



Evaluation Report CCMC 13367-R

MASTERFORMAT: 03 11 19.01
Issued: 2009-07-14
Re-evaluated: 2009-08-26
Revised: 2010-01-05
Re-evaluation due: 2012-07-14

Formtech ICF

1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “Formtech ICF” when used as an insulated concrete form in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code 2005:

- Clause 1.2.1.1.(1)(a), Division A, using the following acceptable solutions from Division B:
 - Article 3.1.5.12. Combustible Insulation and its Protection
 - Article 4.1.1.3. Design Requirements (structural loads and procedures)
 - Article 4.3.3.1. Design Basis for Plain, Reinforced and Pre-Stressed Concrete
 - Subsection 9.3.1. Concrete
 - Section 9.4. Structural Requirements
 - Article 9.10.17.10. Protection of Foamed Plastics
 - Clause 9.15.1.1.(1)(c) General (footings and foundations)
 - Article 9.15.3.3. Application of Footing Width and Area Requirements
 - Clause 9.15.3.5.(1)(c) Adjustments of Footing Widths for Exterior Walls
 - Subsection 9.15.4. Foundation Walls
 - Clause 9.20.1.1.(1)(b) General (masonry and insulating concrete form walls not in contact with the ground)
 - Clause 9.20.1.1.(2) General (masonry and insulating concrete form walls not in contact with the ground)
 - Article 9.20.1.2. Earthquake Reinforcement
 - Subsection 9.20.17. Above-Ground Flat Insulating Concrete Form Walls

This opinion is based on CCMC's evaluation of the technical evidence in Section 4.1 provided by the Report Holder.

2. Description

“Formtech ICF” is a modular, interlocking concrete form system consisting of two expanded-polystyrene (EPS) Type 2 panels with six polypropylene strapping supports that are embedded in the polystyrene panels and equally spaced at 200 mm horizontally. Rectangular polypropylene plastic ties are inserted in the strapping supports to connect the two EPS panels.

The units have a preformed symmetrical interlocking EPS design along the top and the bottom. The interlocking design at the top, which consists of a single row of button-protrusions along the centre line, while the bottom has two rows of teeth along the outer edges that facilitate stacking and alignment while also preventing leakage of freshly placed concrete.

The units are dry-laid and stacked in a running (staggered) configuration. The stacked units form a rectangular space which, after being filled with concrete, results in an insulated, monolithic concrete wall of uniform thickness.

Reinforcement may be placed where required to satisfy strength requirements for above- or below-grade loadbearing walls, beams, lintels and shear walls.

The units have external dimensions of 1219 mm in length and 406 mm in height. The polystyrene panels are 64 mm thick, resulting in an overall wall thickness of 228 mm, 278 mm, 328 mm, and 378 mm that in turn, encloses 100 mm, 150 mm, 200 mm, or 250 mm concrete wall.

“Formtech ICF” forms are available in straight, 90-degree or 45-degree corner form units, and brick ledge forms.

“Formtech ICF” standard and corner units are illustrated in Figures 1 and 2.

