

DISCLAIMER

By using the LOGIX Design Manual, in part or in whole, the user accepts the following terms and conditions.

The LOGIX Design Manual shall be used for the sole purpose of estimating, design or construction of LOGIX Insulated Concrete Forms used in residential, commercial or industrial structures.

The information represented herein is to be used as a reference guide only. The user shall check to ensure the information provided in this manual, including updates and amendments, meets local building codes and construction practices by consulting local building officials, construction and design professionals, including any additional requirements.

Logix reserves the right to make changes to the information provided herein without notice and assumes no liability in connection with the use of this manual including modification, copying or distribution.

The user shall check to ensure that any construction projects utilizing the LOGIX Design Manual includes the latest updates/amendments (related to the version of the LOGIX Design Manual being used at the time of the construction project). Updates/amendments to the LOGIX Design Manual are available for download in the "Technical Library" under "Addenda" at www.logixicf.com.

6.1 – U.S. ENGINEERING ANALYSIS REPORT

INTRODUCTION

LOGIX walls are intended to be used both above and below grade, and can carry large vertical as well as lateral loads. They are particularly effective for residential, commercial and industrial buildings; providing excellent insulation as well as thermal mass and structural strength. They can be easily adapted to accommodate concrete floors and other “non-standard” building systems.

Construction must be in conformance with the LOGIX Design Manual, including assembly of formwork, bracing, accurate rebar positioning, concrete mix design & placement, and details for interconnection with the other building components.

STRUCTURAL DESIGN AND PERFORMANCE

The LOGIX Building System can be used for an infinite variety of building situations with proper engineering. This report, with its load tables and diagrams, is intended to assist with the structural design of buildings using the LOGIX system for the basement only, or continuing to two stories above-grade and/or roof. Where unusual conditions are encountered, it is recommended that the user consult a designer who can evaluate the loadings to the various components and who can appreciate the limitations of “prescriptive” design under unusual conditions. Connection details have generally been excluded from this report because of the great variety of floor and roof systems that can be used with the Logix wall system. The designer should refer to the Logix Design Manual and the literature for the various proprietary products that are available for connections, which are an important part of the total design.

REINFORCEMENT TABLES

Above- and below-grade walls and lintel reinforcement tables are provided in this report. The tables were developed using the applicable sections of Chapter 16 of the International Building Code 2012, Sections 404 and 611 of the International Residential Code 2012, and ACI 318 Building Code Requirements for Structural Concrete.

Table 1 makes use of plain concrete foundation walls adapted from the IRC 2012, Table 404.1.2(8), for LOGIX used below-grade. For walls that fall outside the scope of Table 1, Tables 2A, 2B, 2C and 2D are provided, which cover wall reinforcement for larger walls and larger loading conditions.

Tables 3A and 3B provides reinforcement tables for LOGIX walls used above-grade.

HELIX TSMR TABLES - ALTERNATIVE TO REBAR REINFORCEMENT TABLES

Where applicable, Helix TSMR (Twisted Steel Micro Rebar) Tables 2A-H to 2D-H, and Tables 3.1A-H to 3.6A-H, and 3.1B-H to 3.6B-H, may be used in lieu of the reinforcement requirements in Tables 2A to 2D, and Tables 3A and 3B. Helix is steel fibre reinforcement that can significantly reduce the amount of horizontal and vertical reinforcement in above- and below-grade concrete walls, with exception of lintel and shear wall reinforcement. (For lintel and shear wall reinforcement see Tables 4A to 4E, 5A to 5E and 6A, 6B)

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LIMITATIONS

The limitations of Reinforcement Tables 2A to 2D, and Tabs 3A and 3B, also apply to Helix alternative reinforcement Tables 3.1A-H to 3.6A-H, and 3.1B-H to 3.6B-H.

Building limitations used to develop above- and below-grade tables include:

Building perimeter = 80 ft max x 40 ft max

Roof clear span = 40 ft max

Floor clear span = 32 ft max

Number of stories above grade = 2 max

Number of stories below grade = 1

Tables 4A to 4E and Tables 5A to 5E provide lintel tables for factored uniform and concentrated loading conditions, respectively.

More specific design assumptions and limitations are located with the corresponding reinforcement tables.

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ABOVE-GRADE WALL REINFORCEMENT TABLES

NOTES FOR ABOVE-GRADE WALL TABLES - Tables 3A & 3B

Table 3A covers reinforcement for LOGIX above-grade walls with wind speeds up to 150mph. For larger wind speeds see Table 3B, which covers wind speeds up to 300mph. Alternatively, and where applicable, Helix dosage Tables 3.1A-H to 3.6A-H, and Tables 3.1B-H to 3.6B-H, may be used in lieu of Logix reinforcement Tables 3A and 3B.

