



# TSASK

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GAS INSPECTIONS



**2020 Gas Contractor Presentation  
CSA B149.1-20**





CSA B149.1:20  
National Standard of Canada



**Natural gas and propane installation code**

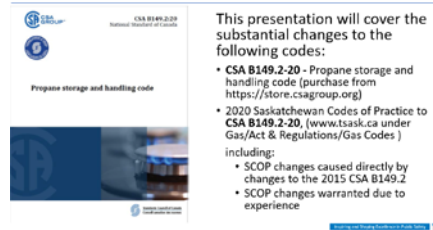


This presentation will cover the substantial changes to the following codes:

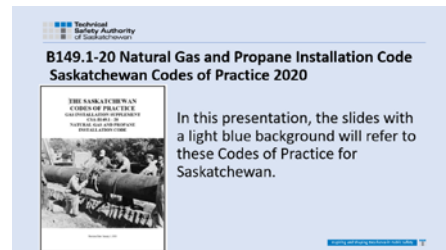
- **CSA B149.1-20** Natural gas and propane installation code (purchase from <https://store.csagroup.org>)
- 2020 Saskatchewan Codes of Practice to **CSA B149.1-20**, ([www.tsask.ca](http://www.tsask.ca) under Gas/Act & Regulations/Gas Codes )
  - including:
    - SCOP changes caused directly by changes to the 2015 CSA B149.1
    - SCOP changes warranted due to experience



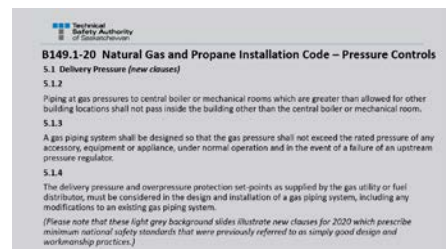
# B149.1-20 – Natural Gas and Propane Installation Code - Color Coding in this Presentation



- White background slides refer to the national code.



- Light blue background slides refer to the Saskatchewan Codes of Practice.

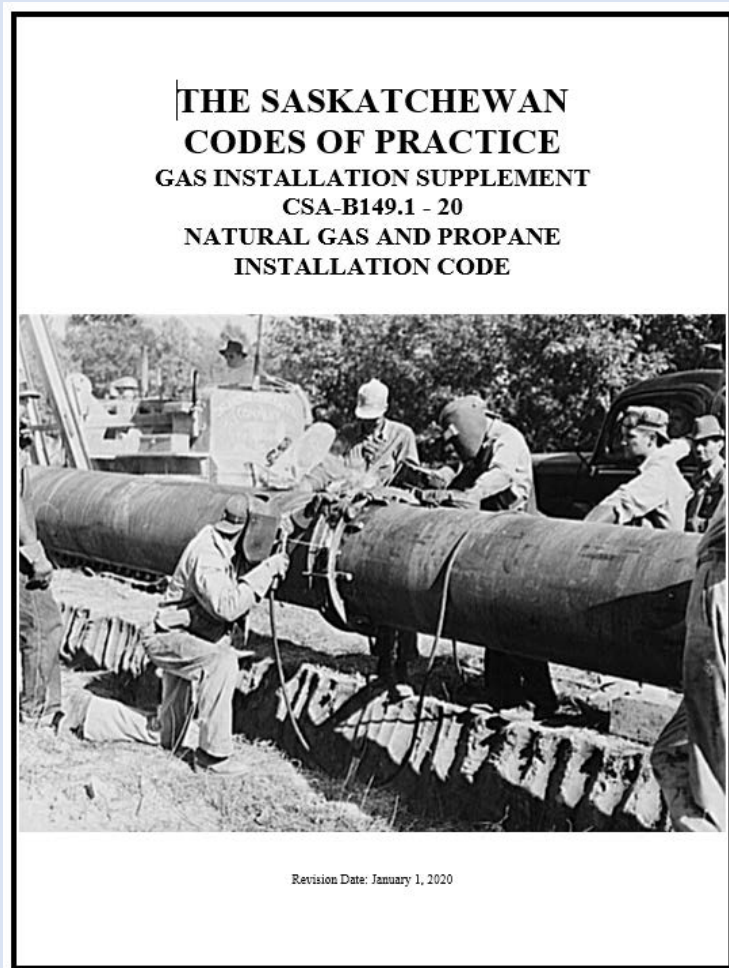


- Light grey background slides are issues specific to good design and workmanship

clauses which might be described as...  
Do we really have to say this??



# B149.1-20 Natural Gas and Propane Installation Code Saskatchewan Codes of Practice 2020



In this presentation, the slides with a light blue background will refer to these Codes of Practice for Saskatchewan.

# What are the Saskatchewan Codes of Practice?

- Collection of requirements and interpretations that are unique to Saskatchewan.
- Formed by:
  - amending clauses in the national code;
  - adding wording, illustrations or charts to clarify national code requirements; or
  - adding new clauses addressing specific issues unique to the Saskatchewan environment.

# Scope of this Presentation

## 2020 CSA code overview

- The  $\Delta$  Delta Symbol (previously used to identify changes in the CSA codes) is no longer used by CSA.
- We will only be covering those clauses having a substantial technical change.
- We will cover only the technical changes to the Saskatchewan Codes of Practice.
- These codes will be enforced on all permits received **May 1, 2021 & after**.

# Scope of this Presentation

- The items addressed in this presentation are only to identify substantial **technical** changes to the Canadian Code and the Saskatchewan Codes Of Practice.
- For example -the new definition of “**gas piping system**” is “all components that convey gas or liquids, such as piping, tubing, valves, hoses, and fittings, from the point of delivery to the inlet of the appliance”. Every clause in the code that once read “**gas piping or tubing**”, now reads “**gas piping system**”. We will not cover these 59 changes, clause by clause.
- **You are strongly encouraged to review the 2020 Code and Saskatchewan Codes of Practice in their entirety.**



**CSA B149.1:20**  
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**Natural gas and propane installation code**



This presentation will proceed through the substantial changes to CSA B149.1-20 and will jump to the resulting changes to the Saskatchewan Code of Practice to B149.1 (slides with a light blue background) as these areas come up.







**CSA B149.1:20**  
National Standard of Canada



## Natural gas and propane installation code



# 3 Definitions



## B149.1-20 Natural Gas and Propane Installations - Definitions

Please refer to the code to review the following new, revised and deleted definitions:

**New:**

**Delivery Pressure**

**Design Pressure**

**Fixed Liquid Level Gauge**

**Gas Piping System**

**Line Relief Valve**

**Lock-up (positive shut-off)**

**Piping / Tubing**

**High Pressure Regulator**

**Rated Pressure**

**Residential Fueling Appliance**

**Safe Location**

**Second Stage Propane Reg.**

**Spray Area**

**Supply Pressure**

**Revised:**

Accessory

Appliance

Gas Connector

Mechanical air intake

Line Pressure Regulator

Line Relief Valve

**Deleted:**

~~Primary Air/Secondary Air~~



**CSA B149.1:20**  
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## Natural gas and propane installation code



# 4 General

## 4.1 Application



## B149.1-20 Natural Gas and Propane Installations - General

### 4.1.4 *(revised)*

Where a conflict exists between the manufacturer's ~~certified~~ installation instructions and this Code, the requirements of this Code shall prevail unless otherwise approved.

*The word "certified" has been removed.*

*Rationale: "because not all installation instructions are certified"*

*Please note that in this presentation:*

- *Clauses with major revisions will be shown in normal type.*
- *Words added into a clause will be shown **bold and underlined**.*
- *Words deleted from a clause will be shown ~~strikethrough in red~~.*
- *Comments (like these) will be in italic type with blue highlighting*



**CSA B149.1:20**  
National Standard of Canada



## Natural gas and propane installation code



# 4 General

## 4.7 Electrical connections and components



## B149.1-20 Natural Gas and Propane Installation Code – General

### **Old 4.7.3 (2015)**

All interior metal gas piping that may become energized shall be made electrically continuous and shall be bonded in accordance with the requirements of the local electrical code or, in the absence of such, the *Canadian Electrical Code, Part I*.

### **New 4.7.3 (2020)**

All interior metal gas piping connected to a gas-fired appliance with an electrical connection shall be made electrically continuous and shall be bonded to the electrical system by a #6 copper or a #4 aluminum bonding conductor with the connection made accessible after the installation and in accordance with the requirements of the local electrical code or, in the absence of such, the *Canadian Electrical Code, Part I*, except where any of the following conditions are met:

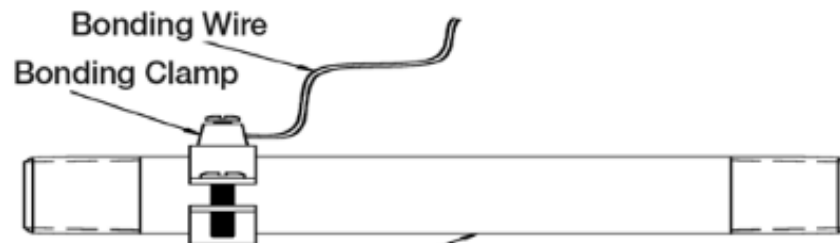
- a) Gas piping and tubing shall be considered to be bonded to the electrical system when it is connected to an appliance connected to a bonding conductor of the circuit supplying the appliances.
- b) Bonding of piping other than CSST (requiring bonding per Clause 4.7.4) is not required where a gas appliance is not connected to an electrical circuit breaker supplying the appliances.

## B149.1-20 Natural Gas and Propane Installation Code – General

*New* 4.7.4 (2020)

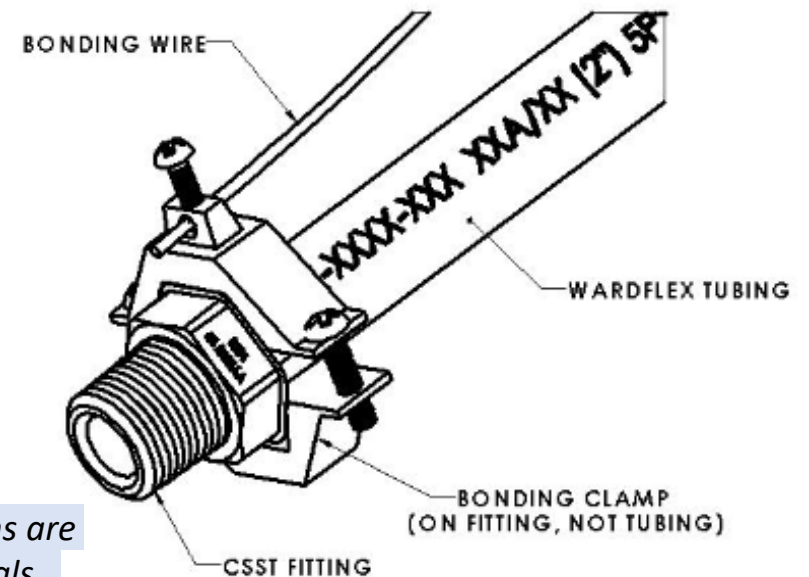
Unless otherwise certified to protect from the effects of lightning strikes, CSST systems or CSST contained within a piping system shall be bonded in accordance with the manufacturer's installation instructions and as follows:

- a) a bonding conductor shall be:
  - i) connected to each end of the CSST tubing; or
  - ii) connected to the inlet end of the CSST tubing with the other end of the bonding conductor connected to the appliance disconnect switch or the electrical distribution panel; and
- b) the bonding connection point at the CSST shall be to the rigid pipe or tubing connected to the CSST and not the CSST itself.



