Plasti-Fab®
EPS PRODUCT SOLUTIONS
Better building ideas from PFB™

The Advantage ICF System® Technical Manual

The Advantage ICF System®

Recommendation: Review the Advantage ICF System Installation Videos.

When building with the Advantage ICF System please review your local building code requirements with your local building officials before your permitting stage.

NOTE:

This Technical Manual is intended for use when designing above or below grade concrete walls constructed with the Advantage ICF System.

Engineering analysis within this manual was prepared based upon requirements within
- Parts 4 and 9 of the National Building Code of Canada 2015 and 2010
- Publication PCA 100-2012, Prescriptive Design of Exterior Concrete Walls for One- and Two-Family Dwellings (Pub. No. EB562) published by the Portland Cement Association.

The tables in this manual provide steel reinforcement in a number of different wall and lintel applications based upon the structural loads as detailed and design assumptions as indicated below each table.

INTRODUCTION

This manual is designed to inform general contractors, installers, engineers and architects of the reinforcement required in structures that are built with the patented Advantage ICF System®. Technical information is provided for both the 150 mm (6”) wall system and the 200 mm (8”) wall system.

The Advantage ICF System is an insulating concrete forming system consisting of two panels of expanded polystyrene (EPS) insulation connected with web connectors moulded into the EPS panel. The EPS panels have a preformed interlocking mechanism along their top and bottom edges to ensure web connectors align vertically for attachment of interior and exterior finish materials.

When reinforcement and concrete are placed in the Advantage ICF system, an insulated, monolithic concrete wall of uniform thickness is formed. The result is a strong, energy efficient wall that will provide long-term energy cost savings and add resale value to the building.

Concrete Reinforcement Design

Engineering analysis within this manual was prepared based upon requirements within Parts 4 and 9 of the **National Building Code of Canada 2015** and **2010**, and requirements within the publication PCA 100-2012, **Prescriptive Design of Exterior Concrete Walls for One- and Two-Family Dwellings** (Pub. No. EB562) published by the Portland Cement Association. The tables in this manual provide steel reinforcement in a number of different wall and lintel applications based upon the structural loads as detailed and design assumptions as indicated below each table.

Those who feel comfortable reading the tables and interpreting the technical drawings contained in Advantage ICF System Installation Detail Book may not need to consult a structural engineer. ***Note however, that site-specific design and engineering is always the sole responsibility of the contractor or installer.***

When the Advantage ICF System is used in structural applications outside the scope of the design analysis provided in this manual, a registered professional engineer skilled in concrete design must certify the design analysis and the design drawings for such application to provide a level of performance equivalent to requirements as noted above.

It is recommended that this manual is used in combination with the **Advantage ICF System Installation Manual**, which describes how to assemble the product. This manual contains the following information:

1. A list of design assumptions applied to the reinforcement design tables and drawings that follow. If your building deviates from any of these assumptions, you should consult a structural design engineer.
2. Tables containing data that specify steel reinforcement requirements and applicable design assumptions.
3. Wall section and detail drawings that illustrate a variety of common construction details found in the **Advantage ICF System Detail Book**.

THIS PAGE LEFT BLANK INTENTIONALLY

Table of Contents

INTRODUCTION 1

ADVANTAGE ICF SYSTEM DESCRIPTION 5

Figure 1 - Advantage ICF System Blocks 5

ADVANTAGE ICF SYSTEM PRODUCT SPECIFICATIONS 6

ENGINEERING ANALYSIS 7

Table 1 - Load Combinations 8

DESIGN TABLES 11

Table 2 – Ledger Size and Bolt Spacing for Floors and Decks 11

Table 3 – Soil Classifications 12

REINFORCING STEEL TABLES FOR 150mm (6") ADVANTAGE ICF SYSTEM 13

Table 4 – Recommended US Rebar Size Substitution for Designated SI Rebar Sizes 13

Table 5 – 150 mm (6") Below Grade Laterally Restrained Walls 14

Table 6 – 150 mm (6") Above Grade Walls 15

Figure 2 – Typical Lintel Reinforcement Layout 16

Table 7a – 210 mm (8 ¼") Deep Lintels Reinforcement 17

Table 7b – 419 mm (16 ½") Deep Lintels Reinforcement 18

Table 7c – 629 mm (24 ¾") Deep Lintels Reinforcement 19

REINFORCING STEEL TABLES FOR 200 mm (8") ADVANTAGE ICF SYSTEM 20

Table 8 – Recommended US Rebar Size Substitution for Designated SI Rebar Sizes 20

Table 9 – 200 mm (8") Below Grade Laterally Restrained Walls 21

Table 10 – 200 mm (8") Above Grade Walls 22

Figure 3 – Typical Lintel Reinforcement Layout 23

Table 11a – 210 mm (8 ¼") Deep Lintels Reinforcement 24

Table 11b – 419 mm (16 ½") Deep Lintels Reinforcement 25

Table 11c – 629 mm (24 ¾") Deep Lintels Reinforcement 26

MINIMUM SOLID WALL LENGTH FOR ADVANTAGE ICF SYSTEM 27

Table 12a – Minimum Solid Wall Length (m): q(1/50) = 0.4 kPa, Open Terrain 28

Table 12b – Minimum Solid Wall Length (m): q(1/50) = 0.6 kPa, Open Terrain 29

Table 12c – Minimum Solid Wall Length (m): q(1/50) = 0.8 kPa, Open Terrain 30

Table 12d – Minimum Solid Wall Length (m): q(1/50) = 1.0 kPa, Open Terrain 31

Table 12e – Minimum Solid Wall Length (m): q(1/50) = 1.2 kPa, Open Terrain 32

Table 13a – Minimum Solid Wall Length (m): Seismic Data $S_a(0.2)$= 0.40 33

Table 13b – Minimum Solid Wall Length (m): Seismic Data $S_a(0.2)$= 0.80 34

Table 13c – Minimum Solid Wall Length (m): Seismic Data $S_a(0.2)$= 1.20 35

THIS PAGE LEFT BLANK INTENTIONALLY

ADVANTAGE ICF SYSTEM DESCRIPTION

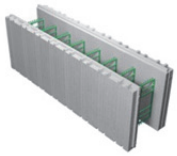
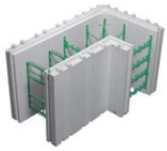
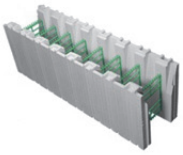
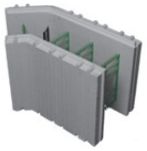
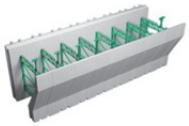
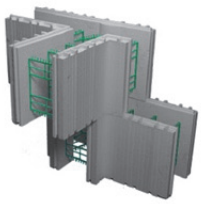
The Advantage ICF System® is designed as a monolithic flat insulating concrete form (ICF) system (Figure 1). One block comprises two corresponding panels made from expanded polystyrene (EPS). The panels function as the form and are held together with high-density plastic webs (or ties) spaced 200 mm (8”) on center for the 150 mm (6”) concrete wall form or 150 mm (6”) on center for the 200 mm (8”) concrete wall form concrete wall form. Once a series of blocks have been assembled to form a wall with the appropriate steel reinforcement, concrete is poured inside the blocks to create a uniform structural wall system. With the application of appropriate interior and exterior wall finishes, the resulting structural concrete wall has exceptional fire, sound, and insulating characteristics.

The outside dimensions of an Advantage ICF System 150 mm (6”) standard block are 419 mm (16 ½”) high, 286 mm (11 ¼”) wide and 1219 mm (48”) long. The outside dimensions of an Advantage ICF System 200 mm (8”) standard block are 419 mm (16 ½”) high, 337 mm (13 ¼”) wide and 1219 mm (48”) long.

Typical dimensions for Advantage ICF System blocks are provided on the next page. If you are reading this document at the planning stage of your project, you should factor block dimensions into your plans if you want to save time on construction.