LOGIX above-grade tables cover three different construction types:

- One storey LOGIX supporting wood roof frame (Fig. 3A)
- One storey LOGIX supporting 2nd storey wood frame plus wood roof frame (Fig. 3B)
- Two storey LOGIX supporting wood roof frame (Fig. 3C)

For two story buildings, the height of the second story wall is equal to the height of the first story provided the height of the first storey wall is not more than 12 feet high.

For first story walls greater than 12 feet high, the second story wall height is a maximum of 12 feet.

With the exception of 4" LOGIX, the second story concrete wall thickness is one size less than the concrete core thickness used for the first storey wall.

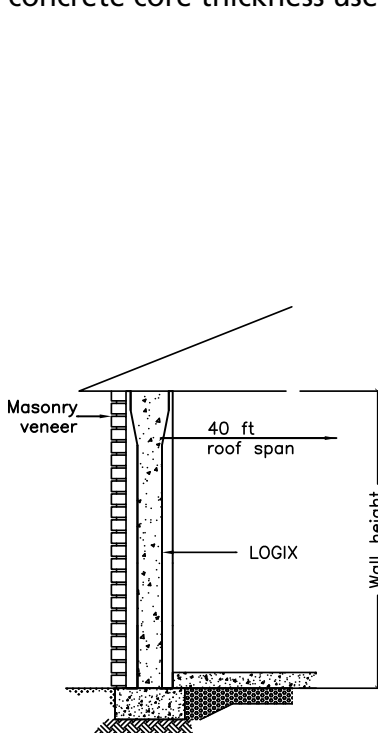


Fig 3A
Assumed typical flooring, wall & roof section for Tables 3A and 3B, LOGIX Supporting Roof Only.

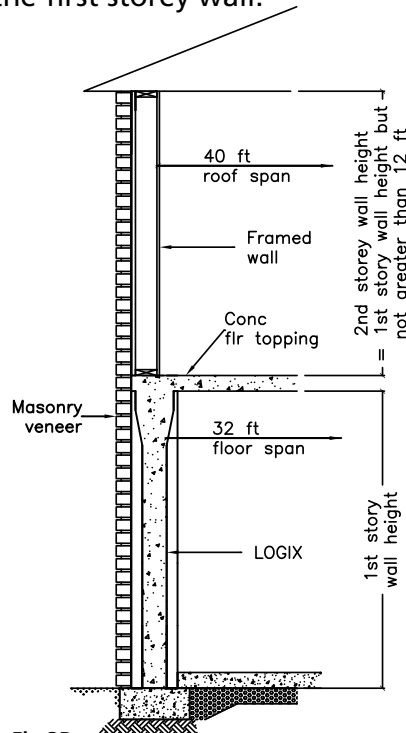


Fig 3B
Assumed typical flooring, wall & roof section for Tables 3A and 3B, LOGIX Supporting 2nd Story Wood Frame & Roof Structure.

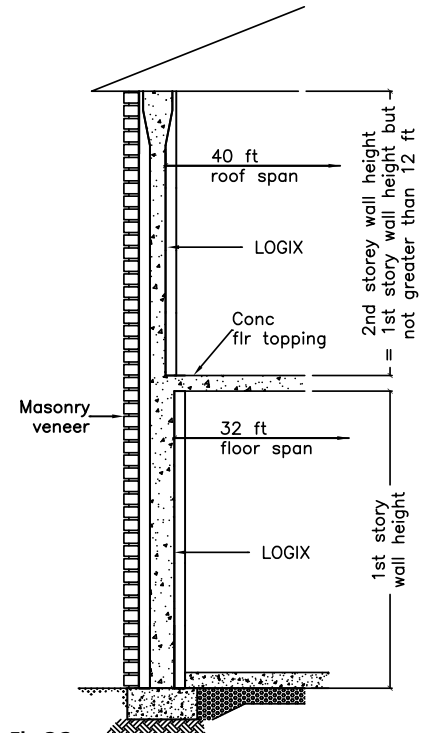


Fig 3C
Assumed typical flooring, wall & roof section for Tables 3A and 3B, LOGIX Supporting 2nd Story LOGIX & Roof Structure.

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NOTES FOR ABOVE-GRADE WALL TABLES - Tables 3A & 3B Cont'd

The above-grade tables shall be used in conjunction with the notes listed below, the building limitations noted in the "Reinforcement Tables" section, and Figures 3A to 3B, which form the basis of this table.

