# ENERGY EFFICIENCY COMPLIANCE CHECKLIST PART 9 NON RESIDENTIAL BUILDINGS BASED ON ONTARIO BUILDING CODE SUPPLEMENTARY STANDARD SB-10 DIVISION 5

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|---|---|
| Project: | Location of Project: |
| Building Permit Application No.: | Date: |

| Designer Information | Designer Information | Designer Information |
|---|---|---|
| Name | Name | Name |
| Discipline /Designer BCIN* | Discipline /Designer BCIN* | Discipline /Designer BCIN* |
| Address | Address | Address |
| City Province | City Province | City Province |
| Signature Date(YY/MM/DD) | Signature Date(YY/MM/DD) | Signature Date(YY/MM/DD) |

*IF REQUIRED

| Energy Efficiency Design 1.1.1.1 | |
|---|---|
| The *building*: | |
| Is within the scope of Part 9. | □ YES |
| Only contains a non-residential occupancy. | □ YES |
| Uses a heating system other than electric space heating. | □ YES |
| Is intended for occupancy on a continuing basis during the winter months. | □ YES |
| Total gross fenestration area: _____m²<br>Total gross area of wall: _____ m²<br>Fenestration to wall ratio: _____<br>Fenestration to wall ratio is less than or equal to 40% | □ YES |
| Total gross skylight area: _____m²<br>Total gross ceiling of wall: _____ m²<br>Skylight to ceiling ratio: _____<br>Fenestration to wall ratio is less than or equal to 3% | □ YES |
| If no to any of the above, this form cannot be used. Refer to Article 1.1.2.1 of Chapter 1, Division 2 of SB-10. | |

THIS CHECKLIST IS BASED ON DIVISION 5 OF THE ONTARIO BUILDING CODE SUPPLEMENTARY STANDARD SB-10.

THIS CHECKLIST IS NOT A SUBSTITUTE FOR COMPLYING WITH THE REQUIREMENTS OF THE ONTARIO BUILDING CODE. WHILE CARE HAS BEEN TAKEN TO ENSURE ACCURACY, THIS CHECKLIST IS PROVIDED FOR CONVENIENCE ONLY. DESIGNERS AND BUILDING OFFICIALS MUST REFER TO THE ACTUAL WORDING AND REQUIREMENTS OF THE ONTARIO BUILDING CODE (O.REG. 350/06 AND AMENDMENTS UP TO AMENDING O.REG. 315/11).

THIS CHECKLIST IS MADE AVAILABLE FOR CODE USERS BY THE MINISTRY OF MUNICIPAL AFFAIRS AND HOUSING. USERS SHOULD ALWAYS CONSULT WITH THE AUTHORITY HAVING JURISDICTION, IF THE CHECKLIST IS GOING TO BE SUBMITTED TO THAT AUTHORITY. THE MINISTRY OF MUNICIPAL AFFAIRS AND HOUSING DOES NOT ASSUME RESPONSIBILITY FOR ERRORS OR OVERSIGHTS RESULTING FROM THE INFORMATION CONTAINED HEREIN.

Version 1 May, 2017

PLEASE FILL IN THE ACTUAL VALUES INSTALLED AND CHECK BOXES AS THEY APPLY.