Bond clamp to rigid pipe or rigid component. (Do not attach clamp to CSST)

*These illustrations are from CSST manuals. They are not printed in the code.*





**CSA B149.1:20**  
National Standard of Canada



## Natural gas and propane installation code



# 5 Pressure controls

## 5.1 Delivery pressure





# B149.1-20 Natural Gas and Propane Installation Code – Pressure Controls

## 5.1 Delivery Pressure *(new clauses)*

### 5.1.2

Piping at gas pressures to central boiler or mechanical rooms which are greater than allowed for other building locations shall not pass inside the building other than the central boiler or mechanical room.

### 5.1.3

A gas piping system shall be designed so that the gas pressure shall not exceed the rated pressure of any accessory, equipment or appliance, under normal operation and in the event of a failure of an upstream pressure regulator.

### 5.1.4

The delivery pressure and overpressure protection set-points as supplied by the gas utility or fuel distributor, must be considered in the design and installation of a gas piping system, including any modifications to an existing gas piping system.

*(Please note that these light grey background slides illustrate new clauses for 2020 which prescribe minimum national safety standards that were previously referred to as simply good design and workmanship practices.)*



**CSA B149.1:20**  
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**Natural gas and propane installation code**



# 5 Pressure controls

## 5.2 Pressure regulators



# B149.1-20 Natural Gas and Propane Installation Code – Pressure Controls

## 5.2 Pressure Regulators (*new clauses*)

### 5.2.1.1

Gas shall be supplied to an appliances, equipment, or accessory at a normal operating pressure that is within the pressure range specified on the appliance's, equipment's, or accessory's rating plate, or as indicated by the manufacturer's instructions.

### 5.2.1.2

One or more pressure regulators in conjunction with any required overpressure protection devices shall be installed if required to meet Clause 5.2.1.1

### 5.2.1.3

Every pressure regulator shall be

- a) suitable for the gas;
- b) of sufficient size to provide the required flow of gas;
- c) factory set or field-adjusted to provide, under normal operating conditions, an outlet pressure required for the gas piping system at the extremes of inlet pressures to which the regulator can be exposed; and
- d) capable of supplying the gas pressure as required by Clause 5.2.1.1.

# B149.1-20 Natural Gas and Propane Installation Code – Pressure Controls

## 5.2 Pressure Regulators *(revised headings)*

### 2015

5.2.2 Additional requirements for pressure regulators for propane applications

5.2.3 Additional requirements for pressure regulators for natural gas applications



### 2020

5.2.2 Additional requirements for delivery pressures of 2 psig (14 kPa) or less

5.2.3 Additional requirements for delivery pressures greater than 2 psig (14 kPa)

5.2.4 Additional requirements for pressure regulators for natural gas applications

*In previous editions, the code divided regulators into a) those for natural gas, and b) those for propane. This section has been re-organized reflecting that the rules for low pressure regulators are identical for both propane and natural gas applications for the majority of services, and that higher delivery pressure regulators (over 2 psig) require separate rules. This is mainly a re-organization of the same rules.*



**CSA B149.1:20**  
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## Natural gas and propane installation code



# 5 Pressure controls

## 5.3 Overpressure protection devices

*(renamed from 2015 – 5.3 Relief Devices)*



## B149.1-15 Natural Gas and Propane Installation Code – Pressure Controls

### *Old* 5.3 Relief Devices (2015)

Except as specified in Clauses 5.2.2.4 and 5.2.3, when a line pressure regulator is not equipped with an internal relief device, it shall have immediately downstream an overpressure protection device or a line relief device as required in Clause 5.2.1.5(b), with a discharge setting of either

- (a) not less than 2 times and not more than 3 times the delivery pressure on systems operating up to 5 psig (35 kPa); or
- (b) not less than 1.5 times and not more than 2 times the delivery pressure on systems operating at more than 5 psig (35 kPa).

The relieving pressure setting of the line relief device shall be not higher than that of the lowest-rated component or accessory located downstream.

*This was the 2015 code rule covering relief devices for line pressure regulators which for 2020 has been completely rewritten.*

## B149.1-20 Natural Gas and Propane Installation Code – Pressure Controls

### New 5.3 Relief Devices Overpressure protection devices (2020)

**5.3.1** Except as permitted in Clause 5.3.2, a line pressure regulator or a high pressure regulator shall be provided with an overpressure protection device.

*Note: Class I line pressure regulators certified to ANSI Z21.80/CSA 6.22, and rated for inlet pressures of either 5 psig (35 kPa) or 10 psig (70 kPa), are supplied with factory-installed overpressure protection devices to limit the downstream pressure to 2 psig (13.8 kPa) in the event of failure of the regulating mechanism, which is acceptable for certified appliances with a maximum inlet gas pressure of 14 in wc. See Annex K.*

**5.3.2** Where a line pressure regulator is certified to ANSI Z21.80/CSA 6.22 and if the inlet pressure to the line pressure regulator is 2 psig (14 kPa) or less, an overpressure protection device shall not be required.

**5.3.3** Where the outlet pressure of a pressure regulator is greater than 14 in wc (3.5 kPa), the setting of the overpressure protection device shall be set in accordance with Table 5.2.

**5.3.4** An overpressure protection device shall be set to operate at the pressures specified in Table 5.2. Additionally, if an internal relief valve or line relief valve is used as the overpressure protection device, it shall be sized to fully relieve the rated capacity of the line pressure regulator.

*(please note the two references to Table 5.2)*

# B149.1-20 Natural Gas and Propane Installation Code – Pressure Controls

**Table 5.2**  
**Overpressure protection device setpoint requirements**  
(See Clauses [5.3.3](#) and [5.3.4](#) and Figure [8.2](#).)

Appliance or equipment maximum rated inlet gas pressure	Maximum allowable downstream pressure
14 in w.c. (3.5 kPa) or less	2 psi (14 kPa)
Greater than 14 in w.c. (3.5 kPa) up and including 2 psi (14 kPa)	5 psi (35 kPa)
Greater than 2 psi (14 kPa) up to and including 10 psi (70 kPa)	5 psi (35 kPa) or 2 times maximum rated inlet pressure, whichever is greater
Greater than 10 psi (70 kPa)	10 psi (70 kPa) over maximum rated inlet pressure

**Notes:**

- 1) *The requirements of this Table shall apply to Class 2 line pressure regulators certified to ANSI Z21.80/CSA 6.22 (i.e., those with a maximum outlet pressure of 2 psi).*
- 2) *The installer might need to consult with pressure regulator manufacturers to determine how best to remain within the maximum allowable downstream pressures.*

*Table 5.2 is no longer the Clearance from Discharge Table. Table 5.2 is the now the new Overpressure protection device (OPD) setpoint table.*





# B149.1-15 Natural Gas and Propane Installation Code – Pressure Controls

**Old (2015)**

**Table 5.2**  
**Clearance from discharge, ft (m)**

(See Clauses 5.5.9, 8.14.8, and 10.1.7.)

	Natural gas (ANSI Z21.80/ CSA 6.22 certified overpressure protection device)	Natural gas	Propane
Building opening*	1 (0.3)	3 (1)	3 (1)
Appliance vent outlet†	1 (0.3)	3 (1)	3 (1)
Moisture exhaust duct‡	3 (1)	3 (1)	3 (1)
Mechanical air intake	3 (1)	10 (3)	10 (3)
Appliance air intake	1 (0.3)	3 (1)	10 (3)
Source of ignition	1 (0.3)	3 (1)	10 (3)

\*Outdoor air intakes that are less than 8 in (200 mm) in diameter or equivalent area shall be considered a building opening in using this Table.

†See also Clause 8.14.8.

‡Applies to gas or electric dryer termination.

**Note:** The outdoor air intake referred to in this Table is the ducting that goes from the outside of the structure and terminates into the return air plenum before the appliance, sometimes referred to as a fresh-air intake.

*This was the previous Table 5.2 - the clearance from discharge Table. Please note the 2nd column title -clearances from a “CSA 6.22-certified overpressure protection device.” Since SaskEnergy service regulators do not comply, this column was largely ignored in Saskatchewan.*

# B149.1-20 Natural Gas and Propane Installation Code – Pressure Controls

**New 2020**

**Table 5.3**  
**Clearance from discharge, ft (m)**  
(See Clause 5.6.4, 8.14.8, and 10.1.9.)

	Reduced clearance for natural gas as permitted in Clause 5.6.4	Natural gas	Propane
Building opening*	1 (0.3)	3 (1)	3 (1)
Appliance vent outlet†	1 (0.3)	3 (1)	3 (1)
Moisture exhaust duct‡	3 (1)	3 (1)	3 (1)
Mechanical air intake	3 (1)	10 (3)	10 (3)
Appliance air intake	1 (0.3)	3 (1)	10 (3)
Source of ignition	1 (0.3)	3 (1)	10 (3)

\*Outdoor air intakes that are less than 8 in (200 mm) in diameter or equivalent area shall be considered a building opening in using this Table.

†See also [Clause 8.14.8](#).

‡Applies to gas or electric dryer termination.

Note: The outdoor air intake referred to in this Table is the ducting that goes from the outside of the structure and terminates into the return air plenum before the appliance, sometimes referred to as a fresh-air intake.

*The new Table 5.3 contains the same rules, where the permission to use the reduced clearances shown in the 2nd column is changed to read “as permitted” by the new clause 5.6.4.*



## B149.1-20 Natural Gas and Propane Installation Code – Pressure Controls

### **New** 5.6.4

The discharge from overpressure protection devices, relief devices, and internal relief valves, and the termination of any other vent not eligible to be vented into a ventilated space, shall terminate outdoors with the clearances specified in Table 5.3.

The clearances in Table 5.3 may be reduced for natural gas in accordance with the second column of this table where a pressure regulator meets the following requirements

- (a) the service regulator is certified to CSA 6.18 and equipped with an overpressure shut-off device;
- (b) the pressure regulator is certified to ANSI Z21.80/CSA 6.22 and equipped with a vent limiting device that vents gas at a rate not exceeding 2.5 scf/h (0.0706 m<sup>3</sup>/h) or less; or
- (c) the pressure regulator is equipped with an overpressure shut-off device which vents gas at a rate not exceeding 2.5 scf/h (0.076 m<sup>3</sup>/h) or less.

