ROCKY VIEW COUNTY

BUILDING SERVICES

Flat Insulating Concrete Form Walls (ICF)

Guideline

Guideline ESP - 24

Purpose

This guideline has been developed to help improve consistency with the installation, education, and enforcement of flat insulating concrete form walls, more commonly known as ICF walls, installed in new construction involving residential and commercial buildings under the scope of the current National Building Code – Alberta Edition.

Code Reference

Current National Building Code – Alberta Edition, Division B, Subsections 9.13.2. - 9.13.3. - 9.15.4. & 9.20.17.
2015 Illustrated Users Guide – NBC 2015 Part 9 Housing and Small Buildings.

Summary

The requirements of this Guideline are applicable to ICF walls and provide clarity towards the options available for ensuring compliance to the current National Building Code – Alberta Edition.

Interpretation

This Guideline provides clarity and direction from Rocky View County on their interpretation of ICF wall construction. Based on the information provided within this Guideline, when ICF wall systems are being proposed for a building, supporting documentation confirming compliance to one of the following methods must be provided to Rocky View County.

1. Registered Professional Engineer Design
   When providing a stamped design from a registered structural engineer, the design must provide information on the type of flat insulating concrete forms (ICF) being used, including specifications on the size(s), and spacing of rebar steel to be installed, and rebar details for openings in the walls and areas that require lateral reinforcement.

2. CCMC Listed Product
   When utilizing an ICF product which has been tested and has a CCMC listing for the type of ICF forms being used, documentation for the CCMC Approval Listing along with the supporting documents to show rebar specifications for the walls and wall openings must be provided.

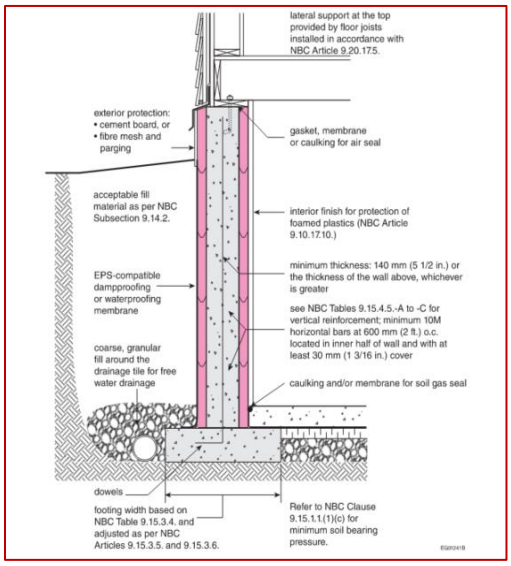
Note: An Engineers' stamped design will be required for walls that exceed backfill heights, for wall heights that require lateral reinforcement as per Subsection 9.15.4. of the current National Building Code – Alberta Edition, or where the wall is not constructed as per the CCMC design.

3. Subsections 9.15.4. & 9.20.17. of the current National Building Code - Alberta Edition.
   Compliance may be achieved by following the Building Code Articles in these Subsections of the current NBC-AE. Flat wall insulating concrete form units shall conform to CAN/ULC-S717.1, "Standard for Flat Wall Insulating Concrete Form (ICF) Units – Material Properties."

   Note: An Engineers' stamped design will be required for walls that exceed backfill heights, for wall heights as per Subsection 9.15.4. that require lateral reinforcement, or where the wall is not constructed as per the Code requirements

   The illustrations below show some of the requirements to gain compliance with these Articles.

   a) Article 9.15.4.2. – This Article provides details on the wall thickness and the required lateral support.



9.15.4.2. Foundation Wall Thickness and Required Lateral Support

1) Except as required in Sentence (2), the thickness of foundation walls made of unreinforced concrete block, concrete core in flat wall insulating concrete forms or solid concrete and subject to lateral earth pressure shall conform to Table 9.15.4.2.-A for walls not exceeding 3.0 m in unsupported height.

2) The concrete core in flat insulating concrete form foundation walls shall be not less than the greater of
a) 150 mm, or
b) the thickness of the concrete in the wall above.