## THERMAL PERFORMANCE OF THE BUILDING ENVELOPE SB-10, DIVISION 5, Article 1.1.1.2

**Building Zone: Zone 1 - Less than 5000 Degree Days** □
**Zone 2 - 5000 or more Degree Days** □

**Table 1.1.1.2**
**Building Envelope Requirements Based on Degree Day Zones (SI)**

| Building Assembly – Opaque Elements | Criteria | | | | Design | |
|---|---|---|---|---|---|---|
| | Zone 1 Less than 5000 Degree Days | | Zone 2 5000 or more Degree Days | | *Insert design thermal resistance* | |
| | Assembly Max U-Value [1] | Insulation Min. RSI-Value | Assembly Max U-Value[1] | Insulation Min. RSI-Value | Value | RSI or U/C Value? |
| Roofs Without Attic Space – Insulation Above Deck | U-0.164 | 6.2 ci | U-0.143 | 7.0 ci | | □ RSI □U |
| Roofs With Attic Space and Other | U-0.1 | 10.6 | U-0.087 | 12.5 | | □ RSI □U |
| Walls Above Grade | U-0.250 | 2.3 + 2.6 ci | U-0.250 | 2.3 + 2.6 ci | | □ RSI □U |
| Walls Below Grade | C-0.284[2] | 3.5 ci | C-0.284[2] | 3.5 ci | | □ RSI □C |
| Exposed Floors – Lightweight Framing [3] | U-0.164 | 6.7[3] + 0.7 ci | U-0.164 | 6.7[3] + 0.7 ci | | □ RSI □U |
| Exposed Floors – Mass | U-0.261 | 3.3 ci | U-0.215 | 4.1 ci | | □ RSI □U |
| Slab on Grade Floors (perimeter + below slab) – Unheated | | 2.64 for 1200mm | | 2.64 for 1200mm | | □ RSI □U |
| Slab on Grade Floors (perimeter + below slab) – Heated | | 1.8 full slab | | 1.8 full slab | | □ RSI □U |
| Opaque Doors | U-2.56 | | U-2.56 | | | □ RSI □U |
| **Fenestration** | **Assembly Max U-Value [1]** | **Assembly Max SHGC** | **Assembly Max U-Value[1]** | **Assembly Max SHGC** | **Design U Value** | **Design SHGC** |
| Vertical Fenestration – All Types Except Entrance Doors | U-2.15 | 0.40 | U-1.94 | 0.45 | | |
| Entrance Doors | U-3.94 | 0.40 | U-3.94 | 0.45 | | |
| Skylights | U-2.56 | 0.40 | U-2.56 | NR | | |
| | | | | | | |

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| *Note that all opaque surfaces must comply with either the minimum RSI value of added insulation in cavities and continuous insulation (ci) requirements or the maximum overall thermal transmittance (U-value) of the entire assembly, where the U-value is provided.*<br><br>*If U-values are being used for compliance, calculations for determining these values have been attached.* | □ YES<br>□ N/A |
| The ratio of visible transmittance to solar heat gain coefficient (VT/SHGC) for vertical fenestration assemblies is ≥ 1.10. | □ YES |

NOTES
(1) OVERALL THERMAL TRANSMITTANCE VALUE OF THE ENTIRE ASSEMBLY INCLUDES AIR FILMS AND THERMAL BRIDGING.
(2) C-VALUE IS OVERALL THERMAL CONDUCTANCE OF THE ASSEMBLY BUT IT DOES NOT INCLUDE SOIL OR AIR FILMS.
(3) WHERE THE FLOOR FRAMING DEPTH IS 254MM OR LESS, THE INSULATION IS PERMITTED TO MEET A MIN. RSI-VALUE OF 5.28.

## AIR INFILTRATION, Article 1.1.1.3

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| Building component or assembly contains an air barrier system conforming to Part 5 or Section 9.25 of the Building Code. | □ YES |

