

# Gas Equipment Bulletins



*Office of the Fire Commissioner*

NOTE: These bulletins are intended to provide guidance on the CSA B149 Installation Code requirements and are meant to serve as explanatory documents. They do not, in any way, amend or replace code.

# Office of the Fire Commissioner



## Inspection and Technical Services

### Gas Bulletin: Acceptable Method for Installation of Roof Top piping on a Sloped Roof

Date Issued: January 1, 2018  
OFC ITSM 17-006

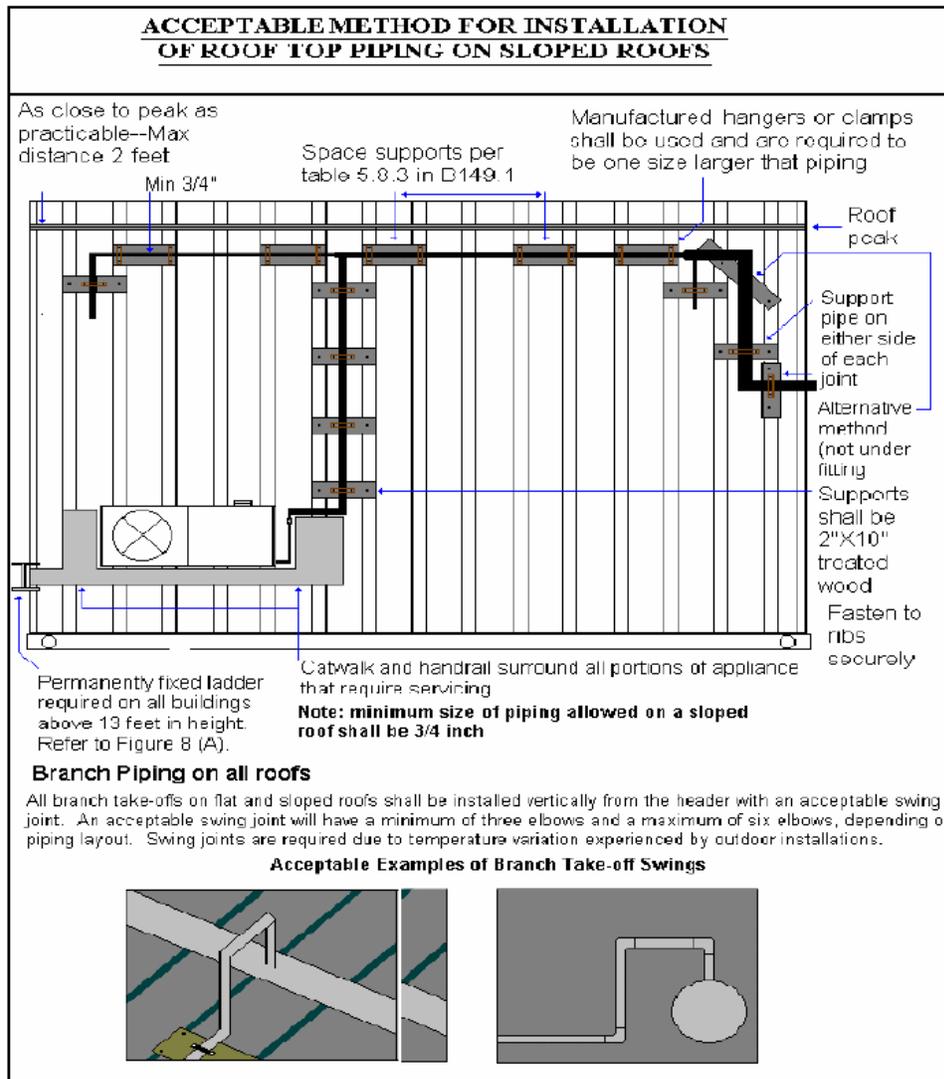
**Rationale:** To illustrate acceptable methods of protecting gas piping installed outdoors on a sloped roof from mechanical damage and/or stresses resulting from expansion and contraction caused by weather changes.

A sloped roof is one where water will drain to the outside perimeter of the building.

Pipe support should be provided according to Clause 6.26.1 and Table 6.2 of the current CSA B149.1. The method of support should be of a design acceptable to the inspecting authority.

Refer to Figure 6.26 (A) for illustration of guardrail and anti-skid walkway surround equipment installed on a roof top.

Figure 6.26 (A)



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## Inspection and Technical Services

### Gas Equipment Bulletin: Acceptable Methods of Pipe Support on a Flat Roof

Date Issued: January 1, 2018

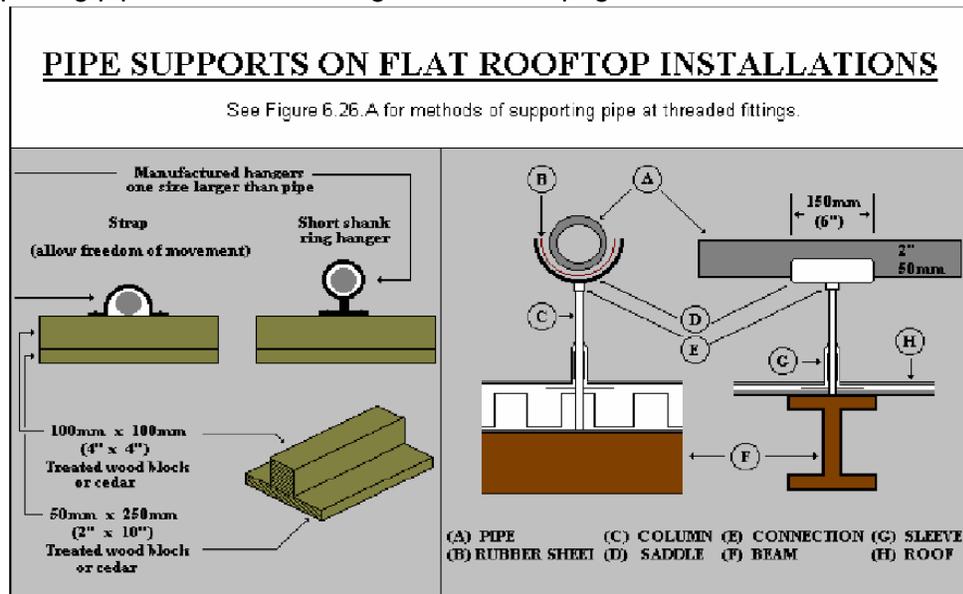
OFC ITSM 17-007

**Rationale:** To illustrate acceptable methods of protecting gas piping installed outdoors on a flat roof from mechanical damage and/or stresses resulting from expansion and contraction caused by weather changes.

Pipe support should be provided according to Clause 6.26.1 and Table 6.2 of the current CSA B149.1. The method of support should be of a design acceptable to the current inspecting authority.

Treated wood saw cuts should be protected by end cut treatment.

Refer to Figure 6.26 (B) as an example, and Figure 6.26 (A) for methods of supporting pipe at threaded fittings on the next page.

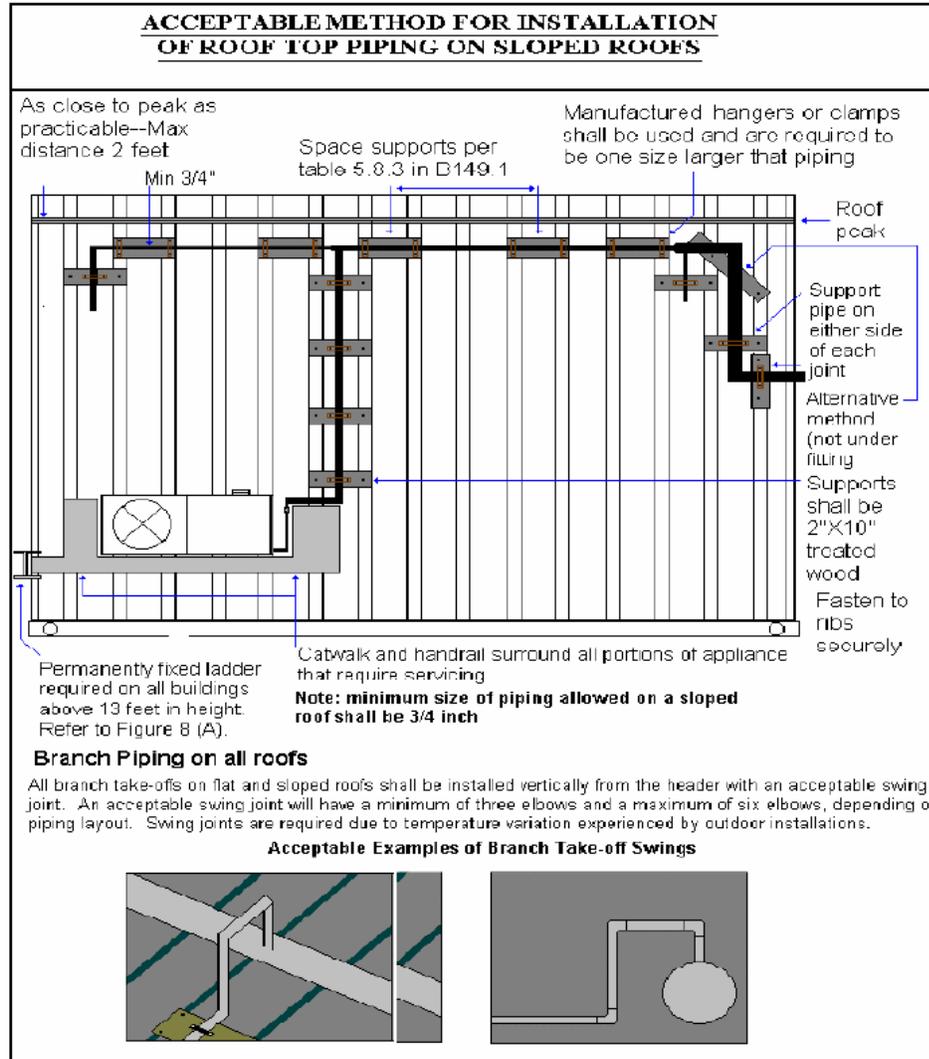


Piping less than  $\frac{3}{4}$ " NPS should not be installed on a roof, with the exception of the final appliance connection including the appliance(s) swing joint which may be less than  $\frac{3}{4}$ " provided no hazard could exist.

**Note:** Moving snow loads and ice on sloped roofs have been known to damage or break piping.



Figure 6.26 (A)



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## Inspection and Technical Services

### Gas Equipment Bulletin: Appliance Protection

Date Issued: January 1, 2018

OFC ITSM 17-008

**Rationale:** To illustrate an example of an acceptable method of protecting outdoor appliances from possible physical damage. See Figure 4.23.