Footings for foundation walls are to conform to subsection 9.15.3. of the current NBC-AE or a Professional Engineer's design.

   b) Articles 9.15.4.3. - 9.15.4.4. & 9.15.4.5. - These Articles show the reinforcement requirements for ICF foundation walls and where they are considered to be laterally supported at the top and bottom of the walls.

   c) Sub-Section 9.20.17. of the current NBC-AE - This Subsection provides information on the construction of ICF walls when used in above-ground construction including the reinforcement of window openings and anchorage of framing materials supported by ICF wall systems, for both load-bearing and non-loadbearing walls. Reinforcement around openings in ICF foundation walls shall also comply with Articles 9.20.17.3. & 9.20.17.4.

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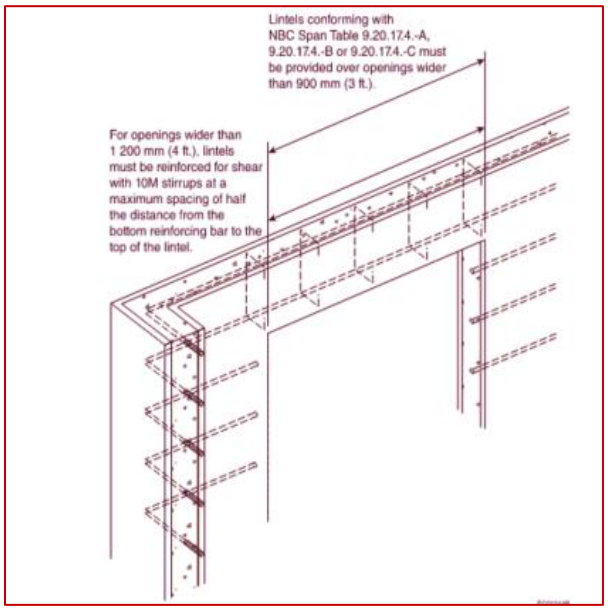
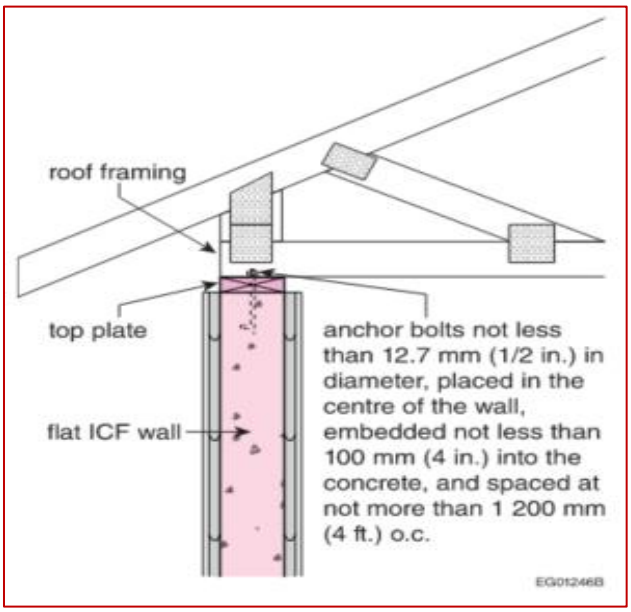
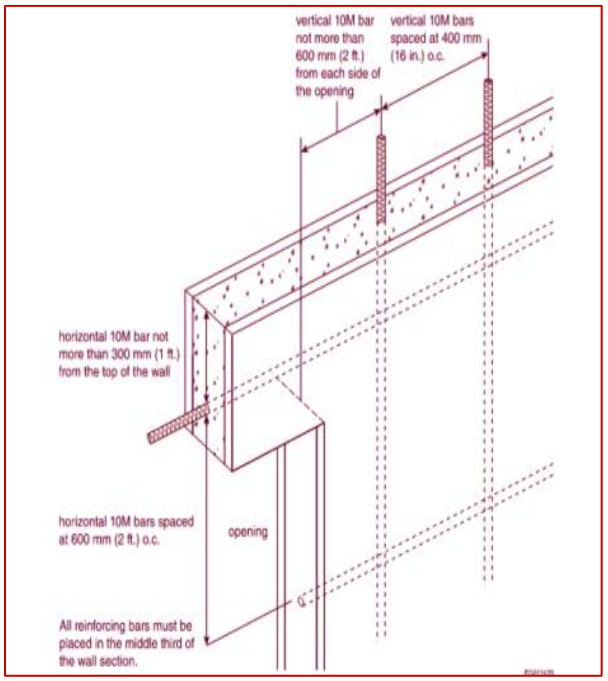
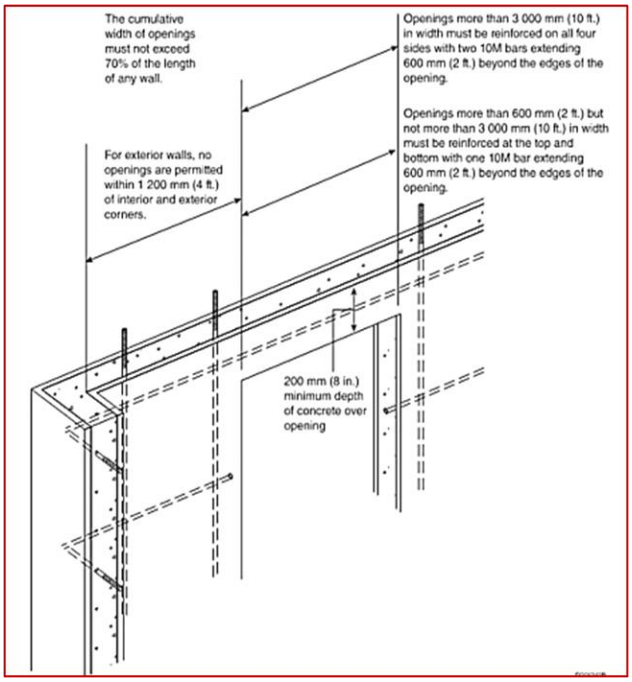
As per Sub-Section 9.20.17. and as noted in the illustrations below, no openings are permitted within 1200mm of interior or exterior corners of ICF walls. For loadbearing walls, lintels are required over all openings over 900mm in ICF walls. Where openings are greater than 1200mm in width, 10M stirrups at a maximum spacing of half the distance from the bottom reinforcing bar to the top of the lintel are required. For non-loadbearing wall requirements refer to sentence 9.20.17.3.









