ³ (0.677 m ³)	± 9.34 ft ³ (0.264 m ³)	± 9.77 ft ³ (0.277 m ³)
LEDGESTONE FACE	± 22.49 ft ³ (0.637 m ³)	± 23.40 ft ³ (0.663 m ³)	± 9.09 ft ³ (0.258 m ³)	± 9.52 ft ³ (0.270 m ³)
SHIPPING/HANDLING WEIGHT ⁽²⁾	MIDDLE	BOTTOM	HALF MIDDLE	HALF BOTTOM
LIMESTONE/COBBLESTONE FACE	± 3287 lb (1491 kg)	± 3418 lb (1550 kg)	± 1335 lb (606 kg)	± 1397 lb (633 kg)
LEDGESTONE FACE	± 3216 lb (1458 kg)	± 3346 lb (1518 kg)	± 1300 lb (590 kg)	± 1364 lb (618 kg)

⁽¹⁾ All dimensions are inches (mm).

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.

CONCRETE MIX PROPERTIES ⁽³⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ^(8,9)					0.15
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ^(10,12) (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹¹⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹¹⁾					35
ALKALI-AGGREGATE REACTIVITY MITIGATION PER ACI 201					

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to order placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ Where used in high sulfate environments or where alkali-silica reactivity is an issue, water soluble chloride shall be limited to no more than trace amounts (from impurities in concrete-making components, not intended constituents.)

⁽¹⁰⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

(a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.

(b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.

(c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹¹⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

⁽¹²⁾ Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze/thaw durability in a detailed and current testing program.

Redi-Rock 60" (1520 mm) Retaining Blocks

DESIGN PROPERTIES

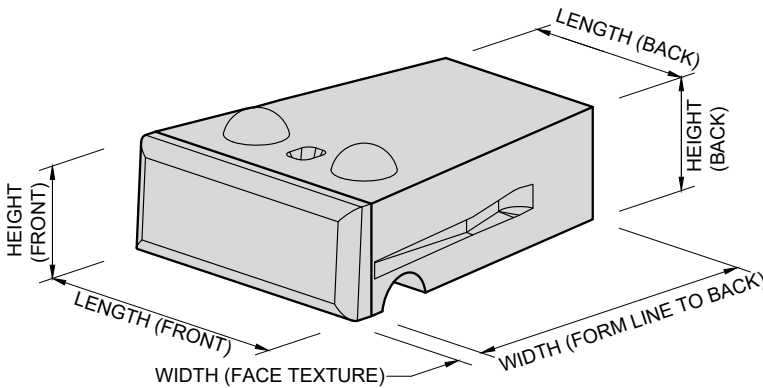
HORIZONTAL SETBACK / WALL FACE BATTER OPTIONS		BLOCK TO BLOCK INTERFACE SHEAR ⁽¹³⁾
10 inch (254 mm) KNOB	1 5/8 inch (41 mm) PER BLOCK COURSE (5.2° BATTER)	$V = 6,061 + N \tan 44^\circ \leq 11,276 \text{ lb/ft}$ ($88.4 + N \tan 44^\circ \leq 164.5 \text{ kN/m}$)
7 1/2 inch (190 mm) KNOB	3/8 inch (10 mm) PER BLOCK COURSE (1.2° BATTER)	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft}$ ($17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m}$)
6 3/4 inch (171 mm) KNOB	NO SETBACK (NO BATTER) ⁽¹²⁾	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft}$ ($17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m}$)
INFILLED UNIT WEIGHT FOR WALL STABILITY CALCULATIONS ⁽¹⁴⁾		
60" (1520) BOTTOM RETAINING UNIT		60" (1520) MIDDLE RETAINING UNIT
LIMESTONE / COBBLESTONE BLOCKS	134 lb/ft ³ (2146 kg/m ³)	130 lb/ft ³ (2082 kg/m ³)
LEDGESTONE BLOCKS	132 lb/ft ³ (2114 kg/m ³)	128 lb/ft ³ (2050 kg/m ³)
MINIMUM CONSTRUCTION RADIUS ⁽¹⁵⁾		
CONCAVE CURVE		14 ft 6 in (4.42 m)
CONVEX CURVE		14 ft 6 in (4.42 m)

⁽¹²⁾ Special consideration should be given to the design of vertical retaining walls subject to active lateral earth pressure.

