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.

<table>
<thead>
<tr>
<th>Foundation ICF Wall Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sentence 9.3.1.1.(4) – General requirements for concrete used in ICF construction</td>
</tr>
<tr>
<td>Sentences 9.13.2.4.(3) and 9.13.3.4.(3) – ICF surface preparation for application of dampproofing or waterproofing</td>
</tr>
<tr>
<td>Clause 9.15.1.1.(1)(c) – General requirements for footings and foundations related to ICF foundation walls</td>
</tr>
<tr>
<td>Articles 9.15.3.3., 9.15.3.4. and 9.15.3.5. – Footing width and area requirements for ICF foundations</td>
</tr>
<tr>
<td>Sentence 9.15.3.8.(1) – Footing thickness</td>
</tr>
<tr>
<td>Sentence 9.15.3.9.(1) – Step footings</td>
</tr>
<tr>
<td>Sentence 9.15.4.1.(1) – Reference to CAN/ULC-S701 for EPS insulation used in ICF systems</td>
</tr>
<tr>
<td>Sentences 9.15.4.2.(2) and (3) – Foundation wall thickness and required lateral support</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>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 using15M @ 1.2 m.</td>
</tr>
<tr>
<td>Article 9.15.4.5. and Tables 9.15.4.5.A. to 9.15.4.5.C. – Reinforcement for ICF walls</td>
</tr>
<tr>
<td>Sentences 9.20.17.5.(2) and (3) – Size and attachment requirements for ledger boards used for support of floor joists</td>
</tr>
<tr>
<td>Table 9.20.17.5. – Anchor bolt spacing for the connection of ledger boards</td>
</tr>
</tbody>
</table>
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.

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

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 95.4.2. 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:
   c. D.0.3 – RESIDENTIAL OPENINGS REINFORCING REQUIREMENT PER NBC 2005 AND NBC 2010.
ICF FOUNDATION WALLS

9.15.4.3.(5)
LATERAL SUPPORT @ TOP
9.20.17.5.(4)
9.23.6.1.(2)

9.15.4.5.(1)(a)(i)
TOP REINFORCING

9.15.4.5.(1)(a)(ii)
TYPICAL HORIZONTAL REINFORCING

9.15.4.4.(1)
LATERAL SUPPORT (SHEAR KEY OR DOWELS)

9.15.4.5.(2)
TYPICAL VERTICAL REINFORCING

SOIL BEARING CAPACITY AS PER
9.15.1.1.(c)(i)(ii)

PROTECTIVE COVER EPS
9.10.17.10.(1)

9.13.2 & 9.13.3
DAMMPPROOFING
9.13.2.4.(3)
ICF PREPARATION
OR
WATERPROOFING
9.13.3.4.(3)
ICF PREPARATION

9.15.3.8.(1)
STEP FOOTING 9.15.3.9

9.15.3.3
9.15.3.4
9.15.3.5
FOOTING THICKNESS
9.15.3.8.(1)
STEP FOOTING 9.15.3.9

FOOTING WIDTH AS PER
9.15.3.3
9.15.3.4
9.15.3.5

TYPE 2 EPS UNDERSLAB INSULATION AS PER
9.25.2.1
9.25.2.2

NOTE: SEE D.0.3 FOR REINFORCING REQUIREMENT FOR OPENINGS

PLASTI-FAB LTD
RESIDENTIAL FOUNDATION WALL
PRESCRIPTIVE REQUIREMENT PER NBC 2005 AND NBC 2010

FEB, 11
FEB, 11
FEB, 11
NOTE: SEE D.0.3 FOR REINFORCING REQUIREMENT FOR OPENINGS
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

BOTTOM REINFORCING
NBC TABLES A-17, A-18 OR A-19
OR ADVANTAGE TECH MANUAL

STIRRUPS
9.20.17.4.(3)

> 900 IN WIDTH