

OBC SB-12

Energy Efficiency for Housing – Prescriptive Compliance

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Summary

The 2024 Ontario Building Code's (OBC) Part 12, Resource Conservation and Environmental Integrity, requires buildings to be designed with a minimum level of energy performance. For residential buildings in the scope of OBC Part 9, detailed requirements are presented in Supplementary Standard SB-12, Energy Efficiency for Housing.

SB-12 provides a relatively straightforward path to compliance through pre-designed compliance packages. The resulting compliance process relies more on the adoption of “compliance packages” than on the development and coordination of the energy performance of individual building systems, as would be seen in Part 3 designs demonstrating compliance to SB-10 using the National Energy Code of Canada for Buildings (NECB) or ASHRAE 90.1, Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings.

The compliance packages represent pre-modelled combinations of building systems that satisfy the building code requirement, while allowing adjustments reflecting variations in site conditions and budgets. Project location (climate zone), fuel type, and efficiency of heating systems are at the root of the requirements for the building enclosure, heat recovery for ventilation, and domestic water heating efficiency.

This Practice Tip focuses on demonstrating code compliance for energy efficiency using the prescriptive compliance approach, for building permit application.

Background

The following section provides an overview of the organization of OBC 2024's SB-12 and identifies some of the key clauses, with particular focus on the prescriptive compliance path.

SB-12 has been organized into three chapters.

Chapter 1 – General

Providing scope, application, terms, definitions and references, this relatively short chapter is limited to housing; the definitions, terms, and abbreviations are the same as those used in the OBC itself. Of note are the following requirements:

- **Sentence 1.1.1.1.(4)** requires that the energy efficiency of existing buildings comply with the requirements of OBC Part 10 with respect to changes of use and OBC Part 11 regarding renovations. Chapter 3, Subsection 3.1.1, Article 3.1.1.11 provides further guidance for additions to existing buildings.
- **Sentence 1.2.1.1.(1)** notes the scope of SB-12 as “...a *building* or part of a *building of residential occupancy* that is within the scope of Part 9...” This requirement is read to mean that buildings of non-residential occupancies within the scope of Part 9 are excluded from SB-12. Non-residential occupancies (e.g. small retail, offices) within Part 9 buildings must follow SB-10, not SB-12. Refer to Practice Tip PT. 36.2 for an overview of the SB-10 prescriptive compliance path.

Chapter 2 - Reserved

This chapter formerly discussed energy efficiency requirements prior to January 1, 2017.

Chapter 3 – Acceptable Solutions for Energy Efficiency Compliance

This chapter provides the acceptable solutions for demonstrating code compliant energy performance. There are three paths with which to demonstrate compliance:

- prescriptive compliance packages (Subsection 3.1.1);
- performance compliance (Subsection 3.1.2); and
- other acceptable compliance methods (Subsection 3.1.3), specifically
 - NRCan's Energy Star for New Homes Standard v12.6, clause 3.1.3.1.(1)(a) and
 - NRCan's 2012 R-2000 Standard, clause 3.1.3.1.(1)(b).

Section 3.1 Methods for Achieving Energy Efficiency Compliance

3.1.1 Prescriptive Compliance Packages

Prescriptive compliance packages set a minimum standard. Certificate of practice (CoP) holders may exceed these requirements to align with client goals and project requirements.

Article 3.1.1.1 provides mandatory conditions to be used with each compliance package. Of special note are the following sentences:

- **Sentence 3.1.1.1.(1)** establishes the climate zones used with the compliance packages.
- **Sentences 3.1.1.1.(7) to (9)** set out the terms for window performance in each compliance package relative to fenestration-and-door to wall ratio (FDWR). Houses with FDWR greater than 22% must use the performance path following Subsection 3.1.2.
- **Sentence 3.1.1.1.(14)** requires rim joist areas be insulated to the same level as surrounding walls.
- **Sentence 3.1.1.1.(16)** requires each dwelling unit to have a heat recovery device on ventilation equipment (HRV). Sentence 3.1.1.1.(19) provides additional requirements for HRVs. The principal conditions of the requirements are also represented in the compliance package tables.
- **Sentences 3.1.1.1.(17) and (18)** provide the required conditions for houses designed to be heated by wood burning appliances, ground source heat pumps, and air or water source heat pumps that do not use electricity as the back-up heat source.
- **Sentence 3.1.1.1.(22)** requires the installation of drain water heat recovery devices where there is space (basements or crawl spaces below showers) to do so.

Article 3.1.1.2 provides the compliance tables for Zone 1, while **Article 3.1.1.3** provides them for Zone 2.

Article 3.1.1.11 includes requirements for additions to existing buildings. It presents mandatory conditions or exemptions for additions in Sentences 1 through 3. Tables of compliance packages for both climate zones and all heating fuels in metric (SI) and imperial (IP) units are also presented based on that article.

3.1.2 Performance Compliance

Subsection 3.1.2 presents the modelling conditions for comparing a theoretical code-compliant reference building to the proposed building intended for construction.

- The comparison is based on annual energy consumption, with compliance demonstrated by the proposed building using less energy than the reference.
- The reference building applies one of the relevant compliance packages from the same location, using the same heating fuel and the same heating equipment efficiency as the proposed building.
- Table 3.1.2.1 presents the conditions for the models being compared.

3.1.3 Other Acceptable Compliance Methods

Subsection 3.1.3 accepts certification under the two listed programs as evidence of compliant designs. Full documentation from the referenced programs would be required.

Suggested Procedures for Prescriptive Compliance

For the prescriptive compliance path, an individual compliance package that best supports the client's goals should be selected. The project requirements and objectives therefore must first be confirmed with the client and reviewed with the project team to ensure alignment.