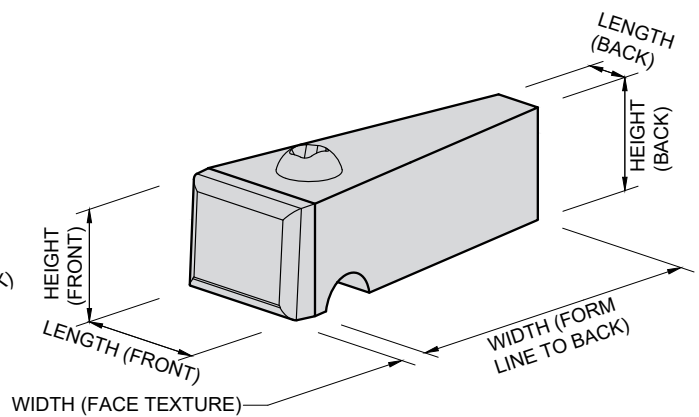
⁽¹³⁾ Values based on full scale testing performed in October 2011. Copies of the full test reports are available at www.redi-rock.com.

⁽¹⁴⁾ The infilled unit weights shown here are based on full width units and an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³) and an assumed soil unit weight of 100 lb/ft³ (1602 kg/m³). They 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.

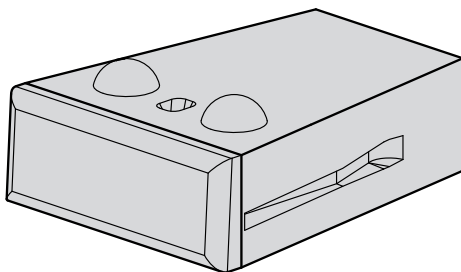
⁽¹⁵⁾ The minimum construction radius stated is applicable to both concave and convex curved retaining wall sections. Increases to this minimum radius are required to account for wall batter. Special consideration should be given to block selection, facing batter, and wall height when selecting the minimum radius for the final wall alignment.



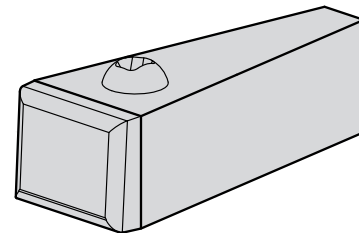
MIDDLE - 60" (1520)



HALF MIDDLE - 60" (1520)



BOTTOM - 60" (1520)



HALF BOTTOM - 60" (1520)

Redi-Rock 60" (1520 mm) wide, 9" (230 mm) Setback Retaining Blocks

The Redi-Rock 60" (1520mm) Retaining wall blocks are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended for constructing dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock Retaining wall products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾	MIDDLE	BOTTOM	HALF MIDDLE	HALF BOTTOM
HEIGHT (FRONT OF BLOCK)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)
HEIGHT (BACK OF BLOCK)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)	18 ± 3/16 (457 ± 5)
LENGTH (FRONT OF BLOCK)	46 1/8 ± 1/2 (1172 ± 13)		22 13/16 ± 1/4 (579 ± 6)	
LENGTH (BACK OF BLOCK)	31 3/8 ± 1/2 (797 ± 13)		8 3/8 ± 1/4 (231 ± 6)	
WIDTH	54 5/8 ± 1/2 (1387 ± 13) PLUS ± 5 3/8 (136) FACE TEXTURE		54 5/8 ± 1/2 (1387 ± 13) PLUS ± 5 3/8 (136) FACE TEXTURE	
CONCRETE VOLUME	MIDDLE	BOTTOM	HALF MIDDLE	HALF BOTTOM
LIMESTONE/COBBLESTONE FACE	± 23.06 ft ³ (0.653 m ³)	± 23.97 ft ³ (0.677 m ³)	± 9.37 ft ³ (0.264 m ³)	± 9.80 ft ³ (0.276 m ³)
LEDGESTONE FACE	± 22.56 ft ³ (0.639 m ³)	± 23.47 ft ³ (0.665 m ³)	± 9.12 ft ³ (0.258 m ³)	± 9.55 ft ³ (0.270 m ³)
SHIPPING/HANDLING WEIGHT ⁽²⁾	MIDDLE	BOTTOM	HALF MIDDLE	HALF BOTTOM
LIMESTONE/COBBLESTONE FACE	± 3297 lb (1495 kg)	± 3428 lb (1554 kg)	± 1340 lb (608 kg)	± 1401 lb (635 kg)
LEDGESTONE FACE	± 3226 lb (1463 kg)	± 3356 lb (1522 kg)	± 1305 lb (592 kg)	± 1366 lb (620 kg)

⁽¹⁾ All dimensions are inches (mm).

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.

CONCRETE MIX PROPERTIES ⁽³⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ⁽⁸⁾					0.015
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ^(9, 11) (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹⁰⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹⁰⁾					35
ALKALI-AGGREGATE REACTIVITY MITIGATION PER ACI 201					

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to order placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

- (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- (c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹⁰⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

⁽¹¹⁾ Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze/thaw durability in a detailed and current testing program.