*Note: The reduced clearances from SaskEnergy regulators to building openings, outlets, intakes, and sources of ignition are permitted only for those service regulators having high pressure shut-off.*

*SaskEnergy service regulators having high pressure shut-off (meeting {a} above), are usually farm-service regulators that are painted red.*

*Most residential service regulators (painted grey) have low-pressure-shutoff only and therefore are not eligible for the reduced clearances.*

## B149.1-20 Natural Gas and Propane Installation Code – Pressure Controls

*Clause 5.5.4 is re-written as Clause 5.5.2.1 – Added wording underlined in bold*

### 5.5.2.1

Except as specified in Clause 5.5.5, when a pressure regulator with internal relief or a line relief valve is installed, it shall be vented separately to a safe location outdoors by a vent line

- (a) of steel pipe, or of seamless steel tubing or copper tubing **or corrugated stainless steel tubing (CSST)** that complies with Clause 6.2; and
- (b) of a size
  - (i) at least equal to the nominal pipe size of the vent outlet of the valve or regulator increased as specified by the manufacturer's instructions **and for CSST increased by one pipe size diameter**; or
  - (ii) in the absence of manufacturer's instructions, increased by one pipe size diameter for every 50 ft (15 m) or part thereof that the vent line extends beyond the initial 50 ft (15 m). This increase shall be made at the connection on the device.

*This clarification eliminates SCOP's 5.5.1 and 5.5.4 that disallowed CSST as a permissible material for vent lines. Gas Inspections stresses that if CSST vent lines cannot be installed without being protected from kinking or damage, this provision will be reviewed.*

## B149.1-20 Natural Gas and Propane Installation Code – Pressure Controls

*New clauses to compile previous requirements and to detail the adequacy of the ventilation required for an area to be considered a ventilated space.*

### 5.5.4.2

For line pressure regulators with inlet pressure of 5 or 10 psig (35 or 70 kPa), a line pressure regulator shall be exempt from compliance with Clause 5.2.1.8 provided that

- a) the pressure regulator is equipped with a leak limiting system orifice to limit the escape of gas from the vent openings, even in the event of a main diaphragm failure, to less than 2.5 ft<sup>3</sup>/h (0.0706 m<sup>3</sup>/h) of a gas having a specific gravity of 0.6;
- b) the pressure regulator is equipped with an overpressure protection device consisting of either a monitoring regulator or an overpressure shut-off device, which is
  - i) set to limit the downstream pressure to 2 psig (14 kPa) or less; and
  - ii) supplied as a complete unit with the line pressure regulator;
- c) the pressure regulator and its overpressure protection device is certified to ANSI 21.80/CSA 6.22; and
- d) the pressure regulator is installed in a ventilated space.

### 5.5.4.3

For the purpose of Clause 5.5.4, a space shall be considered to be a ventilated space where the accumulation of gas in the space does not exceed 25% of the lower explosion limit of the gas.



**CSA B149.1:20**  
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**Natural gas and propane installation code**



## 6 Piping and Tubing Systems, Hose and Fittings



## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

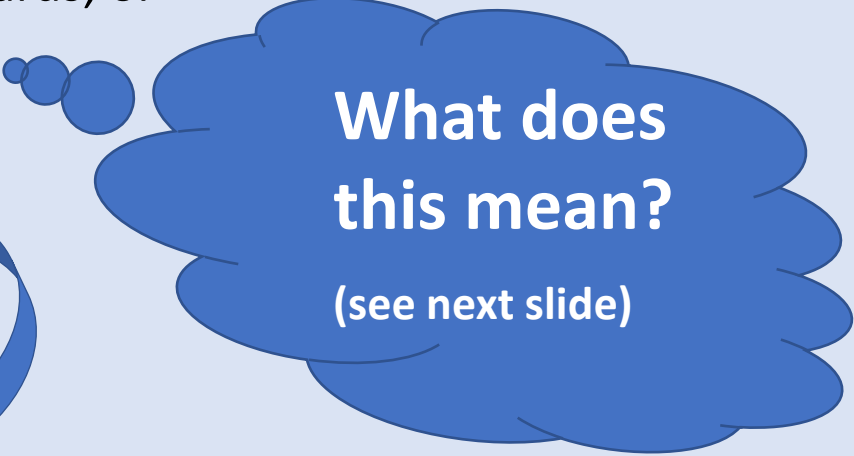
### 6.2.2 (*added wording underlined in bold*)

A fitting used with steel pipe shall be

- (a) either malleable iron or steel and shall comply with **the material selection requirements of CSA Z662: or the applicable ASME B16 series of standards**; or
- (b) certified to Standard ANSI LC-4/CSA 6.32.

**When schedule 80 pipe is required, the minimum class of fitting used with the pipe shall be class 300.**

*This new note in the code eliminates SCOP clause:*  
~~6.2.3.1 All fittings on schedule 80 piping systems shall be minimum Class 300.~~



**What does  
this mean?**  
(see next slide)

*(Please note the slides which are outlined in light blue in this presentation. These reflect changes in the Saskatchewan Code of Practice for CSA B149.1-20 which are in response to the changes made to the national code).*

## **B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems**

### **6.2.2.1** *(New SCOP)*

“CSA 6.32/ANSI LC-4” is the certification code for “Press-Connect Metallic Fittings For Use In Fuel Gas Distribution Systems” such as ViegaMegaPressG.

*This SCOP is to simply clarify that Press-Connect Fittings are permitted by clause 6.2.2*



## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.2.3 *(rewritten –significant added wording underlined in bold)*

A gas piping system using natural gas or propane vapour phase with operating pressures up to and including 125 psig (860 kPa) shall comply with either the following:

- (a) **Piping shall be at least sch-10 for NPS ½”-to-2”**. **When using sch-10 to less than sch-40, piping shall be located indoors and joints shall use fittings certified to CSA 6.32/ANSI LC-4.** ← *alias; Press Connect*
- (b) Piping shall be at least sch-40 for NPS 2½”-to-10”.
- (c) Pipe larger than NPS 10 shall be at least standard weight.

A gas piping system using natural gas or propane vapour phase with operating pressures exceeding 125 psig (860 kPa) and all liquid piping systems shall comply with either of the following:

- (a) For pipe sizes up to and including NPS 10.
  - (i) Piping shall be at least sch-40 when using welded or flanged joints
  - (ii) Piping shall be at least sch-80 when using threaded joints. Threaded joints shall be threaded or threaded and back welded.
- (b) Pipe larger than NPS 10 shall be at least standard weight.

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.9.1 *(added wording underlined in bold)*

Joints in steel piping shall be threaded, flanged, press-connected, or welded, and shall be as permitted in Clause 6.15.2. **When mating flanges, they shall be of the same face type and rating.**

*This new wording in the code eliminates SCOP clause:*

#### ~~6.9.1.1~~

~~A raised-face flange shall connect to a raised-face flange. A flat-faced flange shall connect to a flat-faced flange.~~

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.9.4 *(the strikethrough text is replaced with everything below)*

The acceptance criteria for any welds shall

~~be as specified in Clause 7.10.2 of CSA Z662 or other approved methods.~~

- (a) for design pressures greater than 250 psi (1720 kPa), comply with the visual and radiographic inspection requirements of Clause 7 of CSA Z662 or other approved methods;
- (b) for design pressures between 100 psi (700 kPa) and 250 psi (1720 kPa), be in accordance with the visual and radiographic inspection requirements of Chapter IV of ANSI/ASME B31.3; or
- (c) for design pressures of 100 psi (700 kPa) and less, be by visual inspection of the external weld surface, as well as the internal weld surface where accessible without the use of special tools.

Acceptance criteria of the weld shall be in accordance with the requirements of Annex J.

Notes:

- 1) For clarification, the use of the word “inspection” in CSA B149.1 means the same as “examination” in ANSI/ASME B31.3.
- 2) Hand mirrors and flashlights are not considered to be special tools.

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.16.15 (*added wording underlined in bold*)

The piping or tubing entering a building shall be protected from vehicular damage by one of the following means:

(a) Posts shall

- (i) be not less than 12 in (300 mm) from the riser, regulator, or equipment;
- (ii) be spaced not more than 42 in (1050 mm) apart;
- (iii) be buried not less than 36 in (900 mm) below grade;
- (iv) extend at least 30 in (760 mm) above grade; and
- (v) be one of the following:
  - (1) 4 in (100 mm) capped steel pipe;
  - (2) 4 in (100 mm) tubing filled with concrete;
  - (3) 8 in (200 mm) pressure-treated wood, **either square or round**; or
  - (4) 6 in (150 mm) minimum dimension reinforced concrete.

(b) Guardrails shall be

- (i) not less than 12 in (300 mm) from the riser, regulator, or equipment;
- (ii) of the steel deep beam type, 12 in (300 mm);
- (iii) supported by 6 in (150 mm) minimum pressure-treated wooden posts, either square or round, located not more than 42 in (1050 mm) apart, centre to centre and **buried not less than 36 in (900 mm) below grade**; and
- (iv) located so that the top of the beam is not less than 24 in (610 mm) nor more than 30 in (760 mm) above grade.



## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.18 Manual shut-off valves (*added wording underlined in bold*)

#### 6.18.1

A manual shut-off valve shall be ~~of the plug, ball, or eccentric type~~ **certified to CSA 3.11, CSA 3.16, or ANSI Z21.15/CSA 9.1, or approved for use with gas**, and it shall not be subjected to either a temperature or a pressure outside of its certified rating range.

*New SCOP*

#### 6.18.1.1

A manual shut-off valve on a liquid propane piping system shall be certified to UL 125, or approved for use with liquid propane.

*(Gas Inspections will continue to accept NACE rated valves where necessary for sour gas service.)*

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.23 Purging of gas piping systems after leak testing

*This entire section on purging has been revised for clarity. On the next two slides we will present .....*

- *New clause and Table providing the conditions under which a system must be purged to the outdoors, and*
- *Conditions under which a system may be purged indoors.*

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

*New clause & Table providing the conditions under which a system must be purged outdoors*

**6.23.1** A gas piping system shall be purged to the outdoors using approved engineering practices or in accordance with Clauses 6.23.2 through 6.23.4 where it meets either of the following:

- a) the gas pressure in the gas piping system is greater than 2 psig (14 kPag); or
- b) the gas piping system being purged contains one or more sections of pipe, tubing, or gas hose meeting the size and length described in Table 6.4.

**Table 6.4**  
(See Clauses 6.23.1 to 6.23.3.)

Nominal piping, tubing, or gas hose size in inches	Length of piping, tubing, or gas hose in feet (m)
Greater or equal to 2 ½ but smaller than 3	Greater than 50 (15.2)
Greater or equal to 3 but smaller than 4	Greater than 30 (9)
Greater or equal to 4 but smaller than 6	Greater than 15 (5)
Greater or equal to 6 but smaller than 8	Greater than 10 (3)
Greater than 8	Any length

Note: Corrugated stainless steel tubing of size 2 in or less shall be sized accordingly to the same as piping.

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### *Conditions under which a system may be purged indoors*

**6.23.6** A gas piping system not meeting the conditions specified in clause 6.23.1 may be purged either

- a) to the outdoors, in accordance with clause 6.23.4, or
- b) to the indoors, in accordance with clause 6.23.7, or
- c) in accordance with good engineering practice.

