



**Concept Plan Review Report:  
Proposed 7-Building Expansion to Existing Self-Storage Facility**

**May 21, 2024**

Tom Livisianos  
Parkhill Storage  
192 County Road 4  
Douro-Dummer, ON K9J 6Y1

---

**Introduction**

Andrew Smith Building Design Inc. was retained to provide review of the latest Concept Plan produced by EcoVue Consulting Services Inc., dated April 17, 2024, to confirm compliance with the Ontario Building Code as it relates to Self-Service Storage Buildings for the proposed 7 prefabricated steel buildings shown on the plan. The following report outlines our observations and recommendations based on this review.

All Ontario Building Code references are taken from Volume 1, Division B, except where indicated, and are included at the end of the report for convenience.

**Observations and Recommendations**

Water Supply for Firefighting Purposes

Refer to Stormwater Management and Floodplain Cut and Fill Balance Report, produced by Tatham Engineering Ltd., dated May 7, 2024, for information regarding water supply and water source.

Access Routes for Fire Department Vehicles

The continuous 9m wide access route currently shown on the Concept Plan between and around the 7 proposed buildings complies with 3.10.4.5.(2). The 12m centreline radius currently shown complies with 3.2.5.6.(1)(b). It should be determined whether the entry portion of the access route (from County Road 4) has the minimum clearance of 5m below the existing overhead wires, per 3.2.5.6.(1)(c). The access route complies with all other clauses under 3.2.5.6., however the local fire department should be consulted to confirm that the proposed gravel surface is suitable for the expected loads imposed by firefighting equipment.

### Building Grouping and Limiting Distance

For the purposes of 3.10.4.2. and 3.10.4.3., the buildings shall be considered as a group to eliminate the requirement for limiting distance between individual buildings within that group.

In terms of limiting distance, all exposed building faces (long side) for Buildings 2 to 6 currently face another building within the group at a distance greater than the 6m minimum, so there are no restrictions for area of unprotected openings. For the exterior side of Buildings 1 and 7, the area of unprotected openings is approximately 77%, which based on the requirements of Table 3.2.3.1.C, requires a limiting distance of 15m\* (\*interpolated based on an Exposing Building Face less than 140m<sup>2</sup>, and a building ratio greater than 10:1). The limiting distance currently shown for these 2 buildings equals or exceeds the 15m minimum. Similarly, the end (short) walls of each building require a minimum limiting distance of 8m. Currently, the limiting distance along the west side of the property is 14m.

Given all the above, the following can be concluded:

- The existing and proposed buildings can be classified as Group F, Division 2, up to 4 Storeys per 3.2.2.70.
- The group of buildings equals 3418.8 sq. m. and therefore faces 2 streets per Table 3.2.2.70.A (73.78% of buildings are within 15m of fire access route)

It should be noted that any reconfiguration of the proposed buildings or fire access route will require all the above data to be re-calculated.

### Sanitary Facilities

Per 3.10.2.7.(2), at least one of the buildings on the property requires a minimum of 2 washrooms, each containing a toilet and sink. It should be confirmed that the existing building contains the minimum number of washrooms and fixtures, and this data should be shown on the plan in the form of a table. If existing facilities are inadequate, new facilities will need to be provided and shall meet the requirements of 3.7.4.

**Conclusion**

In summary, a sufficient supply of water for firefighting purposes is required on the property to serve all buildings, and some investigation may be required to determine existing washroom facilities. The 7 proposed buildings appear to comply with all other requirements for Self-Service Storage Buildings in the Ontario Building Code.

Please let me know if you have any questions or concerns regarding any of the information in this report.

Yours sincerely,

**Drew Johnson**

Andrew Smith Building Design Inc.

A handwritten signature in black ink, appearing to read 'Drew Johnson', with a long horizontal flourish extending to the right.

Senior Designer, BCIN

## Ontario Building Code excerpts referenced in this report:

### 3.2.2.70. Group F, Division 2, up to 4 Storeys

- (1) A *building* classified as Group F, Division 2 is permitted to conform to Sentence (2) provided,
- (a) it is not more than 4 *storeys* in *building height*, and
  - (b) it has a *building area* not more than the value in Table 3.2.2.70.A. or Table 3.2.2.70.B.
- (2) The *building* referred to in Sentence (1) shall be of *combustible construction* or *noncombustible construction* used singly or in combination, and,
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
  - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min,
  - (c) if the *building* is not *sprinklered*, roof assemblies shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, except that in *buildings* not more than 1 *storey* in *building height*, the *fire-resistance rating* is permitted to be waived provided the roof assembly is constructed as a *fire-retardant treated wood* roof system conforming to Article 3.1.14.1., and the *building area* is not more than,
    - (i) 1 600 m<sup>2</sup> if facing one *street*,
    - (ii) 2 000 m<sup>2</sup> if facing two *streets*, or
    - (iii) 2 400 m<sup>2</sup> if facing three *streets*,
  - (d) *loadbearing walls*, columns and arches supporting an assembly required to have a *fire-resistance rating* shall,
    - (i) have a *fire-resistance rating* not less than 45 min, or
    - (ii) be of *noncombustible construction*, and
  - (e) *loadbearing walls*, columns and arches supporting a *fire separation* shall have a *fire-resistance rating* not less than that required for the supported assembly.