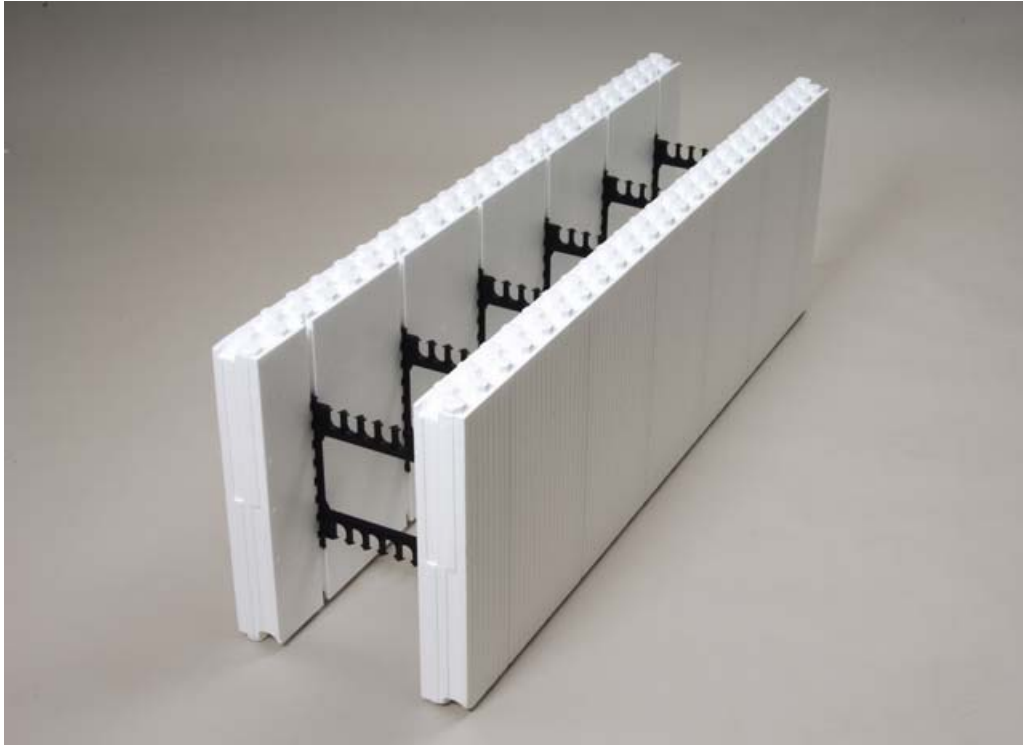


Figure 1. “Formtech ICF” standard unit

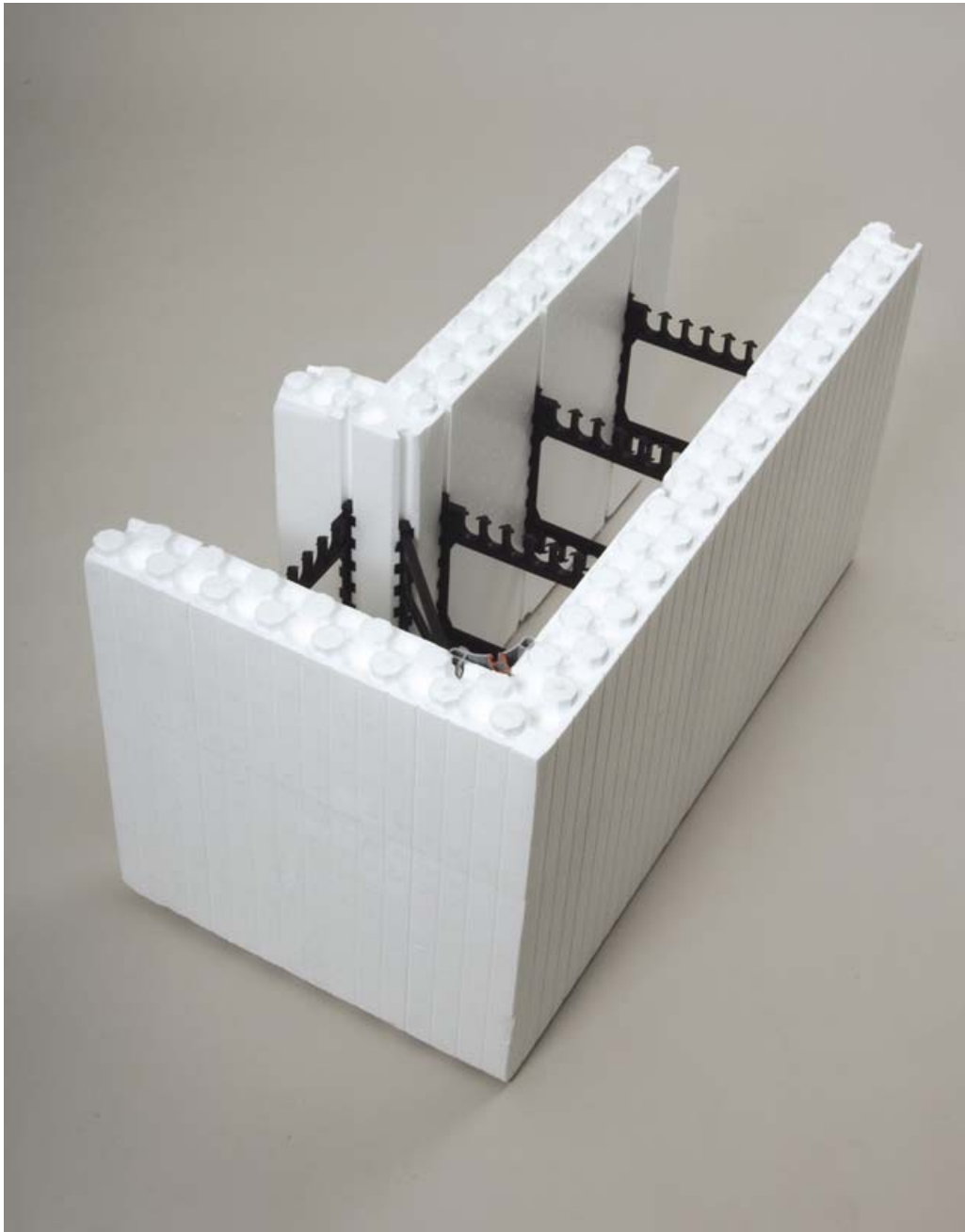


Figure 2. "Formtech ICF" 90° corner unit

3. Conditions and Limitations

CCMC's compliance opinion in Section 1 is bound by the "Formtech ICF" being used in accordance with the conditions and limitations set out below.

- The use of "Formtech ICF" is permitted in the construction of houses and small buildings up to two storeys high that fall under the provisions of Part 9 of Division B of the NBC 2005, subject to all of the conditions listed below.
- The structural applications of "Formtech ICF" must be in strict accordance with the design analysis as prepared for Tegrant Diversified Brands Inc. and included in Report No. 070511.2, dated 12 November 2008, from which Tables 4.1.2.1.1 to 4.1.2.1.22 have been reproduced. When "Formtech ICF" is used in structural applications outside the scope of the referenced design analysis, a registered professional engineer skilled in concrete design must certify the design analysis and the design drawings for such applications. The engineer shall certify that the construction provides a level of performance equivalent to that required by Part 4 and/or Part 9 of the NBC 2005.
- The attachment of exterior cladding and interior finishing materials has not been assessed by the present evaluation.
- For load-bearing walls and shear wall application, the minimum core thickness of "Formtech ICF" must be 150 mm.
- For non-load-bearing wall applications, the minimum core thickness of "Formtech ICF" must be 100 mm.
- The concrete used in "Formtech ICF" must be Type 10 or Type 30 with a minimum compressive strength of 20 MPa and a maximum slump of 150 ± 12 mm.
- The maximum aggregate size to be used in conjunction with "Formtech ICF" must be no greater than 14 mm.
- For the wall heights indicated in Tables 4.1.2.1.1 and 4.1.2.1.2, the pouring of concrete must be made at a rate of 1.3 m per hour in consecutive lifts; each lift is limited to a maximum height of 1.3 m.
- The EPS insulation used in this system must comply with CAN/ULC-S701-01, "Standard For Thermal Insulation, Polystyrene, Boards and Pipe Covering," Type 2.
- "Formtech ICF" EPS insulation panels must be aged for at least three weeks from their date of manufacturing.
- The interior face of "Formtech ICF" panels must be protected from the inside of the building in accordance with Sentence 9.10.17.10.(1) of Division B of the NBC 2005.
- For above-grade installations, the exterior face of the "Formtech ICF" must be protected with materials conforming to Article 9.20.6.4., Masonry Veneer, and Sections 9.27., Cladding, and/or 9.28., Stucco, of Division B of the NBC 2005.
- The concrete must be cured a minimum of seven days before backfilling. The top of the foundation wall must be supported by the first floor prior to backfilling.
- For below-grade installations, dampproofing material that is compatible with the EPS insulation must be provided in accordance with Article 9.13.2.2., Material Standards (dampproofing), of Division B of the NBC 2005.
- Where hydrostatic pressure exists, waterproofing that is compatible with the EPS insulation must be provided in accordance with Article 9.13.3.2., of Division B of the NBC 2005.
- For foundation-wall installations, the backfill 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 footing in accordance with NBC requirements.
- Installation of the "Formtech ICF" must be in strict compliance with the Formtech Insulated Concrete Forms Technical Building Manual, dated 01 July, 2006. Only installers authorized by Tegrant Diversified Brands Inc. shall be contracted to set up the wall system.

4. Technical Evidence

CCMC's Technical Guide for "Formtech ICF" sets out the nature of the technical evidence required by CCMC to enable it to evaluate a product as an acceptable or alternative solution in compliance with the NBC 2005. The Report Holder has submitted test results and engineering design analyses for CCMC's evaluation. Testing was conducted at independent laboratories recognized by CCMC. The corresponding test results for "Formtech ICF" are summarized below.

4.1 NBC 2005 Compliance Data for "Formtech ICF" on which CCMC Based its Opinion in Section 1

4.1.1 Material Requirements

4.1.1.1 Conformance of the EPS

Compliance of the expanded polystyrene thermal insulation with the requirements of CAN/ULC-S701-01 is covered under Intertek Testing Services NA LTD. certification program.

4.1.2 Design Requirements

4.1.2.1 Conformance of Structural Capacity (Steel Reinforcement Designs)

The design analysis in Report No. 070511.2, (see Conditions and Limitations above for complete reference) of walls using "Formtech ICF" provides a level of performance equivalent to that required by applicable provisions in Part 4 and/or Part 9 of Division B of the NBC 2005. The corresponding design analysis is summarized in Tables 4.1.2.1.1 to 4.1.2.1.22. The tables provide steel reinforcement specifications for a number of different wall and lintel applications based on specific structural loads. The design assumptions are indicated below each table.

