SUSTAINABLE BUILDINGS CANADA

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March 11, 2022

Mansoor Mahmood,
Director, Ontario Ministry of Municipal Affairs and Housing,
Building and Development Branch

Re: Comments regarding proposed changes to the Ontario Building Code.

Sustainable Buildings Canada (SBC) is pleased to provide the following commentary regarding the proposed changes to the Ontario Building Code (OBC). SBC would like to acknowledge the support of EQ Building Performance in the preparation of this commentary.

SBC has a long history related to Code development and support, including encouraging increasingly higher energy performance requirements. Members of our Board have sat on provincial code development committees including the Building Code Conservation Advisory Council (BCCAC) and the provincial Technical Advisory Council (Parts 5 and 12). We regularly advise municipalities regarding the implementation of Green Development Standards, including for Toronto, Whitby and Ottawa and have recently lent our support to standards currently being contemplated in Mississauga.

Through our partnership with the Enbridge Savings by Design program we have delivered over 500 design workshops to builders of Part 3 buildings throughout the province. This activity has provided us with unique insights regarding the impacts of alternative design and technology specifications that affect energy performance. These insights help to inform the following commentary and related recommendations regarding the proposed changes to the Code. In particular we believe that the path to net zero energy by 2030 is achievable using current design and technology specifications.

Code Provision Number: 12.2.3.1 – Peak Electric Demand

This proposed change includes retaining a requirement to conform to the peak electric demand requirements of Section 1.1.2.3, Chapter 1 Division 3 of the Current SB-10, and moving this part to Part 12.

- The current SB-10 Section 1.1.2.3(5), Chapter 1 Division 3 allows a building to meet the peak electric demand requirements through a prescriptive approach for certain equipment following NECB 2015 Section 1 to 7. We recommend a similar sentence remain to allow this type of compliance path. The rules which define the creation of the reference building and proposed building were not created with peak electric demand reduction in mind, and as a result it is not un-common for buildings to have difficulty meeting this requirement despite meeting the prescriptive requirements of NECB 2020 Section 1 through 7 as well as the energy efficiency requirements of Part 8. It therefore provides an important alternative compliance path.

Code Provision Number: 12.2.1.2 – Energy Efficiency Design - Adoption of NECB 2020 to replace Supplementary Standard SB-10

The proposed change includes eliminating the Supplementary Standard SB-10 and replacing it with reference to NECB 2020. We offer the following comments:

- NECB 2020 is an energy source neutral document. As a reflection of this, the rules within Part 8, which governs the creation of the Reference Building and Proposed Building, in most cases compares like-for-like energy sources. This is best demonstrated in NECB 2020 Part 8 Table 8.4.4.7.-A and Table 8.4.4.7.-B.
- A consequence of this is that higher efficiency, low carbon space heating and service water heating systems are not necessarily reflected as more energy efficient in terms of % improvement over the Reference design. As an example, in our experience a building served by a high efficiency natural gas heating system performs similarly to that same building served by a low carbon electric based heat pump heating system based on the comparison to their respective NECB Part 8 reference buildings. The electric heat pump design, however, may be as much as 20% more energy efficient than the natural gas based design on an absolute energy use basis, and emit as much as 40% fewer GHG emissions.
- NECB 2020 has introduced at Tiered pathway as the new Part 9 of that standard. It is understood that these Tiers are currently not being proposed for adoption in Ontario, with only Tier 1 being brought in.
- NECB 2020 has introduced the ability to claim energy savings through measured whole building air tightness, which Ontario proposes to adopt without revision. We commend this as an important inclusion in the Code, as the ability to claim savings will encourage builders to test the air tightness of their buildings as well as develop strategies towards improving air tightness.

Given these considerations, SBC recommends the following:

Recommendation #1: Provide an energy performance pathway with a means to fully support high efficiency, low carbon heating and domestic hot water systems

Higher efficiency heating and domestic hot water heating system, e.g. heat pumps, are a key strategy towards provincial and federal GHG reduction targets, and as such must be supported as viable energy savings strategies within the OBC. For the reasons described above, this is not achieved through NECB 2020 as the rules of Part 8 allow high carbon, lower efficiency systems to perform similarly to high efficiency systems. We therefore recommend one of the following approaches:

1) Adopt an absolute energy use intensity (EUI) metric pathway for compliance. This metric would set a firm target in terms of energy use per square metre which would reflect building type and climate zone. As a firm target, the use of high efficiency, low carbon systems would be reflected towards achieving this metric in a fulsome manner.

   This is the preferred approach as EUI is a more meaningful energy savings metric compared to percent better than reference, which has been documented to lead to a performance gap between modelled results and real energy savings in many instances. It is further noted that precedents to the EUI approach exist within Ontario through the City of Toronto's Toronto Green Standard as well as the City of Ottawa's High Performance Development Standard, and so is a metric and approach that the development community is familiar with. SBC also notes that the use of the EUI metric will simplify the specification of Tiers and accommodate increasing performance requirements in future codes simply by lowering the EUI requirement.