Redi-Rock 60" (1520 mm) wide, 9" (230 mm) Setback Retaining Blocks

DESIGN PROPERTIES

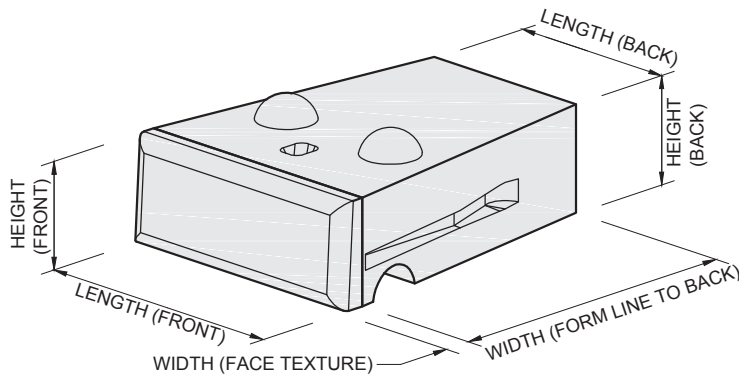
HORIZONTAL SETBACK / WALL FACE BATTER OPTIONS		BLOCK TO BLOCK INTERFACE SHEAR ⁽¹³⁾
10 inch (254 mm) KNOB	1 5/8 inch (41 mm) PER BLOCK COURSE (5.2° BATTER)	$V = 6,061 + N \tan 44^\circ \leq 11,276 \text{ lb/ft} (88.4 + N \tan 44^\circ \leq 164.5 \text{ kN/m})$
7 1/2 inch (190 mm) KNOB	3/8 inch (10 mm) PER BLOCK COURSE (1.2° BATTER)	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft} (17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m})$
6 3/4 inch (171 mm) KNOB	NO SETBACK (NO BATTER) ⁽¹²⁾	$V = 1,178 + N \tan 54^\circ \leq 10,970 \text{ lb/ft} (17.2 + N \tan 54^\circ \leq 160.1 \text{ kN/m})$
INFILLED UNIT WEIGHT FOR WALL STABILITY CALCULATIONS ⁽¹⁴⁾		
60" (1520) BOTTOM RETAINING UNIT		60" (1520) MIDDLE RETAINING UNIT
LIMESTONE / COBBLESTONE BLOCKS		135 lb/ft ³ (2146 kg/m ³)
LEDGESTONE BLOCKS		132 lb/ft ³ (2114 kg/m ³)
128 lb/ft ³ (2050 kg/m ³)		
MINIMUM CONSTRUCTION RADIUS ⁽¹⁵⁾		
CONCAVE CURVE		14 ft 6 in (4.42 m)
CONVEX CURVE		14 ft 6 in (4.42 m)

⁽¹²⁾ Special consideration should be given to the design of vertical retaining walls subject to active lateral earth pressure.

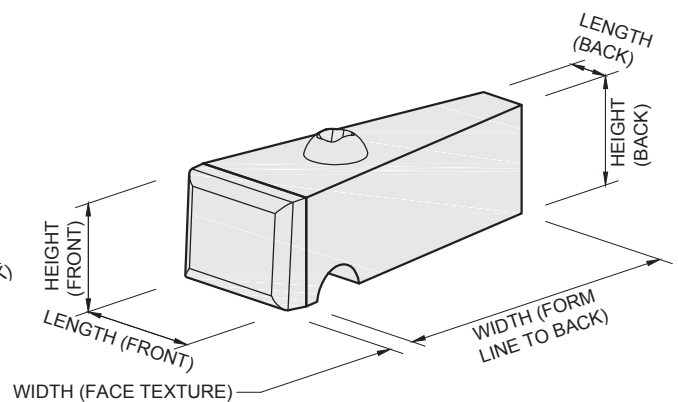
⁽¹³⁾ Values based on full scale testing performed in October 2011. Copies of the full test reports are available at www.redi-rock.com.

⁽¹⁴⁾ The infilled unit weights shown here are based on full width units and an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³) and an assumed soil unit weight of 100 lb/ft³ (1602 kg/m³). They 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.

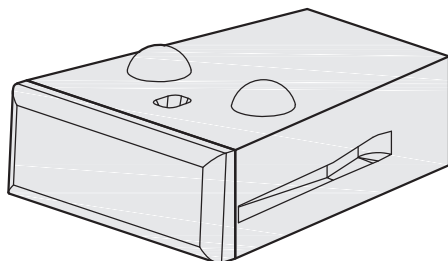
⁽¹⁵⁾ The minimum construction radius stated is applicable to both concave and convex curved retaining wall sections. Increases to this minimum radius are required to account for wall batter. Special consideration should be given to block selection, facing batter, and wall height when selecting the minimum radius for the final wall alignment.



