MUNICODE SERVICES LTD

TIERED PRESCRIPTIVE COMPLIANCE
SECTION 9.36. OF THE NATIONAL BUILDING CODE OF CANADA

This form is intended to clarify the compliance with Section 9.36. prescriptive path.

Must be completed by a competent person who is knowledgeable, experienced, and trained in building design under Section 9.36 of the NBC and acceptable to the Authority Having Jurisdiction.

Project Information			
Address:			Climate Zone: 7A
Occupancy Class:		Conditioned Space Volume (m^3):	
Select Performance Tier	☐ Tier 1 ☐ Tier 2 ☐ Tier 3 ☐ Tier 4 ☐ Tier 5		

Energy prescriptive compliance paths apply to:

- 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, and
- Buildings containing any mixture of the above two.

Prescriptive Compliance Path (Subsection 9.36.2. – 9.36.4.)

All calculations and specifications must be attached to this form to be considered complete and be accepted for review.

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

HRV / ERV: ☐ Yes ☐ No

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	
Walls & 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	Maximum U-Value 1.61 or Minimum Energy Rating ≥ 25		
One door exception	Maximum U-Value 2.60		
Attic hatch	Minimum RSI_{nom} 2.60		
Skylights	Maximum U-Value 2.75		
Effective Thermal Resistance of Below-Grade or In-Contact-With-Ground Opaque Buildings Assemblies (RSI)			
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	

Trade Off Compliance Path (9.36.2.11.): ☐ Yes ☐ No

Should trade off be proposed, all calculations must be attached to this form to be considered complete and be accepted for review. The location and extent of assemblies used in the calculations shall be clearly identified on the drawings by hatch or note.

HVAC Equipment Performance Requirements				
Equipment	**Capacity KW**	**Standard**	**Min. Efficiency**	**Proposed**
Electric Heat Pump (split & single package)	≥ 19	See Tables 5.2.12.1.-A to -P of Division B of the NECB		
Gas Fired Furnace w or w/o A/C	≤ 66 using single-phase electric current	CAN/CSA-P.2	AFUE ≥ 95% and must be equipped with a high-efficiency constant torque or constant airflow fan motor	
	≤ 66, through the wall furnace		E_t ≥ 78.5% AFUE ≥ 90%	
	≤ 66 using three-phase electric current	ANSI Z21.47/CSA 2.3	AFUE ≥ 78% or E_t ≥ 80%	
	> 66 and ≤ 117.23		E_t ≥ 80%	
Electric Boiler	< 88	(1)		
Gas Fired Boiler	< 88	CAN/SCA-P.2	AFUE ≥ 90%	
	≥ 88 & < 733	ANSI/AHRI 1500 or DOE 10 CFR, Part 431, Subpart E, Appendix A	E_t ≥ 83%	
Other				
Heat Loss/Heat Gain Calculation	☐ Calculations were prepared in conformance with CSA F280-12			BTU
Nomenclature	**AFUE**= annual fuel utilization efficiency, **E_t**= thermal efficiency			

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

Water Heaters 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 to ≤ 454 L capacity)		SL ≤ (0.472V) - 38.5 (top inlet)	
			SL ≤ (0.472V) - 33.5 (bottom inlet)	
	>12 kW	ANSI Z21.10.3/CSA 4.3 or DOE 10 CFR, Part 431, Subpart G App B	SL≤ 0.30 + (102.2 V_s)	
Tank Storage Gas Fired	≤ 22 kW and first-hour rating < 68 L	CAN/CSA-P.3	UEF ≥ 0.3456 – (0.00053 V_s)	
	≤ 22 kW and first-hour rating ≥ 68 L but < 193 L		UEF ≥ 0.5982 – (0.00050 V_s)	
	≤ 22 kW and first-hour rating ≥ 193 L but < 284 L		UEF ≥ 0.6483 – (0.00045 V_s)	
	≤ 22 kW and first-hour rating ≥ 284 L		UEF ≥ 0.6920 – (0.00034 V_s)	
	> 22 kW but ≤ 30.5kW and V_r ≤ 454 L		UEF ≥ 0.8107 – (0.00021 V_s)	
	> 22 kW	DOE 10 CFR, Part 431, Subpart G, Appendix A	E_t ≥ 90% and SL ≤ 0.84 [(1.25 Q) + (16.57 $\sqrt{V_r}$)]	
Tankless Gas Fired	< 58.56 kW, V_r ≤ 7.6 L and max. flow rate < 6.4 L/min	CAN/CSA-P.3	UEF ≥ 0.86	
	< 58.56 kW, V_r ≤ 7.6 L and max. flow rate ≥ 6.4 L/min		UEF ≥ 0.87	
	≥ 58.56 kW, V_r ≤ 37.85 L and input rate to V_r ratio ≥ 309 W/L	DOE 10 CFR, Part 431, Subpart G, Appendix C	E_t ≥ 94%	