4. Dampproofing & Waterproofing

   Subsections 9.13.2. & 9.13.3. of the Current NBC-AE give reference to where dampproofing or waterproofing of ICF foundation walls is required. Where dampproofing or waterproofing is required, the instructions provided from the ICF manufacturer are to be followed. Where spray applied asphalt based emulsion or roll on bituminous type products are being used for dampproofing it must be shown to be compatible with the ICF forms being used.

   Note: Some ICF manufacturers require mechanical protection to the waterproofing or dampproofing membrane, so they are not mechanically damaged during backfill.

5. Protecting ICF walls from the Elements

   Above ground ICF walls shall be protected from precipitation and damage in conformance with Section 9.27 of the Current NBC-AE.

6. Thermal Barrier

   Where an ICF foundation is installed, the interior walls of rigid insulation which are exposed to adjacent space within the building (other than adjacent concealed spaces within attic or roof spaces, crawl spaces, wall assemblies and ceiling assemblies), must be protected with a thermal barrier. Some common materials used as a thermal barrier on ICF walls in residential construction include but are not limited to:

   - Drywall,
   - Plywood,
   - Hardboard,
   - OSB,
   - Particleboard or
   - Waferboard

Additional Information

- CAN/ULC-S717.1, - Standard for Flat Wall Insulating Concrete Form (ICF) Units – Material Properties.
- CAN/ULC-S701.1-2017- Standard for Thermal Insulation, Polystyrene Boards.
- National Research Council of Canada Website
- CCMC Technical Bulletin

Reference

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