Table 4.1.2.1.1(a) Vertical and horizontal steel reinforcement for below-grade walls⁽¹⁾

Wall Height (m)	Backfill Height (m)	Max. Spacing for Vertical Reinforcement (mm)			Max. Spacing for Horizontal Reinforcement (mm)		
		150-mm Wall	200-mm Wall	250-mm Wall	150-mm Walls	200-mm Wall	250-mm Wall
2.44	1.22	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	1.52	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	1.82	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	2.12	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
3.05	1.22	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	1.52	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	1.82	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	2.12	15M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	2.42	15M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
2.74	15M @ 200	15M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	
3.66	1.22	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	1.52	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	1.82	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	2.12	15M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	2.52	15M @ 200	15M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
	2.82	–	15M @ 200	10M @ 200	–	10M @ 200	10M @ 200
	3.12	–	–	15M @ 200	–	–	10M @ 200
	3.35	–	–	15M @ 200	–	–	10M @ 200

Table 4.1.2.1.1(b) Alternate vertical and horizontal steel reinforcement for below-grade walls⁽¹⁾

Wall Height (m)	Backfill Height (m)	Max. Spacing for Vertical Reinforcement (mm)			Max. Spacing for Horizontal Reinforcement (mm)		
		150-mm Wall	200-mm Wall	250-mm Wall	150-mm Wall	200-mm Wall	250-mm Wall
2.44	1.22	10M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	1.52	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	1.82	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	2.12	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
3.05	1.22	10M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	1.52	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	1.82	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	2.12	15M @ 200	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	2.42	15M @ 200	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	2.74	15M @ 200	15M @ 200	15M @ 400	15M @ 400	15M @ 400	15M @ 400
3.66	1.22	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	1.52	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	1.82	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	2.12	15M @ 200	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	2.52	15M @ 200	15M @ 200	15M @ 400	15M @ 400	15M @ 400	15M @ 400
	2.82	–	15M @ 200	15M @ 400	–	15M @ 400	15M @ 400
	3.12	–	–	15M @ 200	–	–	15M @ 400
	3.35	–	–	15M @ 200	–	–	15M @ 400

Note to Tables 4.1.2.1.1(a) and (b): Table cells without a value indicate that the spacing is not feasible with respect to the proposed backfill height.

(1) Tables 4.1.2.1.1(a) and (b) are based on the following assumptions:

- The design is applicable to seismic zones up to $S_a(1.2)$ for soil Type A.
- Maximum building width is 24.0 m.
- Maximum building length is 18.0 m.
- Maximum clear floor span is 8.0 m.
- Maximum clear roof span is 12.0 m with supports at mid-point.
- Maximum number of storeys above grade is two (2).
- Maximum number of storeys below grade is one (1).
- Minimum roof slope is 1:3.
- Roof dead load is 0.60 kPa.
- Floor dead load is 0.70 kPa.
- Roof live load is 0.50 kPa.
- Floor live load is 1.9 kPa.
- Snow load is 1.9 kPa.
- Loads include earth pressure and surcharge loads, plus gravity load. Gravity load assumes 2 ICF storeys and a wood-frame roof.
- Wall height above ground is taken 3.05 m.
- The exterior walls are assumed to be clad with clay bricks.
- Specified compressive strength of concrete, f'_c at 28 days is 20 MPa.
- Reinforcing bars shall be hard-grade deformed bars conforming to CAN/CSA G30.12, “Billet-Steel Bars for Concrete Reinforcement,” Grade 400. Specified yield strength of reinforcement, f_y , is 400 MPa.
- Wall design detailing bends, placement, spacing, splicing and protection of reinforcement shall be in accordance with CAN/CSA A23.3 (R2000), “Design of Concrete Structures.”
- Minimum concrete cover for reinforcement is 20 mm from the inside face of the concrete.

- Two 15M bars shall be placed around all openings and extend 600 mm (24") beyond each side of the openings.
- Minimum 28-day concrete yield strength of 20 MPa. Mix designs in accordance with the manufacturer's recommendations.
- Concrete shall be allowed to cure for a minimum of seven days prior to backfilling.
- Basement walls are considered to be supported by the floor system at the top.
- Floor and roof connections to ICF walls shall be designed to accommodate diaphragm action in seismic zones and zones of high wind pressure.
- All materials and workmanship shall conform to the requirements of the NBC 2005 including any Revisions and Errata that have been released as of the issue date of these tables.

Table 4.1.2.1.2(a) Vertical and horizontal steel reinforcement for above-grade walls⁽²⁾

Wall Height (m)	Max. Spacing for Vertical Reinforcement (mm)			Max. Spacing for Horizontal Reinforcement (mm)		
	150-mm Wall	200-mm Wall	250-mm Wall	150-mm Wall	200-mm Wall	200-mm Wall
Single-storey concrete construction supporting a wood-frame roof structure						
2.44	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
3.05	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
3.66	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
Ground floor concrete construction supporting a second storey wood-frame construction and wood-frame roof structure						
2.44	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
3.05	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
3.66	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
Ground floor concrete construction supporting a second storey concrete construction and a wood-frame roof structure						
2.44	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
3.05	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200
3.66	10M @ 400	10M @ 200	10M @ 200	10M @ 200	10M @ 200	10M @ 200

Table 4.1.2.1.2(b) Alternate vertical and horizontal steel reinforcement for above-grade walls⁽²⁾

Wall Height (m)	Max. Spacing for Vertical Reinforcement (mm)			Max. Spacing for Horizontal Reinforcement (mm)		
	150-mm Wall	200-mm Wall	250-mm Wall	150-mm Wall	200-mm Wall	200-mm Wall
Single-storey concrete construction supporting a wood-frame roof structure						
2.44	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
3.05	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
3.66	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
Ground floor concrete construction supporting a second storey wood-frame construction and wood-frame roof structure						
2.44	10M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
3.05	10M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
3.66	10M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
Ground floor concrete construction supporting a second storey concrete construction and a wood-frame roof structure						
2.44	10M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
3.05	10M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400
3.66	10M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400	15M @ 400

Notes to Tables 4.1.2.1.2(a) and (b):

(2) Tables 4.1.2.1.2(a) and (b) are based on the following assumptions:

- The design is applicable to seismic zones up to $S_a(1.2)$ for soil Type A.
- Applicable to a maximum factored wind pressure of 3.15 kPa.
- Loads include all applicable gravity loads and wind loads.
- Specified compressive strength of concrete, f'_c , at 28 days is 20 MPa.
- Specified yield strength of reinforcement, f_y , is 400 MPa.
- Two 15M bars should be placed around all openings and shall extend at least 600 mm beyond each corner of the opening.