- A)
  - 4" schedule 40 pipe filled with concrete
  - Painted or coated. Paint may suit architectural design or building safety requirements.
  - Top edge; rounded with no sharp edges.
  - May require additional size, reinforcement or method depending on hazard assessment.
  
- B)
  - Minimum distance from finish grade to top of bollard.
  - Additional distance may be required if the appliance could be damaged from higher elevations.
  
- C)
  - Minimum clearance measured from furthest point of appliance to inner edge of bollard or protection.
  - Additional clearance may be required for opening of doors, removal of access panels, serviceability, potential impact force or manufacturer's specifications, etc.
  
- D)
  - Distance measured from centre to centre.
  - Additional horizontal projection may be required if a potential hazard could be created from objects passing through bollards.
  
- E)
  - Below grade portion set in concrete.
  - Crown final grade for drainage.
  - Concrete and depth dependant on potential impact force, ground conditions, etc.



Consideration should be given to public accessibility.

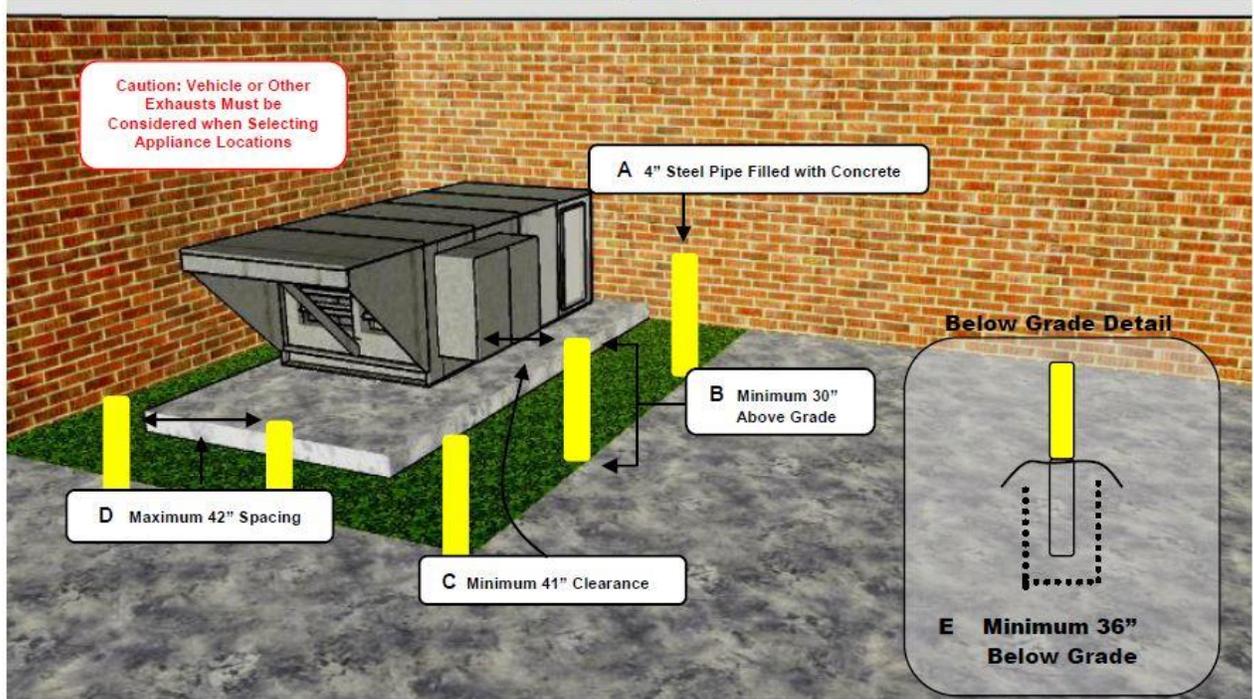


Figure 4.23

All clearances and distances are considered minimum requirements. Due to a wide range of potential hazards associated with protection of appliances, installers and designers are to assess each installation individually providing appropriate protection based on their judgment and experience.

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## Inspection and Technical Services



### Gas Equipment Bulletin: Clarification of Appliance Vent Termination

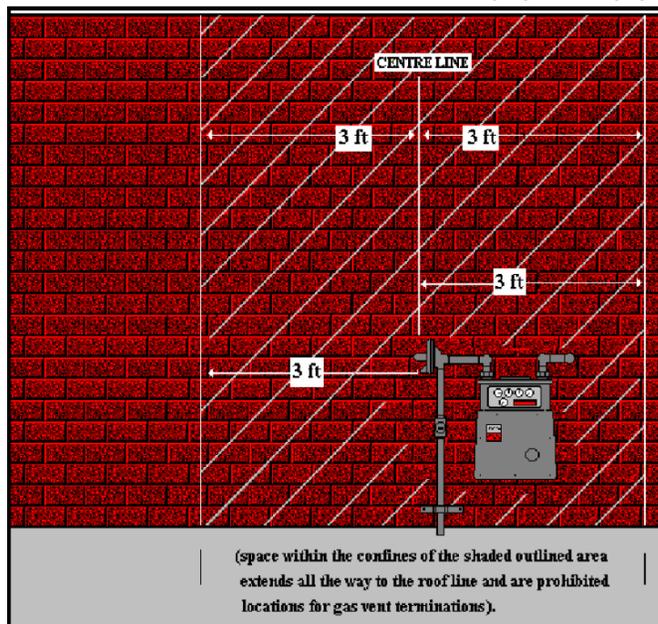
Date Issued: January 1, 2018  
OFC ITSM 17-009

B149.1 code allows an appliance vent to terminate directly over the centre-line of a regulator providing that the appliance vent terminates at a height of 15 feet or more above the meter/regulator assembly.

However, moisture in flue products may condense at the outlet of the vent in cold weather and there is potential for this condensation to drip down onto and interfere with a regulator installed directly below.

Therefore, in Manitoba, an appliance vent must **NEVER** terminate within 3 feet (900 mm) horizontally of the vertical centre of the regulator vent outlet.

#### Clarification of Section 8.14.8 (D) and (E)



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## Inspection and Technical Services

### Gas Equipment Bulletin: Connecting Supply Piping to a Utility Gas Meter

Date Issued: January 1, 2018  
OFC ITSM 17-010

**Purpose:** To clarify and provide direction to installers and contractors who are connecting customer's supply piping to the outlet of a single residential diaphragm type Utility gas meter.

**Rationale:** To ensure installers connecting customer's supply piping, or additional piping, to a single diaphragm Utility gas meter is piped so that it does not compromise the meter's engineered piping swing, or interferes with access to the plug on the Utilities outlet tee.

#### **Background:**

##### **Swing Joints**

When soil or cover material settles or heaves from frost action on the inlet side of a residential Utility Gas meter, it can cause the inlet piping to move in a downward/upwards/sideways direction. The Utility meter installation is designed and engineered to allow for this movement through the use of a meter piping swing that pivots on predetermined points on the inlet and outlet side of the meter.

**Customer piping connected at the outlet of the Utility Meter that is not installed correctly can compromise this swing.** If piping is connected incorrectly the piping will be held fast and will not swing on the pivot points. This exerts excessive stress on the Utility Gas Meter or piping or fittings, and can lead to a small gas leak or to total piping failure.

Note: This bulletin applies to typical residential installations and should **not** be used on the following:

- **Multiple meter sets** (normally installed on but not restricted to commercial buildings).

Rationale: These sets have all of the required piping swings on the inlet of the meter set prior to the connection at the header.

**-Rotary or turbine meters** (normally installed on but not restricted to commercial and industrial buildings).

Rationale: These meters are typically supported on a meter bracket and the outlet piping is not engineered into the meter swing.

**-Diaphragm meters with an outlet greater than 1 ¼ inch.**

Rationale: Diaphragm meters with outlets greater than 1 ¼ inch are typically supported on a meter bracket and the outlet piping is not engineered into the meter swing. The meter bypass system is not used on outlets larger than 1 ¼ inch.

### **Utility Meter By-pass Tee**

The standard design of all new Utility Meter Installations with a 1 inch outlet incorporates a tee immediately downstream of the outlet meter swivel. This tee is installed on the meter outlet to facilitate the use of a Meter By-pass System. **The Utility uses this tee and Meter By-pass System to change meters without interrupting the customer's gas supply.**

**This tee is the property of the Gas Utility and should not be removed from the system. Customer piping should be connected to this tee as per the attached drawings leaving the access plug for the Utility.**

**When connecting to the Utility gas meter, it is imperative that new piping be connected downstream of any pivot point.**

### **New Appliance Installations:**

On new appliance installations the supply piping to any appliance should be connected in a manner that does not compromise the Utility meter swing or interfere with the use of the Utilities Meter By-pass tee.

### **Replacement Appliances:**

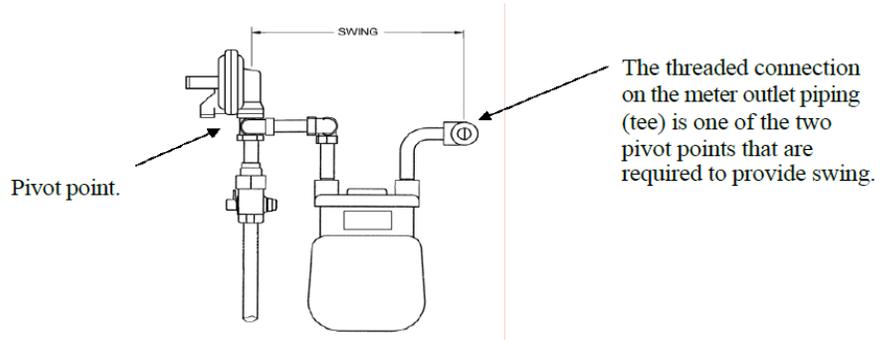
On replacement appliance installations the existing piping should not be installed in a way that compromises the Utility Meter Swing.

**It is the responsibility of the fitter replacing the appliance to ensure that any existing piping to the appliance is upgraded.**

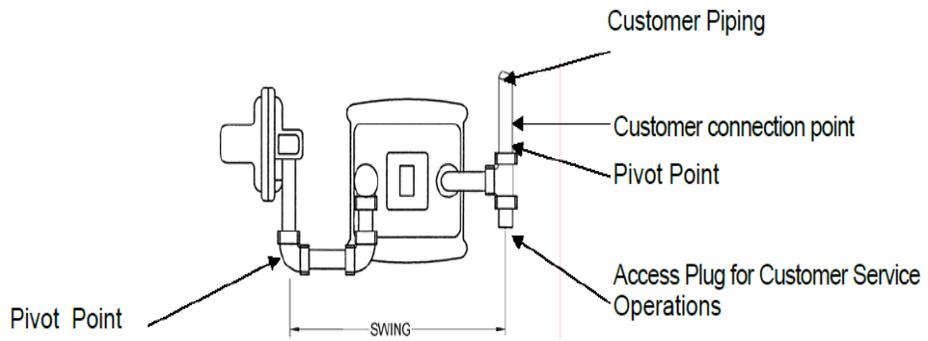
### Meter Set Swing

The swing for current residential meter sets is shown in Figure 1.  
The swing for the older style meter sets is shown in Figure 2.

