ERO- 019-4974 Proposed Changes for the Next Edition of Ontario's Building Code (Winter Consultation)

The Ontario Society of Professional Engineers (OSPE) is the advocacy body and voice of the engineering profession. Ontario currently has over 85,000 professional engineers, 250,000 engineering graduates, 6,600 engineering post-graduate students and 37,000 engineering undergraduate students.

General Comments

The Ontario Building Code requires every building designed by an architect and/or professional engineer to be reviewed for general conformity to the approved design by professionals. Professional engineers play a vital role in executing these general reviews. This should be the norm. Professional engineers are trained and have the expertise to perform such reviews. Under the *Professional Engineers Act*, engineers must ensure that life, health, property, and the public welfare are protected. Engineers know that protecting the environment is essential to promoting a sustainable and healthy lifestyle for current and future generations. Eroding the jobs essential jobs performed by professional engineers equates to eroding safety measures within Building Code Standards. Therefore, The Ontario Government should make it a priority to ensure that professional engineers are required to conduct the necessary reviews that will ensure the public's safety.

Part 2 is new and describes the scope, application, definitions, classification, separation, occupancies, fire-related requirements, electrical, building size, alarm and detention systems, safety, exit and hazardous substance. However, there are no details on the components and connections that could / shall be used for construction of farm/agricultural buildings similar to those described and specified in Part 9 of the Ontario Building Code. In addition, minimum requirements on some equipment that is commonly used / installed on farm buildings, e.g., lift, need to be added. A continuous load path from the roof to foundation walls should be achieved. Gable end walls should be continuously sheathed, and roof trusses / rafters and gable end trusses shall be securely fastened to the top plate of wall frames using hurricane ties or framing anchors rather than nails (toe-nailed connections).

Part 9

Roof framing members in both compression and tension should be secured with improved connections, e.g., nail plates, rather than few nails or a single truss connector plate. This includes the connections to the top plates of interior wall frames or ceiling joists. Wall studs to the sill plates seated on foundation walls should be connected with ties rather than toe-nailed.

Specific Comments

OSPE agrees with the incorporation of the following items:

Part 2: Farm Buildings

Subject: Large Farm Buildings Technical Provisions - Heating, Ventilating and Air-conditioning Requirement

2.4.2. Ventilation

2.4.2.1. Required Ventilation

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(1) Except as provided in Sentence (2), the rates at which outdoor air is supplied in farm buildings by ventilation systems shall be in accordance with good engineering practice as described in Article 6.2.1.1.

(2) Except as otherwise provided in this Subsection, farm buildings containing a Group G, Division 4 major occupancy need not comply with Sentence (1).

Part 4: Structural Design

Subject: Serviceability

4.1.3.4. Serviceability

(1) A building and its structural components shall be checked for serviceability limit states as defined in Clause 4.1.3.1.(1)(a) under the effect of service loads for serviceability criteria specified or recommended in Articles 4.1.3.5. and 4.1.3.6. and in the standards listed in Section 4.3.

(2) The effect of service loads on the serviceability limit states shall be determined in accordance with this Article and the load combinations listed in Table 4.1.3.4., the applicable combination being that which results in the most critical effect.

(3) Other load combinations that must also be considered are the principal loads acting with the companion loads taken as zero.

(4) Deflections calculated for load types P, T, and H, if present, with load factors of 1.0 shall be included with the calculated deflections due to principal loads.

(5) The determination of the deflection shall consider the following: (a) for materials that result in increased deformations over time under sustained loads, the deflection calculation shall consider the portion of live load, L, that is sustained over time, Ls, and the portion that is transitory, Lt, and (b) the calculated deflection due to dead load, D, and sustained live load, Ls, shall be increased by a creep factor as specified in the standards listed in Section 4.3. to obtain the additional long-term deflection.

(6) The determination of the long-term settlement of foundations shall consider the following:

> *(a) for foundation soil types that result in increased settlement over time under sustained loads, the additional long-term settlements shall be determined for the portion of live load, L, that is sustained over time, Ls, and the portion that is transitory, Lt, and*
>
> *(b) the additional long-term settlements due to dead load, D, and sustained live loads, Ls, shall be calculated from the foundation soil properties provided by a qualified professional geotechnical engineer.*

Part 9

Subject: Penetrations

9.10.9.6. Penetration of Fire Separations

Details on penetration should not to be removed.

