Professional qualification of construction contractors

Competency profile

15.5 - Owner-builder – Plumbing

Régie du bâtiment Québec

This document was produced with the collaboration of the team of competency assessment advisors (Direction de la qualification) of the Régie du bâtiment du Québec.

In this document, the masculine gender is used without discrimination and solely for the sake of brevity.

Changes to the content may be made at any time.

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Introduction

Successful candidates may act as guarantors for construction work included in subclass 15.5 - Owner-builder – Plumbing.

This competency profile is based on the scope of application of the *Building Act*, as well as on Section (21-22-23 or 24) of the *Regulation respecting the professional qualification of contractors and owner-builders*.

Subclass definition

15.5 - Owner-builder – Plumbing

This subclass authorizes construction work that is reserved exclusively for master pipe-mechanics under the *Master Pipe-Mechanics Act* relating to plumbing systems in any building or structure, including piping and all the fixtures used for drainage, back venting of traps, hot and cold water supply or gas supply.

It also authorizes construction work in subclass 15.5.1.

Lastly, it authorizes related construction work.

Module 1 – DEFINITIONS AND TYPES OF SYSTEMS

Elements of competency covered in this module:

1. Define concepts and terms related to plumbing
2. Describe the characteristics of plumbing systems
3. Define the units of measurement used in plumbing
4. Perform basic mathematical calculations for plumbing

Module 1 – DEFINITIONS AND TYPES OF SYSTEMS

Elements of competency	Skills required
1. Define concepts and terms related to plumbing	1.1. Define plumbing system concepts: distribution network, ventilation and sanitary drainage network, rainwater disposal network, public supply network, connection, manifold, soil stack, ventilation manifold, downspout, etc.
	1.2. Define terms associated with fluid mechanics: fluid, gas, liquid, pressure, hydraulic load, flow, capacity, back-siphonage, backflow, etc.
	1.3. Define the terms associated with fittings and piping: pipe, tube, flap, valve, tap, backflow preventer, cleanout, trap, tee, straight Y branch (Y), fitting, flange, support, etc.
	1.4. Define terms related to water: clear water, rainwater, wastewater, gray water, drinking water, etc. Language skills
	1.5. Define terms related to plumbing fixtures and devices: toilet, separator, holding tank, sump, catch basin, etc.
2. Describe the characteristics of plumbing systems	2.1. Name the various materials used in the plumbing systems of a combustible building and indicate their characteristics
	2.2. Name the various materials used in the plumbing systems of a non-combustible building and indicate their characteristics
	2.3. Name the various materials used in the plumbing systems of a high-rise building and indicate their characteristics
	2.4. Describe the various components of a building's water supply system

Elements of competency	Skills required
	2.5. Describe the various components of a building’s ventilation and sanitary drainage system
	2.6. Describe the various components of a building’s rainwater disposal system
3. Define the units of measurement used in plumbing	3.1. Identify the units of measurement associated with the various plumbing systems
	3.2. Convert imperial units into metric units
4. Perform basic mathematical calculations for plumbing	4.1. Perform calculations using trigonometric rules
	4.2. Calculate surface areas
	4.3. Calculate volumes

Module 2 – LEGISLATIVE, NORMATIVE AND REGULATORY FRAMEWORK

Elements of competency covered in this module:

5. Situate plumbing work with respect to current legislation and regulations
6. Situate plumbing work with respect to the various codes and standards in force

Module 2 – LEGISLATIVE, NORMATIVE AND REGULATORY FRAMEWORK

Elements of competency	Skills required
5. Situate plumbing work with respect to current legislation and regulations	5.1. Explain the regulations of the *Building Act* (R.S.Q., c. B-1.1) that apply to plumbing work (*Construction Code, Safety Code, Regulation respecting application*, etc.)
	5.2. Explain the scope of the *Master Pipe-Mechanics Act* (R.S.Q., c. M-4)
	5.3. Distinguish between “contractor” and “owner-builder”
	5.4. Explain the roles and responsibilities of the designer and trade contractors regarding compliance of work with plans, specifications and standards (R.S.Q. c. B-1.1)
	5.5. Explain when the *Pressure Vessels Act* (R.S.Q., c. A-20.01) applies to plumbing work
	5.6. Explain the requirements for plumbing work under the *Act respecting the conservation of energy in buildings* (R.S.Q., c. E-1.1) and the *Regulation respecting energy conservation in new buildings* (R.S.Q. c. E-1.1, r.1)
	5.7. Explain the limits of a plumbing guarantor for an owner-builder
	5.8. Determine workforce qualification requirements
	5.9. Explain when the *Act respecting workforce vocational training and qualification* (R.S.Q., c. F-5) applies
6. **Situate plumbing work with respect to the various codes and standards in force**	6.1. Describe the links between the various codes and standards specific to plumbing work in relation to the *Québec Construction Code* (R.S.Q. c. B-1.1, r.0.01.01) (structure)