Figure 1 - Advantage ICF System Blocks

ADVANTAGE ICF SYSTEM PRODUCT SPECIFICATIONS

Product	Feature	6 inch (152 mm)	8 inch (203 mm)
Standard Block			
	Height: Width: Length:	16-1/2" (419 mm) 11-1/4" (286 mm) 48" (1219 mm)	16-1/2" (419 mm) 13-1/4" (337 mm) 48" (1219 mm)
* NOTE: Standard block height adjuster is also available in 7-1/2" (191 mm) height.			
90° Corner Blocks			
	Height: Width: Long Leg Length: Short Leg Length:	16-1/2" (419 mm) 11-1/4" (286 mm) 32" (813 mm) 16" (406 mm)	16-1/2" (419 mm) 13-1/4" (337 mm) 29" (737 mm) 17" (432 mm)
* NOTE: 90° block height adjuster is also available in 7-1/2" (191 mm) height.			
Taper Top Block			
	Height: Width: Length: Bearing at Top:	16-1/2" (419 mm) 11-1/4" (286 mm) 48" (1219 mm) 9-3/4" (249 mm)	16-1/2" (419 mm) 13-1/4" (337 mm) 48" (1219 mm) 11-1/2" (292 mm)
45 ° Corner Block			
	Height: Width: Long Leg Length: Short Leg Length:	16-1/2" (419 mm) 11-1/4" (286 mm) 25-3/8" (645 mm) 9-1/2" (241 mm)	16-1/2" (419 mm) 13-1/4" (337 mm) 21-1/4" (540 mm) 9-1/4" (236 mm)
Brick Ledge			
	Height: Width at Top: Width at Bottom: Length:	16-1/2" (419 mm) 15-3/4" (400 mm) 11-1/4" (286 mm) 48" (1219 mm)	16-1/2" (419 mm) 17-3/4" (451 mm) 13-1/4" (337 mm) 48" (1219 mm)
T-Block Set			
	T-Block Long Height: Width: Leg Length: T-Leg Length: --- T-Block Short Height: Width: Leg Length: T-Leg Length:	16-1/2" (419 mm) 11-1/4" (286 mm) 37" (935 mm) 20-3/4" (527 mm) --- 16-1/2" (419 mm) 11-1/4" (286 mm) 37" (935 mm) 4-3/4" (122 mm)	16-1/2" (419 mm) 13-1/4" (337 mm) 32.75" (832 mm) 15-3/4" (400 mm) --- 16-1/2" (419 mm) 13-1/4" (337 mm) 32.75" (832 mm) 3-3/4" (95 mm)
* NOTE: T-block height adjuster is also available in 7-1/2" (191 mm) height.			

ENGINEERING ANALYSIS

This engineering analysis has been prepared for above and below grade reinforced concrete walls formed using the Advantage ICF System.

Design Assumptions

The following design assumptions define the parameters used to determine the reinforcement stated in the tables and drawings in this manual.

Below Grade Wall Heights

- 2440 mm (8 ft)
- 2740 mm (9 ft)
- 3050 mm (10 ft)
- 3660 mm (12 ft)

Backfill Height Below Grade

The height of backfill used to cover below grade laterally restrained walls is assumed to be as follows:

- 2440 mm (8 ft) wall: 1220 mm (4 ft) to 2440 mm (8 ft)
- 2740 mm (9 ft) wall: 1220 mm (4 ft) to 2740 mm (9 ft)
- 3050 mm (10 ft) wall: 1220 mm (4 ft) to 3050 mm (10 ft)
- 3660 mm (12 ft) wall: 1220 mm (4 ft) to 3660 mm (12 ft)

Backfill Material and Required Drainage

The backfill material must be placed in such a way as to avoid damaging the wall, the exterior insulation panel and the waterproofing and dampproofing protection. The backfill material must be well drained and a drainage system must be installed around the exterior of the foundation in accordance with the requirements of the NBC 2010 & 2015.

Above Grade Wall Height

Reinforcement requirements for three above grade wall heights are provided in this manual:

- 2440 mm (8 ft)
- 3050 mm (10 ft)
- 3660 mm (12 ft)

Clear Spans

Walls are designed for the following maximum clear spans:

- Floor: 9.75 m (32 ft)
- Roof: 12.2 m (40 ft)

Wall Thickness

Thickness of the concrete inside the Advantage ICF System is assumed to be either 150 mm (6”) or 200 mm (8”).

Maximum Building Dimensions

- Maximum building length: 24.4 m (80 ft)
- Maximum building width: 12.2 m (40 ft)

Restraint Conditions

The following restraint conditions are assumed:

- Walls are laterally restrained at the top unless otherwise noted.
- Laterally restrained walls are considered pinned top and bottom.
- Lateral restraint is provided at each floor by diaphragm action.

Eccentricity

- Floor load on above grade walls has a maximum eccentricity of 145 mm (5 5/8”) for the 150 mm (6”) wall system and of 170 mm (6 5/8”) for the 200 mm (8”) wall system.
- Below grade walls are assumed to support a brick veneer of maximum 6,100 mm (20 ft) high with an eccentricity of 220 mm (8 5/8”) for the 150 mm (6”) wall system and of 245 mm (9 5/8”) for the 200 mm (8”) wall system. The eccentricity of floor load is not considered for below grade walls as it is counteracting the earth pressure of backfill.

Design Loads

The following maximum floor, roof, wall, wind and seismic loads have been considered:

- Floor dead load: 0.96 kPa (20 psf)
- Floor live load: 1.92 kPa (40 psf)
- Roof dead load: 0.72 kPa (15 psf)
- Roof snow load: 4.32 kPa (90 psf)
- Passenger vehicle surcharge: 2.4 kPa (50 psf)
- Wall dead load:
  4.3 kPa (90 psf) for the 150 mm (6”) wall system including interior and exterior finish
  5.5 kPa (115 psf) for the 200 mm (8”) wall system including interior and exterior finish
  0.72 kPa (15 psf) for wood frame wall
  1.92 kPa (40 psf) for brick veneer
- Maximum hourly wind pressure: q (1/50) = 1.2 kPa (25 psf) (open terrain)
- Seismic load for above grade walls: S_a (0.2) ≤ 1.2 (Site Class C)

Table 1 - Load Combinations

Case	Load Combination	
	Principal Loads	**Companion Loads**
1	1.4D	
2	(1.25D or 0.9D) + 1.5(L + H)	0.5S or 0.4W
3	(1.25D or 0.9D) + 1.5(S + H)	0.5L or 0.4W
4	(1.25D or 0.9D) + 1.4W + 1.5H	0.5L or 0.5S
5	1.0D + 1.0E + 1.0H	0.5L + 0.2S

Deflection Limits

Deflection limits are as follows:

- Below grade wall: H/240
- Above grade wall: H/240

H is wall height per story.

Soils, Footings and Foundation Pressures

Design lateral soil loads are per m (ft) of backfill height for moist soil conditions without hydrostatic pressure. Wall reinforcement requirements in Tables 5 and 9 are grouped into the following three categories:

1. Walls with soil backfill having a maximum lateral soil load of 480 kg/m^3 (30 pcf);
2. Walls with soil backfill having a maximum lateral soil load of 720 kg/m^3 (45 pcf); and
3. Walls with soil backfill having a maximum lateral soil load of 960 kg/m^3 (60 pcf).

It is also assumed that the sub-floor or adequate bracing has been installed prior to backfilling in order to allow walls to resist the lateral pressure from the backfill.

For seismic design, the footing soil is assumed to be a dense soil or soft rock. Note that a site inspection should be performed at all building locations to confirm that the soil has adequate bearing capacity.

Material Properties

Concrete

The following conditions with regard to concrete usage are assumed:

- Concrete compressive strength 20 MPa (3,000 psi) at 28 days with a maximum aggregate size of 19 mm (0.75”) as per 9.3.1.1.(4)(a) of the NBC 2010 & 2015
- Concrete slump: 100 to 150 mm (4” to 6”)
- Concrete wall thickness: 150 mm (6”) or 200 mm (8”)
- Concrete Air entrainment: minimum 4 to 7 percent where exposed to freeze/thaw cycles
- Concrete pour rate: 1,220 mm (4 ft) /hr
- Internal vibration with a 25 mm (1”) mechanical vibrator

Reinforcing Steel

The following conditions with regard to reinforcing steel (rebar) are assumed:

- Design as per CSA-A23.3-14
- Reinforcement steel as per CSA-A23.1-14 and CAN/CSA-G30.18
- Rebar strength (10M, 15M, 20M and 25M): 400 MPa (60 ksi)
- For below grade walls vertical reinforcement shall be located in the inside half of the wall section with a minimum cover of 38 mm (1 ½”) to the inside face of concrete; for above grade walls vertical reinforcement shall be placed in the middle third of the wall section.
- For below grade walls horizontal reinforcement shall be located in the inside half of the wall section with a minimum cover of 25 mm (1”) to the inside face of concrete; for above grade walls horizontal reinforcement shall be placed in the middle third of the wall section.
- Distance from the edge of the wall to the primary reinforcement for exterior walls is 50 mm (2”) for reinforcement steel 20M or greater, and 38 mm (1 ½”) for reinforcement steel 15M or smaller.
- Corner bars are provided for all wall intersections.
- As per NBC 2010 & 2015, Clause 9.3.1.1.(4)(b)(iii), horizontal & vertical rebar lap lengths are lapped a minimum of 450 mm (18”) for 10M rebar and 650 mm (26”) for 15M rebar.