| HEATING, VENTILATING AND AIR CONDITIONING, Article 1.1.1.4 | | |
|---|---|---|
| Each HVAC system serves as a single HVAC zone. | | □ YES |
| Energy efficiency of the HVAC equipment complies with Supplementary Standard SB-10 Clause 1.1.2.1.(1) of Chapter 1 of Division 3. | | □ YES |
| Cooling capacity of a single A/C unit ≥ 15.8 kW. | □ YES | □ NO |
| If the cooling capacity of single A/C unit <15.8 kW the following is N/A.<br>If the cooling capacity of single A/C unit ≥15.8 kW, the unit:<br>• Has an economizer.<br>• Economizer is controlled by high limit shut off.<br>• Economizer is equipped with barometric or powered relief.<br>• Has outdoor air dampers provided with blade and jamb seals. | | □ YES |
| HRV with 55% recovery effectiveness or more (at the outside winter design temperature) is provided where outdoor air supplied to the air duct distribution system is more than 1400 L/s or operates more than 8000 hours per year, except where the largest exhaust at a single point is less than 75% of the outdoor air. | □ YES | □ N/A |
| Where a HRV is used, the system has provisions to bypass or control the HRV to permit proper operation of the air economizer. | □ YES | □ N/A |
| HVAC system controlled by: | □ manual changeover thermostat | □ dual set point thermostat |
| HVAC system with greater capacity than 4.4 kW and a supply fan motor more than 0.5 kW provided with time check and programmable thermostat. | □ YES | □ N/A |
| HVAC system greater than 5000 L/s provided with optimum start controls. | □ YES | □ N/A |
| **DUCTS, PLENUMS AND PIPING, Article 1.1.1.5** | | |
| Duct or plenum not protected by an insulated exterior wall or exposed to an unheated space is sealed in accordance with SMACNA and insulated to RSI 1.4. | □ YES | □ N/A |
| Supply, exhaust duct or plenum in conditioned space sealed in accordance with SMACNA. | □ YES | □ N/A |
| Pipes used for steam, hot water heating or cooling comply with Table 1.1.1.5. | □ YES | □ N/A |
| Insulation exposed to weather is protected by a covering. | □ YES | □ N/A |
| Non continuous exhaust systems with capacity of more than 140 L/s equipped with gravity or motorized damper. | □ YES | □ N/A |
| Air duct distribution system is balanced. Fans exceeding 0.75kW are balanced for design airflow. | □ YES | □ N/A |
| Hydronic system is balanced. | □ YES | □ N/A |

**Table 1.1.1.5.**
**Minimum Thickness of Pipe Insulation(1)**
(1) Insulation material shall have a thermal conductivity of not more than 0.042 W/(m•°C).

| Use of Pipe | Nominal Pipe Size not more than 40 mm | Nominal Pipe size more than 40mm |
|---|---|---|
| Steam | 64 | 76 |
| Hot water heating | 38 | 51 |
| Domestic hot water - 40°C to 60°C | 25 | 38 |
| Domestic hot water - 61°C and higher | 38 | 51 |
| Cooling | 13 | 25 |

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| SERVICE WATER HEATING, Article 1.1.1.6 | | |
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| Energy efficiency of water heating equipment complies with Supplementary Standard SB-10 Clause 1.1.2.1.(1) of Chapter 1 of Division 3. | | □ YES |
| Domestic hot water piping is insulated in accordance with Table 1.1.1.5. if it is: | | |
| • Recirculating piping. | □ YES | □ N/A |
| • Located within the first 2.5 m of outlet piping in a constant temperature non-recirculating storage system. | □ YES | □ N/A |
| • Piping between inlet pipe and heat trap. | □ YES | □ N/A |
| • Heat traced. | □ YES | □ N/A |
| Hot water storage tank is provided with temperature control. | □ YES | □ N/A |
| Where a recirculating hot water system or heat trace is used, control to switch off system is provided. | □ YES | □ N/A |
| Hot water discharge temperature limited to maximum 43°C for lavatory faucets in public washrooms. | | □ YES |
| Vertical pipe risers that serve a storage water heater or hot water tank are equipped with heat traps. | | □ YES |
| Where a system has been designed that provides both space heating and domestic water heating, the system efficiencies meet those required by SB-10 Clause 1.1.2.1.(1)(c) of Chapter 1 of Division 3. | □ YES | □ N/A |

