PROGRAM PROGRAMME
EXCELLENCE
RED SEAL · SCEAU ROUGE

Red Seal Occupational Standard

Carpenter

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Title: Carpenter

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Foreword

The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this Red Seal Occupational Standard (RSOS) as the Red Seal standard for the Carpenter trade.

Background

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to co-operate with provincial and territorial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. Employment and Social Development Canada (ESDC) sponsors the Red Seal Program, which, under the guidance of the CCDA, develops a national occupational standard for each of the Red Seal trades.

Standards have the following objectives:

- to describe and group the tasks performed by skilled workers;
- to identify which tasks are performed in every province and territory;
- to develop instruments for use in the preparation of Interprovincial Red Seal Examinations and assessment tools for apprenticeship and certification authorities;
- to develop common tools for apprenticeship on-the-job and technical training in Canada;
- to facilitate the mobility of apprentices and skilled workers in Canada;
- to supply employers, employees, associations, industries, training institutions and governments with occupational standards.

Any questions, comments, or suggestions for changes, corrections, or revisions to this standard or any of its related products may be forwarded to:

Trades and Apprenticeship Division
Apprenticeship and Sectoral Initiatives Directorate
Employment and Social Development Canada
140 Promenade du Portage, Phase IV, 6th Floor
Gatineau, Quebec K1A 0J9

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Randy Callaghan	British Columbia
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This standard was prepared by the Apprenticeship and Sectoral Initiatives Directorate of ESDC. The coordinating, facilitating and processing of this standard were undertaken by employees of the standards development team of the Trades and Apprenticeship Division and of New Brunswick, the host jurisdiction for this trade.

Structure of the Occupational Standard

This standard contains the following sections:

Methodology: an overview of the process for development, review, validation and weighting of the standard

Description of the Carpenter trade: an overview of the trade's duties, work environment, project requirements, similar occupations and career progression

Trends in the Carpenter trade: some of the trends identified by industry as being the most important for workers in this trade

Skills for Success Summary: an overview of how each of the skills for success (formerly called essential skills) is applied in this trade

Industry Expected Performance: description of the expectations regarding the level of performance of the tasks, including information related to specific codes, regulations and standards that must be observed

Roles and Opportunities for Skilled Trades in a Sustainable Future: an overarching description of how in the context of climate change, skilled trades play a large role in implementing solutions and adjusting to changes in the world. In addition to highlighting the importance of this awareness, the standard may also contain more details on activities, skills and knowledge elements that are specific to the trade

Language Requirements: description of the language requirements for working and studying in this trade in Canada

Pie Chart of Red Seal Examination Weightings: a graph which depicts the national percentages of exam questions assigned to the major work activities

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

Harmonization of Apprenticeship Training: the aspects of apprenticeship training that participating provinces and territories have agreed upon to substantively align apprenticeship systems across Canada

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

Task Descriptor: a general description of the task

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

Skills:

Performance Criteria: description of the activities that are done as the sub-task is performed

Evidence of Attainment: proof that the activities of the sub-task meet the expected performance of a tradesperson who has reached journeyperson level

Knowledge:

Learning Outcomes: describes what should be learned relating to a sub-task while participating in technical or in-school training

Learning Objectives: topics to be covered during technical or in-school training in order to meet the learning outcomes for the sub-task

Range of Variables: elements that provide a more in-depth description of a term used in the performance criteria, evidence of attainment, learning outcomes, or learning objectives

Appendix A – Acronyms: a list of acronyms used in the standard with their full name

Appendix B – Tools and Equipment / Outils et équipement: a non-exhaustive list of tools and equipment used in this trade

Appendix C – Glossary / Glossaire: definitions or explanations of selected technical terms used in the standard

Methodology

Development of the Standard

A draft standard is developed by a broad group of trade representatives, including tradespeople, instructors and employers at a National Workshop led by a team of facilitators. This draft standard breaks down all the tasks performed in the occupation and describes the knowledge and abilities required for a tradesperson to demonstrate competence in the trade.

Harmonization of Apprenticeship Training

An analysis of all provinces' and territories' apprenticeship programs is performed and recommendations are made on harmonizing the name of the trade, the hours of training required and the number of levels of training. Provinces and territories consult with their respective industry stakeholders on these elements and revisions are discussed until consensus is reached. Following the development of the workshop draft of the RSOS, participants discuss and come to consensus on the sequence of training topics, as expressed in the new standard. Their sequencing recommendations are reviewed by stakeholders in participating provinces and territories and further discussions are convened to reach consensus and to identify any exceptions.

Online Survey

Stakeholders are asked to review and validate the activities described in the new standard via an online survey. These stakeholders are invited to participate in this consultation through apprenticeship authorities, as well as national stakeholder groups.

Draft Review

The RSOS development team forwards a copy of the standard and its translation to provincial and territorial authorities who consult with industry representatives to review it. Their recommendations are assessed and incorporated into the standard.

Validation and Weighting

Participating provinces and territories also consult with industry to validate and weight the document for the purpose of planning the makeup of the Red Seal Interprovincial Examination for the trade. They validate and weight the major work activities (MWA), tasks and sub-tasks, of the standard as follows:

MWA	Each jurisdiction assigns a percentage of questions to each MWA for an examination that would cover the entire trade.
Tasks	Each jurisdiction assigns a percentage of exam questions to each task within a MWA.
Sub-Tasks	Each jurisdiction indicates, with a YES or NO, whether or not each sub-task is performed by skilled workers within the occupation in its jurisdiction.

The results of this exercise are submitted to the RSOS development team who then analyzes the data and incorporates it into the document. The RSOS provides the individual jurisdictional validation results as well as the national averages of all responses. The national averages for MWA and task weighting guide the Interprovincial Red Seal Examination plan for the trade.

The validation of the RSOS is used to identify common core sub-tasks across Canada for the occupation. If at least 70% of the responding jurisdictions' industry performs a sub-task, it shall be considered common core. Interprovincial Red Seal Examination questions are limited to the common core sub-tasks identified through this validation process.

Definitions for Validation and Weighting

YES	sub-task performed by qualified workers in the occupation in that province or territory
NO	sub-task not performed by qualified workers in the occupation in that province or territory
NV	standard Not Validated by that province or territory
ND	trade Not Designated in a province or territory
Not Common Core (NCC)	sub-task, task or MWA performed less than 70% of responding jurisdictions; these will not be tested by the Interprovincial Red Seal Examination for the trade
National Average %	average percentage of questions assigned to each MWA and task in Interprovincial Red Seal Examination for the trade

Provincial/Territorial Abbreviations

NL	Newfoundland and Labrador
NS	Nova Scotia
PE	Prince Edward Island
NB	New Brunswick
QC	Quebec
ON	Ontario
MB	Manitoba
SK	Saskatchewan
AB	Alberta
BC	British Columbia
NT	Northwest Territories
YT	Yukon Territory
NU	Nunavut

Description of the Carpenter Trade

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

Carpenters construct, install, renovate and repair residential, civil, institutional, commercial and industrial (ICI) structures made of wood, steel, concrete and other materials.

They can work for a wide array of employers, including new home builders and renovation firms, construction firms, building owners, property managers and tenants, building developers and government departments. Some carpenters are union members and a significant number are self-employed.

While the scope of the carpenter trade includes many aspects of building construction, a growing number of carpenters work for contractors in such areas of trade practice as concrete forming, framing, finishing, interior systems, renovations and surveying. Carpenters are employed in a variety of project environments, including houses under construction or renovation, ICI, civil and infrastructure projects, and plants that pre-fabricate buildings. Carpenters are found working in a variety of sectors such as construction, manufacturing, service, mining, agricultural, institutional, commercial, forestry, and transit and transportation.

Safety is critical to all carpenters. In addition to typical risks of injury resulting from slips and falls, falling objects and the use of hand and power tools, carpenters must be aware of constantly changing work surroundings to mitigate the chance of injury to self and others. The proper use of personal protective equipment (PPE) and related training is very important to carpenters regardless of their location of work. Risk/hazard assessments prior to performing tasks are necessary and important.

Some important competencies of a carpenter are good knowledge of mathematics, the ability to use metric and imperial measurements, an understanding of building science, communication and problem-solving skills, and the ability to work independently or as part of a team. Other skills present in a competent carpenter are the ability to work at heights, the ability to stand or kneel for long periods of time, manual dexterity and good balance. Carpenters must be prepared to work in a variety of working environments including extreme temperatures. Carpentry at times may be a physically demanding occupation requiring the lifting of heavy tools and materials. Carpenters may operate equipment such as mobile elevated work platforms and material moving equipment. Journeyperson carpenters are expected to mentor apprentices given the hands-on nature of the trade.

This standard recognizes similarities and overlaps with the work of other tradespersons such as roofers, lathers (interior systems mechanics), building envelope technicians, drywall finishers and plasterers, floorcovering installers, concrete finishers, ironworkers (reinforcing) and cabinetmakers. Experienced carpenters may advance to supervisory positions, or become independent contractors, due to their involvement in most aspects of building construction.

Trends in the Carpenter Trade

Technology

The carpenter trade is constantly evolving with advanced innovations and technology for increased accuracy and efficiency. There is an increase in the use of digital technologies, 3D modeling, mobile devices, drones, GPS total station, robotic survey systems and software related to project management. Carpenters must be competent in digital technology to work with drawings and construction documents, and to do online research for materials and specialty products.

Health and Safety

Many companies in the construction industry are providing leadership in safety awareness and in the enforcement of safety policies on the project site. Safety training and the development of safety policies and procedures are being done by many companies in excess of regulations. Carpenters must be familiar with safety systems, such as confined space retrievals, awareness and fall arresting systems.

Tools and Equipment

There is an increase in the use of specialized power tools that are taking the place of some hand tools. Such tools as computer numerical control (CNC) routers, detail sanders, layout instruments (total stations), digital and robotic survey systems and laser levels are making the carpenters' work more efficient. Oscillating tools are becoming popular because they make accurate cuts and are extremely versatile. Compressed gas-powered fastening tools are increasing in use due to their portability and efficiency. Mobile elevated work platforms and material handling equipment are replacing scaffolding and ladders on many project sites. Cordless tools are now commonplace and are improving in longevity, durability and torque.

Products and Materials

Products and materials used in construction continue to be improved to achieve higher efficiency and a longer life expectancy. Use of innovative mass timber materials such as cross-laminated timber (CLT), dowel-laminated timber (DLT), nail laminated timber (NLT) and glulam are an emerging trend in prefabricated building construction components such as posts and beams for on-site erection.

Building science is evolving, and with the vast array and complexity of building materials increasing, carpenters need to remain current on how to put them together in a unit that works and does not decrease their efficacy. Carpenters may be involved in the manufacturing or installation processes of mass timber material.

Some concrete forming systems are now made of plastics, composites and aluminium, making concrete forming more versatile and efficient. There continues to be an increase in the use of engineered forming systems such as insulated concrete forms (ICF).

Soundproofing systems are evolving with the introduction of sound transmission class (STC) assemblies including insulation products such as mineral wool insulation. These systems include soundproofing for many elements of construction including floors, walls and ceilings.

Countertop materials continue to diversify using materials such as stone, composite stone and concrete.

Environmental

There are a number of certification systems such as Leadership in Energy and Environmental Design (LEED) that are becoming commonplace. Use of these environmentally friendly systems can influence the selection of building materials and products, and can include building techniques aimed at achieving increased energy-efficiency. These techniques include: net–zero energy (NZE), passive housing construction, building envelope technology and seismic considerations. These areas are advancing environmentally responsible construction. Low volatile organic compound (VOC) building products are increasingly being demanded by the public. Many of these changes are motivated by cost-benefit analysis that demonstrate long-term payback for these investments.

Legislative and Regulatory

The National Building Code of Canada (NBCC) and the National Energy Code for Buildings (NECB) are updated every five years. The most recent update will address climate change through an NZE model building code by 2030.

Other

Modular construction and prefabrication of construction components are increasingly popular in both residential and commercial construction. Carpenters are becoming more specialized in specific fields of carpentry. The mentoring of all levels of workers is becoming pronounced in the worksite and during apprenticeship technical training.

Skills for Success Summary

Skills for Success are needed in a quickly changing world for work, learning and life. They are foundational for building other skills and important for effective social interaction. Everyone benefits from having these skills as they help individuals get a job, progress at their current job and change jobs. They also help individuals become active members of their community and succeed in learning.

Through extensive research and consultations, the Government of Canada launched the new Skills for Success model renewing the previous Essential Skills framework to better reflect the needs of the current and future labour market.

The summary presented here is based on existing Essential Skills profiles and will be updated to align with the new Skills for Success model over time.

Reading

Carpenters need to read work orders, invoices and brief notes from co-workers. They also read and interpret technical documents, drawings, specifications, building codes, regulations, bylaws and standards. Carpenters read notices, bulletins and newsletters to stay up-to-date on workplace issues as well as trade journals and website articles to keep current on industry trends.

Document Use

Carpenters scan documents, products and signs for symbols and icons to identify workplace hazards. They complete checklists and forms by checking boxes and entering data, such as dates, times and quantities. They locate data in a variety of tables. Carpenters complete a variety of documents such as log books, work orders, building permit applications, and safety and budget documents.

Writing

Carpenters write reminders and notes to themselves, customers and co-workers. They write comments in field books, on forms and on schedules about obstacles such as overhead power lines. They may also write accident or incident reports depending on the jurisdiction. Carpenters write pre-job hazard assessments or field-level risk assessments.

Oral Communication

Carpenters speak with suppliers to learn about products, prices and delivery schedules. They talk with co-workers and other tradespeople about timelines, procedures, expectations and other work-related matters. They speak with safety and building inspectors, manufacturer representatives, customers and the public, and they participate in worksite meetings. Carpenters may also provide detailed instructions to co-workers and apprentices.

Numeracy

Carpenters must have a thorough understanding of basic arithmetic, ratio and proportion, geometry and trigonometry. They often work with both the metric and the imperial systems of measurement. They perform calculations and apply formulas to determine offsets, elevations and grades. Furthermore, they use formulas to determine area, volume and quantities, and make calculations to build stairs and rafters. Carpenters estimate material and time requirements to complete a project.

Thinking

Carpenters decide on the order of tasks based on priorities and delays. They consult with co-workers and other tradespeople when they encounter problems to exchange ideas and select the best approach. They choose tools, methods and products for projects based on project specifications, building code requirements and the availability of products, time and labour. Carpenters evaluate the safety of a work site and potential hazards.

Working with Others

Carpenters work in groups some of the time as this promotes efficiency and productivity. They also work with apprentices some of the time to direct, mentor and monitor their work. Carpenters may also work alone when the task may be performed unassisted. Carpenters are often leaders of the construction team, working together on a daily basis with other trades, forepersons, suppliers and engineers to complete the project through combined effort and organized co-operation.

Digital Technology

Carpenters use digital and robotic survey equipment, calculators and portable electronic devices to complete a variety of tasks. They may use a variety of software such as word processing, spreadsheets, databases, accounting, communication and estimating software. They may use design software such as computer aided design (CAD) to develop and communicate design ideas. They access information online from suppliers, manufacturers, unions and associations. They may also use the Internet to access training courses and seminars.

Continuous Learning

There is a requirement for ongoing learning to maintain current knowledge of changing codes, regulations, standards and materials for new construction and renovations. It is also very important to apply new skills and methods emerging due to technological and environmental advancements.

Roles and Opportunities for Skilled Trades in a Sustainable Future

Climate change affects all of us. Trades play a large role in implementing solutions and adjusting to changes in the world.

Throughout this standard, there may be specific references to tasks, skills and knowledge that clearly show this trade's role in a more sustainable future. Each trade has different roles to play and contributions to make in their own way.

For example:

- Construction tradespeople need to consider the materials they are using, building methods, and improvements to mechanical and electrical installations. There are important changes to codes and standards to help meet the climate change goals and commitments set for 2030 and 2050. Retrofits and new construction of low-energy buildings provide enormous opportunities for workers in this sector. Concepts, such as energy efficiency and regarding buildings as systems are foundational.

- Automotive and mechanical trades are seeing a shift towards the electrification of vehicles and equipment. As a result, new skills and knowledge will be required for tradespeople working in this sector. There are mandates for sales of new light-duty zero-emission vehicles (ZEV) in Canada, with the goal of achieving 100% ZEV sales by 2035. Due to this mandate, the demand for these vehicles is growing quickly among consumers and fleets. With this escalating demand, the need for skilled workers to maintain and repair these vehicles is also increasing.

- In industrial and resource sectors, there is pressure to move towards increased electrification of industrial processes. Many industrial and commercial facilities are also being upgraded to improve energy efficiency in areas such as lighting systems, and new production processes and technologies. There are also opportunities in carbon capture, utilization and storage (CCUS), as well as the production and export of low-carbon hydrogen.

- Trades in the service sector may also need to be aware of responsible sourcing, as well as efficient use of products and materials. New ways of working better are always a part of the job.

There are fast-moving changes in guidelines, codes, regulations and specifications. Many are being implemented for the purpose of energy efficiency and climate change. Those that affect specific trades may be mentioned within the standard. Examples of these guidelines and legislation include:

- The National Energy Code of Canada for Buildings (NECB).

- The Canadian Net-Zero Emissions Accountability Act (CNZEAA).

- programs that encourage sustainable building design and construction such as Leadership in Energy and Environmental Design (LEED) and the Zero Carbon Building (ZCB) standards.

- the Montreal Protocol for phasing out R22 refrigerants.

- energy efficiency programs such as ENERGY STAR.

- principles of the United Nations Declaration for the Rights of Indigenous Peoples pertaining to energy sector development.

Apprentices and tradespeople need to increase their climate literacy and reinforce their own understanding of energy issues and environmental practices. It is important for them to understand why these changes are happening and their effect on trades' work. While individual tradespeople and apprentices may not be able to choose certain elements like; the architectural design of buildings, building material selection, regulatory requirements, use of electric vehicles and technologies, they must understand the impact of using these elements in their work. Impacts include using environmentally friendly products and following requirements related to the disposal and recycling of materials.

In apprenticeship, as well as in ongoing professional development, employers and instructors should encourage learning about these concepts, why they are important, how they are implemented, and the overarching targets they are aiming to achieve.

All in all, it's about doing the work better and building a better world.

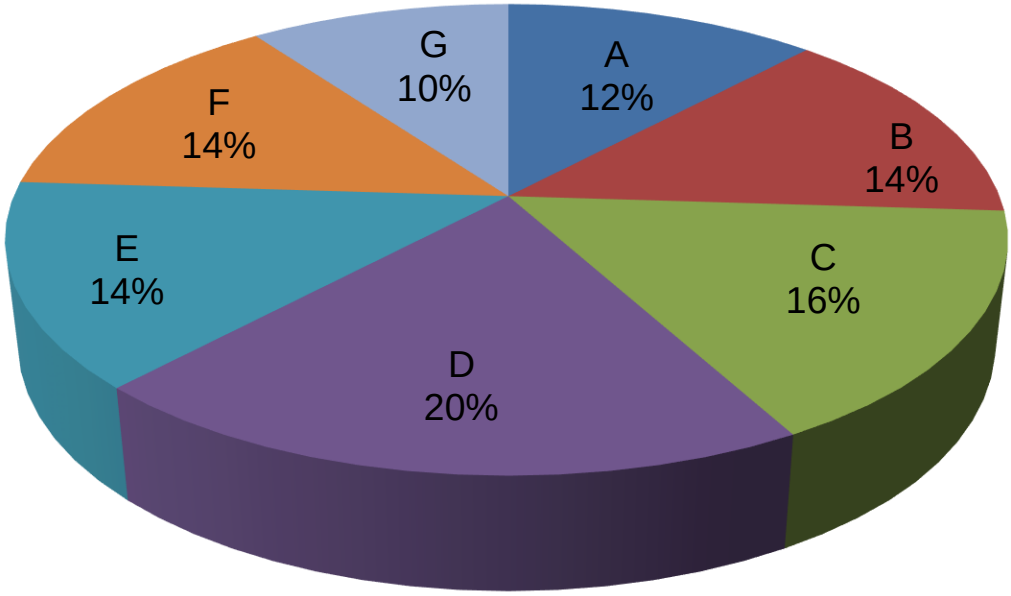
Industry Expected Performance

All tasks must be performed according to the applicable jurisdictional codes and standards. All health and safety standards must be respected and observed. Work should be done efficiently and to a high quality without material waste or environmental damage. All requirements of employers, engineers, designers, manufacturers, clients and quality control policies must be met. At a journeyperson level of performance, all tasks must be done with minimal direction and supervision. As a journeyperson progresses in their career there is an expectation they continue to upgrade their skills and knowledge to maintain pace with industry and promote continuous learning in their trade through mentoring of apprentices.

Language Requirements

It is expected that journeypersons are able to understand and communicate in either English or French, which are Canada's official languages. English or French are the common languages of business as well as languages of instruction in apprenticeship programs.

Pie Chart
of Red Seal Examination Weightings



MWA A	Performs common occupational skills	12%
MWA B	Performs planning and layout	14%
MWA C	Performs concrete work	16%
MWA D	Performs framing	20%
MWA E	Performs exterior finishing	14%
MWA F	Performs interior finishing	14%
MWA G	Performs renovations	10%

This pie chart represents a breakdown of the interprovincial Red Seal examination. Percentages are based on the collective input from workers from the trade from across Canada. The Task Matrix on the next pages indicates the breakdown of tasks and sub-tasks within each Major Work Activity and the breakdown of questions assigned to the Tasks. The Interprovincial examination for this trade has 100 questions.

Carpenter

Task Matrix

A – Performs common occupational skills — 12%

Task A-1 **Uses and maintains tools and equipment** **32%**	**A-1.01 Uses hand, power and pneumatic tools**	**A-1.02 Uses stationary tools**	**A-1.03 Uses powder-actuated tools**
	A-1.04 Uses lifting, rigging and hoisting equipment	**A-1.05 Uses layout instruments and equipment**	**A-1.06 Uses tack welding equipment (Not Common Core)**
	A-1.07 Uses torch cutting equipment (Not Common Core)		
Task A-2 **Performs safety-related activities** **26%**	**A-2.01 Uses personal protective equipment (PPE) and safety equipment**	**A-2.02 Maintains safe work environment**	
Task A-3 **Builds and uses temporary access structures** **26%**	**A-3.01 Uses stationary access equipment**	**A-3.02 Uses mobile access equipment**	**A-3.03 Erects/dismantles scaffolding**
	A-3.04 Modifies scaffolding		
Task A-4 **Uses communication and mentoring techniques** **16%**	**A-4.01 Uses communication techniques**	**A-4.02 Uses mentoring techniques**	

B – Performs planning and layout — 14%

Task B-5 **Interprets documentation** **35%**	**B-5.01 Interprets project drawings**	**B-5.02 Interprets specifications**	**B-5.03 Interprets safety documentation**
	B-5.04 Interprets workplace documentation		
Task B-6 **Organizes work** **24%**	**B-6.01 Schedules work sequence**	**B-6.02 Performs site preparation**	**B-6.03 Performs quantity takeoff**
	B-6.04 Organizes material		
Task B-7 **Performs layout** **41%**	**B-7.01 Performs site layout**	**B-7.02 Lays out concrete formwork**	**B-7.03 Lays out floors**
	B-7.04 Lays out decks	**B-7.05 Lays out walls**	**B-7.06 Lays out ceilings**
	B-7.07 Lays out roofs	**B-7.08 Lays out stairs**	**B-7.09 Lays out balustrades**

C – Performs concrete work

16%

Task C-8 **Constructs formwork** **72%**	**C-8.01 Erects excavation shoring and underpinning**	**C-8.02 Erects concrete falsework**	**C-8.03 Constructs footing forms**
	C-8.04 Constructs wall form systems and grade beam formwork	**C-8.05 Constructs slab formwork**	**C-8.06 Constructs column formwork**
	C-8.07 Constructs stair formwork	**C-8.08 Installs embedded reinforcements**	**C-8.09 Dismantles formwork**
Task C-9 **Installs concrete, cement-based and epoxy products** **28%**	**C-9.01 Places concrete**	**C-9.02 Facilitates curing of concrete**	**C-9.03 Performs basic concrete finishing**
	C-9.04 Installs pre-cast components	**C-9.05 Installs grout**	

D – Performs framing

20%

Task D-10 **Constructs floor systems** **29%**	**D-10.01 Installs engineered floor systems**	**D-10.02 Constructs dimensional lumber floor framing**
Task D-11 **Constructs deck systems** **16%**	**D-11.01 Constructs decks**	**D-11.02 Installs deck components**
Task D-12 **Constructs wall systems** **27%**	**D-12.01 Installs engineered wall systems**	**D-12.02 Constructs dimensional lumber wall framing**
Task D-13 **Constructs roof and ceiling systems** **28%**	**D-13.01 Installs engineered trusses**	**D-13.02 Constructs roof and ceiling framing**

E – Performs exterior finishing — 14%

Task E-14 **Installs exterior doors and windows** **41%**	**E-14.01 Installs exterior jambs/frames**	**E-14.02 Installs exterior doors**	**E-14.03 Installs exterior windows**
	E-14.04 Installs exterior door and window hardware		
Task E-15 **Installs roofing** **24%**	**E-15.01 Installs roofing components**	**E-15.02 Installs roof coverings**	
Task E-16 **Installs exterior finishes** **35%**	**E-16.01 Installs exterior wall components**	**E-16.02 Installs exterior wall coverings**	

F –Performs interior finishing — 14%

Task F-17 **Applies wall and ceiling finishes** **17%**	**F-17.01 Installs wallboard**	**F-17.02 Applies compound to walls and ceilings**	**F-17.03 Installs panels, tiles and solid wood finishes**
	F-17.04 Installs suspended ceilings	**F-17.05 Installs demountable wall systems**	
Task F-18 **Installs flooring** **17%**	**F-18.01 Installs underlayment**	**F-18.02 Installs floor coverings**	**F-18.03 Installs access flooring**
Task F-19 **Installs interior doors and windows** **31%**	**F-19.01 Installs interior jambs/frames**	**F-19.02 Installs interior doors**	**F-19.03 Installs interior windows**
	F-19.04 Installs interior door and window hardware		
Task F-20 **Constructs and installs finish components and stairs** **35%**	**F-20.01 Fabricates finish components**	**F-20.02 Installs finish components and accessories**	**F-20.03 Constructs stairs**

G – Performs renovations

10%

Task G-21 **Performs renovation-specific support activities** **48%**	**G-21.01 Removes existing material**	**G-21.02 Protects structure during renovations**
Task G-22 **Performs renovation-specific construction activities** **52%**	**G-22.01 Joins new to existing construction**	**G-22.02 Changes existing structure during renovations**

Harmonization of Apprenticeship Training

Provincial and territorial apprenticeship authorities are each responsible for their respective apprenticeship programs. In the spirit of continual improvement, and to facilitate mobility among apprentices in Canada, participating authorities have agreed to work towards harmonizing certain aspects of their programs where possible. After consulting with their stakeholders in the trade, they have reached consensus on the following elements. Note that implementation of these elements may vary from jurisdiction to jurisdiction, depending on their own circumstances. For more information on the implementation in any province and territory, please contact that jurisdiction's apprenticeship authority.

1. Trade name

The official Red Seal name for this trade is Carpenter.

2. Number of Levels of Apprenticeship

The number of levels of technical training recommended for this trade is 4 (four).

3. Total Training Hours During Apprenticeship Training

The total hours of training, including both on-the-job and in-school training for this trade is 7200.

4. Sequencing Topics and Related Sub-tasks

The topic titles in the table below are placed in a column for each apprenticeship level for technical training. Each topic is accompanied by the sub-tasks and their reference number. The topics in the grey shaded cells represent those that are covered "in context" with other training in the subsequent years.

Level 1	Level 2	Level 3	Level 4
	Tools and Equipment	Tools and Equipment	Tools and Equipment
	Documentation	Documentation	Documentation
Tools and Equipment 1.01 Uses hand, power and pneumatic tools 1.02 Uses stationary tools 1.03 Uses powder-actuated tools 1.04 Uses lifting, rigging and hoisting equipment 1.05 Uses layout instruments and equipment (1.06, 1.07 Not Common Core)	**Tools and Equipment** 1.05 Uses layout instruments		
Safety-Related Activities 2.01 Uses personal protective equipment (PPE) and safety equipment 2.02 Maintains safe work environment			

Level 1	Level 2	Level 3	Level 4
Temporary Access Structures 3.01 Uses stationary access equipment 3.02 Uses mobile access equipment 3.03 Erects/dismantles scaffolding 3.04 Modifies scaffolding			
Uses Communication Techniques 4.01 Uses communication techniques			**Uses Mentoring Techniques** 4.02 Uses mentoring techniques
Documentation 5.01 Interprets project drawings 5.02 Interprets specifications. 5.03 Interprets safety documentation 5.04 Interprets workplace documentation			
			Organizes Work 6.01 Schedules work sequence 6.02 Performs site preparation 6.03 Performs quantity take off 6.04 Organizes material
Layout 7.01 Performs site layout 7.02 Lays out concrete formwork 7.03 Lays out floors 7.04 Lays out decks 7.05 Lays out walls 7.06 Lays out ceilings 7.07 Lays out roofs	**Layout** 7.01 Performs site layout 7.03 Lays out floors 7.05 Lays out walls 7.06 Lays out ceilings 7.07 Lays out roofs 7.08 Lays out stairs	**Layout** 7.02 Lays out concrete formwork 7.03 Lays out floors 7.06 Lays out ceilings 7.07 Lays out roofs 7.08 Lays out stairs 7.09 Lays out balustrades	**Layout** 7.03 Lays out floors 7.07 Lays out roofs 7.08 Lays out stairs 7.09 Lays out balustrades
Formwork 8.03 Constructs footing forms 8.04 Constructs wall form systems and grade beam formwork 8.05 Constructs slab formwork 8.08 Installs embedded reinforcements 8.09 Dismantles formwork		**Formwork** 8.01 Erects excavation shoring and underpinning 8.02 Erects concrete falsework 8.06 Constructs column formwork 8.07 Constructs stair formwork 8.08 Installs embedded reinforcements	

Level 1	Level 2	Level 3	Level 4
Concrete, Cement-Based and Epoxy Products 9.01 Places concrete 9.02 Facilitates curing of concrete 9.03 Performs basic concrete finishing		**Concrete, Cement-Based and Epoxy Products** 9.04 Installs pre-cast components 9.05 Installs grout	
Floor Systems 10.01 Installs engineered floor systems. 10.02 Constructs dimensional lumber floor framing	**Floor Systems** 10.02 Constructs dimensional lumber floor framing		
Deck Systems 11.01 Constructs decks 11.02 Installs deck components			
Wall Systems 12.01 Installs engineered wall systems 12.02 Constructs dimensional lumber wall framing	**Wall Systems** 12.01 Installs engineered wall systems 12.02 Constructs dimensional lumber wall framing		
	Roof and Ceiling Systems 13.01 Installs engineered trusses 13.02 Constructs roof and ceiling framing	**Roof and Ceiling Systems** 13.01 Installs engineered trusses 13.02 Constructs roof and ceiling framing	**Roof and Ceiling Systems** 13.01 Installs engineered trusses 13.02 Constructs roof and ceiling framing
	Exterior Doors and Windows 14.01 Installs exterior jambs/frames 14.02 Installs exterior doors 14.03 Installs exterior windows 14.04 Installs exterior door and window hardware		
	Roofing 15.01 Installs roofing components 15.02 Installs roofing coverings		
	Exterior Finishes 16.01 Installs exterior wall components 16.02 Installs exterior wall coverings		

Level 1	Level 2	Level 3	Level 4
		Wall and Ceiling Finishes 17.01 Installs wallboard 17.02 Applies compound to walls and ceilings 17.03 Installs panels, tiles and solid wood finishes 17.04 Installs suspended ceilings 17.05 Installs demountable wall systems	
			Flooring 18.01 Installs underlayment 18.02 Installs floor coverings 18.03 Installs access flooring
		Interior Doors and Windows 19.01 Installs interior jambs/frames 19.02 Installs interior doors. 19.03 Installs interior windows 19.04 Installs interior door and window hardware	
	Finish Components and Stairs 20.03 Constructs stairs[1]	**Finish Components and Stairs** 20.01 Fabricates finish components 20.02 Installs finish components and accessories 20.03 Constructs stairs	**Finish Components and Stairs** 20.03 Constructs stairs
			Renovation Support Activities 21.01 Removes existing material 21.02 Protects structure during renovations
			Renovation Construction Activities 22.01 Joins new to existing construction 22.02 Changes existing structure during renovations

[1] Some basic overview of stair construction concepts could be introduced by trainers as a meet and exceed in level one (e.g. in combination with decks), but note that industry would be introducing the experience on the job when possible.