Other Construction Materials

The following specifications apply to other materials used in addition to those described above:

- All dimensional lumber is SPF No. 2 or better.
- A structural engineer is to design any steel beams.
- A structural engineer is to review shop drawings for engineered wood product floors, roofs and pre-engineered truss systems.

All anchor bolts are 200 mm (8") long "L" shaped 13 mm (½") diameter ASTM A36 or A307 unless noted otherwise.

Openings

- For below grade walls when considered to be laterally supported at top, it is assumed that
  - Openings are not more than 1220 mm (4 ft) in width and the total openings in the wall are less than 25% of the wall area.
  - Foundation walls that include openings greater than 1220 mm (4 ft) in width require additional engineering review to address lateral support requirements for the portion of the wall beneath the opening.
  - When the length of solid wall between windows is less than the average length of the windows, the wall is considered unsupported and additional engineering is required.
- For above grade walls
  - For exterior non-load bearing walls, no openings shall occur within 1220 mm (4 ft) of corners. The cumulative width of openings in non-load bearing walls shall not make up more than 70% of the wall length. Openings shall be reinforced on all four sides with minimum two 10M bars, extending 600 mm (2 ft) beyond the edges of the openings.
  - For load-bearing walls, lintels shall be provided over all openings wider than 900 mm (3 ft). See lintel reinforcement tables for additional information.
- For above and below grade walls, vertical reinforcement required by Tables 5, 6, 9 & 10 interrupted by wall openings shall be equally placed on each side of the opening not more than 600 mm (24") from each side of the opening.

Angle Iron Brick ledges

- Angle iron are assumed to be 89 mm (3 ½") by 89 mm (3 ½") by 6 mm (¼") angle iron anchored with 13 mm (½") diameter anchor bolts at 600 mm (24") on center for a brick veneer of maximum 6100 mm (20 ft) high.
- Anchor bolt minimum length needs to extend to center line of wall.
- Minimum anchor bolt cut-outs to be 100 mm (4") wide and 200 mm (8") high.
- Factored Design Load = 16 kN/m (1096 plf) when used as support for floor slab support.

Advantage Brick Ledge Blocks

- Advantage brick ledge requires 10M stirrups at 200 mm (8") on center.
- Maximum 6100 mm (20 ft) high continuous height of brick veneer.
- A local engineer should be retained when loads or spans exceed what is used in the manual.
- Factored Design Load = 16 kN/m (1096 plf) when used as support for floor slab support.

Lintels

The following with regard to the design of lintel reinforcement is assumed:

- 15M and larger bottom reinforcement steel and 10M stirrups have yield strength of 400 MPa (60 ksi).
- Concrete compressive strength 20 MPa (3,000 psi).
- Support a uniformly distributed load including live and dead loads.
- An engineer is to review point loads from beams, girder trusses or other sources.
- Lintel tables only apply to foundation walls with openings not more than 1220 mm (4 ft) in width.
- Lintels are laterally supported at top by connection to the floor or roof system.

DESIGN TABLES

The purpose of the design tables contained in this document is to enable users to determine rebar reinforcement requirements based on the design loads stated. Please note that all dimensions in the tables have been rounded for practical purposes.

Table 2 – Ledger Size and Bolt Spacing for Floors and Decks

Material	Clear Span		Bolt Spacing
2 x 12 (SPF No.2 or better)	4.88 m	16 ft	12.7mm x 152mm@250 mm o/c (½" x 6" @ 10" o/c)
2 x 12 (SPF No.2 or better)	9.76 m	32 ft	12.7mm x 152mm@250 mm o/c, 2 rows (½" x 6" @ 10" o/c, 2 rows)
Timber Strand 1.55E 44 x 286 (1 3/4" x 11 ¼")	4.88 m	16 ft	12.7mm x 152mm@300 mm o/c (½" x 6" @ 12" o/c)
Timber Strand 1.55E 44 x 286 (1 3/4" x 11 ¼")	9.76 m	32 ft	12.7mm x 152mm@300 mm o/c, 2 rows (½" x 6" @ 12" o/c, 2 rows)

Notes: 1. All anchor bolts are ASTM A307 grade A or ASTM F1554 grade 36.
2. Anchor bolts are staggered between the top and bottom 1/3 of ledger width.

Table 3 – Soil Classifications

Types of Soils and Engineering Characteristics						
Soil Group	**Unified Soil Classification Symbol**	**Soil Description**	**Drainage Characteristics**	**Frost Heave Susceptibility**	**Bearing Capacity kPa (psf)**	**Lateral Soil Load kg/m³ pcf)**
I	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Good	Low	150 (3000)	480 (30)
	GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Good	Low	150 (3000)	480 (30)
	SW	Well-graded sands, gravelly sands, little or no fines	Good	Low	100 (2000)	480 (30)
	SP	Poorly graded sands, gravelly sands, little or no fines	Good	Low	100 (2000)	480 (30)
	GM	Silty gravels, gravel-sand-silt mixtures	Good	Medium	100 (2000)	720 (45)
	SM	Silty sand, sand-silt mixtures	Good	Medium	100 (2000)	720 (45)
II	GC	Clayey gravels, gravel-sand-clay mixtures	Medium	Medium	100 (2000)	720 (45)
	SC	Clayey sand, sand-clay mixtures	Medium	Medium	100 (2000)	960 (60)
	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	Medium	High	75 (1500)	960 (60)
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	Medium	Medium	75 (1500)	960 (60)

Note: Refer to NBC 2010 & 2015 Table 9.4.4.1 and PCA 100 for additional information.

REINFORCING STEEL TABLES FOR 150mm (6") ADVANTAGE ICF SYSTEM

Assumptions used for development of reinforcing tables for above and below grade walls are as follows:

1. Maximum floor span: 9.76 m (32 ft); maximum roof span: 12.2 m (40 ft).
2. Specified compressive strength of concrete, f'_c at 28 days is 20 MPa (3,000 psi).
3. Specified yield strength of reinforcement, f_y is 400 MPa (60 ksi).
4. All above grade walls are assumed to be on top of ICF foundation walls.
5. Add one vertical rebar 15M at each corner.
6. Table 4 below provides recommended US rebar substitutions for SI rebar sizes designated in tables 5 to 7.

Table 4 – Recommended US Rebar Size Substitution for Designated SI Rebar Sizes

Reinforcing Steel Bars (SI Units) Per Advantage Reinforcing Tables			**Reinforcing Steel Bars (US Units) Recommended Substitution**		
Metric Bar Size Designation	**Rebar Properties**		**US Bar Size Designation**	**Rebar Properties**	
	Diameter mm	**Nom. Mass Kg/m**		**Diameter mm**	**Nom. Mass Kg/m**
10M	11.3	0.785	#4	12.7	0.994
15M	16.0	1.570	#5	15.9	1.552
20M	19.5	2.355	#6	19.1	2.235
25M	25.2	3.925	#8	25.4	3.982

