

Product Information Bulletin

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NBC 2005 and 2010, Part 9 - Prescriptive Requirements for ICF Construction

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The National Building Code of Canada (NBC) 2005 and 2010 provide *prescriptive* requirements for construction of concrete walls using insulating concrete forming (ICF) systems. The NBC 2005 and 2010 *prescriptive* requirements specifically address ICF construction that results in solid concrete walls of uniform thickness over the height and width of the wall. The NBC 2005 provisions have also been adopted in the 2006 Alberta Building Code (ABC), the 2006 British Columbia Building Code (BCBC) and the 2006 Ontario Building Code (OBC).

The Advantage ICF System® combines rigid expanded polystyrene (EPS) insulation panels with a web and interlock connector system that results in a concrete wall of uniform thickness. The EPS insulation panels in the Advantage ICF System stay in place permanently to provide an insulated cast-in-place concrete wall resulting in a superior, energy efficient building envelope.

The table below summarizes prescriptive requirements contained in NBC Section 9.15. and associate references related to ICF foundation wall applications.

Foundation ICF Wall Applications
Sentence 9.3.1.1.(4) – General requirements for concrete used in ICF construction
Sentences 9.13.2.4.(3) and 9.13.3.4.(3) – ICF surface preparation for application of dampproofing or waterproofing
Clause 9.15.1.1.(1)(c) – General requirements for footings and foundations related to ICF foundation walls
Articles 9.15.3.3., 9.15.3.4. and 9.15.3.5. – Footing width and area requirements for ICF foundations
Sentence 9.15.3.8.(1) – Footing thickness
Sentence 9.15.3.9.(1) – Step footings
Sentence 9.15.4.1.(1) – Reference to CAN/ULC-S701 for EPS insulation used in ICF systems
Sentences 9.15.4.2.(2) and (3) – Foundation wall thickness and required lateral support
Sentence 9.15.4.3.(5) – Required lateral support at the top of foundation using floor joists installed according to Article 9.20.17.5.
Sentence 9.15.4.4.(1) – Required lateral support at the bottom of foundation using footing shear key and floor joists on top of the wall or doweled to the footing using 15M @ 1.2 m.
Article 9.15.4.5. and Tables 9.15.4.5.A. to 9.15.4.5.C. – Reinforcement for ICF walls
Sentences 9.20.17.5.(2) and (3) – Size and attachment requirements for ledger boards used for support of floor joists
Table 9.20.17.5. – Anchor bolt spacing for the connection of ledger boards