Major Work Activity A

Performs common occupational skills

Task A-1 Uses and maintains tools and equipment

Task Descriptor

Carpenters use and maintain tools and equipment to perform tasks efficiently and safely.

A-1.01 Uses hand, power and pneumatic tools

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-1.01.01P	organize and store tools	tools are organized and stored in clean, dry, ventilated and secure area to prevent damage
A-1.01.02P	add protective coating to ***hand tools***	protective coating is added to ***hand tools***
A-1.01.03P	lubricate ***fuel-powered and pneumatic tools***	***fuel-powered and pneumatic tools*** are lubricated according to manufacturers' specifications to prevent rusting and corrosion, and to protect internal components
A-1.01.04P	sharpen tools	tools are sharpened according to industry standards
A-1.01.05P	recognize, tag and remove worn, damaged and defective tools from service	worn, damaged and defective tools are recognized, tagged and removed from service according to project requirements and manufacturers' specifications
A-1.01.06P	charge batteries	batteries are charged according to manufacturers' specifications to avoid damage to battery
A-1.01.07P	clean tools	tools are cleaned for ease of operation and longevity according to manufacturers' specifications

A-1.01.08P	inspect tools, hoses and connections	tools, hoses and connections are inspected according to manufacturers' specifications to prevent damage to tools and injury to workers
A-1.01.09P	change oil and filter of pneumatic tools	oil and filter of pneumatic tools are changed according to manufacturers' specifications
A-1.01.10P	drain compressor tank after use	compressor tank is drained after use according to manufacturers' specifications to prevent corrosion of tank and damage to tools
A-1.01.11P	perform setup and alignment adjustments of ***fuel-powered tool attachments*** and components	setup and alignment adjustments of ***fuel-powered tool attachments*** and components are performed
A-1.01.12P	set up depth stop on hammer drill	depth stop on hammer drill is set up

Range of Variables

hand tools include: see Appendix B
fuel-powered and pneumatic tools include: see Appendix B
fuel-powered tool attachments include: chain saw bars, chains

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-1.01.01L	demonstrate knowledge of ***hand tools, portable power tools***, ***pneumatic tools and equipment,*** and ***fuel-powered tools and equipment***, their characteristics and applications	identify types of ***hand tools***, and describe their characteristics and applications
		identify types of ***portable power tools***, and describe their characteristics and applications
		identify types of ***pneumatic tools and equipment***, and describe their characteristics and applications
		identify types of ***fuel-powered tools and equipment,*** and their ***fuels***, and describe their characteristics and applications
		describe revolutions per minute (RPM) ratings for blades and discs and importance of matching rating to power tool RPM
A-1.01.02L	demonstrate knowledge of procedures to maintain ***hand tools, portable power tools***, ***pneumatic tools and equipment,*** and ***fuel-powered tools and equipment***	describe procedures to maintain ***hand tools***
		describe procedures to maintain ***portable power tools***

		describe procedures to maintain ***pneumatic tools and equipment***
		describe procedures to maintain ***fuel-powered tools and equipment***
		identify tools requiring sharpening
A-1.01.03L	demonstrate knowledge of safe use practices for ***hand tools, portable power tools***, ***pneumatic tools and equipment,*** and ***fuel-powered tools and equipment***	describe safe use practices for ***hand tools, portable power tools***, ***pneumatic tools and equipment,*** and ***fuel-powered tools and equipment***

Range of Variables

hand tools include: see Appendix B
portable power tools include: see Appendix B
pneumatic tools and equipment include: see Appendix B
fuel-powered tools and equipment include: see Appendix B
fuels include: gasoline, propane, kerosene

A-1.02 Uses stationary tools

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-1.02.01P	remove, replace or sharpen dull or damaged cutting and abrading attachments on ***stationary tools***	dull or damaged cutting and abrading attachments on ***stationary tools*** are removed, replaced or sharpened according to manufacturers' specifications
A-1.02.02P	adjust and align ***components*** of ***stationary tools***	***components*** of ***stationary tools*** are adjusted and aligned according to manufacturers' specifications to prevent wear and to maintain proper operation
A-1.02.03P	maintain ***guards***	***guards*** are maintained according to manufacturers' specifications to prevent injury
A-1.02.04P	clean ***stationary tools***	***stationary tools*** are cleaned to ensure smooth operation and to eliminate cutting hazards and injuries

A-1.02.05P	identify, tag out and remove from service damaged and worn ***stationary tools*** and ***components***	damaged and worn ***stationary tools*** and ***components*** are identified, tagged-out and removed from service according to project and manufacturers' specifications and safety standards
A-1.02.06P	use ***stationary tools***	***stationary tools*** are used according to job tasks and manufacturers' specifications

Range of Variables

stationary tools include: see Appendix B
components include: knives, blades
guards include: anti-kickback devices, belt guards, basket guards

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-1.02.01L	demonstrate knowledge of ***stationary tools***, their characteristics and applications	identify types of ***stationary tools***, and describe their characteristics and applications
		identify hazards and describe safe work practices pertaining to ***stationary tools***
A-1.02.02L	demonstrate knowledge of procedures to use ***stationary tools***	describe procedures to use ***stationary tools***
A-1.02.03L	demonstrate knowledge of procedures to maintain ***stationary tools***	identify tools and equipment used to maintain ***stationary tools***
		describe procedures to maintain ***stationary tools***
		describe procedures to maintain ***guards***
		describe tagout procedures

Range of Variables

stationary tools include: see Appendix B
guards include: anti-kickback devices, belt guards, basket guards

A-1.03 Uses powder-actuated tools

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
A-1.03.01P	inspect powder-actuated tools prior to use	powder-actuated tools are inspected according to manufacturers' specifications prior to use to detect faults and defects
A-1.03.02P	maintain powder-actuated tools prior to use	powder-actuated tools are maintained according to manufacturers' specifications prior to use to detect faults and defects
A-1.03.03P	dismantle, lubricate, clean and re-assemble powder-actuated tools	powder-actuated tools are dismantled, lubricated, cleaned and re-assembled according to manufacturers' specifications
A-1.03.04P	store tools, pins and shots/cartridges	tools, pins and shots/cartridges are stored in a secure, clean and dry location according to manufacturers' specifications and safety regulations
A-1.03.05P	store and dispose of unused and misfired shots/cartridges	unused and misfired shots/cartridges are stored and disposed of according to manufacturers' specifications and safety regulations
A-1.03.06P	use powder-actuated tools	powder-actuated tools are used according to manufacturers' specifications and jurisdictional requirements

Knowledge

	Learning Outcomes	Learning Objectives
A-1.03.01L	demonstrate knowledge of powder-actuated tools, their characteristics and applications	identify types of powder-actuated tools and shots/cartridges, and describe their characteristics and applications
		identify hazards and describe safe work practices for powder-actuated tools
		describe procedures for storage and disposal of unused or misfired shots/cartridges
A-1.03.02L	demonstrate knowledge of inspection and maintenance procedures for powder-actuated tools	describe procedures to inspect and maintain powder-actuated tools

A-1.03.03L	demonstrate knowledge of procedures to use powder-actuated tools	describe procedures to use powder-actuated tools
A-1.03.04L	demonstrate knowledge of training and certification requirements for use of powder-actuated tools	describe training and certification requirements for use of powder-actuated tools

A-1.04 Uses lifting, rigging and hoisting equipment

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-1.04.01P	select and use hand signals for lifting and hoisting loads	hand signals are selected and used for lifting and hoisting loads according to jurisdictional requirements
A-1.04.02P	select and tie knots	knots are selected and tied according to load and application
A-1.04.03P	select and use lifting and rigging equipment	lifting and rigging equipment are selected and used according to load and application, and manufacturers' specifications
A-1.04.04P	prepare load	load is prepared using dunnage to enable access for lifting chains and slings, and for storage
A-1.04.05P	secure load	load is secured using ***rigging methods***
A-1.04.06P	locate lifting points	lifting points are located to ensure sling angle and to balance and secure load
A-1.04.07P	use tag lines	tag lines are used to guide and control load
A-1.04.08P	follow ***daily procedures***	***daily procedures*** are followed according to jurisdictional requirements

Range of Variables

rigging methods include: choking, slinging, securing hooks, sling angles
daily procedures include: inspection of rigging equipment, storage

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-1.04.01L	demonstrate knowledge of lifting, rigging and hoisting equipment, their characteristics and applications	identify types of lifting, rigging and hoisting equipment, and describe their characteristics and applications
		identify hazards and describe safe work practices for lifting, rigging and hoisting equipment
		identify components of lifting, rigging and hoisting equipment, and describe their characteristics and applications
A-1.04.02L	demonstrate knowledge of procedures to use lifting, rigging and hoisting equipment	describe ***rigging and hoisting procedures***
		describe hand signals for lifting and hoisting
		describe procedures to perform knots and hitches
A-1.04.03L	demonstrate knowledge of training and certification requirements for use of power-elevated work platforms	describe training and certification requirements for use of power-elevated work platforms
A-1.04.04L	demonstrate knowledge of regulatory requirements for operation of ***material handling equipment***	describe regulations and requirements for operation of ***material handling equipment***

Range of Variables

rigging and hoisting procedures include: load weight calculations, working load limits (WLL), sling angles

material handling equipment includes: tele-handlers, skid steers, forklifts

A-1.05 Uses layout instruments and equipment

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-1.05.01P	select ***layout instruments and equipment***	***layout instruments and equipment*** are selected according to project requirements
A-1.05.02P	select location of setup	location of setup is selected to avoid high traffic areas and to ensure efficiency and accuracy of layout

A-1.05.03P	transport, set up, secure and level ***layout instruments and equipment***	***layout instruments and equipment*** are transported, set up, secured and leveled to ensure accuracy of layout and good access for operator according to site requirements and conditions
A-1.05.04P	check for accuracy of ***layout instruments and equipment***	***layout instruments and equipment*** are checked for accuracy according to back sighting and fore sighting
A-1.05.05P	determine elevations and angles	elevations and angles are determined according to ***drawings*** and project requirements
A-1.05.06P	record ***layout information***	***layout information*** is recorded according to ***drawings*** and project requirements
A-1.05.07P	clean, dry and store ***layout instruments and equipment***	***layout instruments and equipment*** are cleaned, dried and stored in a clean, dry and secure location after each use according to manufacturers' specifications
A-1.05.08P	set out building points	building points are set out using ***layout instruments and equipment*** according to information on project drawings

Range of Variables

layout instruments and equipment include: see Appendix B
drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans
layout information includes: elevations, grid lines, offsets, as-builts

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-1.05.01L	demonstrate knowledge of ***layout instruments and equipment***, and describe their characteristics and applications	identify ***layout instruments and equipment***, and describe their characteristics and applications
		identify ***layout information***, and describe associated applications
		describe basic survey theory and terminology
A-1.05.02L	demonstrate knowledge of procedures to use ***layout instruments and equipment***	identify ***layout instruments and equipment***, and describe procedures for use
		describe procedures to transport, set up, secure and level equipment
		describe procedures to determine elevations and angles

	describe procedures to clean, dry and store equipment
	describe procedures to set out building points

Range of Variables

layout instruments and equipment include: see Appendix B
layout information includes: elevations, grid lines, offsets, as-builts

A-1.06 Uses tack welding equipment (Not Common Core)

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
no	no	NV	no	NV	yes	no	yes	no	no	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-1.06.01P	inspect equipment	equipment is inspected for safe use and to identify ***defects***
A-1.06.02P	maintain fuel and oil levels	fuel and oil levels are maintained according to manufacturers' specifications
A-1.06.03P	select and use tack welding equipment	tack welding equipment is selected and used according to project requirements
A-1.06.04P	store equipment and rods	equipment and rods are stored in clean and dry location

Range of Variables

defects include: frayed cables, damaged ground clamps and electrode holder

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-1.06.01L	demonstrate knowledge of tack welding equipment	identify tack welding equipment, and describe their characteristics and applications
		describe inspection requirements for safe use and identify equipment ***defects***
A-1.06.02L	demonstrate knowledge of procedures to use tack welding equipment	describe tack welding techniques and practices
		describe procedures to maintain fuel and oil levels

		describe procedures to store equipment and rods
A-1.06.03L	demonstrate knowledge of training and certification requirements	describe training and certification requirements for use of tack welding equipment

Range of Variables

defects include: frayed cables, damaged ground clamps and electrode holder

A-1.07 Uses torch cutting equipment (Not Common Core)

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
no	no	NV	no	NV	yes	no	yes	no	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
A-1.07.01P	select and use ***torch cutting equipment***	***torch cutting equipment*** is selected and used according to project requirements
A-1.07.02P	inspect hoses, gauges, compressed gas cylinders and connections	hoses, gauges, compressed gas cylinders and connections are inspected for leaks and damage according to manufacturers' specifications
A-1.07.03P	clean tips	tips are cleaned with tip cleaner to ensure even flow of gas according to manufacturers' specifications
A-1.07.04P	set gauges	gauges are set to required pressures for efficient cutting according to manufacturers' specifications
A-1.07.05P	follow procedures and sequences for lighting and operation	procedures and sequences for lighting and operation are followed according to gases used
A-1.07.06P	store ***torch cutting equipment***	***torch cutting equipment*** is stored securely according to Occupational Health and Safety (OH&S) regulations and manufacturers' specifications
A-1.07.07P	maintain striker	striker is maintained by replacing flint according to manufacturers' specifications

Range of Variables

torch cutting equipment includes: see Appendix B

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-1.07.01L	demonstrate knowledge of ***torch cutting equipment***, their components, characteristics and applications	identify ***torch cutting equipment***, and describe their characteristics and applications
		identify components of ***torch cutting equipment***, and describe their characteristics and applications
		identify types of fire extinguishers and describe their characteristics, applications and procedures for use
A-1.07.02L	demonstrate knowledge of procedures to use torch cutting equipment	describe torch cutting techniques and practices
		describe procedures to use ***torch cutting equipment*** and associated components
		describe procedures to maintain ***torch cutting equipment*** and associated components
		describe procedures to store ***torch cutting equipment***
A-1.07.03L	demonstrate knowledge of training and certification requirements for use of ***torch cutting equipment***	describe training and certification requirements for use of ***torch cutting equipment***
A-1.07.04L	demonstrate knowledge of regulatory requirements for operating ***torch cutting equipment***	identify ***standards and regulations*** for operating ***torch cutting equipment***

Range of Variables

torch cutting equipment includes: see Appendix B

standards and regulations include: Canadian Standards Association (CSA), OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task A-2 Performs safety-related activities

Task Descriptor

Carpenters' work is heavily influenced by safety-related activities. They must be knowledgeable in safe work practices and proper use of PPE and safety equipment.

A-2.01 Uses personal protective equipment (PPE) and safety equipment

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-2.01.01P	identify, tag and remove damaged ***PPE*** from service	damaged ***PPE*** is identified, tagged and removed from service according to manufacturers' specifications and company policies
A-2.01.02P	select ***fall protection equipment***	***fall protection equipment*** is selected according to manufacturers' specifications, work conditions, ***standards and regulations*** and company policies
A-2.01.03P	use ***PPE*** and ***safety equipment***	***PPE*** and ***safety equipment*** is used according to manufacturers' specifications regarding lifespan and use, project requirements, company policies and ***standards and regulations***
A-2.01.04P	ensure fit of ***PPE***	***PPE*** is adjusted to ensure fit according to manufacturers' specifications
A-2.01.05P	locate ***safety equipment***	***safety equipment*** is located on site plan according to ***standards and regulations***
A-2.01.06P	wear ***work appropriate clothing***	***work appropriate clothing*** is worn according to company policies and ***standards and regulations***
A-2.01.07P	use ***fall protection equipment***	***fall protection equipment*** is used according to manufacturers' specifications, company policy and ***standards and regulations***

A-2.01.08P	use site-specific ***safety equipment***	site-specific ***safety equipment*** is used according to manufacturers' specifications, site instructions and company policies
A-2.01.09P	store ***PPE***	***PPE*** is stored in a clean and dry location according to manufacturers' specifications

Range of Variables

PPE includes: hard hats, fall protection, hand protection, face shields, eye protection, respiratory protection, hearing protection, safety boots

fall protection equipment includes: harness, lanyard, rope grab, lifeline (static, self-retracting), anchorage

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

safety equipment includes: see Appendix B

work appropriate clothing includes: sleeved shirts, long pants, task-appropriate gloves

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-2.01.01L	demonstrate knowledge of ***PPE*** and ***safety equipment***, their characteristics and applications	identify types of ***PPE***, and describe their characteristics and applications
		identify types of ***safety equipment***, and describe their characteristics and applications
		identify ***fall protection equipment***, and describe their characteristics and applications
		identify ***work appropriate clothing***, and describe their characteristics and applications
A-2.01.02L	demonstrate knowledge of procedures to select and use ***PPE*** and ***safety equipment***	describe procedures to select and use ***PPE***
		describe procedures to select and use ***safety equipment***
		describe procedures to locate ***safety equipment***
A-2.01.03L	demonstrate knowledge of training and certification requirements for ***PPE*** and ***safety equipment***	identify training requirements for ***PPE*** and ***safety equipment***
		identify ***safety training requirements***
A-2.01.04L	demonstrate knowledge of regulatory requirements for ***PPE*** and ***safety equipment***	identify safety manuals, ***standards and regulations*** for ***PPE*** and ***safety equipment***

Range of Variables

PPE includes: hard hats, fall protection, hand protection, face shields, eye protection, respiratory protection, hearing protection, safety boots

safety equipment includes: see Appendix B

fall protection equipment includes: harness, lanyard, rope grab, lifeline (static, self-retracting), anchorage

work appropriate clothing includes: sleeved shirts, long pants, task-appropriate gloves

safety training requirements include: confined space entry, working near high voltage, elevated work platforms, equipment operation, site-specific training, fall protection

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

A-2.02 Maintains safe work environment

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-2.02.01P	use ***barrier equipment and structures***	***barrier equipment and structures*** are used to bring attention to potential hazardous situations and to prevent entry of workers and public on site
A-2.02.02P	install temporary lighting, environmental protection and hoarding	temporary lighting, environmental protection and hoarding are installed according to ***standards and regulations***
A-2.02.03P	follow ***safe work procedures***	***safe work procedures*** are followed according to company policies, ***standards and regulations***
A-2.02.04P	identify and report hazards	hazards are identified and reported according to company policies, ***standards and regulations*** to prevent incidents
A-2.02.05P	apply ***WHMIS procedures***	***WHMIS procedures*** are applied
A-2.02.06P	comply with ***standards and regulations***	***standards and regulations*** are reviewed and complied with
A-2.02.07P	keep worksite clean	worksite is kept clean according to company policy, ***standards and regulations*** to ensure a safe and organized worksite environment
A-2.02.08P	block, cover, fasten and label openings	openings are blocked, covered, fastened and labelled according to ***standards and regulations*** to avoid injury to workers and public

A-2.02.09P	write and use pre-task safety instructions and hazard assessments [field level risk assessment (FLRA)]	pre-task safety instructions and hazard assessments (FLRAs) are written and used according to company policy, ***standards and regulations*** to determine hazards and to mitigate or eliminate risks of tasks being performed
A-2.02.10P	identify location of ***safety equipment***	location of ***safety equipment*** is identified according to site safety plan posted on project site

Range of Variables

barrier equipment and structures include: barricades, caution tape, ropes, chains, wires, rails

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

safe work procedures include: fall protection, confined space, lockout and tagout, material handling, access and egress, control zones

WHMIS procedures include: record keeping of Safety Data Sheets (SDS), product identification, handling, disposal

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-2.02.01L	demonstrate knowledge of maintaining a safe work environment	identify ***barrier equipment and structures***, and describe their characteristics and applications
		describe procedures to install temporary lighting, environmental protection and hoarding
		identify ***safe work procedures***, and describe their characteristics and applications
		identify hazards and describe associated reporting procedures
		describe associated ***standards and regulations*** and ***WHMIS procedures***
		identify and describe elements of pre-task safety instructions and hazard assessments [field level risk assessment (FLRA)]
A-2.02.02L	demonstrate knowledge of procedures to maintain safe work environment	describe procedures to ensure clean worksite
		describe procedures to block, cover, fasten and label openings
		describe procedures to locate safety equipment
		describe lockout and tagout procedures

A-2.02.03L	demonstrate knowledge of training requirements for maintaining safe work environment	identify training requirements for maintaining safe work environment
A-2.02.04L	demonstrate knowledge of regulatory requirements for maintaining safe work environment	identify safety manuals, ***standards and regulations*** for maintaining safe work environment

Range of Variables

barrier equipment and structures include: barricades, caution tape, ropes, chains, wires, rails

safe work procedures include: fall protection, confined space, lockout and tagout, material handling, access and egress, control zones

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

WHMIS procedures include: record keeping of Safety Data Sheets (SDS), product identification, handling, disposal

Task A-3 Builds and uses temporary access structures

Task Descriptor

Carpenters must access various work locations and must be able to use different types of access equipment. Sometimes carpenters must design and build access equipment and structures such as scaffolds, ladders and ramps to perform their work, or to be used by other trades.

A-3.01 Uses stationary access equipment

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-3.01.01P	construct, install and secure site-built access equipment	site-built access equipment is constructed, installed and secured according to ***standards and regulations***
A-3.01.02P	install and secure prefabricated access equipment	prefabricated access equipment is installed and secured according to ***standards and regulations***

A-3.01.03P	maintain ***stationary access equipment***	***stationary access equipment*** is maintained according to ***standards and regulations***
A-3.01.04P	inspect ***stationary access equipment*** for defects	***stationary access equipment*** is inspected for defects according to ***standards and regulations***

Range of Variables

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

stationary access equipment includes: guardrails, ladders, ladder jacks, scaffolding

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-3.01.01L	demonstrate knowledge of ***stationary access equipment***, their characteristics and applications	identify types of ***stationary access equipment***, and describe their characteristics and applications
		identify types of site-built access equipment, and describe their characteristics and applications
		identify types of prefabricated access equipment, and describe their characteristics and applications
A-3.01.02L	demonstrate knowledge of procedures to inspect and maintain ***stationary access equipment***	identify tools and equipment used to inspect and maintain ***stationary access equipment***, and describe their procedures for use
		describe procedures to inspect and maintain ***stationary access equipment***
A-3.01.03L	demonstrate knowledge of training and certification requirements for using ***stationary access equipment***	identify training and certification requirements for using ***stationary access equipment***
A-3.01.04L	demonstrate knowledge of regulatory requirements for using ***stationary access equipment***	identify ***standards and regulations*** for using ***stationary access equipment***
A-3.01.05L	demonstrate knowledge of construction, and installation of site-built access equipment	describe procedures for site-built access equipment construction and installation according to ***standards and regulations***
A-3.01.06L	demonstrate knowledge of assembly and installation of prefabricated access equipment	describe procedures for assembly and installation of prefabricated access equipment according to ***standards and regulations***

Range of Variables

stationary access equipment includes: guardrails, ladders, ladder jacks, scaffolding

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

A-3.02 Uses mobile access equipment

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-3.02.01P	select ***mobile access equipment***	***mobile access equipment*** is selected according to project task
A-3.02.02P	set up and operate ***mobile access equipment***	***mobile access equipment*** is set up and operated according to manufacturers' specifications, site conditions and ***standards and regulations***
A-3.02.03P	maintain ***mobile access equipment***	***mobile access equipment*** is maintained according to manufacturers' specifications
A-3.02.04P	inspect ***mobile access equipment***	***mobile access equipment*** is inspected for defects according to manufacturers' specifications

Range of Variables

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

mobile access equipment includes: aerial work platforms (AWP) (scissor lift, articulating boom lift [ABL], telescopic boom lift)

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-3.02.01L	demonstrate knowledge of ***mobile access equipment,*** their characteristics and applications	identify types of ***mobile access equipment***, and describe their characteristics and applications
A-3.02.02L	demonstrate knowledge of procedures to use ***mobile access equipment***	describe procedures to use ***mobile access equipment***
		identify ***hazardous conditions*** affecting operation of ***mobile access equipment***
A-3.02.03L	demonstrate knowledge of procedures to inspect and maintain ***mobile access equipment***	identify tools and equipment used to inspect and maintain ***mobile access equipment***, and describe their procedures for use

		describe procedures to inspect and maintain ***mobile access equipment***
A-3.02.04L	demonstrate knowledge of training and certification requirements for using ***mobile access equipment***	identify training and certification requirements for using ***mobile access equipment***
A-3.02.05L	demonstrate knowledge of regulatory requirements for using ***mobile access equipment***	identify ***standards and regulations*** for using ***mobile access equipment***

Range of Variables

mobile access equipment includes: aerial work platforms (AWP) (scissor lift, articulating boom lift (ABL), telescopic boom lift)

hazardous conditions include: soft ground, wet conditions, overhead powerlines

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

A-3.03 Erects/dismantles scaffolding

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-3.03.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
A-3.03.02P	select ***scaffold systems*** and ***scaffold components***	***scaffold systems*** and ***scaffold components*** are selected according to project requirements
A-3.03.03P	assemble ***scaffold components***	***scaffold components*** are assembled in sequence according to manufacturers' specifications, and ***standards and regulations***
A-3.03.04P	tie in ***scaffold systems***	***scaffold systems*** are tied in according to ***standards and regulations***
A-3.03.05P	dismantle ***scaffold components***	***scaffold components*** are dismantled in sequence according to ***standards and regulations***

A-3.03.06P	identify use-approval systems	use-approval systems are identified and used to inform others of condition of scaffold according to ***standards and regulations***
A-3.03.07P	tag and remove from service damaged ***scaffold components***	damaged ***scaffold components*** are tagged and removed from service according to ***standards and regulations***

Range of Variables

tools and equipment include: see Appendix B

scaffold systems include: wood, platform, frame, system scaffolding, tube-and-clamp, pump-jack scaffolds

scaffold components include: transoms, ledgers and standards, frames, cross braces, couplers, tubes, clamps, platforms, mud sills

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-3.03.01L	demonstrate knowledge of ***scaffold systems*** and associated ***scaffold components***, characteristics and applications	identify ***scaffold systems*** and ***scaffold components***, and describe their characteristics and applications
A-3.03.02L	demonstrate knowledge of procedures to erect and dismantle ***scaffold systems***	identify ***tools and equipment*** used to erect and dismantle ***scaffold systems*** and describe their procedures for use
		describe procedures to erect and dismantle ***scaffold systems***
A-3.03.03L	demonstrate knowledge of training and certification requirements for inspecting, erecting and dismantling ***scaffold systems***	identify training and certification requirements for inspecting, erecting and dismantling ***scaffold systems***
A-3.03.04L	demonstrate knowledge of regulatory requirements for erecting and dismantling ***scaffold systems***	identify ***standards and regulations*** for erecting and dismantling ***scaffold systems***

Range of Variables

scaffold systems include: wood, platform, frame, system scaffolding, tube-and-clamp, pump-jack scaffolds

scaffold components include: transoms, ledgers and standards, frames, cross braces, couplers, tubes, clamps, platforms, mud sills

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

A-3.04 Modifies scaffolding

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-3.04.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
A-3.04.02P	identify location and types of support required for altering existing scaffold structure	location and types of support required for altering existing scaffold structure are identified according to engineer's specifications and ***standards and regulations***
A-3.04.03P	select ***scaffold components*** for modification of scaffold structure	***scaffold components*** for modification of scaffold structure are selected according to engineer's specifications and ***standards and regulations***
A-3.04.04P	plan scaffold modification sequences	scaffold modification sequences are planned taking into consideration existing scaffold design, according to engineer's specifications and ***standards and regulations***
A-3.04.05P	remove or install ***scaffold components***	scaffold components are removed or installed according to established modification sequence

Range of Variables

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

scaffold components include: transoms, ledgers and standards, frames, cross braces, couplers, tubes, clamps, platforms, mud sills

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-3.04.01L	demonstrate knowledge of ***scaffold systems***, and associated ***scaffold components***, characteristics and applications	identify ***scaffold systems*** and describe their characteristics and applications
		identify ***scaffold components***, and describe their characteristics and applications
		identify and describe soil types and conditions

		interpret scaffold drawings
		describe hand signals appropriate for scaffold assembly
		identify ***specialty access equipment***, and describe their characteristics and applications
A-3.04.02L	demonstrate knowledge of procedures to modify ***scaffold systems***	identify ***tools and equipment*** used to modify ***scaffold systems***, and describe their procedures for use
		describe procedures to modify ***scaffold systems***

Range of Variables

scaffold systems include: wood, platform, frame, system scaffolding, tube-and-clamp, pump-jack scaffolds

scaffold components include: transoms, ledgers and standards, frames, cross braces, couplers, tubes, clamps, platforms, mud sills

specialty access equipment includes: swing stages, boatswain's (bosun's) chairs

tools and equipment include: see Appendix B

Task A-4 Uses communication and mentoring techniques

Task Descriptor

Learning in the trades is done primarily in the workplace with tradespeople passing on their skills and knowledge to apprentices, as well as sharing knowledge among themselves. Apprenticeship is, and always has been about mentoring – learning workplace skills and passing them on. Because of the importance of this to the trade, this task covers the activities related to communication in the workplace and mentoring skills.