1. Vertical rebar spacing shown in the tables provide simple placement between ICF ties.
2. Steel yield strength = 40 ksi and 60 ksi for Table 3A and 3B, respectively. 28 day concrete compressive strength = 3 ksi
3. For rebar spacing based on 40 ksi reinforcing steel multiply spacing by 1.5 if using 60 ksi steel.
4. Deflection criteria = $L/240$
5. Snow load = 70 psf
6. Assumed eccentricity = 1".
7. The walls must be supported at the top and bottom of the wall.
8. Where spaces have been left blank, the corresponding bar size is presumed to be less economical and/or practical than that shown. Consult a local licensed engineer to determine proper design.
9. Except as noted for seismic considerations, vertical rebar shall be placed in middle of wall, and minimum horizontal rebar shall be:
 - 4" & 6.25" LOGIX = #4 @ 32" on center
 - 8" & 10" LOGIX = #4 @ 16" on center

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Provide additional mat of rebar for 12" LOGIX

- Horizontal rebar = #4 @ 32" on center (double mat)

- Vertical rebar = to match vertical bar spacing in **Tables 3A or 3B, whichever applies.**

Provide at least one #4 bar (two for 12" LOGIX) to be placed at the bottom course and top course.

10. In Seismic Design Categories D0, D1, and D2, the reinforcing steel shall meet the requirements of ASTM A 706 for low-alloy steel with a minimum yield strength of 60 ksi.
11. For townhouses in Seismic Category C, the minimum vertical reinforcement shall be one #5 at 24 inches on center or one #4 bar at 16 inches on center, and the minimum horizontal reinforcement shall be one #4 bar at 16 inches on center.
12. For all buildings in Seismic Design Categories D0, D1 and D2, the minimum vertical reinforcement shall be one #5 at 18 inches on center or one #4 bar at 12 inches on center, and the minimum horizontal reinforcement shall be one #5 bar at 16 inches on center.
13. Horizontal reinforcement shall be continuous around building corners using corner bars or by bending the bars. The minimum lap splice shall be 24 inches. For townhouses in Seismic Design Categories D0, D1, and D2, each end of all horizontal reinforcement shall terminate with a standard hook or lap splice.
14. For openings provide one #4 horizontal bar within 12 inches from the bottom of the opening to extend minimum 24 inches beyond opening. In locations with wind speeds greater than or equal to 110mph or in Seismic Design Categories A and B, provide one #4 bar for the full height of the wall story within 12 inches each side of the opening. In locations with wind speeds greater than 110 mph, townhouses in Seismic Design Categories D0, D1, and D2, provide two #4 bars or one #5 bar for full height of the wall story within 12 inches of each side of the opening.
15. Where design wind pressure exceeds 40 psf or for townhouses in Seismic Design Category C, and all buildings in Seismic Design Categories D0, D1 and D2, the vertical wall reinforcement in the top-most ICF story shall terminate with a 90-degree standard hook in accordance with IRC 2006, Section R611.7.1.5. The free end of the hook shall be within 4 inches of the top of the wall and shall be oriented parallel to the horizontal steel in the top of the wall.

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16. Carefully consider floor/wall connection details for lateral loads, especially with higher backfills, walkout basements, and active seismic areas.
17. Tables R301.2.1.3 and R611.3(1) are taken from the 2006 International Residential Code. These tables can be used to convert wind speeds to wind loads used in Table 3A, Logix Above-Grade Wall Minimum Vertical Reinforcement.
18. For larger wind speeds greater than 150mph see Table 3B.
19. Where applicable alternative Helix dosage Tables 3.1A-H to 3.6A, and Tables 3.1B-H to 3.6B-H, may be used in lieu of Logix reinforcement Tables 3A and 3B.

**TABLE R301.2.1.3
EQUIVALENT BASIC WIND SPEEDS^a**

3-second gust, V_{3s}	85	90	100	105	110	120	125	130	140	145	150	160	170
Fastest mile, V_{fm}	71	76	85	90	95	104	109	114	123	128	133	142	152

For SI: 1 mile per hour = 0.447 m/s.

a. Linear interpolation is permitted.

**TABLE R611.3(1)
DESIGN WIND PRESSURE FOR USE WITH TABLES R611.3(2), R611.4(1), AND R611.5 FOR ABOVE GRADE WALLS^a**

WIND SPEED (mph) ^e	DESIGN WIND PRESSURE (psf)					
	Enclosed ^b			Partially Enclosed ^b		
	Exposure ^c			Exposure ^c		
	B	C	D	B	C	D
85	18	24	29	23	31	37
90	20	27	32	25	35	41
100	24	34	39	31	43	51
110	29	41	48	38	52	61
120	35	48	57	45	62	73
130	41	56	66	53	73	85 ^d
140	47	65	77	61	84 ^d	99 ^d
150	54	75	88 ^d	70	96 ^d	114 ^d

For SI: 1 pound per square foot = 0.0479 kPa; 1 mile per hour = 0.447 m/s; 1 foot = 304.8 mm; 1 square foot = 0.0929 m².

a. This table is based on ASCE 7-98 components and cladding wind pressures using a mean roof height of 35 ft and a tributary area of 10 ft².

b. Buildings in wind-borne debris regions as defined in Section R202 shall be considered as "Partially Enclosed" unless glazed openings are protected in accordance with Section R301.2.1.2, in which case the building shall be considered as "Enclosed." All other buildings shall be classified as "Enclosed."

c. Exposure Categories shall be determined in accordance with Section R301.2.1.4.

d. For wind pressures greater than 80 psf, design is required in accordance with ACI 318 and approved manufacturer guidelines.

e. Interpolation is permitted between wind speeds.