(1) Piping, tubing, ducts, chimneys, wiring, conduit, electrical outlet boxes Except as required by Sentence (2) and other similar service equipment that penetrate Articles 9.10.9.7. and 9.10.9.7.A. and as permitted by Article 9.10.9.7.B., penetrations of a required fire separation or a membrane forming part of an assembly required to be a fire separation shall be (a) sealed by a firestop that, when subjected to the fire test method in CAN/ULC-S115, "Standard Method of Fire Tests of Firestop Systems," has an F rating not less than the required fire-resistance rating for the fire separation, (b) tightly fitted or fire stoppedcast in place, provided the penetrating item is made of steel, ferrous, copper, concrete or masonry, or (c) sealed to maintain the integrity of the fire separation.

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(3) Except as provided in Sentences (4) to (12) and Article 9.10.9.7., pipes, ducts, electrical outlet boxes, totally enclosed raceways or other similar service equipment that partly or wholly penetrate an assembly required to have a fire-resistance rating shall be noncombustible unless the assembly has been tested incorporating such equipment.

(4) Electrical wires or other similar wiring enclosed in noncombustible totally enclosed raceways are permitted to partly or wholly penetrate an assembly required to have a fire-resistance rating without being incorporated in the assembly at the time of testing as required in Sentence (3).

(5) Single conductor metal-sheathed cables with combustible jacketing that are more than 25 mm in overall diameter are permitted to penetrate a fire separation required to have a fire-resistance rating without being incorporated in the assembly at the time of testing as required in Sentence (3), provided the cables are not grouped and are spaced a minimum of 300 mm apart.

(6) Electrical wires or cables, single or grouped, with combustible insulation or jacketing that is not totally enclosed in raceways of noncombustible material, are permitted to partly or wholly penetrate an assembly required to have a fire-resistance rating without being incorporated in the assembly at the time of testing as required in Sentence (3), provided the overall diameter of the wiring is not more than 25 mm.

(7) Combustible totally enclosed raceways that are embedded in a concrete floor slab are permitted in an assembly required to have a fire-resistance rating without being incorporated in the assembly at the time of testing as required in Sentence (3), where the concrete provides at least 50 mm of cover between the raceway and the bottom of the slab.

(8) Combustible outlet boxes are permitted in an assembly required to have a fire-resistance rating without being incorporated in the assembly at the time of testing as required in Sentence (3), provided the opening through the membrane into the box does not exceed 160 cm².

(9) Combustible water distribution piping is permitted to partly or wholly penetrate a fire separation that is required to have a fire-resistance rating without being incorporated in the assembly at the time of testing as required in Sentence (3), provided the piping is protected with a fire stop in conformance with Sentence 3.1.9.4.(4).

(10) Combustible sprinkler piping is permitted to penetrate a fire separation provided the fire compartments on each side of the fire separation are sprinklered.

(11) Sprinklers are permitted to penetrate a fire separation or a membrane forming part of an assembly required to have a fire-resistance rating without having to meet the fire stop requirements of Sentence (1), provided the annular space created by the penetration of a fire sprinkler is covered by a metal escutcheon plate in accordance with NFPA 13, "Installation of Sprinkler Systems".

(12) Combustible piping for central vacuum systems is permitted to penetrate a fire separation provided the installation conforms to the requirements that apply to combustible piping in Sentences 9.10.9.7.(2) to (6).

(13) Fire dampers are permitted to penetrate a fire separation or a membrane forming part of an assembly required to have a fire-resistance rating without having to meet the fire stop requirements of Sentence (1), provided the fire damper is, (a) installed in conformance with NFPA 80, "Fire Doors and Other Opening Protectives," or (b) designed specifically with a fire stop.

9.10.9.7 Combustible Piping

(1) Except as permitted provided in Sentences (2) to (6), combustible and (5), piping shall not be used where any part of a piping system partly or wholly penetrates a fire separation required to have a fire resistance rating or penetrates a membrane for drain, waste, vent and central vacuum systems that contributes to the required fire-resistance rating of an assembly.

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(2) Combustible piping is not located in a vertical shaft service space is permitted to penetrate a fire separation required to have a fire-resistance rating or a membrane that forms part of an assembly required to have a fire-resistance rating, provided the piping is sealed at the penetration by a fire stop system that has an F rating not less than the fire-resistance rating required for the fire separation. penetration is protected in accordance with Clause 9.10.9.6.(1)(a)

(3) The rating referred to in Sentence (2) shall be based on CAN/ULC-S115, "Fire Tests of Firestop Systems", with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side.

