Professional qualification of construction contractors

Competency profile

1.10 - Contractor – Passenger ropeways

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.

Table of contents

Introduction

The person who passes the exam can act as a guarantor for construction work included in subclass 1.10 - Contractor – Passenger ropeways.

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

1.10 - Contractor – Passenger ropeways

This subclass authorizes construction work on passenger ropeways and conveyors subject to paragraph 7 of article 3.4 of the *Regulation respecting the application of the Building Act*.

It also authorizes construction work included in subclasses 3.1, 4.1, 5.1 and 6.1 of Schedule II, when said work relates to a passenger ropeway or conveyor governed by this subclass.

Finally, 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 passenger ropeway installations
2. Describe the characteristics and operating principles of various passenger ropeway installations

Module 1 – DEFINITIONS AND TYPES OF SYSTEMS

Elements of competency	Skills required
1. Define and explain concepts and terms related to passenger ropeway installations	1.1. Define the different types of passenger ropeways: cableways, aerial passenger ropeways, surface passenger ropeways, draglifts, passenger ropeways for secondary towed vehicles, conveyors, etc.
	1.2. Define the main components of a passenger ropeway: sheaves, sheave assemblies, counterweight sheaves, hangers, brakes, backstops, hauling and counterweight ropes, ramps, cars, towers, stations, etc.
	1.3. Define the different types of drive and evacuation machines (hydraulic, electric, diesel, etc.)
	1.4. Define the various hydraulic systems and components
	1.5. Define terms associated with passenger ropeway installations (safety factors, non-destructive testing, etc.)
	1.6. Define the units of measurement associated with passenger ropeway installations (speed, mass, etc.)
2. Describe the characteristics and operating principles of various passenger ropeway installations	2.1. Describe the different types of passenger ropeway components and explain their field of application
	2.2. Explain the operating principles of different passenger ropeways
	2.3. Explain the operating principles of the various passenger ropeway components
	2.4. Know the main electrical circuits and components (power, control and safety circuits)

Elements of competency	Skills required
	2.5. Know the principles of operation, installation and maintenance of the main types of passenger ropeways
	2.6. Know the principles of operation, installation and maintenance of the main components of passenger ropeways
	2.7. Explain the uses of the different types of electrical conductors used in passenger ropeway installations
	2.8. Describe and explain the features of normal and emergency power sources to which passenger ropeways can be connected (power circuits, accumulators and generators)

Module 2 – LEGISLATIVE, NORMATIVE AND REGULATORY FRAMEWORK

Elements of competency covered in this module:

3. Situate work on passenger ropeway installations in relation to current laws and regulations
4. Situate passenger ropeway construction work in relation to current codes and standards

Module 2 – LEGISLATIVE, NORMATIVE AND REGULATORY FRAMEWORK

Elements of competency	Skills required
3. Situate work on passenger ropeway installations in relation to current laws and regulations	3.1. Identify and define the obligations and responsibilities of the contractor under the *Building Act* (CQLR, c. B-1.1)
	3.2. Explain the regulations of the *Building Act* that apply to passenger ropeway work
	3.3. Distinguish between “contractor” and “owner-builder”
	3.4. Explain the roles and responsibilities of designers and contractors with regard to compliance with plans, specifications and standards
	3.5. Explain the scope of application of the *Engineers Act* (CQLR, c. I-9)
	3.6. Explain the impact of the *Environment Quality Act* (CQLR, c. Q-2) and other legislative provisions on land protection and rehabilitation in relation to the use of hydraulic systems (soil protection and decontamination)
	3.7. Determine workforce qualification requirements
	3.8. Explain when the *Act respecting workforce vocational training and qualification* (CQLR, c. F-5) applies
4. Situate passenger ropeway construction work in relation to current codes and standards	4.1. Describe the links between the various regulations, laws and standards governing the installation of passenger ropeways
	4.2. Identify and define the chapters of the *Québec Construction Code* (CQLR, c. B-1.1, r.