Tankless, Electric	No standard addresses the performance efficiency; however, their efficiency typically approaches 100%			
Other				
Nomenclature	**EF** = energy factor		**E_t** = thermal efficiency with a 38.9°C (70°F) water temp difference	
	Q = nameplate input rate, in kW		**SL** = standby loss, in W	
	V_r = rated nominal storage volume, in L		**V_s** = measured storage volume, in L	

Compliance via Tiered Prescriptive Results (9.36.8.): ☐ Yes ☐ No

This option applies only to buildings of residential occupancy to which Part 9 applies.

Energy Performance Measures	Minimum Energy Conservation Points (Zone 7A)
Above-Ground Walls	
Fenestration and Doors	
Below-Grade or In Contact with Ground	
Airtightness	
Ventilation Systems	
Service Water Heating Equipment	
Building Volume	
Total Energy Conservation Points Achieved:	

Where points are achieved through Table 9.36.8.8., an airtightness test is required to be conducted. Provide the Airtightness Certificate to service@municode.ca once complete and required prior to scheduling a final inspection.

Declaration
I hereby certify that the calculations submitted were prepared in full accordance with Section 9.36.
Print Name _____ Signature _____ Date _____

TRADE OFF COMPLIANCE
SECTION 9.36. OF THE NATIONAL BUILDING CODE OF CANADA

This form is intended to clarify the compliance with Section 9.36., prescriptive path with trade-offs.
Note: In addition to the submission of trade-off calculations, the prescriptive form shall be completed and submitted.

Must be completed by a competent person who is knowledgeable, experienced, and trained in building design under Section 9.36 of the NBC and acceptable to the Authority Having Jurisdiction.

Project Information

Address:			Climate Zone: 7A
Occupancy Class:		Floor Area (m^2):	

Trade-off compliance paths apply to:

- 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, and
- Buildings containing any mixture of the above two.

Trade Off

Please check off all that apply.

☐ 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.

Declaration

I hereby certify that the calculations submitted were prepared in full accordance with Section 9.36.

_____
Print Name

_____ _____
Signature Date

MUNICODE SERVICES LTD

AIRTIGHTNESS CERTIFICATE

SECTION 9.36. OF THE NBC

Complete this form when the chosen energy efficiency design compliance path requires a verified post construction airtightness test:

- **Tiered Prescriptive Path achieves points through Table 9.36.8.8., or**
- **Tiered Performance Path:**
  - **For Tier 1:** Where the air-leakage rate is a value other than 3.2 ACH@50 Pa or 2.5 ACH@50 Pa
  - **For Tier 2 or higher:** Where the air-leakage rate is a value less than 3.2 ACH@50 Pa

Building Address/Land Location	
Municipality	
Owner's Name	

Airtightness Declaration:

Input Parameters:	**Reference Value**	**Proposed Value**	**Actual**
Airtightness (air changes per hour @ 50 Pa)			
Airtightness Design Units (check one)	☐ ACH_{50}	☐ NLA_{10}	☐ NLR_{50}
Zone Method (check one)	☐ Guarded	☐ Unguarded	
Airtightness Performer Information:			
Name:	Company:		
Phone:	Email:		

I certify that I am knowledgeable, experienced, and trained in the airtightness testing equipment and methodology. Testing has been completed in accordance with CAN/CGSB-149.10-M and meets or exceeds the expected results of the proposed model or design.

Signature: _____ Date: _____