(4) Combustible drain piping or (b).

(5) Drain piping leading directly from a water closet through a concrete floor slab is permitted to penetrate a horizontal fire separation or a membrane that contributes to the required fire-resistance rating of a horizontal fire separation, provided it leads directly from a non combustible water closet through a concrete floor slab.

(6) (a) the piping is non combustible and the penetration is protected in accordance with Sentence 9.10.9.6.(1), or (b) the piping is combustible and the penetration is sealed by a firestop conforming to Clause 9.10.9.6.(1)(a).

(7) Combustible drain, waste and vent piping is permitted, (a) on one side of a vertical fire separation, provided it is not located in a vertical shaft, and. (b) to penetrate a vertical or horizontal fire separation when the fire compartment on each side of the fire separation is sprinklered.

(8) In a house buildings containing two dwelling units only, combustible drain, waste and vent piping is permitted on one side of a horizontal fire separation.

(9) Water distribution piping is permitted to partly or wholly penetrate a fire separation required to have a fire-resistance rating, provided

(a) the piping is non combustible and the penetration is protected in accordance with Sentence 9.10.9.6.(1), or (b) the piping is combustible and is not located in a vertical shaft, and the penetration is sealed by a firestop conforming to Clause 9.10.9.6.(1)(a).

Subject: Structural Design

<u>9.23.13.11 Wood Roof Trusses</u>

Details on wood roof trusses not to be removed from 9.23.13.11

(1) Roof trusses that are not designed in accordance with Part 4 shall,

(a) be capable of supporting a total ceiling load (dead load plus live load) of 0.35 kPa plus two and two-thirds times the specified live roof load for 24 h, and

(b) not exceed the deflections shown in Table 9.23.13.11. when loaded with the ceiling load plus one and one-third time

(3) Where the length of compression web members in roof trusses described in Sentence (1) exceeds 1.83 m, such web members shall be provided with continuous bracing to prevent buckling.

(4) Bracing required in Sentence (3) shall consist of not less than 19 mm by 89 mm lumber nailed at right angles to the web members near their centres with at least two 63 mm nails for each member.

(5) Where the ability of a truss design to satisfy the requirements of Sentence (1) is demonstrated by testing, it shall consist of a full scale load test carried out in conformance with CSA S307-M, "Load Test Procedure for Wood Roof Trusses for Houses and Small Buildings".

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(6) Where the ability of a truss design to satisfy the requirements of Sentence (1) is demonstrated by analysis, it shall be carried out in accordance with good engineering practice such as described in TPIC, "Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses".

Subject: Referenced Documents

9.27.11.1 Material Standards

CAN/CGSB-93.4 to remain and CSSBI-23M be added

(1) Horizontal and vertical strip steel siding, including flashing and trim accessories, shall conform to CAN/CGSB-93.4, "Galvanized Steel and Aluminum-Zinc Alloy Coated Steel Siding, Soffits and Fascia, Prefinished, Residential".

(2) Steel sheet cladding shall have a minimum thickness of 0.3 mm and conform to CAN/CGSB93.3-M, "Prefinished Galvanized and Aluminum Zinc Alloy Steel Sheet for Residential Use".

9.23.3.4 and 9.23.13.8:

Given the higher number of wind events / tornadoes in Ontario, it is recommended that hurricane straps be used to connect the roof rafters / trusses to the top of the wall framing rather than a few 3" or 3-½" nails as specified in Tables 9.23.3.4 and 9.23.13.8 of current version of OBC.

Section 9.36 Energy Efficiency

OSPE believes that the government should define clear steps and deadlines to achieve a Net Zero Code by 2030. Rather than simply adopting tier 3 as proposed, a phased approach to move to tier 4 and eventually tier 5 is required.

OSPE believes that performance-based codes should be based on an absolute energy target for a reference building. Section 9.36.5 should be aligned with the EnerGuide rating system to enable performance based codes and home energy labelling for small buildings and houses.

OSPE believes that major retrofits of small buildings and houses (part 9) should require a rough-in for future electric vehicle charging stations.

The *Building Code Act, 1992* covers new construction, renovation and change of use of buildings. However, the energy efficiency requirements in the current code appear to apply to new construction only. OSPE believes that building permits for major renovations of small buildings and houses should include the requirement to conform to the latest energy efficiency requirements in 9.36.

Sincerely,

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