

## Residential Gas Piping Systems Questionnaire

### **Important notes about building permit request submissions**

- All permit applications must be submitted online using the [Customer Access](#) portal.
- There is no need to email us when you submit documents. Staff is notified automatically within one business day of your submission.
- Submit documents as PDF file type only.
- Please include the following:
  1. List the site address on all documents and plans.
  2. Include the owner's name on all documents.
- Permit review will be delayed if the required documents are not submitted online, if they are not submitted as PDFs, or if the documentation is missing information.
- All submitted documents will become a public permanent record of the property. It is in your best interest that the submitted PDFs are of the highest quality and detail, in case you or somebody else needs to refer to them in the future.

### **Instructions**

1. Read the "[Adding or Replacing Residential Gas Appliances – permit guide](#)" to familiarize yourself with all relevant codes and regulations and ensure you are in compliance before applying.
2. Complete all questions on page 2
3. Submit this questionnaire with your permit application

## Gas Piping Systems Questionnaire

Contact Name: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Project address: \_\_\_\_\_

Will the final connection of the appliances be performed under this permit?  Yes  No  
If not answered, sizing cannot be approved.

If "No", a [Future Gas Appliance Documentation Affidavit](#) must be provided for the final inspection.

Natural gas supplier: \_\_\_\_\_

Delivery pressure at meter is 6" Water Column (WC) or marked at meter. Delivery pressure \_\_\_\_\_

Not required for propane – If not provided, sizing will be reviewed for 6" WC

Piping material (select all materials used or provide a description).

Indicate on drawing the material of each section\* of piping if more than one type of piping is used. For example: Corrugated Stainless-Steel Tubing (CSST) and Schedule 40 Steel.  
(Please read more information and examples in the following pages of this form.)

Schedule 40 metallic  Polyethylene plastic  SDR<sup>1</sup> 9.33  SDR 11.00

Other piping system not shown above: \_\_\_\_\_

CSST, provide name of manufacturer: \_\_\_\_\_

Sizing method (select one) – Sizing will be reviewed as "longest length" if nothing is selected.

Longest Length  Branch Length  
 Friction Loss per Foot  Manufacturer's instructions

Write the code table number or alternate method used: \_\_\_\_\_

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<sup>1</sup> Standard Dimensional Ratio

## Residential Piping System Schematic Drawing Instructions

Indicate on the drawing any existing piping.

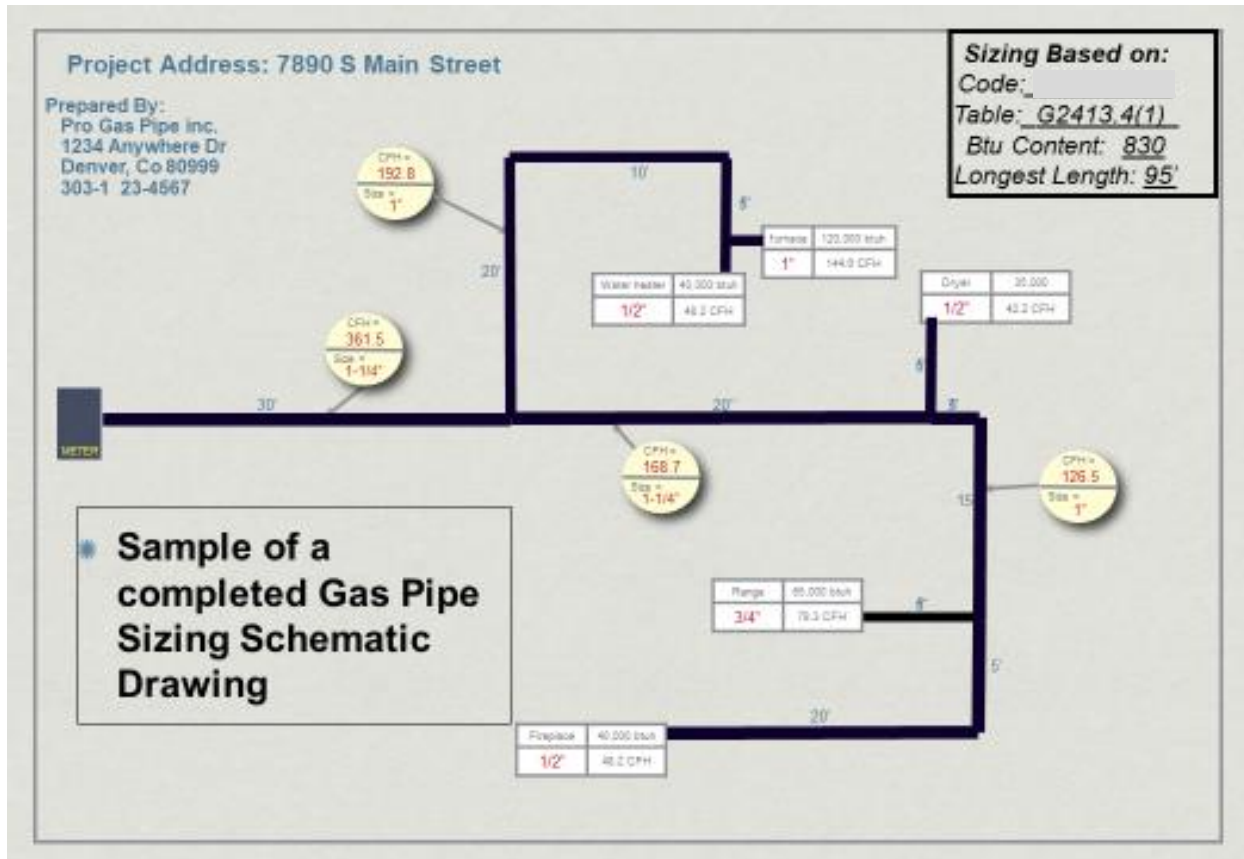
A section of pipe is a combination of pipe and fittings that are of the same material, size, and demand. Indicate all gas-fired appliances.