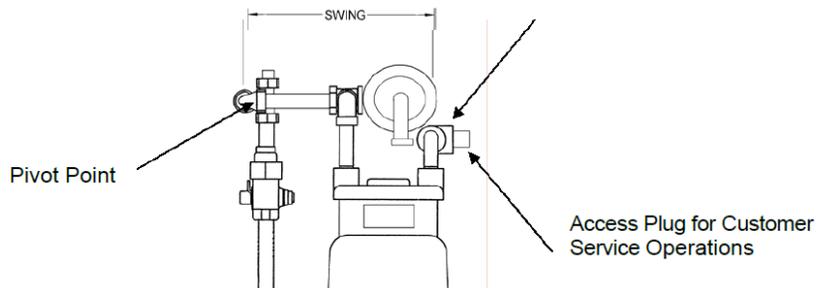
**Figure 1**  
**Residential Meter Set**



**Figure 2**  
**Older Style Meter Set**



The threaded connection on the meter outlet piping (tee) is one of the two pivot points that are required to provide swing



### **Access Plug for Customer Service Operations**

New meter assemblies are equipped with two threaded plugs on a tee on the meter outlet. The plug facing the customer's building is the point designated for the customer to connect their gas piping to the meter set. The second plug either facing toward the front of the meter or to the left side of the meter is installed exclusively for the future use of Manitoba Hydro Customer Service Operations.

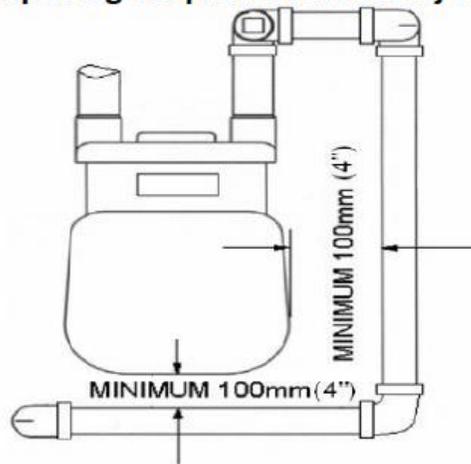
Note: The treaded plug designated for Customer Service Operations is required for future operations requirements and should **NOT** be used as an additional customer tie-in point. These plugs are show in Figure 1, 2 & 4.

### **Acceptable Piping Practices for Customer Piping Connection**

Acceptable piping practices for a customer piping tie-in to a meter outlet should:

- Maintain the pivot point on the meter outlet piping.
- Not use or obstruct the plug on the meter outlet piping that is for Manitoba Hydro Use only.
- Be a minimum of 100 mm from the sides and/or the bottom of the meter (where piping is placed beside or beneath the meter). See Figure 3.

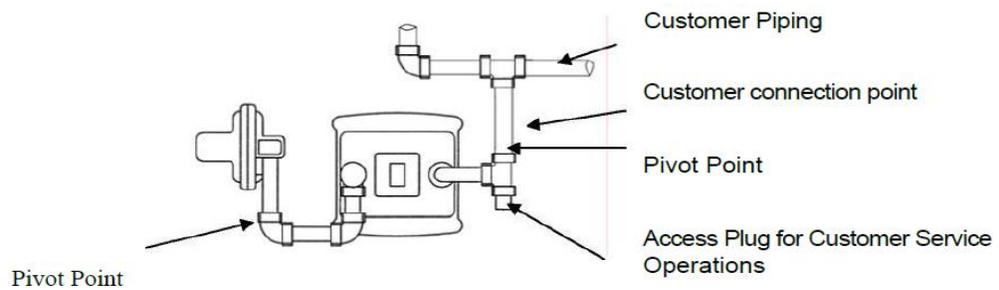
**Figure 3**  
**Minimum Spacing Requirements to Adjacent Piping.**



**Piping Practices**

Figure 4 shows an example of acceptable piping.

**Figure 4**  
**Acceptable Customer Piping Connection**



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## Inspection and Technical Service

### Gas Equipment Bulletin: Copper and Corrugated Stainless Tubing for Residential Use

Date Issued: January 1, 2018  
OFC ITSM 17-011

**Rationale:** To explain methods to protect copper and corrugated stainless steel tubing systems from mechanical damage.

The following applies to the installation of semi-rigid tubing and corrugated piping systems in residential and multiple-family dwellings.

#### Tubing Location and Protection

1. Tubing may be run parallel, diagonal or at a right angle to the floor joist. When run parallel, it is to be fastened to the centre of the vertical face. When run at right angle or diagonally to the joists or partitions, it is to be installed through drilled holes as near as practicable to the centre of the joist. The diameter of the drilled hole should be at least one and one half times as large as the diameter of the tubing. Alternatively, tubing may be run at right angles to the joists by fastening to the underside of every second joist. Protection should be provided by conduit, duct work, or centre beams. Where tubing is run in an open area and where it is subject to mechanical damage, protecting it by running a 1 inch dimensional lumber fastened adjacent to one side of the tubing is recommended.
2. When tubing is installed inside a partition, a steel plate may be used to protect the tubing where it extends through the floor or top-plate or other structural member of the wall.
3. Tubing should be protected with a plate at least 4 inches (10 mm) square, of 16 gauge steel or greater, when it passes through a stud, joist, plate or other structural member and where the tubing is less than 1  $\frac{3}{4}$  inches (45 mm) from the exposed edge.
4. Concealed piping or tubing should be installed where it can be inspected and tested in its final position prior to being concealed.

## **Corrugated Stainless Steel Tubing**

Where the current CSA B149.1 capacity and pipe sizing tables do not provide information to size corrugated stainless steel tubing, the manufacturer's certified instructions for sizing should be followed.

**In all cases, when manufacturer's installation instructions exceed the minimum requirements stated here, manufacture's instructions should be followed.**

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## Inspection and Technical Services

### Gas Equipment Bulletin: Flexible Connectors

Date Issued: January 1, 2018

OFC ITSM 17-012

**Rationale:** Clarify requirements for using flexible connectors on moveable and stationary appliances (as per section 36 of *The Gas and Oil Burner Regulation*).

1. Flexible connectors for domestic movable appliances:

- a) When using flexible connectors for appliances such as dryers, ranges, etc, these connectors should comply with the current CSA 6.10/ANSI Z21.24 *Connectors for gas appliances*. The minimum length may be 3 feet (90 mm). Maximum length 6 feet (1.8 m).
- b) Each appliance of the above type should have an acceptable restraining device installed in a manner that will effectively prevent undue strain on the connector when the appliance is moved

2. Flexible connectors for domestic stationary appliances:

- a) Flexible connectors for domestic appliances should comply with the current CGA 6.10/ANSI Z21.24 "Connectors for gas appliances." The maximum allowable horizontal deflection from centre to centre is 1 ½ inches. Refer to CSA B149.1 Clause 6.21.3.
- b) When a flexible connector is installed on a water heater, it should be located to prevent physical damage, and may follow the contour of the appliance.
- c) A flexible connector should not pass through the walls of a cabinet unless it is approved to do so and this approval is stated within the manufacturer's certified installation instructions.

3. CSA Brazed-end flexible connectors:

All CSA **Brazed-end** flexible connectors must be replaced when the appliance they serve is being serviced or replaced.

*ANSI Z21.24/CSA 6.10, ANSI Z21.69/CSA 6.16 and ANSI Z21.75/CSA 6.27 Connectors and fittings are designed for use only on the original installation and **should not be reused** for another appliance or at another location.*

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## Inspection and Technical Services

### Gas Equipment Bulletin: Initial Start-Up Procedure for High Input Equipment (Input Exceeding 400,000 BTU/hrs)

Date Issued: January 1, 2018  
OFC ITSM 17-013

**Rationale:** Recommended procedures for the safe start-up and commissioning of high-input gas fired equipment.

This guideline has been developed to help ensure safe start-ups of high input gas-fired equipment. Due to a large variation in the types of equipment and controls, some of the procedures as set out will not be applicable to certain burners. On some equipment, other safety checks that are not mentioned in this guideline may be required.

The commercial and industrial gas fitter ultimately responsible for the installation, and must be present during the initial start-up. This person should check to demonstrate that the installation meets all relevant codes, including the testing of piping, a check of safety controls electrical connections, safety interlocks and relief valve rating.

The gas fitter should ensure that all persons not directly involved in the start-up are cleared from the room, or the area of the equipment if outdoors, in which the equipment is located, before start-up is attempted.

A dry-run should be carried out with all manual valves closed to determine that all controls are in a safe operating condition before gas is supplied to the pilot or main burner. It is suggested that the dry run checks will take a minimum of four control cycles to perform and can be carried out as follows:

#### First Cycle:

1. Check and determine the movement of position of the air dampers during the pre-purge to ensure the air flow is not less than 60% of that required for the minimum input to the unit during this period.
2. Check the volume of pre-purge air to determine its conformance with applicable codes and standards (at least four air changes to the combustion chambers and flue passages).
3. At the end of the pre-purge cycle, check the modulating gas valve and the air damper to determine that they have returned to the low fire position.

#### Second Cycle:

During pre-purge, simulate failure of the airflow or forced fan operation and ensure that ignition spark does not occur. Failure may be simulated by failing a motor, closing the damper, removing the belt, removing tubing connection from air providing device, or other acceptance means.

### **Third Cycle:**

Connect a meter for the measurement of scanner or detector signal. Check this reading during the ignition period to ensure it reads zero. If there is a reading, the scanner or detector may be sensing a false signal due to a spark, etc.

**NOTE: The meter should be connected according to the applicable specifications and the type and make of controls.**

### **Fourth Cycle:**

Subject the scanner or detector to a simulated flame, and check that:

1. The pilot is proved.
2. The main gas valve opens.
3. The pilot is interrupted (ignition spark ceases).
4. The trial for main flame is proven (the time between the opening of the main gas valve and the interruption of the spark).
5. The loss-of-flame signal is proven when the simulated is removed and the gas valve closes.
6. The manual reset valve, when used in conjunction with a firing valve that incorporates an end-switch interlock, cannot be opened with the firing valve in an open position (carried out by subjecting scanner or detector to a simulated flame).