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TABLE 3B - LOGIX ABOVE-GRADE WALL MINIMUM VERTICAL REINFORCEMENT (WIND SPEEDS GREATER THAN 150 MPH)

NOTE: LOGIX recommends builders, owners and/or designers using these tables confirm that on-site building conditions are w/in the scope of the tables being used.
LOGIX ABOVE-GRADE WALLS - VERTICAL REINFORCEMENT SPACING, in.

Ground Floor LOGIX Supporting Roof Only																									
Wall Height, ft	4" LOGIX Wall Thickness					6.25" LOGIX Wall Thickness					8" LOGIX Wall Thickness					10" LOGIX Wall Thickness					12" LOGIX Wall Thickness				
	Wind Speed, mph					Wind Speed, mph					Wind Speed, mph					Wind Speed, mph					Wind Speed, mph				
	160	200	250	275	300	160	200	250	275	300	160	200	250	275	300	160	200	250	275	300	160	200	250	275	300
8	16	12	6	-	-	48	24	12	8	8	48	32	16	12	12	48	48	24	16	16	48	48	32	24	16
9	16	8	-	-	-	24	16	8	8	6	40	24	12	8	8	48	32	16	12	12	48	48	24	16	12
10	8	6	-	-	-	16	12	6	6	-	32	16	8	8	6	48	24	12	8	8	48	32	16	12	12
12	6	-	-	-	-	12	8	-	-	-	16	8	6	-	-	24	16	8	6	-	40	16	8	8	6
14	-	-	-	-	-	8	-	-	-	-	12	6	-	-	-	16	8	6	-	-	24	12	6	6	-
16	-	-	-	-	-	6	-	-	-	-	8	-	-	-	-	12	6	-	-	-	16	8	-	-	-
18	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	8	-	-	-	-	12	6	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	8	-	-	-	-

Ground Floor LOGIX Supporting 2nd Storey LOGIX (or 2nd Storey Wood Frame) & Roof Structure																									
Wall Height, ft	4" LOGIX Wall Thickness					6.25" LOGIX Wall Thickness					8" LOGIX Wall Thickness					10" LOGIX Wall Thickness					12" LOGIX Wall Thickness				
	Wind Speed, mph					Wind Speed, mph					Wind Speed, mph					Wind Speed, mph					Wind Speed, mph				
	160	200	250	275	300	160	200	250	275	300	160	200	250	275	300	160	200	250	275	300	160	200	250	275	300
8	16	6	-	-	-	48	24	12	8	8	48	48	16	12	12	48	48	32	24	16	48	48	32	24	16
9	12	6	-	-	-	40	16	8	6	-	48	24	12	8	8	48	48	16	16	12	48	48	24	16	12
10	6	-	-	-	-	24	12	6	-	-	48	16	8	8	6	48	32	16	12	8	48	48	16	12	12
12	-	-	-	-	-	12	6	-	-	-	16	8	6	-	-	48	16	8	6	-	48	24	8	8	6
14	-	-	-	-	-	8	-	-	-	-	12	6	-	-	-	24	8	-	-	-	40	16	8	6	-
16	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	12	6	-	-	-	16	8	-	-	-
18	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	8	-	-	-	-	12	6	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	8	-	-	-	-

NOTES:

1. Table 3B must be used in conjunction with the notes listed under "Notes For Above-Grade Wall Tables".
2. Vertical bar spacing is for #4 rebar. #5 rebar can be substituted provided the spacing is multiplied by 1.5. Spacing shall be no more than 48 inches on center.
3. Steel yield strength = 60 ksi, 28 day concrete compressive strength = 3 ksi.