Please refer to the “Example of a Gas Pipe Sizing Schematic” section on page 4. Each section on the drawing must show:

1. The piping type or material each section. If not shown, sizing will be reviewed for Sch. 40 steel.
  - a. If all piping is the same material, note that on the drawing.
2. The size of each section. If not shown, sizing cannot be approved.
3. The total length of each section. If not shown, sizing cannot be approved.
4. The total demand in cubic feet per hour (CFH) of each section. (For propane no conversion from BTU per hour (BTU/H) to CFH required.) If not shown, sizing cannot be approved.

Refer to Chapter 24 of the 2021 International Residential Code or International Fuel Gas Code for additional information.

**Example of a Gas Pipe Sizing Schematic**



## Gas Pipe Sizing Example using the longest length method

This sizing method is conservative in its approach by applying the maximum operating conditions in the system as the norm for the system and by setting the length of pipe used to size any given part of the piping system to the maximum value. Proceed as follows to determine the size of each section of gas piping in a system within the range of the capacity tables:

1. Divide the piping system into appropriate segments consistent with the presence of tees, branch lines, and main runs. For each segment, determine the gas load (assuming all appliances operate simultaneously) and its overall length. An allowance (in equivalent length of pipe) as determined from IRC AA102.2 Table A.2.2 shall be considered for piping segments that include four or more fittings.
2. Determine the gas demand of each appliance to be attached to the piping system. Where IRC Tables G2413.4 (1) through G2413.4 (21) are to be used to select the piping size and calculate the gas demand in terms of cubic feet per hour for each piping system outlet.
  - a. Divide the total Btu/h input of all appliances by the average Btu heating value per cubic foot of the gas to obtain the cubic feet per hour of gas required.
3. Determine the design system pressure, the allowable loss in pressure (pressure drop), and the specific gravity of the gas to be used in the piping system when the piping system will be used with other than undiluted liquefied petroleum gases.
4. Determine the length of piping from the point of delivery to the most remote outlet in the building/piping system.
5. Select the row showing the measured length or the next longer length if the table does not give the exact length in the appropriate capacity table. This is the only length used in determining the size of any section of gas piping.
  - a. The values in the selected row of the table are multiplied by the appropriate multiplier from IRC AA102.4 Table A.2.4. (0.93) if the gravity factor is to be applied.
6. Use this horizontal row to locate ALL gas demand figures for the particular system of piping.
7. Find the gas demand for that outlet in the horizontal row just selected starting at the most remote outlet. Choose the next larger figure left in the row if the exact figure of demand is not shown.

8. Find the current size of gas piping opposite this demand figure, in the first row at the top.
9. Proceed in a similar manner for each outlet and each section of gas piping. Determine the total gas demand supplied by that section or each section of piping. When many piping components (such as elbows, tees, and valves) are installed in a pipe run, additional pressure loss can be accounted for using equivalent lengths. Pressure loss across any piping component can be equated to the pressure drop through a length of pipe. The equivalent length of a combination of only four elbows/tees can result in a jump to the next larger length row, resulting in a significant reduction in capacity. The equivalent lengths in feet shown in IRC AA 102.2 Table A.2.2 have been computed on a basis that the inside diameter corresponds to that of Schedule 40 (standard- weight) steel pipe, which is close enough for most purposes involving other schedules of pipe. Multiply the actual inside diameter of the pipe in inches by  $n/12$ , or the actual inside diameter in feet by  $n$  ( $n$  can be read from the table heading) if you desire a more specific solution for equivalent length. The equivalent length values can be used with reasonable accuracy for copper or brass fittings and bends, although the resistance per foot of copper or brass pipe is less than that of steel. For copper or brass valves, however, the equivalent length of pipe should be taken as 45 percent longer than the values in the table, which are for steel pipe.

Other sizing methods may be approved – contact an Inspector for additional information.