### **Start-up of burner or burners:**

#### **1. Purging gas piping**

- (a) **Do not** open the firing valve. This valve should remain closed until piping is purged of air.
- (b) Determine a safe location and method of dispersal of purged gas.
- (c) The purge connection should be made between the manual shut-off valve on the drop and the pilot connection or main input valve.
- (d) The purge connection should be large enough to ensure an adequate purge velocity to evacuate air.
- (e) Once the above conditions having been fulfilled, the piping can be purged. To ensure all air is evacuated, purging must continue until gas is detected at the purging tube by means of flaring or other positive method (not in the combustion chamber of the unit).
- (f) When purging is complete, the piping should be reassembled or purge connection closed off and all untested joints soap-tested under gas pressure.

- (g) During the above purge period the firing valve should be closed. After completion of (f) above, connect a manometer or pressure gauge between the main gas valve and the firing valve. The pressure reading on this instrument should be zero, as a pressure reading would indicate the main gas valve is leaking or open.

## 2. Light-up of burner

The following are supplementary to specific manufacturer's instruction. These should, however, be carried out in conjunction with manufacturer's instructions.

- i. Pilot turn-on
  - i. Ensure the main firing valve is closed. Check that the pilot burner is in the correct position to ignite the main burner.
  - ii. Turn-on pilot the gas supply and establish the pilot.
  - iii. Using a multi-meter, adjust pilot flame to attain a maximum and steady signal.
  - iv. Terminate cycle during the 'Trial for Pilot'. Ensure lockout with appropriate time limit.
  - v. De-energize the control system and adjust for a new cycle.
- ii. Gas manifold pressure check with firing valve closed.

This check is only an indication that the regulator is working when gas pressure is to be reduced from pounds (5 PSI or higher) to inches of W.C. at the main burner. Do not adjust the regulator. The reading observed will be a lock-up pressure. This is carried out by putting the burner through a cycle and noting the reading on the manometer that was connected in 1 (g) above – purging gas piping.

- iii. Burner turn-on
  - i. The main flame turn-on procedure will vary with the type of equipment. For some types of equipment it is preferable to use the firing valve to establish main flame. For other types it may be necessary to turn on the firing valve and permit the establishment of main flame through the automatic input valve.

For example: a burner with an interrupted pilot has a period of 15 seconds to establish a main flame. It is therefore considered safe and practical to open the firing valve and establish main flame through the automatic valve.

A unit equipped with an intermittent pilot however, has a constant open automatic valve after the pilot is proven, thus the main burner or initial start must be established using the firing valve.

- ii. When main flame is established, adjust air dampers to produce a stable, clean flame and make the following adjustments.
  - i. Establish correct burner input by checking input on gas meter; manifold pressure.
  - ii. Set air adjustment for correct air/gas ratio over complete firing range; CO<sub>2</sub> check; excess air check; CO check.
  - iii. Check (where applicable) function of:
    - Low – Gas pressure switches
    - Air flow proving devices
    - Low water cut-off
    - High limit control
    - Operating limit control
    - All other interlocks and limit devices

(iv) Perform a minimum pilot turn-down test. The minimum pilot is considered the input at which the pilot will ignite, be sensed with a minimum signal by the flame sensing device, and provide safe lighting of main flame.

**Caution must be exercised when carrying out this test to observe the size of the minimum flame and its ability to safely light the main flame.**

- iv. Re-establish normal pilot adjustment.

**NOTE:**

When starting up gas fired boilers, the gas fitter must ensure that any boiler with a rating greater than 3 Boiler Horsepower (3 Boiler Horsepower = 30 Kilowatts = 126,000 BTU/hrs input) is not activated without prior notification and approval of the OFC Boiler Inspection Unit in other than one (1) or two (2) family dwellings.

**(10 kw = 1 boiler horse boiler = 42,000 BTU/hrs)**

For booking a boiler inspection, please contact us at the numbers located at the bottom of this bulletin.

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## Inspection and Technical Services

### Gas Equipment Bulletin: Inspection of Heat Exchanger Failures

Date Issued: January 1, 2018  
OFC ITSM 17-014

**Rationale:** To provide guidelines for the inspection of a gas fired heating appliance suspected of having a cracked heat exchanger.

When checking for a cracked heat exchanger, be sure to operate the furnace for a reasonable length of time (10-15 minutes) to allow the heat exchanger to heat sufficiently.

#### Face Plate Cracks

1. Advise the furnace owner of the defect if there is no flame disturbance or carbon monoxide being produced. A crack in the faceplate may not necessitate the replacement of the heat exchanger or appliance.
2. If the face plate crack can be repaired or if it is not interfering with the operation of the appliance, the appliance may stay in service until the next scheduled maintenance check (annually).
3. Check for loose screws in the draft diverter and on face plates. Replace loose screws with larger screws where necessary.

#### Cracks or Hairline Fractures in the Heat Exchanger

Regardless of the apparent extent of the defect on discovery, all cracks and hairline fractures have the potential to become serious safety hazards.

Where there is no flame disturbance or evidence of carbon monoxide in ambient atmosphere:

1. Advise the owner in writing of the defect and of the safety hazard.
2. Advise the owner that it should be replaced as per section 4.21.1 of the current CSA B 149.1.
3. Notify the Utility if the owner does not replace the appliance immediately. When authorization is given to replace the appliance the Utility need not be involved in the determination of the defect.
4. When the Utility is required to verify a defect, the Heating Contractor should mark the location of the fracture directly on the appliance, or alternatively by

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means of a sketch left on site. **NOTE:** The Utility will **NOT** accept camera technology to verify defective heat exchangers. Defects must be readily seen or felt for Utility verification. The Utility will also not remove heat exchangers. If a Heating Contractor finds it necessary to remove the heat exchanger the Utility will make an effort to accommodate requests for appointments for verification.

### **Where there is flame disturbance and/or evidence of carbon monoxide in ambient atmosphere:**

1. Immediately turn off the fuel supply at the drop.
2. Tag the drop identifying the deficiency.
3. Advise the owner in writing of the failure in the heat exchanger and of the potential safety hazard.
4. Advise the owner that replacement should be done as per section 4.21.1 of the current CSA B 149.1.
5. Notify the Utility if the owner does not replace the appliance immediately. When authorization is given to replace the appliance the Utility need not be involved in the determination of the defect.
6. When the Utility is required to verify a defect the Heating Contractor should indicate the location of the fracture directly on the appliance or alternatively by means of a sketch left on site. **NOTE:** The Utility will **NOT** accept camera technology to verify defective heat exchangers. Defects must be readily seen or felt for Utility verification. The Utility will also not remove heat exchangers. If a Heating Contractor finds it necessary to remove the heat exchanger the Utility will make an effort to accommodate requests for appointments for verification.

**NOTE: If carbon monoxide is being produced and found to be in the ambient space the installer/fitter should determine the cause and/or turn the appliance off.**

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## Inspection and Technical Services

### Gas Equipment Bulletin: Installation of Buried Piping or Tubing by Directional Boring, Pushing or Ploughing

Date Issued: January 1, 2018  
OFC ITSM 17-015

#### CSA B149.1-2010 - Natural gas and propane installation code

##### 6.15 Underground piping and tubing

###### Topic

CSA B149.1-2010 - Natural gas and propane installation code requires underground pipes to be protected against corrosion and physical damage in accordance with good engineering practice, and in accordance with the manufacturer's instructions.

###### Important Information

Piping or tubing is required to be mounted, braced, and supported to provide for expansion, contraction, jarring, vibration, and settling, and must be protected against either damage or breakage due to strain, wear, and mechanical impact. In addition, it is important to accompany plastic piping or tubing by a tracing wire or other electronically detectable tracing media.

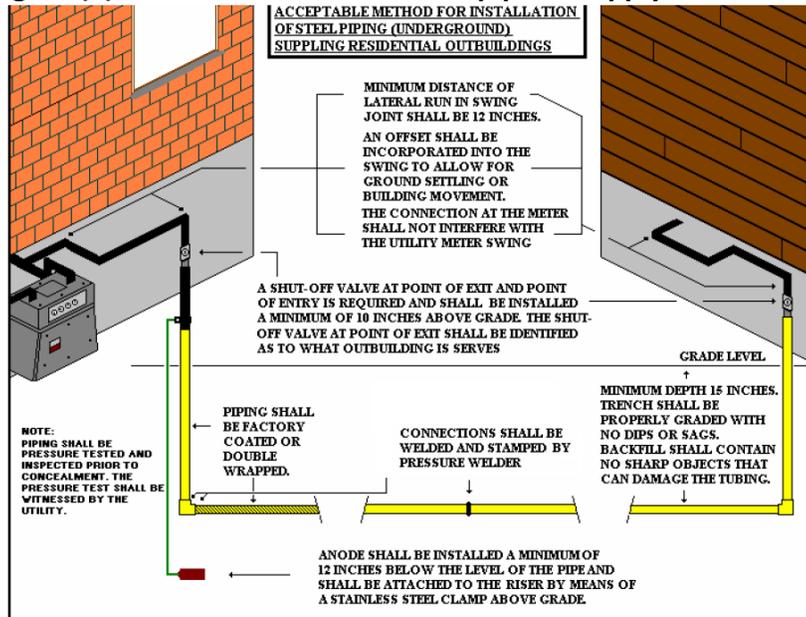
The following best practices should be employed during the installation of buried piping or tubing by directional boring, pushing or ploughing.

- (i) All underground steel pipe is to be factory coated or double wrapped.
- (ii) Plastic piping and tubing is to be inspected by the installer before installation for defects such as cuts, scratches and gouges. Damaged cylindrical pieces are to be cut out and replaced. Inspection must be adequate to confirm sound joints. refer to clause 6.27.1 of the CAN/CSA B-149.1.
- (iii) Polyethylene pipe and fittings are to be joined by heat fusion, electro-fusion or mechanical methods. Such joining methods must be compatible with the materials being joined. Manufacturer's instructions are to be followed when performing heat fusion, electro-fusion and bonding in polyethylene piping systems. All fusers are to be certified in the applicable procedures by the manufacturer or an organization acceptable to the inspecting authority.
- (iv) Polyethylene pipe fusion joints will not be classified as welded joints in respect to pressure test requirements.

