

# Trade Profile

## Plumber



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# **RED SEAL**

# **TRADE PROFILE**

## **Plumber**



# STRUCTURE OF THE TRADE PROFILE

This profile has two sections that provide a snapshot of the trade's description, and all trade activities as they are organized in the Red Seal Occupational Standard:

**Description of the Plumber trade:** an overview of the trade's duties, work environment, job requirements, similar occupations and career progression

**Task Matrix:** a chart which outlines graphically the major work activities, tasks and sub-tasks of this trade

**Major Work Activity (MWA):** the largest division within the standard that is comprised of a distinct set of trade activities

**Task:** distinct actions that describe the activities within a major work activity

**Sub-task:** distinct actions that describe the activities within a task

A complete version of the occupational standard, which provides additional detail for the trade activities, skills and knowledge can be found at [www.red-seal.ca](http://www.red-seal.ca).

# Description of the Plumber Trade

“Plumber” is this trade’s official Red Seal occupational title approved by the CCDA. This standard covers tasks performed by plumbers.

Plumbers plan, install, test and service plumbing fixtures and systems such as water, hydronic, drain, waste and vent (DWV), low pressure steam, residential fire, chemical and irrigation. They also install specialized systems such as medical gas, process piping, compressed air, water conditioners, fuel piping, sewage and water treatment, and storage and flow equipment. Plumbers interpret drawings, refer to layouts of existing services, and review applicable codes and specifications to determine work details and procedures. They locate and mark positions for fixtures, pipe connections and sleeves, and cut openings to accommodate pipe and fittings.

Plumbers may be employed by plumbing/mechanical contractors, service companies, and maintenance departments of manufacturing, commercial, health care and educational facilities. They may also be self-employed. Plumbers install piping and equipment in residential, commercial, institutional and industrial buildings and sites.

Plumbers use a variety of tools and equipment such as hand and power tools, welding and soldering/brazing equipment, and hoisting and lifting equipment to perform the tasks in their trade. To perform some tasks or use some equipment, specific certification may be required. Plumbers work with a variety of piping materials such as copper, steel, plastic, glass, cast iron, cement, fibreglass and specialty materials. Before assembling pipe, tubing and fittings, the pipes must be measured, cut, cleaned, bent and supported. Joining pipe may be done by various means, such as threading, using mechanical joints, welding, soldering/brazing, crimping, using compression, using press fittings and using fastening materials and compounds. Plumbers install supports for piping and equipment. When servicing appliances, components and systems plumbers work with low voltage equipment. Plumbers test and commission systems to ensure proper operation. They perform scheduled, unscheduled and emergency maintenance and repair.

Safety awareness is essential for plumbers. They may work indoors or outdoors, and working conditions vary from one job to another. The work of plumbers can be physically demanding. Plumbers often need to lift and carry heavy materials and equipment. While performing their duties, plumbers are also required to do considerable standing, climbing and kneeling. They may work at heights and in confined spaces. Special precautions may have to be taken when working with fluids, gases, steam and hazardous elements. Plumbers need to assess the systems and the environment to identify possible dangers.

Key attributes for people entering this trade are good mechanical, mathematical and spatial visualization skills. Plumbers also need good communication skills to communicate with co-workers, clients, architects, engineers and building officials. Analytical/problem solving skills are required to interpret building plans, inspect piping systems and diagnose system faults and malfunctions.

This standard recognizes some similarities or overlaps with the work of gasfitters, steamfitters/pipefitters, refrigeration and air conditioning mechanics and sprinkler fitters.

With experience, plumbers act as mentors and trainers to apprentices in the trade. They may also move into other positions such as instructors, inspectors, estimators and project managers.

# Trends in the Plumber Trade

## Technology

There is an increase of necessary training in technology and computer-based equipment such as GPS for pipe layouts and modelling, smart phones/tablets for accessing online resources and video calling for off-site technical help. 3-D drawings are increasingly being used in the trade and require additional training. Technology continues to improve digital documentation.

Plumbers are increasingly expected to understand the complete low voltage system of any heating or cooling appliance and plumbing fixtures.

## Health and Safety

There continues to be a greater focus on physical and mental health and safety. There has been an increased awareness since COVID-19 concerning air-borne viruses. Additional PPE may be required when working in sewage pits, on active drain lines and in occupied residences. There is an increase in awareness and support of equity, diversity and inclusion in the workplace.

## Tools and Equipment

Most tools and equipment have become cordless for less power dependency and tripping hazards on site. Many tools are constantly changing and improving such as press/fusion tools for pipe joining.

Tablets and computers are being used onsite by all workers. Tablets are used to organize drawings, construct emails and requests for information (RFI). They also allow for multiple projects to be monitored at one time from any location. Communication with plumbers and apprentices can be done remotely. Engineers, owners and project managers can transfer changes or alterations to plumbers quickly. This allows for a more accurate and less wasteful piping installation.

