

**PROPANE FILLING PLANTS AND CONTAINER REFILL CENTRES****Date of Issue:** December 24, 2021**Directive No:** D-G5 051206 7 **Rev:** 03

This directive is being issued by a provincial safety manager pursuant to section 30 of the *Safety Standards Act*.

### Scope

This directive provides details on the design and installation requirements for propane filling plants (PFP) and container refill centres (CRC) in accordance with the CSA B149.2 Propane Storage and Handling Code (CSA B149.2). Information is also included on how heavily populated or congested areas are determined using the BC Building Code for occupant load and restrictions based on CSA B149.2.

These requirements apply to new installations or changes to tank capacity or tank locations at existing facilities. Propane companies operating with a valid Safety Management Plan under the Alternative Safety Approaches Regulation must comply with the requirements of this directive unless an acceptable alternative has been specifically identified under the terms of any current plan.

### Specific Details:

CSA B149.2 section 7.12 states: "In heavily populated or congested areas, the authority having jurisdiction may determine restrictions of individual tank capacity, total storage, distance to line of adjoining property, and other requirements."

**Heavily populated or congested areas** - may include high rises, offices, hotels and below grade occupancies. It is any assessed area which has fifty (50) or more dwelling units intended for human occupancy, or an area occupied by more than three hundred (300) people as provided in the BC Building Code.

#### Requirements:

1. PFP and CRC are to adhere to the heavily populated or congested area determination requirements listed in this directive.
2. An application for design registration must be submitted to, accepted by, and registered by Technical Safety BC **prior** to the start of construction or installation.
3. For commercial or industrial (non-retail) CRC applications, in lieu of design registration submission, the commercial or industrial (non-retail) zoning confirmation and occupancy load determination must be submitted with the installation permit application.

For all other new PFP or CRC installation, submission of the approval or verification documentation from the following associated authorities having jurisdiction is required as part of a design registration application:

- a. The local government where the facility will be located. This may include, but is not limited to, business licensing, issuance of building permit where applicable, or confirmation of site zoning type;
  - b. The fire department responsible for the area where the facility will be located. This may include, but is not limited to, a completed occupancy load determination document if required by a local government bylaw; and
  - c. If not provided in item 3b above, the completion of an occupancy load determination document provided by a registered professional recognized by the local government.
4. Drawings must demonstrate compliance by the applicant to the applicable requirements of CSA B149.2 and CSA B149.1 Natural Gas and Propane Installation Code.
  5. In accordance with the *Safety Standards Act*, all regulated equipment or product, including refuelling equipment, must be certified by a Standards Council of Canada accredited certification body to an adopted standard where one exists.
  6. Tanks located at a CRC must have a maximum propane storage capacity of 5000 USWG (19 000L) total as required by CSA B149.2 section 7.19.

**Note:** CRC with a maximum propane storage capacity in excess of 5000 USWG (19 000L) total are classified as “filling or bulk plants” and are required to maintain a Propane bulk plant operating permit with Technical Safety BC.

7. In accordance with the Safety Standard General Regulation, **prior** to construction or installation taking place, a licensed gas contractor must:
  - obtain a propane dispenser installation permit; and
  - where applicable, obtain a remote dispenser installation permit.
8. In accordance with the Safety Standard General Regulation, **prior** to final approval of all installation permits and before regulated equipment is placed into service, an appropriate operating permit must be obtained by the owner or operator of the site.

## Revision, modification or alteration to existing facilities:

Any revision, modification or alteration of an existing site installation, such as change in container size or container location, must be approved by all applicable authorities having jurisdiction.

A new application for design registration must be submitted to, accepted by and registered by Technical Safety BC **prior** to the start of construction. In addition, an installation permit is required

**before** any alterations are made. It is the sole responsibility of the owner of the propane equipment to ensure compliance is maintained. [Learn more about design registration fuelling stations.](#)

Like-for-like replacement of equipment during normal maintenance will not be construed as a modification of an installation, though permits are required where applicable (i.e., such as the replacement of a dispenser).

## Heavily populated or congested areas:

### Determination

A population density assessment that identifies the site as heavily populated or congested must be provided by:

- the fire department responsible for the area where the facility is to be located; or
- a professional engineer registered with the Association of Professional Engineers and Geoscientists of the Province of British Columbia (Engineers and Geoscientists BC).

Occupant density is determined by the number of dwelling units and by the normal population density load from Table 3.1.17.1 of the BC Building Code, based only on that portion of the building or population within 100 metres from any external surface of the proposed propane tank(s).

See Appendix A for an extract from the BC Building Code relating to occupancy load calculations.

### Consideration of Future Development

When calculating occupancy load, consideration must be given to the development plans of the area. If a building permit has been issued for the area around a proposed installation, any future development must be taken into consideration in the design and assigned occupant load determination of the location.