Elements of competency	Skills required
	0.01.01) applicable to passenger ropeway construction work
	4.3. Identify and define the application of the *Québec Safety Code, Chapter V, Passenger Ropeways*
	4.4. Outline the scope of standards that apply to passenger ropeway construction work
	4.5. Explain the various welding standards related to the construction and maintenance of a passenger ropeway (W47.1-09, W47.2-11, W178.1-08, W178.2-08, W186-FM1990)
	4.6. Identify the certification bodies that affix their marks to passenger ropeway components (CSA, UL, ASME, WH)
	4.7. Identify and define the scope of application of the *Québec Construction Code, Chapter I, Building* in relation to passenger ropeway construction work
	4.8. Differentiate between the scope of application of the *Québec Construction Code, Chapter V, Electricity*, and the *Canadian Electrical Code* (C22.1-09) in relation to passenger ropeway construction work

Module 3 – PLANS – SPECIFICATIONS AND ESTIMATES

Elements of competency covered in this module:

5. Read and interpret passenger ropeway schematics and plans
6. Read and interpret the divisions of passenger ropeway construction specifications
7. Estimate passenger ropeway construction work
8. Estimate repair and maintenance work on existing passenger ropeways

Module 3 – PLANS AND SPECIFICATIONS

Elements of competency	Skills required
5. Read and interpret passenger ropeway schematics and plans	5.1. Explain the meaning of the main symbols used for passenger ropeway installation drawings and plans
	5.2. Locate, read and interpret the main dimensions and annotations associated with passenger ropeway installation components
	5.3. Locate, read and interpret cross-sections and details associated with passenger ropeway installation components
	5.4. Read and interpret general notes and tables associated with passenger ropeway installation components
	5.5. Prepare the quantity survey[1]
6. Read and interpret the divisions of passenger ropeway construction specifications	6.1. Define the divisions of passenger ropeway construction specifications
	6.2. Interpret information relating to site work in specifications (02xx)
	6.3. Interpret information relating to concrete in specifications (03xx)
	6.4. Interpret information relating to timber frames in specifications (06xx)
	6.5. Interpret information relating to steel structures in specifications (05xx)
	6.6. Interpret information relating to special installations in specifications (13XX)
	6.7. Interpret information relating to carrier systems in specifications (14xx)
	6.8. Interpret information relating to building mechanicals in specifications (15xx)

[1] Prepare the quantity survey: measure the structure and calculate the quantities of materials required.

Elements of competency	Skills required
	6.9. Interpret information relating to electricity in specifications (16xx)
7. Estimate passenger ropeway construction work	7.1. Identify the type of soil to ensure that it can support the foundations of a passenger ropeway
	7.2. Identify the characteristics of passenger ropeway foundations
	7.3. Choose a passenger ropeway that meets the requirements of the plans and specifications issued for bidding purposes
	7.4. Ensure availability, delivery times and prices of the identified passenger ropeway
	7.5. Determine required resources (labour, equipment, materials) and productivity rate
	7.6. Complete, check and submit the bid
8. Estimate repair and maintenance work on existing passenger ropeways	8.1. Evaluate the characteristics of a passenger ropeway (use, equipment, electricity, compliance)
	8.2. Ensure parts availability, delivery times and prices
	8.3. Determine required resources (labour, equipment, materials) and productivity rate
	8.4. Explain the particularities of payments and warranties (subsidized and non-subsidized work)
	8.5. Complete, check and submit the bid

Module 4 – STANDARDS AND EXECUTION OF WORK

Elements of competency covered in this module:

9. Plan work related to the installation of passenger ropeways
10. Manage the installation or alteration of passenger ropeways in accordance with current standards
11. Carry out acceptance tests
12. Put the passenger ropeway into service
13. Repair, check and maintain passenger ropeways in compliance with current standards
14. Ensure the health and safety of workers