Elements of competency	Skills required
	6.2. Identify and define the chapters and sections of the *Québec Construction Code* (R.S.Q. c. B-1.1, r.0.01.01) that apply to plumbing work
	6.3. Identify the various standards referenced in *Chapter III: Plumbing* of the *Construction Code* that apply to plumbing work (CSA and others)
	6.4. Outline the scope of the various codes and standards applicable to plumbing work (materials, building types, etc.)
	6.5. Identify the approval bodies that affix their marks to plumbing products
	6.6. Identify the licences required for specialized plumbing contractors and name the organizations that issue them (CMMTQ, RBQ)

Module 3 – READING PLANS AND SPECIFICATIONS

Elements of competency covered in this module:

7. Read and interpret drawings and plans for plumbing
8. Read and interpret the divisions of specifications associated with plumbing

Module 3 – READING PLANS AND SPECIFICATIONS

Elements of competency	Skills required
7. Read and interpret drawings and plans for plumbing	7.1. Locate the various elements on a plumbing plan and diagram
	7.2. Explain the meaning of the main symbols used for plumbing designs and plans
	7.3. Locate, read and interpret the main dimensions and annotations associated with plumbing elements
	7.4. Locate, read and interpret cross-sections and details associated with plumbing elements
	7.5. Read and interpret general notes and tables associated with plumbing elements
	7.6. Prepare the quantity survey[1]
8. Read and interpret the divisions of specifications associated with plumbing **(in both networks: 1995 16-division network and 2004 49-division network)**	8.1. Define the divisions and sections associated with plumbing in construction specifications
	8.2. Interpret information associated with plumbing in specifications (section 01550)

[1] Prepare the survey: Measure a construction project and calculate the quantities of materials required.

Module 4 – STANDARDS AND EXECUTION OF WORK

Elements of competency covered in this module:

12. Plan and organize plumbing work
13. Manage the execution of water supply system work
14. Manage work on sanitary drainage systems and their ventilation
15. Manage work on rainwater disposal systems
16. Manage the execution of gas supply system work
17. Manage equipment installation and maintenance
18. Ensure quality control of plumbing work
19. Ensure worker health and safety

Module 4 – STANDARDS AND EXECUTION OF WORK

Elements of competency	Skills required
12. Plan and organize plumbing work	12.1. Order and receive materials
	12.2. Describe the pre- and post-construction stages of plumbing work
	12.3. Determine the logical order of execution of plumbing work
	12.4. Obtain authorizations and permits required for plumbing work
	12.5. Describe the characteristics of plumbing projects that require plans and specifications
	12.6. Explain the process for modifying plumbing plans
13. Manage the execution of water supply system work **Sections 2.1, 2.6 and 2.7 of *Chapter III – Plumbing* of the *Québec Construction Code*** **Part 3, ss. 3.7.4, 3.8.3; Part 7; Part 9, ss. 9.18, 9.31; Section 10.7 of *Chapter I – Building* of the *Québec Construction Code***	13.1. Describe the steps and requirements for a compliant connection to the water service or individual water supply installation
	13.2. Distinguish between materials permitted for potable and non-potable water supply and distribution networks
	13.3. Calculate the hydraulic load of a plumbing system in terms of supply factor
	13.4. Calculate the dimensions of the connection pipe to the water supply service or individual water supply installation
	13.5. Calculate piping dimensions for the cold water supply and distribution network
	13.6. Calculate piping dimensions for the hot water supply and distribution network
	13.7. Explain the requirements for installing a hot water recirculation system
	13.8. Select feed pumps
	13.9. Explain how to size a water heater