**Table 3.2.2.70.A.**  
**Maximum Building Area, Group F, Division 2, up to 4 Storeys**

Forming Part of Sentence 3.2.2.70.(1)

Item	Column 1	Column 2	Column 3	Column 4
	No. of <i>Storeys</i>	Maximum Area, m <sup>2</sup>		
		Facing 1 <i>Street</i>	Facing 2 <i>Streets</i>	Facing 3 <i>Streets</i>
1.	1	3 200	4 000	4 800
2.	2	1 600	2 000	2 400
3.	3	1 070	1 340	1 600
4.	4	800	1 000	1 200

### 3.2.5.6. Access Route Design

- (1) A portion of a roadway or yard provided as a required access route for fire department use shall,
- (a) have a clear width not less than 6 m, unless it can be shown that lesser widths are satisfactory,
  - (b) have a centreline radius not less than 12 m,
  - (c) have an overhead clearance not less than 5 m,
  - (d) have a change of gradient not more than 1 in 12.5 over a minimum distance of 15 m,
  - (e) be designed to support the expected loads imposed by firefighting equipment and be surfaced with concrete, asphalt or other material designed to permit accessibility under all climatic conditions,
  - (f) have turnaround facilities for any dead-end portion of the access route more than 90 m long, and

(g) be connected with a public thoroughfare.

#### **3.10.2.7. Sanitary Facilities**

- (1) Except as provided in Sentence (2), the requirements in Subsection 3.7.4. shall apply.
- (2) Except as permitted in Sentences 3.7.4.1.(2) and (3), two washrooms, each containing a water closet and a lavatory, shall be provided within one of the *buildings* on the property.

#### **3.10.3.4. Provisions for Firefighting**

- (1) Except as provided in Sentences (2) and (3), the requirements in Subsection 3.2.5. shall apply.
- (2) Access routes for fire department vehicles shall be provided and shall be not less than 9 m wide.
- (3) Hydrants shall be located in the access routes required in Sentence (2) so that,
  - (a) for a *building* provided with a fire department connection for a standpipe system or a sprinkler system,
    - (i) a fire department pumper vehicle can be located adjacent to a hydrant, and
    - (ii) the unobstructed path of travel for the firefighter from the vehicle to the fire department connection is not more than 45 m, and
  - (b) for a *building* that is not *sprinklered*, a fire department pumper vehicle can be located in the access route so that the unobstructed path of travel for the firefighter is not more than,
    - (i) 45 m from the hydrant to the vehicle, and
    - (ii) 45 m from the vehicle to every opening in the *building*.

#### **3.10.4.2. Building Area**

- (1) For the purposes of Subsection 3.2.2., *building area* means,
  - (a) the *building area* of each *building*,
  - (b) the total of the *building areas* of all *buildings* as a group, or
  - (c) the total of the *building areas* of any number or group of *buildings*.

#### **3.10.4.3. Spatial Separations**

- (1) Except as provided in Sentences (2) to (4), the requirements in Subsection 3.2.3. shall apply.
- (2) Where the *building area* conforms to Clause 3.10.4.2.(1)(b), the *limiting distance* requirements shall not apply between individual *buildings*.
- (3) Where the *building area* conforms to Clause 3.10.4.2.(1)(c),
  - (a) the *limiting distance* requirements shall apply between each group of *buildings*, but not between individual *buildings* within a group, and
  - (b) the distance between each group of *buildings* shall be not less than 9 m.
- (4) The distance between individual *buildings* within a group shall be not less than 6 m.

#### **3.10.4.5. Provisions for Firefighting**

- (1) Except as provided in Sentences (2) to (7), the requirements in Subsection 3.2.5. shall not apply.
- (2) Access routes for fire department vehicles shall be provided and shall be not less than 9 m wide.
- (3) Hydrants shall be located in the access routes required in Sentence (2) so that the locations conform to Sentence 3.10.3.4.(3).
- (4) The access routes required in Sentence (2) shall conform to the requirements in Sentence 3.2.5.6.(1).

- (5) An adequate water supply for firefighting shall be provided for every *building*.
- (6) Where a sprinkler system is installed, the system shall conform to the requirements in Articles 3.2.5.13., 3.2.5.16. and 3.2.5.18.
- (7) Where *combustible* sprinkler piping is installed, it shall conform to the requirements in Article 3.2.5.14.

