Helix Micro-Rebar Application Guide

Residential Above Grade Walls

Basic Requirements

· Wall complies with the requirements of the IRC.
· Wall thickness is 4'', 6'', 8'' or 10''.
· Wall is braced against lateral translation. The shorter distance between the bracing shall be less than 24 times the wall thickness.
· Minimum (1) #4 bar is provided around all openings.
· Dowels provided at all cold joints at spacing equal to or less than the rebar spacing in table 1, but not less than #4@48'' spacing.

Approval Method, Design Basis and Class

· Class A: Shrinkage and Temperature - Uniform ES ER-0279 Section 4.2
· Class B: Structural Reinforcement - Uniform ES ER-0279 Section 4.3

Instructions

· Select the dosage in the table below based on the wall thickness and reinforcement detail.
· Review Uniform ES ER-0279 to ensure compliance with restrictions.
· To activate the performance guarantee*, submit your design to Helix Steel at www.helixsteel.com/technical
· Note the drawing with the Helix alternative: ''Use the rebar as shown on the drawing or XX lbs/yd^3 of Helix 5-25 designed in accordance with Uniform ES ER-0279''
· Instruct contractor to contact Helix for pricing, delivery and installation instructions at 734-322-2114 x1 or sales@helixsteel.com
· This table shows only a sampling of common configurations. Any wall configuration meeting the basic requirements above may be designed with Helix in accordance with Uniform ES ER-0279 using Class B Design, Section 4.3, and using the methods described in Section 4.6.

Dosage of Helix 5-25 Based on Above Grade Flat Wall and Rebar Configuration (lb/yd^3) [1,2,3,4,5,6,7]

Maximum Wind Speed Exposure Category B	C	D	Maximum Unsupported Wall Height Per Story (feet)	4 inches Top[8]		Side[8]		6 inches Top[8]		Side[8]		8 inches Top[8]		Side[8]		10 inches Top[8]		Side[8]	
85	—	—	8	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			9	#4 @ 48	9.0 [10]	#4 @ 43	9.0 [9]	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			10	#4 @ 47	9.0 [10]	#4 @ 36	13.5	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
90	—	—	8	#4 @ 48	9.0	#4 @ 47	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			9	#4 @ 48	9.0 [10]	#4 @ 39	10 [10]	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			10	#4 @ 42	9.0 [10]	#4 @ 34	13.5 [9]	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
100	85	—	8	#4 @ 48	9.0	#4 @ 40	10.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			9	#4 @ 42	9.0 [10]	#4 @ 34	13.5 [10]	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			10	#4 @ 34	9.0 [10]	#4 @ 34	13.5 [9]	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
110	90	85	8	#4 @ 44	9.0	#4 @ 34	13.5	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			9	#4 @ 34	9.0 [10]	#4 @ 34	13.5 [10]	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			10	#4 @ 34	9.0 [10]	#4 @ 31	13.5 [9]	#4 @ 48	9.0	#4 @ 37	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
120	100	90	8	#4 @ 36	13.5	#4 @ 34	13.5	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			9	#4 @ 34	9.0 [10]	#4 @ 32	13.5	#4 @ 48	9.0	#4 @ 38	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			10	#4 @ 30	9.0 [10]	#4 @ 27	15 [10]	#4 @ 48	9.0	#5 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
130	110	100	8	#4 @ 34	13.5	#4 @ 34	13.5	#4 @ 48	9.0	#4 @ 33	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			9	#4 @ 32	9.0 [10]	#4 @ 28	13.5 [10]	#4 @ 48	9.0	#4 @ 33	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0
			10	#4 @ 26	9.0 [10]	#4 @ 23	18.0 [10]	#4 @ 48	9.0	#5 @ 43	10.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0	#4 @ 48	9.0

1. The highlighted values are the Helix 5-25 dosage rates in lb/yd^3 conforming to Helix Class B design
2. Table is based on IRC-2012 TABLE R611.6(1)-Minimum Vertical Reinforcement for Flat Above-Grade Walls
3. Table is based on ASCE 7 components and cladding wind pressures for an enclosed building using a mean roof height of 35 feet, interior wall area 4, an effective wind area of 10 square feet, and topographic factor, Kzt, and importance factor, I, equal to 1.0.
4. Table is based on concrete with a minimum specified compressive strength of 3,000 psi.
5. Table values are calculated using rebar located in the center of the wall
6. Interpolation is not permitted.
7. Rebar minimum yield strength of 60,000 psi has been used
8. Top means gravity load from roof and/or floor construction bears on top of wall. Side means gravity load from floor construction is transferred to wall from a wood ledger or cold-formed steel track bolted to side of wall. Where floor framing members span parallel to the wall, use of the top bearing condition is permitted.
9. Nominal wall thickness. The actual as-built thickness of a flat wall shall be not more than 1/2-inch less or more than 1/4-inch more than the nominal dimension indicated.
10. These wall configurations may only be used if wall is laterally braced at a horizontal distance not to exceed 8 feet