**6.23.7** When the conditions in clause 6.23.6 allow it, a gas piping system shall be purged in an indoor space only in accordance with one of the following options:

- a) The gas in the piping system shall be ignited at an appliance having an input rating up to and including 400 000 Btu/h (120 kW) with a readily accessible burner not located in a combustion chamber. Such burner shall be provided with a continuous source of ignition and a continuously burning flame shall be maintained at the burner port(s) until a stable gas flame is established; or
- b) For an appliance not equipped with a continuous pilot, in accordance with the procedure described in Annex H shall be used at an appliance not equipped with a continuous pilot.
- c) When there is an open point of discharge during the purge, it shall be continuously attended by a qualified person.





**CSA B149.1:20**  
National Standard of Canada



## Natural gas and propane installation code



# 7 Installations of Specific Types of Appliances



## B149.1-20 Natural Gas and Propane Installation Code – Installation of Specific Types of Appliances

*(added wording underlined in bold)*

### 7.20.9

**The outdoor intake of** a DFMAH shall be located not less than 20 ft (6 m) horizontally from a vertical plane in which combustible gas, vapour, or dust is present.

## B149.1-20 Natural Gas and Propane Installation Code – Installation of Specific Types of Appliances

### 7.31 Lighting

#### *New* 7.31.4

Ventilation shall be provided when a lighting appliance is installed or used in an enclosure. The ventilation openings shall be at the top of the enclosure or as high as possible at the top of it and at the bottom of the enclosure, not less than 12 in (300 mm) above the outside grade level. The openings shall be of a minimum of 4 square inches for each lighting appliance installed or used.

*There were two deaths in the Northwest Territories in the winter of 2013 -2014 due to gas lights, mounted in a hunter's cabin with insufficient ventilation, running overnight.*



**CSA B149.1:20**  
National Standard of Canada



**Natural gas and propane installation code**



## 8 Venting Systems and Air Supply for Appliances



## B149.1-20 Natural Gas and Propane Installation Code – Venting Systems and Air Supply for Appliances

*(added wording underlined in bold)*

### 8.5.4

**Except as permitted by Clause 8.5.6**, an automatically operated damper or automatically adjustable louvre shall be interlocked so that the main burner cannot operate unless either the damper or louvre is in the fully open position.

*(see next slide for new clause 8.5.6, conditions under which a damper or louvre interlock is not required.....)*

## B149.1-20 Natural Gas and Propane Installation Code – Venting Systems and Air Supply for Appliances

### *New* 8.5.6

For emergency generators, stand-by generators, or firewater pumps, the combustion air damper interlock is not required, provided

- a) the intake combustion air dampers and the ventilation air dampers, if provided separately, are sized for a maximum face velocity of 500 fpm (2.5 m/s);
- b) the combustion air dampers and ventilation air dampers
  - i) fail open on loss of power;
  - ii) open on a generator run command from the generator control panel; and
  - iii) fail open fully in under 30 s;
- c) the combustion air damper remains open at all times while the generator is operating;
- d) the ventilation air damper remains open for at least the first 30 s after start of all dampers moving to the open position;\* and
- e) the combustion air damper is equipped with a position switch that is set at least at 85% open to annunciate an alarm to a supervised location if the damper is not proved open after 30 s.

\* The intent is for the ventilation air damper to go to its fully open position and not come under temperature control (if provided) until the combustion air damper is also fully open.

## B149.1-20 Natural Gas and Propane Installation Code – Venting Systems and Air Supply for Appliances

### *New* 8.5.6

For emergency generators, stand-by generators, or firewater pumps, the combustion air damper interlock is not required, provided .....

*These new conditions (shown on that last slide) under which a damper or louvre interlock is not required, effectively eliminates the need for this SCOP:*

~~8.5.4 An automatically operated damper or automatically adjustable louvre shall be interlocked so that the main burner cannot operate unless either the damper or louvre is in the fully open position. **Stationary engines and turbines are exempt from this requirement (7.2.1.3)**~~



**CSA B149.1:20**  
National Standard of Canada



## Natural gas and propane installation code



# Annexes





## B149.1-20 Natural Gas and Propane Installation Code – Annexes

### *New Annexes*

- **Annex J -Acceptance criteria for visual inspection of welds** (*New Annex derived from Z662 -see clause 6.9.4 earlier in this presentation*)
- **Annex K -Pressure regulators and overpressure protection devices** (*New Annex to aid in the proper selection -see clauses 5.2.1.7 and 5.3.1 next slide*)
- **Annex L -Recommended requirements for automatic safety shut-off valves and automatic vent valves installed on gas turbines having capacities greater than 12.5 MMBtu/h (3.66 MW) and inlet pressures greater than 150 PSI** (*New Annex when outside the certification criteria for CSA 6.5 C/I valves*)
- **Annex M -Requirements for the operation of appliances at shows, exhibitions, or other similar events** (*New Annex for temporary gas appliances on display –see new clause 7.35 below*)
- **Annex N -Generators, compressors/pressure boosters, engines, and turbines** (*Some of the stationary engine requirements which were relocated to CSA B149.3-20 have been reprinted in this B149.1 Annex for the information of the installer.*)

## B149.1-20 Natural Gas and Propane Installation Code – Annexes

### *New Annexes*

**5.2.1.7** A pressure regulator shall have

- a) a manual shut-off valve installed upstream of the pressure regulator; and
- b) an overpressure protection device in accordance with Clause 5.3.

Note: Refer to **Annex K** regarding certified line pressure regulators and overpressure protection devices.

**5.3.1** Except as permitted in Clause 5.3.2, a line pressure regulator or a high pressure regulator shall be provided with an overpressure protection device.

Note: Class I line pressure regulators certified to ANSI Z21.80/CSA 6.22, and rated for inlet pressures of either 5 psig (35 kPa) or 10 psig (70 kPa), are supplied with factory-installed overpressure protection devices to limit the downstream pressure to 2 psig (13.8 kPa) in the event of failure of the regulating mechanism, which is acceptable for certified appliances with a maximum inlet gas pressure of 14 in wc. **See Annex K.**

### *New Annex K (informative)*

#### **Pressure regulators and overpressure protection devices**

*This Annex is designed to help in the selection process for pressure regulators and overpressure protection devices depending upon the situation.*

## **B149.1-20 Natural Gas and Propane Installation Code – Installation of Specific Types of Appliances**

### ***New* 7.34 Operation of appliances at shows, exhibitions, or other similar events**

The operation of appliances at shows, exhibitions, or other similar events shall comply with **Annex M** and meet any additional requirements of the authority having jurisdiction.

### ***New* Annex M (normative)**

#### **Requirements for the operation of appliances at shows, exhibitions, or other similar events**

*This Annex applies to appliances that are designed to be used outdoors or vented to the outdoors, but are on display at shows, exhibitions, or other similar events.*

*An appliance may be operated and vented indoors if it meets the requirements of this Annex, and the appliance is only operated for the purpose of demonstrating its operation.*

*. . . we all hope to one day have public spring home shows again . . .*

## B149.1-20 Natural Gas and Propane Installation Code – Annexes

### *New Annexes*

- **Annex L -Recommended requirements for automatic safety shut-off valves and automatic vent valves installed on gas turbines having capacities greater than 12.5 MMBtu/h (3.66 MW) and inlet pressures greater than 150 PSI(see CSA B149.3-20)**
- **Annex N -Generators, compressors/pressure boosters, engines, and turbines(see CSA B149.3-20)**

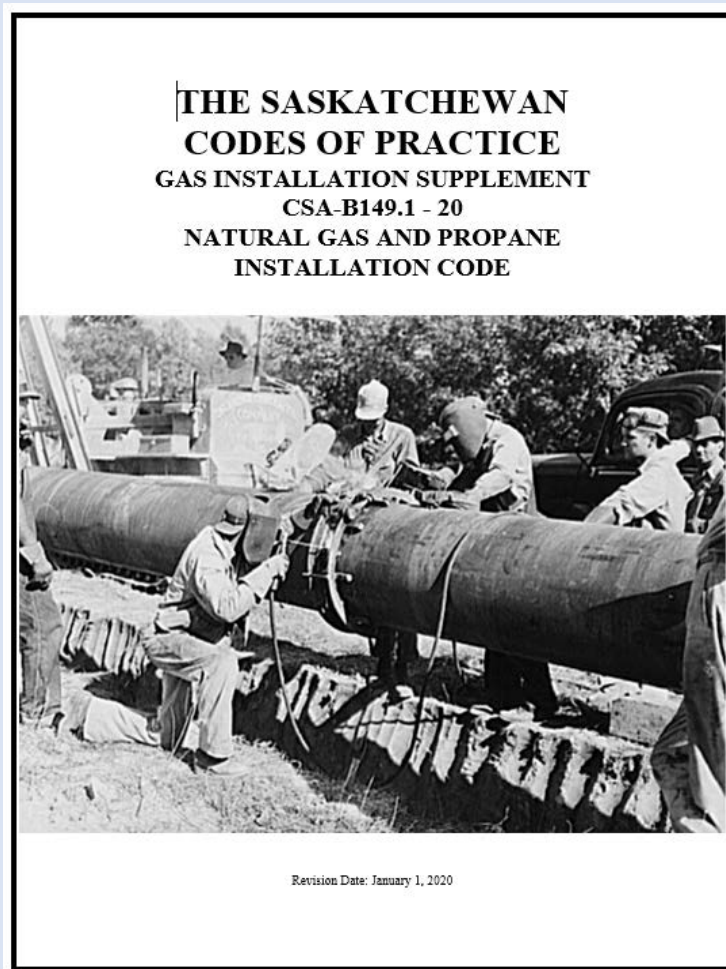
*The relocation of several of the requirements for engines/turbines, to CSA B149.3 for the purposes of field approval of these types of gas-fired equipment, leaves a knowledge-gap in references that are also important awareness for the installer.*

*These two Annexes provide a means to close that knowledge-gap where necessary.*

Thank you for reviewing the first section of this presentation of the substantial changes to B149.1-20 and the resulting changes to the Saskatchewan Code of Practice to CSA B149.1-20

The next section of this presentation provides changes to the Saskatchewan Code of Practice to CSA B149.1-20 resulting from recent experiences.

# B149.1-20 Natural Gas and Propane Installation Code Saskatchewan Codes of Practice 2020



The remainder of this presentation will detail technical changes to this document, the Saskatchewan Codes of Practice for CSA B149.1-20.

## B149.1-20 Natural Gas and Propane Installation Code – General

### 4.3.9 (*added wording underlined in bold*)

Installers activating any appliance shall fill in all information on an appliance activation tag and hang the tag on the gas line in an accessible location proximal to the appliance. **Activation Tags may be those purchased from Gas Inspections, or may be of the gas contractor’s company design provided that the same information is provided at minimum.** Gas appliances that have supply and return duct work attached to them shall have the date tested, the tested temperature rise, and the manifold pressure during the test recorded. **This data shall be displayed** prominently, either on the supply plenum with a permanent marking device in a legible manner, or in the start-up sheet accompanying the installation manual and left on site..