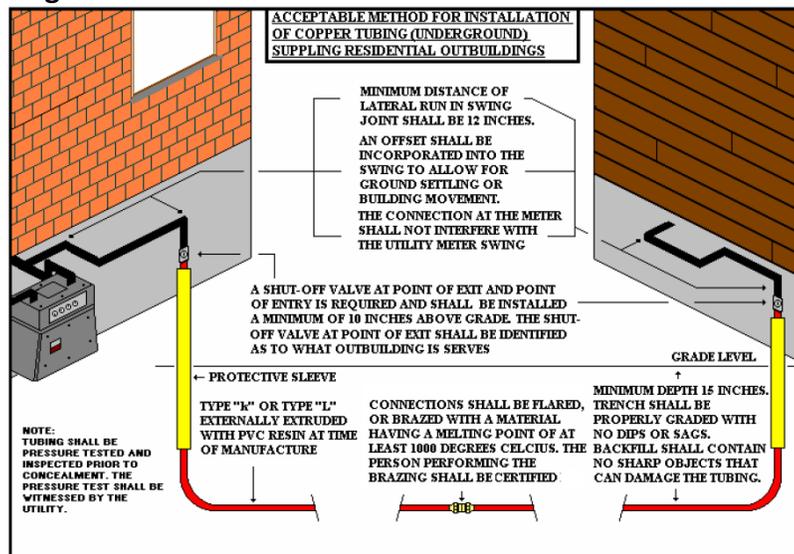
- (v) Polyethylene pipe must not be installed above ground.
- (vi) Polyethylene piping or tubing are to be accompanied by a tracer wire or an equivalent medium. An acceptable method could be to use a minimum of 14-gauge wire as a means of pipeline location. Both ends of the wire are to be attached to the polyethylene pipe above grade with a minimum of 18 inches (450 mm) of wire left above grade.
- (vii) Pressure testing conducted is to be conducted as per CAN/CSA B-149.1.
- (viii) If the ploughing method is used, the installer must leave all joints and connections exposed to allow visual inspection by the inspecting authority.
- (ix) The installer may be required to verify the integrity of the tracer wire to the inspecting authority upon request.
- (x) Cathodic protection may be required to be installed as necessary. The responsibilities of an installer performing the installation and replacement of appliances that are connected to an underground line that was installed by directional boring, pushing, ploughing or an existing line installed by a third party are as follows:
  - (i) Connections made to a line installed by a third party must be made by a licensed gas fitter.
  - (ii) The licensed gas fitter assumes responsibility of the installation of all underground piping or tubing back to the interconnection to the Utility meter or customer piping.
  - (iii) The licensed gas fitter may be required to verify the integrity of the tracer wire to the inspecting authority upon request.

To illustrate good engineering practices, an example arrangement is provided below, demonstrating items to consider in the process of installation of buried steel gas piping, on Figure (1), copper tubing on Figure (2) and plastic pipe on Figure (3)

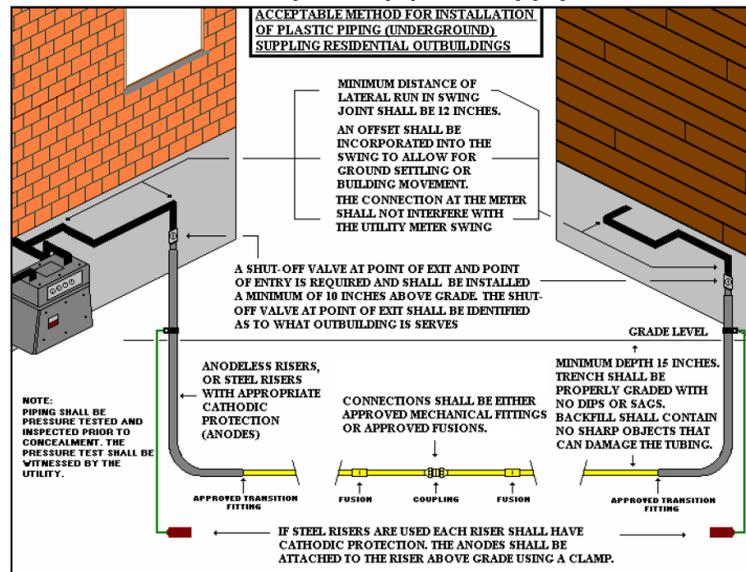
**Figure (1) Installation of buried steel pipe to supply outbuildings**



**Figure (2) Installation of buried copper tubing to supply residential outbuildings**



**Figure (3) Installation of buried plastic pipe to supply residential outbuildings**



**Reference Documents:**

**Gas and Oil Burner Regulation 104/87 R  
 CSA B149.1- 2010 - Natural gas and propane installation code**

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## Inspection and Technical Services

### Gas Equipment Bulletin: Job Fabricated Support(s) for Non-Residential Appliances/Equipment

Date Issued: January 1, 2018  
OFC ITSM 17-016

#### CSA B149.1- 2010 - Natural gas and propane installation code

##### 4.2.1

*An appliance, accessory, component, equipment, or material used in an installation shall be of a type and rating approved for the specific purpose for which it is employed.*

#### Topic

Non-residential gas fired appliances/equipment are to be installed in accordance with the manufacturer's certified instructions and the CSA B149 Code requirements. The purpose of this bulletin is to provide information for consideration to one of the requirements to installation of appliances and equipment - **load distributing base supports**.

#### Important Information

Usually, load distributing base supports are supplied by the manufacture of the appliance or equipment. If the supports are not supplied by the manufacture, job fabricated base supports are allowed and it is recommended that:

- The design to be by P. Eng. to provide a sufficient number of strategically placed supports and have a load capacity to prevent damage to the building structure, appliance, equipment piping or any combination.
- Structural supports consist of material that will not be affected by the appliance or equipment's operation including heat generation, vibration, exhaust, condensation etc.
- External conditions that may weaken supports such as weather, temperature difference, corrosive environment, snow loads, insects etc. are accounted for.

In addition, when selecting location, it is important to consider distances from wall, buildings, fences, parking lots, roof edges, building air openings, exhausts, property lines, anticipated snow levels, flammable vapors, combustible dusts or fibers etc. in accordance to current codes, standards and manufacturer's instruction.

**Reference Documents:**

**Gas and Oil Burner Regulation 104/87 R  
CSA B149.1 - 2010 - Natural gas and propane installation code**

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## Office of the Fire Commissioner

### Inspection and Technical Services



#### Gas Equipment Bulletin: Metal Liners in Masonry Chimneys

Date Issued: January 1, 2018  
OFC ITSM 17-017

**Rationale:** To highlight existing requirements within the Manitoba Gas and Oil Burner Regulation that impose requirements for metal liners in certain masonry chimneys.

The Gas and Oil Burner Act requires that **regardless of input**, when gas burning equipment installed in day care facilities and residential buildings that house more than two families are vented into a masonry chimney, the masonry chimney may either be lined with an approved metal liner, or the owner may ensure that mandatory chimney inspection requirements are met.

All metal liners should be provided with an accessible clean-out that allows for inspection of the liner.

Specifically, under Section 47 of the Gas and Oil Burner Regulation.

47(1) The owner of a building in which a day care facility is operated, or of a residential building, other than a one or two family dwelling unit, heated by gas burning equipment vented through a masonry chimney, shall not operate or allow persons to operate the gas burning equipment unless;

- (a) The chimney is equipped with a metal liner that conforms with CAN/ULC-S635-M90 “Standard for Lining Systems for Existing Masonry or Factory Built Chimneys and Vents” or,
- (b) The owner ensures that the requirements of Subsections 47(2) to 47(5) of the Gas and Oil Burner Regulation are met.

Subsection 47(2) states: Gas burning equipment referred to in Subsection (1) may be operated if the chimney is inspected annually by a chimney sweep certified by the Canadian Wood Energy Institute and the following conditions are met:

- (a) The chimney is equipped with a cleanout;
- (b) The owner ensures that the chimney sweep removes all debris from the chimney;

- (c) Where the chimney sweep informs the owner that he or she has reason to believe that any debris removed from the chimney is a result of chimney deterioration, the owner shall ensure that the chimney is swept and a scan by video camera is conducted to determine the condition of the chimney: and
- (d) Where, in the opinion of the chimney sweep, the scan reveals deterioration of the chimney, the owner shall immediately take steps to repair or replace the chimney or equip the chimney with a metal liner that conforms with the requirements of Subsection (1).

47(3) An owner shall ensure that a log book is provided for a masonry chimney inspected under Subsection (2) and a record of all inspections, maintenance and repairs is entered by the person carrying out the inspection, maintenance or repair.

47(4) An owner shall make a log book referred to in Subsection (3) available to an inspector upon request.

47(5) Where there is a dispute between an owner and a chimney sweep as to the condition of the chimney inspected under Subsection (2), the matter shall be referred to the Chief Inspector for determination and where the Chief Inspector is of the opinion that the chimney is not in satisfactory condition, the Chief Inspector shall give notice to the owner of any defects and the period of time within which the owner must correct the defects.

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Inspection and Technical Services

Gas Equipment Bulletin: Piped Connections to Manufactured Homes

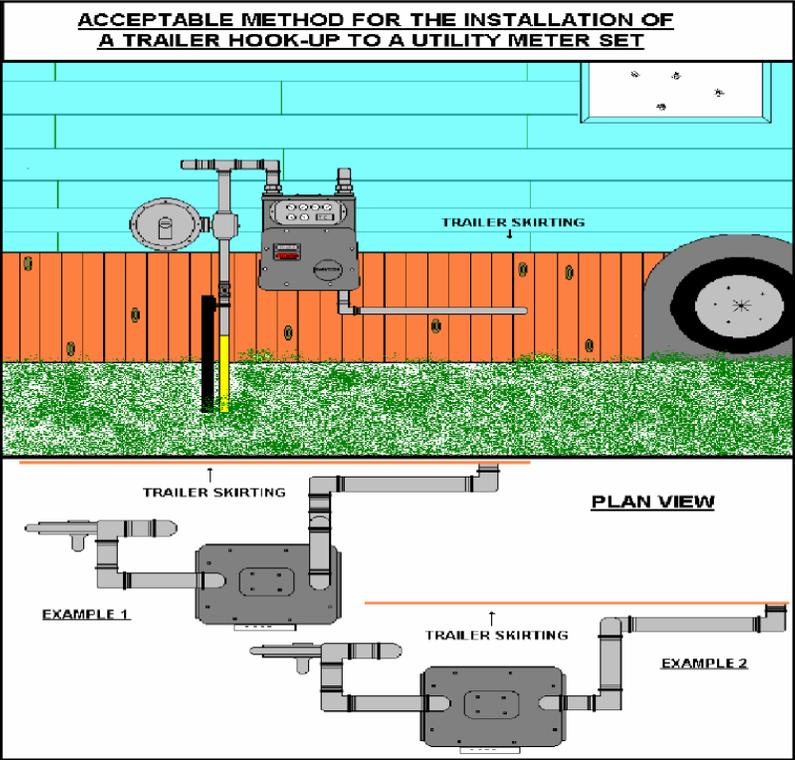
Date Issued: January 1, 2018  
OFC ITSM 17-018

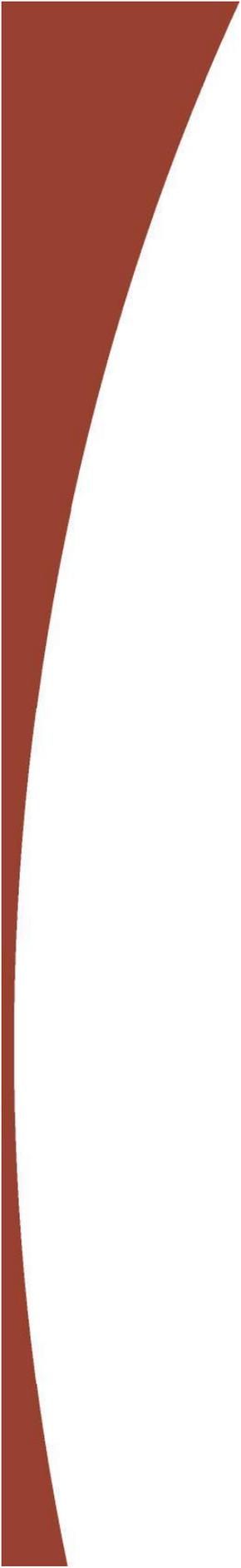
**Rationale:** Guidance for installing acceptable swing joints (as per section 36 of the Gas and Oil Burner Regulation).