A-4.01 Uses communication techniques

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-4.01.01P	demonstrate communication practices with individuals or in a group	instructions and messages are interpreted by all parties involved in communication
A-4.01.02P	listen using ***active listening*** practices	***active listening*** practices are used

A-4.01.03P	receive and respond to feedback on work completed or performed	response to feedback indicates understanding and corrective measures are taken
A-4.01.04P	receive and respond to instruction on task assignment	response to instructions indicates understanding and work is undertaken
A-4.01.05P	explain and provide feedback	explanation and feedback is provided and task is carried out as directed
A-4.01.06P	use questions to improve communication	asking questions enhance understanding, on-the-project training and goal setting
A-4.01.07P	participate in safety and information meetings	meetings are attended, information is relayed to workforce, and is applied
A-4.01.08P	send and receive ***electronic messages***	***electronic messages*** are sent and received using professionalism, plain language and clear expressions according to company policy

Range of Variables

active listening includes: hearing, interpreting, reflecting, responding, paraphrasing

electronic messages include: email, text (short message service [SMS], Multimedia Messaging Service [MMS], Over the Top [OTT] applications)

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-4.01.01L	demonstrate knowledge of trade terminology	define terminology used in trade
A-4.01.02L	demonstrate knowledge of effective communication practices	describe importance of using effective verbal and non-verbal communication with ***people in the workplace***
		identify ***sources of information*** to effectively communicate
		identify communication and ***learning styles***
		describe effective listening and speaking skills
		describe effectively receiving and giving instructions
		identify ***personal responsibilities and attitudes*** that contribute to on-the-project success
		identify value of equity, diversity and inclusion (EDI) in workplace

		identify communication that constitutes as bullying, ***harassment*** and ***discrimination***
A-4.01.03L	demonstrate knowledge of various communications styles for ***electronic messages***	identify communication styles appropriate to different systems and applications of ***electronic messages***

Range of Variables

people in the workplace include: other tradespeople, colleagues, apprentices, supervisors, clients, jurisdictional representatives, manufacturers

sources of information include: regulations, codes, occupational health and safety requirements, jurisdictional requirements, prints, drawings, specifications, company and client documentation

learning styles include: seeing it, hearing it, trying it

personal responsibilities and attitudes include: asking questions, working safely, accepting constructive feedback, time management and punctuality, respect for authority, good stewardship of materials, tools and property, efficient work practice

harassment as defined by the Canadian and jurisdictional Human Rights Commissions

discrimination as defined by the Canadian Human Rights Act and jurisdictional human rights laws

electronic messages include: email, text (SMS, MMS, OTT applications)

A-4.02 Uses mentoring techniques

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
A-4.02.01P	identify and communicate learning objective and point of lesson	apprentice or learner can explain objective and point of lesson
A-4.02.02P	link lesson to other lessons and projects	lesson order and unplanned learning opportunities are defined
A-4.02.03P	demonstrates performance of a skill to an apprentice or learner	***steps required to demonstrate a skill*** are performed
A-4.02.04P	set up ***practice conditions*** required for an apprentice or learner to practice a skill	***practice conditions*** are set up so that skill can be practiced safely by apprentice or learner
A-4.02.05P	assess apprentice or learner's ability to perform tasks with increasing independence	performance of apprentice or learner improves with practice to point where skill can be done with little supervision
A-4.02.06P	give supportive and corrective feedback	apprentice or learner adopts best practice after having been given supportive or corrective feedback
A-4.02.07P	support apprentices or learners in pursuing technical training opportunities	technical training is completed within timeframe prescribed by apprenticeship authority

A-4.02.08P	support anti-***harassment*** in workplace	workplace is ***harassment*** and ***discrimination***-free
A-4.02.09P	assess apprentice or learner suitability to trade during probationary period	apprentice or learner is given constructive feedback that helps them identify their own strengths and weaknesses and suitability for trade

Range of Variables

steps required to demonstrate a skill include: understanding the who, what, where, when, why, and how, explaining, showing, giving encouragement, following up to ensure skill is performed correctly

practice conditions mean: guided, limited independence, full independence

harassment as defined by the Canadian and jurisdictional Human Rights Commissions

discrimination as defined by the Canadian Human Rights Act and jurisdictional human rights laws

	Knowledge	
	Learning Outcomes	**Learning Objectives**
A-4.02.01L	demonstrate knowledge of strategies for learning skills in workplace	describe importance of individual experience
		describe shared responsibilities for workplace learning
		determine one's own learning preferences and explain how these relate to learning new skills
		describe importance of different types of skills in workplace
		describe importance of ***essential skills*** in workplace
		identify different ***learning styles***
		identify different ***learning needs*** and strategies to meet them
		identify ***strategies to assist in learning a skill***
A-4.02.02L	demonstrate knowledge of strategies for ***teaching*** workplace ***skills***	identify different roles played by workplace mentor
		describe ***teaching skills***
		explain importance of identifying point of lesson
		identify how to choose a good time to present lesson
		explain importance of linking lessons
		identify components of skill (context)
		describe considerations in setting up opportunities for skill practice
		explain importance of providing constructive feedback

	identify techniques for giving constructive feedback
	describe a skills assessment
	identify methods of assessing progress
	explain how to adjust lesson to different situations

Range of Variables

essential skills are: reading, document use, writing, oral communication, numeracy, thinking, working with others, digital technology, continuous learning

learning styles include: seeing it, hearing it, trying it

learning needs include: learning disabilities, learning preferences, language proficiency

strategies to assist in learning a skill include: understanding the basic principles of instruction, developing coaching skills, being mature and patient, providing feedback

teaching skills include: identifying the point of the lesson, linking the lesson, demonstrating the skill, providing practice, giving constructive feedback, assessing skills and progress

Major Work Activity B
Performs planning and layout

Task B-5 Interprets documentation

Task Descriptor

Carpenters must locate information in various documents and understand the relationship between them in order to form a plan of construction.

B-5.01 Interprets project drawings

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-5.01.01P	determine measurements from paper and digital project drawings	measurements from project drawings are determined using ***drafting instruments*** and ***digital tools***
B-5.01.02P	locate ***information*** for layout	***information*** for layout is located
B-5.01.03P	relay drawing ***information*** to co-workers or others	drawing ***information*** is relayed to co-workers or others
B-5.01.04P	identify conflicts within set of project drawings	conflicts within a set of project drawings are identified taking into consideration priority of different ***drawings***
B-5.01.05P	visualize two-dimensional information into three-dimensional space	two-dimensional information is visualized into three-dimensional space in order to complete project
B-5.01.06P	identify grid lines	grid lines are identified to determine distances and locations of key building components for layout

Range of Variables

drafting instruments include: protractors, scale rulers, compasses
digital tools include: drafting software, laptops, tablets, smartphones
information includes: details, elevations, sections, door and window schedules, all project documentation
drawings include: site, architectural, structural, electrical, mechanical, as-built, details, shop

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-5.01.01L	demonstrate knowledge of project ***drawings***, their characteristics and applications	identify types of ***drawings***, and describe their characteristics and applications
		identify types of ***drawing components***, and describe their characteristics and applications
		identify client and manufacturers' specifications
		identify location of specifications and drawings on work site
		explain importance of maintaining accurate and thorough records and creating as-built drawings
B-5.01.02L	demonstrate knowledge of regulatory requirements for project drawings	identify ***standards and regulations*** for project drawings and their locations

Range of Variables

drawings include: site, architectural, structural, electrical, mechanical, as-built, details, shop
drawing components include: lines, dimensions, symbols, legends, schedules, abbreviations
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-5.02 Interprets specifications

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-5.02.01P	identify products, materials and installation procedures	products, materials and installation procedures are identified according to project ***documents***
B-5.02.02P	determine when alternatives can be used	alternatives are determined according to project requirements
B-5.02.03P	cross-reference various ***documents***	various ***documents*** are cross-referenced according to project requirements

Range of Variables

documents include: code books, contract specifications, manufacturers' specifications, change orders

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-5.02.01L	demonstrate knowledge of project ***documents***, their characteristics and applications	identify types of project ***documents***, and describe their characteristics and applications
		identify client and manufacturers' specifications
		identify ***elements of project documents*** containing specifications
		identify location of project ***documents*** on work site
		explain importance of maintaining accurate and thorough records
B-5.02.02L	demonstrate knowledge of regulatory requirements for specifications	identify ***standards and regulations*** for specifications and their locations

Range of Variables

documents include: code books, contract specifications, manufacturers' specifications, change orders

elements of project documents include: specification tables (span, lintel, snow load), drawings (site, architectural, mechanical, electrical, structural, shop, details), specification books

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-5.03 Interprets safety documentation

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-5.03.01P	identify OH&S requirements	OH&S requirements are identified according to jurisdictional regulations and company policies
B-5.03.02P	identify safety precautions and procedures	safety precautions and procedures are identified according to ***safety documentation***
B-5.03.03P	use information found in ***safety documentation***	information found in ***safety documentation*** is used to employ safe work procedures
B-5.03.04P	document workplace health and safety risks	risk assessment documentation is complete with all potential risks and mitigations identified

Range of Variables

safety documentation includes: SDS, safety manuals, operating manuals, manufacturer labels, safety work permits, safety meeting documents, FLRAs

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-5.03.01L	demonstrate knowledge of ***safety documentation***, their characteristics and applications	identify types of ***safety documentation***, and describe their characteristics and applications
		explain importance of maintaining accurate and thorough records
B-5.03.02L	demonstrate knowledge of risk assessment	identify ***workplace risks***
		identify risk mitigation strategy
B-5.03.03L	demonstrate knowledge of regulatory requirements for ***safety documentation***	identify ***standards and regulations*** for ***safety documentation*** and their locations

Range of Variables

safety documentation includes: SDS, safety manuals, operating manuals, manufacturer labels, safety work permits, safety meeting documents, FLRAs

workplace risks include: overhead hazards, fall hazards, trip hazards, physical injury risks, environmental risks

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-5.04 Interprets workplace documentation

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-5.04.01P	identify how ***workplace documents*** affect project requirements	effects of ***workplace documents*** on project requirements are identified
B-5.04.02P	identify pertinent information on ***in-house documents*** and ***reports***	pertinent information on ***in-house documents*** and ***reports*** is identified according to project

Range of Variables

workplace documents include: requests for information (RFI), site instructions (SI), change orders (CO), building permits

in-house documents include: work permits, operating manuals

reports include: engineers', non-conformance, deficiencies, soils, hazardous materials, inspection and revision requests

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-5.04.01L	demonstrate knowledge of ***workplace documents***, their characteristics and applications	identify types of ***workplace documents***, and describe their characteristics and applications
		identify types of ***reports***, and describe their characteristics and applications
		identify location of ***workplace documents*** on work site
		explain importance of maintaining accurate and thorough records
B-5.04.02L	demonstrate knowledge of regulatory requirements for ***workplace documents***	identify ***standards and regulations*** for ***workplace documents*** and their locations

Range of Variables

workplace documents include: requests for information (RFI), site instructions (SI), change orders (CO), building permits

reports include: engineers', non-conformance, deficiencies, soils, hazardous materials, inspection and revision requests

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task B-6 Organizes work

Task Descriptor

Scheduling of work tasks and organization of materials are important to ensure project efficiencies, product quality, and safety of workers and the public.

B-6.01 Schedules work sequence

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-6.01.01P	identify and plan sequence of steps	sequence of steps is identified and planned to ensure efficient and safe process, and quality product according to scope of work
B-6.01.02P	coordinate delivery of materials	delivery of materials is coordinated according to schedule and sequencing of project
B-6.01.03P	coordinate work with other trades	work is coordinated with other trades according to project critical path and sequence of work
B-6.01.04P	estimate time to complete tasks	task completion matches estimated time
B-6.01.05P	adapt to changing ***environmental conditions***	changing ***environmental conditions*** are adapted to
B-6.01.06P	account for ***changes in schedule***	alternate plans are developed to account for ***changes in schedule***

Range of Variables

environmental conditions include: rain, snow, wind, heat, cold, natural daylight, soil, water, ambient air, exposure

changes in schedule include: material availability, work stoppages, other trades' schedules

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-6.01.01L	demonstrate knowledge of scheduling work sequence	identify ***task requirements*** and their impact on scheduling work sequence
		describe considerations when determining material delivery and lead times
		describe considerations when determining material storage requirements

	describe procedures to coordinate necessary components to be installed by other trades
	describe procedure to plan project schedule and task sequence
	identify ***environmental conditions*** and their impact on scheduling work sequence
	identify ***changes in schedule*** and their impact on scheduling work sequence

Range of Variables

task requirements include: material, tools, labour

environmental conditions include: rain, snow, wind, heat, cold, natural daylight, soil, water, ambient air, exposure

changes in schedule include: material availability, work stoppages, other trades' schedules

B-6.02 Performs site preparation

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-6.02.01P	assess requirements for utilities and identify locations of existing utilities	utility requirements are assessed and locations of existing utilities are identified
B-6.02.02P	plan access and egress to and from project site	access and egress to and from project site is planned for safe movement of workers and efficient delivery of materials
B-6.02.03P	determine requirements for ***temporary structures***	***temporary structures*** are planned according to plans, specifications, codes, regulations and project requirements
B-6.02.04P	construct enclosures and supports for ***temporary utilities***	enclosures and supports are constructed for ***temporary utilities*** according to plans, specifications, codes and regulations
B-6.02.05P	install fencing, control gates and hoarding	fencing, control gates and hoarding is installed to prevent injury to public and loss of materials and tools
B-6.02.06P	set up storage for building materials	storage is set up for building materials considering accessibility, crane location, safety of workers, security, material requirements and prefab area
B-6.02.07P	prepare location for materials and deliveries	location for materials and deliveries is prepared according to construction sequence and security considerations

B-6.02.08P	remove obstructions	obstructions are removed according to plans and specifications, and site requirements
B-6.02.09P	provide temporary protection of environment	temporary protection of environment is provided according to plans, specifications and environmental regulations
B-6.02.10P	lock out and tag out sources of potential energy	sources of potential energy are locked out and tagged out according to jurisdictional regulations and company policies

Range of Variables

temporary structures include: signage, guard rails, construction trailers, outbuildings, environmental protection, scaffolding, hoarding

temporary utilities include: electrical, heating, water, toilets

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-6.02.01L	demonstrate knowledge of site preparation	identify ***on-site conditions and requirements***, and describe their characteristics
		describe how site work impacts environment
		describe procedures to locate and identify utilities
		describe excavation techniques, types of soil, water problems and shoring requirements
		describe building techniques or practices
		describe types and classifications of hazardous materials
		describe storage and handling requirements for hazardous materials
		identify ***tools and equipment*** used for site preparation, and describe their procedures for use
		describe procedures for site preparation
		describe lockout and tagout procedures
B-6.02.02L	demonstrate knowledge of training and certification requirements for site preparation	identify training requirements for site preparation
		identify certification requirements for ***material handling equipment***
B-6.02.03L	demonstrate knowledge of regulatory requirements for site preparation	identify ***standards and regulations*** for site preparation

Range of Variables

on-site conditions and requirements include: weather conditions, existing structures, pedestrian/vehicular traffic, security requirements, safety signage

tools and equipment include: see Appendix B

material handling equipment includes: rough terrain forklifts, telescopic booms, skid steers, forklifts, cranes

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-6.03 Performs quantity takeoff

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
B-6.03.01P	perform calculations	calculations are performed to determine required quantities of materials taking into account application of material, waste and reuse of available material
B-6.03.02P	determine required quantities of materials	required quantities of materials are determined according to project drawings, on-site measurements and change orders

Knowledge

	Learning Outcomes	Learning Objectives
B-6.03.01L	demonstrate knowledge of procedures to perform quantity takeoff	identify ***tools and equipment*** used to perform quantity takeoff, and describe their procedures for use
		identify physical and electronic ***estimating tools***, and describe their procedures for use
		identify calculations performed to determine required quantities of materials
		describe procedures to determine required quantities of materials using project drawings, specifications and on-site measurements

Range of Variables

tools and equipment include: see Appendix B

estimating tools include: estimating guides, software

B-6.04 Organizes materials

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-6.04.01P	arrange delivered materials and confirm their delivery	delivered materials are arranged to maximize efficiency and productivity, and their delivery is confirmed
B-6.04.02P	protect materials	materials are protected from ***conditions*** to ensure product integrity
B-6.04.03P	store and handle hazardous materials	hazardous materials are stored and handled according to jurisdictional regulations, manufacturers' specifications and company policies
B-6.04.04P	place materials	materials are placed to avoid excessive point loading on existing structures, to protect surroundings and people, and to facilitate installation sequence

Range of Variables

conditions include: environmental, security, general foot traffic

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-6.04.01L	demonstrate knowledge of procedures to organize materials	describe procedures to order, receive, organize and store materials
		describe procedures to protect product integrity
		describe acclimatization requirements of materials
B-6.04.02L	demonstrate knowledge of hazardous materials	describe types, classifications and symbols of hazardous materials
		describe storage and handling requirements for hazardous materials
B-6.04.03L	demonstrate knowledge of ***training and certification requirements*** for organizing materials	identify ***training and certification requirements*** for storage and handling requirements for hazardous materials
		identify certification requirements for ***material handling equipment***

Range of Variables

training and certification requirements include: WHMIS, Transport of Dangerous Goods (TDG), company training programs

material handling equipment includes: rough terrain forklifts, telescopic booms, skid steers, forklifts

Task B-7 Performs layout

Task Descriptor

Layout means to use information from construction drawings to create physical structures and their various components with accuracy while maintaining structural integrity and efficient use of materials. Laying out involves measuring, calculating and marking locations of components and cuts in preparation for construction.

B-7.01 Performs site layout

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-7.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
B-7.01.02P	determine location of building and ***other structures***	location of building and ***other structures*** is determined from survey control points found in project drawings
B-7.01.03P	place ***layout structures***	***layout structures*** are placed to identify location of buildings and ***other structures***

Range of Variables

tools and equipment include: see Appendix B

other structures include: curbs, light standards, sidewalks, wells, septic systems

layout structures include: batter boards, benchmarks, iron pins, flagged nails

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-7.01.01L	demonstrate knowledge of procedures to perform site layout	describe characteristics and applications of site layout
		identify ***tools and equipment*** used to perform site layout, and describe their procedures for use
		describe procedures to perform site layout
		describe applications for using survey control points
		identify ***layout structures***, and describe their characteristics and applications
		describe geometry and calculations used to perform layout
		describe basic survey theory used to perform layout
		identify ***task requirements***, and describe their characteristics and applications
		identify other trades/sub-trades to take into consideration
		identify procedures to locate underground/hidden utilities
		identify ***site conditions***, and describe their characteristics
B-7.01.02L	demonstrate knowledge of regulatory requirements for performing site layout	identify ***standards and regulations*** for performing site layout

Range of Variables

tools and equipment include: see Appendix B

layout structures include: batter boards, benchmarks, iron pins, flagged nails

task requirements include: material, tools, labour

site conditions include: soil types, water problems, shoring requirements, pedestrian and vehicular traffic, seismic, grading, vegetation, environmental

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-7.02 Lays out concrete formwork

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-7.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
B-7.02.02P	establish and follow grid lines, and determine offsets	grid lines are established and followed, and offsets are determined according to ***drawings***
B-7.02.03P	determine elevations of ***building components***	elevations of ***building components*** are determined using benchmarks according to ***drawings*** and ***specifications***, and site requirements and conditions
B-7.02.04P	determine locations of penetrations, voids and openings	locations of penetrations, voids and openings in concrete are determined according to ***drawings***
B-7.02.05P	locate ***building components***	***building components*** are located according to ***drawings***, grid lines and control points
B-7.02.06P	apply measurements from project drawings to structures	measurements on structures reflect those on ***drawings***
B-7.02.07P	establish and transfer control points	control points are established and transferred according to ***drawings*** using layout tools
B-7.02.08P	determine elevation and location of falsework	elevation and location of falsework is determined according to benchmarks, codes, ***drawings*** and ***specifications***
B-7.02.09P	identify locations of temporary shoring	locations of temporary shoring are identified according to ***drawings***

Range of Variables

tools and equipment include: see Appendix B
drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans
building components include: beams, girders, beam pockets, concrete walls, footings, embeds
specifications include: project, engineer, manufacturers'
task requirements include: material, tools, labour

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-7.02.01L	demonstrate knowledge of concrete formwork, their characteristics and applications	describe characteristics and applications of concrete formwork
		identify types of concrete formwork materials, and describe their characteristics and applications
B-7.02.02L	demonstrate knowledge of procedures to lay out concrete formwork	identify ***tools and equipment*** used to lay out concrete formwork, and describe their procedures for use
		describe the use of ***drawings*** for layout
		describe procedures to lay out concrete formwork
		describe importance of grid lines, offsets and control points
		identify locations of concrete formwork, shoring and reshoring
		describe geometry and calculations used to perform layout
		describe basic survey theory used to perform layout
		identify ***task requirements***, and describe their characteristics and applications
		identify other trades/sub-trades to take into consideration
		identify ***building components***, and describe their characteristics and applications
		describe forming techniques, their characteristics and applications
		identify ***site conditions***, and describe their characteristics
B-7.02.03L	demonstrate knowledge of regulatory requirements for laying out concrete formwork	identify ***standards and regulations*** for laying out concrete formwork

Range of Variables

tools and equipment include: see Appendix B

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

task requirements include: material, tools, labour

building components include: beams, girders, beam pockets, concrete walls, footings, embeds

site conditions include: soil types, water problems, shoring requirements, pedestrian and vehicular traffic, seismic, grading, vegetation, environmental

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-7.03 Lays out floors

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-7.03.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
B-7.03.02P	determine quarter points for built-up beams	quarter points for built-up beams are determined according to codes
B-7.03.03P	determine lengths and size of material required for built-up beams	lengths and size of material required for built-up beams are determined according to codes
B-7.03.04P	determine material requirements used for engineered beams	material requirements used for engineered beams are determined according to engineered drawings
B-7.03.05P	determine lengths and size of material required for steel beams	lengths and size of material required for steel beams are determined according to codes
B-7.03.06P	mark locations of ***building components***	locations of ***building components*** are marked
B-7.03.07P	identify joist locations and spacing	joist locations and spacing are identified to ensure support for walls and to allow for openings and offsets according to ***drawings*** and code
B-7.03.08P	verify accuracy of layout	accuracy of layout is verified by performing ***checks*** according to ***drawings***
B-7.03.09P	determine locations of ***penetrations and openings***	locations of ***penetrations and openings*** are determined according to ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

building components include: floor systems, pre-fabricated trusses, columns, beams, girders, joists, sill plates, engineered lumber, stairwells, chases

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

checks include: back check, Pythagorean theorem (3-4-5), measuring diagonals

penetrations and openings include: for electrical, heating, ventilation and air conditioning (HVAC), plumbing components, stairwells

specifications include: project, engineer, manufacturers'

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-7.03.01L	demonstrate knowledge of floors, their characteristics and applications	identify types of floor framing materials, and describe their characteristics and applications
B-7.03.02L	demonstrate knowledge of procedures to lay out floors	identify ***tools and equipment*** used to lay out floors, and describe their procedures for use
		describe procedures to lay out floors
		identify elevation of finished flooring
		describe procedures to perform ***checks***
		describe procedure to lay out beam quarter points
		describe geometry and calculations used to perform layout
		identify ***task requirements***, and describe their characteristics and applications
		identify other trades/sub-trades to take into consideration
		identify procedure for communicating work deficiencies and discrepancies
		identify ***building components***, and describe their characteristics and applications
		describe framing techniques, their characteristics and applications
B-7.03.03L	demonstrate knowledge of regulatory requirements for laying out floors	identify ***standards and regulations*** for laying out floors

Range of Variables

tools and equipment include: see Appendix B

checks include: back check, Pythagorean theorem (3-4-5), measuring diagonals

task requirements include: material, tools, labour

building components include: floor systems, pre-fabricated trusses, columns, beams, girders, joists, sill plates, engineered lumber, stairwells, chases

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-7.04 Lays out decks

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-7.04.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
B-7.04.02P	mark locations and determine size of ***deck components***	locations are marked and size of ***deck components*** are determined according to ***drawings***, ***standards and regulations***
B-7.04.03P	determine locations of ***anchor points***	locations of ***anchor points*** are determined according to drawings and specifications
B-7.04.04P	determine locations of ***penetrations and openings***	locations of ***penetrations and openings*** are determined according to drawings and specifications
B-7.04.05P	verify accuracy of layout by performing ***checks***	accuracy of layout is verified by performing ***checks***
B-7.04.06P	identify slope requirements	slope requirements are identified to allow for drainage and water-shedding according to ***drawings*** and ***specifications***
B-7.04.07P	identify membrane requirements	membrane requirements are identified to protect material from moisture according to ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

deck components include: footings, columns, helical piles, beams, joists, stairs, ramps, guards/rails, glass railings, pre-cast steps, composite decking and components, pre-engineered and pre-fabricated systems

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

anchor points include: those required for ledgers and columns, anchor bolts

penetrations and openings include: for vegetation and drainage, for mechanical components and site services, for stairs

checks include: back check, Pythagorean theorem (3-4-5), measuring diagonals

specifications include: project, engineer, manufacturers'

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-7.04.01L	demonstrate knowledge of decks, their characteristics and applications	identify ***deck components***, and describe their characteristics and applications
		identify types of deck materials, and describe their characteristics and applications
B-7.04.02L	demonstrate knowledge of procedures to lay out decks	identify ***tools and equipment*** used to lay out decks, and describe their procedures for use
		describe procedures to lay out decks
		describe procedures to perform ***checks***
		describe importance of ***anchor points***
		describe importance of attachment and maintaining building envelope of existing structure
		describe importance of ***structural deck supports*** for load bearing and frost protection
		describe geometry and calculations used to perform layout
		identify ***task requirements***, and describe their characteristics and applications
		identify other trades/sub-trades to take into consideration
		identify procedures to locate underground/hidden utilities
		describe framing techniques, their characteristics and applications

		identify ***site conditions***, and describe their characteristics
B-7.04.03L	demonstrate knowledge of regulatory requirements for laying out decks and ***deck components***	identify ***standards and regulations*** for laying out decks and ***deck components***

Range of Variables

deck components include: footings, columns, helical piles, beams, joists, stairs, ramps, guards/rails, glass railings, pre-cast steps, composite decking and components, pre-engineered and pre-fabricated systems

tools and equipment include: see Appendix B

checks include: back check, Pythagorean theorem (3-4-5), measuring diagonals

anchor points include: those required for ledgers and columns, anchor bolts

structural deck supports include: footings, columns, beams, braces

task requirements include: material, tools, labour

site conditions include: soil types, water problems, pedestrian and vehicular traffic, grading, vegetation, environmental

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-7.05 Lays out walls

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
B-7.05.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
B-7.05.02P	identify wall locations	wall locations are identified according to ***drawings*** and ***specifications***
B-7.05.03P	determine ***key measurements***	***key measurements*** are determined according to ***drawings*** and ***specifications,*** and ***task requirements***
B-7.05.04P	identify stud locations and ***wall openings***	stud locations and ***wall openings*** are identified by marking wall plates according to ***drawings*** and ***specifications***
B-7.05.05P	determine locations of framing members and various components	locations of framing members and various components are determined to ensure structural integrity according to ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

specifications include: project, engineer, manufacturers',

key measurements include: lintel sizes, length of wall, height of wall, location of rough openings, load-bearing points, intersecting walls, intersecting beams, blocking

task requirements include: material, tools, labour

wall openings include: electrical, HVAC, plumbing components, windows, doors

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-7.05.01L	demonstrate knowledge of walls, their characteristics and applications	identify types of walls, and describe their characteristics and applications
		identify ***types of wall materials***, and describe their limits, characteristics and applications
B-7.05.02L	demonstrate knowledge of procedures to lay out walls	identify ***tools and equipment*** used to lay out walls, and describe their procedures for use
		describe procedures to lay out walls
		describe geometry and calculations used to perform layout
		identify ***task requirements***, and describe their characteristics and applications
		identify other trades/sub-trades to take into consideration
		identify ***wall components***, and describe their characteristics and applications
		describe framing techniques, their characteristics and applications
B-7.05.03L	demonstrate knowledge of regulatory requirements for laying out walls	identify ***standards and regulations*** for laying out walls

Range of Variables

types of wall materials include: dimensional lumber, masonry, steel wall systems, pre-manufactured wall systems, insulated concrete forms (ICF) systems, structural insulated panels (SIPs), timber frame

tools and equipment include: see Appendix B

task requirements include: material, tools, labour

wall components include: studs, jacks, lintels, plates

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-7.06 Lays out ceilings

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-7.06.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
B-7.06.02P	determine and mark locations of ***ceiling components***	locations of ***ceiling components*** are determined and marked according to ***drawings*** and ***specifications***
B-7.06.03P	determine and mark locations of bulkheads and ceiling openings	locations of bulkheads and ceiling openings for mechanical fixtures and penetrations are determined and marked according to ***drawings*** and ***specifications***
B-7.06.04P	determine and mark elevation of ceiling	elevation of ceiling is determined and marked using levels according to ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

ceiling components include: joists, main tees, grids, furring, hangers, trusses, wall angle, wire, wall beam, main beam, crown molding, access panels, attic hatches, blocking, backing, supports

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

specifications include: project, engineer, manufacturers'

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-7.06.01L	demonstrate knowledge of ceilings, their characteristics and applications	identify ***types of ceilings***, and describe their characteristics and applications
		identify ***ceiling components***, and describe their characteristics and applications
		identify ***types of materials***, and describe their ***characteristics*** and applications
B-7.06.02L	demonstrate knowledge of procedures to lay out ceilings	identify ***tools and equipment*** used to lay out ceilings, and describe their procedures for use
		describe procedures to lay out ceilings
		describe geometry and calculations used to perform layout

		identify ***task requirements***, and describe their characteristics and applications
		identify other trades/sub-trades to take into consideration
		describe framing techniques, their characteristics and applications
B-7.06.03L	demonstrate knowledge of regulatory requirements for laying out ceilings	identify ***standards and regulations*** for laying out ceilings

Range of Variables

types of ceilings include: attached drywall, suspended tile, suspended drywall, attached tile, decorative ceiling, sheet ceilings, coffered

ceiling components include: joists, main tees, grids, furring, hangers, trusses, wall angle, wire, wall beam, main beam, crown molding, access panels, attic hatches, blocking, backing, supports

types of materials include: wood, vinyl, metal, composites, drywall

characteristics include: fireproofing, sound-proofing, moisture resistance

tools and equipment include: see Appendix B

task requirements include: material, tools, labour

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-7.07 Lays out roofs

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
B-7.07.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
B-7.07.02P	mark locations of rafters and roof openings on walls	locations of rafters and roof openings on walls are marked according to ***drawings*** and ***specifications***
B-7.07.03P	determine ***roof framing component measurements***	***roof framing component measurements*** are determined, taking into account adjustments, according to calculations, ***drawings*** and ***specifications***
B-7.07.04P	mark measurements on lumber	measurements are marked on lumber according to ***drawings*** and ***specifications*** using ***methods***
B-7.07.05P	mark locations of prefabricated roof systems	locations of prefabricated roof systems are marked on wall plates according to ***drawings*** and ***specifications***

B-7.07.06P	mark bracing and blocking locations of roofs	bracing and blocking locations of roofs are marked according to ***standards and regulations***, ***drawings*** and ***specifications***
B-7.07.07P	mark locations of ***roof framing components***, ***penetrations and openings***	***roof framing components, penetrations and openings*** are marked according to ***standards and regulations***, ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

specifications include: project, engineer, manufacturers'

roof framing components include: rafters (common, hip/valley and jacks), ceiling joists, collar ties, webs, purlins, dormers, crickets, ridge, gussets, sheathing

measurements include: rafter size and length, overhangs, projections, area

methods include: stepping off, taking successive measurements from square, line length calculation (Pythagorean theorem), rafter tables, ratio and proportion

penetrations and openings include: vents, skylights, attic hatches, chimneys, HVAC

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-7.07.01L	demonstrate knowledge of roofs, their characteristics and applications	identify roof styles and types, and describe their characteristics and applications
		identify ***roof framing components***, and describe their characteristics and applications
		identify roof ***penetrations and openings***, and describe their characteristics and applications
		identify types of roof framing materials, and describe their characteristics and applications
		identify ***types of roofing materials***, and describe their characteristics and applications
B-7.07.02L	demonstrate knowledge of procedures to lay out roofs	identify ***tools and equipment*** used to lay out roofs, and describe their procedures for use
		describe procedures to lay out roofs
		describe actual and theoretical roof ***measurements***, adjustments and deductions
		describe procedures to lay out hand-cut ***roof framing components***

		describe procedures to lay out trusses
		describe geometry and calculations used to perform layout
		identify ***task requirements***, and describe their characteristics and applications
		identify other trades/sub-trades to take into consideration
		describe framing techniques, their characteristics and applications
B-7.07.03L	demonstrate knowledge of regulatory requirements for laying out roofs	identify ***standards and regulations*** for laying out roofs

Range of Variables

roof framing components include: rafters (common, hip/valley and jacks), ceiling joists, collar ties, webs, purlins, dormers, crickets, ridge, gussets, sheathing

penetrations and openings include: vents, skylights, attic hatches, chimneys, HVAC

types of roofing materials include: shingles (asphalt, fibreglass, metal), shakes, built-up roofing, metal

tools and equipment include: see Appendix B

measurements include: rafter size and length, overhangs, projections, area

task requirements include: material, tools, labour

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-7.08 Lays out stairs

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-7.08.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
B-7.08.02P	measure and calculate total rise and run of stairs, and length of stairwell opening	total rise and run of stairs and length of stairwell opening are measured and calculated according to ***drawings***, ***specifications***, ***standards and regulations***
B-7.08.03P	determine and mark ***measurements***	***measurements*** are determined and marked according to ***drawings***, ***specifications, standards and regulations***

B-7.08.04P	mark stringers	stringers are marked using layout tools taking into consideration adjustments for nosings, risers, tread, effective depth and finished floor thicknesses
B-7.08.05P	lay out forms for exterior concrete stairs	forms are laid out for exterior concrete stairs taking into account adjustments for water runoff
B-7.08.06P	lay out forms for interior concrete stairs	forms are laid out for interior concrete stairs
B-7.08.07P	determine placement of embeds in concrete stairs	placement of embeds in concrete stairs is determined according to ***drawings*** and ***specifications***
B-7.08.08P	determine and mark location and size of geometric stair components	location and size of geometric stair components are determined and marked according to ***drawings***, ***specifications*** and ***standards and regulations***

Range of Variables

tools and equipment include: see Appendix B

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

specifications include: project, engineer, manufacturers'

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

measurements include: unit rise, unit run, total rise, total run, length of stringer, allowable headroom, landing locations, length of opening, ratio and proportion

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-7.08.01L	demonstrate knowledge of stairs, their characteristics and applications	describe characteristics and applications of stairs
		identify ***stair components***, and describe their characteristics and applications
		identify types of stair materials, and describe their characteristics and applications
B-7.08.02L	demonstrate knowledge of procedures to lay out stairs	identify ***tools and equipment*** used to lay out stairs, and describe their procedures for use
		describe procedures to lay out stairs
		describe stairwell calculations performed during layout
		describe geometry and calculations used to perform layout
		identify ***task requirements***, and describe their characteristics and applications
		identify other trades/sub-trades to take into consideration

		describe stair construction techniques, their characteristics and applications
B-7.08.03L	demonstrate knowledge of regulatory requirements for laying out stairs	identify ***standards and regulations*** for laying out stairs

Range of Variables

stair components include: railings, spindles, balusters, guard rails, hand rails, stringers, risers, treads, nosings, weld plates, reinforcing bars, forms

tools and equipment include: see Appendix B

task requirements include: material, tools, labour

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

B-7.09 Lays out balustrades

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
B-7.09.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
B-7.09.02P	measure and calculate total rise and run of balustrades, and length of opening	total rise and run of balustrades and length of opening are measured and calculated according to ***drawings***, ***specifications***, ***standards and regulations***
B-7.09.03P	determine and mark ***measurements***	***measurements*** are determined and marked according to ***drawings***, ***specifications, standards and regulations***
B-7.09.04P	determine and mark location and size of ***balustrade components***	location and size of ***balustrade components*** are determined and marked according to ***drawings***, ***specifications, standards and regulations***

Range of Variables

tools and equipment include: see Appendix B

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

specifications include: project, engineer, manufacturers'

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

measurements include: height of guard rail, height of railing, baluster spacing, finished tread dimensions, newel post dimensions

balustrade components include: railings, volute, gooseneck, newel posts, fittings, balusters, removable railings, fillets

	Knowledge	
	Learning Outcomes	**Learning Objectives**
B-7.09.01L	demonstrate knowledge of balustrades, their characteristics and applications	describe characteristics and applications of balustrades
		identify ***balustrade components***, and describe their characteristics and applications
		identify types of balustrade materials, and describe their characteristics and applications
B-7.09.02L	demonstrate knowledge of procedures to lay out balustrades	identify ***tools and equipment*** used to lay out balustrades, and describe their procedures for use
		describe procedures to lay out balustrades
		describe geometry and calculations used to perform layout
		identify ***task requirements***, and describe their characteristics and applications
		identify other trades/sub-trades to take into consideration
		describe balustrade construction techniques, their characteristics and applications
B-7.09.03L	demonstrate knowledge of regulatory requirements for laying out balustrades	identify ***standards and regulations*** for laying out balustrades

Range of Variables

balustrade components include: railings, volute, gooseneck, newel posts, fittings, balusters, removable railings, fillets

tools and equipment include: see Appendix B

task requirements include: material, tools, labour

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Major Work Activity C
Performs concrete work

Task C-8 Constructs formwork

Task Descriptor

Carpenters construct formwork to create concrete structural and architectural components.