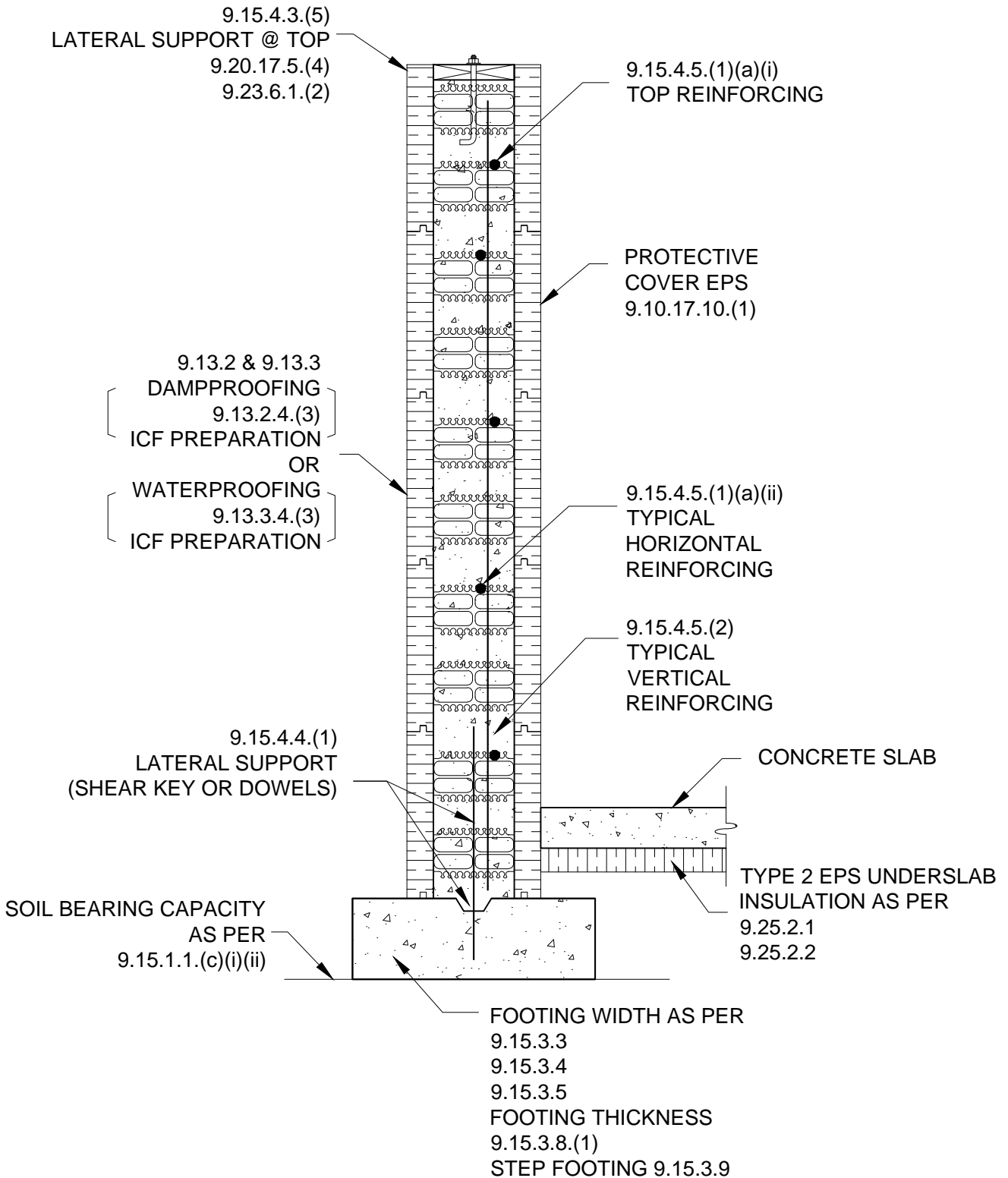
The table below summarizes prescriptive requirements contained in NBC 2005 and 2010, Section 9.20. and associated references related to ICF walls not in contact with the ground (above-grade) applications to a maximum of two storeys.

Above Grade ICF Wall Construction:
Clause 9.20.1.1.(1)(b) – General requirements for ICF above-grade walls
Article 9.20.17.1. – Thickness of flat ICF walls
Article 9.20.17.2. – Reinforcement for ICF walls
Article 9.20.17.3. – Openings in non-load bearing ICF walls
Article 9.20.17.4. – Openings in load bearing ICF walls
Article 9.20.17.5. – Framing supported on ICF walls either on the side or on top
Sentence 9.20.17.5.(2) – Size and attachment requirements for ledger boards used for support of floor joists
Sentence 9.20.17.5.(3) and Table 9.20.17.5 – Size and attachment requirements for anchor bolts used to attach ledger boards
Sentence 9.20.17.5.(4) – Floor joists supported on top of ICF walls in accordance with Article 9.23.6.1.
Article 9.20.17.6. – Anchoring of roof framing to the top of ICF walls and attachment of roof framing to top plates in accordance with Table 9.23.3.4
Article 9.20.17.7. – Protection from Precipitation and Damage

The following notes provide additional information related to design and installation of wall construction using the Advantage ICF System:

1. For design conditions beyond the scope of the NBC 2005 and 2010 provisions refer to the **Advantage ICF System Design Manual**.
2. The **Advantage ICF System Installation Manual** provides additional information on the construction of ICF walls.
3. Article 9.25.3.2. related to air barrier system properties has been revised in the NBC 2010 to add a reference to a new Table A-9.25.5.1.(1) in Appendix A. Table indicates the air leakage characteristic for minimum 50 mm thick concrete is negligible.
4. Article 9.25.4.2. relates to vapour barrier materials has been revised to add a new Sentence 9.25.4.2.(6) indicating that foamed plastic insulation (e.g. EPS insulation) with sufficient thickness can be used to meet the vapour material requirements.
5. The following detail drawings attached with this bulletin provide additional assistance to identify NBC requirements for ICF construction:
 - a. **D.0.1 – RESIDENTIAL FOUNDATION WALL PRESCRIPTIVE REQUIREMENTS PER NBC 2005 AND NBC 2010.**
 - b. **D.0.2 – RESIDENTIAL ABOVE-GROUND PRESCRIPTIVE REQUIREMENT PER NBC 2005 AND NBC 2010.**
 - c. **D.0.3 – RESIDENTIAL OPENINGS REINFORCING REQUIREMENT PER NBC 2005 AND NBC 2010.**

ICF FOUNDATION WALLS



NOTE: SEE D.0.3 FOR REINFORCING REQUIREMENT FOR OPENINGS

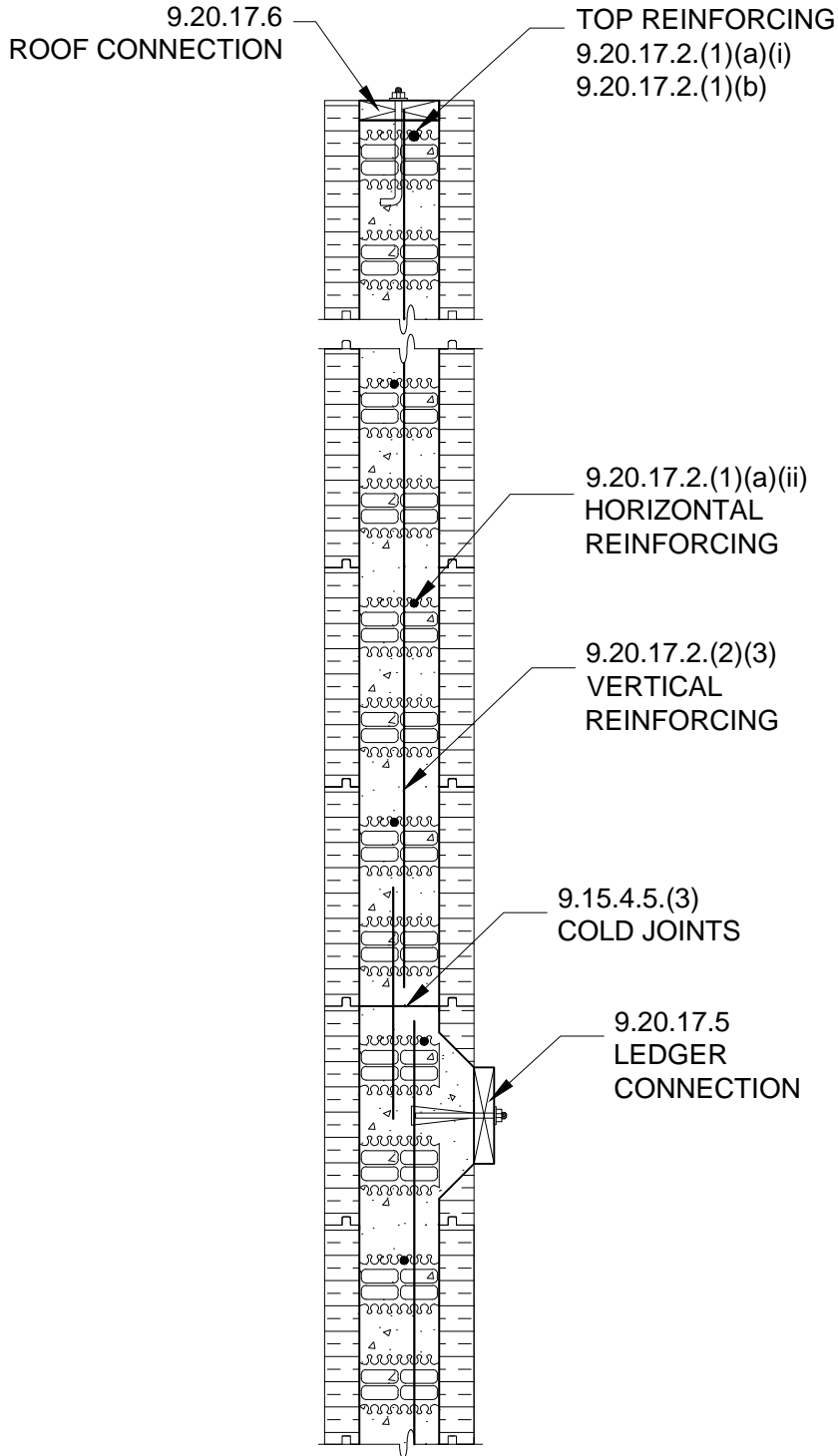
No.	REVISION DESCRIPTION	DATE	BY	CHKD	APPD