Table 4.1.2.1.3 Minimum steel reinforcement of lintels with a 250-mm core made with “Formtech ICF”⁽³⁾

Opening Width (mm)	Factored Uniformly Distributed Load (kN/m)													
	2.0		5.0		10.0		15.0		20.0		25.0		30.0	
	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)
1000	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0
1500	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	55
2000	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	167	1-15M	305
2500	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	208	1-15M	417	1-20M	555
3000	1-15M	0	1-15M	0	1-15M	0	1-15M	111	1-15M	458	1-20M	667	1-20M	805
3500	1-15M	0	1-15M	0	1-15M	0	1-15M	361	1-20M	708	2-15M	917	1-25M	1055
4000	1-15M	0	1-15M	0	1-15M	0	1-20M	611	2-15M	958	1-25M	1167	2-20M	1305
4500	1-15M	0	1-15M	0	1-20M	166	2-15M	861	1-25M	1208	2-20M	1417	2-25M	1555
5000	1-15M	0	1-15M	0	1-20M	416	1-25M	1111	2-20M	1458	2-25M	1667	2-25M	1805

Table 4.1.2.1.4 Minimum steel reinforcement of lintels with a 200-mm core made with “Formtech ICF”⁽³⁾

Opening Width (mm)	Factored Uniformly Distributed Load (kN/m)													
	2.0		5.0		10.0		15.0		20.0		25.0		30.0	
	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)
1000	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0
1500	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	83	1-15M	194
2000	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	167	1-15M	333	1-15M	444
2500	1-15M	0	1-15M	0	1-15M	0	1-15M	139	1-15M	417	1-15M	583	1-20M	694
3000	1-15M	0	1-15M	0	1-15M	0	1-15M	389	1-15M	667	1-20M	833	2-15M	944
3500	1-15M	0	1-15M	0	1-15M	83	1-15M	639	1-20M	917	2-15M	1083	1-25M	1194
4000	1-15M	0	1-15M	0	1-15M	333	1-20M	889	2-15M	1167	1-25M	1333	2-20M	1444
4500	1-15M	0	1-15M	0	1-20M	583	2-15M	1139	1-25M	1417	1-30M	1583	2-25M	1694
5000	1-15M	0	1-15M	0	1-20M	833	1-25M	1389	1-30M	1667	2-25M	1833	–	–

Table 4.1.2.1.5 Minimum steel reinforcement of lintels with a 150-mm core made with “Formtech ICF”⁽³⁾

Opening Width (mm)	Factored Uniformly Distributed Load (kN/m)													
	2.0		5.0		10.0		15.0		20.0		25.0		30.0	
	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)	Bottom Steel	Stirrup End Dist. (mm)
1000	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	83
1500	1-15M	0	1-15M	0	1-15M	0	1-15M	0	1-15M	125	1-15M	250	1-15M	333
2000	1-15M	0	1-15M	0	1-15M	0	1-15M	167	1-15M	375	1-15M	500	1-15M	583
2500	1-15M	0	1-15M	0	1-15M	0	1-15M	417	1-15M	625	1-15M	750	1-20M	833
3000	1-15M	0	1-15M	0	1-15M	250	1-15M	667	1-15M	875	1-20M	1000	2-15M	1083
3500	1-15M	0	1-15M	0	1-15M	500	1-20M	917	1-20M	1125	2-15M	1250	1-25M	1333
4000	1-15M	0	1-15M	0	1-15M	750	1-20M	1167	2-15M	1375	1-25M	1500	–	–
4500	1-15M	0	1-15M	0	1-20M	1000	2-15M	1417	1-25M	1625	–	–	–	–
5000	1-15M	0	1-15M	0	1-20M	1250	1-25M	1667	–	–	–	–	–	–

Note to Tables 4.1.2.1.3 to 4.1.2.1.5: Table cells without a value indicate that the load is not feasible with respect to the proposed wall height and/or core thickness.

(3) Table 4.1.2.1.3 to 4.1.2.1.5 are based on the following assumptions:

- The factored uniformly distributed load includes live and dead loads.
- The minimum height of the lintel is 400 mm.
- Stirrups are single leg fabricated from 10M bars spaced at 170 mm on centre.
- Lintel reinforcing is located at the bottom of the lintel and projects 205 mm into the lintel support on each side.
- Specified compressive strength of concrete, f'_c , at 28 days is 20 MPa.
- Specified yield strength of reinforcement, f_y , is 400 MPa.
- Two 15M bars should be placed around all openings and shall extend at least 600 mm beyond each corner of the opening.

Table 4.1.2.1.6 Minimum solid shear wall length for wind pressure equal to 0.35 kPa⁽⁴⁾

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)											
		150				200				250			
		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor	
		Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.
6	6	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.20	1.21	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	21	1.20	1.20	1.20	1.41	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	24	1.20	1.20	1.20	1.62	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
12	6	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.20	1.21	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	21	1.20	1.20	1.20	1.41	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	24	1.20	1.20	1.20	1.62	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
18	6	1.20	1.20	1.20	1.21	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	1.21	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.20	1.21	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.21	1.21	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	21	1.20	1.20	1.21	1.41	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	24	1.20	1.20	1.21	1.62	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25

Table 4.1.2.1.7 Minimum solid shear wall length for wind pressure equal to 0.45 kPa⁽⁴⁾

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)											
		150				200				250			
		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor	
		Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.
6	6	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.20	1.30	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.20	1.56	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	21	1.20	1.20	1.20	1.82	1.20	1.20	1.20	1.30	1.25	1.25	1.25	1.25
	24	1.20	1.20	1.20	2.08	1.20	1.20	1.20	1.49	1.25	1.25	1.25	1.25
12	6	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.20	1.30	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.20	1.56	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	21	1.20	1.20	1.20	1.82	1.20	1.20	1.20	1.30	1.25	1.25	1.25	1.25
	24	1.20	1.20	1.20	2.08	1.20	1.20	1.20	1.49	1.25	1.25	1.25	1.25
18	6	1.20	1.20	1.20	1.56	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	1.56	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.30	1.56	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.56	1.56	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	21	1.20	1.20	1.56	1.82	1.20	1.20	1.20	1.30	1.25	1.25	1.25	1.25
	24	1.20	1.20	1.56	2.08	1.20	1.20	1.20	1.49	1.25	1.25	1.25	1.25

Table 4.1.2.1.8 Minimum solid shear wall length for wind pressure equal to 0.55 kPa⁽⁴⁾

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)											
		150				200				250			
		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor	
		Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.
6	6	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	1.27	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.20	1.59	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.20	1.90	1.20	1.20	1.20	1.36	1.25	1.25	1.25	1.25
	21	1.20	1.20	1.20	2.22	1.20	1.20	1.20	1.59	1.25	1.25	1.25	1.25
	24	1.20	1.27	1.20	2.54	1.20	1.20	1.20	1.82	1.25	1.25	1.25	1.36
12	6	1.20	1.20	1.20	1.27	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.27	1.27	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.27	1.59	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.27	1.90	1.20	1.20	1.20	1.36	1.25	1.25	1.25	1.25
	21	1.20	1.20	1.27	2.22	1.20	1.20	1.20	1.59	1.25	1.25	1.25	1.25
	24	1.20	1.27	1.27	2.54	1.20	1.20	1.20	1.82	1.25	1.25	1.25	1.36
18	6	1.20	1.20	1.20	1.90	1.20	1.20	1.20	1.36	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.27	1.90	1.20	1.20	1.20	1.36	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.59	1.90	1.20	1.20	1.20	1.36	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.90	1.90	1.20	1.20	1.36	1.36	1.25	1.25	1.25	1.25
	21	1.20	1.20	1.90	2.22	1.20	1.20	1.36	1.59	1.25	1.25	1.25	1.25
	24	1.20	1.27	1.90	2.54	1.20	1.20	1.36	1.82	1.25	1.25	1.25	1.36