Following is an overview of the key steps and considerations required to select an appropriate compliance package and to prepare a permit application submission. To fully understand all requirements, SB-12 must be consulted in its entirety, as the information below is not exhaustive.

Considerations when Selecting an Appropriate Prescriptive Package (refer to Articles 3.1.1.2 and 3.1.1.3):

- Identify the climatic design region for the project.
 - Ontario Zone 1 includes locations where heating degree days below 18 °C are less than 5,000 (the full table of HDD values is listed in SB-1, Table 1.2).
 - Ontario Zone 2 includes locations where heating degree days below 18 °C are 5,000 or greater.
- Is space heating electric? If yes, select the appropriate table as noted in Article 3.1.1.2 or 3.1.1.3.
 - Note that electric space heating includes the use of air source heat pumps. Use of heat pumps allows a relaxation of the performance requirements for other building systems in both Zone 1 (Compliance Package C4) and Zone 2 (Compliance Package C2).
- Where space heating is not electric, identify the type and the annual fuel utilization efficiency (AFUE) of the proposed space heating equipment.
- Using the climate zone, the energy source, and the heating system AFUE, select the appropriate table from Article 3.1.1.2. or 3.1.1.3.
- Select an individual compliance package that best supports the project budget, schedule, and equipment availability. Note the performance values for roofs, walls above grade, walls below grade, slabs on grade, slab edge conditions, windows and sliding doors, HRVs, and domestic water heating efficiency. For prescriptive compliance, the proposed building component performance must equal or exceed all the element performance values in the compliance package.

Fenestration-and-Door to Wall Ratio (FDWR)

The most significant calculation required for an SB-12 submission is the documentation of the fenestration-and-door to wall ratio (FDWR). The result of this calculation may preclude a project from the prescriptive compliance path, or it may reduce the maximum U-value for windows or sliding glass doors required by an individual compliance package.

Per Sentence 3.1.1.1.(7), projects with a FDWR equal or less than 17% may use the requirements set out in the compliance packages. Projects with a FDWR greater than 17%, but less than or equal to 22% have the maximum allowable U-value for windows and sliding glass doors reduced in accordance with Sentence 3.1.1.1.(8).

Projects with a FDWR greater than 22% must use the performance path as stated in Sentence 3.1.1.1.(9).

The FDWR documentation process should be completed using the following steps:

1. **Calculate the gross wall area** using a vertical dimension from grade to the underside of the top-most ceiling, and plan dimensions taken to the exterior face of the building enclosure.
2. **Calculate the gross window and glass door area** by summing the rough opening areas of all windows, skylights, glazing in doors (including sidelights), and sliding glass doors.
3. **Divide the gross window and glass door area by the gross wall area** to determine the project's FDWR.

Opaque doors are not included in the FDWR calculation. They are governed by Article 3.1.1.10.

A one-storey sunroom or glazed porch addition to an existing building is addressed separately by Sentence 3.1.1.11.(3).

Special Provisions to Consider

Insulation Concrete Forms (ICF) Walls

- Where insulation concrete form (ICF) walls are being considered for a project, refer to Articles 3.1.1.2 (for Zone 1) and 3.1.1.3 (for Zone 2) as the ICF wall assemblies described in these articles are deemed to comply with the thermal values set out in certain compliance packages.
- Although these ICF assemblies are deemed to comply with the relevant compliance packages, some AHJs may request documentation to confirm compliance. This may include product literature, third-party thermal resistance testing, or other manufacturer-provided specifications.

Air Tightness Testing

- Where the project will conduct air tightness testing, relaxations in the requirements for the enclosure, HRV performance, and window performance are available as per Article 3.1.1.4.
- The requirements for air tightness testing are given in Sentence 3.1.1.4.(2).
- Performance thresholds are given in Table 3.1.1.4A.
- Performance relaxations are given in Tables 3.1.1.4B and 3.1.1.4C. One substitution per dwelling unit is available for items in Table 3.1.1.4B. Two substitutions per dwelling unit are available from Table 3.1.1.4C.
- Air tightness testing must follow a recognized standard methodology. Testing is typically conducted in accordance with either ASTM E779 or CGSB 149.10.

Preparing for a Building Permit Application: Assembling Documentation for SB-12

The benefit of the prescriptive path is its simplicity. All that is required for most of the building enclosure is a declaration of the design U-values, which is supported by the drawings and specifications. At the time of submission for a building permit, cut sheets for mechanical equipment may not be available. Drawings and specifications will need to describe the intended efficiencies for space heating systems, HRVs, and domestic hot water heating declared in the SB-12 submission.

While the Energy Efficiency Design Summary (EEDS) form is not prescribed under the OBC, it is widely accepted by the Ontario Building Officials Association (OBOA) and Authorities Having Jurisdiction (AHJs) as a convenient way to demonstrate compliance with SB-12. It has become standard practice with building permit application for CoP holders, similar to the OBC Matrix. CoP holders may complete the EEDS form if they have sufficient knowledge of SB-12 and its application to the proposed design.

References

1. OBC Volume 1 Division B, Part 12 Resource Conservation and Environmental Integrity
2. OBC Volume 2 Supplementary Standard SB-12 Energy Efficiency for Housing
3. OBC Volume 2 Supplementary Standard SB-1 Climatic and Seismic Data
4. OBC Volume 2 Supplementary Standard SB-10 Energy Efficiency Requirements
5. Practice Tip PT.36 Building Energy Performance Series
6. [Ontario Building Officials Association \(OBOA\) - FAQs for EEDS Forms - Dec 6, 2016](#)
7. [OBOA - EEDS Form: Prescriptive Method - 2017](#)
8. [OBOA - EEDS Form: Performance & Other Acceptable Compliance Methods - 2017](#)

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