PLANT OR PROJECT: PLASTI-FAB LTD
 RESIDENTIAL FOUNDATION WALL
 PRESCRIPTIVE REQUIREMENT
 PER NBC 2005 AND NBC 2010

SCALE		NTS	
DESIGN	J WHALEN	DATE	FEB. 11
DRAWN	L XIE	DATE	FEB. 11
CHECKED	J WHALEN	DATE	FEB. 11
DRAWING No.	D.0.1		REV.

ABOVE-GROUND ICF WALLS



NOTE: SEE D.0.3 FOR REINFORCING REQUIREMENT FOR OPENINGS

No.	REVISION DESCRIPTION	DATE	BY	CHKD	APPD



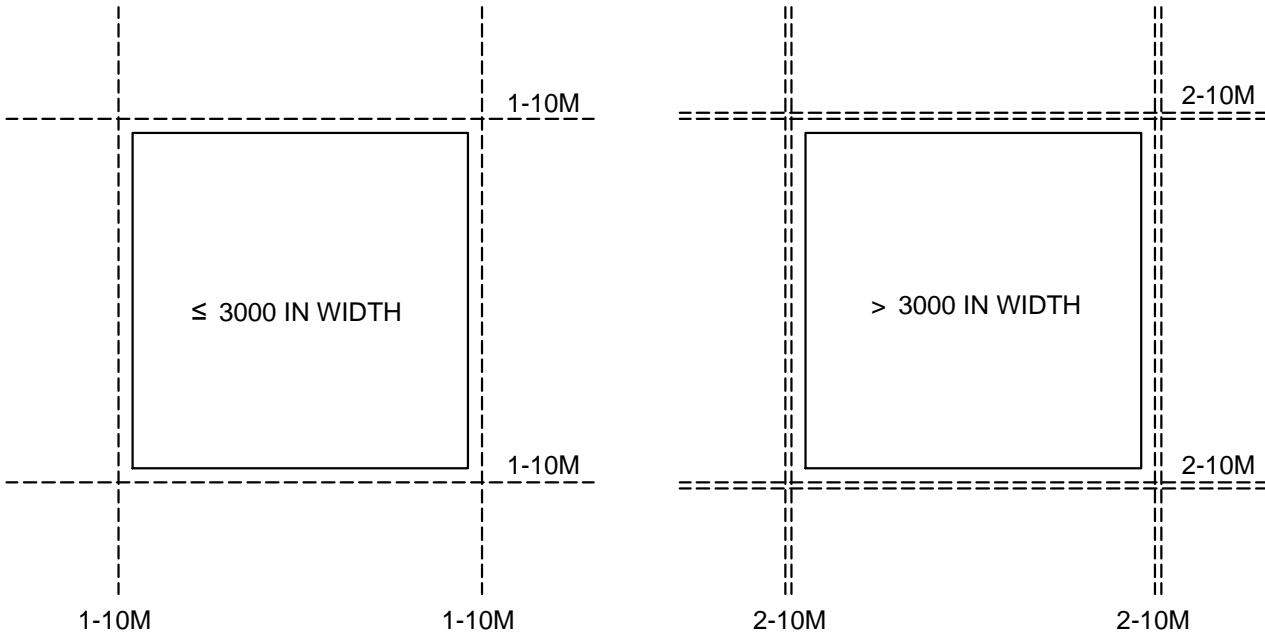
PLANT OR PROJECT	PLASTI-FAB LTD	
RESIDENTIAL ABOVE-GROUND PRESCRIPTIVE REQUIREMENT PER NBC 2005 AND NBC 2010		