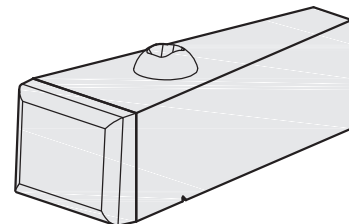
MIDDLE - 60" (1520)



HALF MIDDLE - 60" (1520)



BOTTOM - 60" (1520)



HALF BOTTOM - 60" (1520)

R-5236HC 52" (1,320 mm) Hollow-Core Retaining Blocks

The Redi-Rock 52" (1,320 mm) XL retaining wall blocks are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended for use in the construction of dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock retaining wall products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾	
HEIGHT (FRONT OF BLOCK)	36 ± 3/16 (914 ± 5)
HEIGHT (BACK OF BLOCK)	36 ± 3/16 (914 ± 5)
LENGTH (FRONT OF BLOCK)	46 1/8 ± 1/2 (1172 ± 13)
LENGTH (BACK OF BLOCK)	31 ± 1/2 (787 ± 13)
WIDTH	46 5/8 ± 1/2 (1184 ± 13) FORM LINE TO BACK OF BLOCK AND 5 3/8 (136) ± FACE TEXTURE
CONCRETE VOLUME	
LEDGESTONE FACE	23.29 ft ³ (0.660 m ³)±
SHIPPING/HANDLING WEIGHT ⁽²⁾	
LEDGESTONE FACE	3330 lb (1510 kg)±

⁽¹⁾ All dimensions are *inches (mm)*.

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.

CONCRETE MIX PROPERTIES ⁽³⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ^(8,9)					0.15
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ^(10,12) (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹¹⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹¹⁾					35
ALKALI-AGGREGATE REACTIVITY MITIGATION per ACI 201					

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to ordering placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ Where used in high sulfate environments or where alkali-silica reactivity is an issue, water soluble chloride shall be limited to no more than trace amounts (from impurities in concrete-making components, not intended constituents.)

⁽¹⁰⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

- (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- (c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹¹⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

⁽¹²⁾ Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze/thaw durability in a detailed and current testing program.

R-5236HC 52" (1,320 mm) Hollow-Core Retaining Blocks

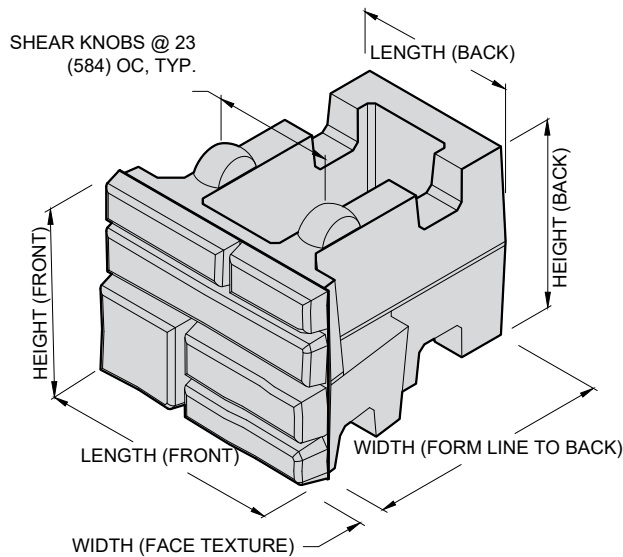
DESIGN PROPERTIES

HORIZONTAL SETBACK / WALL FACE BATTER	BLOCK TO BLOCK INTERFACE SHEAR ⁽¹³⁾	
		$S_{p(1)} = 4547 \text{ lb/ft} + N \tan 44^\circ$ (66.4 kN/m + N tan 44°)
3¼ inches (83 mm) PER COURSE	$S_{p(2)} = 8488 \text{ lb/ft} + N \tan 22^\circ$ (123.9 kN/m + N tan 22°)	for $7017 \leq N < 16,118 \text{ lb/ft}$ ($102.4 \leq N < 235.2 \text{ kN/m}$)
(5.2° BATTER)	$S_{p(\text{max})} = 15,000 \text{ lb/ft}$ (218.9 kN/m)	for $N \geq 16,118 \text{ lb/ft}$ ($N \geq 235.2 \text{ kN/m}$)
INFILLED UNIT WEIGHT FOR WALL STABILITY CALCULATIONS ⁽¹⁴⁾		
LEDGESTONE FACE	112 lb/ft ³ (1801 kN/m ³)	
MINIMUM CONSTRUCTION RADIUS ⁽¹⁵⁾		
CONCAVE CURVE	14 ft - 6 in (4.42 m)	
CONVEX CURVE	14 ft - 6 in (4.42 m)	

⁽¹³⁾ Values based on full scale testing performed in 2017 and 2018. Copies of the full test reports are available at www.redi-rock.com.