C-8.01 Erects excavation shoring and underpinning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
C-8.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-8.01.02P	select ***shoring materials***	***shoring materials*** are selected according to soil conditions, depth of excavation, ***specifications***, and safety regulations
C-8.01.03P	inspect materials	materials are inspected for structural integrity
C-8.01.04P	provide access and egress	access and egress are provided prior to erecting shoring according to project requirements
C-8.01.05P	secure excavation shoring	excavation shoring is secured firmly in place using ***fasteners***
C-8.01.06P	place shoring	shoring is placed to contain loose debris with appropriate materials
C-8.01.07P	select shoring technique	shoring technique is selected according to ***conditions*** and ***specifications***
C-8.01.08P	identify underpinning requirements	underpinning requirements are identified to ***drawings***, site conditions, and ***standards and regulations***
C-8.01.09P	build underpinning support under existing structure	underpinning support is built under existing structure to maintain structural integrity

Range of Variables

tools and equipment include: see Appendix B

shoring materials include: wire mesh, plywood, timbers, chain links, fibre reinforced concrete, concrete forming materials

specifications include: project, engineer

fasteners include: rock anchors, bolts, pilings

conditions include: depth of excavation, soil conditions, types of installation, project size, OH&S requirements

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-8.01.01L	demonstrate knowledge of excavation shoring and underpinning, their characteristics and applications	identify types of shoring, and describe their characteristics and applications
		identify ***shoring scaffolding components***, and describe their characteristics and applications
		describe shoring techniques for horizontal and vertical use
		identify ***shoring materials***, and describe their characteristics and applications
		identify ***fasteners***, and describe their characteristics and applications
		identify types of underpinning techniques, and describe their characteristics and applications
C-8.01.02L	demonstrate knowledge of procedures to erect excavation shoring and place underpinning	identify ***tools and equipment*** used to erect excavation shoring and place underpinning, and describe their procedures for use
		describe procedures to erect excavation shoring
		describe procedures to place underpinning
C-8.01.03L	demonstrate knowledge of training and certification requirements for erecting excavation shoring and placing underpinning	identify training and certification requirements for erecting excavation shoring and placing underpinning
C-8.01.04L	demonstrate knowledge of regulatory requirements for erecting excavation shoring and placing underpinning	identify ***standards and regulations*** for erecting excavation shoring and placing underpinning

Range of Variables

shoring scaffolding components include: frame scaffolding, mud sills, bracing, u-heads, base jacks, needle beams

shoring materials include: wire mesh, plywood, timbers, chain links, fibre reinforced concrete, concrete forming materials

fasteners include: rock anchors, bolts, pilings

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-8.02 Erects concrete falsework

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
C-8.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-8.02.02P	determine ground conditions	ground conditions that are required for support of falsework to prevent settling and movement of structure are determined according to ***drawings*** and project requirements
C-8.02.03P	select falsework	falsework is selected according to engineered shoring and re-shoring drawings, and project requirements
C-8.02.04P	prepare mud sill	mud sill for weight distribution is prepared according to engineered drawings or project requirements
C-8.02.05P	select ***materials***	***materials*** required for falsework are selected according to project requirements
C-8.02.06P	place falsework	falsework is placed and components are plumb, level and square according to ***specifications*** and project requirements
C-8.02.07P	secure components	components are secured using ***fasteners*** for ease of dismantling

C-8.02.08P	re-shore falsework	falsework is re-shored according to ***specifications*** until concrete has achieved desired strength
C-8.02.09P	remove falsework	falsework is removed sequentially after concrete has achieved desired strength according to ***specifications*** and project requirements

Range of Variables

tools and equipment include: see Appendix B
drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans
materials include: strongbacks, lateral bracing, shoring, frames, panels, walers, lumber
specifications include: project, engineer, manufacturers'
fasteners include: nails, threaded rods, ties, plate washers

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-8.02.01L	demonstrate knowledge of concrete falsework, and its characteristics and applications	identify types of concrete falsework, and describe their characteristics and applications
		describe effects of ground conditions
		identify supporting substrates and describe their characteristics
		identify ***fasteners***, and describe their characteristics and applications
C-8.02.02L	demonstrate knowledge of procedures to erect concrete falsework	identify ***tools and equipment*** used to erect concrete falsework, and describe their procedures for use
		describe procedures to erect concrete falsework
		describe stripping sequence of falsework
C-8.02.03L	demonstrate knowledge of regulatory requirements for erecting concrete falsework	identify ***standards and regulations*** for erecting concrete falsework

Range of Variables

fasteners include: nails, threaded rods, ties, plate washers
tools and equipment include: see Appendix B
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-8.03 Constructs footing forms

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
C-8.03.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-8.03.02P	select materials	materials are selected according to ***site-specific requirements***
C-8.03.03P	determine elevations of footing in excavation	elevations of footing in excavation are determined using ***layout tools*** and benchmarks according to ***drawings***
C-8.03.04P	plan sequence to begin construction of footing forms	sequence to begin construction of footing forms is planned considering existing site conditions; previously established benchmarks and elevations
C-8.03.05P	construct footing forms	footing forms are constructed and components are plumb, level, square and accessible for steel reinforcement and finishing work according to ***drawings, specifications, standards and regulations***
C-8.03.06P	brace footing forms	footing forms are braced to maintain location, plumb, square and level, and to prevent blowouts according to project requirements, ***specifications*** and site conditions
C-8.03.07P	install ***components***	***components*** are installed according to ***drawings*** and ***specifications***
C-8.03.08P	secure ***components***	***components*** are secured using ***fasteners*** for ease of dismantling
C-8.03.09P	inspect assembled formwork	assembled formwork is inspected to ensure it is in required location and is assembled according to ***drawings***

Range of Variables

tools and equipment include: see Appendix B

site-specific requirements include: soil conditions, size of footing

layout tools include: laser levels, builders' levels, string lines (with batter boards), plumb bob, robotic total station

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

specifications include: project, engineer, manufacturers'

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

components include: keyways, water stops, templates, bulkheads, miscellaneous embeds or inserts

fasteners include: nails, threaded rods, ties

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-8.03.01L	demonstrate knowledge of footing forms, their characteristics and applications	identify types of footing forms, and describe their characteristics and applications
		identify ***components***, and describe their characteristics and applications
		identify ***fasteners***, and describe their characteristics and applications
		identify types of ***piles***, and describe their characteristics and applications
		identify ***formwork material***, and describe their characteristics and applications
		identify form release agents, and describe their characteristics and applications
		describe building and stripping sequence of formwork
		identify tie systems, and describe their characteristics and applications
C-8.03.02L	demonstrate knowledge of procedures to assemble footing forms	identify ***tools and equipment*** used to assemble footing forms, and describe their procedures for use
		describe procedures to assemble footing forms
C-8.03.03L	demonstrate knowledge of regulatory requirements for constructing footing forms	identify ***standards and regulations*** for constructing footing forms

Range of Variables

components include: keyways, water stops, templates, bulkheads, miscellaneous embeds or inserts

fasteners include: nails, threaded rods, ties

piles include: steel, wood, concrete, helical (screw)

formwork materials include: wood, steel, aluminium, composite, foam

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-8.04 Constructs wall form systems and grade beam formwork

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
C-8.04.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-8.04.02P	identify ***wall form system*** and grade beam formwork	***wall form system*** and grade beam formwork are identified according to ***drawings*** and project requirements
C-8.04.03P	place sleepers and void forms	sleepers and void forms are placed under grade beams to allow for frost heave according to ***drawings*** and ***specifications***
C-8.04.04P	determine placement of vertical formwork	placement of vertical formwork is determined according to layout
C-8.04.05P	determine formwork system	formwork system is determined according to concrete volume requirements, and system availability and capabilities
C-8.04.06P	erect forms	forms are erected to achieve required measurement according to ***drawings*** and project requirements
C-8.04.07P	assemble prefabricated forms	prefabricated forms are assembled according to project requirements, ***drawings*** and ***specifications***
C-8.04.08P	install keyways, control joints, dowels and chamfer edges	keyways, control joints, dowels and chamfer edges are installed in wall forms according to ***drawings*** and ***specifications***
C-8.04.09P	place formwork	formwork is placed and components are plumb, level, straight, square, and accessible for concrete placement and finishing according to ***drawings***, ***specifications, standards and regulations***

C-8.04.10P	install window and door bucks, sleeves penetrations and bulkheads	window and door bucks, sleeves penetrations and bulkheads are installed according to location and project requirements
C-8.04.11P	install ***accessories***	***accessories*** are installed according to ***drawings*** and project requirements
C-8.04.12P	install ***form ties***	***form ties*** are installed according to ***specifications***
C-8.04.13P	install ***bracing***	***bracing*** is installed to align and support formwork in place and according to ***specifications***
C-8.04.14P	lock corners of forms	corners of forms are locked to prevent blowouts
C-8.04.15P	install yokes, blocks or cleats	yokes, blocks or cleats are installed to maintain wall thickness and prevent form failure
C-8.04.16P	inspect ***formwork components*** and installation	***formwork components*** and installation are inspected to prevent blowouts and distortion
C-8.04.17P	establish finish elevation	finish elevation is established using ***methods*** according to ***drawings*** and project requirements

Range of Variables

tools and equipment include: see Appendix B
wall form systems include: slip forms, gang forms, ICF, tilt-up formwork, free-form
drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans
specifications include: project, engineer, manufacturers'
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements
accessories include: chairs, stirrups, lifting inserts, form liners, water stops
form ties include: snap, coil, taper
bracing includes: turnbuckles, strongbacks, kickers, walers
formwork components include: capitals, piers, columns, pilasters, beams, girders, corbels, bulkheads
methods include: using chamfer strips, brick ledge, grade nails

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-8.04.01L	demonstrate knowledge of ***wall form systems*** and grade beam formwork, their characteristics and applications	identify types of ***wall form systems***, and describe their characteristics and applications
		identify concrete placement methods and factors
		identify ***form ties***, and describe their characteristics and applications
		identify ***bracing***, and describe their characteristics and applications

		identify ***formwork material***, and describe their characteristics and applications
		identify types of form hardware, and describe their characteristics and applications
		identify ***formwork components***, and describe their characteristics and applications
		identify ***joints***, and describe their characteristics and applications
		identify engineered forming systems, and describe their characteristics and applications
		identify form release agents, and describe their characteristics and applications
		describe building and stripping sequence of formwork
		describe stripping techniques
		identify types of concrete, and describe their characteristics and applications
		identify ***accessories***, and describe their characteristics and applications
		determine elevations from project drawings
		describe how to coordinate necessary components to be installed by other trades
		identify types of prefabricated forms, and describe their characteristics and applications
C-8.04.02L	demonstrate knowledge of procedures to construct ***wall form systems*** and grade beam formwork	identify ***tools and equipment*** used to construct ***wall form systems*** and grade beam formwork, and describe their procedures for use
		describe procedures to construct ***wall form systems*** and grade beam formwork
C-8.04.03L	demonstrate knowledge of regulatory requirements for constructing ***wall form systems*** and grade beam formwork	identify ***standards and regulations*** for constructing ***wall form systems*** and grade beam formwork

Range of Variables

wall form systems include: slip forms, gang forms, ICF, tilt-up formwork, free-form
form ties include: snap, coil, taper
bracing includes: turnbuckles, strongbacks, kickers, walers
formwork materials include: wood, steel, aluminium, composite, foam, form plywood
formwork components include: capitals, piers, columns, pilasters, beams, girders, corbels, bulkheads
joints include: expansion, control, isolation joint construction
accessories include: chairs, stirrups, lifting inserts, form liners, water stops
tools and equipment include: see Appendix B
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-8.05 Constructs slab formwork

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
C-8.05.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-8.05.02P	identify ***slabs***	***slabs*** are identified according to project requirements
C-8.05.03P	prepare substrate	substrate is prepared according to specifications, ***standards and regulations***
C-8.05.04P	place void forms	void forms are placed for frost protection, to allow for frost heave and for other applications
C-8.05.05P	select materials for formwork	materials are selected for formwork according to ***drawings*** and project requirements
C-8.05.06P	apply ***products*** under slab on-grade	***products*** are applied under slab on-grade to serve as an air, soil, gas (radon) and vapour barrier, and to prevent heat loss, according to ***drawings*** and project requirements
C-8.05.07P	place formwork	formwork is placed and components are plumb, level, straight and square, and accessible for finishing work, considering elevations, according to ***drawings*** and ***specifications***
C-8.05.08P	install clean out access for suspended slabs	clean out access is installed for suspended slabs according to ***drawings*** and project requirements

C-8.05.09P	measure for location and install ***embeds***	***embeds*** are located and installed according to ***drawings*** and project requirements
C-8.05.10P	install ***components***	***components*** are installed according to ***drawings*** and project requirements
C-8.05.11P	install ***joints***	***joints*** are installed according to ***drawings*** and project requirements
C-8.05.12P	lock corners of forms	corners of forms are locked in order to prevent blowouts and maintain ***slab shape***
C-8.05.13P	install ***bracing***	***bracing*** is installed in order to support formwork in place and according to ***drawings*** and project requirements
C-8.05.14P	ensure other trades have ***below-grade services*** installed	other trades have ***below-grade services*** installed
C-8.05.15P	ensure other trades have ***suspended slab services and components*** located and installed in sequence	other trades have ***suspended slab services and components*** that are required to be located and installed in sequence
C-8.05.16P	inspect assembled formwork for ***deficiencies***	assembled formwork is inspected for ***deficiencies***
C-8.05.17P	establish finish elevation	finish elevation is established according to benchmark and ***drawings*** and project requirements

Range of Variables

tools and equipment include: see Appendix B

slabs include: on-grade, suspended, raft, casting bed, pre-cast

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

products include: polyethylene, rigid insulation

specifications include: project, engineer, manufacturers'

embeds include: anchor bolts, sleeves, weld plates

components include: reinforcement steel, keyways, water stops, bulkheads, screed level pegs, miscellaneous embeds or inserts, anti-bonding agents

joints include: construction, expansion, control

slab shape includes: raft slabs (over size), cantilevered, suspended

bracing includes: turnbuckles, strongbacks, kickers, walers

below-grade services installed include: sump pit, drains, electrical conduit, hydronic heating

suspended slab services and components include: electrical conduit, hydronic heating, mechanical voids, suspended ceiling inserts, anchors, embeds

deficiencies include: inadequate bracing, crooked, unleveled formwork, improper grading, inadequate tie placement

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-8.05.01L	demonstrate knowledge of concrete ***slabs***, their characteristics and applications	identify types of ***slab*** formwork, and describe their characteristics and applications
		identify substrates, and describe their characteristics and applications
		identify form voids under grade beams and slabs, and describe their characteristics and applications
		identify ***slab form systems***, and describe their characteristics and applications
		identify concrete placement methods and factors
		identify materials, and describe their characteristics and applications
		identify ***products used under slab*** to serve as an air, soil, gas (radon) and vapour barrier and to prevent heat loss, and describe their characteristics and applications
		identify ***embeds***, and describe their characteristics and applications
		identify ***components***, and describe their characteristics and applications
		identify ***deficiencies***, and describe their characteristics
		identify ***joints***, and describe their characteristics and applications
		identify ***bracing***, and describe their characteristics and applications
		identify ***below-grade services*** installed by other trades
		identify ***suspended slab services and components*** installed by other trades
		identify ***formwork material***, and describe their characteristics and applications
		identify types of form hardware, and describe their characteristics and applications
		identify ***formwork components***, and describe their characteristics and applications
		identify engineered forming systems, and describe their characteristics and applications

		identify form release agents, and describe their characteristics and applications
		describe building and stripping sequence of formwork
		describe stripping techniques
		identify tie systems, and describe their characteristics and applications
		identify types of concrete, and describe their characteristics and applications
		identify ***accessories***, and describe their characteristics and applications
		identify elevations from project drawings
		describe how to coordinate necessary components to be installed by other trades
C-8.05.02L	demonstrate knowledge of procedures to construct ***slabs***	identify ***tools and equipment*** used to construct ***slabs***, and describe their procedures for use
		describe procedures to construct ***slabs***
C-8.05.03L	demonstrate knowledge of regulatory requirements for constructing ***slabs***	identify ***standards and regulations*** for constructing ***slabs***

Range of Variables

slabs include: on-grade, suspended, raft, casting bed, pre-cast

slab form systems include: scaffold forms, panelized forms, fly forms, pan slab forms, other engineered systems

products used under slab include: polyethylene, rigid insulation

embeds include: anchor bolts, sleeves, weld plates

components include: reinforcement steel, keyways, water stops, bulkheads, screed level pegs, miscellaneous embeds or inserts, anti-bonding agents

deficiencies include: inadequate bracing, crooked, unleveled formwork, improper grading, inadequate tie placement

joints include: construction, expansion, control

bracing includes: turnbuckles, strongbacks, kickers, walers

below-grade services include: sump pit, drains, electrical conduit, hydronic heating

suspended slab services and components include: electrical conduit, hydronic heating, mechanical voids, suspended ceiling inserts, anchors, embeds

formwork materials include: wood, steel, aluminium, composite, foam, form plywood

formwork components include: capitals, piers, columns, pilasters, beams, girders, corbels

accessories include: chairs, stirrups, sleeves

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-8.06 Constructs column formwork

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
C-8.06.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-8.06.02P	determine size and location of column forms	size and location of column forms are determined according to ***drawings*** and project requirements
C-8.06.03P	select ***materials***	***materials*** are selected according to ***drawings*** and formwork design
C-8.06.04P	place ***formwork components***	***formwork components*** are placed, and are plumb, level, square and accessible for finishing work
C-8.06.05P	brace column formwork	column formwork is braced in multiple directions to stabilize formwork, prevent any movement when placing concrete, and ensure it is plumb, level and square, and according to ***drawings, standards and regulations,*** and project requirements
C-8.06.06P	install templates in column formwork	templates are installed in column formwork according to ***drawings*** and project requirements
C-8.06.07P	inspect assembled formwork	assembled formwork is inspected for ***deficiencies***

Range of Variables

tools and equipment include: see Appendix B

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

materials include: wood, steel, round concrete forms

formwork components include: chamfer strips, reveal strips, form liners, embeds

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

deficiencies include: inadequate bracing, out of plumb, incorrect elevation

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-8.06.01L	demonstrate knowledge of column formwork, their characteristics and applications	describe characteristics and applications of column formwork
		identify concrete placement methods and factors
		identify ***materials***, and describe their characteristics and applications
		identify ***formwork components***, and describe their characteristics and applications
		identify templates, and describe their characteristics and applications
		identify ***formwork materials***, and describe their characteristics and applications
		identify types of form hardware, and describe their characteristics and applications
		identify engineered forming systems, and describe their characteristics and applications
		identify form release agents, and describe their characteristics and applications
		describe building and stripping sequence of formwork
		identify tie systems, and describe their characteristics and applications
		identify types of concrete, and describe their characteristics and applications
		identify ***accessories***, and describe their characteristics and applications
		describe stripping techniques
		identify embeds, and describe their characteristics and applications
C-8.06.02L	demonstrate knowledge of procedures to construct column formwork	identify ***tools and equipment*** used to construct column formwork, and describe their procedures for use
		describe procedures to construct column formwork
C-8.06.03L	demonstrate knowledge of regulatory requirements for constructing columns	identify codes, ***standards and regulations*** for constructing columns

Range of Variables

materials include: wood, steel, round concrete forms
formwork components include: chamfer strips, reveal strips, form liners, embeds
formwork materials include: wood, steel, aluminium, composite, foam
accessories include: chairs, stirrups, sleeves
tools and equipment include: see Appendix B
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-8.07 Constructs stair formwork

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
C-8.07.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-8.07.02P	place and secure ***stair formwork***	***stair formwork*** is placed and secured according to project requirements and ***specifications***, and components are plumb, level, straight, square and accessible for finishing work
C-8.07.03P	select materials for falsework	materials are selected for falsework according to project requirements and formwork design
C-8.07.04P	apply ***bracing***	***bracing*** is applied in order to support formwork and according to project requirements
C-8.07.05P	install ***formwork components***	***formwork components*** are installed according to project requirements
C-8.07.06P	inspect assembled ***stair formwork***	assembled ***stair formwork*** is inspected for accessibility, for finishing and ***deficiencies***

Range of Variables

tools and equipment include: see Appendix B
stair formwork includes: inverted stringers, soffits, risers, nosings
specifications include: project, engineer, manufacturers'
bracing includes: kickers, cleats
formwork components include: chamfer strips, embeds, form release agents
deficiencies include: insufficient bracing, improper rise, run, slope and dimensions

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-8.07.01L	demonstrate knowledge of ***stair formwork***, its characteristics and applications	identify types of ***stair formwork***, and describe their characteristics and applications
		identify concrete placement methods and factors
		identify ***formwork components***, and describe their characteristics and applications
		describe characteristics and applications of materials for falsework
		identify ***bracing***, and describe their characteristics and applications
		identify ***formwork material***, and describe their characteristics and applications
		identify types of form hardware, and describe their characteristics and applications
		identify engineered forming systems, and describe their characteristics and applications
		identify form release agents, and describe their characteristics and applications
		describe building and stripping sequence of formwork
		describe stripping techniques
		identify tie systems, and describe their characteristics and applications
		identify types of concrete, and describe their characteristics and applications
		identify ***accessories***, and describe their characteristics and applications
C-8.07.02L	demonstrate knowledge of procedures to construct ***stair formwork***	identify ***tools and equipment*** used to construct ***stair formwork***, and describe their procedures for use
		describe procedures to construct ***stair formwork***
C-8.07.03L	demonstrate knowledge of regulatory requirements for constructing ***stair formwork***	identify ***standards and regulations*** for constructing ***stair formwork***

Range of Variables

stair formwork includes: inverted stringers, soffits, risers, nosings
formwork components include: chamfer strips, embeds, form release agents
bracing includes: kickers, cleats
formwork materials include: wood, steel, aluminium, composite, foam
accessories include: chairs, stirrups, sleeves, temperature bars
tools and equipment include: see Appendix B
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-8.08 Installs embedded reinforcements

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
C-8.08.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-8.08.02P	select reinforcing material	reinforcing material is selected according to project requirements and ***specifications***
C-8.08.03P	select and install chairs	chairs are selected and installed to ensure proper coverage of reinforcing material
C-8.08.04P	install ***templates***	***templates*** are located and installed according to structural drawings and project requirements
C-8.08.05P	calculate overlaps	overlaps for reinforcing material or wire mesh are calculated according to structural drawings and project requirements, and building codes for ICF
C-8.08.06P	cut and bend reinforcing material or wire mesh	reinforcing material or wire mesh is cut and bent on site using ***equipment***
C-8.08.07P	tie reinforcing material	reinforcing material is tied to ensure spacing continuity according to structural drawings and project requirements
C-8.08.08P	place ***embeds***	***embeds*** are placed according to structural drawings and project requirements
C-8.08.09P	install ***reinforcing components***	***reinforcing components*** are installed according to structural drawings and project requirements

C-8.08.10P	inspect reinforcing material	reinforcing material is inspected for ***defects*** before installation
C-8.08.11P	install ***post tension components***	***post tension components*** are installed according to structural drawings and project requirements

Range of Variables

tools and equipment include: see Appendix B
specifications include: project, engineer, manufacturers'
templates include: reinforcing steel, bolt sets, electrical, architectural, mechanical
equipment includes: benders, quick-cut saws, grinders***,*** cutting torches
embeds include: angle irons, anchor bolts, structural steel weld plates
reinforcing components include: stirrups, vertical and horizontal bars, fibreglass rebar, wire mesh
defects include: dirt, debris, rust, corrosion
post tension components include: bulkheads, sleeves, cables, chairs, wedges, boots

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-8.08.01L	demonstrate knowledge of embedded materials, their characteristics and applications	identify types of embedded materials, and describe their characteristics and applications
		identify concrete placement methods and factors
		identify ***embeds***, and describe their characteristics and applications
		identify ***reinforcing components***, and describe their characteristics and applications
		identify types of reinforcing materials, and describe their characteristics and applications
		identify ***post tension components***, and describe their characteristics and applications
		describe pre-stressed and post-stressed concrete characteristics and applications
		identify form release agents, and describe their characteristics and applications
		identify types of concrete, and describe their characteristics and applications
		identify ***accessories***, and describe their characteristics and applications
C-8.08.02L	demonstrate knowledge of procedures to install reinforced materials and ***embeds***	identify ***tools and equipment*** used to install reinforced materials and ***embeds***, and describe their procedures for use

		describe procedures for tying reinforcing materials
		describe procedures to place and install ***embeds***
		describe procedures to brace ***embeds***
C-8.08.03L	demonstrate knowledge of regulatory requirements for installing ICF reinforcing steel	identify ***standards and regulations*** for installing ICF reinforcing steel

Range of Variables

embeds include: angle irons, anchor bolts, structural steel weld plates
reinforcing components include: stirrups, vertical and horizontal bars, fibreglass rebar, wire mesh
post tension components include: bulkheads, sleeves, cables, chairs, wedges, boots
accessories include: chairs, stirrups, sleeves, temperature bars
tools and equipment include: see Appendix B
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-8.09 Dismantles formwork

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
C-8.09.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-8.09.02P	remove nails and fasteners	nails and fasteners are removed
C-8.09.03P	remove forms and ***formwork components***	forms and ***formwork components*** are removed in sequence while ensuring quality of finish according to stripping schedule and ***specifications***
C-8.09.04P	clean forms	forms are cleaned by scraping and sweeping excess concrete, and applying release agent
C-8.09.05P	repair damaged forms by replacing ***formwork components***	damaged forms are repaired by replacing ***formwork components***
C-8.09.06P	organize and store forms and forming materials	forms and forming materials are organized and stored for future use

Range of Variables

tools and equipment include: see Appendix B
formwork components include: plywood, strongbacks, walers, turnbuckles
specifications include: project, engineer, manufacturers'

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-8.09.01L	demonstrate knowledge of formwork, their characteristics and applications	identify types of formwork, and describe their characteristics and applications
		identify form systems, and describe their characteristics and applications
		identify hazards associated with erecting and dismantling formwork
		identify types of ***formwork components***, and describe their characteristics and applications
		identify ***formwork material***, and describe their characteristics and applications
		identify types of form hardware, and describe their characteristics and applications
		identify ***joints***, and describe their characteristics and applications
		identify engineered forming systems, and describe their characteristics and applications
		identify ***wall form systems***, and describe their characteristics and applications
		identify form release agents, and describe their characteristics and applications
		describe building and stripping sequence of formwork
		identify tie systems, and describe their characteristics and applications
		identify fasteners used in formwork, and describe their characteristics and applications
C-8.09.02L	demonstrate knowledge of procedures to dismantle formwork	identify ***tools and equipment*** used to dismantle formwork, and describe their procedures for use
		describe procedures to dismantle formwork
		describe procedures to clean forms or formwork
		describe procedures to repair damaged forms or formwork

		describe procedures to store forms and formwork
C-8.09.03L	demonstrate knowledge of regulatory requirements for dismantling formwork	identify ***standards and regulations*** for dismantling formwork

Range of Variables

formwork components include: plywood, strongbacks, walers, turnbuckles
formwork materials include: wood, steel, aluminium, composite, foam
joints include: expansion, control, isolation joint construction
wall form systems include: slip forms, gang forms, ICF, tilt-up formwork
tools and equipment include: see Appendix B
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task C-9 Installs concrete, cement-based and epoxy products

Task Descriptor

Carpenters install and apply concrete, cement-based and epoxy products to build and finish structures.
In this standard, pre-cast components are understood to be concrete components cast in different locations and installed on-site by carpenters.

