

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.

6.2 – CANADIAN ENGINEERING ANALYSIS REPORT: IMPERIAL UNITS

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 and 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 a second floor 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 Product 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 lintels were developed using the design criteria of Part 4 of the National Building Code of Canada 2010, and CSA A23.3-04, Design of Concrete Structures.

The reinforcement tables allow for bar spacings common in residential construction. In addition, the above-grade wall reinforcement tables have been properly developed to include LOGIX with a 4 inch concrete core. This is provided to reflect the construction industry’s common practice of using 4 inch concrete walls above-grade with both traditional concrete and ICF walls. This is further reflected by the fact that building codes in the United States (International Residential Code 2012) allows for larger bar spacings, and the use of ICF walls above-grade with concrete core thicknesses of 3.5 inches.

HELIX TSMR TABLES - ALTERNATIVE TO REBAR REINFORCEMENT TABLES

Where applicable, Helix TSMR (Twisted Steel Micro Rebar) Tables 1A-H to 1D-H, and Tables 2.1-H to 2.5-H, may be used in lieu of reinforcement requirements in Tables 1A to 1D, and Table 2. 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 reinforcement see Tables 3A to 3E, and 4A to 4E)

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LIMITATIONS

The limitations of Reinforcement Tables 1A to 1D, and Table 2, also apply to Helix alternative reinforcement Tables 1A-H to 1D-H, and Table 2.1-H to 2.5-H.

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

Building perimeter = 24.384 m (80 ft) max x 12.192 m (40 ft) max
Roof clear span = 12.192 m (40 ft) max
Floor clear span = 9.754 m (32 ft) max
Number of stories above grade = 2 max
Number of stories below grade = 1

Tables 3A to 3E and Tables 4A to 4E provide lintel tables for factored uniform and concentrated loading conditions, respectively.

In addition, crawl space reinforcement requirements were developed and can be found in Figure 1.

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

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BELOW-GRADE WALL TABLES

NOTE FOR BELOW-GRADE WALL TABLES

LOGIX below-grade Tables 1A to 1D, and alternative Helix TSMR (Twisted Steel Micro Rebar) Tables 1A-H to 1D-H, shall be used in conjunction with corresponding Figures 2A to 2D, the notes listed below, and the building limitations noted in the "Reinforcement Tables" and "Helix TSMR Tables - Alternative to Rebar Reinforcement Tables" section, which form the basis of these tables.

1. Tables do not consider seismic loads. For seismic load considerations refer to the Appendix in the Table of Contents. Factored snow load = 3.54 kPa
2. Horizontal rebar shall be 10M @ 32" o/c. Provide at least one 10M bar to be placed at the bottom course and top course.
3. Steel yield strength = 400MPa, 28 day concrete compressive strength = 20MPa
4. Deflection criteria = L/240
5. Assumed eccentricity = 3" (to account for loads on LOGIX Brick Ledge).
6. The basement walls must be supported at the top and bottom of the wall.
7. For light vehicles parked or travelling near the wall use reinforcement corresponding to 1 ft higher backfill.
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. Provide two 15M bars (One 15M bar for 4" concrete core thickness) should be placed around all openings (along the vertical sides and bottom of opening), and extend a minimum of 2 ft beyond openings.
10. For walls with over 50% of height exposed to wind, also check rebar requirements for above-grade walls.
11. Carefully consider floor/wall connection details for lateral loads, especially with higher backfills, walkout basements, and active seismic areas.
12. Soil density is often referred to as "equivalent fluid density", and is the density of a liquid which would exert an equivalent horizontal load on a wall. The actual soil density is generally greater – ranging between 90 & 120pcf.
13. Consult a local licensed engineer for design of walls that fall outside the scope of the tables.
14. Where applicable alternative Helix dosage Tables 1A-H to 1D-H may be used in lieu of Logix reinforcement Tables 1A to 1D.

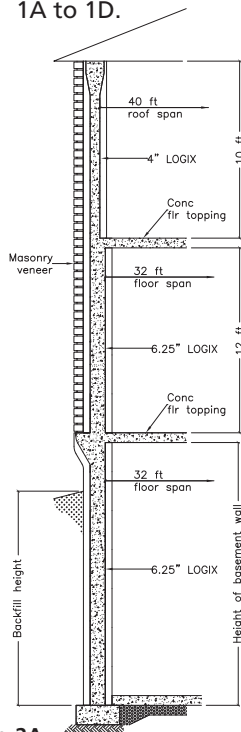


Fig 2A
Assumed typical flooring, wall & roof for **Table 1A**. Height & thickness of above-grade walls, floor & roof spans, including materials (i.e., wood frame, concrete, and cladding) can vary provided the total factored load on basement wall does not exceed 6 kips/ft.

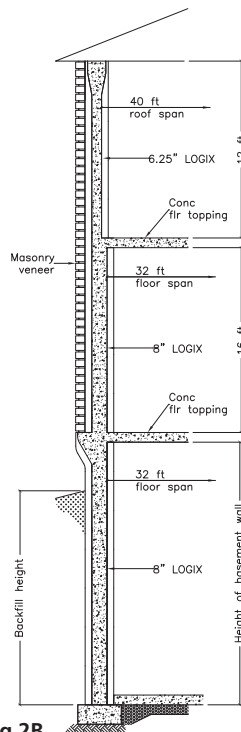


Fig 2B
Assumed typical flooring, wall & roof for **Table 1B**. Height & thickness of above-grade walls, floor & roof spans, including materials (i.e., wood frame, concrete, and cladding) can vary provided the total factored load on basement wall does not exceed 7.5 kips/ft.

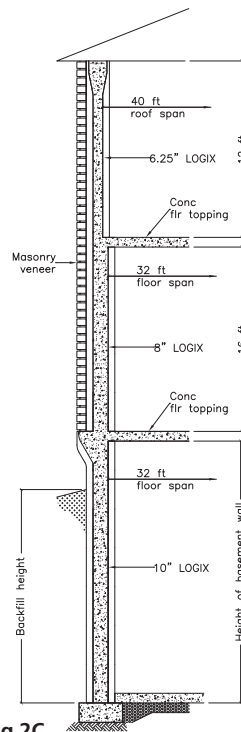


Fig 2C
Assumed typical flooring, wall & roof for **Table 1C**. Height & thickness of above-grade walls, floor & roof spans, including materials (i.e., wood frame, concrete, and cladding) can vary provided the total factored load on basement wall does not exceed 7.5 kips/ft.