⁽¹⁴⁾ The infilled unit weights shown here are based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³) and an assumed soil unit weight of 100 lb/ft³ (1602 kN/m³). They 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.

⁽¹⁵⁾ The minimum construction radius stated is applicable to both concave and convex curved retaining wall sections. Increases to this minimum radius are required to account for wall batter. Special consideration should be given to block selection, facing batter, and wall height when selecting the minimum radius for the final wall alignment.



R-7236HC 72" (1,830 mm) Hollow-Core Retaining Blocks

The Redi-Rock 72" (1,830 mm) XL retaining wall blocks are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended for use in the construction of dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock retaining wall products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾	
HEIGHT (FRONT OF BLOCK)	36 ± 3/16 (914 ± 5)
HEIGHT (BACK OF BLOCK)	36 ± 3/16 (914 ± 5)
LENGTH (FRONT OF BLOCK)	46 1/8 ± 1/2 (1172 ± 13)
LENGTH (BACK OF BLOCK)	28 1/8 ± 1/2 (714 ± 13)
WIDTH	66 5/8 ± 1/2 (1184 ± 13) FORM LINE TO BACK OF BLOCK AND 5 3/8 (136) ± FACE TEXTURE
CONCRETE VOLUME	
LEDGESTONE FACE	29.10 ft ³ (0.824 m ³)±
SHIPPING/HANDLING WEIGHT ⁽²⁾	
LEDGESTONE FACE	4160 lb (1890 kg)±

⁽¹⁾ All dimensions are *inches (mm)*.

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.

CONCRETE MIX PROPERTIES ⁽³⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ^(8,9)					0.15
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ^(10,12) (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹¹⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹¹⁾					35
ALKALI-AGGREGATE REACTIVITY MITIGATION per ACI 201					

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to ordering placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ Where used in high sulfate environments or where alkali-silica reactivity is an issue, water soluble chloride shall be limited to no more than trace amounts (from impurities in concrete-making components, not intended constituents.)

⁽¹⁰⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

- (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- (c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹¹⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

⁽¹²⁾ Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze/thaw durability in a detailed and current testing program.

R-7236HC 72" (1,830 mm) Hollow-Core Retaining Blocks

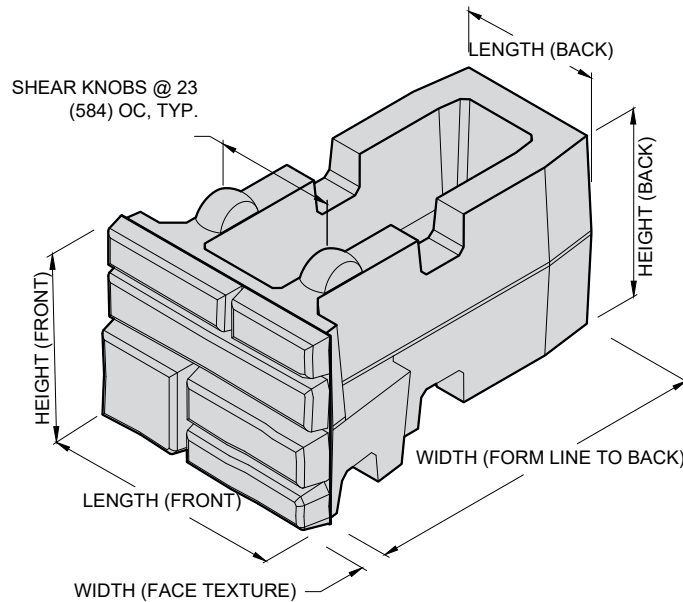
DESIGN PROPERTIES

HORIZONTAL SETBACK / WALL FACE BATTER	BLOCK TO BLOCK INTERFACE SHEAR ⁽¹³⁾	
	$S_{p(1)} = 4547 \text{ lb/ft} + N \tan 44^\circ$ (66.4 kN/m + $N \tan 44^\circ$)	for $N < 7017 \text{ lb/ft}$ ($N < 102.4 \text{ kN/m}$)
3¼ inches (83 mm) PER COURSE	$S_{p(2)} = 8488 \text{ lb/ft} + N \tan 22^\circ$ (123.9 kN/m + $N \tan 22^\circ$)	for $7017 \leq N < 16,118 \text{ lb/ft}$ ($102.4 \leq N < 235.2 \text{ kN/m}$)
(5.2° BATTER)	$S_{p(\text{max})} = 15,000 \text{ lb/ft}$ (218.9 kN/m)	for $N \geq 16,118 \text{ lb/ft}$ ($N \geq 235.2 \text{ kN/m}$)
INFILLED UNIT WEIGHT FOR WALL STABILITY CALCULATIONS ⁽¹⁴⁾		
LEDGESTONE FACE	112 lb/ft ³ (1801 kN/m ³)	
MINIMUM CONSTRUCTION RADIUS ⁽¹⁵⁾		
CONCAVE CURVE	14 ft - 6 in (4.42 m)	
CONVEX CURVE	14 ft - 6 in (4.42 m)	

⁽¹³⁾ Values based on full scale testing performed in 2017 and 2018. Copies of the full test reports are available at www.redi-rock.com.