C-9.01 Places concrete

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
C-9.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-9.01.02P	plan placement	placement is planned taking into consideration ***factors*** and according to project requirements
C-9.01.03P	select ***additives***	***additives*** are selected according to ***specifications*** and project requirements
C-9.01.04P	participate in ***concrete testing*** procedures	***concrete testing*** is conducted in collaboration with third party before starting pour to maintain integrity of desired mix design according to project specifications

C-9.01.05P	select and use ***placement methods***	***placement methods*** are selected and used according to accessibility to location and size of project
C-9.01.06P	vibrate concrete	concrete is vibrated to consolidate and eliminate voids, while avoiding over-vibrating, segregation and blowouts
C-9.01.07P	recognize ***signs of an impending blowout*** and take remedial measures	***signs of an impending blowout*** are recognized and remedial measures taken
C-9.01.08P	produce ***joints*** in poured concrete	***joints*** are produced in poured concrete
C-9.01.09P	inspect and make adjustments after concrete is placed	inspection is performed after concrete is placed for straightness and dimensions of wall and column forms, and adjustments are made to achieve plumb, level and square formwork

Range of Variables

tools and equipment include: see Appendix B

factors include: weather conditions, location of equipment, starting point, sequence of pour, rate of pour, drop

additives include: plasticizers, hardeners, accelerators, curing agents, admixtures

specifications include: project, engineer, manufacturers'

concrete testing includes: slump, compression, temperature

placement methods include: using concrete pump, crane and bucket, wheelbarrow, chute

signs of an impending blowout include: deformation, deflection, leakage, noise

joints include: expansion, isolation, control

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-9.01.01L	demonstrate knowledge of concrete, its characteristics and applications	identify types of cement, and describe their characteristics and applications
		identify types of concrete and mix designs, and describe their characteristics and applications
		describe rate of pour on lateral pressures
		identify ***concrete testing***, and describe their characteristics and applications
		identify concrete ***additives***, and describe their characteristics and applications
		identify PPE and silica control plan required for working with cementitious products
		describe crane and pump truck hand signals and rigging points
		identify ***signs of an impending blowout***

C-9.01.02L	demonstrate knowledge of procedures to place and finish concrete	identify ***tools and equipment*** used to place and finish concrete, and describe their procedures for use
		describe procedures to place concrete
C-9.01.03L	demonstrate knowledge of regulatory requirements for placing concrete	identify ***standards and regulations*** for placing concrete

Range of Variables

concrete testing includes: slump, compression, temperature

additives include: plasticizers, hardeners, accelerators, curing agents, admixtures

signs of an impending blowout include: deformation, deflection, leakage, noise

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-9.02 Facilitates curing of concrete

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
C-9.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to ***curing system***
C-9.02.02P	determine protection needed for curing	protection needed for curing is determined according to assessment of environmental conditions and project requirements
C-9.02.03P	determine ***curing system***	***curing system*** is determined according to assessment of environmental conditions and project requirements
C-9.02.04P	set up ***curing system***	***curing system*** is set up according to project requirements and ***specifications***
C-9.02.05P	install temporary hydrating, heating or cooling systems	temporary hydrating, heating or cooling systems are installed according to seasonal conditions
C-9.02.06P	lay out and create control joints	control joints are laid out and created according to project specifications and requirements
C-9.02.07P	add chemical curing compounds	chemical curing compounds are added according to project specifications
C-9.02.08P	apply chemical curing compounds and sealants	chemical curing compounds and sealants are applied according to project requirements

Range of Variables

tools and equipment include: see Appendix B

curing system includes: wet (water, ponding, soaking), dry, heating or cooling (wet burlap, polyethylene, thermal blankets)

specifications include: project, engineer, manufacturers'

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-9.02.01L	demonstrate knowledge of ***curing systems***, their characteristics and applications	identify types of ***curing systems***, and describe their characteristics and applications
		identify types of concrete mixes, and describe their characteristics and applications
		describe ***climate protection techniques***, their characteristics and applications
		describe effects of climatic conditions
		describe effects of curing process on compressive strength
C-9.02.02L	demonstrate knowledge of procedures to cure concrete	identify ***tools and equipment*** used to cure concrete, and describe their procedures for use
		describe procedures to cure concrete
		describe procedures to test surface and compressive strength
C-9.02.03L	demonstrate knowledge of regulatory requirements for curing	identify ***standards and*** **regulations** for curing

Range of Variables

curing system includes: wet (water, ponding, soaking), dry, heating or cooling (wet burlap, polyethylene, thermal blankets)

climate protection techniques include: hoarding, heating, thermal couples

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-9.03 Performs basic concrete finishing

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
C-9.03.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-9.03.02P	determine ***finishing methods***	***finishing methods*** are determined according to finishing sequence and project requirements
C-9.03.03P	apply ***finishing additives***	***finishing additives*** are applied according to ***specifications***
C-9.03.04P	apply ***architectural finishing techniques***	***architectural finishing techniques*** are applied according to ***specifications*** and project requirements
C-9.03.05P	finish concrete	concrete is finished according to ***specifications*** and project requirements
C-9.03.06P	apply patching products to patch or repair concrete	patching products to patch or repair concrete are applied according to ***specifications*** and project requirements
C-9.03.07P	apply ***protection products***	***protection products*** are applied by brushing, rolling or spraying according to ***specifications*** and project requirements

Range of Variables

tools and equipment include: see Appendix B
finishing methods include: screed, float, trowel
finishing additives include: colouring, aggregates, hardeners, retarders
specifications include: project, engineer, manufacturers'
architectural finishing techniques include: stamped, exposed aggregate, broom finish, edging
protection products include: paint, epoxies, traffic coating, membranes

Knowledge

	Learning Outcomes	Learning Objectives
C-9.03.01L	demonstrate knowledge of concrete finishing, their characteristics and applications	identify types of concrete finishing, and describe their characteristics and applications
		identify types of ***finishing additives***, and describe their characteristics and applications

		identify ***architectural finishing techniques***, and describe their characteristics and applications
		identify types of ***protection products***, and describe their characteristics and applications
		identify concrete repair materials, and describe their characteristics and applications
C-9.03.02L	demonstrate knowledge of procedures to finish concrete	identify ***tools and equipment*** used to finish concrete, and describe their procedures for use
		describe procedures to finish concrete
		describe procedures to apply ***protection products***
		describe procedures to apply patching products to patch or repair concrete
C-9.03.03L	demonstrate knowledge of regulatory requirements for concrete finishing	identify ***standards and regulations*** for concrete finishing

Range of Variables

finishing additives include: colouring, aggregates, hardeners, retarders
architectural finishing techniques include: stamped, exposed aggregate, broom finish, edging
protection products include: paint, epoxies, traffic coating, membranes
tools and equipment include: see Appendix B
standards and regulations include CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-9.04 Installs pre-cast components

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
C-9.04.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-9.04.02P	identify location of pick-points	location of pick-points of pre-cast components are identified according to engineered drawings and ***specifications***
C-9.04.03P	determine sequence of installation	sequence of installation is determined according to ***specifications***, engineered drawings and lift plan

C-9.04.04P	determine installation location	installation location is determined according to layout and project drawings
C-9.04.05P	align, shim and brace pre-cast components	pre-cast components are aligned, shimmed and braced
C-9.04.06P	install grout	grout is installed according to ***specifications*** and project requirements
C-9.04.07P	fasten pre-cast components	pre-cast components are fastened using ***fastening methods***
C-9.04.08P	seal and caulk joints	joints are sealed and caulked according to ***specifications*** and project requirements

Range of Variables

tools and equipment include: see Appendix B
specifications include: project, engineer, manufacturers'
fastening methods include: applying epoxy products, welding, bolting

	Knowledge	
	Learning Outcomes	**Learning Objectives**
C-9.04.01L	demonstrate knowledge of pre-cast components, their characteristics and applications	identify types of pre-cast components, and describe their characteristics and applications
		identify types of pre-cast systems, and describe their characteristics and applications
		describe pre-stressed and post-stressed concrete applications
		describe crane hand signals and rigging points
		describe layout procedures for pre-cast components locations
C-9.04.02L	demonstrate knowledge of procedures to install pre-cast components	identify ***tools and equipment*** used to install pre-cast components, and describe their procedures for use
		describe procedures to install pre-cast components with cast in place formwork
		describe procedures to seal and caulk joints
		describe procedures to install bearing plates
C-9.04.03L	demonstrate knowledge of certification for installing pre-cast components	identify certification requirements for installing pre-cast components
C-9.04.04L	demonstrate knowledge of regulatory requirements for pre-cast component installation	identify ***standards and regulation****s* for pre-cast component installation

Range of Variables

tools and equipment include: see Appendix B

standards and regulations include CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

C-9.05 Installs grout

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
C-9.05.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
C-9.05.02P	select and prepare grout and additives	grout and additives are selected and prepared according to project requirements and ***specifications***
C-9.05.03P	select, construct and install grout forms	grout forms are selected, constructed and installed according to project requirements
C-9.05.04P	prepare surface to be grouted	surface to be grouted is prepared by roughing, cleaning and applying bonding agent
C-9.05.05P	use ***grout placement methods***	***grout placement methods*** are used
C-9.05.06P	apply backing material	backing material is applied when installing grout

Range of Variables

tools and equipment include: see Appendix B

specifications include: project, engineer, manufacturers'

grout placement methods include: using grout forms, pumping, hand trowelling, dry packing

Knowledge

	Learning Outcomes	Learning Objectives
C-9.05.01L	demonstrate knowledge of grout, their characteristics and applications	identify ***types of grout***, and describe their characteristics and applications
		identify grout additives, and describe their characteristics and applications
		describe effects of compressive strength requirements

C-9.05.02L	demonstrate knowledge of procedures to install grout	identify ***tools and equipment*** used to install grout, and describe their procedures for use
		describe procedures to construct and install grout forms
		describe procedures to prepare surface for grouting
		describe procedures to install grout
		describe procedures to cure grout
		identify PPE and silica control plan required for working with grout

Range of Variables

types of grout include: expanding, epoxy, sanded, unsanded, non-shrink, self-levelling
tools and equipment include: see Appendix B

Major Work Activity D

Performs framing

Task D-10 Constructs floor systems

Task Descriptor

Carpenters construct floor systems to separate the storeys of a building, support walls and create usable space.

D-10.01 Installs engineered floor systems

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
D-10.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
D-10.01.02P	assess and adjust floor systems	floor systems are assessed and adjusted for ***pre-existing conditions***
D-10.01.03P	identify sequence of installation for ***components***	specified sequence of installation for ***components*** is identified according to project requirements
D-10.01.04P	build and install ***beams***	***beams*** are built and installed according to ***drawings***, ***specifications*** and codes
D-10.01.05P	frame rough ***openings***	rough ***openings*** are framed according to ***drawings*** and ***specifications***
D-10.01.06P	install ***lateral and vertical bracing***	***lateral and vertical bracing*** is installed according to ***drawings*** and ***specifications***
D-10.01.07P	install ***components***	***components*** are installed according to ***drawings*** and ***specifications***
D-10.01.08P	place and secure sheathing on joists	sheathing is placed and secured in staggered pattern on joists to ensure square and strength according to codes, ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

pre-existing conditions include: out-of-square, out-of-level

components include: plates, sill gaskets, hangers, beams, joists, grouts, membranes, adhesives, cross-bridging, blocking, strapping, web stiffeners

beams include: built-up, engineered, steel, concrete

drawings include: project, shop, engineering, architectural, structural

specifications include: project, engineer, manufacturers'

openings include: stairwells, chases

lateral and vertical bracing include: strongback, blocking, backing

	Knowledge	
	Learning Outcomes	**Learning Objectives**
D-10.01.01L	demonstrate knowledge of engineered floor systems, their characteristics and applications	identify types of engineered floor systems, and describe their characteristics and applications
		identify engineered flooring ***components***, and describe their characteristics and applications
		identify components of ***mass timber***, and describe their characteristics and applications
		identify floor supports such as load-bearing walls and ***beams***, and describe their characteristics and applications
		describe cantilever beams and joists and their applications and framing practices for them
		identify floor sheathing, and describe their characteristics and applications
		identify components of post and beam framing, and describe their characteristics and applications
D-10.01.02L	demonstrate knowledge of procedures to install engineered floor systems	identify ***tools and equipment*** used to install engineered floor systems, and describe their procedures for use
		describe procedures to install engineered floor systems
		identify other trades/sub-trades to take into consideration
D-10.01.03L	demonstrate knowledge of training and certification requirements for installing engineered floor systems	identify training and certification requirements for installing engineered floor systems
D-10.01.04L	demonstrate knowledge of regulatory requirements for installing engineered floor systems	identify ***standards and regulations*** for installing engineered floor systems

Range of Variables

components include: plates, sill gaskets, hangers, beams, joists, grouts, membranes, adhesives, cross-bridging, blocking, strapping, web stiffeners

mass timber includes: cross-laminated timber (CLT), dowel-laminated timber (DLT), nail laminated timber (NLT)

beams include: built-up, engineered, steel, concrete

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

D-10.02 Constructs dimensional lumber floor framing

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
D-10.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
D-10.02.02P	assess and adjust floor systems	floor systems are assessed and adjusted for ***pre-existing conditions***
D-10.02.03P	inspect and select floor members	floor members are inspected for ***defects*** and quality members are selected
D-10.02.04P	install floor members	floor members are installed considering crown placement
D-10.02.05P	install ***joist restraints***	***joist restraints*** are installed according to codes, ***drawings*** and ***specifications***
D-10.02.06P	frame rough ***openings***	rough ***openings*** are framed according to codes, ***drawings*** and ***specifications***
D-10.02.07P	notch and drill framing components	framing components are notched and drilled according to codes, ***drawings*** and ***specifications***
D-10.02.08P	place and secure sheathing on joists	sheathing is placed and secured in staggered pattern on joists to ensure square and strength according to codes, ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B
pre-existing conditions include: out-of-square, out-of-level
defects include: unsound knots, excessive bow, wane, cracks, splits, rot, decay, mould
joist restraints include: cross-bridging, blocking, strapping, backing
drawings include: project, shop, engineering, architectural, structural
specifications include: project, engineer, manufacturers'

	Knowledge	
	Learning Outcomes	**Learning Objectives**
D-10.02.01L	demonstrate knowledge of dimensional lumber floor framing, their characteristics and applications	identify types of dimensional lumber floor framing, and describe their characteristics and applications
		identify ***floor framing components***, and describe their characteristics and applications
		identify floor supports such as load-bearing walls and ***beams***, and describe their characteristics and applications
		identify grade stamps and describe related terminology
		describe cantilever beams and joists, their applications and framing practices
		identify floor sheathing, and describe their characteristics and applications
		identify components of post and beam framing, and describe their characteristics and applications
D-10.02.02L	demonstrate knowledge of procedures to construct dimensional lumber floor framing	identify ***tools and equipment*** used to construct dimensional lumber floor framing, and describe their procedures for use
		describe procedures to construct dimensional lumber floor framing
		identify other trades/sub-trades to take into consideration
D-10.02.03L	demonstrate knowledge of regulatory requirements for constructing dimensional lumber floor framing	identify ***standards and regulations*** for constructing dimensional lumber floor framing

Range of Variables

floor framing components include: plates, sill gaskets, hangers, beams, joists, grouts, membranes, adhesives, cross-bridging, blocking, strapping

beams include: built-up, engineered, steel, concrete

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task D-11 Constructs deck systems

Task Descriptor

Carpenters design and construct deck systems and install components. They ensure that deck systems comply with municipal, provincial, territorial and national codes. Decks must have structural integrity, and when fastened to building structures, must take into account building envelope components. They should not interfere with the effectiveness and integrity of the envelope. It should be noted that ramps are included in this task about deck construction.

D-11.01 Constructs decks

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
D-11.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
D-11.01.02P	select ***materials***	***materials*** are selected according to exposure to elements, deck finish, compatibility, ***drawings*** and ***specifications***
D-11.01.03P	select ***fasteners and connectors***	***fasteners and connectors*** are selected according to compatibility, codes, ***drawings*** and ***specifications***
D-11.01.04P	install ***structural members*** and fasteners	***structural members*** and fasteners are installed to support deck according to compatibility, codes, ***drawings*** and ***specifications***
D-11.01.05P	fasten header joist/rim board/ledger to structures and supports	header joist/rim board/ledger are fastened to structures and supports according to codes, ***drawings*** and ***specifications***

D-11.01.06P	install joist to header joist/rim board/ledger	joist is installed to header joist/rim board/ledger using fasteners according to codes, ***drawings*** and ***specifications***
D-11.01.07P	slope deck	deck is sloped according to codes, ***drawings*** and ***specifications***
D-11.01.08P	install ***deck surface***	***deck surface*** is installed to complete deck finish according to codes, ***drawings*** and ***specifications***
D-11.01.09P	install flashings and membranes	flashings and membranes are installed according to codes, ***drawings*** and ***specifications***
D-11.01.10P	maintain integrity of building envelope	integrity of building envelope is maintained according to ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B
materials include: dimensional lumber, plywood, composite products, membranes
drawings include: project, shop, engineering, architectural, structural
specifications include: project, engineer, manufacturers'
fasteners and connectors include: post saddles, hangers, straps, material-specific fasteners
structural members include: columns, beams, joists
deck surface includes: panel products, pressure-treated wood, composite

	Knowledge	
	Learning Outcomes	**Learning Objectives**
D-11.01.01L	demonstrate knowledge of decks, their characteristics and applications	identify types of decks, and describe their characteristics and applications
		identify ***deck components***, and describe their characteristics and applications
		identify ***materials***, and describe their characteristics and applications
		identify types of ***fasteners and connectors***, and describe their characteristics and applications
		identify ***structural members***, and describe their characteristics and applications
		identify types of ***column bearings***, and describe their characteristics and applications
		describe ***deck surface*** patterns
		identify types and construction of railings, and describe their characteristics and applications

		describe importance of maintaining integrity of building envelope
D-11.01.02L	demonstrate knowledge of procedures to construct decks	identify ***tools and equipment*** used to construct decks, and describe their procedures for use
		describe procedures to construct decks
		identify PPE required for working with treated lumber
D-11.01.03L	demonstrate knowledge of regulatory requirements for constructing decks	identify ***standards and regulations*** for constructing decks

Range of Variables

deck components include: footings, columns, helical piles, beams, joists, stairs, ramps, guards/rails, glass railings, pre-cast steps, composite decking and components, pre-engineered and pre-fabricated systems

materials include: dimensional lumber, plywood, composite products, membranes

fasteners and connectors include: post saddles, hangers, straps, material-specific fasteners

structural members include: columns, beams, joists

column bearings include: concrete piers, blocks, helical piles, wood piers, friction piers

deck surface includes: panel products, pressure-treated wood, composite

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

D-11.02 Installs deck components

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
D-11.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
D-11.02.02P	select ***guardrail material***	***guardrail material*** is selected according to ***drawings*** and ***specifications***
D-11.02.03P	select ***fasteners and connectors***	***fasteners and connectors*** are selected according to application and codes
D-11.02.04P	determine location of ***balustrades***	location of ***balustrades*** are determined according to codes, ***drawings*** and ***specifications***
D-11.02.05P	measure and cut material	material is measured and cut according to site conditions, ***drawings*** and ***specifications***

D-11.02.06P	fasten and space ***balustrades***	***balustrades*** are fastened and spaced according to codes, ***drawings*** and ***specifications***
D-11.02.07P	construct, assemble and install ***deck components*** and ***accessories***	***deck components*** and ***accessories*** are constructed, assembled and installed according to codes, ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

guardrail material includes: aluminium, wood, glass, steel

drawings include: project, shop, engineering, architectural, structural

specifications include: project, engineer, manufacturers'

fasteners and connectors include: post saddles, hangers, straps, material-specific fasteners, screws, lags, nails, bolts

balustrades include: balusters, newel posts, railings

deck components include: stairs, ramps, guards/rails, glass railings, pre-cast steps, pre-engineered and pre-fabricated systems

accessories include: pergolas, arbour, lattice, skirting, benches, planters

	Knowledge	
	Learning Outcomes	**Learning Objectives**
D-11.02.01L	demonstrate knowledge of ***deck components***, their characteristics and applications	identify ***deck components***, and describe their characteristics and applications
		identify types of materials, and describe their characteristics and applications
		identify types of ***fasteners and connectors***, and describe their characteristics and applications
		identify types of railings, and describe their characteristics, applications and construction
D-11.02.02L	demonstrate knowledge of procedures to install ***deck components***	identify ***tools and equipment*** used to install deck components, and describe their procedures for use
		describe procedures to install ***deck components***
		describe sequence and procedures to construct stairs
		describe procedures to construct ramps
D-11.02.03L	demonstrate knowledge of regulatory requirements for installing ***deck components***	identify ***standards and regulations*** for installing ***deck components***

Range of Variables

deck components include: stairs, ramps, guards/rails, glass railings, pre-cast steps, pre-engineered and pre-fabricated systems

fasteners and connectors include: post saddles, hangers, straps, material-specific fasteners, screws, lags, nails, bolts

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task D-12 Constructs wall systems

Task Descriptor

Carpenters construct wall systems to define areas within buildings and to provide structural integrity. Wall systems also are used as exterior surfaces to enclose structures and to shelter from elements.

D-12.01 Installs engineered wall systems

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
D-12.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
D-12.01.02P	assess and adjust wall systems	wall systems are assessed and adjusted for ***pre-existing conditions***
D-12.01.03P	frame rough ***openings***	rough ***openings*** are framed according to ***drawings*** and ***specifications***
D-12.01.04P	install bracing (lateral and temporary)	bracing (lateral and temporary) is installed to maintain design according to codes, ***drawings*** and ***specifications***
D-12.01.05P	fit and secure panels together	panels are fit and secured together
D-12.01.06P	place and secure sheathing on studs	sheathing on studs are placed and secured according to codes, ***drawings*** and ***specifications***
D-12.01.07P	install ***engineered wall components***	***engineered wall components*** are installed according to ***drawings*** and ***specifications***

D-12.01.08P	install lintel bearing	lintel bearing is installed directly on supporting members according to ***drawings*** and ***specifications***
D-12.01.09P	install ***pre-fabricated wall systems***	***pre-fabricated wall systems*** are installed according to ***specifications***
D-12.01.10P	install ***membranes*** and fire protection materials	***membranes*** and fire protection materials are installed according to codes, ***drawings*** and ***specifications*** to enhance durability, improve energy performance and maintain integrity of building envelope

Range of Variables

tools and equipment include: see Appendix B
pre-existing conditions include: out-of-square, out-of-level, out-of-line, out-of-plumb
openings include: doors, windows, chases
drawings include: project, shop, engineering, architectural, structural
specifications include: project, engineer, manufacturers'
engineered wall components include: hangers, fasteners
pre-fabricated wall systems include: structural insulated panels (SIPs), panelized
membranes include: weather barrier, air barrier, air vapour barrier, vapour barrier

	Knowledge	
	Learning Outcomes	**Learning Objectives**
D-12.01.01L	demonstrate knowledge of engineered wall systems, their characteristics and applications	identify ***types of engineered wall systems***, and describe their characteristics and applications
		identify materials used in engineered wall systems, and describe their characteristics and applications
		describe door and window rough opening clearances
		describe blocking, backing and back framing requirements
		describe preserved wood foundations, and describe their characteristics and applications
		identify ***types of beam supports***, and describe their characteristics and applications
		identify ***types of beams***, and describe their characteristics and applications
		identify components of ***mass timber***, and describe their characteristics and applications
		identify load bearing wall requirements
		describe load transfer and point loading

		describe framing requirements for ***openings***
		describe notching and drilling requirements
		describe fastening requirements
		identify ***membranes*** and fire protection systems, and describe their characteristics and applications
		identify components of post and beam framing, and describe their characteristics and applications
D-12.01.02L	demonstrate knowledge of procedures to install engineered wall systems	identify ***tools and equipment*** used to install engineered wall systems, and describe their procedures for use
		describe procedures to install engineered wall systems
D-12.01.03L	demonstrate knowledge of training and certification requirements for installing engineered wall systems	identify training and certification requirements for installing engineered wall systems
D-12.01.04L	demonstrate knowledge of regulatory requirements for installing engineered wall systems	identify ***standards and regulations*** for installing engineered wall systems

Range of Variables

types of engineered wall systems include: strapped, double and triple-wall, platform, balloon, timber, steel stud, curtain, panel, pre-fabricated wall systems, post and beam, shear wall, mass timber

types of beam supports include: steel, wood, concrete

types of beams include: steel, built-up, engineered

mass timber includes*:* CLT, DLT, NLT

openings include: doors, windows, chases

membranes include: weather barrier, air barrier, air vapour barrier, vapour barrier

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

D-12.02 Constructs dimensional lumber wall framing

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
D-12.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
D-12.02.02P	assess and adjust wall framing	wall framing is assessed and adjusted for ***pre-existing conditions***
D-12.02.03P	install gaskets and sill plates	gaskets and sill plates are installed according to ***drawings*** and ***specifications***
D-12.02.04P	install wall members	wall members are installed with crowns in same direction
D-12.02.05P	frame rough ***openings***	rough ***openings*** are framed according to codes, ***drawings*** and ***specifications***
D-12.02.06P	notch and drill framing components	framing components are notched and drilled according to code requirements
D-12.02.07P	install ***stud restraints***	***stud restraints*** are installed according to code requirements
D-12.02.08P	place and secure sheathing on studs	sheathing is placed and secured on studs to maintain design according to codes, ***drawings*** and ***specifications***
D-12.02.09P	install bracing	bracing is installed to maintain design according to ***drawings*** and ***specifications***
D-12.02.10P	install backing in exterior and interior walls	backing in exterior and interior walls is installed to provide support for interior finish components
D-12.02.11P	install ***membranes*** and fire protection materials	***membranes*** and fire protection materials are installed according to codes, ***drawings*** and ***specifications*** to enhance durability and improve energy performance
D-12.02.12P	square and plumb walls	walls are squared and plumbed

Range of Variables

tools and equipment include: see Appendix B
pre-existing conditions include: out-of-square, out-of-level, out-of-line
drawings include: project, shop, engineering, architectural, structural
specifications include: project, engineer, manufacturers'
openings include: doors, windows, chases
stud restraints include: blocking, strapping, metal connectors
membranes include: weather barrier, air barrier, air vapour barrier, vapour barrier

	Knowledge	
	Learning Outcomes	**Learning Objectives**
D-12.02.01L	demonstrate knowledge of dimensional lumber wall framing, their characteristics and applications	identify types of dimensional lumber wall framing, and describe their characteristics and applications
		identify ***types of wall systems***, and describe their characteristics and applications
		identify materials used in wall systems, and describe their characteristics and applications
		identify grade stamps and describe related terminology
		describe framing requirements and clearances for ***openings***
		describe blocking and backing requirements
		identify preserved wood foundations, and describe their characteristics and applications
		identify ***types of beam supports***, and describe their characteristics and applications
		identify ***types of beams***, and describe their characteristics and applications
		describe load bearing wall requirements
		describe transfer of load and point loading
		describe notching and drilling requirements
		describe fastening requirements
		identify ***membranes*** and fire protection systems, and describe their characteristics and applications
		identify components of post and beam framing, and describe their characteristics and applications

D-12.02.02L	demonstrate knowledge of procedures to construct and erect dimensional lumber wall framing	identify ***tools and equipment*** used to construct and erect dimensional lumber wall framing, and describe their procedures for use
		describe procedures to construct and erect dimensional lumber wall framing
		describe procedures to coordinate necessary components to be installed by other trades
D-12.02.03L	demonstrate knowledge of regulatory requirements for constructing dimensional lumber wall framing	identify ***standards and regulations*** for constructing dimensional lumber wall framing

Range of Variables

types of wall systems include: conventional, strapped, double and triple-wall, platform, balloon, timber, steel stud, curtain, panel, post and beam, shear

openings include: doors, windows, chases

types of beam supports include: steel, wood, concrete

types of beams include: steel, built-up, engineered

membranes include: weather barrier, air barrier, air vapour barrier, vapour barrier

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task D-13 Constructs roof and ceiling systems

Task Descriptor

Carpenters construct roof and ceiling systems to enclose buildings and to protect from elements.

D-13.01 Installs engineered trusses

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
D-13.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
D-13.01.02P	assess and adjust engineered trusses	engineered trusses are assessed and adjusted for ***pre-existing conditions*** according to engineer requirements
D-13.01.03P	fit and secure girders and sections together	girders and sections are fit and secured together according to ***drawings*** and ***specifications***
D-13.01.04P	align and plumb trusses	trusses are aligned and plumbed to ensure straight roof according to ***drawings*** and ***specifications***
D-13.01.05P	install temporary bracing	temporary bracing is installed to maintain plumb, level, square and secure trusses
D-13.01.06P	install permanent lateral and angle bracing	permanent lateral and angle bracing is installed according to ***drawings*** and ***specifications***
D-13.01.07P	frame rough ***openings***	rough ***openings*** are framed according to specifications, project drawings and codes
D-13.01.08P	install ***truss components***	***truss components*** are installed according to ***drawings*** and ***specifications***
D-13.01.09P	install ***components within trusses***	***components within trusses*** are installed according to ***drawings*** and ***specifications***
D-13.01.10P	install and align fascia boards	fascia boards are installed and aligned
D-13.01.11P	construct and install parapet walls, curbs and cant strips	parapet walls, curbs and cant strips are constructed and installed according to ***drawings*** and ***specifications***
D-13.01.12P	install purlins	purlins are installed according to ***drawings*** and ***specifications***

D-13.01.13P	install sheathing	sheathing is installed according to ***drawings*** and ***specifications***
D-13.01.14P	make allowances for attic venting	allowances for attic venting are made according to codes, ***drawings*** and ***specifications***
D-13.01.15P	make allowances for roof drainage	allowances for roof drainage are made according to codes, ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B
pre-existing conditions include: out-of-square, out-of-level, out-of-line
drawings include: project, shop, engineering, architectural, structural
specifications include: project, engineer, manufacturers'
openings include: attic access, skylights, stairwells, chases
truss components include: hangers, fasteners, metal connectors, ledgers, hip truss, dormers, valley sets, saddles, crickets
components within trusses include: insulation stops, drywall backing, blocking

	Knowledge	
	Learning Outcomes	**Learning Objectives**
D-13.01.01L	demonstrate knowledge of engineered trusses, their characteristics and applications	identify types of engineered trusses, and describe their characteristics and applications
		identify types of roof and ceiling systems, and describe their characteristics and applications
		identify ***truss components***, and describe their characteristics and applications
		identify ***components within trusses***, and describe their characteristics and applications
		describe framing requirements for ***openings***
		identify ***beam supports***, and describe their characteristics and applications
		identify ***types of beams***, and describe their characteristics and applications
		identify ***load supports***, and describe their characteristics and applications
		identify ***types of loads***, and describe their characteristics and applications
		describe load bearing requirements
		describe load bearing wall requirements
		describe geometry and calculations used to perform layout

		describe blocking and backing requirements
		describe notching and drilling requirements
		identify components of post and beam framing
D-13.01.02L	demonstrate knowledge of rigging trusses for crane lift	identify attachment points for lifting engineered trusses
D-13.01.03L	demonstrate knowledge of procedures to install engineered trusses	identify ***tools and equipment*** used to install engineered trusses, and describe their procedures for use
		describe procedures to install engineered trusses
		describe procedures to install sheathing
		describe procedures to install purlins
D-13.01.04L	demonstrate knowledge of regulatory requirements for installing engineered trusses	identify ***standards and regulations*** for installing engineered trusses

Range of Variables

truss components include: hangers, fasteners, metal connectors, ledgers, hip truss, dormers, valley sets, saddles, crickets

components within trusses include: insulation stops, drywall backing, blocking

openings include: attic access, skylights, stairwells, chases

beam supports include: steel, wood, concrete

types of beams include: steel, built-up, engineered

load supports include: steel, wood, concrete

types of loads include: point, distributed, environmental, live, dead

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

D-13.02 Constructs roof and ceiling framing

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
D-13.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
D-13.02.02P	select species and size of lumber	species and size of lumber are selected according to codes, ***drawings*** and ***specifications***
D-13.02.03P	assess and adjust roof and ceiling framing	roof and ceiling framing is assessed and adjusted for ***pre-existing conditions***
D-13.02.04P	cut ***roof and ceiling members***	***roof and ceiling members*** are cut according to layout lines, ***standards and regulations***
D-13.02.05P	align ridge and rafter tails	ridge and rafter tails are aligned to ensure straight fascia according to cornice design
D-13.02.06P	install temporary bracing	temporary bracing is installed to secure roof members
D-13.02.07P	install ***permanent lateral and angle bracing***	***permanent lateral and angle bracing*** is installed to maintain structural integrity
D-13.02.08P	frame rough ***openings***	rough ***openings*** are framed according to codes, ***drawings*** and ***specifications***
D-13.02.09P	install blocking and backing	blocking and backing are installed according to codes
D-13.02.10P	install equal and unequal slope intersecting roof components	equal and unequal slope intersecting roof components are installed according to codes, ***drawings*** and ***specifications***
D-13.02.11P	install fascia boards	fascia boards are installed according to codes, ***drawings*** and ***specifications***
D-13.02.12P	place strapping, sheathing and purlins	strapping, sheathing and purlins are placed perpendicular to rafters to maintain structural integrity
D-13.02.13P	construct and install parapet walls, curbs and cant strips	parapet walls, curbs and cant strips are constructed and installed according to ***drawings*** and ***specifications***
D-13.02.14P	make allowances for attic venting	allowances for attic venting are made according to codes, ***drawings*** and ***specifications***

D-13.02.15P	make allowances for roof drainage	allowances for roof drainage are made according to codes, ***drawings*** and ***specifications***
D-13.02.16P	install ***engineered timber components***	***engineered timber components*** are installed according to ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

drawings include: project, shop, engineering, architectural, structural

specifications include: project, engineer, manufacturers'

pre-existing conditions include: out-of-square, out-of-level, out-of-line

roof and ceiling members include: trusses, collar ties, purlins, various rafters, ridge boards, bracing, ceiling joists, webs, gusset plates, gable studs

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

permanent lateral and angle bracing include: collar ties, webs, knee walls

openings include: attic access, skylights, stairwells, chases, vents

engineered timber components include: CLT, NLT, posts, beams, paralam, glulam

	Knowledge	
	Learning Outcomes	**Learning Objectives**
D-13.02.01L	demonstrate knowledge of roof and ceiling framing, their characteristics and applications	identify types of roof and ceiling framing, and describe their characteristics and applications
		identify types of ***roof and ceiling members***, and describe their characteristics and applications
		describe framing requirements for ***openings***
		identify ***beam supports***, and describe their characteristics and applications
		identify ***types of beams***, and describe their characteristics and applications
		identify ***load supports***, and describe their characteristics and applications
		identify ***types of loads***, and describe their characteristics and applications
		describe load bearing requirements
		describe load bearing wall requirements
		identify requirements for attic ventilation
		identify requirements for roof drainage
		identify ***roofing components***, and describe their characteristics and applications

		identify ***connectors and supports***, and describe their characteristics and applications
		describe blocking and backing requirements
		identify notching and drilling limitations
		identify ***engineered timber components***
		identify grade stamps and describe related terminology
D-13.02.02L	demonstrate knowledge of procedures to construct roof and ceiling framing	identify ***tools and equipment*** used to construct roof and ceiling framing, and describe their procedures for use
		describe procedures to construct roof and ceiling framing
		describe sequence of assembly for ***engineered timber components***
D-13.02.03L	demonstrate knowledge of regulatory requirements for constructing roof and ceiling framing	identify ***standards and regulations*** for constructing roof and ceiling framing

Range of Variables

roof and ceiling members include: trusses, collar ties, purlins, various rafters, ridge boards, bracing, ceiling joists, webs, gusset plates, gable studs

openings include: attic access, skylights, stairwells, chases, vents

beam supports include: steel, wood, concrete

types of beams include: steel, built-up, engineered

load supports include: steel, wood, concrete

types of loads include: point, distributed, environmental, live, dead

roofing components include: blocking, backing, strapping, saddles/crickets

connectors and supports include: joist hangers, hurricane clips, H-clips

engineered timber components include: CLT, NLT, posts, beams, paralam, glulam

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Major Work Activity E
Performs exterior finishing

Task E-14 Installs exterior doors and windows

Task Descriptor

Carpenters install exterior doors and windows to ensure energy efficient construction. This is essential to maintain the integrity of the building envelope.