Table 4.1.2.1.9 Minimum solid shear wall length for wind pressure equal to 0.65 kPa⁽⁴⁾

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)											
		150				200				250			
		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor	
		Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.
6	6	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	1.50	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.20	1.88	1.20	1.20	1.20	1.34	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.20	2.25	1.20	1.20	1.20	1.61	1.25	1.25	1.25	1.25
	21	1.20	1.31	1.20	2.63	1.20	1.20	1.20	1.88	1.25	1.25	1.25	1.41
	24	1.20	1.50	1.20	3.00	1.20	1.20	1.20	2.15	1.25	1.25	1.25	1.61
12	6	1.20	1.20	1.20	1.50	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.50	1.50	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.50	1.88	1.20	1.20	1.20	1.34	1.25	1.25	1.25	1.25
	18	1.20	1.20	1.50	2.25	1.20	1.20	1.20	1.61	1.25	1.25	1.25	1.25
	21	1.20	1.31	1.50	2.63	1.20	1.20	1.20	1.88	1.25	1.25	1.25	1.41
	24	1.20	1.50	1.50	3.00	1.20	1.20	1.20	2.15	1.25	1.25	1.25	1.61
18	6	1.20	1.20	1.20	2.25	1.20	1.20	1.20	1.61	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.50	2.25	1.20	1.20	1.20	1.61	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.88	2.25	1.20	1.20	1.34	1.61	1.25	1.25	1.25	1.25
	18	1.20	1.20	2.25	2.25	1.20	1.20	1.61	1.61	1.25	1.25	1.25	1.25
	21	1.20	1.31	2.25	2.63	1.20	1.20	1.61	1.88	1.25	1.25	1.25	1.41
	24	1.20	1.50	2.25	3.00	1.20	1.20	1.61	2.15	1.25	1.25	1.25	1.61

Table 4.1.2.1.10 Minimum solid shear wall length for wind pressure equal to 0.75 kPa⁽⁴⁾

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)											
		150				200				250			
		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor	
		Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.
6	6	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	1.73	1.20	1.20	1.20	1.24	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.20	2.16	1.20	1.20	1.20	1.55	1.25	1.25	1.25	1.25
	18	1.20	1.30	1.20	2.60	1.20	1.20	1.20	1.86	1.25	1.25	1.25	1.39
	21	1.20	1.51	1.20	3.03	1.20	1.20	1.20	2.17	1.25	1.25	1.25	1.63
	24	1.20	1.73	1.20	3.46	1.20	1.24	1.20	2.48	1.25	1.25	1.25	1.86
12	6	1.20	1.20	1.20	1.73	1.20	1.20	1.20	1.24	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.73	1.73	1.20	1.20	1.24	1.24	1.25	1.25	1.25	1.25
	15	1.20	1.20	1.73	2.16	1.20	1.20	1.24	1.55	1.25	1.25	1.25	1.25
	18	1.20	1.30	1.73	2.60	1.20	1.20	1.24	1.86	1.25	1.25	1.25	1.39
	21	1.20	1.51	1.73	3.03	1.20	1.20	1.24	2.17	1.25	1.25	1.25	1.63
	24	1.20	1.73	1.73	3.46	1.20	1.24	1.24	2.48	1.25	1.25	1.25	1.86
18	6	1.20	1.30	1.20	2.60	1.20	1.20	1.20	1.86	1.25	1.25	1.25	1.39
	12	1.20	1.30	1.73	2.60	1.20	1.20	1.24	1.86	1.25	1.25	1.25	1.39
	15	1.20	1.30	2.16	2.60	1.20	1.20	1.55	1.86	1.25	1.25	1.25	1.39
	18	1.30	1.30	2.60	2.60	1.20	1.20	1.86	1.86	1.25	1.25	1.39	1.39
	21	1.30	1.51	2.60	3.03	1.20	1.20	1.86	2.17	1.25	1.25	1.39	1.63
	24	1.30	1.73	2.60	3.46	1.20	1.24	1.86	2.48	1.25	1.25	1.39	1.86

Table 4.1.2.1.11 Minimum solid shear wall length for wind pressure equal to 0.85 kPa⁽⁴⁾

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)											
		150				200				250			
		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor	
		Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.
6	6	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	1.96	1.20	1.20	1.20	1.41	1.25	1.25	1.25	1.25
	15	1.20	1.23	1.20	2.45	1.20	1.20	1.20	1.76	1.25	1.25	1.25	1.32
	18	1.20	1.47	1.20	2.94	1.20	1.20	1.20	2.11	1.25	1.25	1.25	1.58
	21	1.20	1.72	1.20	3.43	1.20	1.23	1.20	2.46	1.25	1.25	1.25	1.84
	24	1.20	1.96	1.20	3.92	1.20	1.41	1.20	2.81	1.25	1.25	1.25	2.11
12	6	1.20	1.20	1.20	1.96	1.20	1.20	1.20	1.41	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.96	1.96	1.20	1.20	1.41	1.41	1.25	1.25	1.25	1.25
	15	1.20	1.23	1.96	2.45	1.20	1.20	1.41	1.76	1.25	1.25	1.25	1.32
	18	1.20	1.47	1.96	2.94	1.20	1.20	1.41	2.11	1.25	1.25	1.25	1.58
	21	1.20	1.72	1.96	3.43	1.20	1.23	1.41	2.46	1.25	1.25	1.25	1.84
	24	1.20	1.96	1.96	3.92	1.20	1.41	1.41	2.81	1.25	1.25	1.25	2.11
18	6	1.20	1.47	1.20	2.94	1.20	1.20	1.20	2.11	1.25	1.25	1.25	1.58
	12	1.20	1.47	1.96	2.94	1.20	1.20	1.41	2.11	1.25	1.25	1.25	1.58
	15	1.23	1.47	2.45	2.94	1.20	1.20	1.76	2.11	1.25	1.25	1.32	1.58
	18	1.47	1.47	2.94	2.94	1.20	1.20	2.11	2.11	1.25	1.25	1.58	1.58
	21	1.47	1.72	2.94	3.43	1.20	1.23	2.11	2.46	1.25	1.25	1.58	1.84
	24	1.47	1.96	2.94	3.92	1.20	1.41	2.11	2.81	1.25	1.25	1.58	2.11

Table 4.1.2.1.12 Minimum solid shear wall length for wind pressure equal to 0.95 kPa⁽⁴⁾