⁽¹⁴⁾ The infilled unit weights shown here are based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³) and an assumed soil unit weight of 100 lb/ft³ (1602 kN/m³). They 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.

⁽¹⁵⁾ The minimum construction radius stated is applicable to both concave and convex curved retaining wall sections. Increases to this minimum radius are required to account for wall batter. Special consideration should be given to block selection, facing batter, and wall height when selecting the minimum radius for the final wall alignment.



R-9636HC 96" (2,440 mm) Hollow-Core Retaining Blocks

The Redi-Rock 96" (2,440 mm) XL retaining wall blocks are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended for use in the construction of dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock retaining wall products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾	
HEIGHT (FRONT OF BLOCK)	36 ± 3/16 (914 ± 5)
HEIGHT (BACK OF BLOCK)	36 ± 3/16 (914 ± 5)
LENGTH (FRONT OF BLOCK)	46 1/8 ± 1/2 (1172 ± 13)
LENGTH (BACK OF BLOCK)	21 5/8 ± 1/2 (549 ± 13)
WIDTH	90 5/8 ± 1/2 (2302 ± 13) FORM LINE TO BACK OF BLOCK AND 5 3/8 (136) ± FACE TEXTURE
CONCRETE VOLUME	
LEDGESTONE FACE	33.83 ft ³ (0.958 m ³)±
SHIPPING/HANDLING WEIGHT ⁽²⁾	
LEDGESTONE FACE	4840 lb (2190 kg)±

⁽¹⁾ All dimensions are *inches (mm)*.

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.

CONCRETE MIX PROPERTIES ⁽³⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ^(8,9)					0.15
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ^(10,12) (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹¹⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹¹⁾					35
ALKALI-AGGREGATE REACTIVITY MITIGATION per ACI 201					

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to ordering placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ Where used in high sulfate environments or where alkali-silica reactivity is an issue, water soluble chloride shall be limited to no more than trace amounts (from impurities in concrete-making components, not intended constituents.)

⁽¹⁰⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

- (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- (c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹¹⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

⁽¹²⁾ Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze/thaw durability in a detailed and current testing program.