When installing a manufactured home connection to a utility meter set, the swing joint required should be a minimum 12 inches (30 cm) above grade, and a minimum of a 12 inches (30 cm) lateral from the building.

Refer to current CSA B149.1 Clause 6.21.7.

**Figure 6.21.7**  
**Piped connections to manufactured homes**





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## Inspection and Technical Services

### Gas Equipment Bulletin: Piping to Commercial Cooking Equipment

Date Issued: January 1, 2018  
OFC ITSM 17-019

**Rationale:** To explain general requirements for commercial cooking installations.

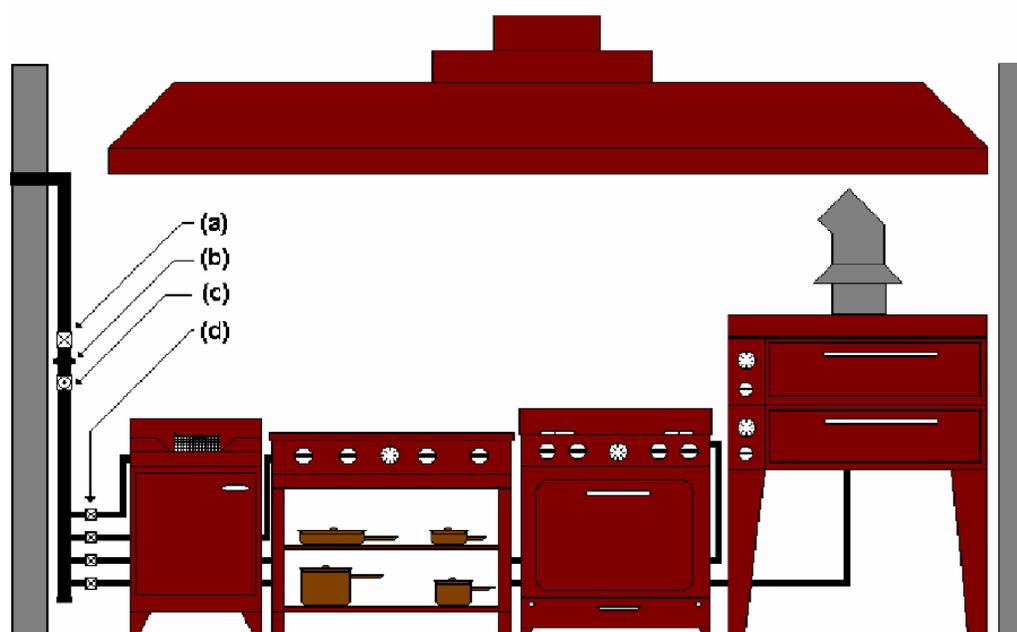
1. The in-line gas piping for commercial cooking equipment should have **readily accessible** shut-off valves installed for each appliance at either end of the in-line equipment.
2. The automatic fire safety valve should be installed in a **readily accessible** location outside of the protected canopy area.
3. Each individual appliance shut-off valve should be identified as to the appliance it serves.
4. Appliance shut-off valves should not be subjected to temperatures in excess of 125 degrees Fahrenheit (50 degrees Celsius).

Refer to Figure 7.31 on the next page.



Figure 7.31

**ACCEPTABLE LOCATION OF SHUT-OFF VALVES  
INSTALLED WITHIN A COMMERCIAL KITCHEN**



- a) Manual shut off valve.
- b) Union.
- c) Automatic fire safety valve should be installed in a readily accessible position outside of the protected canopy area.
- d) Readily accessible individual shut off valve identified as to the appliance served should not be subjected to temperatures in excess of 125°F. (50°C).

**NOTE: Connections at appliances should be installed according to current B149.1 Code requirements.**

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## Inspection and Technical Services

### Gas Equipment Bulletin: Procedure for Propane Installations

Date Issued: January 1, 2018

OFC ITSM 17-020

**Rationale:** To inform propane suppliers and gas fitters of their responsibilities under the Manitoba Gas and Oil Burner Act to provide inspecting authorities all required documentation pertaining to propane installations, and to obtain inspection and approval if required.

Liquefied Petroleum Gas installations should conform to the requirements of the Gas and Oil Burner Act and Regulations, including the current CSA B149.1, B149.2, B149.3 codes as applicable.

Regulations under the Gas and Oil Burner Act make the propane supplier responsible, when product is supplied to a new installation, to submit a turn-on report to the Office of the Fire Commissioner with seven days of the installation.

This report should confirm that the installation, including tank location, supports, and piping conforms to the current CSA B149.1 and B149.2 codes and certified eor approved equipment in accordance with the current CSA B149.3 code is being installed.. It should also give the name of the licensed gas fitter who conducted the installation for the supplier.

Gas permits should be obtained for each component of the installation, i.e. for all appliances and the supply vessel or 'tank set'. 'Tank set' includes the first and second stage regulators and the piping between regulators.

The permits should be obtained as follows:

- When the propane supplier installs both the supply vessel and the appliance(s), the supplier should obtain one permit for the entire installation, prior to the installation.
- When the propane supplier installs the supply vessel and a gas fitter not employed by the propane supplier installs the appliance(s), the propane supplier should obtain a gas permit for the installation of the supply vessel, and the gas fitter shall obtain a permit for the appliance(s).

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## Inspection and Technical Services

### Gas Equipment Bulletin: Propane Storage Tanks on a Construction Site

Date Issued: January 1, 2018  
OFC ITSM 17-021

**Rationale:** To explain minimum requirements for protection of a propane deliver system installed at a temporary site.

1. Permits and drawings should be submitted for approval to the Office of the Fire Commissioner prior to installation of any propane storage tanks.
2. Installation of propane storage tanks up to 2,000 gallon maximum capacity should be at least 10 feet (3.05 m) from all buildings, hoardings, driveways and excavations below grade.
3. All propane tank installations should be protected from vehicle traffic. One acceptable way to do this would be to use 45 gallon drums filled with sand placed 4 feet (1.2 m) apart around the complete propane installation.
4. All supply hoses from tank installations to buildings and hoarding should be protected from damage. 2" x 4" lumber can be used as a means to protect gas hoses as a temporary measure.
5. Any mobile propane tank used at a construction site should be adequately blocked, and the installation should be protected from physical damage by an acceptable method, such as that used to protect stationary propane tank installations.
6. Steel piping may be used where it passes through walls, floors and hoarding. Hoses **are not allowed** for these applications.
7. Gas shut-off valves should be installed at building entrances and on all branch lines on piping manifolds supplying construction heaters.
8. The hose and any connectors used should be approved for use by a recognized approval agency. The hose should be sized properly for the rated input of the construction heater being supplied. The hose should not be less than 15 feet (4.6 m) nor more than 75 feet (16 m), per the current CSA B149.1 Section 6.20.3 (c). No connections are allowed in the hose.

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## Inspection and Technical Services

### Gas Equipment Bulletin: Providing Combustion Air to Residential and Commercial/Industrial Installation

Date Issued: January 1, 2018  
OFC ITSM 17-022

#### CSA B149.1- 2010 - Natural gas and propane installation code

##### *8.3 Air-supply openings and ducts*

##### *8.4 Air-supply requirements for appliances having a total input exceeding 400,000 Btuh (120 kW)*

#### Topic

CSA B149.1- 2010 - Natural gas and propane installation code provides methods of providing air supply to gas-fired equipment. Considering Manitoba's cold winter climate, it is important to design installations that provide free flow of combustion air to residential or commercial/industrial gas-fired equipment, without delivering excessive cold air to the space.