#### **A-3.2.5.7. Water Supply.**

This Article requires that an adequate water supply for firefighting is to be provided for every building. However, farm buildings of low human occupancy under the National Farm Building Code of Canada 1995 are exempted. The water supply requirements for interior fire suppression systems such as sprinkler systems and standpipe and hose systems are contained in other standards, for example, NFPA Standard 13, "Installation of Sprinkler Systems", and NFPA Standard 14, "Installation of Standpipe and Hose Systems". This Appendix note focuses only on water supplies that are considered essential to firefighting by fire department or other trained personnel using fire hoses.

Minimum requirements for water supply for firefighting are relevant mainly to building sites not serviced by municipal water supply systems. For building sites serviced by municipal water supply systems where the water supply duration is not a concern, water supply flow rates at minimum pressures would be the main focus of this Appendix note. However, where municipal water supply capacities are limited, it would be necessary for buildings to have on-site supplemental water supply.

An adequate water supply for firefighting should be an immediately available and accessible water supply with sufficient volume and/or flow to enable fire department personnel using fire hoses to control fire growth until the building is safely evacuated, prevent the fire from spreading to adjacent buildings, limit environmental impact of the fire, and provide a limited measure of property protection.

The sources of water supply for firefighting purposes may be natural or man-made. Natural sources may include ponds, lakes, rivers, streams, bays, creeks, springs, artesian wells, and irrigation canals. Man-made sources may include aboveground tanks, elevated gravity tanks, cisterns, swimming pools, wells, reservoirs, aqueducts, tankers, and hydrants served by a public or private water system. It is imperative that such sources of water be accessible to fire department equipment under all climate conditions.

The available water supply would allow arriving fire department personnel to use the water at their discretion when entering a burning building with hose lines. During the search and evacuation operation, hose streams may be needed for fire suppression to limit fire spread. The duration of the water supply should be sufficient to allow complete search and evacuation of the building. Once the search and rescue operations are complete, additional water may be required for exposure protection or fire suppression to limit property damage.

Fire departments serving remote or rural areas often have to respond to a fire with a transportable water supply of sufficient volume for approximately 5 to 10 minutes when using one or two 38 mm hose lines. This would provide minimal hose streams allowing immediate search and rescue operations in small buildings with simple layouts but limited fire suppression capabilities, especially if a fire is already well-established.

For larger more complex buildings, an on-site water supply for firefighting would be needed to provide an extended duration of hose stream use by the fire department to allow search and evacuation of the building, exposure protection and fire suppression. The volume of this on-site water supply would be dependent on the building size, construction, occupancy, exposure and environmental impact potential, and should be sufficient to allow at least 30 minutes of fire department hose stream use.

The recommendations of this Appendix note are predicated on prompt response by a well equipped fire department using modern firefighting techniques, and buildings being evacuated in accordance with established building fire safety plans and fire department pre-fire plans. For buildings constructed in areas where fire department response is not expected at all or in a reasonable time, sprinkler protection should be considered to ensure safe evacuation.

Elementary and secondary schools usually have a record of well established and practiced fire safety plans which would allow complete evacuations within 4 minutes. Because of this and the inherent high level of supervision in these buildings, a reduction of the water supply for firefighting may be considered. It is suggested that the level of reduction should be determined by the local enforcement authority based on the resources and response time of the fire department, and the size and complexity of the buildings.

When designing open, unheated reservoirs as sources of fire protection water, a 600 mm ice depth allowance should be included in the water volume calculations, except where local winter temperature conditions result in a greater ice depth (as typically found on local lakes or ponds). As well, make-up water supplies should be provided to maintain the design volumes, taking into account volume loss due to evaporation during drought periods.

1. Buildings not Requiring an On-Site Water Supply
  - (a) A building would not require an on-site water supply for firefighting if the building satisfies the criteria set out in Item 1(b) or Item 1(c) provided that:
    - (i) the building is serviced by a municipal water supply system that satisfies Item 3(b), or
    - (ii) the fire department can respond with a transportable water supply of sufficient quantity to allow them to conduct an effective search and evacuation of the building, determined on the basis of other guidelines or standards (such as, NFPA 1142, "Standard on Water Supplies for Suburban and Rural Fire Fighting").
  - (b) A building would not require an on-site water supply for firefighting where all of the following criteria are met:
    - (i) the building area is 200 m<sup>2</sup> or less,
    - (ii) the building height is 2 storeys or less,
    - (iii) the building does not contain a care or detention occupancy,
    - (iv) the building does not require a sprinkler system or a standpipe and hose system,
    - (v) the limiting distance from the property line is at least 13 m if the building contains a high hazard industrial occupancy, and
    - (vi) the building constitutes no significant environmental contamination potential due to fire.
  - (c) A building that exceeds 200 m<sup>2</sup> in building area or 2 storeys in building height and that contains a low hazard industrial occupancy may not require an on-site water supply for firefighting if the combustible loading in the building is insignificant (such as that found in cement plants, steel stock storage sheds, etc.), as determined by the chief building official.