E-14.01 Installs exterior jambs/frames

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
E-14.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
E-14.01.02P	select frames for openings	frames for openings are selected according to schedule, ***drawings*** and ***specifications***
E-14.01.03P	assess and adjust rough openings	rough openings are assessed and adjusted for ***pre-existing conditions***
E-14.01.04P	prepare hinges and bolt locations on metal door frames	hinges and bolt locations on metal door frames are prepared to protect from grout and mortar
E-14.01.05P	brace metal door frames	metal door frames are braced for plumb, square and support
E-14.01.06P	align adjacent jambs/frames	adjacent jambs/frames are aligned with each other
E-14.01.07P	level head jamb and plumb side jambs	head jamb is level and side jambs are plumb
E-14.01.08P	secure jambs/frames	jambs/frames are secured by shimming and fastening to steel, wood and masonry
E-14.01.09P	insulate cavity around jambs/frames	cavity around jambs/frames is insulated to create a thermal break according to codes and project requirements

E-14.01.10P	coordinate with other trades	other trades are coordinated with to ensure considerations are made for ***components*** and ***exterior door and window hardware***
E-14.01.11P	install membrane and flashing around outside exterior jamb's trim	membrane and flashing is installed around outside exterior jamb's trim according to codes and project requirements

Range of Variables

tools and equipment include: see Appendix B

drawings include: project, shop, engineering, architectural, structural

specifications include: project, engineer, manufacturers'

pre-existing conditions include: out-of-square, out-of-level, wrong size, wrong location, wood rot

exterior door and window hardware include: locks, latches, electronic systems, astragals, kick plates, stops, hinges, closers

	Knowledge	
	Learning Outcomes	**Learning Objectives**
E-14.01.01L	demonstrate knowledge of exterior jambs and frames, their characteristics and applications	identify types of exterior window and door jambs/frames, and describe their characteristics and applications
		identify types of exterior doors and windows, and describe their characteristics and applications
		identify exterior door ***components***, and describe their characteristics and applications
		identify ***weather protection systems***, and describe their characteristics and applications
		identify air and vapour barriers, and describe their characteristics and applications
		identify types of ***exterior door and window hardware***, and describe their characteristics and applications
		identify exterior door and window schedules, and describe their characteristics and applications
		describe barrier-free access requirements
E-14.01.02L	demonstrate knowledge of procedures to install exterior jambs/frames	identify ***tools and equipment*** used to install exterior jambs/frames, and describe their procedures for use

		describe procedures to install exterior jambs/frames
E-14.01.03L	demonstrate knowledge of regulatory requirements for installing exterior jambs/frames	identify ***standards and regulations*** for installing exterior jambs/frames

Range of Variables

components include: side jambs, head jambs, sill, threshold, exterior finishes, flooring, access hardware, alarm system, security hardware

weather protection systems include: flashing, weather stripping, sealants, membranes

exterior door and window hardware include: locks, latches, electronic systems, astragals, kick plates, stops, hinges, closers

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

E-14.02 Installs exterior doors

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
E-14.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
E-14.02.02P	select ***door type*** and ***exterior door components***	***door type*** and ***exterior door components*** are selected according to door schedule, ***drawings*** and ***specifications***
E-14.02.03P	determine swing for pedestrian doors	swing is determined for pedestrian doors according to door schedule, codes, ***drawings*** and project requirements
E-14.02.04P	mark door slab and jamb for hinge location	door slab and jamb are marked for hinge location according to jamb or ***door type*** and project requirements
E-14.02.05P	mortise hinge gains on slab and jambs	hinge gains are mortised on slab and jambs according to jamb or ***door type*** and project requirements
E-14.02.06P	secure door to jamb using ***fasteners***	door is secured to jamb using ***fasteners*** according to manufacturers' specifications
E-14.02.07P	install ***weather protection systems***	***weather protection systems*** are installed according to manufacturers' specifications, door hardware schedule and project requirements

E-14.02.08P	install ***door accessories***	***door accessories*** are installed according to manufacturers' specifications, door hardware schedule and project requirements
E-14.02.09P	coordinate with other trades	other trades are coordinated with to ensure considerations are made for ***exterior door components*** and ***hardware***
E-14.02.10P	verify ***operation***	***operation*** is verified according to codes and project requirements

Range of Variables

tools and equipment include: see Appendix B

door type includes: overhead, access hatch, bypass, panel, flush, security, fire rated

exterior door components include: rails, stiles, panels, lites, exterior finishes, flooring, access hardware, alarm system, security hardware

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

specifications include: project, engineer, manufacturers'

fasteners include: wood screws, metal screws, bolts, lag screws, anchors

weather protection systems include: flashing, weather stripping, sealants, membranes

door accessories include: astragals, kick plates, stops, hinges, closers

exterior door hardware include: locks, latches, electronic systems, astragals, kick plates, stops, hinges, closers

operation include: latching, spacing, alignment, clearances

	Knowledge	
	Learning Outcomes	**Learning Objectives**
E-14.02.01L	demonstrate knowledge of exterior doors, their characteristics and applications	identify exterior ***door types***, and describe their characteristics and applications
		identify types of ***fasteners***, and describe their characteristics and applications
		identify types of membranes and flashings, and describe their characteristics and applications
		identify types of door jambs/frames, and describe their characteristics and applications
		identify ***exterior door components***, and describe their characteristics and applications
		identify ***door accessories***, and describe their characteristics and applications
		identify ***weather protection systems***, and describe their characteristics and applications

		identify air and vapour barriers, and describe their characteristics and applications
		identify types and styles of ***exterior door hardware***, and describe their characteristics and applications
		identify exterior door schedules, and describe their characteristics and applications
		describe barrier-free access requirements
E-14.02.02L	demonstrate knowledge of procedures to install exterior doors	identify ***tools and equipment*** used to install exterior doors, and describe their procedures for use
		describe procedures to install exterior doors
E-14.02.03L	demonstrate knowledge of training and certification requirements for installing exterior doors	identify training and certification requirements for installing exterior doors and specialty hardware (security)
E-14.02.04L	demonstrate knowledge of regulatory requirements for installing exterior doors	identify ***standards and regulations*** for installing exterior doors

Range of Variables

door type includes: overhead, access hatch, bypass, panel, flush, security, fire rated

fasteners include: wood screws, metal screws, bolts, lag screws, anchors

exterior door components include: rails, stiles, panels, lites, exterior finishes, flooring, access hardware, alarm system, security hardware

door accessories include: astragals, kick plates, stops, hinges, closers

weather protection systems include: flashing, weather stripping, sealants, membranes

exterior door hardware include: locks, latches, electronic systems, astragals, kick plates, stops, hinges, closers

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

E-14.03 Installs exterior windows

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
E-14.03.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
E-14.03.02P	select windows	windows are selected according to window schedule, codes and project requirements
E-14.03.03P	assess and adjust rough openings	rough openings are assessed and adjusted for ***pre-existing conditions***
E-14.03.04P	place and secure window in rough opening	window is placed and secured in rough opening using shims and fasteners to level and plumb
E-14.03.05P	brace window frames	window frames are braced for plumb, square and support
E-14.03.06P	align adjacent jambs/frames	adjacent jambs/frames are aligned with each other and other units according to project requirements
E-14.03.07P	install ***weather protection systems***	***weather protection systems*** are installed according to codes, ***drawings, specifications***, window hardware schedule and project requirements
E-14.03.08P	coordinate with other trades	other trades are coordinated with to ensure considerations are made for ***components***
E-14.03.09P	verify ***operation***	***operation*** is verified according to codes and project requirements

Range of Variables

tools and equipment include: see Appendix B
pre-existing conditions include: out-of-square, out-of-level and wrong size, wrong location, wood rot
weather protection systems include: flashing, weather stripping, sealants, membranes
drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans
specifications include: project, engineer, manufacturers'
components include: exterior finishes, access hardware, alarm system, security hardware
operation includes: latching, spacing, alignment, clearances

	Knowledge	
	Learning Outcomes	**Learning Objectives**
E-14.03.01L	demonstrate knowledge of exterior windows, their characteristics and applications	identify types of exterior windows, and describe their characteristics and applications including their ***energy efficiency***
		identify types of window jambs/frames, and describe their characteristics and applications
		identify ***exterior window components***, and describe their characteristics and applications
		identify ***weather protection systems***, and describe their characteristics and applications
		identify air and vapour barriers, and describe their characteristics and applications
		identify types and styles of ***exterior window hardware***, and describe their characteristics and applications
		identify exterior window schedules, and describe their characteristics and applications
		describe egress requirements
E-14.03.02L	demonstrate knowledge of procedures to install exterior windows	identify ***tools and equipment*** used to install exterior windows, and describe their procedures for use
		describe procedures to install exterior windows
E-14.03.03L	demonstrate knowledge of regulatory requirements for installing exterior windows	identify ***standards and regulations*** for installing exterior windows

Range of Variables

energy efficiency includes: gas filled, reflective coatings

exterior window components include: stiles, rails, mullions, muttons

weather protection systems include: flashing, weather stripping, sealants, membranes

exterior window hardware include: locks, latches, electronic systems

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

E-14.04 Installs exterior door and window hardware

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
E-14.04.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
E-14.04.02P	select ***exterior door and window hardware***	***exterior door and window hardware*** is selected according to ***specifications***, codes, and door and window hardware schedule
E-14.04.03P	position ***exterior door and window hardware***	***exterior door and window hardware*** is positioned using ***layout tools*** according to ***specifications***, codes and project requirements
E-14.04.04P	secure ***exterior door and window hardware***	***exterior door and window hardware*** is secured to door or window according to ***specifications***
E-14.04.05P	adjust ***exterior door and window hardware***	***exterior door and window hardware*** is adjusted to ensure smooth operation
E-14.04.06P	coordinate with other trades	other trades are coordinated with to ensure ***considerations*** are made for components
E-14.04.07P	verify ***operation***	***operation*** is verified according to codes and project requirements

Range of Variables

tools and equipment include: see Appendix B

exterior door and window hardware include: locks, latches, electronic systems, closers, emergency devices, panic hardware

specifications include: project, engineer, manufacturers'

layout tools include: templates, mortising jigs, manufacturers' templates

considerations include: exterior finishes, flooring, access hardware, alarm system, security hardware

operation includes: latching, spacing, alignment, clearances

	Knowledge	
	Learning Outcomes	**Learning Objectives**
E-14.04.01L	demonstrate knowledge of ***exterior door and window hardware***, their characteristics and applications	identify types of ***exterior door and window hardware***, and describe their characteristics and applications
		identify types of window and door jambs/frames, and describe their characteristics and applications
		identify types of exterior doors and windows, and describe their characteristics and applications
		identify ***exterior door and window components***, and describe their characteristics and applications
		identify ***weather protection systems***, and describe their characteristics and applications
		identify exterior door and window schedules, and describe their characteristics and applications
		describe barrier-free access requirements
		describe egress requirements
		identify ***sound transmission control methods*** and fire ratings, and describe their characteristics and applications
E-14.04.02L	demonstrate knowledge of procedures to install exterior door and window hardware	identify ***tools and equipment*** used to install exterior door and window hardware, and describe their procedures for use
		describe procedures to install exterior door and window hardware
		describe procedures to position hardware using ***layout tools***
E-14.04.03L	demonstrate knowledge of training and certification requirements for installing exterior door and window hardware	identify training and certification requirements for installing exterior door, window and specialty hardware (security)
E-14.04.04L	demonstrate knowledge of regulatory requirements for installing exterior door and window hardware	identify ***standards and regulations*** for installing exterior door and window hardware

Range of Variables

exterior door and window hardware include: locks, latches, electronic systems, closers, emergency devices, panic hardware

exterior door and window components include: transom, mullion, astragal, muntin, sash

weather protection systems include: flashing, weather stripping, sealants, membranes

sound transmission control methods include: cores, weather stripping, frame grouting

tools and equipment include: see Appendix B

layout tools include: templates, mortising jigs, manufacturers' templates

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task E-15 Installs roofing

Task Descriptor

Carpenters install roofing for the purpose of protecting the building from the elements as well as functionality and aesthetics. Proper installation methods are critical to maintaining the building envelope.

E-15.01 Installs roofing components

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
E-15.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
E-15.01.02P	select ***roof ventilation components***	***roof ventilation components*** are selected according to location, ***standards and regulations,*** and type and size of roof
E-15.01.03P	assess and adjust roofing components	roofing components are assessed and adjusted for pre-existing conditions
E-15.01.04P	select strapping	strapping is selected according to ***specifications*** and product requirements
E-15.01.05P	select ***flashing***	***flashing*** is selected according to location, ***specifications*** and type of roof
E-15.01.06P	apply ***membrane***	***membrane*** materials are applied according to codes and ***specifications***

E-15.01.07P	apply ***flashing***	***flashing*** is applied to direct water and prevent moisture penetration using fasteners and sealants according to ***specifications***
E-15.01.08P	mount ***roof ventilation components***	***roof ventilation components*** are mounted according to codes and ***specifications***
E-15.01.09P	install skylights	skylights are installed according to ***specifications***
E-15.01.10P	install ***roof safety components***	***roof safety components*** are installed according to codes, ***specifications***, and regulations
E-15.01.11P	select fasteners and sealants	fasteners and sealants are selected according to ***specifications***
E-15.01.12P	apply fasteners and sealants	fasteners and sealants are applied according to ***specifications***

Range of Variables

tools and equipment include: see Appendix B

roof ventilation components include: ridge vents, exhaust vents

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

specifications include: project, engineer, manufacturers'

flashing includes: drip edges, step flashing, cap flashing, valley flashing, saddle flashing, vent and chimney flashing, neoprene roof flashing

membrane includes: rolled roofing, ice and water shield, synthetic felt, tar paper

roof safety components include: anchors, davit systems

	Knowledge	
	Learning Outcomes	**Learning Objectives**
E-15.01.01L	demonstrate knowledge of ***roofing components,*** their characteristics and applications	identify types of strapping, their characteristics and applications
		identify types of ***membranes***, their characteristics and applications
		identify types of ***flashing***, their characteristics and applications
		identify types of sealants, their characteristics and applications
		identify types of ***roof ventilation components***, their characteristics and applications
		describe types of fasteners, their characteristics and applications
		describe adhesion requirements for site conditions

		describe sequence of installation
		describe ***safety requirements***
		describe handling and placement requirements for roofing materials
E-15.01.02L	demonstrate knowledge of procedures to install ***roofing components***	identify ***tools and equipment*** used to install ***roofing components***, and describe their procedures for use
		identify substrate requirements
		describe procedures to install strapping
		describe procedures to install ***membranes***
		describe procedures to install ***flashing***
		describe procedures to install sealants
		describe procedures to install ***roof ventilation components***
		describe procedures to repair ***roofing components***
E-15.01.03L	demonstrate knowledge of training and certification requirements for installing ***roofing components***	identify training and certification requirements for installing ***roofing components***
E-15.01.04L	demonstrate knowledge of regulatory requirements for installing ***roofing components***	identify ***standards and regulations*** for installing ***roofing components***

Range of Variables

membrane includes: rolled roofing, ice and water shield, synthetic felt, tar paper

flashing includes: drip edges, step flashing, cap flashing, valley flashing, saddle flashing, vent and chimney flashing, neoprene roof flashing

roof ventilation components include: ridge vents, exhaust vents

safety requirements include: fall protection, fire protection

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

E-15.02 Installs roof coverings

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
E-15.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
E-15.02.02P	select ***roofing materials***	***roofing materials*** are selected according to site requirements, conditions, ***standards and regulations***, and ***specifications***
E-15.02.03P	secure ***metal roofing materials***	***metal roofing materials*** are secured according to ***standards and regulations***, and ***specifications***
E-15.02.04P	secure ***wood roofing materials***	***wood roofing materials*** are secured according to ***standards and regulations***, and ***specifications***
E-15.02.05P	secure ***asphalt composite roofing materials***	***asphalt composite roofing materials*** are secured according to ***standards and regulations***, and ***specifications***
E-15.02.06P	install ridge and hip caps	ridge and hip caps are installed according to ***specifications***

Range of Variables

tools and equipment include: see Appendix B

roofing materials include: asphalt composite, wood, metal, synthetic, clay, slate

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

specifications include: project, engineer, manufacturers'

metal roofing materials include: corrugated, steel tile

wood roofing materials include: shakes, shingles

asphalt composite roofing materials include: shingles, rolled roofing, ballast, selvage, granular, smooth bitumen, torch-down, fibreglass

	Knowledge	
	Learning Outcomes	**Learning Objectives**
E-15.02.01L	demonstrate knowledge of roof coverings, their characteristics and applications	identify types of ***roofing materials***, and describe their characteristics and applications
		identify types of ***metal roofing materials***, and describe their characteristics and applications

		identify types of ***wood roofing materials***, and describe their characteristics and applications
		identify types of ***asphalt composite roofing materials***, and describe their characteristics and applications
		identify types of fasteners, and describe their characteristics and applications
		describe adhesion requirements for site conditions
		describe sequence of installation
		identify safety requirements
		describe handling and placement requirements for ***roofing materials***
E-15.02.02L	demonstrate knowledge of procedures to install ***roofing materials***	identify ***tools and equipment*** used to install ***roofing materials***, and describe their procedures for use
		describe procedures to install ***roofing materials***
E-15.02.03L	demonstrate knowledge of regulatory requirements for installing ***roofing materials***	identify ***standards and regulations*** for installing ***roofing materials***

Range of Variables

roofing materials include: asphalt composite, wood, metal, synthetic, clay, slate

metal roofing materials include: corrugated, steel tile

wood roofing materials include: shakes, shingles

asphalt composite roofing materials include: shingles, rolled roofing, ballast, selvage, granular, smooth bitumen, torch-down, fibreglass

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task E-16 Installs exterior finishes

Task Descriptor

The installation of exterior finishes is essential to the aesthetics, comfort, weather protection and functioning of the building. Carpenters install exterior finishes for aesthetics, comfort, weather protection and functioning of the building. Different components work together effectively to create a weather shield while contributing to the curb appeal of the structure.

E-16.01 Installs exterior wall components

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
E-16.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
E-16.01.02P	check for plumb, level and square structure	structure is checked for plumb, level and square and ***exterior wall coverings*** are adjusted for aesthetics
E-16.01.03P	select and install ***membranes, adhesives and sealants***	***membranes, adhesives and sealants*** are selected and installed according to specifications and ***exterior wall coverings***
E-16.01.04P	select and install ***flashings***	***flashings*** are selected and installed according to specifications, building codes and ***exterior wall coverings***
E-16.01.05P	select and install ***strapping***	***strapping*** is selected and installed according to specifications and ***exterior wall coverings***
E-16.01.06P	select and install ***cladding components***	***cladding components*** are selected and installed according to specifications and ***exterior wall coverings***
E-16.01.07P	select and install ***fasteners***	***fasteners*** are selected and installed according to specifications and ***exterior wall coverings***
E-16.01.08P	select and install coverings for cornice (soffit/fascia)	coverings for cornice (soffit/fascia) are selected and installed according to specifications

Range of Variables

tools and equipment include: see Appendix B

exterior wall coverings include: wood, vinyl, composite products, masonry, stucco

membranes, adhesives and sealants include: air barriers, tar paper, self-adhesive membrane, weather barrier, sheathing tape, silicone, latex and acrylic caulking

flashings include: window flashing, door flashing, sills, transition flashing

strapping includes: z-bar, furring, ventilated underlayment, lattice work

cladding components include: starter strips, trims, corner posts, frieze boards, water table, belt course

fasteners include: electro-galvanized nails, stainless steel nails, ring nails, coated screws, specialty fasteners

	Knowledge	
	Learning Outcomes	**Learning Objectives**
E-16.01.01L	demonstrate knowledge of exterior wall components, their characteristics, applications and procedures for use	identify ***membranes, adhesives and sealants***, and describe their characteristics, applications and procedures for use
		identify ***flashings***, and describe their characteristics, applications and procedures for use
		identify ***strapping***, and describe their characteristics, applications and procedures for use
		identify ***cladding components***, and describe their characteristics, applications and procedures for use
		identify ***fasteners***, and describe their characteristics, applications and procedures for use
		identify ***exterior wall coverings***, and describe their characteristics, applications and procedures for use
		identify planes of protection and rain screen, and describe their characteristics and applications
E-16.01.02L	demonstrate knowledge of remedial measures for out-of-plumb, not level or not square structure	describe remedial measures for out-of-plumb, not level or not square structure
E-16.01.03L	demonstrate knowledge of coverings for cornice (soffit/fascia), and their procedures for use	identify coverings for cornice (soffit/fascia) their characteristics and applications
E-16.01.04L	demonstrate knowledge of procedures to install exterior wall components	describe procedures to install ***membranes, adhesives and sealants***
		describe procedures to install ***flashings***
		describe procedures to install ***strapping***
		describe procedures to install ***cladding components***

	describe procedures to install ***fasteners***
	describe sequence of installation

Range of Variables

membranes, adhesives and sealants include: air barriers, tar paper, self-adhesive membranes, weather barrier, sheathing tape, silicone, latex and acrylic caulking

flashings include: window flashing, door flashing, sills, transition flashing

strapping includes: z-bar, furring, ventilated underlayment, lattice work

cladding components include: starter strips, trims, corner posts, frieze boards, water table, belt course

fasteners include: electro-galvanized nails, stainless steel nails, ring nails, coated screws, specialty fasteners

exterior wall coverings include: wood, vinyl, composite products, masonry, stucco

E-16.02 Installs exterior wall coverings

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
E-16.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
E-16.02.02P	select ***exterior wall coverings***	***exterior wall coverings*** are selected according to ***specifications***
E-16.02.03P	apply ***exterior wall coverings***	***exterior wall coverings*** are applied for desired aesthetics and weather protection according to ***specifications***
E-16.02.04P	prepare ***joints***	***joints*** are prepared according to ***exterior wall coverings*** being installed, and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

exterior wall coverings include: wood, vinyl, composite products, masonry, stucco, rain screens, steel

specifications include: project, engineer, manufacturers'

joints include: butt, scarf, mitre, lap, control

	Knowledge	
	Learning Outcomes	**Learning Objectives**
E-16.02.01L	demonstrate knowledge of ***exterior wall coverings***, their characteristics and applications	identify types of ***exterior wall coverings***, and describe their characteristics and applications
		describe effects of weather on exterior walls and ***exterior wall coverings***
		describe installation sequence and procedures for ***exterior wall coverings***
		identify types of ***fasteners***, and describe their characteristics and applications
		identify safety requirements
		identify types of ***joints***, and describe their characteristics, applications and procedures for use
E-16.02.02L	demonstrate knowledge installation of ***exterior wall coverings***	identify ***tools and equipment*** used to install ***exterior wall coverings***, and describe their procedures for use
		describe procedures to install ***exterior wall coverings***
		describe procedures to prepare ***joints***
E-16.02.03L	demonstrate knowledge of regulatory requirements for installing ***exterior wall coverings***	identify ***standards and regulations*** for installing exterior wall coverings

Range of Variables

exterior wall coverings include: wood, vinyl, composite products, masonry, stucco, rain screens, steel

fasteners include: electro-galvanized nails, ring nails, stainless steel nails, specialty fasteners, screws with washers

joints include: butt, scarf, mitre, lap, control

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Major Work Activity F
Performs interior finishing

Task F-17 Applies wall and ceiling finishes

Task Descriptor

Carpenters install interior finishes for aesthetics, comfort and proper functioning of the building. A well-installed finish contributes to the overall ambience and character intended for a room and demonstrates the quality of work.

F-17.01 Installs wallboard

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-17.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-17.01.02P	select ***wallboard***	***wallboard*** is selected according to ***standards, regulations***, ***drawings*** and ***specifications***
F-17.01.03P	***prepare*** wall or ceiling surface	wall or ceiling surface is ***prepared*** to receive ***wallboard***
F-17.01.04P	cut ***wallboard***	***wallboard*** is cut to fit walls, ceilings and ***openings***
F-17.01.05P	place ***wallboard***	***wallboard*** is placed ready for ***finish application*** according to ***drawings*** and ***specifications***
F-17.01.06P	secure ***wallboard***	***wallboard*** is secured with ***fasteners*** according to ***standards, regulations***, ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

wallboard includes: gypsum, cement, fibre boards, specialty boards

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, site plans

specifications include: project, engineer, manufacturers'

prepare includes: aligning studs, adding backing and blocking materials

openings include: electrical, plumbing, windows, doors, HVAC, specialties

finish applications include: joint filling, scratch coat, interior masonry

fasteners include: mechanical, adhesives

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-17.01.01L	demonstrate knowledge of ***wallboard***, their characteristics and applications	identify types of ***wallboard***, and describe their characteristics and applications
F-17.01.02L	demonstrate knowledge of ***wall systems***, their characteristics and applications	identify types of ***wall systems***, and describe their characteristics and applications
		describe fire-rated assemblies and requirements
		describe blocking and backing requirements for ***wallboard*** application
		identify ***sound transmission control methods***, and describe their characteristics and applications
F-17.01.03L	demonstrate knowledge of procedures to install ***wallboard***	identify ***tools and equipment*** used to install ***wallboard***, and describe their procedures for use
		describe procedures used to install ***wallboard***
		describe cutting methods for ***wallboard***
		describe methods to scribe and fit panels
		describe sequence of installation
		identify ***fasteners*** used to secure ***wallboard***, and describe their characteristics and applications
		identify ***safe work practices***
		describe requirements of other trades
F-17.01.04L	demonstrate knowledge of regulatory requirements for installing ***wallboard***	identify ***standards and regulations*** for installing ***wallboard***

Range of Variables

wallboard includes: gypsum, cement, fibre boards, specialty boards
wall systems include: shaft wall, fire-rated wall, sound transmission class (STC)-rated wall
fasteners include: mechanical, adhesives
sound transmission control methods include: resilient channels, sound batts, baffles
tools and equipment include: see Appendix B
safe work practices include: dust control, respiratory protection
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

F-17.02 Applies compound to walls and ceilings

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
no	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-17.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-17.02.02P	select compound and tapes	compound and tapes are selected according to application
F-17.02.03P	cut back joints	joints are cut back to receive compound
F-17.02.04P	install ***accessories***	***accessories*** are installed according to drawings and specifications
F-17.02.05P	mix compound	compound is mixed according to manufacturers' specifications
F-17.02.06P	tape joints and ***accessories***	joints and ***accessories*** are taped
F-17.02.07P	fill joints and seams	joints and seams are filled with compound
F-17.02.08P	sand surface	surface is sanded
F-17.02.09P	repeat compound application and sanding	compound application and sanding are repeated until smooth surface is achieved

Range of Variables

tools and equipment include: see Appendix B
accessories include: corner beads, expansion joints, flexible mouldings, backing
safe work practices include: dust control, respiratory protection
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-17.02.01L	demonstrate knowledge of wall compounds, their characteristics and applications	identify types of wall compound, and describe their characteristics and applications
		describe requirements of other trades
		describe taping and compound application for fire-rated assemblies
F-17.02.02L	demonstrate knowledge of procedures to apply wall compound	identify ***tools and equipment*** used to apply wall compound, and describe their procedures for use
		identify ***safe work practices*** when preparing and applying wall compound
		describe procedures to apply wall compound
		identify and describe taping and filling applications and requirements
		describe proper consistency of compound according to coat being applied
F-17.02.03L	demonstrate knowledge of regulatory requirements for applying wall compound	identify ***standards and regulations*** for applying wall compound

Range of Variables

tools and equipment include: see Appendix B

safe work practices include: dust control, respiratory protection

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

F-17.03 Installs panels, tiles and solid wood finishes

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-17.03.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-17.03.02P	prepare wall or ceiling surface	wall or ceiling surface is prepared according to finish to be applied
F-17.03.03P	measure and cut ***panels***, tiles and solid wood finishes	***panels***, tiles and solid wood finishes are measured and cut to fit wall/ceiling/corners and for ***penetrations***

F-17.03.04P	place ***panels*** and tiles	***panels*** and tiles are placed using ***tools and equipment*** so that they are aligned for appearance and fit
F-17.03.05P	secure ***panels***, tiles and solid wood finishes	***panels***, tiles and solid wood finishes are secured using ***fasteners***
F-17.03.06P	secure finished trim	finished trim is secured according to ***specifications***

Range of Variables

tools and equipment include: see Appendix B
panels include: wood products, acoustic, fibre-reinforced panels (FRP), metals, plastics, cementitious
penetrations include: electrical outlets, plumbing pipes, HVAC ducts
fasteners include: finish nails, brad nails, adhesives, staples, cleats