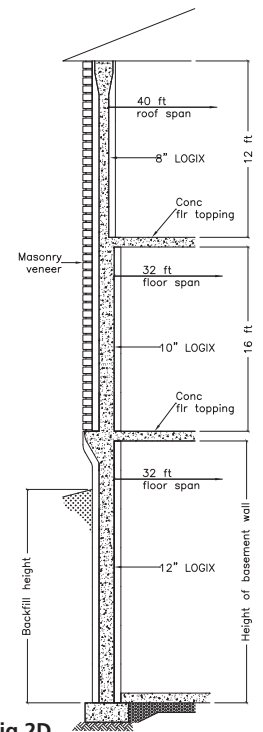


Fig 2D
Assumed typical flooring, wall & roof for **Table 1D**. Height & thickness of above-grade walls, floor & roof spans, including materials (i.e., wood frame, concrete, and cladding) can vary provided the total factored load on basement wall does not exceed 8.3 kips/ft.

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TABLE 1A - LOGIX 6.25" BELOW-GRADE WALL MINIMUM VERTICAL REINFORCEMENT

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.

Max. Height of Basement Wall, ft	Max. Unbalanced Backfill Height, ft	Vertical Bar Spacing, in.																
		Maximum Equivalent Density 30pcf				Maximum Equivalent Density 45pcf				Maximum Equivalent Density 60pcf				Maximum Equivalent Density 75pcf				
		12	24	32	48	12	24	32	48	12	24	32	48	12	24	32	48	
8	4	12	24	32	48	12	24	32	48	12	24	32	48	12	24	32	48	
	5	12	24	32	48	12	24	32	48	12	24	32	48	8	16	24	48	
	6	12	24	32	48	8	16	32	48	8	16	24	40	6	12	16	32	
	7	12	16	32	40	8	16	24	40	6	12	16	24	-	8	12	24	
	8	8	16	24	32	6	12	16	24	-	8	12	16	-	8	8	16	
9	4	12	24	32	48	12	24	32	48	12	24	32	48	12	24	32	48	
	5	12	24	32	48	12	24	32	48	8	16	32	48	8	16	24	40	
	6	12	24	32	48	8	16	24	48	8	16	16	32	6	12	16	24	
	7	8	16	24	40	6	12	16	32	-	8	16	24	-	8	12	16	
	8	8	16	24	32	-	8	16	24	-	8	12	16	-	6	8	12	
10	4	12	24	32	48	12	24	32	48	12	24	32	48	12	24	32	48	
	5	12	24	32	48	12	24	32	48	8	16	24	48	8	16	24	40	
	6	12	24	32	48	8	16	24	40	6	12	16	32	6	12	16	24	
	7	8	16	24	32	6	12	16	32	-	8	12	24	-	8	12	16	
	8	6	12	16	24	-	8	12	24	-	6	8	16	-	-	8	12	
	9	6	12	16	16	-	6	8	16	-	-	8	12	-	-	6	8	
	10	-	8	12	16	-	6	8	12	-	-	6	8	-	-	-	-	
11	4	12	16	32	48	12	16	32	48	12	16	32	48	12	16	32	48	
	5	12	16	32	48	12	16	32	48	8	16	24	40	8	16	24	32	
	6	12	16	32	48	8	16	24	40	6	12	16	32	-	8	16	24	
	7	8	16	24	32	6	12	16	24	-	8	12	16	-	6	8	16	
	8	6	12	16	24	-	8	12	16	-	6	8	12	-	-	6	8	
	9	-	8	12	16	-	6	8	16	-	-	6	8	-	-	-	6	
	10	-	8	12	12	-	-	6	12	-	-	-	6	-	-	-	-	
	11	-	6	8	8	-	-	-	8	-	-	-	-	-	-	-	-	
12	4	8	16	32	48	8	16	32	48	8	16	32	48	8	16	32	48	
	5	8	16	32	48	8	16	32	48	8	16	24	40	8	12	16	32	
	6	8	16	32	40	8	16	16	32	6	12	16	24	-	8	12	16	
	7	8	16	24	24	-	8	16	24	-	8	12	16	-	6	8	12	
	8	6	12	16	16	-	8	12	16	-	6	8	12	-	-	6	8	
	9	-	8	12	16	-	6	8	12	-	-	6	8	-	-	-	-	
	10	-	6	8	12	-	-	6	8	-	-	-	-	-	-	-	-	
	11	-	6	8	8	-	-	-	-	-	-	-	-	-	-	-	-	
	12	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	
			10M	15M	20M	25M	10M	15M	20M	25M	10M	15M	20M	25M	10M	15M	20M	25M
			Bar size															

NOTES:

1. Tables do not consider seismic loads. For seismic load considerations refer to the Appendix in the Table of Contents.
2. Reinforcement to be placed on interior face of concrete wall. Effective depth of vertical rebar (exterior face of concrete to center of vertical rebar) = 4.375"
3. Table 1A shall be read in conjunction with Fig 2A, and section "Notes for Below-grade Wall Tables."
4. 1 ft = 0.3048 m, 1 in = 25.4 mm, 1 pcf = 16.02 kg/m³ = 0.157 kN/m³
5. Where cells show "-" engineering is required.
6. Unless cell is shaded, Helix dosage Table 1A-H may be used in lieu of Table 1A.