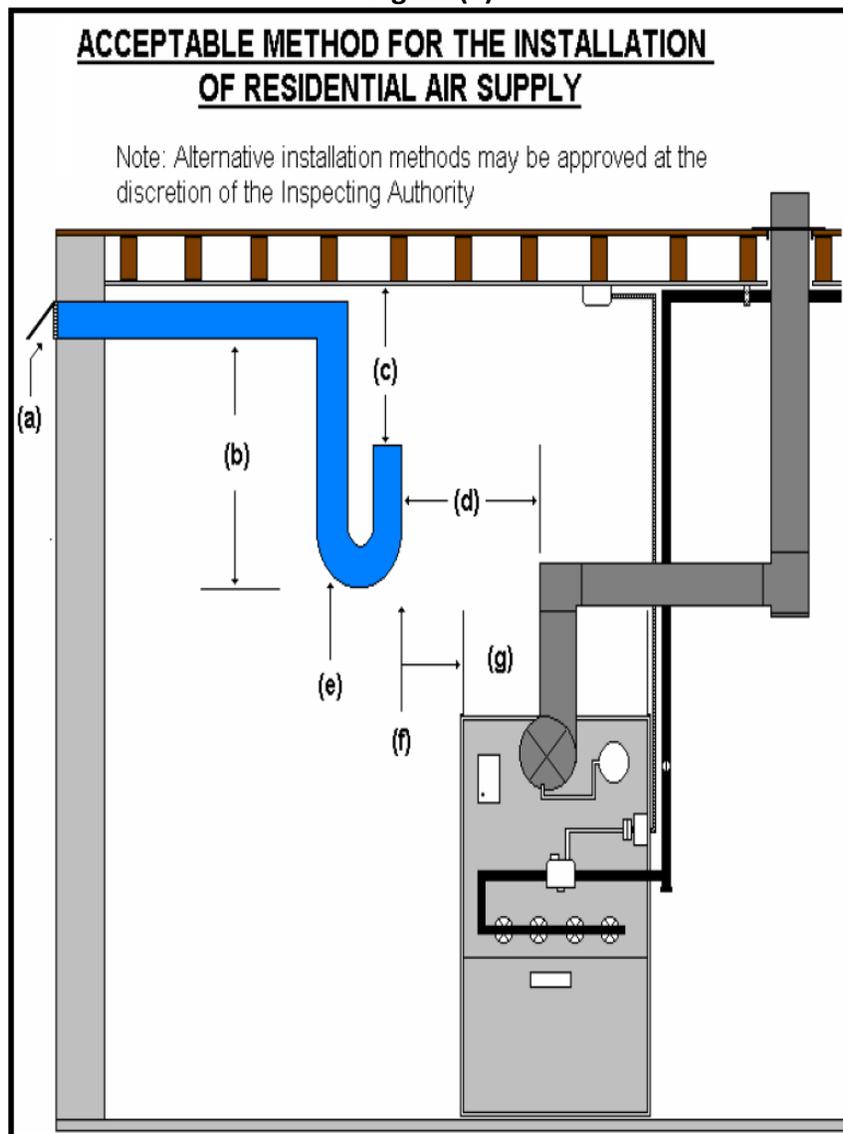
#### Important Information

Methods of providing air supply to gas-fired equipment must comply with the current CSA B149.1. However, to prevent excessive cold air entering rooms where residential or commercial/industrial gas-fired equipment is installed, the air supply inlet may be ducted in accordance with Figure (1) for residential, Figure (2a) and (2b) for commercial/industrial installations, or by a method approved by the inspecting authority.

**Note:** This method is intended to provide air for combustion purposes only and does not provide air that may be required by other systems in the building, such as high-volume exhaust fans and dryers. All other air requirements must be assessed and adequate provision for total building air requirements must be made.



Figure (1)



- (a) An inlet protected by a device that prevents rain, snow or rodents from entering the building. This inlet should be installed 12 inches (30 cm) above grade.
- (b) Trap with minimum depth of 2 feet (60 cm).
- (c) Duct terminate not less than 1 foot (30cm) from the ceiling.
- (d) Duct a minimum distance of 3 feet (90 cm) from the venting.
- (e) Duct insulated throughout its entire length.
- (f) Duct terminate with a horizontal distance of 2 feet (60 cm) from the plenum.

Figure (2a)

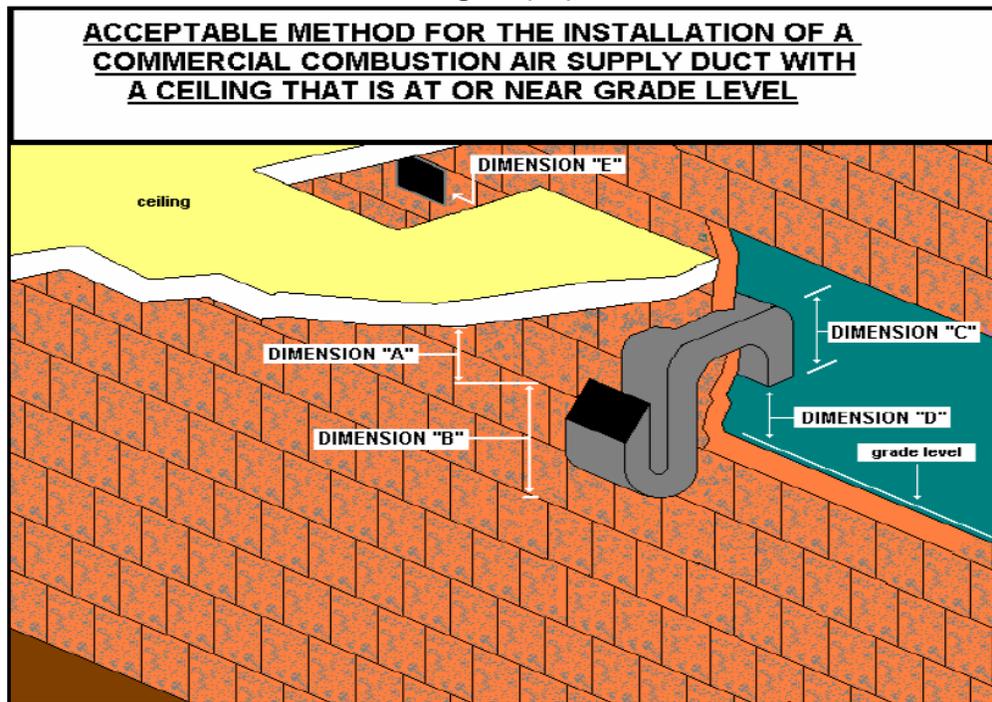
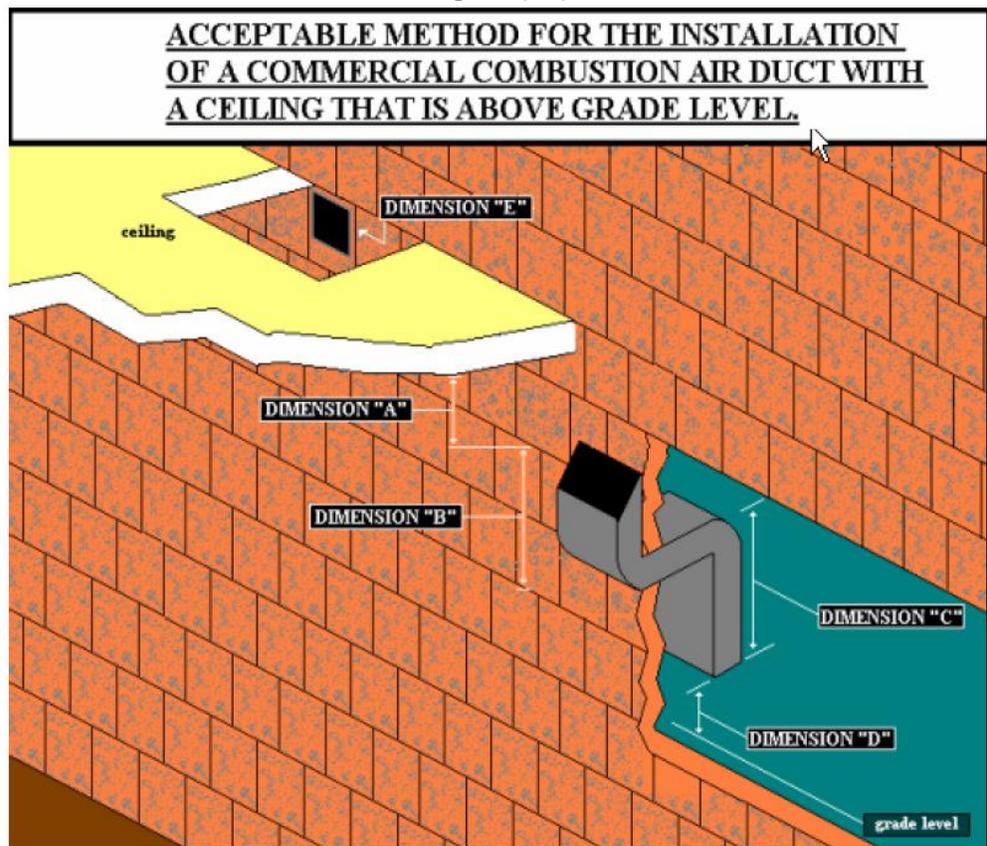


Figure (2a)



## Office of the Fire Commissioner



(a) The duct should not terminate closer than 12 inches (30 cm) from the ceiling.

(b&c) The duct should be formed in the shape of an 'S' with the outlet directed upward towards the ceiling. The length of the portion turned upward inside the building and also the length of the portion turned downward outside must be equal to at least the depth of the duct.

(d) An air inlet opening from the outdoors should be located not less than 3 feet (100 cm) above the outside grade level.

(e) Ventilation air should be installed as close to the ceiling and as far from the combustion air supply duct as is practicable.

(f) Air supply ducts are to be sized to the current CSA B149.1

### Reference Documents:

**Gas and Oil Burner Regulation 104/87 R**

**CSA B149.1- 2010 - Natural gas and propane installation code**

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## Inspection and Technical Services

### Gas Equipment Bulletin: Regulator Stations on Roof-Tops

Date Issued: January 1, 2018  
OFC ITSM 17-023

#### CSA B149.1- 2010 - Natural gas and propane installation code

##### 5.2.1.6

***A pressure regulator provided in a gas supply line shall not be installed***

- a) ***where it is inaccessible for repair, replacement, servicing, or inspection;***
- b) ***in a concealed location; or***
- c) ***where it could be reasonably expected to be subject to physical or chemical damage.***

#### Topic

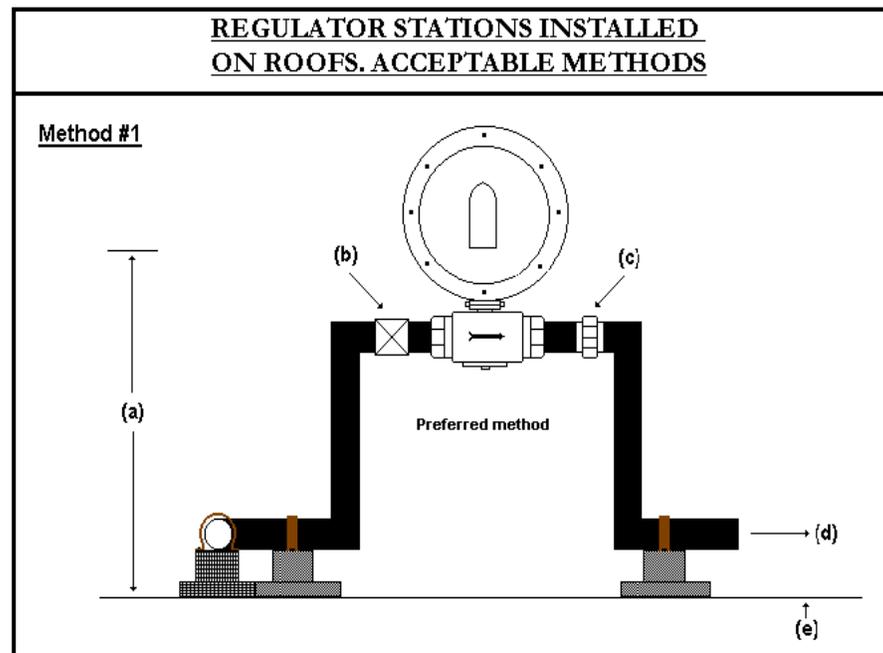
CSA B149.1-2010- Natural gas and propane installation code requires a regulator to be installed and adequately supported to ensure the regulator remains in its permanent position. This bulletin provide methods for consideration to help protect a gas regulator station installed on a rooftop from snow and moisture.