HELIX™ **Micro-Rebar**

Given
· Above grade wall 10" thick, 10' tall and 30' long.
· Load is applied by bearing on the top of the wall.
· Vertical reinforcement is #4 bars at 48" at the center of the wall.
· Horizontal reinforcement is #4 bars at 48" at the center of the wall.
· Wind Speed is a maximum of 90 mph; Exposure category C.

Calculation
Step 1 - Calculate the bracing ratio which must be less than 24 for the least of height/thickness or length/thickness
Height (120") / thickness (10") = 12 ; length (360") / thickness (10") = 36 The smaller is less than 24 therefore Class B okay.

Step 2 - Find the column in the table for the thickness and bearing condition (yellow)

Step 3 - Read across the table for 90 mph, Category C and 10' tall wall (blue)

Step 4 - Select the dosage rate at the intersection , 9.0 lb/yd^3 (green)

Step 5 - Add note to drawing with the Helix alternative: "Use the rebar as shown on the drawing or 9.0 lb/yd^3 Helix 5-25 designed in accordance with Uniform ES ER-0279.

Step 6- If required, a calculation can be provided for the result shown in the table. Contact your local Helix representative.
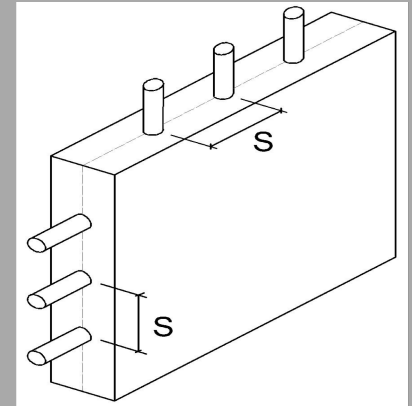
Dosage of Helix 5-25 Based on Above Grade Flat Wall and Rebar Configuration (lb/yd³) [1,2,3,4,5,6,7]

Maximum Wind Speed / Exposure Category			Maximum Unsupported Wall Height Per Story (feet)	Nominal wall thickness							
				4 inches		6 inches		8 inches		10 inches	
B	C	D		Top	Side	Top	Side	Top	Side	Top	Side
85	—	—	8	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			9	#4 @ 48 9.0(10)	#4 @ 43 9.0(9)	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			10	#4 @ 47 9.0(10)	#4 @ 36 13.5	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
90	—	—	8	#4 @ 48 9.0	#4 @ 47 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			9	#4 @ 48 9.0(10)	#4 @ 39 10(10)	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			10	#4 @ 42 9.0(10)	#4 @ 34 13.5(9)	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
100	85	—	8	#4 @ 48 9.0	#4 @ 40 10.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			9	#4 @ 42 9.0(10)	#4 @ 34 13.5(10)	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			10	#4 @ 34 9.0(10)	#4 @ 34 13.5(9)	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
110	90	85	8	#4 @ 44 9.0	#4 @ 34 13.5	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			9	#4 @ 34 9.0(10)	#4 @ 34 13.5(10)	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			10	#4 @ 34 9.0(10)	#4 @ 31 13.5(9)	#4 @ 48 9.0	#4 @ 37 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
120	100	90	8	#4 @ 36 13.5	#4 @ 34 13.5	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			9	#4 @ 34 9.0(10)	#4 @ 32 13.5	#4 @ 48 9.0	#4 @ 38 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			10	#4 @ 30 9.0(10)	#4 @ 27 15(10)	#4 @ 48 9.0	#5 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
130	110	100	8	#4 @ 34 13.5	#4 @ 34 13.5	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			9	#4 @ 32 9.0(10)	#4 @ 28 13.5(10)	#4 @ 48 9.0	#4 @ 33 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0
			10	#4 @ 26 9.0(10)	#4 @ 23 18.0(10)	#4 @ 48 9.0	#5 @ 43 10.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0	#4 @ 48 9.0

HELIX™ Micro-Rebar