*Note* -“**This data shall be displayed**” replaces “**They shall be recorded**”

## B149.1-20 Natural Gas and Propane Installation Code – General

*New SCOP*

### 4.11 ISOLATION OF SAFETY DEVICES

**4.11.1** Where burners are required to operate constantly, then a locked-open manual valve to isolate a safety limit control may be installed for servicing, maintenance or testing purposes. This valve shall only be closed if the gas-fired equipment under the protection of the safety limit control has constant manual supervision while the safety limit control is out of service. A documented work procedure submitted and acceptable to Gas Inspections shall be followed during use of each such isolation valve.

*Note – This permission is only offered to plant or similar environments having a Car-Seal safety program for critical operation of valves and controls.*



## B149.1-20 Natural Gas and Propane Installation Code – General

*New SCOP*

### 4.11 ISOLATION OF SAFETY DEVICES

**4.11.2** In a plant environment where a relief valve terminates into a common flare header, a locked-open full port manual valve may be used to isolate the flare header from the relief valve discharge for maintenance purposes. This valve shall only be closed if the gas piping system under the protection of the relief valve has been completely depressurized and is out of service. A documented work procedure submitted and acceptable to Gas Inspections shall be followed during use of each such isolation valve.

*Note – This permission is only offered to plant or similar environments having an approved Pressure Relief Path (PRP) Stop Valve Control (SVC) Program registered with TSASK.*

## **B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems**

### **4.23 PROTECTION OF APPLIANCES FROM PHYSICAL DAMAGE**

*New SCOP*

#### **4.23.1**

When appliances are installed in locations that do not afford protection from damage from motor vehicles, they shall be protected by posts or guardrails in compliance with CSA B149.1-20 clause 6.16.15 or other equivalent means of acceptable protection.

*This includes protecting all pad-mounted appliances which may be subject to damage from motor vehicles.*

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.7 LOCATION

*New SCOP*

#### 6.7.7

Gas piping systems installed in an aggressive environment including, but not limited to, intensive livestock barns, and potash mines, shall not use materials with low tolerance for these conditions. The use of CSST, schedule 10 steel piping, or brass fittings and components, on gas piping systems in these environments is prohibited. Where the source for corrosion is a component of the gas stream, such as sour oilfield or digester gas, low tolerance materials, such as CSST, schedule 10 steel piping, or brass, shall not be allowed in contact with the gas stream.

*Piping must be at least schedule 40. Stainless steel is acceptable.*

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

*(Please refer to national code rule 6.8.8 which is unchanged in CSA B149.1 for 2020)*

**6.8.8** When a gas supply header is NPS 2-1/2 or larger, the branch line connection may be a job-fabricated welded fitting, provided that the branch line does not exceed 50% of the pipe diameter of the gas supply header, and in no case shall the branch connection be less than NPS 3/4.

*(The SCOP to this clause has been revised for clarity. The added wording to the Code of Practice is underlined in bold)*

*(2020 SCOP)* **6.8.8** Job-fabricated welded fittings (for example, branch connections job-fabricated using the stub-in and back-welding method in CSA B149.1-20) are NOT allowed in any gas piping system. Branch connections on steel gas piping systems shall use a manufactured fitting, such as a tee, weld-o-let, or thread-o-let, meeting the material selection criteria of CSA B149.1-20 clause 6.2.2.

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.11 APPLIANCE CONNECTIONS *(added wording underlined in bold)*

#### 6.11.1.1

Except as permitted by S.C.O.P. 6.11.1.2, where an appliance is connected to a flexible piping or tubing system, connection to the appliance shall be outside the cabinet and into a tee fitting containing a drip pocket and rigid piping that extends to the appliance gas valve.

#### 6.11.1.2

A flexible piping or tubing system, may be used with a protective sleeve to:

- a) penetrate the cabinet of a mobile/manufactured home furnace, or
- b) penetrate the cabinet of a fireplace.

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.15 UNDERGROUND PIPING & TUBING *(added wording underlined in bold)*

#### 6.15.2

Underground steel piping systems shall only be joined below grade by welding.  
**Underground polyethylene piping systems shall only be joined below grade by butt fusion, socket fusion, electrofusion, or mechanical fittings certified to CSA B137.4 (such as “Permasert” or “Con-Stab”), except for underground piping systems in active landslide areas (see Appendix K) in which case all mechanical fittings underground are prohibited.**

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.15 UNDERGROUND PIPING & TUBING

*(added wording underlined in bold)*

#### 6.15.13.1

The gas supply to underground piping or tubing shall be controlled by a shut-off valve located above ground near the point of entry to the ground, and by a shut-off valve ~~situated above ground at the point of exit from the ground~~ **located between the point of exit from the ground and the outdoor appliance or building being served. The underground permit holder is responsible for ensuring that these two valves are installed.**

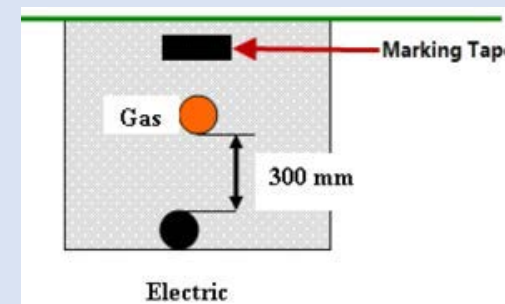
## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.15 UNDERGROUND PIPING & TUBING (*added wording underlined in bold*)

#### 6.15.16

Electrical wiring may be installed in the same trench as customer-owned propane or natural gas lines provided the electrical wiring is placed at a greater depth with at least 12" (300 mm) earth separation. Clearance can be reduced to 6" (150 mm) of earth separation if a treated plank is installed between the gas line and electrical wiring. **All underground electrical installations must still have a suitable marking tape buried halfway between the cable and grade level, and the tape must extend the entire length of the trench containing the electrical cable.**

*Note: the treated plank is no longer specified as 2x6; a 2x4 treated plank is acceptable.*





## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.22 TESTING OF PIPING, TUBING, HOSE (*added wording underlined in bold*)

#### 6.22.2.1

**All copper and polyethylene piping systems shall be leak tested using air or inert gas (such as nitrogen) as the test medium.** All steel piping systems where the test pressure generates a stress below 30% of Specified Minimum Yield Strength (SMYS) of the piping material, shall be leak tested using air or inert gas as the test medium. **Only under special circumstances will Gas Inspections permit liquid hydrostatic testing of piping systems, (see 6.22.1.3 regarding applications to Gas Inspections for approval to use a liquid as the test medium).**

Example test pressures equating to a stress of 30% SMYS for steel piping systems are given in Appendix C.

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.22 TESTING OF PIPING, TUBING, HOSE

6.22.1.3 For test pressures exceeding a stress of 30% of SMYS:

- a) both a leak and a strength test are required following the testing requirements and limitations of CSA Z662;
- b) 100% of all welds have successfully passed radiographic inspection; and
- c) **dry** air, **inert gas** or **liquids** are permissible as the leak and strength test medium on natural gas piping, provided the test and purge procedures have been approved by the Chief Gas Inspector. **Liquid freezing temperature must be significantly lower than the potential ambient temperature during the test. Purge procedures must include a liquid removal and disposal plan, and a plan for drying the gas piping system to an acceptable dewpoint of 0°F (-18°C).** **Liquids** are not permissible as a test medium on propane piping systems.

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.22 TESTING OF PIPING, TUBING, HOSE and FITTINGS

*The following notes under Table 6.3 refer to propane M.A.O.P.:*

*\* Propane maximum operating pressure is defined as*

- a) 250 psi (1725 kPa) for piping and tubing operating at container pressure;*
- b) 350 psi (2400 kPa) when connected to the outlet of a pump or compressor; or*
- c) 375 psi (2570 kPa) minimum or the setting of the hydrostatic relief valve in piping that can contain liquid propane, that can be isolated by valves, and that requires hydrostatic relief valves as specified in Clause 5.4.1 of this Code or Clause 5.6.1 of CSA B149.2.*

*New SCOP for proper test pressure of propane piping and tubing.*

*The test pressure of propane piping or tubing shall be 1.5 times the maximum operating pressure.*

- a) 250 psi propane piping and tubing operating at container pressure shall be tested to 375 psi;*
- b) 350 psi propane piping and tubing connected to the outlet of a pump or compressor shall be tested to 525 psi; and*
- c) 375 psi liquid propane piping shall be tested to 562.5 psi*

## **B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems**

### **6.22 TESTING OF PIPING, TUBING, HOSE and FITTINGS**

*New SCOP*

#### **6.22.7**

Where the operating pressure of the gas piping system is being increased, the entire gas piping system affected by the change in operating pressure must be retested in compliance with CSA B149.1-20 clause 6.22., including situations where the new pressure test duplicates the parameters of the original pressure test.

## B149.1-20 Natural Gas and Propane Installation Code – Gas Piping Systems

### 6.22 TESTING OF PIPING, TUBING, HOSE

*(added wording underlined in bold)*

#### 6.22.8

On all installations of a piping or tubing system, the installer shall ~~fill in all information on the~~ **complete a** Piping Verification Tag and hang the tag on the gas line in an assessable location proximal to the work performed. **Piping Verification Tags may be those purchased from Gas Inspections, or may be of the gas contractor's company design provided that the same information is provided at minimum.**

## B149.1-20 Natural Gas and Propane Installation Code – Boilers

### 7.1.4.4 Boiler Low Water Cut-off Requirements

(deleted)

CAPACITY – TYPE	REQUIREMENTS
Coil or Fin tube	Flow Switch*
All other boiler types Not exceeding 400,000 BTU/HR	Flow Switch or Low Water Cut-off*
All other boiler types Exceeding 400,000 BTU/HR	Low Water Cut-off

\* See 3.1

#### **3.0 Low Water Cut-off Requirements**

- 3.1** A low water cut-off control must be installed when the boiler is located above the lowest point in the heating system.
- 3.2** Low water cut-off controls shall be installed as specified by the manufacturers certified installation instructions and shall be capable of shutting off the fuel supply to the burner(s).