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TABLE 1A-H - LOGIX 6.25" BELOW-GRADE WALL, HELIX 5-25 ALTERNATIVE REINFORCEMENT

Maximum Height of Basement Wall, ft	Maximum Unbalanced Backfill Height, ft	Helix Dosage and Hybrid Vertical Rebar Requirement			
		Maximum Equivalent Density 30 pcf	Maximum Equivalent Density 45 pcf	Maximum Equivalent Density 60 pcf	Maximum Equivalent Density 75 pcf
8	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	16 lb/yd ³	20 lb/yd ³
	7	9 lb/yd ³	17 lb/yd ³	22 lb/yd ³	23 lb/yd ³
	8	9 lb/yd ³	22 lb/yd ³	23 lb/yd ³	27 lb/yd ³
9	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	18 lb/yd ³	22 lb/yd ³
	7	9 lb/yd ³	19 lb/yd ³	23 lb/yd ³	23 lb/yd ³
	8	17 lb/yd ³	23 lb/yd ³	24 lb/yd ³	30 lb/yd ³
10	9	21 lb/yd ³	23 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 24"
	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	19 lb/yd ³	23 lb/yd ³
	7	9 lb/yd ³	20 lb/yd ³	23 lb/yd ³	25 lb/yd ³
	8	18 lb/yd ³	23 lb/yd ³	27 lb/yd ³	30 lb/yd ³ + 10M @ 48"
11	9	23 lb/yd ³	26 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"
	10	23 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"
	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	16 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	20 lb/yd ³	23 lb/yd ³
	7	9 lb/yd ³	21 lb/yd ³	23 lb/yd ³	26 lb/yd ³
12	8	19 lb/yd ³	23 lb/yd ³	29 lb/yd ³	30 lb/yd ³ + 10M @ 36"
	9	23 lb/yd ³	28 lb/yd ³	30 lb/yd ³ + 10M @ 30"	30 lb/yd ³ + 10M @ 12"
	10	23 lb/yd ³	30 lb/yd ³ + 10M @ 42"	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"
	11	28 lb/yd ³	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"
	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	16 lb/yd ³
12	6	9 lb/yd ³	16 lb/yd ³	20 lb/yd ³	23 lb/yd ³
	7	15 lb/yd ³	22 lb/yd ³	23 lb/yd ³	28 lb/yd ³
	8	21 lb/yd ³	23 lb/yd ³	30 lb/yd ³	30 lb/yd ³ + 10M @ 24"
	9	23 lb/yd ³	30 lb/yd ³	30 lb/yd ³ + 10M @ 18"	30 lb/yd ³ + 15M @ 18"
	10	25 lb/yd ³	30 lb/yd ³ + 10M @ 24"	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 18"
	11	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"
	12	30 lb/yd ³ + 10M @ 30"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"	-

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 above table are Helix Design Class B, and walls must conform to all restrictions of Section 4.3.5 of ER-279.
- Conventional reinforcement (as required) to be placed on interior face of concrete wall. Effective depth of vertical rebar (exterior face of concrete to center of vertical rebar) = 4.375"
- Table shall be read in conjunction with Fig 2A, and section "Notes for Below-grade Wall Tables."
- Conventional rebar yield strength = 400 MPa, 28 day concrete compressive strength = 20.7 MPa (3000 psi).
- Modulus of rupture of Helix reinforced concrete with 9 lb/yd³ Helix 5-25 = 7.5 v(3000 psi) = 410 psi = 2.83 MPa.
- Walls must be laterally supported at top and bottom of wall before backfilling.
- The listed Helix 5-25 dosage rate is adequate to replace the required horizontal 10M bars at 32 inches.
- Tables do not consider seismic loads.
- For more information contact your local Logix rep.

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TABLE 1B - LOGIX 8" BELOW-GRADE WALL MINIMUM VERTICAL REINFORCEMENT

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.

Max. Height of Basement Wall, ft	Max. Unbalanced Backfill Height, ft	Vertical Bar Spacing, in.															
		Maximum Equivalent Density 30pcf				Maximum Equivalent Density 45pcf				Maximum Equivalent Density 60pcf				Maximum Equivalent Density 75pcf			
		16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48
8	4	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48
	5	16	32	48	48	16	32	48	48	16	32	48	48	16	24	40	48
	6	16	32	48	48	16	32	48	48	12	24	40	48	8	16	32	48
	7	16	32	48	48	12	24	32	48	8	16	24	48	8	16	24	40
	8	12	24	40	48	8	16	24	48	8	16	16	32	6	12	16	24
9	4	16	24	40	48	16	24	40	48	16	24	40	48	16	24	40	48
	5	16	24	40	48	16	24	40	48	16	24	40	48	12	24	40	48
	6	16	24	40	48	16	24	40	48	12	24	32	48	8	16	24	48
	7	16	24	40	48	12	16	32	48	8	16	24	40	6	12	16	32
	8	12	24	32	48	8	16	24	40	6	12	16	32	-	8	16	24
10	4	12	24	40	48	12	24	40	48	12	24	40	48	12	24	40	48
	5	12	24	40	48	12	24	40	48	12	24	40	48	12	24	40	48
	6	12	24	40	48	12	24	40	48	8	16	32	48	8	16	24	40
	7	12	24	40	48	8	16	32	48	8	16	24	40	6	12	16	32
	8	12	24	32	40	8	16	24	40	6	12	16	24	-	8	12	24
	9	8	16	24	32	6	12	16	32	-	8	12	24	-	8	8	16
11	4	8	16	16	24	-	8	16	24	-	8	12	16	-	6	8	12
	5	12	24	40	48	12	24	40	48	12	24	40	48	12	24	40	48
	6	12	24	40	48	12	24	40	48	8	16	32	48	8	16	24	40
	7	12	24	40	48	8	16	24	48	8	12	16	32	6	12	16	24
	8	8	16	32	40	6	12	16	32	6	8	16	24	-	8	12	16
	9	8	16	24	32	6	12	16	24	-	8	12	16	-	6	8	16
12	4	12	24	40	48	12	24	40	48	12	24	40	48	12	24	40	48
	5	12	24	40	48	12	24	40	48	12	24	40	48	12	24	32	48
	6	12	24	40	48	12	24	32	48	8	16	24	48	8	16	24	40
	7	12	24	40	48	8	16	24	40	6	12	16	32	6	12	16	24
	8	8	16	24	32	6	12	16	32	-	8	16	24	-	8	12	16
	9	8	16	24	24	-	8	16	24	-	8	12	16	-	6	8	12
	10	6	12	16	16	-	8	12	16	-	6	8	12	-	-	6	12
14	4	-	8	16	16	-	6	8	16	-	-	6	12	-	-	-	8
	5	-	8	12	12	-	-	8	12	-	-	6	8	-	-	-	6
	6	-	6	8	12	-	-	6	8	-	-	-	6	-	-	-	-
	7	-	6	8	8	-	-	-	8	-	-	-	-	-	-	-	-
	8	-	-	6	8	-	-	-	6	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	4	12	24	32	48	12	24	32	48	12	24	32	48	12	24	32	48
	5	12	24	32	48	12	24	32	48	12	24	32	48	8	16	32	48
	6	12	24	32	48	8	16	32	48	8	16	24	40	6	12	16	32
	7	8	16	32	40	8	12	16	32	6	12	16	24	-	8	12	16
	8	8	16	24	24	-	8	16	24	-	8	12	16	-	6	8	16
	9	6	12	16	16	-	8	12	16	-	6	8	12	-	-	6	8
	10	-	8	12	16	-	6	8	12	-	-	6	8	-	-	-	8
	11	-	6	8	12	-	-	6	8	-	-	-	8	-	-	-	-
	12	-	6	8	8	-	-	-	8	-	-	-	-	-	-	-	-
	13	-	-	6	8	-	-	-	6	-	-	-	-	-	-	-	-
	14	-	-	-	6	6	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		10M	15M	20M	25M	10M	15M	20M	25M	10M	15M	20M	25M	10M	15M	20M	25M
		Bar size															