Table 5 – 150 mm (6") Below Grade Laterally Restrained Walls

Wall Height m (ft)	Backfill Height m (ft)	Vertical Reinforcement Spacing, mm (in)			Horizontal Reinforcement Spacing, mm (in)
		Lateral Soil Load Per m (ft) of Backfill Height			All Soil Types
		480 kg/m^3 (30 pcf)	720 kg/m^3 (45 pcf)	960 kg/m^3 (60 pcf)	
2.44 (8)	1.22 (4)	10M@406 (16)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
	1.52 (5)	10M@406 (16)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
	1.83 (6)	10M@406 (16)	10M@406 (16)	10M@305 (12)	10M @ 419 (16 ½)
	2.13 (7)	10M@305 (12)	10M@305 (12)	10M@203 (8)	10M @ 419 (16 ½)
	2.44 (8)	10M@254 (10)	10M@203 (8)	15M@305 (12)	10M @ 419 (16 ½)
2.74 (9)	1.22 (4)	10M@406 (16)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
	1.52 (5)	10M@406 (16)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
	1.83 (6)	10M@406 (16)	10M@406 (16)	10M@305 (12)	10M @ 419 (16 ½)
	2.13 (7)	10M@305 (12)	10M@305 (12)	10M@203 (8)	10M @ 419 (16 ½)
	2.44 (8)	10M@254 (10)	10M@203 (8)	15M@305 (12)	10M @ 419 (16 ½)
	2.74 (9)	10M@203 (8)	15M@305 (12)	15M@203 (8)	10M @ 419 (16 ½)
3.05 (10)	1.22 (4)	10M@406 (16)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
	1.52 (5)	10M@406 (16)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
	1.83 (6)	10M@406 (16)	10M@305 (12)	10M@254 (10)	10M @ 419 (16 ½)
	2.13 (7)	10M@305 (12)	10M@254 (10)	10M@203 (8)	10M @ 419 (16 ½)
	2.44 (8)	10M@254 (10)	10M@203 (8)	15M@305 (12)	10M @ 419 (16 ½)
	2.74 (9)	10M@203 (8)	15M@305 (12)	15M@203 (8)	10M @ 419 (16 ½)
	3.05 (10)	15M@305 (12)	15M@203 (8)	15M@152 (6)	10M @ 419 (16 ½)
3.66 (12)	1.22 (4)	10M@406 (16)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
	1.52 (5)	10M@406 (16)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
	1.83 (6)	10M@406 (16)	10M@305 (12)	10M@254 (10)	10M @ 419 (16 ½)
	2.13 (7)	10M@305 (12)	10M@254 (10)	10M@203 (8)	10M @ 419 (16 ½)
	2.44 (8)	10M@254 (10)	10M@203 (8)	15M@305 (12)	10M @ 419 (16 ½)
	2.74 (9)	10M@203 (8)	15M@305 (12)	15M@203 (8)	10M @ 419 (16 ½)
	3.05 (10)	15M@305 (12)	15M@203 (8)	15M@152 (6)	10M @ 419 (16 ½)
	3.35 (11)	15M@203 (8)	15M@152 (6)		10M @ 419 (16 ½)
	3.66 (12)	15M@152 (6)			10M @ 419 (16 ½)

indicates engineering input is required.

Notes:

1. Passenger car surcharge has been taken into account.

2. when supporting above grade ICF walls, horizotal and verical wall reinforcement shall be greater of that required in table above, or that in table 6 for the above grade wall.

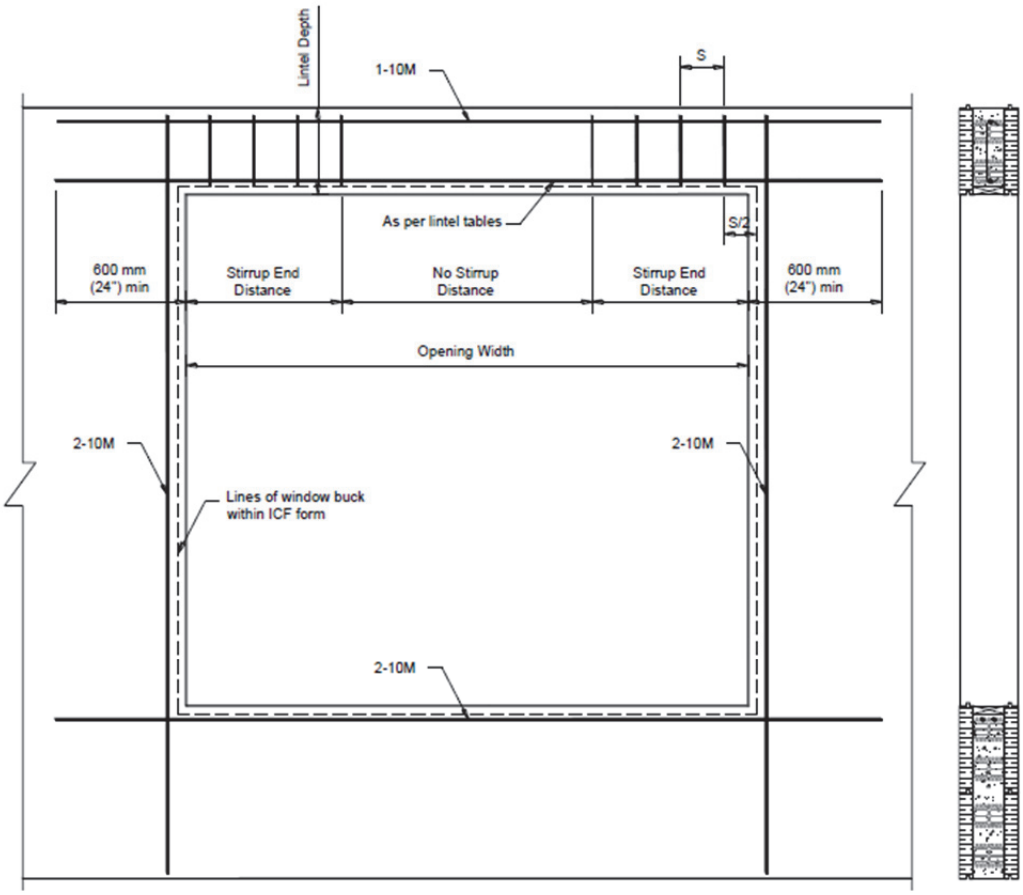
Table 6 – 150 mm (6") Above Grade Walls

Seismic Data $S_a(0.2)$	Story	Wall Height per story m (ft)	Vertical Reinforcement Spacing mm (in)		Horizontal Reinforcement Spacing, mm (in)
			With Brick Veneer	Without Brick Veneer	
≤ 0.4	2nd	2.44 (8)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
		3.05 (10)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
		3.66 (12)	10M@305 (12)	10M@406 (16)	10M @ 419 (16 ½)
	1st	2.44 (8)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
		3.05 (10)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
		3.66 (12)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
≤ 1.2	2nd	2.44 (8)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
		3.05 (10)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
		3.66 (12)	10M@254 (10)	10M@406 (16)	10M @ 419 (16 ½)
	1st	2.44 (8)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
		3.05 (10)	10M@406 (16)	10M@406 (16)	10M @ 419 (16 ½)
		3.66 (12)	10M@305 (12)	10M@406 (16)	10M @ 419 (16 ½)

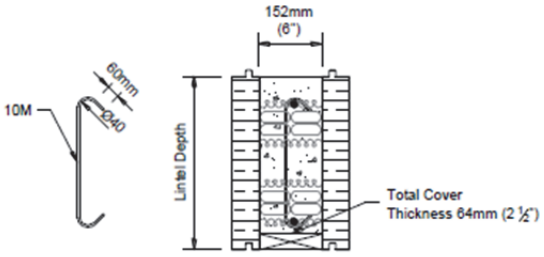
Notes:

1. Table is based on NBCC 2015 elements and components seismic loads for two story buildings on a class C site and hourly wind pressure q(1/50) ≤ 1.2 kPa.

Figure 2 – Typical Lintel Reinforcement Layout



Lintel Elevation



Lintel Section

Notes: 1. Reinforcement shall be placed in the middle third of the lintel section.
2. See Table 7a for stirrup spacing (S) for each lintel depth.

Table 7a – 210 mm (8 ¼") Deep Lintels Reinforcement

Opening Width m (ft)	Factored Uniformly Distributed Load - kN/m (plf)											
	5 (342)		10 (685)		15 (1027)		20 (1370)		25 (1712)		30 (2055)	
	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)
≤1.2 (4)	1-15M		1-15M		1-15M		1-15M		1-15M	406 (16)	1-15M	406 (16)
1.5 (5)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-20M	406 (16)
2.1 (7)	1-15M		1-15M	406 (16)	1-20M	406 (16)						
2.7 (9)	1-15M		1-20M	406 (16)								
3.3 (11)	1-20M											
3.9 (13)												
4.5 (15)												
5.1 (17)												

indicates engineering input is required.

indicates stirrups are not required.

Tables 7a, 7b and 7c are based on the following assumptions:

1. Stirrups are fabricated from 10M bars with spacing (S) at 102 mm (4") on center (o/c) for Table 7a, 203 mm (8") o/c for Tables 7b and 305 mm (12") o/c for Table 7c.
2. The factored uniformly distributed load includes live and dead loads, not including lintel self-weight.
3. Lintel reinforcing is located at bottom of lintel and projects minimum 610 mm (24") into lintel support on each side.

Table 7b – 419 mm (16 ½") Deep Lintels Reinforcement

Opening Width m (ft)	Factored Uniformly Distributed Load - kN/m (plf)											
	5 (342)		10 (685)		15 (1027)		20 (1370)		25 (1712)		30 (2055)	
	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)
≤1.2 (4)	1-15M		1-15M		1-15M		1-15M		1-15M		1-15M	
1.5 (5)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)
2.1 (7)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)
2.7 (9)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-20M	610 (24)	1-20M	610 (24)
3.3 (11)	1-15M		1-15M	406 (16)	1-20M	406 (16)	1-20M	610 (24)	1-25M	914 (36)	1-25M	914 (36)
3.9 (13)	1-15M		1-20M	406 (16)	1-25M	610 (24)	1-25M	914 (36)				
4.5 (15)	1-15M		1-20M	406 (16)	1-25M	914 (36)						
5.1 (17)	1-20M		1-25M	610 (24)								

indicates engineering input is required.

indicates stirrups are not required.