R-9636HC 96" (2,440 mm) Hollow-Core Retaining Blocks

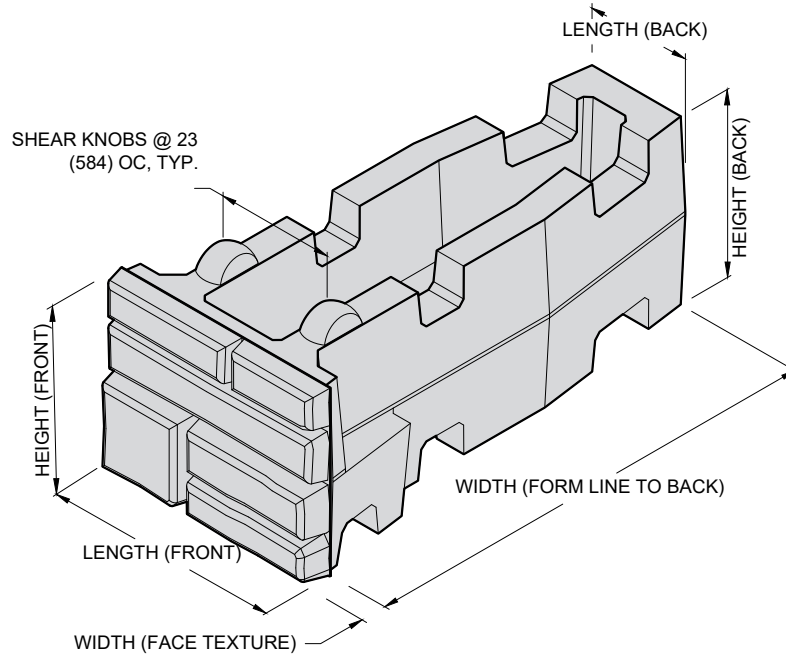
DESIGN PROPERTIES

HORIZONTAL SETBACK / WALL FACE BATTER	BLOCK TO BLOCK INTERFACE SHEAR ⁽¹³⁾	
		$S_{p(1)} = 4547 \text{ lb/ft} + N \tan 44^\circ$ (66.4 kN/m + N tan 44°)
3¼ inches (83 mm) PER COURSE	$S_{p(2)} = 8488 \text{ lb/ft} + N \tan 22^\circ$ (123.9 kN/m + N tan 22°)	for $7017 \leq N < 16,118 \text{ lb/ft}$ ($102.4 \leq N < 235.2 \text{ kN/m}$)
(5.2° BATTER)	$S_{p(\text{max})} = 15,000 \text{ lb/ft}$ (218.9 kN/m)	for $N \geq 16,118 \text{ lb/ft}$ ($N \geq 235.2 \text{ kN/m}$)
INFILLED UNIT WEIGHT FOR WALL STABILITY CALCULATIONS ⁽¹⁴⁾		
LEDGESTONE FACE	112 lb/ft ³ (1801 kN/m ³)	
MINIMUM CONSTRUCTION RADIUS ⁽¹⁵⁾		
CONCAVE CURVE	14 ft - 6 in (4.42 m)	
CONVEX CURVE	14 ft - 6 in (4.42 m)	

⁽¹³⁾ Values based on full scale testing performed in 2017 and 2018. Copies of the full test reports are available at www.redi-rock.com.

⁽¹⁴⁾ The infilled unit weights shown here are based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³) and an assumed soil unit weight of 100 lb/ft³ (1602 kN/m³). They 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.

⁽¹⁵⁾ The minimum construction radius stated is applicable to both concave and convex curved retaining wall sections. Increases to this minimum radius are required to account for wall batter. Special consideration should be given to block selection, facing batter, and wall height when selecting the minimum radius for the final wall alignment.



Redi-Rock Freestanding Straight Blocks

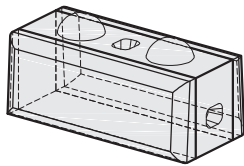
The Redi-Rock Freestanding wall units are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended to be used exclusively or in combination with dry-stacked modular retaining wall blocks. These units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

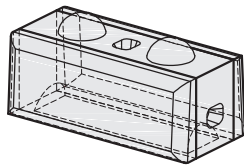
DIMENSIONS ⁽¹⁾				
HEIGHT: 18 ± 3/16 (457 ± 5)	LENGTH: 46 1/8 ± 1/2 (1172 ± 13)		WIDTH: ± 24 (610) LEDGESTONE / COBBLESTONE, ± 23 (584) LIMESTONE	
CONCRETE VOLUME	BOTTOM	MIDDLE	TOP	GARDEN TOP
LIMESTONE/COBBLESTONE FACE	±10.65 ft ³ (0.302 m ³)	±9.84 ft ³ (0.279 m ³)	±9.61 ft ³ (0.272 m ³)	±7.35 ft ³ (0.208 m ³)
LEDGESTONE FACE	±9.66 ft ³ (0.273 m ³)	±8.84 ft ³ (0.250 m ³)	±8.62 ft ³ (0.244 m ³)	±6.35 ft ³ (0.180 m ³)
SHIPPING/HANDLING WEIGHT ⁽²⁾	BOTTOM	MIDDLE	TOP	GARDEN TOP
LIMESTONE/COBBLESTONE FACE	± 1523 lb (691 kg)	± 1407 lb (638 kg)	± 1375 lb (623 kg)	± 1050 lb (476 kg)
LEDGESTONE FACE	± 1381 lb (626 kg)	± 1264 lb (573 kg)	± 1232 lb (559 kg)	± 908 lb (412 kg)

⁽¹⁾ All dimensions are inches (mm).

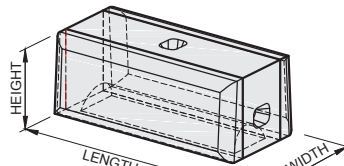
⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.



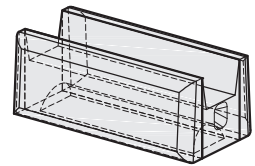
BOTTOM



MIDDLE



TOP



GARDEN TOP

CONCRETE MIX PROPERTIES ⁽²⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ⁽⁸⁾					0.015
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ⁽⁹⁾ (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹⁰⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹⁰⁾					35

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to order placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

- (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- (c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹⁰⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

Redi-Rock Freestanding Variable Radius Blocks

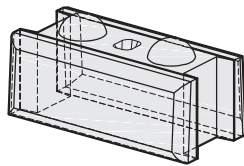
The Redi-Rock Freestanding wall units are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended to be used exclusively or in combination with dry-stacked modular retaining wall blocks. These units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

