Application:

As per Article 9.36.1.3 of NBC 2015, the code applies to the design and construction of all *buildings* and *additions* including:

- *Buildings* of *residential occupancy* to which Part 9 applies.
- *Buildings* containing *business and personal services, mercantile or low hazard industrial* occupancies to which Part 9 applies to whose combined floor area does not exceed 300 m^2, excluding parking garages serving residential occupancies.
- *Buildings* containing any mixture of the above two.

Energy Performance compliance applies only to:

- Houses with or without a secondary suite.
- Buildings containing only dwelling units and common spaces whose floor area does not exceed 20% of the floor area of the building.

Notes:

At this time Section 9.36 of the NBC is being applied to *New Buildings* and *Additions* while we develop the energy efficiency requirements to alterations and renovations. As such, this form is currently required for *New Buildings* and *Additions* only.

Definitions:

***Competent person** is defined as a person who is familiar and fluent with building design under Section 9.36 of the NBC and acceptable to the Authority Having Jurisdiction.

***New Building, for ground oriented dwelling units,** means the initial construction and footprint of the base building.

***New Building, for other project types,** means the base building and the initial tenant development / fitout.

***Addition** means any conditioned space that is added to an existing building that increases the building footprint and / or the above grade floor area.

This form clarifies the design direction chosen for new buildings* and additions* to comply with Section 9.36 of the current National Building Code of Canada (NBC).

All calculations are required to be completed by a *competent person and attached to this form to be accepted for review.**

Conversions:	
R = 5.678 x RSI	**U = 1 / RSI**

Section A: Prescriptive

Project Information		
Project Address		BPA Number (Office use only)
Occupancy Class:	Floor Area (m^2):	Climate Zone: 7B & 8
Design Option: ☐ Prescriptive (See Section A)	☐ Trade-Off (See Section B)	☐ Performance (See Section C)

HRV / ERV: Yes ☐ No ☐

Effective Thermal Resistance of Above Ground Opaque Building Assemblies (RSI)				
Assembly	**w/ HRV**	**w/o HRV**	**Proposed**	**Office Use**
Ceilings below attics	10.43	10.43		
Cathedral / Flat roofs	5.02	5.02		
Walls	3.08	3.85		
Rim Joist Space	3.08	3.85		
Floors over unheated spaces	5.02	5.02		
Floors over garage	4.86	4.86		
Thermal Characteristics of Fenestration, Doors and Skylights (U)				
Assembly	**Efficiency**		**Proposed**	**Office Use**
Windows & Doors	Maximum U-Value 1.40 or Minimum Energy Rating ≥ 29			
One door exception	Maximum U-Value 2.60			
Attic hatch	Maximum U-Value 2.60			
Skylights	Maximum U-Value 2.40			
Effective Thermal Resistance of Below-Grade or In-Contact-With-Ground Opaque Buildings Assemblies (RSI)				
Assembly	**w/ HRV**	**w/o HRV**	**Proposed**	**Office Use**
Foundation Walls	2.98	3.46		
Slab On Grade With Integral Footing	2.84	3.72		
Unheated floors: (does not apply to crawl spaces)				
Below Frost Line	uninsulated	uninsulated		
Above Frost Line	1.96	1.96		
Heated Floors	2.84	2.84		

Calculations of RSI_{eff} for the above assemblies are required to be submitted.

HVAC Equipment Performance Requirements					
Equipment	**Capacity KW**	**Standard**	**Min. Efficiency**	**Proposed**	**Office Use**
Gas Fired Furnace w or w/o A/C	≤ 65.9	CSA P.2	AFUE≥ 92%		
	> 65.9 & ≤117.23	CAN/CSA-P.8	E_t ≥78.5%		
Electric Boiler	≤ 88	(1)			
Gas Fired Boiler	≤ 88	CSA P.2	AFUE ≥ 90%		
	> 88 & ≤ 117.23	AHRI BTS	E_t ≥ 83%		
Other					
Heat Loss / Gain Calculations	Calculations were prepared in conformance with CSA 280 Yes / No		BTU:		
Nomenclature	**AFUE**= annual fuel utilization efficiency, **E_t**= thermal efficiency				