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TABLE 3.1B - LOGIX 4" RESIDENTIAL ABOVE-GRADE WALL, HELIX 5-25 ALTERNATIVE REINF. (WIND SPEEDS GREATER THAN 150 MPH)

Ground Floor LOGIX Supporting Roof Only					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	21 lb/yd ³	27 lb/yd ³	30 lb/yd ³ + #4 @ 12"	-	-
9	21 lb/yd ³	30 lb/yd ³ + #4 @ 32"	-	-	-
10	30 lb/yd ³ + #4 @ 32"	30 lb/yd ³ + #4 @ 12"	-	-	-
12	22.5 lb/yd ³ + #4 @ 8"	-	-	-	-
14	-	-	-	-	-
16	-	-	-	-	-
18	-	-	-	-	-
20	-	-	-	-	-

Ground Floor LOGIX Supporting 2nd Storey LOGIX (or 2nd Storey Wood Frame) & Roof Structure					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	21 lb/yd ³	30 lb/yd ³ + #4 @ 12"	-	-	-
9	27 lb/yd ³	30 lb/yd ³ + #4 @ 12"	-	-	-
10	30 lb/yd ³ + #4 @ 12"	-	-	-	-
12	-	-	-	-	-
14	-	-	-	-	-
16	-	-	-	-	-
18	-	-	-	-	-
20	-	-	-	-	-

Notes:

- Design and installation of Helix 5-25 Micro-Rebar reinforced concrete must be in accordance with Uniform Evaluation Service, ER-279.
- Designs given in the unshaded rows of the above table are Helix Design Class B, and walls must conform to all restrictions of Section 4.3.5 or Section 4.3.6 of ER-279.
- Designs given in the shaded rows of the above table are Helix Design Class C, and walls must conform to all restrictions of Section 4.3.5 or Section 4.3.6 of ER-279 except for the minimum wall thickness requirement. In addition, Helix Design Class C must meet the requirements of Section 5.6 of ER-279.
- Helix Design Class C is not allowed in Seismic Design Categories C, D, E or F.
- Table shall be read in conjunction with Fig 3A, Fig 3B, Fig 3C, and section "NOTES FOR ABOVE-GRADE WALL TABLES - Tables 3A & 3B."
- Table shall be used for residential construction only. Additional tables provide designs for commercial construction.
- Dowels shall be used at connection of wall to footing; the use of a keyway with this table is prohibited.
- Conventional reinforcement (as required) to be placed at mid-depth of the concrete wall.
- Conventional rebar yield strength = 60 ksi, 28 day concrete compressive strength = 3000 psi for Helix Design Class B and 4000 psi for Helix Design Class C.
- Walls must be laterally supported at top and bottom of wall.
- Except as noted for seismic design, the listed Helix 5-25 dosage rate is adequate to replace the required horizontal #4 bars at 32 inches.
- Minimum Helix 5-25 dosage rate of 15 lb/yd³ for townhouses in Seismic Design Category C. This dosage replaces the required horizontal #4 bars at 16 inches.
- Minimum Helix 5-25 dosage rate of 31.5 lb/yd³ for all buildings in Seismic Design Categories D0, D1 and D2. This dosage replaces the required horizontal #5 bars at 16 inches.
- Where spaces have been left blank, the Helix design is outside the scope of this table. Contact Helix Steel to determine proper design.
- For more information contact your local Logix rep.

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TABLE 3.2B - LOGIX 4" COMMERCIAL ABOVE-GRADE WALL, HELIX 5-25 ALTERNATIVE REINF. (WIND SPEEDS GREATER THAN 150 MPH)

Ground Floor LOGIX Supporting Roof Only					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	15 lb/yd ³ + #4 @ 24"	30 lb/yd ³ + #4 @ 24"	22.5 lb/yd ³ + #4 @ 8"	-	-
9	15 lb/yd ³ + #4 @ 24"	22.5 lb/yd ³ + #4 @ 12"	-	-	-
10	22.5 lb/yd ³ + #4 @ 12"	22.5 lb/yd ³ + #4 @ 8"	-	-	-
12	22.5 lb/yd ³ + #4 @ 8"	-	-	-	-
14	-	-	-	-	-
16	-	-	-	-	-
18	-	-	-	-	-
20	-	-	-	-	-

Ground Floor LOGIX Supporting 2nd Storey LOGIX (or 2nd Storey Wood Frame) & Roof Structure					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	15 lb/yd ³ + #4 @ 24"	22.5 lb/yd ³ + #4 @ 8"	-	-	-
9	30 lb/yd ³ + #4 @ 24"	22.5 lb/yd ³ + #4 @ 8"	-	-	-
10	22.5 lb/yd ³ + #4 @ 8"	-	-	-	-
12	-	-	-	-	-
14	-	-	-	-	-
16	-	-	-	-	-
18	-	-	-	-	-
20	-	-	-	-	-

Notes:

- Design and installation of Helix 5-25 Micro-Rebar reinforced concrete must be in accordance with Uniform Evaluation Service, ER-279.
- Designs given in the above table are Helix Design Class C, and walls must conform to all restrictions of Section 4.3.5 or Section 4.3.6 of ER-279 except for the minimum wall thickness requirement. In addition, Helix Design Class C must meet the requirements of Section 5.6 of ER-279.
- Helix Design Class C is not allowed in Seismic Design Categories C, D, E or F.
- Table shall be read in conjunction with **Fig 3A, Fig 3B, Fig 3C**, and section "NOTES FOR ABOVE-GRADE WALL TABLES - Tables 3A & 3B."
- Conventional reinforcement (as required) to be placed at mid-depth of the concrete wall.
- Conventional rebar yield strength = 60 ksi, 28 day concrete compressive strength = 4000 psi for Helix Design Class C.
- Walls must be laterally supported at top and bottom of wall.
- Except as noted for seismic design, the listed Helix 5-25 dosage rate is adequate to replace the required horizontal #4 bars at 32 inches.
- Minimum Helix 5-25 dosage rate of 15 lb/yd³ for townhouses in Seismic Design Category C. This dosage replaces the required horizontal #4 bars at 16 inches.
- Minimum Helix 5-25 dosage rate of 31.5 lb/yd³ for all buildings in Seismic Design Categories D0, D1 and D2. This dosage replaces the required horizontal #5 bars at 16 inches.
- Where spaces have been left blank, the Helix design is outside the scope of this table. Contact Helix Steel to determine proper design.
- For more information contact your local Logix rep.

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TABLE 3.3B - LOGIX 6.25" ABOVE-GRADE WALL, HELIX 5-25 ALTERNATIVE REINFORCEMENT (WIND SPEEDS GREATER THAN 150 MPH)

Ground Floor LOGIX Supporting Roof Only					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	9 lb/yd ³	10 lb/yd ³	18 lb/yd ³	26 lb/yd ³	26 lb/yd ³
9	10 lb/yd ³	14 lb/yd ³	26 lb/yd ³	26 lb/yd ³	34 lb/yd ³
10	14 lb/yd ³	18 lb/yd ³	34 lb/yd ³	34 lb/yd ³	-
12	18 lb/yd ³	26 lb/yd ³	-	-	-
14	30 lb/yd ³ + #4 @ 16"	-	-	-	-
16	30 lb/yd ³ + #4 @ 12"	-	-	-	-
18	-	-	-	-	-
20	-	-	-	-	-

Ground Floor LOGIX Supporting 2nd Storey LOGIX (or 2nd Storey Wood Frame) & Roof Structure					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	9 lb/yd ³	10 lb/yd ³	18 lb/yd ³	26 lb/yd ³	26 lb/yd ³
9	9 lb/yd ³	14 lb/yd ³	26 lb/yd ³	34 lb/yd ³	-
10	10 lb/yd ³	18 lb/yd ³	34 lb/yd ³	-	-
12	18 lb/yd ³	34 lb/yd ³	-	-	-
14	30 lb/yd ³ + #4 @ 16"	-	-	-	-
16	-	-	-	-	-
18	-	-	-	-	-
20	-	-	-	-	-

Notes:

- Design and installation of Helix 5-25 Micro-Rebar reinforced concrete must be in accordance with Uniform Evaluation Service, ER-279.
- Designs given in the unshaded rows of the above table are Helix Design Class B, and walls must conform to all restrictions of Section 4.3.5 or Section 4.3.6 of ER-279.
- Designs given in the shaded rows of the above table are Helix Design Class C, and walls must conform to all restrictions of Section 4.3.5 or Section 4.3.6 of ER-279 except for the minimum wall thickness requirement. In addition, Helix Design Class C must meet the requirements of Section 5.6 of ER-279.
- Helix Design Class C is not allowed in Seismic Design Categories C, D, E or F.
- Table shall be read in conjunction with Fig 3A, Fig 3B, Fig 3C, and section "NOTES FOR ABOVE-GRADE WALL TABLES - Tables 3A & 3B."
- Conventional reinforcement (as required) to be placed at mid-depth of the concrete wall.
- Conventional rebar yield strength = 60 ksi, 28 day concrete compressive strength = 3000 psi for Helix Design Class B and 4000 psi for Helix Design Class C.
- Walls must be laterally supported at top and bottom of wall.
- Except as noted for seismic design, the listed Helix 5-25 dosage rate is adequate to replace the required horizontal #4 bars at 32 inches.
- Minimum Helix 5-25 dosage rate of 13.5 lb/yd³ for townhouses in Seismic Design Category C. This dosage replaces the required horizontal #4 bars at 16 inches.
- Minimum Helix 5-25 dosage rate of 22.5 lb/yd³ for all buildings in Seismic Design Categories D0, D1 and D2. This dosage replaces the required horizontal #5 bars at 16 inches.
- Where spaces have been left blank, the Helix design is outside the scope of this table. Contact Helix Steel to determine proper design.
- For more information contact your local Logix rep.