Elements of competency	Skills required
	13.10. Explain measures to prevent contamination of drinking water supply and distribution networks
	13.11. Explain the requirements for installing water supply to sanitary appliances
14. Manage work on sanitary drainage systems and their ventilation **Part 3, ss. 3.7.4, 3.8.3; Part 7; Part 9 art. 9.18, 9.31; Section 10.7 of *Chapter I – Building* of the *Québec Construction Code***	14.1. Name the materials permitted for sanitary drainage and vent piping
	14.2. Describe the steps and requirements for compliant connection to the public sewer system or individual wastewater treatment plant
	14.3. Explain the requirements for connecting sanitary appliances to the sanitary drainage system
	14.4. Explain the requirements for trap ventilation, internal ventilation, ventilation of soil stacks, etc.
	14.5. Apply the rules governing the layout of sanitary drainage pipes
	14.6. Determine the minimum diameter of the sanitary drainage pipe according to the situation
	14.7. Calculate the diameter of the sanitary drainage pipe according to the situation
	14.8. Apply rules governing layout of ventilation piping
	14.9. Ensure pipe gradients
	14.10. Determine the minimum diameter of ventilation pipes
	14.11. Calculate the diameter of the ventilation pipe according to the situation

Elements of competency	Skills required
	14.12. Explain the requirements for installing air intake valves
	14.13. Explain the requirements for installing special pipes (sumps, oil separators, corrosive water tanks, etc.)
	14.14. Explain the requirements for installing special pipes (sumps, oil separators, corrosive water tanks, etc.)
	14.15. Apply the rules governing the connection of special appliances to the sanitary drainage system (sump pits, macerating toilets, grease traps, grinders and neutralization tanks)
	14.16. Apply the rules for installing ventilation pipes on roofs
	14.17. Apply the rules relating to the integrity of fire separations
15. Manage work on rainwater disposal systems **Part 3, ss. 3.7.4, 3.8.3; Part 7; Part 9 art. 9.18, 9.31; Section 10.7 of *Chapter I – Building* of the Québec Construction Code**	15.1. Name the materials permitted for supply and rainwater disposal piping
	15.2. Describe the steps and requirements for compliant connection to the public sewer service
	15.3. Apply the rules governing the layout of rainwater disposal pipes
	15.4. Determine the minimum diameter of rainwater disposal pipes
	15.5. Calculate the diameter of rainwater disposal pipes
	15.6. Ensure pipe gradients
	15.7. Explain the requirements for installing special pipes (sumps, roof drains, floor drains, drainage pipes, etc.)

Elements of competency	Skills required
16. Manage the execution of gas supply system work	16.1. Describe the requirements concerning pressure control
	16.2. Describe the requirements concerning the maximum pressure allowed inside buildings
	16.3. Explain exhaust requirements for pressure control devices
	16.4. Explain proper burial methods
	16.5. Explain the requirements concerning pipe identification
	16.6. Explain the requirements concerning pipe protection
	16.7. Determine the gas supply piping materials required depending on the situation
	16.8. Explain the requirements concerning pipe support
	16.9. Determine appropriate pipe jointing and connection methods
	16.10. Explain safe pipe purging methods
	16.11. Perform pipe sizing calculations
	16.12. Ensure the integrity of firewalls during drilling
	16.13. Explain the pressure test procedure depending on the situation
17. Manage equipment installation and maintenance **Part 3, ss. 3.7.4, 3.8.3; Part 7; Part 9, ss. 9.18, 9.31; Section 10.7 of**	17.1. Explain the requirements for installing toilets in large buildings (3.7.4.2) (number, type, etc.)
	17.2. Explain the requirements for installing toilets, washbasins, urinals, etc. in washrooms with obstacle-free access (3.8.3.8 and 9 and 10 and 11)

Elements of competency	Skills required
Chapter I – Building* of the *Québec Construction Code	17.3. Explain the requirements for the number of sanitary facilities (9.31.4) (depending on use and number of people)
	17.4. Explain methods for preventing water hammer, leaks and other common problems
	17.5. Explain the requirements for water heaters (9.31.6) (temperature, installation, coil, etc.)
18. Ensure quality control of plumbing work	18.1. List ways to ensure quality control of plumbing work
	18.2. Define tests and trials carried out on plumbing systems
	18.3. Identify those responsible for the various stages of quality control of plumbing work
	18.4. Solve problems in the execution of plumbing work (solutions, schedule, etc.)
19. Ensure worker health and safety	19.1. Apply appropriate soldering and brazing methods
	19.2. Ensure safe working practices in confined spaces
	19.3. Ensure proper lifting and handling methods
	19.4. Ensure the use of fall protection devices
	19.5. Ensure that personal protective equipment is worn