## Products/Materials

Plumbing products are moving towards plastic and cold weld applications. Materials are also constantly changing and improving such as press fittings being used instead of solder for many jobs. Press fitting technology is being used more often. It has now been approved for gas installations and is being used in the field.

There are often unforeseen effects of new products in the field that continue to drive innovation and improvement. This is the case now with the introduction of high efficiency fixtures and equipment.

## Environmental

Industry has become conscious of energy usage and efficiency of equipment and systems, resulting in a higher expectation from building owners and clients to meet the standards of programs such as Leadership in Energy and Environmental Design (LEED) and Energy Star. Plumbers must be more aware of the impact the trade has on the environment, the emerging requirements of these programs and the specific site requirements that are critical to projects. Many buildings are being built to environmental standards that require new products and systems. This may include systems such as rainwater harvesting, grey water, solar thermal, geothermal, heat recovery and biomass.

There is an increased awareness of environmental issues related to plumbing. This might include sewage treatment to recyclable piping products. Specific knowledge and training are growing in this area. There are increased requirements for more green piping installation. This includes insulation around pipes and equipment. Energy efficiencies are increasing in equipment. Safer products are being used for various applications. Construction sites are increasing recycling by separating waste products.

**Legislative and Regulatory**

Plumbing requires paperwork and permits. Plumbers must be aware of constantly evolving procedures and codes. Awareness of the responsibility of the individual worker is a key factor when installing piping systems. Plumbers and their apprentices require a good understanding of codes, regulations, and standards as well as a knowledge of record keeping and legal responsibilities. Modern training programs are focusing on these details much better than before.

**Other**

The trade continues to expand its workforce through innovation and inclusion.

# Plumber

## Task Matrix and Weightings

### A – Performs common occupational skills

**11%**

<b>Task A-1</b> <b>Performs safety-related functions</b> <b>19%</b>	<b>A-1.01 Maintains safe work environment</b>	<b>A-1.02 Uses personal protective equipment (PPE) and safety equipment</b>	<b>A-1.03 Performs lock-out and tag-out (LOTO) procedures</b>
<b>Task A-2</b> <b>Uses and maintains tools and equipment</b> <b>23%</b>	<b>A-2.01 Uses common tools and equipment</b>	<b>A-2.02 Uses access equipment</b>	<b>A-2.03 Uses rigging, hoisting, lifting and positioning equipment</b>
	<b>A-2.04 Rigs loads for cranes</b>	<b>A-2.05 Uses welding equipment</b>	<b>A-2.06 Uses soldering and brazing equipment</b>
<b>Task A-3</b> <b>Organizes work</b> <b>20%</b>	<b>A-3.01 Organizes project tasks and procedures</b>	<b>A-3.02 Organizes materials and supplies</b>	<b>A-3.03 Uses documentation</b>
<b>Task A-4</b> <b>Performs routine trade activities</b> <b>34%</b>	<b>A-4.01 Plans layout for piping systems</b>	<b>A-4.02 Calculates tube, tubing and pipe lengths</b>	<b>A-4.03 Installs piping supports</b>
	<b>A-4.04 Installs piping sleeves</b>	<b>A-4.05 Commissions systems</b>	<b>A-4.06 Protects piping systems, equipment and structure from damage</b>
	<b>A-4.07 Coordinates excavation and backfilling of trenches</b>	<b>A-4.08 Installs fire stopping devices and materials</b>	
<b>Task A-5</b> <b>Uses communication and mentoring techniques</b> <b>4%</b>	<b>A-5.01 Uses communication techniques</b>	<b>A-5.02 Uses mentoring techniques</b>	

## B – Prepares and assembles tube, tubing and pipe

10%

<b>Task B-6</b> Prepares tube, tubing and pipe <b>46%</b>	B-6.01 Inspects tube, tubing, pipe and fittings before installation	B-6.02 Cuts tube, tubing and pipe	B-6.03 Bends tube, tubing and pipe
	B-6.04 Prepares tube, tubing and pipe connections		
<b>Task B-7</b> Joins tube, tubing and pipe <b>54%</b>	B-7.01 Joins copper tube, tubing and pipe	B-7.02 Joins plastic tube, tubing and pipe	B-7.03 Joins steel tube, tubing and pipe
	B-7.04 Joins cast iron pipe	B-7.05 Joins specialized tube, tubing and pipe	

## C – Installs, tests and services sewers, sewage treatment systems and drainage, waste and vent (DWV) systems

26%

<b>Task C-8</b> Installs, tests and services sewers <b>20%</b>	C-8.01 Plans layout and sizes piping for sewers	C-8.02 Installs maintenance holes and catch basins	C-8.03 Installs piping for sewers
	C-8.04 Tests maintenance holes, catch basins and piping for sewers	C-8.05 Services maintenance holes, catch basins and piping for sewers	
<b>Task C-9</b> Installs, tests and services sewage treatment systems <b>17%</b>	C-9.01 Plans installation of sewage treatment systems	C-9.02 Installs components for sewage treatment systems	C-9.03 Tests sewage treatment systems
	C-9.04 Services sewage treatment systems		