Note: If lintels are less than 419 mm (16 1/2") deep, see Table 7a.

Table 7c – 629 mm (24 ¾") Deep Lintels Reinforcement

Opening Width m (ft)	Factored Uniformly Distributed Load - kN/m (plf)											
	5 (342)		10 (685)		15 (1027)		20 (1370)		25 (1712)		30 (2055)	
	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)
≤1.2 (4)	1-15M		1-15M		1-15M		1-15M		1-15M		1-15M	
1.5 (5)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)
2.1 (7)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)
2.7 (9)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)
3.3 (11)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-20M	610 (24)
3.9 (13)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-20M	406 (16)	1-25M	610 (24)	1-25M	914 (36)
4.5 (15)	1-15M		1-15M	406 (16)	1-20M	406 (16)	1-25M	610 (24)	1-25M	914 (36)		
5.1 (17)	1-15M		1-20M	406 (16)	1-25M	610 (24)	1-25M	914 (36)				

indicates engineering input is required.

indicates stirrups are not required.

Note: If lintels are less than 629 mm (24 3/4") deep, see Table 7a or 7b.

REINFORCING STEEL TABLES FOR 200 mm (8”) ADVANTAGE ICF SYSTEM

Assumptions used for development of reinforcing tables for above and below grade walls are as follows:

1. Maximum floor span: 9.76 m (32 ft); maximum roof span: 12.2 m (40 ft).
2. Specified compressive strength of concrete, f'_c at 28 days is 20 MPa (3,000 psi).
3. Specified yield strength of reinforcement, fy is 400 MPa (60 ksi).
4. All above grade walls are assumed to be on top of ICF foundation walls.
5. Add one vertical rebar 15M at each corner.
6. Table 8 below provides recommended US rebar substitutions for SI rebar sizes designated in tables 9 to 11.

Table 8 – Recommended US Rebar Size Substitution for Designated SI Rebar Sizes

Reinforcing Steel Bars (SI Units) Per Advantage Reinforcing Tables			**Reinforcing Steel Bars (US Units) Recommended Substitution**		
Metric Bar Size Designation	**Rebar Properties**		**US Bar Size Designation**	**Rebar Properties**	
	Diameter mm	**Nom. Mass Kg/m**		**Diameter mm**	**Nom. Mass Kg/m**
10M	11.3	0.785	#4	12.7	0.994
15M	16.0	1.570	#5	15.9	1.552
20M	19.5	2.355	#6	19.1	2.235
25M	25.2	3.925	#8	25.4	3.982

Table 9 – 200 mm (8”) Below Grade Laterally Restrained Walls

Wall Height m (ft)	Backfill Height m (ft)	Vertical Reinforcement Spacing, mm (in)			Horizontal Reinforcement Spacing, mm (in)
		Lateral Soil Load Per m (ft) of Backfill Height			All Soil Types
		480 kg/m^3 (30 pcf)	720 kg/m^3 (45 pcf)	960 kg/m^3 (60 pcf)	
2.44 (8)	1.22 (4)	15M@610 (24)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
	1.52 (5)	15M@610 (24)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
	1.83 (6)	15M@610 (24)	15M@610 (24)	15M@610 (24)	15M @ 419 (16 ½)
	2.13 (7)	15M@610 (24)	15M@610 (24)	15M@610 (24)	15M @ 419 (16 ½)
	2.44 (8)	15M@610 (24)	15M@610 (24)	15M@547 (18)	15M @ 419 (16 ½)
2.74 (9)	1.22 (4)	15M@610 (24)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
	1.52 (5)	15M@610 (24)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
	1.83 (6)	15M@610 (24)	15M@610 (24)	15M@610 (24)	15M @ 419 (16 ½)
	2.13 (7)	15M@610 (24)	15M@610 (24)	15M@547 (18)	15M @ 419 (16 ½)
	2.44 (8)	15M@610 (24)	15M@547 (18)	15M@406 (16)	15M @ 419 (16 ½)
	2.74 (9)	15M@547 (18)	15M@406 (16)	15M@305 (12)	15M @ 419 (16 ½)
3.05 (10)	1.22 (4)	15M@610 (24)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
	1.52 (5)	15M@610 (24)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
	1.83 (6)	15M@610 (24)	15M@610 (24)	15M@610 (24)	15M @ 419 (16 ½)
	2.13 (7)	15M@610 (24)	15M@610 (24)	15M@547 (18)	15M @ 419 (16 ½)
	2.44 (8)	15M@610 (24)	15M@547 (18)	15M@406 (16)	15M @ 419 (16 ½)
	2.74 (9)	15M@547 (18)	15M@406 (16)	15M@305 (12)	15M @ 419 (16 ½)
	3.05 (10)	15M@406 (16)	15M@305 (12)	15M@254 (10)	15M @ 419 (16 ½)
3.66 (12)	1.22 (4)	15M@610 (24)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
	1.52 (5)	15M@610 (24)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
	1.83 (6)	15M@610 (24)	15M@610 (24)	15M@610 (24)	15M @ 419 (16 ½)
	2.13 (7)	15M@610 (24)	15M@610 (24)	15M@547 (18)	15M @ 419 (16 ½)
	2.44 (8)	15M@610 (24)	15M@547 (18)	15M@406 (16)	15M @ 419 (16 ½)
	2.74 (9)	15M@547 (18)	15M@406 (16)	15M@305 (12)	15M @ 419 (16 ½)
	3.05 (10)	15M@406 (16)	15M@305 (12)	15M@254 (10)	15M @ 419 (16 ½)
	3.35 (11)	15M@305 (12)	15M@254 (10)	15M@203 (8)	15M @ 419 (16 ½)
	3.66 (12)	15M@254 (10)	15M@203 (8)	15M@152 (6)	15M @ 419 (16 ½)

Notes:

1. Passenger car surcharge has been taken into account.

2. when supporting above grade ICF walls, horizotal and verical wall reinforcement shall be greater of that required in table above, or that in table 6 for the above grade wall.

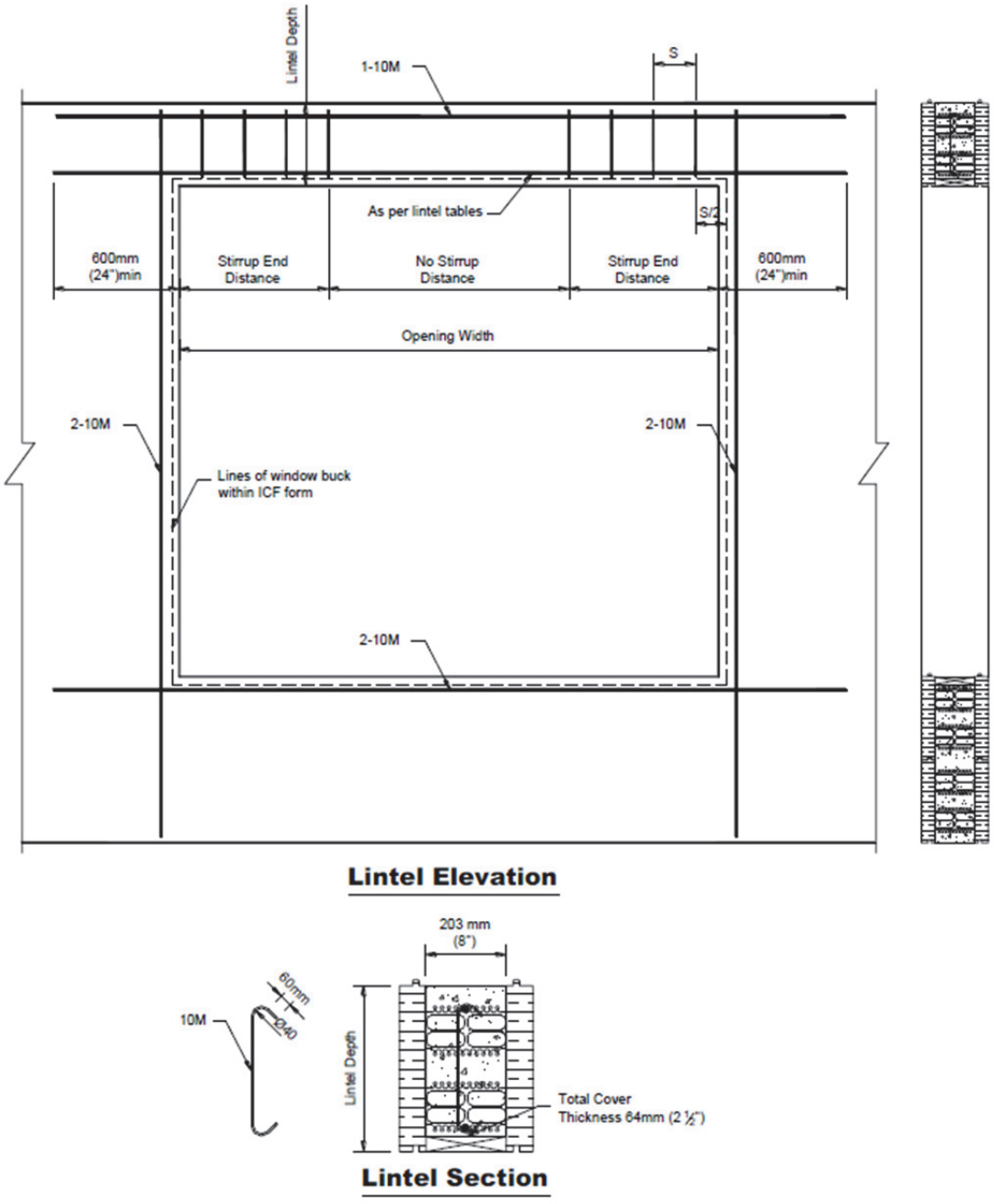
Table 10 – 200 mm (8”) Above Grade Walls