Water Heaters Performance Requirements					
Equipment	**Capacity KW**	**Standard**	**Min. Efficiency**	**Proposed**	**Office Use**
Tank Storage Electric	≤ 12 kW (50 L to 270 L capacity)	CAN/CSA-C191	SL ≤ 35 + 0.20V (top inlet)		
			SL ≤ 40 + 0.20V (bottom inlet)		
	≤ 12 kW (>270 L and ≤ 454 L capacity)		SL ≤ (O.472V) - 38.5 (top inlet)		
			SL≤ (0.472V) - 33.5 (bottom inlet)		
	>12 kW (>75 L capacity)	ANSI Z21.10.3/CSA 4.3 & DOE 10 CFR, Part 431, Subpart G	S = 0.30 + 27 / V_m		
Tank Storage Gas Fired	< 22 kW	CAN/CSA-P.3	EF ≥ 0.67 — 0.0005V		
	≥ 22 kW	ANSI Z21.10.3/CSA 4.3	E_t ≥80% and standby loss≤rated Input/(800 + 16.57)(√V)		
Tankless Gas Fired	≤ 73.2 kW	CAN/CSA-P.7	EF ≥ 0.8		
	> 73.2 kW	ANSI Z21.10.3/CSA 4.3 and DOE 10CFR,Part43l,SubpartG	E_t ≥ 80%		
Tankless Electric	No standard addresses the performance efficiency; however, their efficiency typically approaches 100%				
Other					
Nomenclature	**EF** = energy factor in %/h, **E_t** = thermal efficiency **S** = standby loss in %h, **SL** = standby loss in W, **V**= volume **V_m** = measured storage volume in US gallons				

(1) Must be equipped with automatic water temperature control. No standard addresses the performance efficiency; however their efficiency typically approaches 100%

Section B: Trade Off

To be completed and submitted for review by a *competent person**

□ Opaque to opaque – One or more above-ground opaque building envelope assemblies are permitted to be less than required, provided one or more above-ground opaque building envelope assemblies are increased to more than required.

- Walls and joist type roofs must maintain minimum 55% of the required RSI_{eff}
- All other assemblies must be minimum 60% of the required RSI_{eff}
- The sum of the areas of all traded assemblies divided by their RSI_{eff} must be less than or equal to what it would have been if all assemblies had met 9.36.2.6

□ Transparent to transparent – One or more windows are permitted to be less than required, provided one or more windows are increased to be more than required.

- The traded windows must have the same orientation.
- The sum of the areas of all traded windows divided by their RSI_{eff} must be less than or equal to what it would have been if all windows had met 9.36.2.7

□ Opaque to transparent – This option is meant to allow reduced insulation for factory-constructed buildings with a low floor to ceiling height and a fenestration and door area to gross wall area ratio of 15% or less.

All calculations are required to be attached to this form to be considered complete and be accepted for review. The location and extent of assemblies used in the calculation shall be clearly identified on the drawings by hatch.

☐ **Calculations Attached**

Section C: Performance

This option is available only to houses with or without secondary suites, and buildings that contain only dwelling units with common spaces that are less than 20% of the building's total floor area.

To be completed and submitted for review by a *competent person**

Input parameters		**Reference Model**	**Proposed Model**
Airtightness (air exchanges per hour @ 50 Pa)			
Thermal mass ($MJ/m^{2.0}C$)			
Ventilation rate (l/s)			
HRV Efficiency			
Fenestration and door to wall ratio (FDWR) – reference (%)			
Direction of front elevation (clearly circle one)			N NE E SE S SW W NW
Area of windows and doors	Front elevation (m^2)		
	Rear elevation (m^2)		
	Left elevation (m^2)		
	Right elevation (m^2)		
	Total area of windows (m^2)		
	Total area of opaque doors (m^2)		
Energy use (GJ)			
Software title		**Version**	
Is software ANSI/ASHRAE 140 compliant or Hot 2000?		Yes / No	

Declaration

I hereby certify that the calculations submitted were prepared in full accordance with Subsection 9.36.5 of the 2015 NBC or the Energuide Rating System and the operation procedures of the software.

_____
Print Name

_____ _____
Business Name Address

_____ _____
Email Phone Number

_____ _____
Signature Date

The full modelling report generated by an ANSI/ASHRAE 140 compliant software package or Hot 2000 software is required to be submitted.