**Task C-10**  
**Installs, tests and services interior drainage, waste and vent (DWV) systems**  
**63%**

**C-10.01 Plans layout and sizes piping for interior drainage, waste and vent (DWV) systems**

**C-10.02 Installs underground piping and components for interior drainage, waste and vent (DWV) systems**

**C-10.03 Installs above-ground piping and components for interior drainage, waste and vent (DWV) systems**

**C-10.04 Tests interior drainage, waste and vent (DWV) systems**

**C-10.05 Services interior drainage, waste and vent (DWV) systems**

## **D – Installs, tests and services water service and distribution**

**19%**

**Task D-11**  
**Installs, tests and services water service**  
**24%**

**D-11.01 Plans layout and sizes piping and components for water service**

**D-11.02 Installs piping for water service**

**D-11.03 Installs components for water service**

**D-11.04 Tests water service piping and components**

**D-11.05 Services water service piping and components**

**Task D-12**  
**Installs, tests and services potable water distribution systems**  
**49%**

**D-12.01 Plans layout and sizes piping and components for potable water distribution systems**

**D-12.02 Installs piping for potable water distribution systems**

**D-12.03 Installs components for potable water distribution systems**

**D-12.04 Installs cross connection controls**

**D-12.05 Tests potable water distribution systems**

**D-12.06 Services potable water distribution systems**

**Task D-13**  
**Installs, tests and services private water pressure systems**  
**27%**

**D-13.01 Plans layout and sizes piping and components for private water pressure systems**

**D-13.02 Installs piping for private water pressure systems**

**D-13.03 Installs components for private water pressure systems**

**D-13.04 Tests private water pressure systems**

**D-13.05 Services private water pressure systems**

## E – Installs, tests and services fixtures, appliances and water treatment systems

13%

<b>Task E-14</b> Installs, tests and services plumbing fixtures and appliances <b>63%</b>	E-14.01 Installs fixture supports	E-14.02 Installs plumbing fixtures and appliances	E-14.03 Tests plumbing fixtures and appliances
	E-14.04 Services plumbing fixtures and appliances		
<b>Task E-15</b> Installs, tests and services water treatment systems <b>37%</b>	E-15.01 Sizes water treatment systems	E-15.02 Installs water treatment systems	E-15.03 Tests water treatment systems
	E-15.04 Services water treatment systems		

## F – Installs, tests and services low-pressure steam and hydronic systems

13%

<b>Task F-16</b> Installs, tests and services low-pressure steam systems - Not Common Core <b>0%</b>	F-16.01 Plans layout and sizes piping and components for low-pressure steam systems- Not Common Core	F-16.02 Installs piping and components for low-pressure steam systems- Not Common Core	F-16.03 Tests low-pressure steam systems- Not Common Core
	F-16.04 Services low-pressure steam systems- Not Common Core		
<b>Task F-17</b> Installs, tests and services piping and components for hydronic systems <b>58%</b>	F-17.01 Plans layout and sizes piping and components for hydronic systems	F-17.02 Installs piping and components for hydronic systems	F-17.03 Tests hydronic systems
	F-17.04 Services hydronic systems		

**Task F-18**  
**Installs, tests and services hydronic heating and cooling equipment**  
**42%**

**F-18.01 Installs hydronic heating equipment**

**F-18.02 Installs hydronic cooling equipment**

**F-18.03 Tests hydronic heating and cooling equipment**

**F-18.04 Services hydronic heating and cooling equipment**

## **G- Installs, tests and services specialized systems**

**8%**

**Task G-19**  
**Installs, tests and services process piping systems**  
**51%**

**G-19.01 Plans layout and sizes piping and components for process piping systems**

**G-19.02 Installs piping for process piping systems**

**G-19.03 Installs components for process piping systems**

**G-19.04 Tests process piping systems**

**G-19.05 Services process piping systems**

**Task G-20**  
**Installs, tests and services potable water fire protection systems - Not Common Core**  
**0%**

**G-20.01 Plans layout and sizes piping for potable water fire protection systems - Not Common Core**

**G-20.02 Installs potable water fire protection systems - Not Common Core**

**G-20.03 Tests potable water fire protection systems - Not Common Core**

**G-20.04 Services potable water fire protection systems - Not Common Core**

**Task G-21**  
**Installs, tests and services other specialized systems**  
**49%**

**G-21.01 Plans layout and sizes piping, components and equipment for other specialized systems**

**G-21.02 Installs piping and components for other specialized systems**

**G-21.03 Installs equipment for other specialized systems**

**G-21.04 Tests other specialized systems**

**G-21.05 Services other specialized systems**