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)											
		150				200				250			
		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor	
		Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.
6	6	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.20	1.20	2.19	1.20	1.20	1.20	1.57	1.25	1.25	1.25	1.25
	15	1.20	1.37	1.20	2.74	1.20	1.20	1.20	1.96	1.25	1.25	1.25	1.47
	18	1.20	1.64	1.20	3.29	1.20	1.20	1.20	2.36	1.25	1.25	1.25	1.77
	21	1.20	1.92	1.20	3.84	1.20	1.37	1.20	2.75	1.25	1.25	1.25	2.06
	24	1.20	2.19	1.20	4.39	1.20	1.57	1.20	3.14	1.25	1.25	1.25	2.35
12	6	1.20	1.20	1.20	2.19	1.20	1.20	1.20	1.57	1.25	1.25	1.25	1.25
	12	1.20	1.20	2.19	2.19	1.20	1.20	1.57	1.57	1.25	1.25	1.25	1.25
	15	1.20	1.37	2.19	2.74	1.20	1.20	1.57	1.96	1.25	1.25	1.25	1.47
	18	1.20	1.64	2.19	3.29	1.20	1.20	1.57	2.36	1.25	1.25	1.25	1.77
	21	1.20	1.92	2.19	3.84	1.20	1.37	1.57	2.75	1.25	1.25	1.25	2.06
	24	1.20	2.19	2.19	4.39	1.20	1.57	1.57	3.14	1.25	1.25	1.25	2.35
18	6	1.20	1.64	1.20	3.29	1.20	1.20	1.20	2.36	1.25	1.25	1.25	1.77
	12	1.20	1.64	2.19	3.29	1.20	1.20	1.57	2.36	1.25	1.25	1.25	1.77
	15	1.37	1.64	2.74	3.29	1.20	1.20	1.96	2.36	1.25	1.25	1.47	1.77
	18	1.64	1.64	3.29	3.29	1.20	1.20	2.36	2.36	1.25	1.25	1.77	1.77
	21	1.64	1.92	3.29	3.84	1.20	1.37	2.36	2.75	1.25	1.25	1.77	2.06
	24	1.64	2.19	3.29	4.39	1.20	1.57	2.36	3.14	1.25	1.25	1.77	2.35

Table 4.1.2.1.13 Minimum solid shear wall length for wind pressure equal to 1.05 kPa⁽⁴⁾

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)											
		150				200				250			
		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor	
		Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.
6	6	1.20	1.20	1.21	1.21	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.21	1.21	2.42	1.20	1.20	1.20	1.74	1.25	1.25	1.25	1.30
	15	1.20	1.51	1.21	3.03	1.20	1.20	1.20	2.17	1.25	1.25	1.25	1.63
	18	1.20	1.82	1.21	3.64	1.20	1.30	1.20	2.60	1.25	1.25	1.25	1.95
	21	1.20	2.12	1.21	3.84	1.20	1.52	1.20	3.04	1.25	1.25	1.25	2.28
	24	1.20	2.42	1.21	4.24	1.20	1.74	1.20	3.47	1.25	1.30	1.25	2.60
12	6	1.20	1.21	1.21	2.42	1.20	1.20	1.20	1.74	1.25	1.25	1.25	1.30
	12	1.21	1.21	2.42	2.42	1.20	1.20	1.74	1.74	1.25	1.25	1.30	1.30
	15	1.21	1.51	2.42	3.03	1.20	1.20	1.74	2.17	1.25	1.25	1.30	1.63
	18	1.21	1.82	2.42	3.64	1.20	1.30	1.74	2.60	1.25	1.25	1.30	1.95
	21	1.21	2.12	2.42	4.24	1.20	1.52	1.74	3.04	1.25	1.25	1.30	2.28
	24	1.21	2.42	2.42	4.85	1.20	1.74	1.74	3.47	1.25	1.30	1.30	2.60
18	6	1.20	1.82	1.21	3.64	1.20	1.30	1.20	2.60	1.25	1.25	1.25	1.95
	12	1.21	1.82	2.42	3.64	1.20	1.30	1.74	2.60	1.25	1.25	1.30	1.95
	15	1.51	1.82	3.03	3.64	1.20	1.30	2.17	2.60	1.25	1.25	1.63	1.95
	18	1.82	1.82	3.64	3.64	1.30	1.30	2.60	2.60	1.25	1.25	1.95	1.95
	21	1.82	2.12	3.64	4.24	1.30	1.52	2.60	3.04	1.25	1.25	1.95	2.28
	24	1.82	2.42	3.64	4.85	1.30	1.74	2.60	3.47	1.25	1.30	1.95	2.60

Table 4.1.2.1.14 Minimum solid shear wall length for wind pressure equal to 1.25 kPa⁽⁴⁾

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)											
		150				200				250			
		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor		2 nd Floor		1 st Floor	
		Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.	Short dir.	Long dir.
6	6	1.20	1.20	1.44	1.44	1.20	1.20	1.20	1.20	1.25	1.25	1.25	1.25
	12	1.20	1.44	1.44	2.89	1.20	1.20	1.20	2.07	1.25	1.25	1.25	1.55
	15	1.20	1.80	1.44	3.61	1.20	1.29	1.20	2.58	1.25	1.25	1.25	1.94
	18	1.20	2.16	1.44	4.33	1.20	1.55	1.20	3.10	1.25	1.25	1.25	2.32
	21	1.20	2.52	1.44	5.05	1.20	1.81	1.20	3.62	1.25	1.35	1.25	2.71
	24	1.20	2.89	1.44	5.77	1.20	2.07	1.20	4.13	1.25	1.55	1.25	3.10
12	6	1.20	1.44	1.44	2.89	1.20	1.20	1.20	2.07	1.25	1.25	1.25	1.55
	12	1.44	1.44	2.89	2.89	1.20	1.20	2.07	2.07	1.25	1.25	1.55	1.55
	15	1.44	1.80	2.89	3.61	1.20	1.29	2.07	2.58	1.25	1.25	1.55	1.94
	18	1.44	2.16	2.89	4.33	1.20	1.55	2.07	3.10	1.25	1.25	1.55	2.32
	21	1.44	2.52	2.89	5.05	1.20	1.81	2.07	3.62	1.25	1.35	1.55	2.71
	24	1.44	2.89	2.89	5.77	1.20	2.07	2.07	4.13	1.25	1.55	1.55	3.10
18	6	1.20	2.16	1.44	4.33	1.20	1.55	1.20	3.10	1.25	1.25	1.25	2.32
	12	1.44	2.16	2.89	4.33	1.20	1.55	2.07	3.10	1.25	1.25	1.55	2.32
	15	1.80	2.16	3.61	4.33	1.29	1.55	2.58	3.10	1.25	1.25	1.94	2.32
	18	2.16	2.16	4.33	4.33	1.55	1.55	3.10	3.10	1.25	1.25	2.32	2.32
	21	2.16	2.52	4.33	5.05	1.55	1.81	3.10	3.62	1.25	1.35	2.32	2.71
	24	2.16	2.89	4.33	5.77	1.55	2.07	3.10	4.13	1.25	1.55	2.32	3.10

(4) Table 4.1.2.1.6 to 4.1.2.1.14 are based on the following assumptions:

- Linear interpolation is permitted between hourly wind pressures and building lengths.
- Design applicable to soil Type A.
- Specified compressive strength of concrete, f'_c , at 28 days is 20 MPa.
- Specified yield strength of reinforcement, f_y , is 400 MPa.