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- NOTES:**
- Tables do not consider seismic loads. For seismic load considerations refer to the Appendix in the Table of Contents.
 - Reinforcement to be placed on interior face of concrete wall. Effective depth of vertical rebar (exterior face of concrete to center of vertical rebar) = 6"
 - Table 1B shall be read in conjunction with Fig 2B, and section "Notes for Below-grade Wall Tables."
 - 1 ft = 0.3048 m, 1 in = 25.4 mm, 1 pcf = 16.02 kg/m³ = 0.157 kN/m³
 - Where cells show "-" engineering is required.
 - Unless cell is shaded, Helix dosage Table 1B-H may be used in lieu of Table 1B.

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TABLE 1B-H - LOGIX 8" BELOW-GRADE, HELIX 5-25 ALTERNATIVE REINFORCEMENT

Maximum Height of Basement Wall, ft	Maximum Unbalanced Backfill Height, ft	Helix Dosage and Hybrid Vertical Rebar Requirement			
		Maximum Equivalent Density 30 pcf	Maximum Equivalent Density 45 pcf	Maximum Equivalent Density 60 pcf	Maximum Equivalent Density 75 pcf
8	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	17 lb/yd ³
	8	9 lb/yd ³	9 lb/yd ³	18 lb/yd ³	22 lb/yd ³
9	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	15 lb/yd ³	19 lb/yd ³
	8	9 lb/yd ³	15 lb/yd ³	20 lb/yd ³	25 lb/yd ³
10	9	9 lb/yd ³	19 lb/yd ³	25 lb/yd ³	26 lb/yd ³
	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	17 lb/yd ³	20 lb/yd ³
	8	9 lb/yd ³	17 lb/yd ³	22 lb/yd ³	26 lb/yd ³
	9	9 lb/yd ³	21 lb/yd ³	26 lb/yd ³	26 lb/yd ³
11	10	18 lb/yd ³	26 lb/yd ³	26 lb/yd ³	30 lb/yd ³ + 10M @ 48"
	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	15 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	17 lb/yd ³	22 lb/yd ³
	8	9 lb/yd ³	18 lb/yd ³	23 lb/yd ³	26 lb/yd ³
	9	16 lb/yd ³	23 lb/yd ³	26 lb/yd ³	28 lb/yd ³
	10	19 lb/yd ³	26 lb/yd ³	28 lb/yd ³	30 lb/yd ³ + 10M @ 30"
12	11	23 lb/yd ³	26 lb/yd ³	30 lb/yd ³ + 10M @ 42"	30 lb/yd ³ + 10M @ 12"
	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	16 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	18 lb/yd ³	23 lb/yd ³
	8	9 lb/yd ³	19 lb/yd ³	25 lb/yd ³	26 lb/yd ³
	9	17 lb/yd ³	24 lb/yd ³	26 lb/yd ³	30 lb/yd ³
	10	21 lb/yd ³	26 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 18"
	11	25 lb/yd ³	28 lb/yd ³	30 lb/yd ³ + 10M @ 24"	30 lb/yd ³ + 15M @ 18"
14	12	26 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"
	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	17 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	20 lb/yd ³	24 lb/yd ³
	8	9 lb/yd ³	21 lb/yd ³	26 lb/yd ³	26 lb/yd ³
	9	18 lb/yd ³	26 lb/yd ³	27 lb/yd ³	30 lb/yd ³ + 10M @ 48"
	10	23 lb/yd ³	26 lb/yd ³	30 lb/yd ³ + 10M @ 42"	30 lb/yd ³ + 10M @ 12"
	11	26 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"
	12	26 lb/yd ³	30 lb/yd ³ + 10M @ 18"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"
14	13	30 lb/yd ³	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 12"	-
	14	30 lb/yd ³ + 10M @ 36"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"	-

NOTES:
See next page.