Seismic Data $S_a(0.2)$	Story	Wall Height per story m (ft)	Vertical Reinforcement Spacing mm (in)		Horizontal Reinforcement Spacing, mm (in)
			With Brick Veneer	Without Brick Veneer	
≤ 0.4	2nd	2.44 (8)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
		3.05 (10)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
		3.66 (12)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
	1st	2.44 (8)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
		3.05 (10)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
		3.66 (12)	15M@610 (24)	15M@610 (24)	10M @ 419 (16 ½)
≤ 1.2	2nd	2.44 (8)	15M@547 (18)	15M@547 (18)	15M @ 419 (16 ½)
		3.05 (10)	15M@547 (18)	15M@547 (18)	15M @ 419 (16 ½)
		3.66 (12)	15M@547 (18)	15M@547 (18)	15M @ 419 (16 ½)
	1st	2.44 (8)	15M@547 (18)	15M@547 (18)	15M @ 419 (16 ½)
		3.05 (10)	15M@547 (18)	15M@547 (18)	15M @ 419 (16 ½)
		3.66 (12)	15M@547 (18)	15M@547 (18)	15M @ 419 (16 ½)

Notes:

1. Table is based on NBCC 2015 elements and components seismic loads for two story buildings on a class C site and hourly wind pressure q(1/50) ≤ 1.2 kPa.

Figure 3 – Typical Lintel Reinforcement Layout



Notes: 1. Reinforcement shall be placed in the middle third of the lintel section.
2. See Table 11a for stirrup spacing (S) for each lintel depth

Table 11a – 210 mm (8 ¼") Deep Lintels Reinforcement

Opening Width m (ft)	Factored Uniformly Distributed Load - kN/m (plf)											
	5 (342)		10 (685)		15 (1027)		20 (1370)		25 (1712)		30 (2055)	
	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)
≤1.2 (4)	1-15M		1-15M		1-15M		1-15M		1-15M	406 (16)	1-15M	406 (16)
1.5 (5)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-20M	406 (16)
2.1 (7)	1-15M		1-15M	406 (16)	1-20M	406 (16)	1-25M	406 (16)	1-25M	610 (24)		
2.7 (9)	1-15M		1-20M	406 (16)	1-25M	406 (16)						
3.3 (11)	1-20M		1-25M	406 (16)								
3.9 (13)	1-25M											
4.5 (15)												
5.1 (17)												

indicates engineering input is required.

indicates stirrups are not required.

Tables 11a, 11b and 11c are based on the following assumptions:

1. Stirrups are fabricated from 10M bars with spacing (S) at 102 mm (4") on center (o/c) for Table 11a, 203 mm (8") o/c for Tables 11b and 305 mm (12") o/c for Table 11c.
2. The factored uniformly distributed load includes live and dead loads, not including lintel self-weight.
3. Lintel reinforcing is located at bottom of lintel and projects minimum 610 mm (24") into lintel support on each side.

Table 11b – 419 mm (16 ½") Deep Lintels Reinforcement

Opening Width m (ft)	Factored Uniformly Distributed Load - kN/m (plf)											
	5 (342)		10 (685)		15 (1027)		20 (1370)		25 (1712)		30 (2055)	
	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)
≤1.2 (4)	1-15M		1-15M		1-15M		1-15M		1-15M		1-15M	
1.5 (5)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)
2.1 (7)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)
2.7 (9)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-20M	406 (16)	1-20M	610 (24)
3.3 (11)	1-15M		1-15M	406 (16)	1-20M	406 (16)	1-20M	406 (16)	1-25M	610 (24)	1-25M	914 (36)
3.9 (13)	1-15M		1-20M	406 (16)	1-25M	406 (16)	1-25M	610 (24)				
4.5 (15)	1-15M		1-20M	406 (16)	1-25M	610 (24)						
5.1 (17)	1-20M		1-25M	610 (24)								

indicates engineering input is required.

indicates stirrups are not required.

Note: If lintels are less than 419 mm (16 1/2") deep, see Table 11a.

Table 11c – 629 mm (24 ¾") Deep Lintels Reinforcement

Opening Width m (ft)	Factored Uniformly Distributed Load - kN/m (plf)											
	5 (342)		10 (685)		15 (1027)		20 (1370)		25 (1712)		30 (2055)	
	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)	Bottom Steel	End Distance mm (in)
≤1.2 (4)	1-15M		1-15M		1-15M		1-15M		1-15M		1-15M	
1.5 (5)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)
2.1 (7)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)
2.7 (9)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-15M	406 (16)	1-20M	406 (16)
3.3 (11)	1-15M		1-15M	406 (16)	1-15M	406 (16)	1-20M	406 (16)	1-20M	406 (16)	1-20M	610 (24)
3.9 (13)	1-15M		1-15M	406 (16)	1-20M	406 (16)	1-20M	406 (16)	1-25M	610 (24)	1-25M	610 (24)
4.5 (15)	1-15M		1-20M	406 (16)	1-20M	406 (16)	1-25M	610 (24)	1-25M	914 (36)	1-25M	914 (36)
5.1 (17)	1-15M		1-20M	406 (16)	1-25M	610 (24)	1-25M	610 (24)				

indicates engineering input is required.

indicates stirrups are not required.

Note: If lintels are less than 629 mm (24 3/4") deep, see Table 11a or 11b.

MINIMUM SOLID WALL LENGTH FOR ADVANTAGE ICF SYSTEM

Assumptions used for development of solid wall lengths are as follows:

1. Maximum building width: 12.2 m (40 ft) front wall to back wall; maximum building length: 24.4 m (80 ft) gable wall to gable wall.
2. A solid wall segment is a section of concrete wall extending the full story height. Solid wall segments are minimum 1.22 m (4 ft) in length. Minimum solid wall length required in tables below is the total length of solid wall segments within each gable wall or eave wall. For the gable wall shown in Figure 4, total solid wall length is equal to B1 + B2 + B3. For the eave wall shown in Figure 5, total solid wall length is equal to L1 + L2 + L3 + L4.

