

Introduction

Section 9.36 of the National Building Code – Alberta Edition (NBC (AE)) details energy efficiency requirements for housing and small buildings. It provides three possible options for compliance: Prescriptive, Prescriptive + Trade-Off and Performance Compliance.

To facilitate compliance, The City of Calgary has created the 9.36 Project Summary form outlining the requirements and compliance options for Alberta Building Code (ABC) 9.36. This guide provides information and direction on how to complete this form.

A completed 9.36 Project Summary form has been required for all relevant Building Permit applications since November 01, 2016.

Completing the 9.36 Project Summary form

Basic Building Information

Regardless of the compliance path chosen, certain information is required for all buildings seeking compliance with ABC 9.36. This information must be completed for all projects and be consistent with the accompanying drawings.

Basic information includes:

Climate Zone	Calgary has 5000 Heating Degree Days (HDD) placing it in climate zone 7A . If you have alternative climate data that you wish to use, please supply it with your application.
Building Area	This is as defined in 1.4.1.2 of NBC (AE) as the greatest horizontal area of a building above grade within the outside surface of exterior walls or within the outside surface of exterior walls and the centre line of firewalls.

Selecting a Compliance Path

Using check boxes below please indicate the compliance path you have chosen. Select only one compliance path; **multiple compliance paths are not permitted on a single building.**

Specific requirements associated with the individual compliance paths are found on the form, and explained in greater detail below

Prescriptive Compliance Path

This section describes the minimum information that must be included for prescriptive compliance. It may take the form of notes, drawings, specifications, or calculations and should demonstrate how the proposed assemblies and components will meet the values defined in 9.36.2 – 9.36.4.

In addition to the above information, drawing details shall be provided to illustrate how air barrier and insulation continuity is maintained at joints, transitions, and changes in assemblies. These details will be specific to the chosen air barrier/insulation system. Should the designer choose to take advantage of the Performance Compliance path and specify an airtightness value less than 2.5 Air Changes per Hour (ACH) these details may be excluded from the application package as a blower door test will be required to verify actual performance.

□ Prescriptive + Trade-off Path

This compliance path allows applicants to ‘trade-off’ building envelope requirements, within certain limitations as outlined in NBC (AE) 9.36.2.11. These include:

- Total areas must be the same for both parts of the calculation
- You may only trade off between assemblies from the building envelope, not Heating, Ventilation and air-conditioning (HVAC) or Hot Water.
- You may only trade opaque for opaque assemblies *or* transparent for transparent assemblies.
- If you trade windows for windows, then they must be on the same elevation.

To demonstrate compliance under the trade off path you shall provide all the information indicated above for prescriptive compliance, plus the following

- Trade off calculations must be submitted (calculator available at www.calgary.ca/energycodes)
- Using a hatch, shading, or other mean, the trade-off areas must be indicated on the accompanying drawing submission.

□ Performance Compliance Path

The performance Compliance path employs computer simulation software or calculations to compare a proposed design with a hypothetical reference building to show that the proposed design will use less energy over the course of an operational year. 9.36.5 of the NBC (AE) outlines the procedures for performing this comparison.

The 9.36 Project Summary requires several values to be provided to allow verification of the model inputs. A brief outline of some of these inputs and their requirements follows:

Reference Model

The reference model must be constructed according to 9.36.5.13. – 9.36.5.16 In the Reference building **Airtightness**, Solar Heat Gain Coefficient (**SHGC**), **Thermal Mass** and **Solar Absorbance** must use values specified in 9.36.5.14.

Fenestration and door area to gross wall area ratio FDWR for the Reference building is based on the FDWR of the proposed building, according the to the following table.

Buildings Containing 1 or 2 Dwelling Units	
Actual FDWR	FDWR for Reference Model
<17	17
17-22	Match actual FDWR
>22	22
Buildings containing More Than 2 Dwelling units	
Actual FDWR	FDWR for Reference Model
0-40	Use the rule above
>40	40
NOTE: For the purposes of the reference building, the area of glazing arrived at above shall be divided equally among the elevations of the building in the model. The following boxes on the form allow you to indicate the areas entered in the model for each elevation.	

HVAC System efficiency is to be indicated based on the required efficiency rating from table 9.36.3.10 for the type and size of equipment specified in the proposed design. If the proposed design equipment is not included in the table, then the reference house should be based on a gas fired warm air furnace with an efficiency of 92%.

Space Cooling Efficiency if installed shall meet the efficiency value for the relevant type of equipment as found in table 9.36.3.10

Service Water Heater Efficiency shall be indicated as the value shown in table 9.36.4.2 or if appropriate 9.36.5.16 and shall be the same type, size, and fuel type as the proposed house.

Ventilation Rate shall be set at the value derived from table 9.32.3.3 based on the number of bedrooms.

Proposed Model

Airtightness for the proposed house is a choice to be made by the designer.

Chosen Airtightness level	Construction Requirements
3.2	Install an Air Barrier system in accordance with 9.25.3
2.5	Install an Air Barrier system in accordance with 9.36.2.10
<2.5	Conduct a blower door test to verify that the specified air leakage rate has been achieved.
<p>Note: The results of this test must be supplied to the Building Inspector prior to occupancy. Should the blower door test indicate that the air leakage rate is greater than that specified at permit stage then along with the blower door results, a revised model report using the actual test value will need to be submitted to the Building Inspector prior to occupancy.</p>	

SHGC will be based on the specification of the actual windows proposed for the house and calculated in accordance with 9.36.2.2.

Thermal Mass can be calculated for the proposed house in accordance with 9.36.5.10 or the default value of 0.06 may be used.

Solar Absorptance is held constant between the proposed and reference models and therefore should be 0.4.

FDWR will be entered as the actual value calculated, distributed in the model per the design. The following boxes on the form allow you to indicate the areas for each elevation and should reflect the drawings.

HVAC System Efficiency will be the efficiency of the actual specified equipment.

Space Cooling Efficiency shall be the efficiency of the actual proposed equipment if installed.

Service Water Heater Efficiency will be the efficiency of the actual specified equipment.

Ventilation Rate may be set at a proposed value but may not be less than that derived from table 9.32.3.3 based on the number of bedrooms.

Performance Data Summary

Enter the energy use values generated by the reference and proposed models. Compliance is demonstrated when the Calculated Energy use is equal to or less than the Target Energy Use.

Software

The software used to perform the energy simulation will be detailed here. No specific software package is mandated however whichever software is chosen must have been tested to ANSI/ASHRAE 140 and have any changes or variations made to/within the software listed.

Declaration

Code requires a declaration be made that the calculations have been completed in compliance with all the rules outlined in 9.36.5. In order that the Safety Codes officer can discuss anything arising from the calculations contact information shall be provided for the person who prepared them.

Should the project be particularly complex, or the calculations have significant deficiencies the Safety Codes Officer may request a professional stamp and signature accompany the calculations.