B-3.2.1. Wall Reinforcement Tables for Above Grade Walls

The tables below are based on *Prescriptive Method for insulating concrete forms in residential construction. Second Edition , January 2002. [1]*

This tables are to be used for low-rise residential buildings

Placement of reinforcement shall be in accordance with the local standards, regulations, or code having jurisdiction.

In Canada, the placement of reinforcing steel shall conform to CSA A23.1; design requirements must be in accordance with CSA A23.3, the latest addition.
In the US, the placement and design of reinforcing steel must be in conformance with ACI 318, or ACI 332, or the 2000 International Residential Code. Alternatively, some areas have adopted the 1999 Standard Building Code, or Prescriptive Method for Insulating Concrete Forms in Residential Construction.

Distances between rebars and rebar sizes have been modified in accordance with Armopanel™ Wall System and Canadian rebars designation and are to be used only within the assumptions and restrictions laid out in that document. These tables are to be superseded by the local building code or original engineering performed for the specific construction project.

Specific project information and design criteria should be used to properly design the wall. Deflection criteria is L/240, where L is the height of the wall storey.

The tables have data intended to help the Engineer/Contractor quickly determine the required wall thickness and appropriate reinforcement.

Table B-3.2.1(imperial)

Minimum Horizontal Reinforcement for Flat ICF Above-Grade Walls *

Minimum Concrete Core Thickness (in.)	Maximum Height of Wall Storey (ft.)	Location of Horizontal Reinforcement
3.5	8	One # 4 bar within 12 inches of top of the wall storey, one # 4 rebar within 12 inches from the finish floor, and # 4 bar near third points throughout the remainder of the wall
	9	
	10	
5.5	8	
	9	
	10	
7.5	8	
	9	
	10	

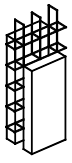
Horizontal reinforcement requirements minimum yield strength of 40,000 psi
* Table is based on Section 4.1, page I-28 [1]

Table B-3.2.2.(metric)

Minimum Horizontal Reinforcement for Flat ICF Above-Grade Walls

Minimum Concrete Core Thickness (mm.)	Maximum Height of Wall Storey (mm.)	Location of Horizontal Reinforcement
100	2400	One 15M bar within 400 mm of top of the wall storey, one 15M rebar within 400 mm from the finish floor, and 15M bar near third points throughout the remainder of the wall
	2700	
	3000	
150	2400	
	2700	
	3000	
200	2400	
	2700	
	3000	

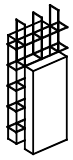
Horizontal reinforcement requirements minimum yield strength of 400 MPa
Concrete compressive strength 20 Mpa
* Table is based on Section 4.1, page I-28 [1]



Minimum Vertical Wall Reinforcement for Flat ICF Above-Grade Walls [1,2,3,4,] Table B-3.2.3.*

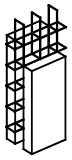
Design Wind Pres. (psf)	Max. Wall Height per Storey (feet.)	Minimum Vertical Reinforcement								
		Supporting Roof or Non-Load Bearing Wall			Supporting Light-Frame Second Storey and Roof			Supporting ICF Second Storey and Light-Frame Roof		
		Minimum Wall Thickness (in.)								
		3.5	5.5		3.5	5.5		3.5	5.5	
20	8	#4@48″	#4@48″		#4@48″	#4@48″		#4@48″	#4@48″	
	9	#4@48″	#4@48″		#4@48″	#4@48″		#4@48″	#4@48″	
	10	#4@32″	#4@48″		#4@40″	#4@48″		#4@40″	#4@48″	
30	8	#4@40″	#4@48″		#4@40″	#4@48″		#4@48″	#4@48″	
	9	#4@32″	#4@48″		#4@32″	#4@48″		#4@32″	#4@48″	
	10	Design Required	#4@48″		Design Required	#4@48″		Design Required	#4@48″	
40	8	#4@24″	#4@48″		#4@24″	#4@48″		#4@32″	#4@48″	
	9	Design Required	#4@40″		Design Required	#4@40″		Design Required	#4@48″	
	10	Design Required	#4@32″		Design Required	#4@32″		Design Required	#4@32″	
50	8	#4@16″	#4@40″		#4@16″	#4@40″		#4@24″	#4@48″	
	9	Design Required	#4@32″		Design Required	#4@32″		Design Required	#4@32″	
	10	Design Required	#4@24″		Design Required	#4@24″		Design Required	#4@24″	
60	8	Design Required	#4@32″		Design Required	#4@32″		Design Required	#4@40″	
	9	Design Required	#4@24″		Design Required	#4@24″		Design Required	#4@32″	
	10	Design Required	#4@16″		Design Required	#4@16″		Design Required	#4@24″	
70	8	Design Required	#4@24″		Design Required	#4@24″		Design Required	#4@32″	
	9	Design Required	#4@16″		Design Required	#4@16″		Design Required	#4@24″	
	10	Design Required	#4@16″		Design Required	#4@16″		Design Required	#4@16″	
80	8	Design Required	#4@24″		Design Required	#4@24″″		Design Required	#4@24″	
	9	Design Required	#4@16″		Design Required	#4@16″		Design Required	#4@16″	
	10	Design Required	#4@8″		Design Required	#4@8″		Design Required	#4@16″	