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TABLE 1B-H - LOGIX 8" BELOW-GRADE, HELIX 5-25 ALTERNATIVE REINFORCEMENT Cont'd

Maximum Height of Basement Wall, ft	Maximum Unbalanced Backfill Height, ft	Helix Dosage and Hybrid Vertical Rebar Requirement			
		Maximum Equivalent Density 30 pcf	Maximum Equivalent Density 45 pcf	Maximum Equivalent Density 60 pcf	Maximum Equivalent Density 75 pcf
16	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	18 lb/yd ³
	7	9 lb/yd ³	16 lb/yd ³	21 lb/yd ³	26 lb/yd ³
	8	9 lb/yd ³	22 lb/yd ³	26 lb/yd ³	27 lb/yd ³
	9	20 lb/yd ³	26 lb/yd ³	29 lb/yd ³	30 lb/yd ³ + 10M @ 24"
	10	25 lb/yd ³	28 lb/yd ³	30 lb/yd ³ + 10M @ 24"	30 lb/yd ³ + 15M @ 18"
	11	26 lb/yd ³	30 lb/yd ³ + 10M @ 30"	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 12"
	12	29 lb/yd ³	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"	-
	13	30 lb/yd ³ + 10M @ 42"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"	-
	14	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 20M @ 12"	-	-
	15	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 12"	-	-
	16	30 lb/yd ³ + 15M @ 12"	-	-	-

Notes:

1. Design and installation of Helix 5-25 Micro-Rebar reinforced concrete must be in accordance with Uniform Evaluation Service, ER-279. Designs given in above table are Helix Design Class B, and walls must conform to all restrictions of Section 4.3.5 of ER-279.
2. Conventional reinforcement (as required) to be placed on interior face of concrete wall. Effective depth of vertical rebar (exterior face of concrete to center of vertical rebar) = 6"
3. Table shall be read in conjunction with **Fig 2B**, and section "Notes for Below-grade Wall Tables."
4. Conventional rebar yield strength = 400 MPa, 28 day concrete compressive strength = 20.7 MPa (3000 psi).
5. Modulus of rupture of Helix reinforced concrete with 9 lb/yd³ Helix 5-25 = 7.5 √(3000 psi) = 410 psi = 2.83 MPa.
6. Walls must be laterally supported at top and bottom of wall before backfilling.
7. The listed Helix 5-25 dosage rate is adequate to replace the required horizontal 10M bars at 32 inches.
8. Tables do not consider seismic loads.
9. For more information contact your local Logix rep.

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6.2 – CANADIAN ENGINEERING ANALYSIS REPORT: IMPERIAL UNITS

TABLE 1C - LOGIX 10" BELOW-GRADE WALL MINIMUM VERTICAL REINFORCEMENT

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.

Max. Height of Basement Wall, ft	Max. Unbalanced Backfill Height, ft	Vertical Bar Spacing, in.																
		Maximum Equivalent Density 30pcf				Maximum Equivalent Density 45pcf				Maximum Equivalent Density 60pcf				Maximum Equivalent Density 75pcf				
		16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48	
14	4	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48	
	5	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48	
	6	16	32	48	48	16	32	48	48	12	24	40	48	8	16	32	48	
	7	16	32	48	48	12	24	32	48	8	16	24	40	8	12	16	32	
	8	12	24	40	48	8	16	24	40	6	12	16	32	-	8	16	24	
	9	8	16	24	32	6	12	16	32	-	8	16	24	-	8	12	16	
	10	8	16	24	24	-	8	16	24	-	8	12	16	-	6	8	16	
	11	6	12	16	24	-	8	12	16	-	6	8	16	-	-	6	12	
	12	-	8	16	16	-	6	8	16	-	-	8	12	-	-	6	8	
	13	-	8	12	16	-	6	8	12	-	-	6	8	-	-	-	8	
	14	-	8	12	12	-	-	8	12	-	-	-	8	-	-	-	6	
	16	4	16	32	40	48	16	32	40	48	16	32	40	48	16	32	40	48
		5	16	32	40	48	16	32	40	48	16	32	40	48	16	32	40	48
		6	16	32	40	48	16	32	40	48	12	24	32	48	8	16	24	48
7		16	32	40	48	8	16	32	48	8	16	24	40	6	12	16	32	
8		12	24	32	40	8	16	24	40	6	12	16	32	-	8	12	24	
9		8	16	24	32	6	12	16	24	-	8	12	16	-	6	8	16	
10		6	12	16	24	-	8	12	24	-	6	8	16	-	-	8	12	
11		6	12	16	16	-	8	12	16	-	-	8	12	-	-	6	8	
12		-	8	12	16	-	6	8	12	-	-	6	8	-	-	-	8	
13		-	8	12	12	-	-	8	12	-	-	-	8	-	-	-	6	
14		-	6	8	12	-	-	6	8	-	-	-	6	-	-	-	-	
15		-	6	8	8	-	-	-	8	-	-	-	6	-	-	-	-	
16		-	-	6	8	-	-	-	6	-	-	-	-	-	-	-	-	
18		4	12	24	40	48	12	24	40	48	12	24	40	48	12	24	40	48
	5	12	24	40	48	12	24	40	48	12	24	40	48	12	24	40	48	
	6	12	24	40	48	12	24	40	48	12	24	32	48	8	16	24	48	
	7	12	24	40	48	8	16	32	48	8	16	24	40	6	12	16	32	
	8	8	16	32	40	8	16	16	32	6	12	16	24	-	8	12	16	
	9	8	16	24	32	6	12	16	24	-	8	12	16	-	6	8	16	
	10	6	12	16	24	-	8	12	16	-	6	8	16	-	-	6	12	
	11	-	8	16	16	-	6	8	16	-	-	6	12	-	-	6	8	
	12	-	8	12	12	-	-	8	12	-	-	6	8	-	-	-	6	
	13	-	6	8	12	-	-	6	8	-	-	-	8	-	-	-	-	
	14	-	6	8	8	-	-	-	8	-	-	-	6	-	-	-	-	
	15	-	-	6	8	-	-	-	6	-	-	-	-	-	-	-	-	
	16	-	-	6	6	-	-	-	6	-	-	-	-	-	-	-	-	
	17	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
20	4	12	24	40	48	12	24	40	48	12	24	40	48	12	24	40	48	
	5	12	24	40	48	12	24	40	48	12	24	40	48	12	24	40	48	
	6	12	24	40	48	12	24	40	48	8	16	32	48	8	16	24	48	
	7	12	24	40	48	8	16	24	48	8	12	16	32	6	12	16	24	
	8	8	16	32	40	6	12	16	32	-	8	16	24	-	8	12	16	
	9	8	16	24	24	-	8	16	24	-	8	12	16	-	6	8	16	
	10	6	12	16	16	-	8	12	16	-	6	8	12	-	-	6	8	
	11	-	8	12	16	-	6	8	16	-	-	6	8	-	-	-	8	
	12	-	8	8	12	-	-	6	12	-	-	-	8	-	-	-	6	
	13	-	6	8	8	-	-	6	8	-	-	-	6	-	-	-	-	
	14	-	-	8	8	-	-	-	8	-	-	-	-	-	-	-	-	
	15	-	-	6	6	-	-	-	6	-	-	-	-	-	-	-	-	
	16	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	
	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		10M	15M	20M	25M	10M	15M	20M	25M	10M	15M	20M	25M	10M	15M	20M	25M	
		Bar size																