SCALE	NTS	
DESIGN	J WHALEN	DATE FEB. 11
DRAWN	L XIE	DATE FEB. 11
CHECKED	J WHALEN	DATE FEB. 11
DRAWING No.	D.0.2	REV.

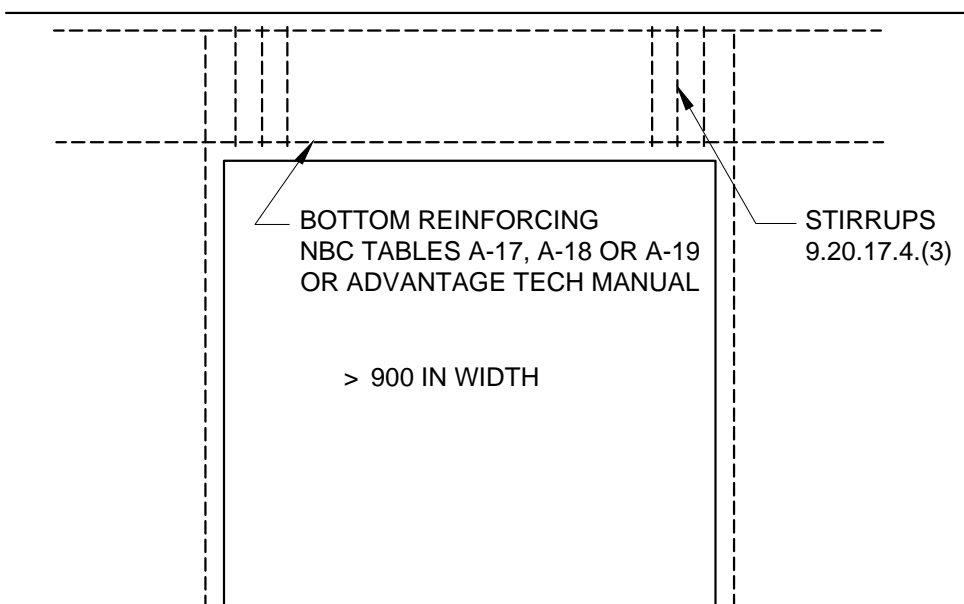
BELOW GRADE OPENING REINFORCING
 9.15.4.5.(4)

ABOVE GRADE OPENING REINFORCING
 9.20.17.3
 9.20.17.4

OPENINGS IN NON-LOADBEARING WALLS



OPENINGS IN LOADBEARING WALLS



No.	REVISION DESCRIPTION	DATE	BY	CHKD	APPD



PLANT OR PROJECT: PLASTI-FAB LTD

RESIDENTIAL OPENINGS REINFORCING REQUIREMENT PER NBC 2005 AND NBC 2010

SCALE: NTS	
DESIGN: J WHALEN	DATE: FEB. 11
DRAWN: L XIE	DATE: FEB. 11
CHECKED: J WHALEN	DATE: FEB. 11
DRAWING No. D.0.3	REV.