*(See next slide for its replacement)*

## B149.1-20 Natural Gas and Propane Installation Code – Boilers

### 7.1.4.4 Boiler Low Water Cut-off Requirements

#### 7.1.4.4.1

When the boiler is located above the lowest point in the heating system, **a safety control to protect against low water conditions must be present as part of the certified appliance or must otherwise be installed.**

*(Gas Inspections will accept the manufacturer's device and type that they choose to use internally to protect their boiler from a low water condition. If not described in the manufacturer's instructions, then an external LWCO must be installed.)*

## B149.1-15 Natural Gas and Propane Installation Code – Engines

### 7.2 Generators, compressors/pressure boosters, engines, and turbines - *Old SCOP (2015)*

7.2.1.9 The ventilation required by CAN/CSA clause 7.2.1.5 shall be interconnected with a gas detector that:

- a) is installed in accordance with the detector manufacturer's instructions for the type of gas;
- b) is set to activate at gas detection levels at and above one-fifth of the lower limit of flammability;
- c) upon activation, produces an audible and visual alarm;
- d) is interlocked with the mechanical ventilation system; **and**
- ~~e) is interlocked to shut off the appliance.~~ → **Not required in Saskatchewan!**

**Note: This clause will only apply to gas fired stationery engines, not of the direct vent type, located in public buildings or buildings normally occupied. An interlocked gas detector is not required for:**

- i) gas fired engines located in stand-alone buildings not normally occupied;***
- ii) gas fired engines of the direct vented type; and***
- iii) residential applications where direct vent combustion is employed.***

***Gas Inspections will refer to the NFPA 101 Life Safety Code definition of “occupied” as “any time a building is open to the public, or at any other time it is occupied by more than 10 persons.”***



## B149.1-20 Natural Gas and Propane Installation Code – Engines

### 7.2 Generators, compressors/pressure boosters, engines, and turbines

*New SCOP (2020)*

**7.2.1.9** The ventilation required by CAN/CSA clause 7.2.1.5 shall be interconnected with a gas detector that:

- a) is installed in accordance with the detector manufacturer’s instructions for the type of gas;
- b) is set to activate at gas detection levels at and above one-fifth of the lower limit of flammability;
- c) upon activation, produces an audible and visual alarm;
- d) is interlocked with the mechanical ventilation system

**CSA B149.1-20 requirement 7.2.1.9(e) “is interlocked to shut off the appliance” is not mandatory in Saskatchewan. See Appendix F for gas detection concentration unit conversions.**

*The wording of this SCOP has been simplified.*

*(Same Rationale: To lock out an emergency genset at a rural water treatment plant due to a minor gas leak would likely cause a boil water advisory should a power outage occur while the genset is locked out. Engaging the mechanical ventilation system will provide an adequate level of safety.)*

## B149.1-20 Natural Gas and Propane Installation Code – Engines

### 7.2.5 Additional requirements for gas

*(this clause is renumbered but otherwise is unchanged for 2020)*

#### 7.2.5.3

An engine or turbine shall be installed in a room that has a minimum 2 h fire separation from the remainder of the building, and the room shall have a fire door having a 1.5 h fire protection rating on every opening that communicates with other sections of the building. The door shall not have a glass panel or vent and shall be of the swinging automatic-closing type, gasketed on all sides, including the top and bottom, to prevent natural gas or propane from entering other sections of the building.

*(See next slide for new SCOP to this clause)*

## B149.1-20 Natural Gas and Propane Installation Code – Engines

### 7.2.3 Additional requirements for gas engines and turbines in buildings

*New SCOP –these are examples only of how to meet 7.2.5.3*

#### 7.2.5.3

Examples of acceptable construction for walls with a 2 hour fire resistance rating includes:

- a) Brick construction –minimum 4” thick.
- b) Wood stud framing, 16” on centre, mineral-fibre insulated between studs and covered with gypsum board drywall, minimum 1” thickness on each side (such as two ½” thick gypsum boards, overlaid on each side).
- c) Minimum 2.5” thickness of gypsum drywall sandwiched between metal cladding on each side.

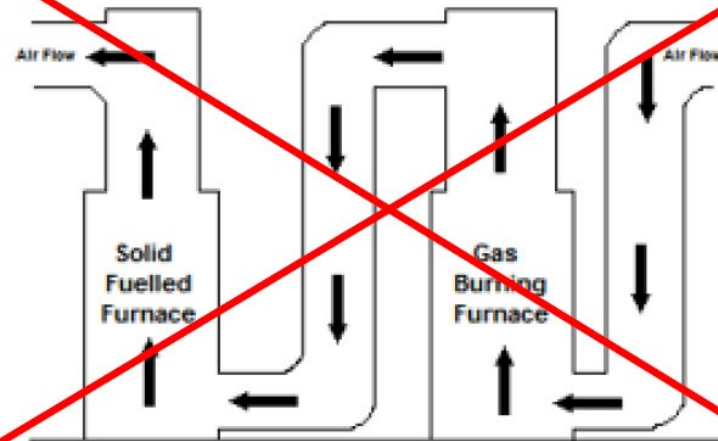
*(Source: Appendix D of The National Building Code 2015)*

## B149.1-20 Natural Gas and Propane Installation Code – Furnaces

### 7.13 CENTRAL FURNACES

~~7.13.7 If a solid-fuel burning appliance and a gas fueled appliance are to be connected together, ductwork must be arranged as per diagram.~~

(deleted)



*Note: appliances must be vented separately as per CAN/CSA B149.1 clause 8.12.3.*

(Not required. Covered by clause 4.18.)

## B149.1-20 Natural Gas and Propane Installation Code – Venting

### 8.10 METHODS OF VENTING APPLIANCES

#### 8.11 e) Exterior Masonry Chimneys (*REVISED*)

When removing the largest (or major) Category I gas appliance vented into an exterior masonry chimney, the masonry chimney may not continue to be used unless it is lined with a properly sized B vent, L vent or an approved **double wall** liner. ~~As well, the chimney must be boxed in and insulated such that the building provides a heated space for the chimney. One method of ensuring that the chimney is provided adequate heat is to have the three exterior sides of the boxed-in chimney insulated to at least twice the insulated value of the existing building wall. All repairs to existing masonry chimneys serving gas fired appliances must comply with these requirements. Note: This rule does not apply to Category 2, 3 or 4 venting, nor does it apply to any appliances with special venting systems.~~

*(The requirement to box-in and insulate an external masonry chimney in this situation has been withdrawn.)*

## B149.1-20 Natural Gas and Propane Installation Code – Venting

### 8.10 METHODS OF VENTING APPLIANCES

#### 8.11 f) Existing Type A Factory Built Metal Chimneys and Other Insulated metal chimneys (*added wording underlined in bold*)

- iii) When the furnace is replaced with a sidewall vented appliance and the water heater is the only appliance left to vent into the class “A”, the chimney shall be down sized as per table C1 or C2.
- iv) If oversized (water heater only), reduce in size in accordance with code requirements and use a certified B vent or approved chimney liner. When the water heater only is in an oversized Type "A" chimney and the water heater is replaced, the chimney shall be replaced as per table C1 or C2.

## B149.1-20 Natural Gas and Propane Installation Code – Venting

### 8.12 CHIMNEYS

CSA B149.1-20 reads:

**8.12.10** A metal chimney liner shall provide a continuous lining from the base inside the space where the appliance is located to the top of the masonry chimney flue, and it shall comply with the requirements of ULC S635. It shall be installed in accordance with the manufacturer's instructions.

*(New SCOP)*

**8.12.10 (a)** Where a vent cap is installed as part of a lining system, adequate space must be provided between the flashing and vent cap to prevent a buildup of ice which could block the flow of products of combustion. Clearance between flashing and vent cap shall be between 5" (125 mm) and 12" (300 mm).

## **B149.1-20 Natural Gas and Propane Installation Code – Venting**

### **8.13 VENT AND CHIMNEY SIZING**

*(New SCOP)*

**8.13.4 All residential vents or chimneys shall be sized using the “DP” column in the tables in Annex C of the CSA B149.1.**

*Residential homes are likely renovated in the future to reduce drafts.*



## **B149.1-20 Natural Gas and Propane Installation Code – Venting**

### **8.14 VENT AND CHIMNEY TERMINATION (see also Appendix A)**

**CSA B149.1-20 reads:**

**8.14.8** A vent shall not terminate:

- h) underneath a veranda, porch, or deck unless
  - i) the veranda, porch, or deck is fully open on a minimum of two sides beneath the floor; and
  - ii) the distance between the top of the vent termination and the underside of the veranda, porch, or deck is greater than 1 ft (300 mm).

*(New SCOP)*

- h) (iii) **The 1 ft (300 mm) min. clearance to the underside of the veranda, porch or deck shall be measured from the top of the vent to the bottom of the joists.**

# B149.1-20 Natural Gas and Propane Installation Code – Appendix B

**(New chart) Appendix B – Sizing  
Maximum capacity of Liquid Propane  
(in thousands of Btu/h)  
for copper tubing, or Schedule 80 piping  
gravity fed from a propane tank (no pump)**

*Reference chart for sizing liquid propane lines.*

*Note that piping sizes are O.D. and tubing sizes are I.D.*

*Flow rates shown in brackets (red italics) are considered too low to be protected by a 4 USGPM excess flow valve mounted on the tank. You must be in the black to meet B149.2 clause 7.4.8.1*

Length (ft)	TUBING (ID)						SCH 80 PIPE (NPS)					
	¼	3/8	1/2	5/8	3/4	1	1/2	3/4	1	1 ¼	1 ½	2
10	(7,110)	14,760	29,700	51,210	72,090	142,830	21,060	44,460	86,670	175,590	261,450	503,820
20	(4,950)	(10,440)	20,970	36,180	50,940	107,370	14,940	31,410	60,930	124,200	184,770	356,220
30	(4,050)	(8,550)	17,100	29,520	41,580	87,660	14,220	25,650	49,860	101,610	151,020	290,610
40	(3,510)	(7,380)	14,850	25,560	36,000	75,870	(10,350)	22,230	43,290	87,840	130,770	251,910
50	(3,150)	(6,570)	(13,230)	22,860	32,220	67,860	(9,630)	19,980	38,700	78,570	116,910	225,810
60	(2,880)	(6,030)	(12,060)	20,880	29,430	62,010	(8,460)	18,000	35,280	71,730	106,560	205,920
70	(2,610)	(5,580)	(11,160)	19,350	27,180	57,330	(8,010)	16,830	32,940	66,690	98,910	190,530
80	(2,430)	(5,220)	(10,440)	18,090	25,470	53,640	(7,290)	15,750	30,690	62,100	92,790	178,290
90	(2,340)	(4,860)	(9,900)	17,010	24,030	50,580	(6,930)	14,580	28,800	58,680	87,030	167,940
100	(2,160)	(4,680)	(9,360)	16,200	22,770	47,970	(6,750)	14,220	27,180	55,620	82,800	159,120
125	(1,980)	(4,140)	(8,370)	14,490	20,340	42,930	(6,120)	(12,690)	24,570	49,860	73,980	142,650
150	--	(3,780)	(7,650)	(13,230)	18,540	39,150	--	(11,520)	22,230	45,270	67,500	129,960
175	--	(3,510)	(7,110)	(12,240)	17,190	36,270	--	(10,710)	20,700	42,210	62,460	120,420
200	--	(3,240)	(6,570)	(11,430)	16,110	33,930	--	(9,990)	19,170	39,150	58,680	112,680
225	--	(3,060)	(6,210)	(10,800)	15,120	31,950	--	(9,630)	18,000	37,170	55,170	106,200
250	--	(2,880)	(5,940)	(10,170)	14,400	30,330	--	(8,820)	17,640	35,280	52,560	100,800
275	--	(2,790)	(5,670)	(9,720)	13,680	28,890	--	(8,460)	16,470	33,390	49,860	95,850
300	--	(2,700)	(5,400)	(9,360)	13,140	27,720	--	(8,010)	15,750	32,220	47,970	91,980
350	--	(2,430)	(4,950)	(8,640)	12,150	25,650	--	(7,650)	14,580	29,880	44,100	85,140
400	--	(2,340)	(4,680)	(8,100)	11,340	23,940	--	(6,930)	(13,770)	27,990	41,400	79,740
450	--	(2,160)	(4,410)	(7,560)	10,710	22,590	--	--	(13,050)	26,100	39,150	75,150
500	--	(2,070)	(4,140)	(7,200)	10,170	21,420	--	--	(11,610)	24,930	37,170	71,280
550	--	--	(3,960)	(6,840)	9,720	20,430	--	--	(11,520)	23,760	35,280	68,220
600	--	--	(3,780)	(6,570)	9,270	19,530	--	--	(11,160)	22,590	33,750	65,160
650	--	--	(3,690)	(6,300)	8,910	18,810	--	--	(10,710)	21,870	32,580	62,460
700	--	--	(3,510)	(6,120)	8,550	18,090	--	--	(10,350)	21,060	31,410	60,210
750	--	--	(3,420)	(5,850)	8,280	17,460	--	--	(9,990)	20,340	30,330	58,320
800	--	--	(3,240)	(5,670)	8,010	16,920	--	--	(9,720)	19,530	29,160	56,340
900	--	--	(3,060)	(5,400)	7,560	15,930	--	--	(9,180)	18,360	27,630	52,920
1000	--	--	(2,970)	(5,040)	7,200	15,120	--	--	(8,460)	17,640	26,100	50,220