2) Modify Part 8 of NECB 2020 to adjust the energy source of the Reference Building to a specific energy source, rather than one which matches the proposed building. This is most relevant toward the space

heating and service water heating system type requirements, and would recognize the efficiency gain achieved through higher efficiency system types. In this respect, we recommend that:

- Table 8.4.4.7.-B, which describes the Reference Building HVAC system type, be modified to indicate that the type of heating system be fuel fired boiler or furnace depending on the system number, rather than a choice between fuel fired or electric resistance depending on the Proposed Building heating energy source.
- Section 8.4.4.13, which describes the use of heat pumps within the Reference Building, be omitted as it would no longer be relevant based on the suggested modification to Table 8.4.4.7.-B.
- Section 8.4.4.20, which describes service water heating systems within the Reference Building, be revised to clarify the Reference Building service water heating system be served by natural gas.

Recommendation #2 – Contingent on recommendation #1, adopt the higher performance Tiers and allow municipalities to choose the appropriate Tier

Ontario municipalities seek methods to mandate building performance levels which align with their GHG reduction ambitions, as evidenced by as the tiered green development standards in the City of Toronto, City of Ottawa, and Town of Whitby . By adopting the tiered pathway and allowing municipalities to adopt a higher tier, the Province will level this playing field and avoid a potential patchwork of energy efficiency requirements. This will align expectations across the province, making it easier for builders and designers to work within different municipalities even when they have different minimum performance tiers.

We note that the issues related to NECB 2020 Part 8 remain without the adoption of Recommendation #1, and in fact are exacerbated as low carbon systems do not reflect increasing percentage savings as might be expected.

Further, we note that PCF 1527, which introduced Part 9 to NECB, is supported by a Natural Resources Canada Simulation Study (report No: A1-013150.16). Upon review, this Report does not consistently follow the rule-set of Part 8, as it relies on fuel-source changes among other energy savings strategies which are not permitted to achieve higher performance Tiers.

For this reason, while we encourage the adoption of higher performance Tiers, we believe this must be coupled with a clearer approach with respect to the adoption of high efficiency systems, such as those provided in Recommendation #1, so that the savings associated with these systems can be properly reflected towards the achievement of the higher performance.

Recommendation #3 – Maintain clarification of the Fenestration and door area to gross wall area ratio (FDWR) from the current SB-10

Section 8.4.4.3(3) of the NECB 2017 states that the FDWR of the Reference shall be set to the maximum permitted in clause 3.2.1.4(1).. This statement allows a credit to buildings with naturally low FDWRs, as the reference building FDWR can be higher that the proposed design. The current SB-10 revises this statement in 1.1.1.6(6), to clarify that where the FDWR of the proposed design is lower than the maximum permitted in clause 3.2.1.4(1), the Reference Building FDWR shall equal the proposed design. This is an important distinction which should be maintained, as it avoids a potentially significant energy savings credit to buildings which have naturally low FDWRs, for example warehouses or retail strip malls. We recommend an identical approach to the calculation of total skylight to gross roof area ratio in the reference building.

Recommendation #4 – Provide clarification on methods for verifying whole building air tightness testing results

We commend the inclusion of whole building air tightness testing as a means to claim energy savings. We note that the timing of a whole building air tightness test for Part 3 buildings will typically happen closer to the end of building construction, and likely after an above ground building permit has been issued.

We recommend that clarification be provided with respect to enforcement protocols where whole building air tightness is claimed as an energy savings measure, including:

- What the preferred protocol will be for communicating whole building air tightness testing results to building code officials, given that such results will likely not be available until well after an energy modelling report has been submitted and above grade building permit has been received.
- What, if any, protocols will be in place with respect to penalties or alternative compliance if the claimed whole building air tightness results are not achieved.
- That a declaration of the modelled air tightness value be included in the future iteration of the current SB-10 compliance forms, as a means of easily identifying projects which are claiming an air tightness savings credit

Recommendation #5 – Provide guidelines related to training and enforcement of energy efficiency measures in Part 3 buildings

In our experience with the current SB-10, the response from building officials varies significantly depending on the municipality, with many municipalities providing no feedback related to the SB-10 energy modelling report and documentation, and others relying on their own additional submittal requirements to evaluate submissions. We note that the review of Part 9 energy requirements in relation to the current SB-12 appears to be much more streamlined and consistent across the province.

We therefore identify a gap in terms of training for building officials with respect to the review of Part 3 performance based energy modelling submissions across the province. We recommend a training program for officials, to both maintain consistency across the province and provide officials with the ability to more confidently review performance based energy modelling submissions. We further note that this recommendation could be supported by revised and/or additional submittal requirements.

We would welcome the opportunity to meet with you and your Team to discuss our recommendations. Please feel free to contact me should you wish to further discuss these important issues and otherwise all the best.

Sincerely,



Larry Brydon, Chair