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TABLE 3.4B - LOGIX 8" ABOVE-GRADE WALL, HELIX 5-25 ALTERNATIVE REINFORCEMENT (WIND SPEEDS GREATER THAN 150 MPH)

Ground Floor LOGIX Supporting Roof Only					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	9 lb/yd ³	9 lb/yd ³	12 lb/yd ³	15 lb/yd ³	15 lb/yd ³
9	9 lb/yd ³	9 lb/yd ³	15 lb/yd ³	21 lb/yd ³	21 lb/yd ³
10	9 lb/yd ³	12 lb/yd ³	21 lb/yd ³	21 lb/yd ³	27 lb/yd ³
12	12 lb/yd ³	21 lb/yd ³	27 lb/yd ³	-	-
14	15 lb/yd ³	27 lb/yd ³	-	-	-
16	21 lb/yd ³	-	-	-	-
18	30 lb/yd ³ + #4 @ 15"	-	-	-	-
20	-	-	-	-	-

Ground Floor LOGIX Supporting 2nd Storey LOGIX (or 2nd Storey Wood Frame) & Roof Structure					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	9 lb/yd ³	9 lb/yd ³	12 lb/yd ³	15 lb/yd ³	15 lb/yd ³
9	9 lb/yd ³	9 lb/yd ³	15 lb/yd ³	21 lb/yd ³	21 lb/yd ³
10	9 lb/yd ³	12 lb/yd ³	21 lb/yd ³	21 lb/yd ³	27 lb/yd ³
12	12 lb/yd ³	21 lb/yd ³	27 lb/yd ³	-	-
14	15 lb/yd ³	27 lb/yd ³	-	-	-
16	21 lb/yd ³	-	-	-	-
18	30 lb/yd ³ + #4 @ 15"	-	-	-	-
20	-	-	-	-	-

Notes:

- Design and installation of Helix 5-25 Micro-Rebar reinforced concrete must be in accordance with Uniform Evaluation Service, ER-279.
- Designs given in the unshaded rows of the above table are Helix Design Class B, and walls must conform to all restrictions of Section 4.3.5 or Section 4.3.6 of ER-279.
- Designs given in the shaded rows of the above table are Helix Design Class C, and walls must conform to all restrictions of Section 4.3.5 or Section 4.3.6 of ER-279 except for the minimum wall thickness requirement. In addition, Helix Design Class C must meet the requirements of Section 5.6 of ER-279.
- Helix Design Class C is not allowed in Seismic Design Categories C, D, E or F.
- Table shall be read in conjunction with Fig 3A, Fig 3B, Fig 3C, and section "NOTES FOR ABOVE-GRADE WALL TABLES - Tables 3A & 3B."
- Conventional reinforcement (as required) to be placed at mid-depth of the concrete wall.
- Conventional rebar yield strength = 60 ksi, 28 day concrete compressive strength = 3000 psi for Helix Design Class B and 4000 psi for Helix Design Class C.
- Walls must be laterally supported at top and bottom of wall.
- Except as noted for seismic design, the listed Helix 5-25 dosage rate is adequate to replace the required horizontal #4 bars at 16 inches.
- Minimum Helix 5-25 dosage rate of 9 lb/yd³ for townhouses in Seismic Design Category C. This dosage replaces the required horizontal #4 bars at 16 inches.
- Minimum Helix 5-25 dosage rate of 18 lb/yd³ for all buildings in Seismic Design Categories D0, D1 and D2. This dosage replaces the required horizontal #5 bars at 16 inches.
- Where spaces have been left blank, the Helix design is outside the scope of this table. Contact Helix Steel to determine proper design.
- For more information contact your local Logix rep.

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TABLE 3.5B - LOGIX 10" ABOVE-GRADE WALL, HELIX 5-25 ALTERNATIVE REINFORCEMENT (WIND SPEEDS GREATER THAN 150 MPH)

Ground Floor LOGIX Supporting Roof Only					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	10 lb/yd ³	10 lb/yd ³
9	9 lb/yd ³	9 lb/yd ³	10 lb/yd ³	12 lb/yd ³	12 lb/yd ³
10	9 lb/yd ³	9 lb/yd ³	12 lb/yd ³	17 lb/yd ³	17 lb/yd ³
12	9 lb/yd ³	10 lb/yd ³	17 lb/yd ³	22 lb/yd ³	-
14	10 lb/yd ³	17 lb/yd ³	22 lb/yd ³	-	-
16	12 lb/yd ³	22 lb/yd ³	-	-	-
18	17 lb/yd ³	-	-	-	-
20	22 lb/yd ³	-	-	-	-

Ground Floor LOGIX Supporting 2nd Storey LOGIX (or 2nd Storey Wood Frame) & Roof Structure					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	10 lb/yd ³
9	9 lb/yd ³	9 lb/yd ³	10 lb/yd ³	10 lb/yd ³	12 lb/yd ³
10	9 lb/yd ³	9 lb/yd ³	10 lb/yd ³	12 lb/yd ³	17 lb/yd ³
12	9 lb/yd ³	10 lb/yd ³	17 lb/yd ³	22 lb/yd ³	-
14	9 lb/yd ³	17 lb/yd ³	-	-	-
16	12 lb/yd ³	22 lb/yd ³	-	-	-
18	17 lb/yd ³	-	-	-	-
20	22 lb/yd ³	-	-	-	-