It is the responsibility of the facility owner to re-evaluate changes to the surrounding population density. Revisions to the installation's population density may necessitate modifications to the installation such that it continues to comply with required safety clearances and fire protection. If modifications cannot be carried out the propane container may have to be removed.

### Restrictions based on CSA B149.2 section 7.12

1. Where a location is determined to be **heavily populated or congested**, a hazard and risk assessment and safety management plan sealed by a professional engineer registered with Engineers and Geoscientists BC must be supplied to, and confirmed as accepted by, the local government jurisdiction and fire department. This plan must be supplied as part of the required documentation in order to apply for Technical Safety BC design registration.

## DIRECTIVE

2. Propane Filling or Bulk Plants must not be located in a heavily populated or congested area.
3. A propane tank that is used for dispensing and located in a heavily populated or congested area must be buried underground or vaulted underground. The installation must comply with all applicable sections of the CSA B149.2. Application for installation of an underground tank is to be included with the gas fuelling station design registration. Learn more about buried pressure vessels [here](#).

## Other Agencies

Local governments, fire departments, and other applicable Federal and Provincial agencies may have approval or permit requirements for other aspects of propane dispensing operations, such as land use, overall site and non-dispensing equipment. Approval by Technical Safety BC **does not** constitute approval by any other agency. The applicant is responsible for identifying and complying with all applicable requirements from all agencies. Approval and verification documentation from all applicable agencies must be submitted to Technical Safety BC prior to acceptance of the design registration.

Vicky Kang  
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Provincial Safety Manager, Gas

### **References:**

*Safety Standards Act*  
Gas Safety Regulation  
Safety Standards General Regulation  
CSA B149.2 Propane Storage and Handling Code  
CSA B149.1 Natural Gas and Propane Installation Code  
BC Building Code 2018

## Appendix A:

Minimum occupant load must be determined by BC Building Code Table 3.1.17.1, unless it can be shown that the area will in fact be occupied by fewer persons. In other words, Table 3.1.17.1 is the default minimum occupant load for design purposes. For instance, in a highly automated manufacturing operation the *occupant load* estimates might be relaxed from those calculated from Table 3.1.17.1, provided there is reasonable assurance that the *occupant load* will not be exceeded in the future.

Table 3.1.17.1 of the BC Building Code and its associated notes are produced below.

### Table 3.1.17.1 - BC Building Code Occupant Load Determination

1. The occupant load of a floor area or part of a floor area is to be determined based on:
  - a. the number of seats in an assembly occupancy having fixed seats,
  - b. 2 persons per sleeping room in a dwelling unit, or
  - c. the number of persons for which the area is designed, but not less than that determined from Table 3.1.17.1. for occupancies other than those described in Clauses (a) and (b), unless it can be shown that the area will be occupied by fewer persons.

Type of Use of <i>Floor Area</i> or Part Thereof	Area per person, m <sup>2</sup>
<b>Assembly uses</b>	
space with fixed seats	(1)
space with non-fixed seats	0.75
stages for theatrical performances	0.75
space with non-fixed seats and tables	0.95
standing space	0.40
stadia and grandstands	0.60
bowling alleys, pool and billiard rooms	9.30
classrooms	1.85
school shops and vocational rooms	9.30
reading or writing rooms or lounges	1.85
dining, beverage and cafeteria space	1.20
laboratories in schools	4.60
<b>Care, treatment or detention uses</b>	
suites	(2)
care, treatment and sleeping room areas	10.00
detention quarters	11.60
<b>Residential uses</b>	
dwelling units	(2)
dormitories	4.60
<b>Business and personal services uses</b>	
personal services shops	4.60
offices	9.30
<b>Mercantile uses</b>	
basement and first storeys	3.70
second storeys having a principal entrance from a pedestrian thoroughfare or a parking area	3.70

other storeys	5.60
<b>Industrial uses</b>	
manufacturing or process rooms	4.60
storage garages	46.00
storage spaces (warehouse)	28.00
aircraft hangars	46.00
<b>Other uses</b>	
cleaning and repair goods	4.60
kitchens	9.30
storage	46.00
public corridors intended for occupancies in addition to pedestrian travel	3.70 <sup>(3)</sup>

**Note to Table 3.1.17.1.:**

1. <sup>(1)</sup> See Clause 3.1.17.1.(1)(a).  
<sup>(2)</sup> See Clause 3.1.17.1.(1)(b) (apply values for dwelling units to suites of care occupancy)  
<sup>(3)</sup> See Note A-3.3.
2. If a floor area or part thereof has been designed for an occupant load other than that determined from Table 3.1.17.1., a permanent sign indicating that occupant load shall be posted in a conspicuous location.
3. For the purposes of this Article, mezzanines, tiers and balconies shall be regarded as part of the floor area.
4. If a room or group of rooms is intended for different occupancies at different times, the value to be used from Table 3.1.17.1. shall be the value which gives the greatest number of persons for the occupancies concerned.