* Table is based on Table 4.2 [1]
1. This table based on Reinforcing bars with a minimum yield strength of 40,000 psi, and Concrete F'c = 2,850 psi.
2. Deflection criterion is L/240, were L is the height of the wall storey in inches.
3. Interpolation shall not be permitted.
4. Vertical reinforcement should be placed within middle third of the concrete wall.



Minimum Vertical Wall Reinforcement for Flat ICF Above-Grade Walls [1,2,3,4] Table B-3.2.4.*

Design Wind Pres. (kPa)	Max. Wall Height per Storey (mm)	Minimum Vertical Reinforcement								
		Supporting Roof or Non-Load Bearing Wall			Supporting Light-Frame Second Storey and Roof			Supporting ICF Second Storey and Light-Frame Roof		
		Minimum Wall Thickness (mm)								
		100	150		100	150		100	150	
0.96	2400	10M@1200	10M@1200		10M@1200	10M@1200		10M@1200	10M@1200	
	2700	10M@1200	10M@1200		10M@1200	10M@1200		10M@1200	10M@1200	
	3000	10M@600	10M@1200		10M@1000	10M@1200		10M@1000	10M@1200	
1.44	2400	10M@800	10M@1200		10M@800	10M@1200		10M@1200	10M@1200	
	2700	10M@600	10M@1200		10M@600	10M@1200		10M@600	10M@1200	
	3000	Design Required	10M@1200		Design Required	10M@1200		Design Required	10M@1200	
1.91	2400	10M@600	10M@1200		10M@600	10M@1200		10M@600	10M@1200	
	2700	Design Required	10M@1000		Design Required	10M@1000		Design Required	10M@1200	
	3000	Design Required	10M@800		Design Required	10M@800		Design Required	10M@800	
2.39	2400	10M@400	10M@1000		10M@400	10M@1000		10M@400	10M@1200	
	2700	Design Required	10M@800		Design Required	10M@800		Design Required	10M@800	
	3000	Design Required	10M@600		Design Required	10M@600		Design Required	10M@600	
2.87	2400	Design Required	10M@800		Design Required	10M@800		Design Required	10M@1000	
	2700	Design Required	10M@600		Design Required	10M@600		Design Required	10M@800	
	3000	Design Required	10M@400		Design Required	10M@400		Design Required	10M@600	
3.35	2400	Design Required	10M@600		Design Required	10M@600		Design Required	10M@800	
	2700	Design Required	10M@400		Design Required	10M@400		Design Required	10M@600	
	3000	Design Required	10M@400		Design Required	10M@400		Design Required	10M@400	
3.83	2400	Design Required	10M@600		Design Required	10M@600		Design Required	10M@600	
	2700	Design Required	10M@400		Design Required	10M@400		Design Required	10M@400	
	3000	Design Required	10M@200 15M@400		Design Required	10M@200 15M@400		Design Required	10M@400	

* Table is based on Table 4.2 [1]

1. This table based on Reinforcing bars with a minimum yield strength of 400 MPa, and Concrete F'c = 20 MPa.
2. Deflection criterion is L/240, were L is the height of the wall storey in inches.
3. Interpolation shall not be permitted.
4. Vertical reinforcement should be placed within middle third of the concrete wall .