#### Important Information

The selected method will ensure that the station is not affected by adverse weather conditions such as wind or snow load. In addition, care should be exercised when selecting the location of the station to ensure that no freezing water can drip on to the vent termination from another source (other roof lines, eaves trough, drain pipes etc.).

To illustrate recommended practices, blocking methods are shown for reference on Figure (1) and Figure (2) for flat roofs and Figure (3) for proper blocking on sloped roofs.

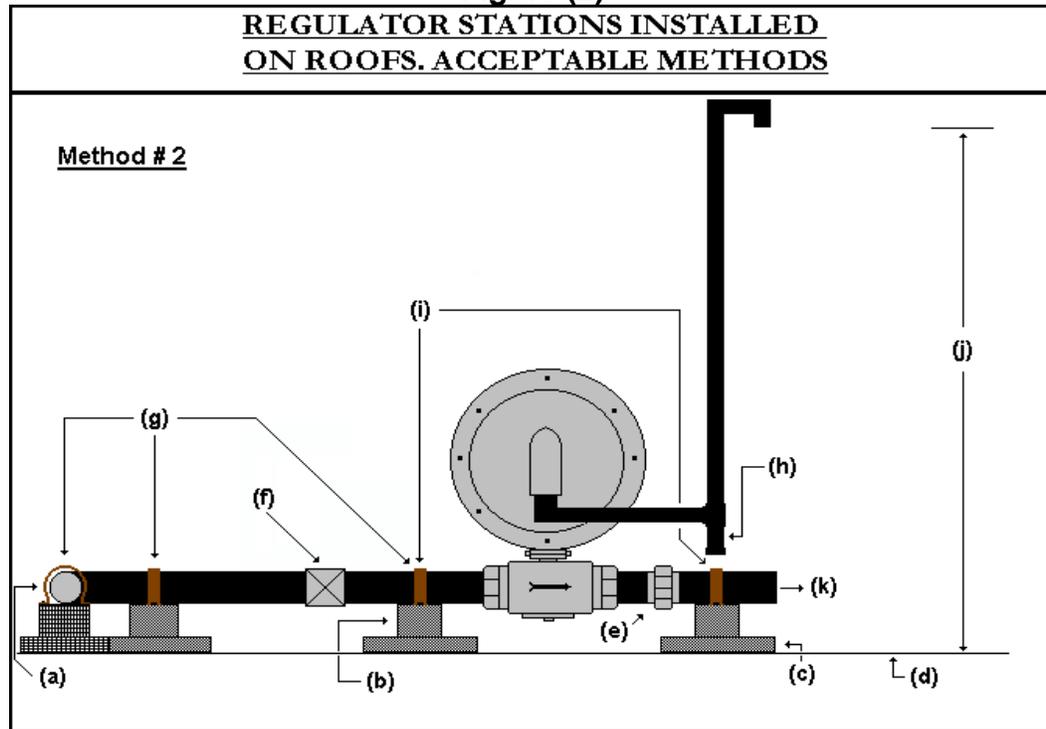
Figure (1)



- (a) **Manufactured hangers or clamps shall be one size larger than pipe diameter**
- (b) 4" X 4" treated wood block or other material acceptable to the inspecting authority
- (c) 2" X 10" treated wood block or other material acceptable to the inspecting authority
- (d) Roof line
- (e) Union
- (f) Shut-off valve
- (g) Supports shall be provided at each threaded fitting
- (i) Regulator shall be supported on either side
- (j) Regulator shall be supported to prevent accidental displacement and the vent shall terminate a minimum of 2 feet (60 cm) above the roof line or higher than expected snow level, whichever is greater
- (k) To appliance

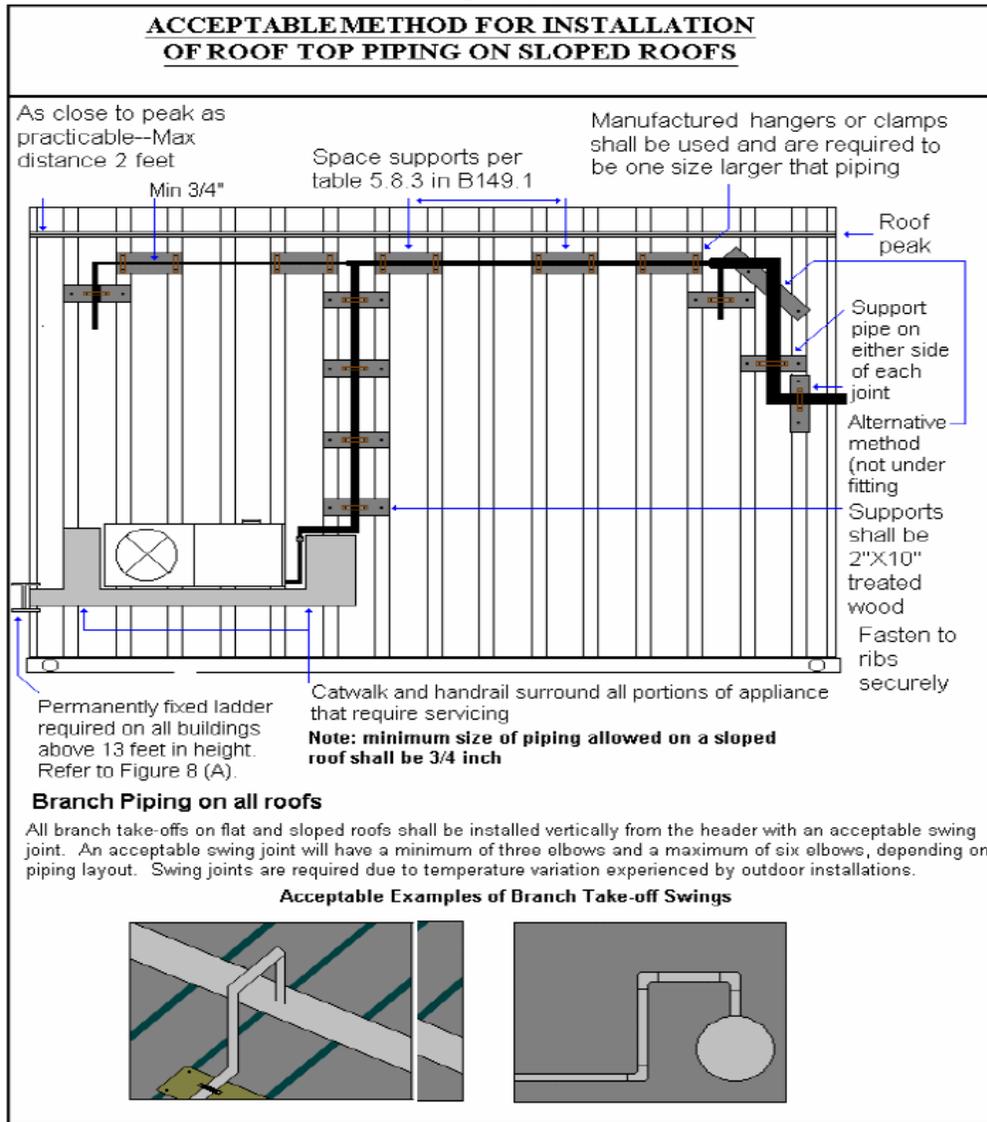


Figure (2)



- (a) Manufactured hangers or clamps that are one size larger than pipe diameter
- (b) 4" X 4" treated wood block or other material acceptable to the inspecting authority
- (c) 2" X 10" treated wood block or other material acceptable to the inspecting authority
- (d) Roof line
- (e) Union
- (f) Shut-off valve
- (g) Supports shall be provided at each threaded fitting
- (h) Dirt pocket on vent line shall be 3 inch (7.5 cm) in depth.
- (i) Regulator shall be supported on either side.
- (j) Termination of vent pipe fitted with a vent cap or screen. Vent supported to prevent accidental displacement and shall terminate a minimum of 2 feet above the roof line or higher than expected snow level, whichever is greater.
- (k) To appliance.

Figure (3)



**Reference Documents:**

**Gas and Oil Burner Regulation 104/87 R**

**CSA B149.1- 2010 - Natural gas and propane installation code**

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## Inspection and Technical Services

### Gas Equipment Bulletin: Semi-rigid Tubing on Roof tops

Date Issued: January 1, 2018  
OFC ITSM 17-024

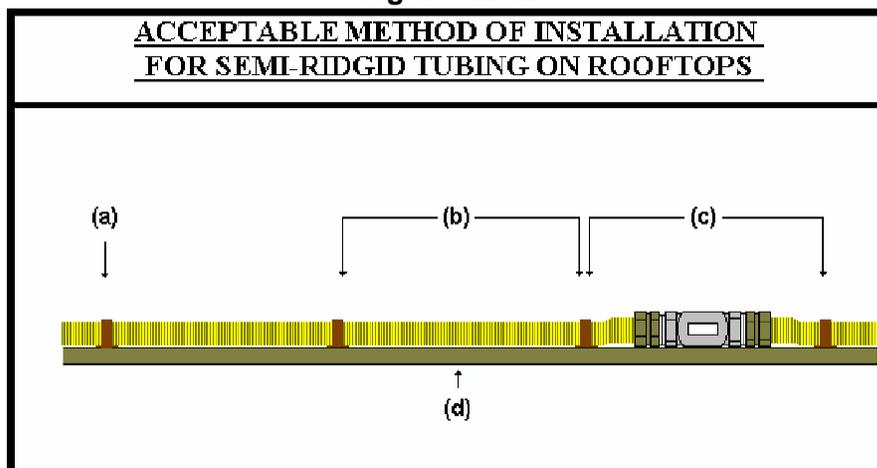
**Rationale:** To illustrate acceptable methods of protecting semi-rigid gas tubing installed outdoors on a roof, from mechanical damage and/or stresses resulting from expansion and contraction caused by weather changes.

Tubing laid on a roof top should be installed according to Clause 6.26.2 and Table 6.2 of the current CSA B149.1 and should be of a design acceptable to the inspecting authority.

Proper blocking methods should be used depending on roof design.

Tubing installed on a sloped roof should be run within 2 ft of the peak. (Refer to Figure 6.26.2.)

**Figure 6.26.2**



- (a) Manufacturer's hanger's one (1) size larger than piping.  
(Use "c" or "u" clamps, do not use ring hangers).
- (b) Hangers may be spaced as per Table 6.2 of the B149.1 code.
- (c) Additional support should be provided for every threaded fitting on flat roofs.
- (d) Tubing should lay flat on a 2" x 4" treated wood board.

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