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-17.03.01L	demonstrate knowledge of ***panels***, tiles and solid wood finishes, their characteristics and applications	identify types of ***panels***, tiles and solid wood finishes, and describe their characteristics and applications
		describe fire-rated assemblies and requirements
		describe blocking and backing requirements for panels, tiles and solid wood finish applications
		identify sound transmission control methods, and describe their characteristics and applications
		describe requirements of other trades
F-17.03.02L	demonstrate knowledge of procedures to install ***panels***, tiles and solid wood finishes	identify ***tools and equipment*** used to install ***panels***, tiles and solid wood finishes, and describe their procedures for use
		describe procedures to install ***panels***, tiles and solid wood finishes
		describe methods to scribe and fit ***panels***, tiles and solid wood finishes
		describe sequence of installation
		identify ***safe work practices***
		identify ***fasteners***, and describe their characteristics and applications
		identify wood ***joints***, and describe their characteristics and applications

F-17.03.03L	demonstrate knowledge of training requirements for installing ***panels***, tiles and solid wood finishes	identify training requirements for installing ***panels***, tiles and solid wood finishes
F-17.03.04L	demonstrate knowledge of regulatory requirements for installing ***panels***, tiles and solid wood finishes	identify ***standards and regulations*** for installing ***panels***, tiles and solid wood finishes

Range of Variables

panels include: wood products, acoustic, fibre-reinforced panels (FRP), metals, plastics, cementitious
tools and equipment include: see Appendix B
safe work practices include: dust control, respiratory protection
fasteners include: finish nails, brad nails, adhesives, staples, cleats
joints includes: coped, mitre, butt, dovetailed, lap, scarf, spline
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

F-17.04 Installs suspended ceilings

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
F-17.04.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-17.04.02P	select ***suspended products***	***suspended products*** are selected according to ***drawings***, ***specifications***, ***standards and regulations***
F-17.04.03P	measure, cut and install ***suspended ceiling components***	***suspended ceiling components*** are measured, cut and installed according to ***drawings***, ***specifications, standards and regulations***
F-17.04.04P	align and level grid	grid is aligned and levelled to ensure it is uniform and square
F-17.04.05P	measure and cut openings in ***suspended product***	openings in ***suspended product*** are measured and cut to accommodate ***fixtures***

Range of Variables

tools and equipment include: see Appendix B

suspended products includes: tiles, panels, wallboard, wood products

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

suspended ceiling components include: wall channels, wallboard, main-tees, cross-tees, eyelets, support drops, tracks, hangers, architectural features

fixtures include: electrical, sprinkler, HVAC

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-17.04.01L	demonstrate knowledge of suspended ceilings, their components, characteristics and applications	identify types of suspended ceilings, and describe their characteristics and applications
		identify ***suspended ceiling components*** and their installation methods
		identify fire ratings of types of suspended ceilings
		describe fire-rated assemblies and requirements
		describe blocking and backing requirements for suspended ceilings
		identify sound transmission control methods, and describe their characteristics and applications
		describe requirements of other trades
F-17.04.02L	demonstrate knowledge of procedures to install suspended ceilings	identify ***tools and equipment*** used to install suspended ceilings, and describe their procedures for use
		describe procedures to install suspended ceilings
		describe methods to scribe and fit ***suspended products***
		explain calculations for installing suspended ceilings
		describe sequence of installation
		identify ***safe work practices***,
F-17.04.03L	demonstrate knowledge of training and certification requirements for installing suspended ceilings	identify training and certification requirements for installing suspended ceilings
F-17.04.04L	demonstrate knowledge of regulatory requirements for installing suspended ceilings	identify ***standards and regulations*** for installing suspended ceilings

Range of Variables

suspended ceiling components include: wall channels, wallboard, main-tees, cross-tees, eyelets, support drops, tracks, hangers, architectural features

tools and equipment include: see Appendix B

suspended product includes: tiles, panels, wallboard, wood products

safe work practices include: dust control, eye and head protection

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

F-17.05 Installs demountable wall systems

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-17.05.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-17.05.02P	place ***demountable wall system***	***demountable wall system*** is placed according to ***drawings***, ***specifications, standards and regulations***
F-17.05.03P	adjust ***demountable wall system***	***demountable wall system*** is adjusted for alignment
F-17.05.04P	install ***hardware***	***hardware*** is installed according to ***specifications***
F-17.05.05P	attach ***demountable wall system***	***demountable wall system*** is attached according to ***standards and regulations***
F-17.05.06P	test ***demountable wall system***	***demountable wall system*** is functional and appearance is according to ***drawings***, ***specifications, standards and regulations***

Range of Variables

tools and equipment include: see Appendix B

demountable wall systems include: office partitions, washroom stalls, room dividers

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

hardware includes: clips, fasteners, brackets, latches, hinges, tracks

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-17.05.01L	demonstrate knowledge of ***demountable wall systems***, their ***hardware***, characteristics and applications	identify types of ***demountable wall systems***, and describe their ***hardware***, characteristics and applications
		explain ***drawings*** and ***specifications*** on demountable wall systems
		describe fire-rated assemblies and requirements
		describe blocking and backing requirements for ***demountable wall systems***
		identify sound transmission control methods, and describe their characteristics and applications
		describe requirements of other trades
F-17.05.02L	demonstrate knowledge of procedures to install ***demountable wall systems***	identify ***tools and equipment*** used to install ***demountable wall systems***, and describe their procedures for use
		describe procedures to install ***demountable wall systems***
		describe sequence of installation
F-17.05.03L	demonstrate knowledge of training and certification requirements for installing ***demountable wall systems***	identify training and certification requirements for installing ***demountable wall systems***
F-17.05.04L	demonstrate knowledge of regulatory requirements for installing ***demountable wall systems***	identify ***standards and regulations*** for installing ***demountable wall systems***

Range of Variables

demountable wall systems include: office partitions, washroom stalls, room dividers

hardware includes: clips, fasteners, brackets, latches, hinges, tracks

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task F-18 Installs flooring

Task Descriptor

Carpenters install flooring for aesthetics, comfort and proper functioning of the building. A floor should look and feel level with minimal transitions to prevent tripping.

F-18.01 Installs underlayment

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-18.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-18.01.02P	***prepare*** substrate	substrate is ***prepared*** according to project specifications and site conditions to receive ***underlayment***
F-18.01.03P	select type and size of ***underlayment*** sheets	type and size of ***underlayment*** sheets are selected according to ***drawings*** and ***specifications***
F-18.01.04P	measure, cut, place and secure ***underlayment*** over substrate	***underlayment*** is measured, cut, placed and secured over substrate according to ***standards, regulations*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

prepare includes: applying floor leveling compound, cleaning, scraping

underlayment includes: hardboard, plywood, sheathing, cement board, isolation membrane

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural, manufacturers'

specifications include: project, engineer, manufacturers'

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-18.01.01L	demonstrate knowledge of ***underlayment***, their characteristics and applications	identify types of ***underlayment***, and describe their characteristics and applications
		describe effects of expansion and contraction of ***underlayment***
		describe requirements of other trades
F-18.01.02L	demonstrate knowledge of procedures to install ***underlayment***	identify ***tools and equipment*** used to install ***underlayment***, and describe their procedures for use
		describe procedures to install ***underlayment***
		describe sequence of installation
		describe procedures to prepare substrate before installation of ***underlayment***
F-18.01.03L	demonstrate knowledge of training requirements for installing ***underlayment***	identify training requirements for installing ***underlayment***
F-18.01.04L	demonstrate knowledge of regulatory requirements for installing ***underlayment***	identify ***standards and regulations*** for installing ***underlayment***

Range of Variables

underlayment includes: hardboard, plywood, sheathing, cement board, isolation membrane

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

F-18.02 Installs floor coverings

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-18.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-18.02.02P	***prepare*** substrate	substrate is ***prepared*** according to project specifications and site conditions to receive ***floor covering***
F-18.02.03P	acclimatize ***floor covering***	***floor covering*** is acclimatized to installation environment

F-18.02.04P	select ***floor covering***	***floor covering*** is selected to ensure quality and uniformity
F-18.02.05P	measure, cut and place ***floor covering***	***floor covering*** is measured, cut and placed considering expansion, and according to ***specifications***, ***drawings***, building codes and site conditions
F-18.02.06P	install ***floor trim and accessories***	***floor trim and accessories*** are installed according to ***drawings*** and ***specifications***
F-18.02.07P	secure ***floor covering***	***floor covering*** is secured according to ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B
prepare includes: applying floor leveling compound, cleaning, scraping, installing underlayment
floor coverings include: tiles, solid wood, laminates, roll flooring, vinyl flooring
specifications include: project, engineer, manufacturers'
drawings include: project, shop, engineering, electrical, architectural, mechanical, structural
floor trim and accessories include: transition strips, expansion joints, stops

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-18.02.01L	demonstrate knowledge of ***floor coverings***, their characteristics and applications	identify types of ***floor coverings***, and describe their characteristics and applications
		describe effects of expansion and contraction of ***floor coverings***
		describe requirements of other trades
F-18.02.02L	demonstrate knowledge of ***specialty floors***, their characteristics and applications	identify types of ***specialty floors***, and describe their characteristics and applications
F-18.02.03L	demonstrate knowledge of procedures to install ***floor coverings***	identify ***tools and equipment*** used to install ***floor coverings***, and describe their procedures for use
		describe procedures to install ***floor coverings***
		describe sequence of installation
F-18.02.04L	demonstrate knowledge of training and certification requirements for installing ***floor coverings***	identify training and certification requirements for installing ***floor coverings***
F-18.02.05L	demonstrate knowledge of regulatory requirements for installing ***floor coverings***	identify ***standards and regulations*** for installing ***floor coverings***

Range of Variables

floor coverings include: tiles, solid wood, laminates, roll flooring, vinyl flooring
specialty floors include: gymnasiums, bowling alley floors
tools and equipment include: see Appendix B
standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

F-18.03 Installs access flooring

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
F-18.03.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-18.03.02P	adapt access flooring to site requirements	access flooring is adapted to site requirements by measuring, cutting, fitting and assembling materials and components according to ***specifications***
F-18.03.03P	level and secure access flooring to substrate and perimeter walls	access flooring is levelled and secured to substrate and perimeter walls according to ***specifications*** using ***fasteners*** and ***adhesives***
F-18.03.04P	coordinate with other trades	other trades are coordinated with to ensure considerations are made for components

Range of Variables

tools and equipment include: see Appendix B
specifications include: project, engineer, manufacturers'
fasteners include: concrete anchors, inserts, clips
adhesives include: mastic, polyurethane, contact

Knowledge

	Learning Outcomes	Learning Objectives
F-18.03.01L	demonstrate knowledge of access flooring, their characteristics and applications	identify types of access flooring, and describe their characteristics and applications
		describe effects of expansion and contraction
		explain ***drawings*** and ***specifications*** on access flooring

		describe requirements of other trades
F-18.03.02L	demonstrate knowledge of procedures to install access flooring	identify ***tools and equipment*** used to install access flooring, and describe their procedures for use
		describe procedures to install access flooring
		describe sequence of installation
		identify ***fasteners*** and ***adhesives*** used to install access flooring, and describe their characteristics and applications
		describe safe work practices for use of ***adhesives***
F-18.03.03L	demonstrate knowledge of training and certification requirements for installing access flooring	identify training and certification requirements for installing access flooring
F-18.03.04L	demonstrate knowledge of regulatory requirements for installing access flooring	identify ***standards and regulations*** for installing access flooring

Range of Variables

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

tools and equipment include: see Appendix B

fasteners include: concrete anchors, inserts, clips

adhesives include: mastic, polyurethane, contact

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task F-19 Installs interior doors and windows

Task Descriptor

Carpenters install interior doors and windows for functionality of the home or building. They reflect the desired style and are often custom ordered.

F-19.01 Installs interior jambs/frames

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-19.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-19.01.02P	assess and adjust rough openings	rough openings are assessed and adjusted for ***pre-existing conditions***
F-19.01.03P	verify rough opening	rough opening is verified according to ***drawings*** and ***specifications***
F-19.01.04P	assemble steel and wood door frames	steel and wood door frames are assembled prior to installation according to site requirements and ***specifications***
F-19.01.05P	install window and door frame plumb, level and square	window and door frame are plumb, level and square
F-19.01.06P	secure jambs/frames	jambs/frames are secured by shimming and fastening
F-19.01.07P	create acoustical break or fire stop	acoustical break or fire stop is created by insulating cavity around jambs/frames according to ***drawings***, ***specifications,*** and ***standards and regulations***
F-19.01.08P	coordinate with other trades	other trades are coordinated with to ensure considerations are made for components

Range of Variables

tools and equipment include: see Appendix B

pre-existing conditions include: out-of-square, out-of-level, wrong size, wrong location, wood rot, wrong swing

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

standards and regulations include CSA, OH&S, building codes (NBC, local), fire codes, site-specific (company or client), jurisdictional requirements

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-19.01.01L	demonstrate knowledge of interior jambs/frames, their characteristics and applications	identify types of interior jambs/frames, and describe their characteristics and applications
F-19.01.02L	demonstrate knowledge of procedures to install interior jambs/frames	identify ***tools and equipment*** used to install interior jambs/frames, and describe their procedures for use
		describe procedures to install interior jambs/frames
		describe sequence of installation of interior jambs/frames
F-19.01.03L	demonstrate knowledge of training requirements for installing interior jambs/frames	identify training requirements for installing interior jambs/frames
F-19.01.04L	demonstrate knowledge of regulatory requirements for installing interior jambs/frames	identify ***standards and regulations*** for installing interior jambs/frames

Range of Variables

tools and equipment include: see Appendix B

standards and regulations include CSA, OH&S, building codes (NBC, local), fire codes, site-specific (company or client), jurisdictional requirements

F-19.02 Installs interior doors

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
F-19.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-19.02.02P	determine ***door*** size, swing, bevel and location	***door*** size, swing, bevel and location are determined according to ***drawings***, ***specifications*** and door schedule
F-19.02.03P	install ***door installation hardware*** for non-swinging doors	***door installation hardware*** for non-swinging doors are installed according to ***drawings*** and ***specifications***
F-19.02.04P	lay out door slab and jamb	door slab and jamb are laid out for hinge location
F-19.02.05P	mortise hinge gains on slab and jambs	hinge gains are mortised on slab and jambs
F-19.02.06P	hang ***door*** with consistent margins	***door*** is hung with consistent margins

Range of Variables

tools and equipment include: see Appendix B
doors include: swinging, non-swinging
drawings include: project, shop, engineering, electrical, architectural, mechanical, structural
specifications include: project, engineer, manufacturers'
door installation hardware includes: tracks, pivots, guides, hinges

Knowledge

	Learning Outcomes	Learning Objectives
F-19.02.01L	demonstrate knowledge of ***interior doors***, their characteristics and applications	identify types of ***interior doors***, and describe their characteristics and applications
		describe and interpret door schedules
F-19.02.02L	demonstrate knowledge of procedures to install ***interior doors***	identify ***tools and equipment*** used to install ***interior doors***, and describe their procedures for use
		describe procedures to install in***terior doors***

		describe sequence of installation of ***interior doors***
F-19.02.03L	demonstrate knowledge of regulatory requirements for installing ***interior doors***	identify ***standards and regulations*** for installing ***interior doors***

Range of Variables

interior doors include: swinging, non-swinging

tools and equipment include: see Appendix B

standards and regulations include CSA, OH&S, building codes (NBC, local), fire codes, site-specific (company or client), jurisdictional requirements

F-19.03 Installs interior windows

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Skills

	Performance Criteria	Evidence of Attainment
F-19.03.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-19.03.02P	assess and adjust rough openings	rough openings are assessed and adjusted for ***pre-existing conditions***
F-19.03.03P	verify rough opening	rough opening is verified according to ***drawings*** and ***specifications***
F-19.03.04P	select window	window is selected according to ***drawings*** and ***specifications***
F-19.03.05P	install window	window is installed plumb, level and square

Range of Variables

tools and equipment include: see Appendix B

pre-existing conditions include: out-of-square, out-of-level, wrong size, wrong location, wood rot, wrong swing

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

Knowledge

	Learning Outcomes	Learning Objectives
F-19.03.01L	demonstrate knowledge of interior windows, their ***components***, characteristics and applications	identify types of interior windows and their ***components***, and describe their characteristics and applications
		describe and interpret window schedules

F-19.03.02L	demonstrate knowledge of procedures to install interior windows and ***components***	identify ***tools and equipment*** used to install interior windows and ***components***, and describe their procedures for use
		describe procedures to install interior windows and ***components***
F-19.03.03L	demonstrate knowledge of regulatory requirements for installing interior windows	identify ***standards and regulations*** for installing interior windows

Range of Variables

components include: mullions, transoms, muntins, sills, stools

tools and equipment include: see Appendix B

standards and regulations include CSA, OH&S, building codes (NBC, local), fire codes, site-specific (company or client), jurisdictional requirements

F-19.04 Installs interior door and window hardware

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-19.04.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-19.04.02P	select ***interior door and window hardware***	***interior door and window hardware*** is selected according to ***drawings***, ***specifications, standards and regulations***
F-19.04.03P	position ***interior door and window hardware***	***interior door and window hardware*** is positioned using ***tools and equipment***
F-19.04.04P	install ***interior door and window hardware***	***interior door and window hardware*** is installed to doors and windows according to ***drawings***, ***specifications***, ***standards and regulations***
F-19.04.05P	adjust and test ***interior door and window hardware***	***interior door and window hardware*** is adjusted and tested to ensure smooth and proper operation
F-19.04.06P	coordinate with other trades	other trades are coordinated with to ensure considerations are made for other ***components*** to be installed

Range of Variables

tools and equipment include: see Appendix B

interior door and window hardware includes: latches, closers, emergency devices***,*** hinges, electronic hardware, push/panic bars, lock/passage sets

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

standards and regulations include CSA, OH&S, building codes (NBC, local), fire codes, site-specific (company or client), jurisdictional requirements

components include: electric strikes, magnetic locks, security systems, mechanical systems, fire alarms

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-19.04.01L	demonstrate knowledge of ***interior door and window hardware***, their characteristics and applications	identify types and styles of ***interior door and window hardware***, and describe their characteristics and applications
		describe and interpret ***interior door and window hardware*** schedules
		identify ***sound transmission control methods*** and fire ratings, and describe their characteristics and applications
F-19.04.02L	demonstrate knowledge of procedures to install ***interior door and window hardware***	identify ***tools and equipment*** used to install ***interior door and window hardware***, and describe their procedures for use
		describe procedures to install ***interior door and window hardware***
F-19.04.03L	demonstrate knowledge of regulatory requirements for installing ***interior door and window hardware***	identify ***standards and regulations*** for installing ***interior door and window hardware***

Range of Variables

interior door and window hardware includes: latches, closers, emergency devices***,*** hinges, electronic hardware, push/panic bars, lock/passage sets

sound transmission control methods include: cores, weather stripping, auto door bottom

tools and equipment include: see Appendix B

standards and regulations include CSA, OH&S, building codes (NBC, local), fire codes, site-specific (company or client), jurisdictional requirements

Task F-20 Constructs and installs finish components and stairs

Task Descriptor

The construction and installation of finish components and accessories transitions the living and working space from an unfinished product to the completed product. Special attention to accuracy and detail is important. The margin of error is much smaller. For example, cuts must be more precise. The quality of the finish work is likely a reflection of the overall quality of the project.

F-20.01 Fabricates finish components

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-20.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-20.01.02P	identify and select materials	materials are identified and selected for quality and uniformity
F-20.01.03P	construct jigs	jigs are constructed for repetitive fabrication
F-20.01.04P	measure, cut, and assemble ***finish components*** and ***built-in components***	***finish components*** and ***built-in components*** are measured, cut, and assembled according to ***drawings***, ***specifications, standards and regulations***

Range of Variables

tools and equipment include: see Appendix B

finish components include: trim, casings, baseboards, crown mouldings, jamb extensions, window sills, aprons, handrails, balustrades, plastic laminate panels

built-in components include: cabinets, shelves, walk-in closets, mantels, counter tops, access hatches

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

standards and regulations include CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-20.01.01L	demonstrate knowledge of ***finish components*** and ***built-in components***, their characteristics and applications	identify types of ***finish components*** and ***built-in components***, and describe their characteristics and applications
		identify types of materials used for finish components and ***built-in components***, and describe their characteristics and applications
F-20.01.02L	demonstrate knowledge of procedures to fabricate ***finish components*** and ***built-in components***	identify ***tools and equipment*** used to fabricate ***finish components*** and ***built-in components***, and describe their procedures for use
		describe procedures to fabricate ***finish components*** and ***built-in components***
		describe boring techniques
		identify abrasives and adhesives, and describe their characteristics and applications
		describe procedures for constructing and using jigs
		identify types of ***fasteners***, and describe their characteristics and applications
		identify types of ***joints***, and describe their characteristics and applications
F-20.01.03L	demonstrate knowledge of training requirements for fabricating finish components	identify training requirements for fabricating finish components
F-20.01.04L	demonstrate knowledge of regulatory requirements for fabricating finish components	identify ***standards and regulations*** for fabricating finish components

Range of Variables

finish components include: trim, casings, baseboards, crown mouldings, jamb extensions, window sills, aprons, handrails, balustrades, plastic laminate panels

built-in components include: cabinets, shelves, walk-in closets, mantels, counter tops, access hatches

tools and equipment include: see Appendix B

fasteners include: adhesives, nails, brackets, clips, screws, dowels, biscuits

joints includes: coped, mitre, butt, dovetailed, lap, scarf

standards and regulations include CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

F-20.02 Installs finish components and accessories

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-20.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-20.02.02P	select ***finish components*** and ***accessories*** to be installed	***finish components*** and ***accessories*** to be installed are selected according to ***drawings***, ***specifications, standards and regulations***
F-20.02.03P	measure, cut and assemble ***finish components*** and ***accessories***	***finish components*** and ***accessories*** are measured, cut and assembled according to ***drawings***, ***specifications***, ***standards and regulations***
F-20.02.04P	secure ***finish components***	***finish components*** are secured level, plumb, aligned and are visually appealing
F-20.02.05P	secure ***accessories***	***accessories*** are secured level, plumb, aligned and are visually appealing according to ***drawings***, ***specifications*** and ***standards and regulations***
F-20.02.06P	attach ***built-in components***	***built-in components*** are attached level, plumb, aligned and are visually appealing
F-20.02.07P	secure accessibility components	accessibility components are secured according to ***drawings***, ***specifications, standards and regulations***
F-20.02.08P	attach hand rails and guards	hand rails and guards are attached according to ***drawings***, ***specifications, standards and regulations***
F-20.02.09P	attach ***balustrade components***	***balustrade components*** are attached according to ***drawings***, ***specifications, standards and regulations***

Range of Variables

tools and equipment include: see Appendix B

finish components include: trim, casings, baseboards, crown mouldings, jamb extensions, window sills, aprons, handrails, balustrades

accessories include: towel bars, shower rods, grab bars, mirrors, backing

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

standards and regulations include CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

built-in components include: cabinets, shelves, walk-in closets, mantels, counter tops, access hatches

balustrade components include: newels, balusters, hand rails, filets

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-20.02.01L	demonstrate knowledge of ***finish components, built-in components,*** accessibility components, hand rails and guards***, balustrade components*** and ***accessories***, their characteristics and applications	identify types of ***finish components, built-in components,*** accessibility components, hand rails and guards***, balustrade components*** and ***accessories***, and describe their characteristics and applications
F-20.02.02L	demonstrate knowledge of procedures to install ***finish components, built-in components***, accessibility components, hand rails and guards, ***balustrade components*** and ***accessories***	identify ***tools and equipment*** used to install ***finish components, built-in components***, accessibility components, hand rails and guards, ***balustrade components*** and ***accessories***, and describe their procedures for use
		describe procedures to install ***finish components, built-in components,*** accessibility components, hand rails and guards, ***balustrade components*** and ***accessories***
		describe sequence of installation of ***finish components, built-in components,*** accessibility components, hand rails and guards, ***balustrade components*** and ***accessories***
		identify ***fasteners*** and anchors, and describe their characteristics and applications
		identify types of ***joints***, and describe their characteristics and applications
		describe boring techniques
		describe marking techniques
F-20.02.03L	demonstrate knowledge of regulatory requirements for installing components and ***accessories***	identify ***standards and regulations*** for installing components and ***accessories***

Range of Variables

finish components include: trim, casings, baseboards, crown mouldings, jamb extensions, window sills, aprons, handrails, balustrades

built-in components include: cabinets, shelves, walk-in closets, mantels, counter tops, access hatches

balustrade components include: newels, balusters, hand rails, filets

accessories include: towel bars, shower rods, grab bars, mirrors, backing

tools and equipment include: see Appendix B

fasteners include: adhesives, nails, brackets, clips, screws, dowels, biscuits

joints includes: coped, mitre, butt, dovetailed, lap, scarf

standards and regulations include CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

F-20.03 Constructs stairs

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
F-20.03.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
F-20.03.02P	calculate and confirm ***stair dimensions***	***stair dimensions*** are calculated and confirmed according to ***drawings, specifications, standards and regulations***
F-20.03.03P	select material	material is selected to ensure quality and uniformity
F-20.03.04P	measure and cut ***stair components***	***stair components*** are measured and cut according to confirmed dimensions, ***standards and regulations***
F-20.03.05P	assemble and install ***stair components***	***stair components*** are assembled and installed using ***fasteners*** according to ***standards and regulations***
F-20.03.06P	install skirt boards and mouldings	skirt boards and mouldings are installed according to ***drawings*** and ***specifications***

Range of Variables

tools and equipment include: see Appendix B

stair dimensions include: openings, total rise, total run, headroom, tread depth, unit rise, unit run

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

standards and regulations include CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

stair components include: stringers, treads, risers, glue blocks, wedges, handrails, landings

fasteners include: lag bolts, screws, adhesives

	Knowledge	
	Learning Outcomes	**Learning Objectives**
F-20.03.01L	demonstrate knowledge of ***stairs***, their ***components***, characteristics and applications	identify types of ***stairs*** and their ***components***, and describe their characteristics and applications
		identify types of ***stringers***, and describe their characteristics and applications
F-20.03.02L	demonstrate knowledge of procedures to construct ***stairs***	identify ***tools and equipment*** used to construct ***stairs***, and describe their procedures for use
		describe procedures to construct ***stairs*** and ***stringers***
		describe sequence of installation of ***stair components***
		describe geometry and calculations used to perform layout
		describe lamination processes to create ***stair components***
		identify abrasives and adhesives, and describe their characteristics and applications
		identify ***fasteners*** and anchors, and describe their characteristics and applications
		describe boring techniques
		describe marking techniques
		identify different types of wood used to finish stairs, and describe their characteristics and applications
F-20.03.03L	demonstrate knowledge of regulatory requirements for constructing ***stairs***	identify ***standards and regulations*** for constructing ***stairs***

Range of Variables

stairs include: straight, stairs with landings, spirals, circular, manufactured

stair components include: stringers, treads, risers, glue blocks, wedges, handrails, landings

stringers include: open, housed, laminated

tools and equipment include: see Appendix B

fasteners include: lag bolts, screws, adhesives

standards and regulations include CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Major Work Activity G
Performs renovations

Task G-21 Performs renovation-specific support activities

Task Descriptor

Carpenters perform renovations on existing structures, and this includes removing existing materials and protecting structures and applying techniques to support existing structures.

G-21.01 Removes existing material

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
G-21.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
G-21.01.02P	assess existing structure for ***pre-existing conditions***	existing structure is assessed for ***pre-existing conditions***
G-21.01.03P	obtain applicable documentation including permits	applicable documentation including permits are obtained from relevant regulatory body
G-21.01.04P	identify ***materials*** to be removed	***materials*** to be removed are identified according to ***conditions***, project requirements, ***drawings*** and ***specifications***
G-21.01.05P	identify ***structures*** to be removed or repaired	***structures*** that need to be removed or repaired are identified according to project requirements and ***drawings***
G-21.01.06P	identify ***materials*** that may be reclaimed and reused	***materials*** that may be reclaimed and reused are identified
G-21.01.07P	remove ***components*** and sort for reuse or disposal	***components*** are sorted for reuse or disposal according to project requirements, ***standards and regulations***

G-21.01.08P	report, abate and contain ***hazardous materials and substances***	***hazardous materials and substances*** are reported, abated and contained according to ***standards and regulations***
G-21.01.09P	remove existing ***materials*** and sort for reuse or disposal	existing ***materials*** are removed and sorted for reuse or disposal according to project requirements, ***standards and regulations***

Range of Variables

tools and equipment include: see Appendix B

pre-existing conditions include: out-of-square, out-of-level, integrity of existing structure

materials include: wood, concrete, insulation, glass, shingles

conditions include: rot/mold, damage, undersized materials, hazardous materials and substances (lead-based paints, asbestos)

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

specifications include: project, engineer, manufacturers'

structures include: doors and windows, exterior walls, concrete foundations

components include: lintels, beams, windows, insulation, roofs, grade beams and walls

hazardous materials and substances include: lead-based paint, mold, animal feces, silica, carcinogenic (asbestos, polychlorinated biphenyl [PCBs])

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

	Knowledge	
	Learning Outcomes	**Learning Objectives**
G-21.01.01L	demonstrate knowledge of existing ***materials***, their characteristics and applications	identify types of existing ***materials,*** and describe their characteristics and applications
		describe appearance and effects of ***conditions***
		describe removal and disposal methods of ***materials***
		identify tarps, hoardings and separations, and describe their characteristics and applications
		describe removal methods of ***framing systems***
		describe removal methods of interior and exterior ***finishing systems***
		describe ***techniques to protect project***, their characteristics and applications
		describe removal methods of ***beam supports***
		describe support or removal methods of load bearing walls

		identify destructive and non-destructive methods of identifying and assessing existing structures, and describe their characteristics and applications
		identify types of ***hazardous materials and substances***, and describe steps that should be followed for abatement
		describe methods of temporary shoring
		identify historical building conservation requirements
G-21.01.02L	demonstrate knowledge of procedures to remove existing ***materials***	identify ***tools and equipment*** used to remove existing ***materials***, and describe their procedures for use
		describe procedures and sequence to remove existing ***materials***
		describe ***material*** removal methods that prevent damage to adjacent structures or components
G-21.01.03L	demonstrate knowledge of training and certification requirements for removing existing ***materials***	identify training and certification requirements for removing existing ***materials***
G-21.01.04L	demonstrate knowledge of regulatory requirements for removing existing ***materials***	identify ***standards and regulations*** for removing existing ***materials***

Range of Variables

materials include: wood, concrete, insulation, glass, shingles

conditions include: rot/mold, damage, undersized materials, hazardous materials and substances (lead-based paints, asbestos)

framing systems include: balloon, platform, energy-efficient framing, post and beam, mass timber

finishing systems include: lath and plaster, masonry, siding, stucco

techniques to protect project include: hoarding, heating, floor protection, weather protection, protection for existing finishes

beam supports include: steel, wood, concrete

hazardous materials and substances include: lead-based paint, mold, animal feces, silica, carcinogenic (asbestos, PCBs)

tools and equipment include: see Appendix B

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

G-21.02 Protects structure during renovations

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
G-21.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
G-21.02.02P	identify location and types of ***temporary supports***	location and types of ***temporary supports*** are identified according to loading conditions and ***drawings***
G-21.02.03P	identify location and types of ***hoarding and coverings***	location and types of ***hoarding and coverings*** are identified according to ***drawings***, ***standards and regulations***
G-21.02.04P	identify permitting requirements	permitting requirements are identified according to ***standards and regulations***
G-21.02.05P	construct and install ***temporary supports***	***temporary supports*** are constructed and installed according to ***drawings***, project requirements, ***standards and regulations***
G-21.02.06P	install ***hoarding and coverings***	***hoarding and coverings*** are installed to protect ***materials, areas, structures*** and ***occupants*** that may be compromised or damaged during renovation activities
G-21.02.07P	assess existing ***building envelope components***	***building envelope components*** are assessed according to current ***standards and regulations***
G-21.02.08P	install ***building envelope components***	***building envelope components*** are installed according to ***standards and regulations***

Range of Variables

tools and equipment include: see Appendix B

temporary supports include: scaffolding, pipe jacks, pilings, beams, posts

drawings include: project, shop, engineering, electrical, architectural, mechanical, structural

hoarding and coverings include: tarps, drop cloths, plywood, cardboard

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

materials, areas and structures include: finished floors, ceilings, walls, trim and door frames, cabinets, walkways, trees

occupants include: tenants, homeowners, public, other trade workers

building envelope components include: building paper, water proofing membranes, flashings, caulking, vapour barriers, insulation, air barriers

	Knowledge	
	Learning Outcomes	**Learning Objectives**
G-21.02.01L	demonstrate knowledge of protecting structure during renovations, their characteristics and applications	identify types of ***hoarding and coverings*** used during renovations, and describe their characteristics and applications
		describe ***temporary supports***, their characteristics and applications
		identify ***techniques to protect project***, and describe their characteristics and applications
		identify types of ***hazardous materials and substances***
		describe methods of containment and abatement of ***hazardous materials and substances*** by certified personnel
		describe methods and sequencing of temporary shoring to protect surrounding structure
		identify historical building conservation requirements
G-21.02.02L	demonstrate knowledge of ***building envelope components***	identify ***building envelope components***
G-21.02.03L	demonstrate knowledge of procedures to protect structure during renovations	identify ***tools and equipment*** used to protect ***materials, areas, structures*** and ***occupants*** during renovations, and describe their procedures for use
		describe procedures to protect ***occupants*** who may be hurt, and ***materials, areas, structures*** that may be compromised or damaged during renovation activities
		describe material removal methods that prevent damage to adjacent structures or components
G-21.02.04L	demonstrate knowledge of training and certification requirements for protection and conservation during renovations	identify training and certification requirements for protection and conservation during renovations
G-21.02.05L	demonstrate knowledge of regulatory requirements for protection and conservation during renovations	identify ***standards and regulations*** for protection and conservation during renovations

Range of Variables

hoarding and coverings include: tarps, drop cloths, plywood, cardboards

temporary supports include: scaffolding, pipe jacks, pilings, beams, posts

techniques to protect project include: hoarding, heating, floor protection

hazardous materials and substances include: lead-based paint, mold, animal feces, silica, carcinogenic (asbestos, PCBs)

building envelope components include: building paper, water proofing membranes, flashings, caulking, vapour barriers, insulation, air barriers

tools and equipment include: see Appendix B

materials, areas and structures include: finished floors, ceilings, walls, trim and door frames, cabinets, walkways, trees

occupants include: tenants, homeowners, public, other trade workers

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Task G-22 Performs renovation-specific construction activities

Task Descriptor

Carpenters perform renovation-specific construction tasks that include adding to and changing existing structures. Renovations have a unique requirement in that the new and existing structures must be blended together to form one cohesive unit.