- NOTES:**
1. Tables do not consider seismic loads. For seismic load considerations refer to the Appendix in the Table of Contents.
 2. Reinforcement to be placed on interior face of concrete wall. Effective depth of vertical rebar (exterior face of concrete to center of vertical rebar = 8")
 3. Table 1C shall be read in conjunction with Fig 2C, and section "Notes for Below-grade Wall Tables."
 4. 1 ft = 0.3048 m, 1 in = 25.4 mm, 1 pcf = 16.02 kg/m³ = 0.157 kN/m³
 5. Where cells show "-" engineering is required.
 6. Unless cell is shaded, Helix dosage Table 1C-H may be used in lieu of Table 1C.

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6.2 – CANADIAN ENGINEERING ANALYSIS REPORT: IMPERIAL UNITS

TABLE 1C-H - LOGIX 10" BELOW-GRADE WALL, HELIX 5-25 ALTERNATIVE REINFORCEMENT

Maximum Height of Basement Wall, ft	Maximum Unbalanced Backfill Height, ft	Helix Dosage and Hybrid Vertical Rebar Requirement			
		Maximum Equivalent Density 30 pcf	Maximum Equivalent Density 45 pcf	Maximum Equivalent Density 60 pcf	Maximum Equivalent Density 75 pcf
14	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	16 lb/yd ³
	8	9 lb/yd ³	9 lb/yd ³	18 lb/yd ³	22 lb/yd ³
	9	9 lb/yd ³	18 lb/yd ³	23 lb/yd ³	29 lb/yd ³
	10	15 lb/yd ³	22 lb/yd ³	29 lb/yd ³	29 lb/yd ³
	11	19 lb/yd ³	27 lb/yd ³	29 lb/yd ³	30 lb/yd ³ + 10M @ 36"
	12	22 lb/yd ³	29 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"
	13	26 lb/yd ³	29 lb/yd ³	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"
	14	29 lb/yd ³	30 lb/yd ³ + 10M @ 42"	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 12"
16	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	17 lb/yd ³
	8	9 lb/yd ³	9 lb/yd ³	19 lb/yd ³	23 lb/yd ³
	9	9 lb/yd ³	19 lb/yd ³	25 lb/yd ³	29 lb/yd ³
	10	17 lb/yd ³	24 lb/yd ³	29 lb/yd ³	30 lb/yd ³
	11	20 lb/yd ³	29 lb/yd ³	30 lb/yd ³	30 lb/yd ³ + 10M @ 18"
	12	25 lb/yd ³	29 lb/yd ³	30 lb/yd ³ + 10M @ 18"	30 lb/yd ³ + 15M @ 18"
	13	29 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 12"
	14	29 lb/yd ³	30 lb/yd ³ + 10M @ 18"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"
15	30 lb/yd ³	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 12"	-	
16	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 15M @ 12"	-	-	
18	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	18 lb/yd ³
	8	9 lb/yd ³	15 lb/yd ³	20 lb/yd ³	24 lb/yd ³
	9	9 lb/yd ³	20 lb/yd ³	26 lb/yd ³	29 lb/yd ³
	10	18 lb/yd ³	26 lb/yd ³	29 lb/yd ³	30 lb/yd ³ + 10M @ 48"
	11	22 lb/yd ³	29 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"
	12	27 lb/yd ³	30 lb/yd ³	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"
	13	29 lb/yd ³	30 lb/yd ³ + 10M @ 24"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"
	14	29 lb/yd ³	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 20M @ 12"	-
	15	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"	-
	16	30 lb/yd ³ + 10M @ 18"	30 lb/yd ³ + 20M @ 12"	-	-
	17	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 20M @ 12"	-	-
18	30 lb/yd ³ + 15M @ 12"	-	-	-	

NOTES:
See next page.

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6.2 – CANADIAN ENGINEERING ANALYSIS REPORT: IMPERIAL UNITS

TABLE 1C-H - LOGIX 10" BELOW-GRADE WALL, HELIX 5-25 ALTERNATIVE REINF. Cont'd

Maximum Height of Basement Wall, ft	Maximum Unbalanced Backfill Height, ft	Helix Dosage and Hybrid Vertical Rebar Requirement			
		Maximum Equivalent Density 30 pcf	Maximum Equivalent Density 45 pcf	Maximum Equivalent Density 60 pcf	Maximum Equivalent Density 75 pcf
20	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	18 lb/yd ³
	8	9 lb/yd ³	16 lb/yd ³	21 lb/yd ³	25 lb/yd ³
	9	9 lb/yd ³	21 lb/yd ³	28 lb/yd ³	29 lb/yd ³
	10	18 lb/yd ³	27 lb/yd ³	29 lb/yd ³	30 lb/yd ³ + 10M @ 42"
	11	23 lb/yd ³	29 lb/yd ³	30 lb/yd ³ + 10M @ 36"	30 lb/yd ³ + 15M @ 18"
	12	28 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"
	13	29 lb/yd ³	30 lb/yd ³ + 10M @ 18"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"
	14	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 12"	-
	15	30 lb/yd ³ + 10M @ 24"	30 lb/yd ³ + 15M @ 12"	-	-
	16	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 20M @ 12"	-	-
	17	30 lb/yd ³ + 15M @ 12"	-	-	-
	18	30 lb/yd ³ + 15M @ 12"	-	-	-
	19	30 lb/yd ³ + 20M @ 12"	-	-	-
	20	30 lb/yd ³ + 20M @ 12"	-	-	-