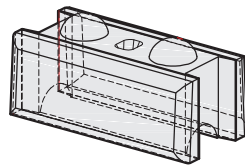
DIMENSIONS ⁽¹⁾				
HEIGHT: 18 ± 3/16 (457 ± 5)	LENGTH: 46 1/8 ± 1/2 (1172 ± 13)		WIDTH: ± 24 (610) LEDGESTONE / COBBLESTONE, ± 23 (584) LIMESTONE	
CONCRETE VOLUME	BOTTOM	MIDDLE	TOP	GARDEN TOP
LIMESTONE/COBBLESTONE FACE	±9.65 ft ³ (0.273 m ³)	±8.86 ft ³ (0.251 m ³)	±8.63 ft ³ (0.244 m ³)	±6.76 ft ³ (0.191 m ³)
LEDGESTONE FACE	±8.66 ft ³ (0.245 m ³)	±7.86 ft ³ (0.223 m ³)	±7.64 ft ³ (0.216 m ³)	±5.76 ft ³ (0.163 m ³)
SHIPPING/HANDLING WEIGHT ⁽²⁾	BOTTOM	MIDDLE	TOP	GARDEN TOP
LIMESTONE/COBBLESTONE FACE	± 1380 lb (626 kg)	± 1267 lb (574 kg)	± 1235 lb (560 kg)	± 967 lb (438 kg)
LEDGESTONE FACE	± 1238 lb (561 kg)	± 1124 lb (510 kg)	± 1092 lb (495 kg)	± 824 lb (374 kg)

⁽¹⁾ All dimensions are inches (mm).

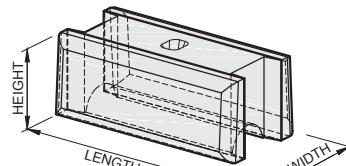
⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.



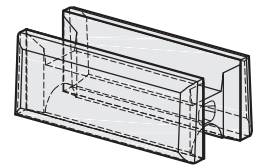
BOTTOM



MIDDLE



TOP



GARDEN TOP

CONCRETE MIX PROPERTIES ⁽²⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ⁽⁸⁾					0.015
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ⁽⁹⁾ (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹⁰⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹⁰⁾					35

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to order placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

- (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- (c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹⁰⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

Redi-Rock Hollow-Core Freestanding Blocks

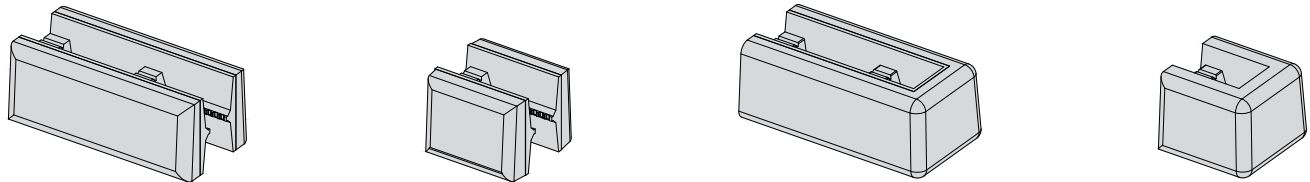
The Redi-Rock Hollow-Core Freestanding wall units are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended to be used exclusively or in combination with dry-stacked modular retaining wall blocks. These units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾				
HEIGHT: 18 ± 3/16 (457 ± 5)	LENGTH: 46 7/8 ± 1/2 (1172 ± 13)		WIDTH: 24 (610) ± LEDGESTONE / COBBLESTONE, 23 (584) ± LIMESTONE	
CONCRETE VOLUME	HOLLOW-CORE	HALF	CORNER	HALF CORNER
LIMESTONE/COBBLESTONE FACE	6.38 ft ³ (0.181 m ³) ±	3.19 ft ³ (0.090 m ³) ±	7.01 ft ³ (0.198 m ³) ±	3.81 ft ³ (0.108 m ³) ±
LEDGESTONE FACE	5.38 ft ³ (0.152 m ³) ±	2.69 ft ³ (0.076 m ³) ±	6.80 ft ³ (0.192 m ³) ±	3.53 ft ³ (0.100 m ³) ±
SHIPPING/HANDLING WEIGHT ⁽²⁾	HOLLOW-CORE	HALF	CORNER	HALF CORNER
LIMESTONE/COBBLESTONE FACE	913 lb (414 kg) ±	456 lb (207 kg) ±	1002 lb (455 kg) ±	545 lb (247 kg) ±
LEDGESTONE FACE	770 lb (349 kg) ±	385 lb (175 kg) ±	972 lb (441 kg) ±	505 lb (229 kg) ±

⁽¹⁾ All dimensions are *inches (mm)*.

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.



CONCRETE MIX PROPERTIES ⁽²⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ^(8,9)					0.15
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ⁽¹⁰⁾ (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹¹⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹¹⁾					35

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to order placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ Where used in high sulfate environments or where alkali-silica reactivity is an issue, water soluble chloride shall be limited to no more than trace amounts (from impurities in concrete-making components, not intended constituents.)

⁽¹⁰⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

- (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- (c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹¹⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.