Table 4.1.2.1.15 Minimum solid shear wall length for $S_a(0.2) \leq 0.2^{(5)}$ and soil Type A

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)					
		150		200		250	
		2 nd Floor	1 st Floor	2 nd Floor	1 st Floor	2 nd Floor	1 st Floor
6	6	1.20	1.20	1.20	1.20	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.25	1.25
	15	1.20	1.20	1.20	1.20	1.25	1.25
	18	1.20	1.20	1.20	1.20	1.25	1.25
	21	1.20	1.20	1.20	1.20	1.25	1.25
	24	1.20	1.20	1.20	1.20	1.25	1.25
12	6	1.20	1.20	1.20	1.20	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.25	1.25
	15	1.20	1.20	1.20	1.20	1.25	1.25
	18	1.20	1.20	1.20	1.20	1.25	1.25
	21	1.20	1.20	1.20	1.20	1.25	1.25
	24	1.20	1.20	1.20	1.20	1.25	1.25
18	6	1.20	1.20	1.20	1.20	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.25	1.25
	15	1.20	1.20	1.20	1.20	1.25	1.25
	18	1.20	1.20	1.20	1.20	1.25	1.25
	21	1.20	1.20	1.20	1.20	1.25	1.25
	24	1.20	1.30	1.20	1.20	1.25	1.25

Table 4.1.2.1.16 Minimum solid shear wall length for $S_a(0.2)$ equals $0.3^{(5)}$ and soil Type A

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)					
		150		200		250	
		2 nd Floor	1 st Floor	2 nd Floor	1 st Floor	2 nd Floor	1 st Floor
6	6	1.20	1.20	1.20	1.20	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.25	1.25
	15	1.20	1.20	1.20	1.20	1.25	1.25
	18	1.20	1.20	1.20	1.20	1.25	1.25
	21	1.20	1.20	1.20	1.20	1.25	1.25
	24	1.20	1.20	1.20	1.20	1.25	1.25
12	6	1.20	1.20	1.20	1.20	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.25	1.25
	15	1.20	1.20	1.20	1.20	1.25	1.25
	18	1.20	1.20	1.20	1.20	1.25	1.25
	21	1.20	1.20	1.20	1.20	1.25	1.25
	24	1.20	1.20	1.20	1.20	1.25	1.25
18	6	1.20	1.20	1.20	1.20	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.25	1.25
	15	1.20	1.20	1.20	1.20	1.25	1.25
	18	1.20	1.20	1.20	1.20	1.25	1.25
	21	1.20	1.20	1.20	1.20	1.25	1.25
	24	1.20	1.30	1.20	1.20	1.25	1.25

Table 4.1.2.1.17 Minimum solid shear wall length for $S_a(0.2)$ equals 0.45⁽⁵⁾ and Soil Type A

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)					
		150		200		250	
		2 nd Floor	1 st Floor	2 nd Floor	1 st Floor	2 nd Floor	1 st Floor
6	6	1.20	1.20	1.20	1.20	1.25	1.25
	12	1.20	1.20	1.20	1.20	1.25	1.25
	15	1.20	1.20	1.20	1.20	1.25	1.25
	18	1.20	1.24	1.20	1.20	1.25	1.25
	21	1.20	1.41	1.20	1.20	1.25	1.25
	24	1.20	1.58	1.33	1.20	1.25	1.25
12	6	1.20	1.20	1.20	1.20	1.25	1.25
	12	1.20	1.35	1.20	1.20	1.25	1.25
	15	1.20	1.58	1.31	1.20	1.25	1.25
	18	1.20	1.80	1.49	1.20	1.25	1.27
	21	1.20	2.02	1.67	1.20	1.25	1.42
	24	1.25	2.25	1.86	1.20	1.25	1.57
18	6	1.20	1.24	1.20	1.20	1.25	1.25
	12	1.20	1.80	1.20	1.49	1.25	1.27
	15	1.20	2.08	1.20	1.71	1.25	1.45
	18	1.32	2.36	1.20	1.94	1.25	1.63
	21	1.49	2.64	1.20	2.16	1.25	1.81
	24	1.65	2.92	1.32	2.38	1.25	2.00

Table 4.1.2.1.18 Minimum solid shear wall length for $S_a(0.2)$ equals $0.66^{(5)}$ and soil Type A

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)					
		150		200		250	
		2 nd Floor	1 st Floor	2 nd Floor	1 st Floor	2 nd Floor	1 st Floor
6	6	1.20	1.20	1.20	1.20	1.25	1.25
	12	1.20	1.45	1.20	1.23	1.25	1.25
	15	1.20	1.72	1.20	1.46	1.25	1.26
	18	1.20	1.99	1.20	1.68	1.25	1.46
	21	1.20	2.26	1.20	1.91	1.25	1.65
	24	1.34	2.53	1.20	2.14	1.25	1.85
12	6	1.20	1.45	1.20	1.23	1.25	1.25
	12	1.20	2.16	1.20	1.81	1.25	1.55
	15	1.37	2.52	1.20	2.10	1.25	1.79
	18	1.58	2.88	1.29	2.39	1.25	2.04
	21	1.79	3.24	1.45	2.68	1.25	2.28
	24	1.99	3.60	1.61	2.97	1.35	2.52
18	6	1.20	1.99	1.20	1.68	1.25	1.46
	12	1.58	2.88	1.29	2.39	1.25	2.04
	15	1.85	3.33	1.49	2.74	1.25	2.33
	18	2.11	3.78	1.70	3.10	1.41	2.62
	21	2.38	4.23	1.91	3.45	1.58	2.90
	24	2.65	4.67	2.11	3.80	1.75	3.19

Table 4.1.2.1.19 Minimum solid shear wall length for $S_a(0.2)$ equals $0.75^{(5)}$ and soil Type A

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)					
		150		200		250	
		2 nd Floor	1 st Floor	2 nd Floor	1 st Floor	2 nd Floor	1 st Floor
6	6	1.20	1.20	1.20	1.20	1.25	1.25
	12	1.20	1.72	1.20	1.46	1.25	1.27
	15	1.20	2.04	1.20	1.73	1.25	1.50
	18	1.25	2.36	1.20	2.00	1.25	1.73
	21	1.42	2.69	1.20	2.27	1.25	1.97
	24	1.59	3.01	1.32	2.54	1.25	2.20
12	6	1.20	1.72	1.20	1.46	1.25	1.27
	12	1.39	2.57	1.20	2.15	1.25	1.85
	15	1.64	3.00	1.34	2.50	1.25	2.14
	18	1.88	3.43	1.53	2.84	1.28	2.42
	21	2.13	3.86	1.73	3.19	1.44	2.71
	24	2.37	4.28	1.92	3.53	1.60	3.00
18	6	1.25	2.36	1.20	2.00	1.25	1.73
	12	1.88	3.43	1.53	2.84	1.28	2.42
	15	2.20	3.96	1.78	3.27	1.48	2.77
	18	2.52	4.50	2.02	3.69	1.68	3.11
	21	2.83	5.03	2.27	4.11	1.88	3.46
	24	3.15	5.56	2.52	4.53	2.08	3.80

Table 4.1.2.1.20 Minimum solid shear wall length for $S_a(0.2)$ equals 0.94⁽⁵⁾ and soil Type A