## 2. Sprinklered Buildings

For sprinklered buildings, water supply additional to that required by the sprinkler systems should be provided for firefighting using fire hoses in accordance with the hose stream demands and water supply durations for different hazard classifications as specified in NFPA 13, "Installation of Sprinkler Systems".

## 3. Buildings Requiring On-Site Water Supply

- (a) Except for sprinklered buildings and as required by Items 3(c) and 3(e), buildings should have a supply of water available for firefighting purposes not less than the quantity derived from the following formula:

$$Q = K \cdot V \cdot S_{\text{tot}}$$

where

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

S<sub>tot</sub> = total of spatial coefficient values from property line exposures on all sides as obtained from the formula:

$$S_{\text{tot}} = 1.0 + [S_{\text{side1}} + S_{\text{side2}} + S_{\text{side3}} + \dots \text{etc.}]$$

where

S<sub>side</sub> values are established from Figure 1, as modified by Items 3(d) and 3(f), and

S<sub>tot</sub> need not exceed 2.0.

- (b) Water supply flow rates should not be less than that specified in Table 2. Where the water supply is from a municipal or industrial water supply system, the required flow rate should be available at a minimum pressure of 140 kPa.
- (c) The water supply as required in Item 3(a) should not be less than that needed to provide the minimum flow rate specified in Table 2 for a minimum duration of 30 minutes.
- (d) Where a masonry wall with a minimum fire-resistance rating of 2 h, and no unprotected openings is provided as an exterior wall, the spatial coefficient (S<sub>side</sub>) for this side of the building may be considered equal to 0. This masonry wall should be provided with a minimum 150 mm parapet. Firewalls that divide a structure into two or more buildings may be given similar consideration when evaluating the exposure of the buildings to each other.
- (e) In elementary or secondary schools, the water supply determined in accordance with Items 3(a) and 3(b) may be reduced. The level of reduction to be applied would be at the discretion of the local enforcement authority, and should not exceed 30 percent.
- (f) The spatial coefficient S<sub>side</sub> may be considered equal to 0 when the exposed building is on the same property and is less than 10 m<sup>2</sup> in building area.

4. Additions to Existing Buildings

- (a) Except as permitted in Items 4(b) and 4(c), additions to existing buildings should be provided with a water supply for firefighting as required in Items 3(a) to 3(e). Although under Part 11, Renovation, the required water supply is to be based only on the building volume of the addition, it is recommended that the entire building volume of the expanded facility be used to ensure complete evacuation and safety of all the occupants.
- (b) Buildings with new additions falling within any one of the following criteria would not require an additional water supply for firefighting where:
  - (i) the expanded building complies with all the requirements of Item 1(a),
  - (ii) the new addition does not exceed 100 m<sup>2</sup> in building area, or
  - (iii) the new addition exceeds 100 m<sup>2</sup> but does not exceed 400 m<sup>2</sup> in building area, contains an assembly, business and personal services, mercantile or low hazard industrial occupancy, is of noncombustible construction, does not result in a significant increase in exposure to other existing buildings, has no combustible storage or process, and is separated from the existing building by a fire separation with a fire-resistance rating of at least 1 h.
- (c) Where a firewall is provided between the new addition and the existing building, the water supply for firefighting may be determined in accordance with Items 1(a) and 3(a), using only the building volume of the new addition.

Table 1					
Water Supply Coefficient - K					
Type of Construction	Classification by Group or Division in Accordance with Table 3.1.2.1. of the Building Code				
	A-2 B-1 B-2 B-3 C D	A-4 F-3	A-1 A-3	E F-2	F-1
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2., including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2., including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2.	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53
Column 1	2	3	4	5	6



Table 2	
Part 3 Buildings under the Building Code	Required Minimum Water Supply Flow Rate, L/min
One-storey building with building area not exceeding 600 m <sup>2</sup>	1 800
All other buildings	2 700 (if Q ≤ 108 000 L) <sup>(1)</sup> 3 600 (if Q > 108 000 L and ≤ 135 000 L) <sup>(1)</sup> 4 500 (if Q > 135 000 L and ≤ 162 000 L) <sup>(1)</sup> 5 400 (if Q > 162 000 L and ≤ 190 000 L) <sup>(1)</sup> 6 300 (if Q > 190 000 L and ≤ 270 000 L) <sup>(1)</sup> 9 000 (if Q > 270 000 L) <sup>(1)</sup>

**Notes to Table 2:**

(1) Q = KVS<sub>tot</sub> as referenced in Paragraph 3(a)