## B149.1-20 Natural Gas and Propane Installation Code – Appendix G

Gas Appliance	Condition	Solution
Furnace	Completely Submerged	Replace Furnace
	Flooded Above Gas Valve or Burner	Replace Furnace
	Wet, or in contact with Fan Blade Assembly	Replace Fan Assembly, or Replace Furnace
	Wet, or in contact with Fan Motor	Replace Fan Motor, or Replace Furnace
	Wet, or in contact with Electronic components	Replace Electronic Board, or Replace Furnace
	Floor wetness not in contact with Fan or Electronic components	Service and Test
Storage Water Heater	Completely Submerged	Replace Water Heater
	Flooded Above Gas Valve, or Burner (non FVIR water heaters only)	Replace affected components, or Replace Water Heater
	Flooded Above FVIR sensor or Arrestor Screen (FVIR - equipped water heaters)	Replace Water Heater
	Floor wetness not in contact with Gas Valve, Burner or FVIR components	Service and Test
Tankless (Instantaneous) Water Heater	Completely Submerged	Replace Water Heater
	Flooded Above Gas Valve, Burner or Electronic Components	Replace affected components, or Replace Water Heater

*(revised)*  
**Emergency  
Flood  
Guidelines**

## B149.1-20 Natural Gas and Propane Installation Code – Appendix G

<b>Clothes Dryer</b>	Completely Submerged	Replace Clothes Dryer
	Flooded Above Gas Valve, Burner or Electronic Components	Replace affected components, or Replace Clothes Dryer
	Floor wetness not in contact with Gas Valve, Burner or Electronic components	Service and Test
<b>Fireplace</b>	Completely Submerged	Replace Fireplace
	Flooded Above Gas Valve, Burner or Electronic Components	Replace affected components, or Replace Fireplace
	Floor wetness not in contact with Gas Valve, Burner or Electronic components	Service and Test
<b>Boiler</b>	Completely Submerged	Replace Boiler
	Flooded Above Gas Valve, Burner or Electronic Components	Replace affected components, or Replace Boiler
	Floor wetness not in contact with Gas Valve, Burner or Electronic components	Service and Test

*(revised)*  
**Emergency  
Flood  
Guidelines**

*These Guidelines have been revised to provide the Mechanical Industry, the Insurance sector, and the public, with clarity and consistency.*

# B149.1-20 Natural Gas and Propane Installation Code – Appendix K

*(New worksheet)* Appendix K

## Worksheet for Unvented Heaters in Livestock and Poultry Barns

This worksheet is designed to assist in the calculations to meet code specifics of clauses 7.23.1 and 8.24.5 of CSA B149.1. All requirements of CSA B149.1 must be in compliance, including clauses 4.9, 7.23 and 8.24 in their entirety including all sub-clauses. This worksheet is an aid-only for the following two calculations:

**7.23.1** Where an infrared heater is of the unvented type, it shall

(e) be provided with mechanical ventilation

ii) that has a ventilation volume of at least **300 cfm for each 100,000 Btu/h input** or fraction thereof;

*NOTE: 300 cfm per 100,000 Btu/h input (or fraction thereof) is the minimum ventilation volume acceptable to Gas Inspections to meet the standard of the term, “adequately ventilated space”, used in CSA B149.1, particularly clause 8.24.5.*

**8.24.5** When located in a large and adequately ventilated space, an appliance may be operated by discharging the combustion products directly into the space, subject to the approval of the authority having jurisdiction and provided that the maximum input of the appliance does not exceed **20 Btu/h/ft<sup>3</sup>** (0.2 kW/m<sup>3</sup>) of the space in which the appliance is located.

## B149.1-20 Natural Gas and Propane Installation Code – Appendix K

A) Barn Owner: \_\_\_\_\_

B) Barn Land Location: \_\_\_\_\_

C) Barn occupancy (# of animals, type of animal): \_\_\_\_\_

D) Barn dimensions: \_\_\_\_\_ ft X \_\_\_\_\_ ft X \_\_\_\_\_ ft (high) = Barn volume (E)

E) Barn volume (E): \_\_\_\_\_ cubic feet

F) Description of heaters (number/type): \_\_\_\_\_

\_\_\_\_\_

G) Total heaters combined input into barn (G): \_\_\_\_\_ BTU/hour

H) Description of ventilation equipment (number/type): \_\_\_\_\_

\_\_\_\_\_

I) Minimum ventilation rate of all ventilation equipment combined (I): \_\_\_\_\_ CFM

J) Ratio of min. ventilation rate to heaters' input = (I) divided by (G) [must be at least 0.003 CFM per BTU/hour]:  
\_\_\_\_\_ CFM per BTU/hour Note: 0.003 CFM per BTU/hour = 300 CFM per 100,000 BTU/hour

K) Ratio of heaters input to barn volume = (G) divided by (E) [must not exceed 20 BTU/hour per cubic foot]:  
\_\_\_\_\_ 20 BTU/hour per cubic foot

L) Calculations verified by Licensed Gas Contractor: (Please print)  
Gas Fitter License #: \_\_\_\_\_ Gas Fitter Name: \_\_\_\_\_

M) Date of verification: Month: \_\_\_\_\_ Day: \_\_\_\_\_ Year: \_\_\_\_\_

### *(New worksheet)* **Appendix K** **Worksheet for Unvented Heaters in** **Livestock and Poultry Barns**

*This is a new worksheet to provide the owner with a step-by-step guide to completing the necessary calculations for unvented heaters in a barn. The permit holder must verify the calculations and provide them to the gas inspector.*

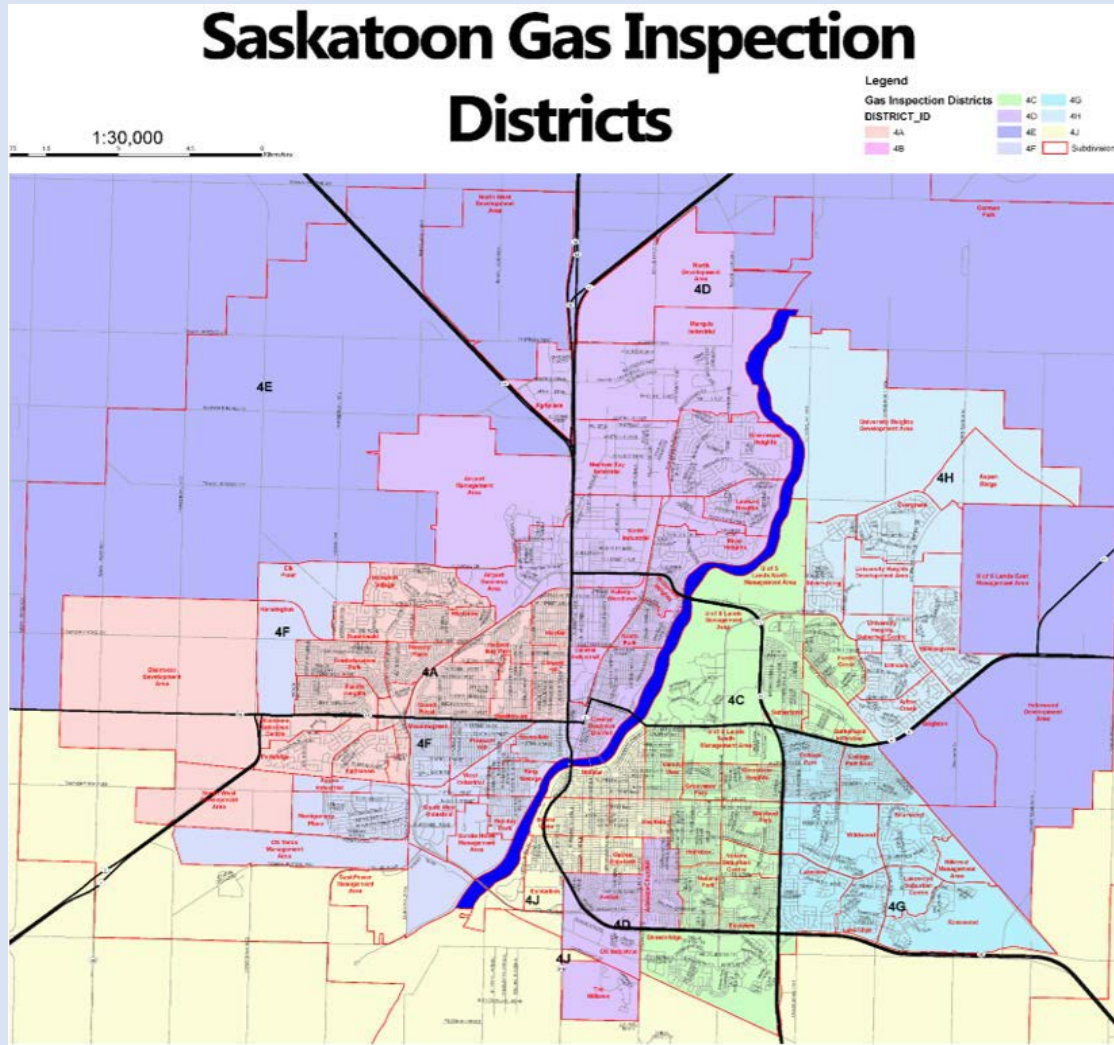
## B149.1-20 Natural Gas and Propane Installation Code – Appendix L