| LIGHTING, Article 1.1.1.7 | |
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| Except as permitted by SB-10, 1.1.1.7.(4), luminaries designed for use with one or three linear fluorescent lamps greater than 30W each use two-lamp tandem-wired ballasts in place of single-lamp ballasts when two or more luminaries are in the same space on the same control device. | □ YES □ N/A |
| **INTERIOR LIGHTING, Article 1.1.1.8** | |
| Allowable Interior Lighting Power Density (From Table 1.1.1.8. SB-10): | W/m² |
| Gross lighted area of building: | m² |
| Interior Lighting Power Allowance (Allowable lighting power density x gross lighted area of building) (ILPA): | W |
| Interior Connected Lighting Power (CLPi): | W |
| CLPi < ILPA | □ YES |
| Calculations attached. | □ YES |
| **INTERIOR LIGHTING CONTROLS, Article 1.1.1.9** | |
| There are manual lighting controls in each space that control the lighting in the space, except for emergency lighting, 24 hour lighting, or safety/security lighting.<br>• The control device is accessible and within sight of the lighting being controlled, except where remote location was required for safety or security (properly labelled to identify the controlled lighting). | □ YES □ N/A |
| Each space excluding corridors, storage rooms, restrooms, and parking garages has a manual control device that allows the occupant to reduce lighting power by a minimum of 50% and to turn the lighting off. | □ YES □ N/A |
| No total lighting load exceeding 0.2 W/m² multiplied by the gross lighted area of the building is permitted to operate at all times. | □ YES |
| All lighting is automatically controlled to turn off when the building is either unoccupied or scheduled to be unoccupied, except as provided by Sentences SB-10 1.1.1.8.(2) and 1.1.1.8.(6), operating on an independent program schedule for each floor (accounting for weekends and holidays) using either:<br>• a scheduled basis using a time-of-day operated control device that turns lighting off at specific programmed times<br>• a signal from another control or alarm system that indicates the area is unoccupied | □ YES □ N/A |
| Where the total lighting input power is 150 W or greater and where skylights or roof monitors are installed, general lighting for dining areas in fast food buildings, apparatus rooms in fire stations buildings, retail spaces, and office spaces have automatic daylight sensing controls installed. | □ YES □ N/A |
| In spaces where total lighting input power is 150 W or greater and the total area of exterior vertical fenestration in the space is 11 m² or greater, automatic daylight sensing controls shall be used to control general lighting, except for retail spaces. | □ YES □ N/A |
| All automatic daylight sensing controls reduce lighting in response to available daylight using continuous dimming or with at least two intermediate control points between fully on and fully off. | □ YES □ N/A |
| Lighting in corridors, post office sorting areas, warehouse storage areas, and parking garages are controlled by occupancy sensors that reduce the lighting power by a minimum of 50% when no activity is detected for not longer than 20 minutes, with each control device not controlling an area > 330 m². | □ YES □ N/A |
| Lighting in the following spaces shall be controlled by occupancy sensors that automatically turn off the lighting when no activity is detected for not longer than 20 minutes:<br>(a) enclosed office areas less than 23 m² (250 ft²),<br>(b) classrooms,<br>(c) training rooms,<br>(d) conference rooms,<br>(e) meeting rooms,<br>(f) breakrooms,<br>(g) non-warehouse storage areas,<br>(h) dressing / fitting rooms, and<br>(i) restrooms | □ YES □ N/A |

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| Control devices separate from those used for general lighting shall control the following:<br>(a) display lighting,<br>(b) accent lighting,<br>(c) case lighting,<br>(d) task lighting,<br>(e) non-visual lighting, and<br>(f) demonstration lighting. | □ YES □ N/A |
| **EXTERIOR LIGHTING, Article 1.1.1.10** | |
| Exterior Lighting Power Allowance (ELPA), excluding façade lighting: | kW |
| Exterior Connected Lighting Power (CLPe), excluding façade lighting: | kW |
| CLPe < ELPA | □ YES |
| Calculations attached. | □ YES |
| The installed exterior lighting power of façade lighting does not exceed 1.1 W/m² multiplied by the façade area. | □ YES |
| Exterior building grounds luminaires exceeding 100W contain lamps with a minimum efficacy of 60lm/W unless controlled by a motion sensor. | □ YES |
| **EXTERIOR LIGHTING CONTROLS, Article 1.1.1.11** | |
| Except for lighting used for covered vehicle entrances or exits from a building, or parking structures required for safety, security, or eye adaptation, exterior lighting has automatic controls that:<br>• automatically turn off the exterior lighting when sufficient daylight is available,<br>• automatically turn off building façade and landscape lighting during non-business hours, and<br>• automatically reduce the connected lighting power for exterior lighting excluding building façade and landscape lighting, by at least 30% during non-business hours or alternatively, during any period when no activity is detected for not longer than 15 minutes. | □ YES □ N/A |
| **ELECTRIC MOTORS, Article 1.1.1.12** | |
| Electric motor efficiency levels comply with the requirements of Chapter 2, Division 3 of SB-10. | □ YES |