Professional Building Inspections, Inc.

ENERGY EFFICIENCY COMPLIANCE FORM

Section 9.36. of the National Building Code of Canada (NBC)

Submit the design option section(s) for a new building, addition or major alteration to comply to NBC 9.36.

All calculations must be completed by a competent person* and be attached to this form to be considered complete and accepted for review.

* **Competent Person** means a person, firm or corporation who is knowledgeable and experienced in the application of NBC Section 9.36. for the design of buildings and/or building systems.

Owner Name:				**Permit Number (Office Use):**	
Project Address:					
Occupancy Type:		**Floor Area (m^2)**		**Climate Zone**	**7A**

Design Option:

☐ **Prescriptive** — Complete Section 'A'

☐ **Trade-Off** — Complete Sections 'A & B'

☐ **Performance** — Complete Section 'C'

Section A (Part 1): Prescriptive

HRV: ☐ Yes ☐ No

Additional information that must be submitted for review:

☐ Window & door schedule
☐ RSI assembly calculations
☐ Air tightness drawings
☐ CSA F280 calculations

Effective Thermal Resistance of Above Ground Opaque Building Assemblies (RSI)			
Assembly	**w/ HRV**	**w/o HRV**	**Proposed**
Ceilings below attics	8.67	10.43	
Cathedral / Flat roofs	5.02	5.02	
Wall joists	2.97	3.08	
Rim joists	2.97	3.08	
Floors over unheated spaces	5.02		
Floors within garage	4.86		

Thermal Characteristics of Fenestration, Doors and Skylights (U)		
Assembly	**Efficiency**	**Proposed**
Windows & Doors (provide window & door schedule)	Maximum U-Value 1.60 *or* Minimum Energy Rating ≥ 25	
One door exception	Maximum U-Value 2.60	
Attic hatch	Minimum RSI_{eff} 2.60	
Skylights	Maximum U-Value 2.70	

Effective Thermal Resistance of Below-Grade or In-Contact-With-Ground Opaque Building Assemblies (RSI) [Frost line depth for zone 7A is 2.4 m (8 ft.)]			
Assembly	**w/ HRV**	**w/o HRV**	**Proposed**
Foundation Walls	2.98	3.46	
Slab-On-Grade with Integral Footing	2.84	3.72	
Unheated Floor Below Frost Line	uninsulated	uninsulated	
Unheated Floor Above Frost Line	1.96	1.96	
Heated Floors	2.84	2.84	

Contact information for person who completed Section A (Part 1 of 2):

Firm Name:		**Ph:**		**Date:**	
Person Name:		**Email:**			

Section A (Part 2): Prescriptive

HVAC Equipment Performance Requirements				
Equipment	**Capacity KW**	**Standard**	**Min. Efficiency**	**Proposed**
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** Calculations (BTU)	☐ Calculations were prepared in conformance with CSA F280 standards			
Heat **Gain** Calculations (BTU)	☐ Calculations were prepared in conformance with CSA F280 standards			
Nomenclature	**AFUE**= annual fuel utilization efficiency, **E_t**= thermal efficiency			

Water Heater Performance Requirements				
Equipment	**Capacity KW**	**Standard**	**Min. Efficiency**	**Proposed**
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, Part 43l, Subpart G	E ≥ 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%.

Contact information for person who completed Section A (Part 2 of 2):					
Firm Name:		**Ph:**		**Date:**	
Person Name:		**Email:**			

Section B: Trade Off

All calculations must be completed by a competent person and attached to this form in order to be considered complete and accepted for review. The location and extent of assemblies used in the calculation shall be clearly identified on the drawings by hatch or note.

Additional information that must be submitted for review:
- ☐ Section A (Parts 1 & 2) completed in their entirety.
- ☐ RSI assembly calculations indicating trade-off calculations.

☐ **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 maintain 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 NBC 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 NBC 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.

Contact information for person who completed Section B:					
Firm Name:		**Ph:**		**Date:**	
Person Name:		**Email:**			

Professional Building Inspections, Inc.

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Section C: Performance (Page 1 of 2)

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.

Full modelling summary reports for the reference and proposed house, completed by a competent person and generated from Hot 2000 v15 or an ANSI/ASHRAE 140 compliant software, is required to be submitted with this form to be considered complete and accepted for review.

Additional information that must be submitted for review:
- ☐ Window & door schedule.
- ☐ Building assembly details (i.e. thoroughly complete "**Proposed House - Building Assembly Details**" section below).
- ☐ If less than 3.2 air exchanges are used in the proposed model, provide vapour barrier installation details.
- ☐ Full modelling summary reports for Reference Model and Proposed Model.

Input Parameters		Reference Model	Proposed Model
Airtightness (air exchanges per hour @ 50 Pa)			
Heat Loss / Heat Gain			
HRV efficiency			
Thermal mass (MJ/m^{20}C)			
Ventilation rate (l/s)			
Fenestration and door to wall ratio (FDWR) – reference (%)			
Direction of front elevation (highlight or shade one in each column)		N NE E SE S SW W NW	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)			

Proposed House - Building Assembly Details:

	Framing	Insulation		
Ceiling:	" o.c. Gable/Cathedral	R	- Batt or spray foam	**Furnace Size:** 00,000 BTU
Exterior Wall:	2" x @ " o.c.	R	-	**Furnace Rating:** ? %
Tall Wall:	2" x @ " o.c.	R	-	**Water Heater:** ? %
Foundation Wall:	2" x @ " o.c.	R	-	**HRV:** ☐ Yes ☐ No
Floor Headers:		R	-	**Air Conditioner:** ? SEER
Cantilever/Bonus Rm:	2" x @ " o.c.	R	-	**Air Barrier (NBC):** 9.26 &/or 9.36
Slab:	☐ None ☐ Int ☐ Ext / (1.2m)	4 "	thick - Rigid or Spray Foam	**Attic Hatch:** 2.60 U-Value
Cladding Type:				**Doors (U-Values):**
Comments:				**Windows:** (List all U-Values)

Section C: Performance (Page 2 of 2)

Software Information			
Software Title:		**Version:**	
Is software Hot 2000 v15 or ANSI/ASHRAE 140 compliant?		☐ Yes ☐ No	

Contact information for person who completed Section C:			
Firm Name:		**Name:**	
Address:		**Phone:**	
Address:		**Email:**	

I hereby certify that the calculations submitted were prepared in full accordance with the operation procedures of the software and:

- ☐ *Subsection 9.36.5. of NBC 2015,*
- ☐ *EnerGuide Rating System v15 w/ variance greater than or equal to 5% above the Reference Model (attach supporting documents)*
- ☐ *Alternative Solution – Specify: _____ (attach supporting documents)*

Date		**Signature**	