Notes:

1. Design and installation of Helix 5-25 Micro-Rebar reinforced concrete must be in accordance with Uniform Evaluation Service, ER-279. Designs given in above table are Helix Design Class B, and walls must conform to all restrictions of Section 4.3.5 of ER-279.
2. Conventional reinforcement (as required) to be placed on interior face of concrete wall. Effective depth of vertical rebar (exterior face of concrete to center of vertical rebar) = 8"
3. Table shall be read in conjunction with **Fig 2C**, and section "Notes for Below-grade Wall Tables."
4. Conventional rebar yield strength = 400 MPa, 28 day concrete compressive strength = 20.7 MPa (3000 psi).
5. Modulus of rupture of Helix reinforced concrete with 9 lb/yd³ Helix 5-25 = 7.5 √(3000 psi) = 410 psi = 2.83 MPa.
6. Walls must be laterally supported at top and bottom of wall before backfilling.
7. The listed Helix 5-25 dosage rate is adequate to replace the required horizontal 10M bars at 32 inches.
8. Tables do not consider seismic loads.
9. For more information contact your local Logix rep.

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6.2 – CANADIAN ENGINEERING ANALYSIS REPORT: IMPERIAL UNITS

TABLE 1D - LOGIX 12" BELOW-GRADE WALL MINIMUM VERTICAL REINFORCEMENT

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.

Max. Height of Basement Wall, ft	Max. Unbalanced Backfill Height, ft	Vertical Bar Spacing, in.																
		Maximum Equivalent Density 30pcf				Maximum Equivalent Density 45pcf				Maximum Equivalent Density 60pcf				Maximum Equivalent Density 75pcf				
		16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48	
14	4	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48	
	5	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48	
	6	16	32	48	48	16	32	48	48	16	32	48	48	12	24	40	48	
	7	16	32	48	48	16	32	48	48	12	24	32	48	8	16	24	48	
	8	16	32	48	48	12	24	32	48	8	16	24	40	6	12	16	32	
	9	12	24	40	48	8	16	24	40	6	12	16	32	-	8	16	24	
	10	8	16	32	40	6	12	16	32	-	8	16	24	-	8	12	16	
	11	8	16	24	32	6	12	16	24	-	8	12	16	-	6	8	16	
	12	6	12	16	24	-	8	12	24	-	6	8	16	-	-	8	12	
	13	6	12	16	16	-	8	12	16	-	6	8	12	-	-	6	12	
	14	-	8	16	16	-	6	8	16	-	-	8	12	-	-	6	8	
	16	4	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48
		5	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48
		6	16	32	48	48	16	32	48	48	16	32	48	48	12	24	40	48
7		16	32	48	48	12	24	40	48	12	16	32	48	8	16	24	40	
8		16	32	48	48	8	16	32	48	8	16	24	40	6	12	16	32	
9		12	24	32	40	8	16	24	40	6	12	16	32	-	8	12	24	
10		8	16	24	32	6	12	16	32	-	8	12	24	-	8	12	16	
11		8	16	24	24	-	8	16	24	-	8	12	16	-	6	8	12	
12		6	12	16	16	-	8	12	16	-	6	8	16	-	-	6	12	
13		-	8	16	16	-	6	8	16	-	-	8	12	-	-	6	8	
14		-	8	12	16	-	6	8	12	-	-	6	8	-	-	-	8	
15		-	8	12	12	-	-	8	12	-	-	-	8	-	-	-	6	
16		-	6	8	12	-	-	6	8	-	-	-	8	-	-	-	6	
18		4	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48
		5	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48
		6	16	32	48	48	16	32	48	48	16	32	48	48	12	24	40	48
	7	16	32	48	48	12	24	40	48	8	16	32	48	8	16	24	40	
	8	12	24	40	48	8	16	24	48	8	16	24	40	6	12	16	32	
	9	8	16	32	40	8	16	24	32	6	12	16	24	-	8	12	16	
	10	8	16	24	32	6	12	16	24	-	8	12	16	-	6	8	16	
	11	6	12	16	24	-	8	12	24	-	6	8	16	-	-	8	12	
	12	6	12	16	16	-	8	8	16	-	-	8	12	-	-	6	8	
	13	-	8	12	16	-	6	8	16	-	-	6	8	-	-	-	8	
	14	-	8	12	12	-	-	8	12	-	-	-	8	-	-	-	6	
	15	-	6	8	12	-	-	6	8	-	-	-	8	-	-	-	6	
	16	-	6	8	8	-	-	6	8	-	-	-	6	-	-	-	-	
	17	-	-	8	8	-	-	-	8	-	-	-	-	-	-	-	-	
	18	-	-	6	8	-	-	-	6	-	-	-	-	-	-	-	-	
	20	4	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48
		5	16	32	48	48	16	32	48	48	16	32	48	48	16	32	48	48
		6	16	32	48	48	16	32	48	48	12	24	40	48	12	24	32	48
7		16	32	48	48	12	24	40	48	8	16	32	48	8	16	24	40	
8		12	24	40	48	8	16	24	48	6	12	16	32	6	12	16	24	
9		8	16	32	40	6	12	16	32	-	8	16	24	-	8	12	16	
10		8	16	24	24	-	8	16	24	-	8	12	16	-	6	8	16	
11		6	12	16	24	-	8	12	16	-	6	8	16	-	-	8	12	
12		-	8	16	16	-	6	8	16	-	-	8	12	-	-	6	8	
13		-	8	12	16	-	6	8	12	-	-	6	8	-	-	-	8	
14		-	6	8	12	-	-	6	12	-	-	-	8	-	-	-	6	
15		-	6	8	8	-	-	6	8	-	-	-	6	-	-	-	-	
16		-	-	8	8	-	-	-	8	-	-	-	6	-	-	-	-	
17		-	-	6	8	-	-	-	6	-	-	-	-	-	-	-	-	
18		-	-	6	6	-	-	-	6	-	-	-	-	-	-	-	-	
19		-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	
20		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		10M	15M	20M	25M	10M	15M	20M	25M	10M	15M	20M	25M	10M	15M	20M	25M	
		Bar size																

- NOTES:**
- Tables do not consider seismic loads. For seismic load considerations refer to the Appendix in the Table of Contents.
 - Effective depth (out face of concrete to center of vertical rebar = 10"
 - Provide additional mat of rebar near exterior face of concrete surface:
- Horizontal = 10M @ 32" o/c.
- Vertical = 10M to match vertical rebar spacing
 - Table 1D shall be read in conjunction with Fig 2D, and section "Notes for Below-grade Wall Tables."
 - 1 ft = 0.3048 m, 1 in = 25.4 mm, 1 pcf = 16.02 kg/m³ = 0.157 kN/m³
 - Where cells show "-" engineering is required.
 - Unless cell is shaded, Helix dosage Table 1D-H may be used in lieu of Table 1D.