GAS INSPECTIONS PHONE LISTING					
LAST NAME	FIRST NAME	OFFICE	DISTRICT	OFFICE PHONE	CELL PHONE
Friedt	Stephen	Saskatoon	Chief Gas Inspector	(306) 933-6087	(306) 227-2455
Fraser	Ken	North Battleford	1A		(306) 441-5966
MacKinnon	Doug	North Battleford	1B		(306) 441-2003
Mollison	Guy	Prince Albert	2A		(306) 961-7796
Overby	Shayne	Prince Albert	2B		(306) 930-8455
Abdai	Jesse	Prince Albert	2C + RM 373		(306) 960-2836
Mohan	Wayne	Kindersley	3A		(306) 460-6394
Mohan	Wayne	Kindersley	3B (acting)		(306) 460-6394
Rawlyk	Neil	Saskatoon	4A		(306) 227-4149
VACANT		Saskatoon	4B		1-866-530-8599
Gowen	Randy	Saskatoon	4C + RM 343		(306) 281-7655
Nast	Patrick	Saskatoon	4D		(306) 221-3901
Reiber	Kurt	Saskatoon	4E		(306) 221-6791
Phelps	Robert	Saskatoon	4F		(306) 260-1896
Novicki	Jeff	Saskatoon	4G		(306) 222-9633
Ollenberg	Ken	Saskatoon	4H		(306) 229-8740
Mooney	Kurt	Saskatoon	4J		(306) 220-5339
St. Amant	George	Tisdale	5		(306) 873-9113
Anderson	Ole	Lloydminster	12		(306) 821-2124
Pinder	Calvin	Lloydminster	12A		(306) 830-7755

*(returning)*  
**Appendix L  
Gas Inspection  
District Contacts**



# B149.1-20 Natural Gas and Propane Installation Code – Appendix L



*(returning)*  
**Appendix L  
 Gas Inspection  
 District Contacts**

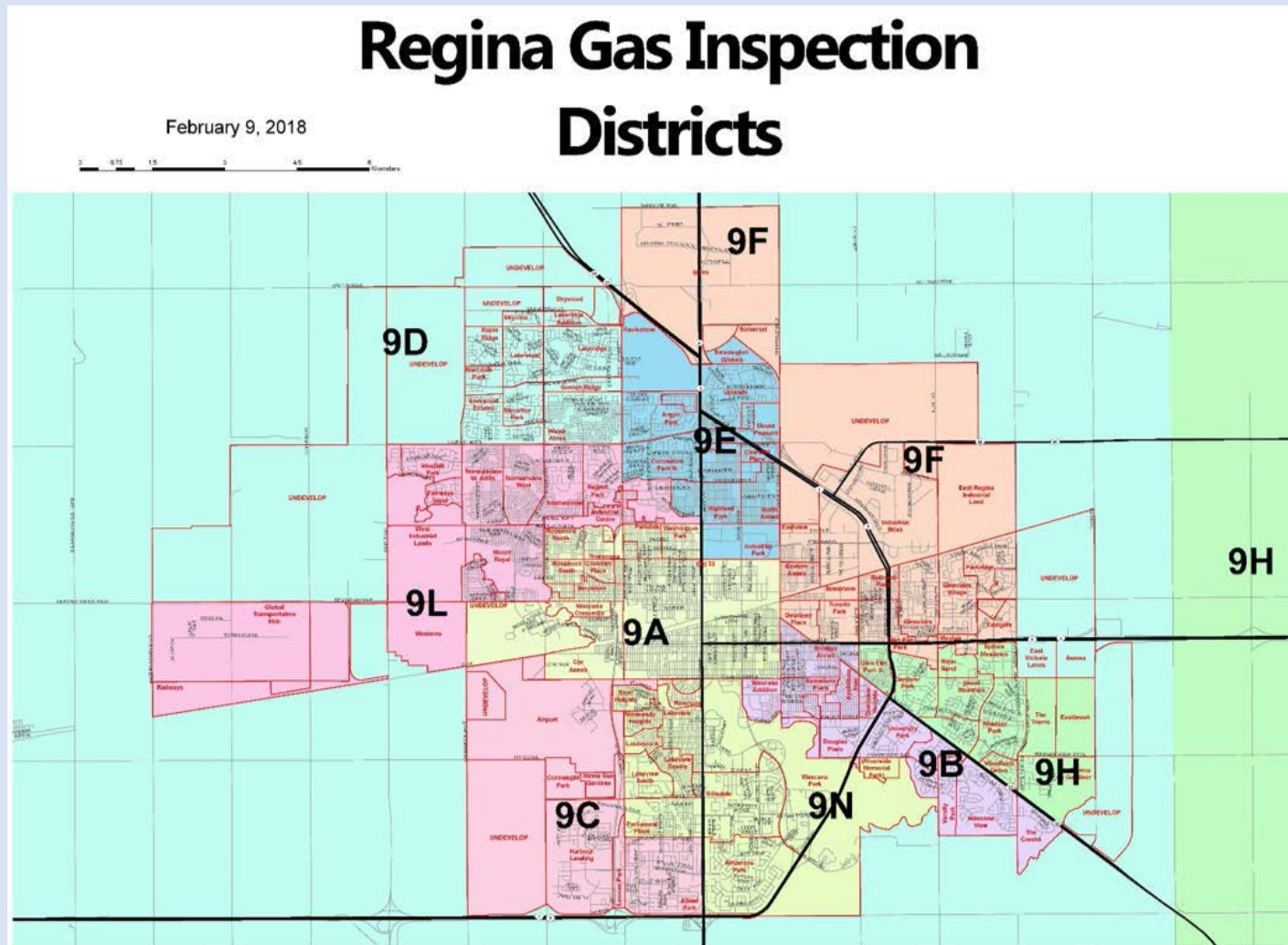


## B149.1-20 Natural Gas and Propane Installation Code – Appendix L

Hird	Doug	Regina	Codes & Stds Engineer	(306) 787-3347	(306) 539-8801
Keck	Tim	Regina	Manager, South	(306) 787-3348	(306) 536-6548
Desroches	Brent	Yorkton	6A		(306) 621-1101
Struble	Darryl	Yorkton	6B		(306) 621-1265
Hannotte	Jeff	Yorkton	6C		(306) 621-4285
Routledge	George	Swift Current	7A		(306) 741-8011
Unger	Craig	Swift Current	7B		(306) 741-5508
Tucker	David	Moose Jaw	8A		(306) 631-0102
Bunce	Michael	Moose Jaw	8B		(306) 630-8533
Soucy	Roland	Regina	9A		(306) 531-9730
Vacant		Regina	9B		1-866-530-8599
Lander	Kevin	Regina	9C		(306) 536-1172
Nernberg	Jonathan	Regina	9D		(306) 533-7205
Mader	Jeff	Regina	9E		(306) 531-2001
Filteau	Jim	Regina	9F		(306) 536-5310
Warren	Dale	Regina	9H		(306) 533-0762
Little	Greg	Regina	9L		(306) 527-4818
Metz	Les	Regina	9N		(306) 533-3917
Hill	Glen	Estevan	10A (acting)		(306) 421-8732
Hill	Glen	Weyburn	10B		(306) 421-8732

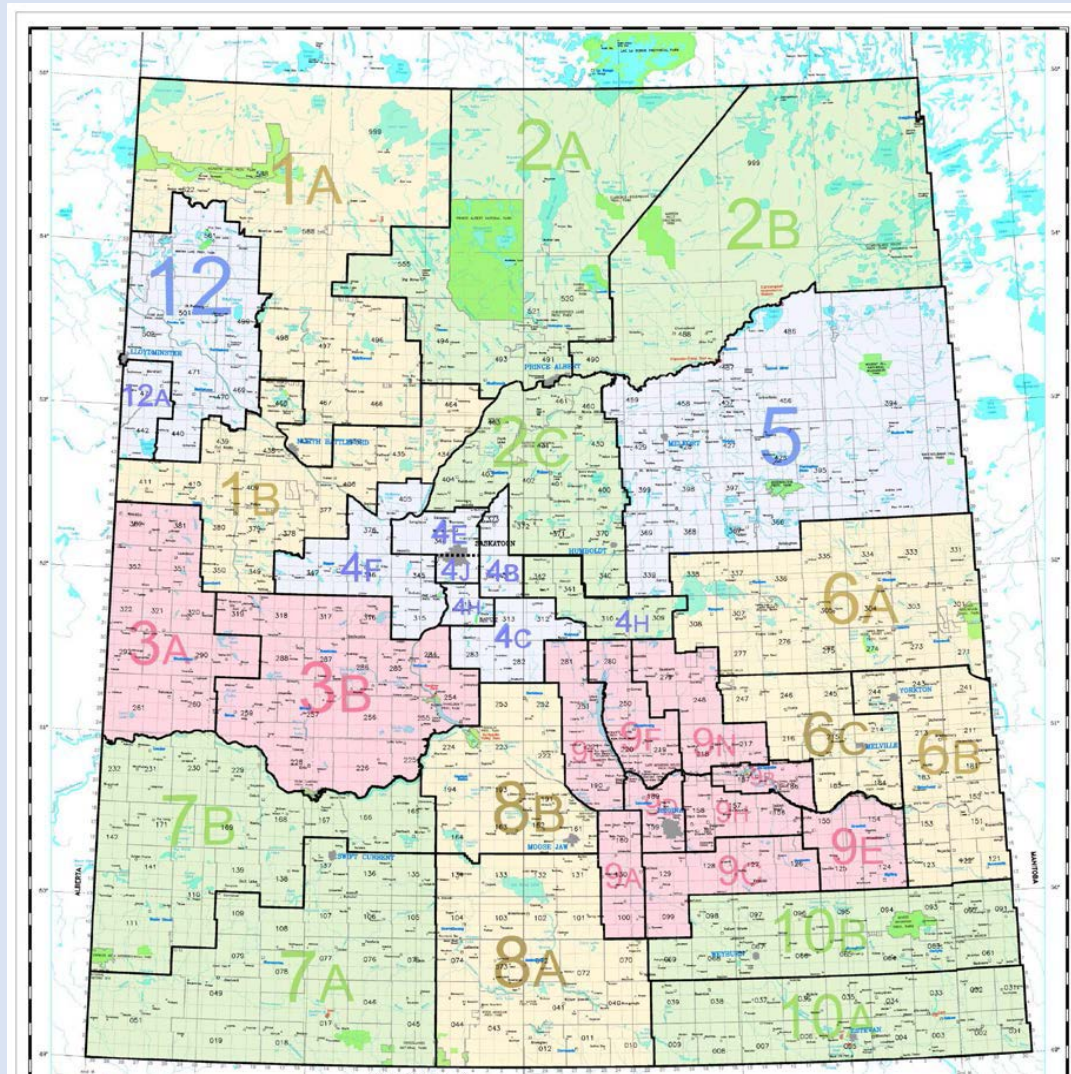
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**Appendix L  
Gas Inspection  
District Contacts**

# B149.1-20 Natural Gas and Propane Installation Code – Appendix L



*(returning)*  
**Appendix L  
Gas Inspection  
District Contacts**

## B149.1-20 Natural Gas and Propane Installation Code – Appendix L



*(returning)*  
**Appendix L**  
**Gas Inspection**  
**District Contacts**



*Thank you for reviewing this presentation of the substantial changes to B149.1-20 and the changes to the Saskatchewan Code of Practice to CSA B149.1-20*

*If you have any questions, please ask. It is likely that others have the same question. Please contact your local gas inspector, or*

*Doug Hird, Senior Engineer  
Gas Codes and Standards  
[doug.hird@tsask.ca](mailto:doug.hird@tsask.ca)*

***We will be posting on-line a running Q&A so no question goes unanswered.***