Notes:

- Design and installation of Helix 5-25 Micro-Rebar reinforced concrete must be in accordance with Uniform Evaluation Service, ER-279.
- Designs given in the above table are Helix Design Class B, and walls must conform to all restrictions of Section 4.3.5 or Section 4.3.6 of ER-279.
- Table shall be read in conjunction with Fig 3A, Fig 3B, Fig 3C, and section "NOTES FOR ABOVE-GRADE WALL TABLES - Tables 3A & 3B."
- Conventional reinforcement (as required) to be placed at mid-depth of the concrete wall.
- Conventional rebar yield strength = 60 ksi, 28 day concrete compressive strength = 3000 psi for Helix Design Class B.
- Walls must be laterally supported at top and bottom of wall.
- Except as noted for seismic design, the listed Helix 5-25 dosage rate is adequate to replace the required horizontal #4 bars at 16 inches.
- Minimum Helix 5-25 dosage rate of 9 lb/yd³ for townhouses in Seismic Design Category C. This dosage replaces the required horizontal #4 bars at 16 inches.
- Minimum Helix 5-25 dosage rate of 13.5 lb/yd³ for all buildings in Seismic Design Categories D0, D1 and D2. This dosage replaces the required horizontal #5 bars at 16 inches.
- Where spaces have been left blank, the Helix design is outside the scope of this table. Contact Helix Steel to determine proper design.
- For more information contact your local Logix rep.

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6.1 – U.S. ENGINEERING ANALYSIS REPORT

TABLE 3.6B - LOGIX 12" ABOVE-GRADE WALL, HELIX 5-25 ALTERNATIVE REINFORCEMENT (WIND SPEEDS GREATER THAN 150 MPH)

Ground Floor LOGIX Supporting Roof Only					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
9	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	10 lb/yd ³
10	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	10 lb/yd ³	10 lb/yd ³
12	9 lb/yd ³	9 lb/yd ³	15 lb/yd ³	15 lb/yd ³	20 lb/yd ³
14	9 lb/yd ³	10 lb/yd ³	20 lb/yd ³	20 lb/yd ³	-
16	9 lb/yd ³	15 lb/yd ³	-	-	-
18	10 lb/yd ³	20 lb/yd ³	-	-	-
20	15 lb/yd ³	-	-	-	-

Ground Floor LOGIX Supporting 2nd Storey LOGIX (or 2nd Storey Wood Frame) & Roof Structure					
Wall Height, ft	Wind Speed, mph				
	160	200	250	275	300
8	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
9	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	10 lb/yd ³
10	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	10 lb/yd ³	10 lb/yd ³
12	9 lb/yd ³	9 lb/yd ³	15 lb/yd ³	15 lb/yd ³	20 lb/yd ³
14	9 lb/yd ³	9 lb/yd ³	15 lb/yd ³	20 lb/yd ³	-
16	9 lb/yd ³	15 lb/yd ³	-	-	-
18	10 lb/yd ³	20 lb/yd ³	-	-	-
20	15 lb/yd ³	-	-	-	-

Notes:

- Design and installation of Helix 5-25 Micro-Rebar reinforced concrete must be in accordance with Uniform Evaluation Service, ER-279.
- Designs given in the above table are Helix Design Class B, and walls must conform to all restrictions of Section 4.3.5 or Section 4.3.6 of ER-279.
- Table shall be read in conjunction with Fig 3A, Fig 3B, Fig 3C, and section "NOTES FOR ABOVE-GRADE WALL TABLES - Tables 3A & 3B."
- Conventional reinforcement (as required) to be placed at mid-depth of the concrete wall.
- Conventional rebar yield strength = 60 ksi, 28 day concrete compressive strength = 3000 psi for Helix Design Class B.
- Walls must be laterally supported at top and bottom of wall.
- Except as noted for seismic design, the listed Helix 5-25 dosage rate is adequate to replace the required horizontal #4 bars at 32 inches (double mat).
- Minimum Helix 5-25 dosage rate of 9 lb/yd³ for townhouses in Seismic Design Category C. This dosage replaces the required horizontal #4 bars at 16 inches.
- Minimum Helix 5-25 dosage rate of 13.5 lb/yd³ for all buildings in Seismic Design Categories D0, D1 and D2. This dosage replaces the required horizontal #5 bars at 16 inches.
- Where spaces have been left blank, the Helix design is outside the scope of this table. Contact Helix Steel to determine proper design.
- For more information contact your local Logix rep.

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