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TABLE 1D-H - LOGIX 12" BELOW-GRADE WALL, HELIX 5-25 ALTERNATIVE REINFORCEMENT

Maximum Height of Basement Wall, ft	Maximum Unbalanced Backfill Height, ft	Helix Dosage and Hybrid Vertical Rebar Requirement			
		Maximum Equivalent Density 30 pcf	Maximum Equivalent Density 45 pcf	Maximum Equivalent Density 60 pcf	Maximum Equivalent Density 75 pcf
14	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	8	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	16 lb/yd ³
	9	9 lb/yd ³	9 lb/yd ³	16 lb/yd ³	20 lb/yd ³
	10	9 lb/yd ³	16 lb/yd ³	21 lb/yd ³	26 lb/yd ³
	11	9 lb/yd ³	19 lb/yd ³	25 lb/yd ³	30 lb/yd ³ + 10M @ 48"
	12	16 lb/yd ³	23 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 48"
	13	18 lb/yd ³	27 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 36"
	14	21 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"
16	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	8	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	17 lb/yd ³
	9	9 lb/yd ³	9 lb/yd ³	18 lb/yd ³	22 lb/yd ³
	10	9 lb/yd ³	17 lb/yd ³	22 lb/yd ³	28 lb/yd ³
	11	9 lb/yd ³	21 lb/yd ³	28 lb/yd ³	30 lb/yd ³ + 10M @ 48"
	12	17 lb/yd ³	26 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 48"
	13	21 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"
	14	24 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 24"	30 lb/yd ³ + 15M @ 18"
15	27 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"	
16	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 24"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"	
18	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	8	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	17 lb/yd ³
	9	9 lb/yd ³	9 lb/yd ³	19 lb/yd ³	23 lb/yd ³
	10	9 lb/yd ³	18 lb/yd ³	24 lb/yd ³	30 lb/yd ³
	11	16 lb/yd ³	23 lb/yd ³	30 lb/yd ³	30 lb/yd ³ + 10M @ 48"
	12	19 lb/yd ³	28 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 30"
	13	22 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 42"	30 lb/yd ³ + 15M @ 18"
	14	26 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 15M @ 12"
	15	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 30"	30 lb/yd ³ + 15M @ 12"	30 lb/yd ³ + 20M @ 12"
	16	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 20M @ 12"	-
	17	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 12"	-
18	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 15M @ 12"	-	-	

NOTES:
See next page.

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TABLE 1D-H - LOGIX 12" BELOW-GRADE WALL, HELIX 5-25 ALTERNATIVE REINF. Cont'd

Maximum Height of Basement Wall, ft	Maximum Unbalanced Backfill Height, ft	Helix Dosage and Hybrid Vertical Rebar Requirement			
		Maximum Equivalent Density 30 pcf	Maximum Equivalent Density 45 pcf	Maximum Equivalent Density 60 pcf	Maximum Equivalent Density 75 pcf
20	4	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	5	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	6	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	7	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³
	8	9 lb/yd ³	9 lb/yd ³	9 lb/yd ³	18 lb/yd ³
	9	9 lb/yd ³	9 lb/yd ³	19 lb/yd ³	24 lb/yd ³
	10	9 lb/yd ³	19 lb/yd ³	25 lb/yd ³	30 lb/yd ³ + 10M @ 48"
	11	16 lb/yd ³	24 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 48"
	12	20 lb/yd ³	30 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 18"
	13	24 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 24"	30 lb/yd ³ + 15M @ 12"
	14	28 lb/yd ³	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 12"
	15	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 10M @ 18"	30 lb/yd ³ + 15M @ 12"	-
	16	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 15M @ 18"	30 lb/yd ³ + 20M @ 12"	-
	17	30 lb/yd ³ + 10M @ 48"	30 lb/yd ³ + 15M @ 12"	-	-
	18	30 lb/yd ³ + 10M @ 18"	30 lb/yd ³ + 20M @ 12"	-	-
	19	30 lb/yd ³ + 10M @ 12"	30 lb/yd ³ + 20M @ 12"	-	-
	20	30 lb/yd ³ + 15M @ 12"	-	-	-

Notes:

1. Design and installation of Helix 5-25 Micro-Rebar reinforced concrete must be in accordance with Uniform Evaluation Service, ER-279. Designs given in above table are Helix Design Class B, and walls must conform to all restrictions of Section 4.3.5 of ER-279.
2. Conventional reinforcement (as required) to be placed on interior face of concrete wall. Effective depth of vertical rebar (exterior face of concrete to center of vertical rebar) = 10"
3. Table shall be read in conjunction with **Fig 2D**, and section "Notes for Below-grade Wall Tables."
4. Conventional rebar yield strength = 400 MPa, 28 day concrete compressive strength = 20.7 MPa (3000 psi).
5. Modulus of rupture of Helix reinforced concrete with 9 lb/yd³ Helix 5-25 = 7.5 √(3000 psi) = 410 psi = 2.83 MPa.
6. Walls must be laterally supported at top and bottom of wall before backfilling.
7. The listed Helix 5-25 dosage rate is adequate to replace the required horizontal 10M bars at 32 inches.
8. Tables do not consider seismic loads.
9. For more information contact your local Logix rep.

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