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)					
		150		200		250	
		2 nd Floor	1 st Floor	2 nd Floor	1 st Floor	2 nd Floor	1 st Floor
6	6	1.20	1.35	1.20	1.20	1.25	1.25
	12	1.20	2.16	1.20	1.84	1.25	1.59
	15	1.34	2.56	1.20	2.17	1.25	1.88
	18	1.56	2.96	1.30	2.51	1.25	2.17
	21	1.78	3.37	1.48	2.85	1.26	2.46
	24	2.00	3.77	1.66	3.19	1.41	2.75
12	6	1.20	2.16	1.20	1.84	1.25	1.59
	12	1.74	3.23	1.43	2.70	1.25	2.32
	15	2.05	3.76	1.68	3.13	1.41	2.68
	18	2.36	4.30	1.92	3.57	1.61	3.04
	21	2.67	4.83	2.16	4.00	1.81	3.40
	24	2.97	5.37	2.41	4.43	2.01	3.76
18	6	1.56	2.96	1.30	2.51	1.25	2.17
	12	2.36	4.30	1.92	3.57	1.61	3.04
	15	2.76	4.97	2.23	4.09	1.86	3.47
	18	3.15	5.63	2.54	4.62	2.11	3.90
	21	3.55	6.30	2.84	5.15	2.36	4.33
	24	3.95	6.97	3.15	5.67	2.60	4.76

Table 4.1.2.1.21 Minimum solid shear wall length for $S_a(0.2) > 0.94 \leq 1.2^{(5)}$ and soil Type A

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)					
		150		200		250	
		2 nd Floor	1 st Floor	2 nd Floor	1 st Floor	2 nd Floor	1 st Floor
6	6	1.20	1.72	1.20	1.48	1.25	1.30
	12	1.44	2.75	1.20	2.34	1.25	2.04
	15	1.71	3.27	1.43	2.77	1.25	2.41
	18	1.99	3.78	1.66	3.21	1.42	2.77
	21	2.27	4.30	1.89	3.64	1.61	3.14
	24	2.55	4.81	2.12	4.07	1.81	3.51
12	6	1.44	2.75	1.20	2.34	1.25	2.04
	12	2.22	4.12	1.83	3.45	1.54	2.96
	15	2.62	4.80	2.14	4.00	1.80	3.42
	18	3.01	5.49	2.45	4.55	2.06	3.88
	21	3.40	6.17	2.76	5.10	2.31	4.34
	24	3.80	6.85	3.07	5.66	2.57	4.80
18	6	1.99	3.78	1.66	3.21	1.42	2.77
	12	3.01	5.49	2.45	4.55	2.06	3.88
	15	3.52	6.34	2.84	5.22	2.37	4.43
	18	4.03	7.19	3.24	5.90	2.69	4.98
	21	4.53	8.05	3.63	6.57	3.01	5.53
	24	5.04	8.90	4.02	7.24	3.32	6.08

Table 4.1.2.1.22 Minimum solid shear wall length for $S_a(0.2) > 1.2 \leq 2.3^{(5)}$ and soil Type A

Wall Length (m)	Wall Width (m)	Wall Thickness (mm)					
		150		200		250	
		2 nd Floor	1 st Floor	2 nd Floor	1 st Floor	2 nd Floor	1 st Floor
6	6	1.69	3.30	1.43	2.84	1.25	2.49
	12	2.75	5.27	2.31	4.49	1.98	3.90
	15	3.29	6.26	2.75	5.32	2.35	4.61
	18	3.82	7.25	3.18	6.14	2.72	5.32
	21	4.35	8.23	3.62	6.97	3.09	6.03
	24	4.89	9.22	4.06	7.80	3.46	6.74
12	6	2.75	5.27	2.31	4.49	1.98	3.90
	12	4.26	7.90	3.50	6.61	2.96	5.67
	15	5.02	9.21	4.10	7.67	3.45	6.55
	18	5.77	10.52	4.70	8.72	3.94	7.43
	21	6.52	11.83	5.29	9.78	4.43	8.31
	24	7.28	13.14	5.89	10.84	4.92	9.19
18	6	3.82	7.25	3.18	6.14	2.72	5.32
	12	5.77	10.52	4.70	8.72	3.94	7.43
	15	6.74	12.15	5.45	10.01	4.55	8.49
	18	7.72	13.79	6.20	11.30	5.16	9.54
	21	8.69	15.42	6.96	12.59	5.76	10.60
	24	9.66	17.05	7.71	13.88	6.37	11.65

Note to Tables 4.1.2.1.15 to 4.1.2.1.22:

(5) Table 4.1.2.1.15 to 4.1.2.1.22 are based on the following assumptions:

- Linear interpolation is permitted between hourly wind pressures and building lengths.
- Design applicable to soil Type A.
- Specified compressive strength of concrete, f'_c , at 28 days is 20 MPa.
- Specified yield strength of reinforcement, f_y , is 400 MPa.

4.1.3 Performance Requirements

4.1.3.1 Conformance of Forming Capacity

4.1.3.1.1 Forming capacity (effect of consolidation)

Test Number	Requirement (kPa)	Recorded Pressure (kPa)	Results
1	25	39.1	Pass
2		36.4	Pass
3		39.0	Pass
4		37.5	Pass
5		34.7	Pass
Average		37.3	-
COV		4.96	

4.1.3.1.2 Forming capacity test (effect of placement)

Test Number	Requirement		Results			
	Minimum applied pressure (kPa)	Maximum displacement (mm)	Recorded Pressure (kPa)	Central back displacement (mm)	Central front displacement (mm)	
1	30	≤ 10	32.1	10	3	Pass

Report Holder: Formtech Corporation
 15455 Bathurst Street
 Aurora, ON L4G 7A7
 Tel: 905-841-6162
 Fax: 905-841-6172

Plant(s): New Brighton, PA, U.S.A.

This Report is issued by the Canadian Construction Materials Centre, a program of the Institute for Research in Construction at the National Research Council of Canada. The Report must be read in the context of the entire CCMC Registry of Product Evaluations, including, without limitation, the introduction therein which sets out important information concerning the interpretation and use of CCMC Evaluation Reports.

Readers must confirm that the Report is current and has not been withdrawn or superseded by a later issue. Please refer to <http://www.nrc-cnrc.gc.ca/eng/services/irc/ccmc.html>, or contact the Canadian Construction Materials Centre, Institute for Research in Construction, National Research Council of Canada, 1200 Montreal Road, Ottawa, Ontario, K1A 0R6. Telephone (613) 993-6189. Fax (613) 952-0268.

NRC has evaluated the material, product, system or service described herein only for those characteristics stated herein. The information and opinions in this Report are directed to those who have the appropriate degree of experience to use and apply its contents. This Report is provided without representation, warranty, or guarantee of any kind, expressed, or implied, and the National Research Council of Canada (NRC) provides no endorsement for any evaluated material, product, system or service described herein. NRC accepts no responsibility whatsoever arising in any way from any and all use and reliance on the information contained in this Report. NRC is not undertaking to render professional or other services on behalf of any person or entity nor to perform any duty owed by any person or entity to another person or entity.