Module 4 – STANDARDS AND EXECUTION OF WORK

Elements of competency	Skills required
9. Plan work related to the installation of passenger ropeways	9.1. Plan installation method in accordance with manufacturer's recommendations and current regulations
	9.2. Ensure that plans and specifications are signed and sealed by an engineer before work begins
	9.3. Ensure compliance of materials and proposed work, and compatibility of components with appropriate standards and manufacturer's specifications
	9.4. Transmit drawings and specifications required to complete the work to the various parties involved
	9.5. Explain the particulars of the work as specified on the plans (symbols, dimensions, annotations, sections, details)
	9.6. Produce installation or modification sketches, as required
	9.7. Coordinate the interface (common boundaries) between the various disciplines on the site
10. Manage the installation or alteration of passenger ropeways in accordance with current standards	10.1. Deliver and move materials and equipment on site
	10.2. Identify the right location for the various work (electricity, concrete, station, structure, etc.)
	10.3. Ensure correct calculation and positioning of loads on equipment (rolling points, roller size, etc.)
	10.4. Ensure that pre-installation work is completed

Elements of competency	Skills required
	10.5. Ensure that handling equipment corresponds to calculations and identified loads
	10.6. Make sure mechanics understand installation steps (transport, assembly, slinging, lifting, etc.)
	10.7. Provide work tools and communicate safe ways of using them
	10.8. Carry out work in accordance with manufacturer's specifications and plans
	10.9. Resolve technical, coordination and other difficulties as work progresses
	10.10. Ensure that all work related to the installation of the passenger ropeway is completed prior to start-up (electricity, etc.)
	10.11. Check the power supply from the disconnect switch to the controller (amperage, wire size, etc.)
	10.12. Control quality during construction and once installation is complete
11. Carry out acceptance tests	11.1. Plan the organization of a test day for the start-up of a new passenger ropeway
	11.2. Explain the checks and tests that must be carried out on a passenger ropeway
	11.3. Explain the requirements for passenger ropeway brakes (service and emergency)
	11.4. Explain passenger ropeway requirements (maintenance, splicing, etc.)
	11.5. Explain the requirements for sheave and tower assemblies on a passenger ropeway
	11.6. Explain the requirements for passenger ropeway tensioning devices

Elements of competency	Skills required
	11.7. Ensure that work complies with standards, plans and manufacturer's specifications
12. Put the passenger ropeway into service	12.1. Ensure the adjustment of passenger ropeway parameters (speed, etc.)
	12.2. Ensure that a certificate of conformity is filed for passenger ropeway work
	12.3. Ensure that instruction and maintenance manuals are given to the owner or owner' representative
13. Repair, check and maintain passenger ropeways in compliance with current standards	13.1. Diagnose an operating problem on a passenger ropeway
	13.2. Provide a solution to repair a passenger ropeway (dismantle, reassemble, adjust parts, etc.)
	13.3. Explain the requirements for checking and maintaining passenger ropeways (standards, manufacturers, engineers)
	13.4. Comply with the maintenance requirements set out in the *Safety Code* (CQLR, c. B-1.1, r. 0.01.01.1) and CSA standard Z98
	13.5. Follow manufacturer's maintenance instructions
	13.6. Carry out periodic tests and checks on a passenger ropeway
	13.7. Describe how to perform tests and checks (visual, electrical, etc.)
	13.8. Ensure calibration, maintenance and replacement of components (including machining of parts if required)
	13.9. Explain the dangers involved in using a passenger ropeway and the conditions that require it to be taken out of service

Elements of competency	Skills required
	13.10. Carry out the necessary corrective actions to maintain the equipment in good working order and ensure safe operation
	13.11. Ensure production of maintenance and repair reports (logbook)
14. Ensure the health and safety of workers	14.1. Identify the risks associated with the installation and maintenance of passenger ropeways (confined space, height, movement, handling, etc.)
	14.2. Explain the precautions to be taken when installing and maintaining a passenger ropeway
	14.3. Explain hazardous materials precautions (WHMIS)
	14.4. Ensure the safe installation and use of scaffolding and lifting equipment