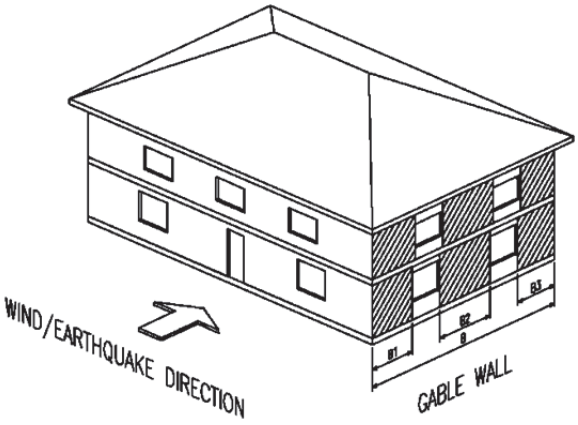


Figure 4 - Gable Wall Length

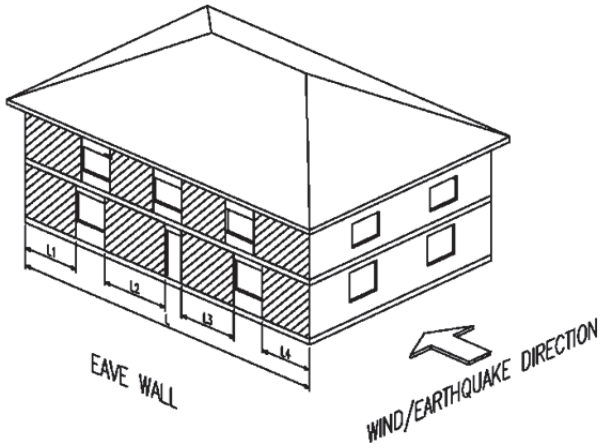


Figure 5 - Eave Wall Length

3. Specified compressive strength of concrete, f'_c at 28 days is 20 MPa (3,000 psi).
4. Specified yield strength of reinforcement, fy is 400 MPa (60 ksi).
5. Roof slopes are up to 12/12.
6. Maximum story height is 3.66 m (12 ft) per story.
7. Mean roof height is 10.67 m (35 ft).
8. Reinforced 150 mm (6") solid walls with 2-15M vertical bars at each end have factored design shear strength of 75 kN/m (5139 plf); reinforced 200 mm (8") solid walls with 2-15M vertical bars at each end have factored design shear strength of 100 kN/m (6852 plf).
9. Tables 12a to 12e provide minimum solid wall length (m) for wind pressure q(1/50) equal to 0.4 to 1.2 kPa, Open Terrain. Tables 13a to 13c provide minimum solid wall length (m) for seismic spectral acceleration factor $S_a(0.2)$ equal to 0.4 to 1.2.

Table 12a – Minimum Solid Wall Length (m): q(1/50) = 0.4 kPa, Open Terrain

Building Width m (ft)	Building Length m (ft)	Roof Slope	Wall Thickness - mm (inch)							
			150 (6)				200 (8)			
			One story or top story of two-story		First story of two-story		One story or top story of two-story		First story of two-story	
			Gable	Eave	Gable	Eave	Gable	Eave	Gable	Eave
6.1 (20)	12.2 (40)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	18.3 (60)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	24.4 (80)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.4	1.2	1.2	1.2	1.2	1.2
12.2 (40)	12.2 (40)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	18.3 (60)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2
	24.4 (80)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.7	1.2	1.2	1.2	1.3	1.2

Table 12b – Minimum Solid Wall Length (m): q(1/50) = 0.6 kPa, Open Terrain

Building Width m (ft)	Building Length m (ft)	Roof Slope	Wall Thickness - mm (inch)							
			150 (6)				200 (8)			
			One story or top story of two-story		First story of two-story		One story or top story of two-story		First story of two-story	
			Gable	Eave	Gable	Eave	Gable	Eave	Gable	Eave
6.1 (20)	12.2 (40)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	18.3 (60)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.6	1.2	1.2	1.2	1.2	1.2
	24.4 (80)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.7	1.2	1.2	1.2	1.3	1.2
		12 in 12	1.2	1.2	2.0	1.2	1.2	1.2	1.5	1.2
12.2 (40)	12.2 (40)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.4	1.2	1.2	1.2	1.2	1.2
	18.3 (60)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.4	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	2.0	1.2	1.2	1.2	1.5	1.2
	24.4 (80)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.8	1.2	1.2	1.2	1.4	1.2
		12 in 12	1.6	1.2	2.6	1.2	1.2	1.2	1.9	1.2

Table 12c – Minimum Solid Wall Length (m): q(1/50) = 0.8 kPa, Open Terrain

Building Width m (ft)	Building Length m (ft)	Roof Slope	Wall Thickness - mm (inch)							
			150 (6)				200 (8)			
			One story or top story of two-story		First story of two-story		One story or top story of two-story		First story of two-story	
			Gable	Eave	Gable	Eave	Gable	Eave	Gable	Eave
6.1 (20)	12.2 (40)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.5	1.2	1.2	1.2	1.2	1.2
	18.3 (60)	1 in 12	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.7	1.2	1.2	1.2	1.3	1.2
		12 in 12	1.2	1.2	2.1	1.2	1.2	1.2	1.6	1.2
	24.4 (80)	1 in 12	1.2	1.2	1.6	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	2.3	1.2	1.2	1.2	1.7	1.2
		12 in 12	1.4	1.2	2.7	1.2	1.2	1.2	2.0	1.2
12.2 (40)	12.2 (40)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.9	1.2	1.2	1.2	1.4	1.2
	18.3 (60)	1 in 12	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.9	1.2	1.2	1.2	1.4	1.2
		12 in 12	1.7	1.2	2.7	1.2	1.2	1.2	2.0	1.2
	24.4 (80)	1 in 12	1.2	1.2	1.6	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	2.5	1.2	1.2	1.2	1.8	1.2
		12 in 12	2.1	1.2	3.5	1.2	1.6	1.2	2.6	1.2

Table 12d – Minimum Solid Wall Length (m): q(1/50) = 1.0 kPa, Open Terrain

Building Width m (ft)	Building Length m (ft)	Roof Slope	Wall Thickness - mm (inch)							
			150 (6)				200 (8)			
			One story or top story of two-story		First story of two-story		One story or top story of two-story		First story of two-story	
			Gable	Eave	Gable	Eave	Gable	Eave	Gable	Eave
6.1 (20)	12.2 (40)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.5	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.2	1.2	1.8	1.2	1.2	1.2	1.4	1.2
	18.3 (60)	1 in 12	1.2	1.2	1.6	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	2.2	1.2	1.2	1.2	1.6	1.2
		12 in 12	1.3	1.2	2.6	1.2	1.2	1.2	2.0	1.2
	24.4 (80)	1 in 12	1.2	1.2	2.0	1.2	1.2	1.2	1.5	1.2
		6 in 12	1.2	1.2	2.8	1.2	1.2	1.2	2.1	1.2
		12 in 12	1.8	1.2	3.4	1.2	1.3	1.2	2.5	1.2
12.2 (40)	12.2 (40)	1 in 12	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.7	1.2	1.2	1.2	1.2	1.2
		12 in 12	1.4	1.2	2.3	1.4	1.2	1.2	1.7	1.2
	18.3 (60)	1 in 12	1.2	1.2	1.6	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	2.4	1.2	1.2	1.2	1.8	1.2
		12 in 12	2.1	1.2	3.3	1.4	1.6	1.2	2.5	1.2
	24.4 (80)	1 in 12	1.2	1.2	2.0	1.2	1.2	1.2	1.5	1.2
		6 in 12	1.4	1.2	3.1	1.2	1.2	1.2	2.3	1.2
		12 in 12	2.7	1.2	4.3	1.4	2.0	1.2	3.2	1.2

Table 12e – Minimum Solid Wall Length (m): q(1/50) = 1.2 kPa, Open Terrain

Building Width m (ft)	Building Length m (ft)	Roof Slope	Wall Thickness - mm (inch)							
			150 (6)				200 (8)			
			One story or top story of two-story		First story of two-story		One story or top story of two-story		First story of two-story	
			Gable	Eave	Gable	Eave	Gable	Eave	Gable	Eave
6.1 (20)	12.2 (40)	1 in 12	1.2	1.2	1.4	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	1.8	1.2	1.2	1.2	1.4	1.2
		12 in 12	1.2	1.2	2.2	1.2	1.2	1.2	1.6	1.2
	18.3 (60)	1 in 12	1.2	1.2	1.9	1.2	1.2	1.2	1.4	1.2
		6 in 12	1.2	1.2	2.6	1.2	1.2	1.2	2.0	1.2
		12 in 12	1.6	1.2	3.1	1.2	1.2	1.2	2.3	1.2
	24.4 (80)	1 in 12	1.2	1.2	2.4	1.2	1.2	1.2	1.8	1.2
		6 in 12	1.3	1.2	3.4	1.2	1.2	1.2	2.5	1.2
		12 in 12	2.1	1.2	4.1	1.2	1.6	1.2	3.0	1.2
12.2 (40)	12.2 (40)	1 in 12	1.2	1.2	1.4	1.2	1.2	1.2	1.2	1.2
		6 in 12	1.2	1.2	2.0	1.4	1.2	1.2	1.5	1.2
		12 in 12	1.7	1.2	2.8	1.7	1.3	1.2	2.1	1.3
	18.3 (60)	1 in 12	1.2	1.2	1.9	1.2	1.2	1.2	1.4	1.2
		6 in 12	1.3	1.2	2.8	1.4	1.2	1.2	2.1	1.2
		12 in 12	2.5	1.2	4.0	1.7	1.9	1.2	3.0	1.3
	24.4 (80)	1 in 12	1.2	1.2	2.4	1.2	1.2	1.2	1.8	1.2
		6 in 12	1.6	1.2	3.7	1.4	1.2	1.2	2.8	1.2
		12 in 12	3.2	1.2	5.2	1.7	2.4	1.2	3.9	1.2

Table 13a – Minimum Solid Wall Length (m): Seismic Data $S_a(0.2)$= 0.40

Building Width m (ft)	Building Length m (ft)	Roof Slope	Wall Thickness - mm (inch)							
			150 (6)				200 (8)			
			One story or top story of two-story		First story of two-story		One story or top story of two-story		First story of two-story	
			Gable	Eave	Gable	Eave	Gable	Eave	Gable	Eave
6.1 (20)	12.2 (40)	1 in 12	1.2	1.2	1.6	1.6	1.2	1.2	1.4	1.4
		6 in 12	1.2	1.2	1.6	1.6	1.2	1.2	1.4	1.4
		12 in 12	1.2	1.2	1.7	1.7	1.2	1.2	1.5	1.5
	18.3 (60)	1 in 12	1.2	1.2	2.1	2.1	1.2	1.2	1.9	1.9
		6 in 12	1.2	1.2	2.2	2.2	1.2	1.2	1.9	1.9
		12 in 12	1.2	1.2	2.3	2.3	1.2	1.2	2.0	2.0
	24.4 (80)	1 in 12	1.2	1.2	2.7	2.7	1.2	1.2	2.4	2.4
		6 in 12	1.2	1.2	2.7	2.7	1.2	1.2	2.4	2.4
		12 in 12	1.3	1.3	2.8	2.8	1.2	1.2	2.5	2.5
12.2 (40)	12.2 (40)	1 in 12	1.2	1.2	2.3	2.3	1.2	1.2	2.0	2.0
		6 in 12	1.4	1.4	2.5	2.5	1.2	1.2	2.2	2.2
		12 in 12	1.7	1.7	2.8	2.8	1.6	1.6	2.6	2.6
	18.3 (60)	1 in 12	1.4	1.4	2.9	2.9	1.2	1.2	2.6	2.6
		6 in 12	1.7	1.7	3.2	3.2	1.5	1.5	2.8	2.8
		12 in 12	2.1	2.1	3.5	3.5	1.9	1.9	3.1	3.1
	24.4 (80)	1 in 12	1.7	1.7	3.6	3.6	1.5	1.5	3.1	3.1
		6 in 12	2.0	2.0	3.9	3.9	1.8	1.8	3.4	3.4
		12 in 12	2.4	2.4	4.2	4.2	2.1	2.1	3.7	3.7

Table 13b – Minimum Solid Wall Length (m): Seismic Data $S_a(0.2)$= 0.80

Building Width m (ft)	Building Length m (ft)	Roof Slope	Wall Thickness - mm (inch)							
			150 (6)				200 (8)			
			One story or top story of two-story		First story of two-story		One story or top story of two-story		First story of two-story	
			Gable	Eave	Gable	Eave	Gable	Eave	Gable	Eave
6.1 (20)	12.2 (40)	1 in 12	1.3	1.3	3.1	3.1	1.2	1.2	2.8	2.8
		6 in 12	1.5	1.5	3.2	3.2	1.3	1.3	2.9	2.9
		12 in 12	1.7	1.7	3.4	3.4	1.5	1.5	3.1	3.1
	18.3 (60)	1 in 12	1.8	1.8	4.2	4.2	1.6	1.6	3.7	3.7
		6 in 12	2.0	2.0	4.3	4.3	1.8	1.8	3.9	3.9
		12 in 12	2.2	2.2	4.5	4.5	2.0	2.0	4.0	4.0
	24.4 (80)	1 in 12	2.3	2.3	5.3	5.3	2.0	2.0	4.7	4.7
		6 in 12	2.4	2.4	5.4	5.4	2.2	2.2	4.8	4.8
		12 in 12	2.6	2.6	5.6	5.6	2.4	2.4	5.0	5.0
12.2 (40)	12.2 (40)	1 in 12	2.1	2.1	4.5	4.5	1.8	1.8	4.0	4.0
		6 in 12	2.7	2.7	5.1	5.1	2.5	2.5	4.5	4.5
		12 in 12	3.5	3.5	5.7	5.7	3.2	3.2	5.1	5.1
	18.3 (60)	1 in 12	2.7	2.7	5.8	5.8	2.4	2.4	5.1	5.1
		6 in 12	3.4	3.4	6.4	6.4	3.0	3.0	5.6	5.6
		12 in 12	4.1	4.1	7.0	7.0	3.7	3.7	6.2	6.2
	24.4 (80)	1 in 12	3.4	3.4	7.2	7.2	2.9	2.9	6.3	6.3
		6 in 12	4.1	4.1	7.7	7.7	3.6	3.6	6.8	6.8
		12 in 12	4.8	4.8	8.4	8.4	4.3	4.3	7.4	7.4

Table 13c – Minimum Solid Wall Length (m): Seismic Data $S_a(0.2)$= 1.20

Building Width m (ft)	Building Length m (ft)	Roof Slope	Wall Thickness - mm (inch)							
			150 (6)				200 (8)			
			One story or top story of two-story		First story of two-story		One story or top story of two-story		First story of two-story	
			Gable	Eave	Gable	Eave	Gable	Eave	Gable	Eave
6.1 (20)	12.2 (40)	1 in 12	2.0	2.0	4.7	4.7	1.8	1.8	4.1	4.1
		6 in 12	2.2	2.2	4.9	4.9	2.0	2.0	4.3	4.3
		12 in 12	2.5	2.5	5.1	5.1	2.3	2.3	4.6	4.6
	18.3 (60)	1 in 12	2.7	2.7		6.3	2.4	2.4	5.6	5.6
		6 in 12	2.9	2.9		6.5	2.6	2.6	5.8	5.8
		12 in 12	3.2	3.2		6.8	2.9	2.9	6.0	6.0
	24.4 (80)	1 in 12	3.4	3.4		8.0	3.0	3.0		7.1
		6 in 12	3.7	3.7		8.2	3.3	3.3		7.3
		12 in 12	4.0	4.0		8.4	3.6	3.6		7.5
12.2 (40)	12.2 (40)	1 in 12	3.1	3.1	6.8	6.8	2.7	2.7	6.0	6.0
		6 in 12	4.1	4.1	7.6	7.6	3.7	3.7	6.7	6.7
		12 in 12	5.2	5.2	8.5	8.5	4.7	4.7	7.7	7.7
	18.3 (60)	1 in 12	4.1	4.1	8.8	8.8	3.6	3.6	7.7	7.7
		6 in 12	5.1	5.1	9.6	9.6	4.5	4.5	8.5	8.5
		12 in 12	6.2	6.2	10.5	10.5	5.6	5.6	9.4	9.4
	24.4 (80)	1 in 12	5.1	5.1	10.8	10.8	4.4	4.4	9.4	9.4
		6 in 12	6.1	6.1	11.6	11.6	5.4	5.4	10.2	10.2
		12 in 12	7.2	7.2		12.5	6.4	6.4	11.1	11.1

indicates engineering input is required for shear reinforcing.

Advantage ICF System® Specifications

Plasti·Fab® EPS PRODUCT SOLUTIONS
Better building ideas from PFB™

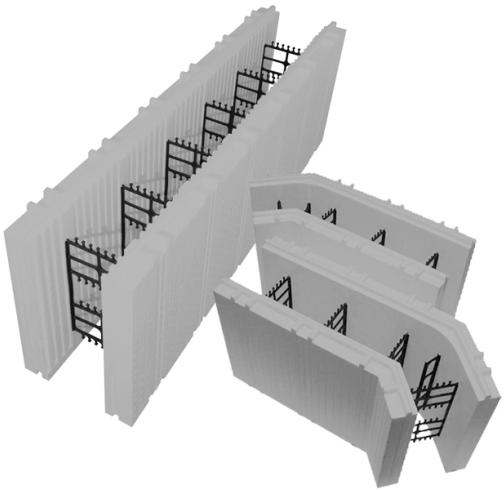
General Product Description

EPS Insulation
Complies with CAN/ULC-S701, Type 2, and ASTM C578, Type 2
Contains no CFCs, HCFCs, HFCs or formaldehyde

Concrete
20 MPa (2900 psi) at 28 days
Nominal Thickness 152-mm(6”) or 203-mm (8”)

Code Evaluation Reports
CCMC Evaluation Report 13101-R (Canada)
Intertek Code Compliance Research Report CCRR-1006 (Canada and US)

Sustainability Certificate
GREENGUARD Gold



@AdvantageICF

PFBCorporation

@plastifabeps