G-22.01 Joins new to existing construction

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
G-22.01.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
G-22.01.02P	assess existing structure for ***pre-existing conditions***	existing structure is assessed for ***pre-existing conditions***
G-22.01.03P	obtain applicable documentation including permits	applicable documentation including permits are obtained from relevant regulatory body
G-22.01.04P	select materials	materials are selected according to compatibility with existing materials, drawings, specifications, and current ***standards and regulations***

G-22.01.05P	install ***exterior components***	***exterior components*** are installed to make weatherproof transition from new to existing construction
G-22.01.06P	install ***building envelope components***	***building envelope components*** are installed to make weatherproof transition from new to existing construction
G-22.01.07P	use ***procedures*** to ensure a continuous building envelope is maintained	***procedures*** are used to ensure a continuous building envelope is maintained
G-22.01.08P	install new materials	new materials are installed using methods that prevent damage to adjacent structure and components of structure
G-22.01.09P	transition new material to existing ***materials and assemblies***	new material is transitioned to existing ***materials and assemblies*** for good bond and aesthetic purposes
G-22.01.10P	install ***fasteners*** and ***adhesives***	***fasteners*** and ***adhesives*** are installed according to manufacturers' specifications, ***standards and regulations***

Range of Variables

tools and equipment include: see Appendix B

pre-existing conditions include: out-of-square, out-of-level, integrity of existing structure

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

exterior components include: flashing, sheathing, doors, windows, soffit, fascia, rain screens, roof and wall cladding

building envelope components include: building paper, water proofing membranes, flashings, caulking, vapour barriers, insulation, air barriers

procedures include: joining new windows and doors to existing vapour and air barriers, joining new roof and wall cladding to existing roof and wall cladding, joining new foundation to existing foundation

materials and assemblies include: concrete, framing, exterior claddings, roof assemblies, interior finishes

fasteners include: screws, hangers, nails, tie-downs, anchor bolts,

adhesives include: construction adhesive, silicone

	Knowledge	
	Learning Outcomes	**Learning Objectives**
G-22.01.01L	demonstrate knowledge of joining new to existing ***materials and assemblies***, their characteristics and applications	identify ways new material is transitioned to existing ***materials and assemblies*** for good bond, aesthetic purposes
		describe energy-efficient retrofit techniques
		describe ***material and assembly*** installation methods that prevent damage to existing structures and components
		describe methods to accommodate ***pre-existing conditions***

		describe impacts of adding, removing or modifying ***materials and assemblies***
		describe methods to accommodate differential movement between new and existing construction
		identify types of current exterior roof and wall cladding and describe their compatibility with existing materials and installation requirements
		identify types of framing systems, and describe their compatibility and procedures to join new to existing
		identify materials manufactured to be compatible with existing and to replicate historic design features
G-22.01.02L	demonstrate knowledge of procedures to join new to existing construction	identify ***tools and equipment*** used to join new to existing construction, and describe their procedures for use
		describe procedures and sequence to join new to existing construction
		describe procedures used to compensate for conditions when joining new and existing construction
		describe methods used to lay out and construct new wall assemblies that meet existing wall assemblies
		describe adjustments used to blend new roof members or structure and existing roof
G-22.01.03L	demonstrate knowledge of ***fasteners*** and ***adhesives***, their characteristics, applications and procedures for use	identify ***fasteners*** and ***adhesives***, and describe their characteristics and applications
		describe procedures to use ***fasteners*** and ***adhesives*** during installation according to ***standards and regulations***
G-22.01.04L	demonstrate knowledge of training and certification requirements for joining new to existing construction	identify training and certification requirements for joining new to existing construction
G-22.01.05L	demonstrate knowledge of regulatory requirements for joining new to existing construction	identify ***standards and regulations*** for joining new to existing construction

Range of Variables

materials and assemblies include: concrete, framing, exterior claddings, roof assemblies, interior finishes

pre-existing conditions include: out-of-square, out-of-level, integrity of existing structure

tools and equipment include: see Appendix B

fasteners include: screws, hangers, nails, tie-downs, anchor bolts

adhesives include: construction adhesive, silicone

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

G-22.02 Changes existing structure during renovations

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

	Skills	
	Performance Criteria	**Evidence of Attainment**
G-22.02.01P	select and use ***tools and equipment***	***tools and equipment*** are selected and used according to project requirements and manufacturers' specifications
G-22.02.02P	change existing ***openings***	existing ***openings*** are changed to accommodate new ***components***
G-22.02.03P	change existing structures	existing structures are changed to meet project requirements using ***methods***
G-22.02.04P	relocate ***components***	***components*** are relocated
G-22.02.05P	change ***structural supports***	***structural supports*** are changed according to project requirements
G-22.02.06P	install ***fasteners*** and ***adhesives***	***fasteners*** and ***adhesives*** are installed according to manufacturers' specifications, ***standards and regulations***

Range of Variables

tools and equipment include: see Appendix B

openings include: stairwells, exterior and interior doors and windows

components include: stairs, built-ins (cabinets, shelves), windows, doors

methods include: adding insulation, replacing cladding, windows and doors

structural supports include: columns, beams, walls, lintels

fasteners include: screws, hangers, nails, tie-downs, anchor bolts

adhesives include: construction adhesive, silicone, sealants

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

	Knowledge	
	Learning Outcomes	**Learning Objectives**
G-22.02.01L	demonstrate knowledge of procedures to change existing structure during renovations	identify ***tools and equipment*** used to change existing structure during renovations, and describe their procedures for use
		describe procedures to change existing structure during renovations
		describe procedures and sequence to change existing ***openings***
		describe procedures and sequence to relocate ***components***
		describe procedures and sequence to change ***structural supports***
		describe procedures to upgrade existing materials and assemblies
G-22.02.02L	demonstrate knowledge of ***fasteners*** and ***adhesives***, their characteristics, applications and procedures for use	identify ***fasteners*** and ***adhesives***, and describe their characteristics and applications
		describe procedures to use ***fasteners*** and ***adhesives*** during installation according to ***standards and regulations***
G-22.02.03L	demonstrate knowledge of training and certification requirements for changing existing structure during renovations	identify training and certification requirements for changing existing structure during renovations
G-22.02.04L	demonstrate knowledge of regulatory requirements for changing existing structure during renovations	identify ***standards and regulations*** for changing existing structure during renovations

Range of Variables

tools and equipment include: see Appendix B

openings include: stairwells, exterior and interior doors and windows

components include: stairs, built-ins (cabinets, shelves), windows, doors

structural supports include: columns, beams, walls, lintels

fasteners include: screws, hangers, nails, tie-downs, anchor bolts

adhesives include: construction adhesive, silicone, sealants

standards and regulations include: CSA, OH&S, building codes (NBC, local), site-specific (company or client), jurisdictional requirements

Appendix A
Acronyms

CNC	computer numerical control
CSA	Canadian Standards Association
FRP	Fibreglass reinforced panels
HVAC	Heating, ventilation and air conditioning
ICF	Insulated concrete forms
ICI	Institutional commercial industrial
MDF	Medium density fibreboard
NBC	National Building Code
OH&S	Occupational Health and Safety
OSB	Oriented strand board
PCBs	polychlorinated biphenyl
PPE	Personal protective equipment
RFI	Request for information
SDS	safety data sheet
SIPs	Structural insulated panel system
STC	Sound transmission class
VDR	Vapour diffusion retarder
VOC	Volatile organic compound
WHMIS	Workplace Hazardous Materials Information System
WLL	Working load limit
WWM	Welded wired mesh
XPS	Extruded polystyrene

Appendix B
Tools and Equipment / Outils et équipement

Hand Tools / Outils à main

adjustable wrench	clé réglable
aviation snips	cisailles de type aviation
bars (pry, wrecking, aligning)	barres (leviers, de démolition, d'alignement)
brad driver	guide-clous à tête perdue
broom	balais
brushes	brosses
floats	aplanissoires
butt gauge	trusquin d'assemblage
carpenter's apron	tablier de charpentier
caulking gun	pistolet à calfeutrer
chalk line	cordeau traceur
circle cutter	trépan
clamps	serre-joints
cold chisel	ciseaux à froid
concrete edgers	coupe-bordures pour le béton
cone/tie wrench	clé à cône
dry line	cordeau
drywall t-square	équerre en T pour cloison sèche
file	lime
finish trowel	truelle de finition
framing square	équerre de charpentier
hammers (framing, finishing, dead blow, rubber mallet, wood mallet, sledge, roofing, drywall)	marteaux (de construction, de finition, marteau à amortisseur, maillet en caoutchouc, maillet en bois, masse, marteau à toiture, marteau à cloison sèche)
hand float	taloche à main
hand level (24", 48", 6-ft., 8-ft., torpedo, line)	niveaux à main (24 po, 48 po, 6 pi, 8 pi, niveau torpille, niveau de ligne)
hand saws (pull, hack, keyhole, drywall, coping, rip, hole, cross cut, back, pruning)	scies à main (scie japonaise, scie à métaux, scie à guichet, scie pour cloison sèche, scie à chantourner, scie à refendre, scie cylindrique, scie à tronçonner, scie à dos, scie à élaguer)
hatchet	hachette
knives (utility, drywall)	couteaux (universel, pour cloison sèche)
measuring tape (various)	rubans à mesurer (divers)
multi-driver screwdriver	tournevis universel
nail puller	arrache-clou

nail set	chasse-clou
pencil/marking instrument	crayon et instrument de marquage
pipe wrench	clé à tuyau
planes (various)	surfaces planes (diverses)
pliers and side cutter	pinces et pinces à tranchant latéral
plumb bob	fils à plomb
rakes	râteaux
rasp	râpe
rollers	rouleaux
scrapers (cabinet, floor, form)	grattoirs (d'ébéniste, de plancher, à manche)
screwdrivers (Robertson, Phillips, straight, Torx, hexagonal)	tournevis tournevis (Robertson, Phillips, droits, Torx, à tête hexagonale)
shovels	pelles
siding shears	cisailles à déclin
slide hammer	marteau à inertie
sliding t-bevel	fausse équerre en T coulissante
speed square	équerre rapide
spud wrench	clé à mâchoires
stapler (hammer, hand, electric)	agrafeuse (marteau agrafeur, à main, électrique)
string lines	cordeaux
tarps	bâches
tile cutter	coupe-carreaux
tin snips	cisailles de ferblantier
trowels	truelles
wall jack	vérin à mur
wheelbarrow	brouette
wood chisels	ciseaux à bois

Portable Power Tools and Accessories / Outils mécaniques portatifs et accessoires

biscuit joiner	fraiseuse à lamelles
calculator	calculatrice
chainsaw	scie à chaîne
circular saw	scie circulaire
cordless drill	perceuse sans fil
coring drill and bits	mèche à annulaire et forets
cut-off saw (metal)	scie à tronçonner (métal)
cut-out tools	outils à découper
concrete bits	mèches à béton
concrete cutting saw	scie à béton
concrete vibrators	vibrateur à béton
construction heaters	radiateurs de construction

drywall gun	pistolet à cloison sèche
electric chipping hammer	marteau à piquer électrique
electric drill and bits	perceuse électrique et forets
electric shears	cisailles électriques
extension cords	rallonges électriques
fan-forced heater	pulso-radiateur
fuel cell nailer	cloueuse à pile à combustible
generator	génératrice
grinders	meuleuses
hammer drill	marteau perforateur
hydraulic jacks	vérins hydrauliques
jackhammer	marteau-piqueur
jigsaw	scie sauteuse
laminate trimmer	rogneuse à laminé
mini-grinder	mini meuleuse
mitre saw	scie à onglets
oscillating multi tool	outils oscillants polyvalents
planer	raboteuse
porta power	accessoires d’outils mécaniques portatifs
powder-actuated tools	outils à charge explosive
reciprocating saw	scie alternative
rotary cut out tools	outils à découper rotatifs
router and bits	toupie et fraises
sanders (palm, belt, random, detail)	ponceuses (à main, à courroie, orbitales spéciales, de précision)
power screed	règle vibrante
staplers	agrafeuses
tiger torch	buse de lance-flammes
tile wet saw	scie à eau à carreaux
wet/dry vacuum	aspirateur d’atelier
wood boring bits	mèches à mortaiser le bois
wood spade bit set	jeu de forets à trois pointes pour le bois

Stationary Power Tools / Outils mécaniques fixes

band saw	scie à ruban
disk sander/drum sander	ponceuse à disque/ ponceuse à tambours
drill press	perceuse à colonne
dust collection equipment	équipement de dépoussiérage
grinder	meuleuse
jointer	fer à joints
mortiser	mortaiseuse

power feeder	entraîneur automatique
radial arm saw	scie radiale
router table	table à toupie
shaper	machine à façonner
table saw	scie circulaire à table
thickness planer	raboteuse
wood lathe	tour à bois

Pneumatic Tools and Equipment / Outils et équipement pneumatiques

air compressor	compresseur d’air
air dryers	déshydrateur d'air
drills	perceuses
fittings	raccords
gauges	guides de traçage
hoses	boyaux
impact gun	pistolet cloueur
nailers	cloueuses
sandblasters	décapeuse au jet de sable
shears	cisailles
staplers	agrafeuses
wrenches	clés

Rigging and Hoisting Equipment / Équipement de gréage et de levage

blocks and tackles	palans à moufles
bosun’s chair	chaise de gabier
cables	câbles
chokers	élingues à étranglement
come-alongs	palans à levier
eyebolts	boulons à œil
forklifts (variable reach forklifts)	chariots élévateurs à fourche (chariots élévateurs à portée variable)
grip hoist (tirfors)	treuils à câble (Tirfor)
ladder hoist	échelle monte-charge
lifting beam	palonnier
pinch bar	barre-levier
pulleys	poulies
rigging	gréage
ropes	cordes
skid ramps	rampes d’attelage
skid steers	chargeuses à direction à glissement
slings	élingues

spreader bar	barre d'écartement
synthetic lifting straps	élingues de levage synthétiques
tag lines	câbles stabilisateurs
turnbuckles	tendeurs
wire rope	câble métallique

Stationary and Mobile Access Equipment / Équipement d'accès

aerial work platforms (AWP) (scissor lift, articulating boom lift (ABL), telescopic boom lift)	plateformes de travail élévatrices (PTE) (table élévatrice à ciseaux, à flèche articulée, télescopique)
guardrails	garde-corps
ladders	échelles
ladder jacks	échafaudages sur échelles
scaffolding	échafaudages
swing stage	échafaudage volant

Layout Instruments and Equipment / Outils de traçage

builder's levels	niveaux de menuisier
chalk lines	cordeaux traceurs
combination squares	équerres combinées
dividers	compas
drawing instruments	instruments de dessin
dry lines (string lines)	cordeaux
framing squares	équerres de charpentier
jigs	gabarits de montage
laser level	niveaux laser
laser measuring system	systèmes de mesure laser
measuring tapes	rubans à mesurer
plumb bobs	fils à plomb
robotic survey equipment	instruments d'arpentage robotisés
scale rulers	règles graduées
scribers	pointes à tracer
scribing compasses	compas de traçage
sliding T-bevel s	fausses équerres en T coulissantes
speed squares	équerres rapides
stair gauges	guides de traçage pour escaliers
templates	gabarits
theodolites	théodolites
total stations	stations totales
transits	théodolites
try squares	équerre de menuisier

Personal Protective Equipment (PPE) and Safety Equipment / Équipement de protection individuelle (EPI) et équipement de sécurité

carabiner	mousqueton
chainsaw safety boots	bottes pour travaux de scie à chaîne
chainsaw safety pants/chaps	pantalons/chapeaux de protection pour travaux de scie à chaîne
fall arrest anchor points	points d'ancrage des dispositifs antichute
fall protection equipment	équipement de protection antichute
first aid kits	trousses de premiers soins
full body harness	harnais de sécurité complet
gloves	gants
hard hat	casque de sécurité
hearing protection	protecteur auditif
knee pads	genouillères
lanyard	corde d'amarrage
reflective vest	gilet réflecteur
respiratory equipment, dust mask and respirators	appareil respiratoire, masque antipoussière et respirateurs
roof jack	support de fixation rapide
rope grab	coulisseau de sécurité
safety boots	bottes de sécurité
safety glasses and shields	lunettes de sécurité et écran facial
safety lifeline	corde de sécurité
solar protection	protection contre le soleil

Appendix C
Glossary / Glossaire

access flooring	a secondary raised floor system that bears on a primary floor, used to create a chase for routing electrical and computer wiring, ventilation ducts, etc.	**faux-plancher**	plancher secondaire surélevé supporté par un plancher principal, utilisé pour créer un passage pour le câblage électrique et des ordinateurs, des conduits de ventilation, etc.
acclimatization	to make or become used to new climates or new conditions	**acclimatation**	s'habituer à de nouveaux climats ou à de nouvelles conditions
astragal	provides a solid edge for the operating door to seal onto in a double door application	**astragale**	permet à la porte en fonction d'un ensemble de porte à deux battants de se sceller sur un montant solide
back framing	the secondary non-structural framing done after the structural framing is completed; includes such items as valances, drop ceilings, chases and boxing for utilities, attic access, backing, etc.	**charpente arrière**	charpente secondaire non structurale construite après que la charpente structurale soit terminée; elle servira à l'installation des cantonnières, des plafonds suspendus, des passages et des espaces clos pour les services publics, des accès au grenier, de renforts pour des accessoires, etc.
balustrade	railing consisting of a series of balusters connected at the top by a rail	**balustrade**	rampe consistant en un ensemble de balustres et d'une main courante
batter boards	boards at each corner of an excavation to identify location of grid lines for the alignment of footings and foundation walls and columns	**planches de repère**	planches à chaque coin d'une excavation et aux lignes de quadrillage, utilisées pour délimiter l'emplacement et l'alignement des semelles, des murs de fondation et des colonnes
beam	a main horizontal structural member constructed of wood, steel or concrete used to support secondary loads	**poutre**	élément structurel horizontal fait en bois, en acier ou en béton et servant à supporter les autres charges
boatswain's chair (bosun's chair)	a seat composed of a plank suspended in a horizontal position from ropes to allow an individual to work on the exteriors of buildings, ships etc. while seated at a considerable height	**sellette (chaise de gabier)**	un siège composé d'une planche en position horizontale suspendue à des cordes qui permet à un ouvrier de travailler sur les parois extérieures d'immeubles, de bateaux, etc. tout en restant assis à une hauteur considérable
caisson	water tight box or enclosure used for construction work below grade or water level	**caisson**	boîte ou ouvrage étanche, utilisé pour des travaux de construction sous le niveau du sol ou de l'eau

cladding	the covering of one material with another	**bardage**	le recouvrement d’un matériau par un autre
column	a vertical structural member that supports the weight of other members	**colonne**	élément porteur vertical
cornice	the entire finished assembly where the walls of a structure meet the roof; sometimes called the eaves	**corniche**	le point de rencontre entre les murs et le toit sur la structure d’un assemblage terminé; parfois appelé avant-toit
curing	a process of maintaining adequate moisture content during hydration for quality concrete	**cure**	un procédé visant à maintenir un état d’humidité adéquat pendant l’hydratation afin d’obtenir un béton de qualité
demountable wall	a wall or partition system designed to be removed from a mounting, setting or place of support	**mur démontable**	un mur, ou une cloison, conçu pour être enlevé d’un support, d’un milieu ou d’une place de soutien
dunnage	wood strips or crating between materials that provides air circulation and lifting space; waste material	**fardage**	lattes de bois ou bois de caisse entre les matériaux pour permettre une circulation d’air et un espace de levage; déchets
embedded steel	steel components that are an integral part of concrete structures; this includes reinforcing steel, anchor bolts, angle iron and miscellaneous hardware	**acier encastré**	composants en acier faisant partie intégrante des structures en béton; y compris les armatures d’acier, les boulons d’ancrage, les cornières et la quincaillerie
falsework	the structural supports and the necessary bracing required for the support of temporary loads during construction	**ouvrage d’étaiement provisoire**	supports structuraux et contreventements nécessaires pour le soutien des charges provisoires pendant la construction
flooring	material used in the construction of floors where the surface material is known as finish flooring, while the base material is called sub-flooring	**revêtement de sol**	matériau utilisé dans l’installation de planchers; le matériau de surface est le revêtement de sol et le matériau sous le revêtement se nomme sous-plancher
fly ash	an additive used in concrete mixtures	**cendre volante**	adjuvent utilisé dans les mélanges de béton
footing	supporting element at the base or bottom of a foundation wall, pier or column used to distribute weight	**semelle**	élément porteur sous un mur de fondation, un pilier ou une colonne qui sert à répartir les charges
formwork	temporary structures constructed to the shape of the finished structural member, to support freshly poured concrete	**coffrage**	structure provisoire construite selon la forme de l’élément porteur fini pour supporter le béton fraîchement coulé

foundation	the lower part that rests on and extends into the ground, providing support for the structure above it	**fondation**	partie inférieure d'une structure qui repose au sol, qui s'étend au sous-sol, et qui supporte le poids des charges de la structure au-dessus
geometric stairs	stair systems that include: elliptical, curved or spiral stairs	**escalier géométrique**	comprend les escaliers elliptiques, tournants et en colimaçon
grout	a cementitious or epoxy-based mixture, installed in a plastic state, to fill structural (column base plates) and non-structural voids (tile joints)	**coulis**	mélange cimentaire ou à base de résine époxyde, mis en place à l'état plastique, pour remplir des vides structuraux (dalles de base de colonne) ou non structuraux (joints de carreaux)
header	a joist or rafter that is perpendicular to the trimmer joists or rafters, used to support and frame openings	**solive d'enchevêture**	solive ou chevron perpendiculaire aux solives ou aux chevrons d'enchevêtrure, pour supporter et créer les ouvertures
hoarding	temporary structure or fencing around a construction site for safety, weather or to maintain heat	**palissade**	structure ou clôture temporaire autour d'un chantier de construction pour la sécurité, les conditions météorologiques ou pour conserver la chaleur
hydration	a chemical reaction of cement and water causing concrete or mortar to harden	**hydratation**	une réaction chimique entre le béton et l'eau qui cause le durcissement du béton ou du mortier
insulated concrete forms (ICF)	a modular system for forming concrete walls made of insulating foam material (block, panel, plank systems) where the forms typically remain in place as part of the finished structure	**coffrage à béton isolé (CBI)**	système modulaire fait de mousse isolante pour couler des murs en béton où le coffrage reste en place et fait partie de la structure finie (systèmes de blocs, de panneaux, de madriers)
insulating	the installation of various materials used to resist heat, sound and cold transmission through walls, floors, ceilings and foundations	**isolation**	installation de divers matériaux dans le but de réduire la transmission de la chaleur, des sons et du froid à travers les murs, les planchers, les plafonds et les fondations
jack (trimmer) stud	a framing member that supports the lintel (header) and is used to provide added strength and stiffness around framed openings	**poteau nain**	élément de la charpente qui supporte le linteau et qui sert à donner plus de résistance et de rigidité autour des ouvertures câdrées
joist	one of a series of horizontal members used to support a floor, ceiling or roof	**solive**	élément horizontal utilisé en combinaison avec d'autres pour soutenir un plancher, un plafond ou un toit
jurisdictional requirement	requirements such as building codes and regulations, including those related to occupational health and safety, legislated through the federal, provincial/territorial or municipal levels of government	**exigences municipales, provinciales, territoriales et fédérales**	exigences comme le Code du bâtiment et les réglementations, y compris ceux liés à la santé et à la sécurité au travail, qui sont réglementés à l'échelle fédérale, provinciale, territoriale ou municipale

lintel	wood, stone or steel member placed across the top of a rough door or window opening; it supports the weight from above	**linteau**	élément en bois, en pierre ou en acier placé en travers de la partie supérieure d'une ouverture brute de porte ou de fenêtre; il permet de supporter le poids de la structure au-dessus de lui
load bearing wall	a wall that supports primary vertical loads	**mur porteur**	mur transférant des charges verticales principales
maintenance	activities required for the proper functioning of power tools such as inspecting, oiling, tensioning of chains or belts, adjusting, dusting air filters, etc.	**maintenance**	techniques d'entretien et de vérification employées pour permettre une utilisation optimale des outils à moteur tels l'inspection, la lubrification, la mise en tension de courroies ou de chaînes, le réglage, le nettoyage des filtres à air, etc.
pier	a foundation which distributes the weight of a column	**pilier**	élément de fondation qui répartit le poids d'une colonne
piles	structural members that are placed into soil to provide foundation support of buildings or other structures	**pieux**	éléments structurels placés dans le sol pour fournir un support de fondation aux bâtiments ou autres structures
ponding (wet curing)	a method of curing a concrete slab by flooding its surface with water	**trempage (cure humide)**	méthode de cure d'une dalle en béton consistant à la recouvrir d'eau
powder - actuated tool	device that drives fasteners by means of an explosive charge	**outil à charge explosive**	outil permettant d'ancrer des dispositifs de fixation au moyen d'une charge explosive
pre-fabricated	building or modular components built in different locations and installed on-site by carpenters	**préfabriqué**	bâtiment ou éléments modulaires fabriqués à différents endroits et installés sur place par des charpentiers ou des charpentières
pre-cast	concrete components cast in different locations and installed on-site by carpenters	**précoulé**	éléments en béton coulés à différents endroits et installés sur place par des charpentiers ou des charpentières
rafter	one of a series of structural members of a roof designed to support roof loads	**chevron**	élément faisant partie d'une série d'éléments porteurs d'un toit prévus pour supporter les charges du toit
rain screen	cavity in an exterior wall constructed to prevent wind, rain, moisture from penetrating the exterior wall to prevent mildew, premature rotting, etc.; rain screens effectively "drain the rain"	**écran pare-pluie**	paroi extérieure d'un mur comportant un vide conçu pour prévenir le vent, la pluie et l'humidité de pénétrer dans la paroi extérieure pour éviter la moisissure, la pourriture prématurée, etc.; écran pare-pluie repousse l'eau effectivement
rise	vertical measurement on stairs, ramps and roofs	**montée**	mesure verticale des marches, des mains courantes et des toits
run	horizontal measurement on stairs, ramps and roofs	**course**	mesure horizontale des marches, des mains courantes et des toits

shoring	v. describes the process of supporting a structure or excavation in order to prevent collapse so that construction can continue; n. refers to the material used in the process to support a structure or excavation; during excavation, shoring systems provide safety for workers in a trench and speeds up excavation	**étayer/étaiement/ contrevente-ment**	v. décrit comment soutenir une structure pour éviter qu'elle s'effondre afin de pouvoir poursuivre la construction; n. fait référence au matériel utilisé au cours du processus visant à soutenir une structure; pendant une excavation, l'étaiement est une mesure de sécurité pour les ouvriers travaillant dans une tranchée et accélère l'excavation
siding	boards and panels used as an exterior wall covering	**parement**	planches et panneaux utilisés comme revêtement extérieur d'un mur
SIPs	structural insulated panel systems; insulating material sandwiched between two layers of oriented strand board (OSB) or plywood, prefabricated in a factory	**panneau structurel isolé (PSI)**	panneau structurel isolé; composé de matériau isolant pris en sandwich entre deux panneaux à copeaux orientés (OSB) ou de contreplaqué, et préfabriqué en usine
site layout	location of primary building components on the building site via construction drawing interpretation in relation to grid property lines	**aménagement du chantier**	aménagement des composants primaires du bâtiment sur le chantier par l'interprétation des plans relativement aux limites de propriété
soffit	the underside of an architectural feature such as a beam, arch, ceiling, stairwell, vault or cornice	**soffite**	le dessous d'un élément architectural, comme une poutre, un arc, un plafond, une cage d'escalier, une voûte ou une corniche
square	having two sides that are at right angels (90 degrees to each other)	**équerre**	avoir deux angles qui sont des angles droits (séparés par 90 degrés)
stud	one of a series of vertical structural members used as support in walls and partitions	**poteau**	élément structurel vertical utilisé comme support dans les murs et les cloisons
subfloor	boards or sheet material laid perpendicular on joists under a finished floor	**sous-plancher**	matériaux en panneaux ou en feuilles, posés perpendiculairement sur les solives sous un plancher fini
temperature bars	steel rods placed horizontally in concrete slabs to prevent cracks due to temperature changes or drying; placed parallel to the reinforcing rods. The steel rods are placed at right angles to the main reinforcing bars	**barres de température**	tiges d'acier placées horizontalement dans les dalles de béton pour éviter les fissures dues aux changements de température ou au séchage; placées parallèlement aux barres d'armature. Les tiges d'acier sont placées à angle droit par rapport aux barres d'armature principales
temporary structure	any structure erected during construction that is removed upon completion of the project	**structure provisoire**	toute structure érigée pendant la construction et qui est enlevée quand le projet est terminé

tile	thin building material made of cement, plastic or other resilient material used as a finish for walls, floors, ceilings or roofs	**carreau**	matériau de construction de faible épaisseur fait de ciment, de plastique ou de tout autre matériau résilient utilisé comme finition de murs, de planchers, de plafonds ou de toitures
trimmer	see jack stud	**chevêtre**	voir poteau nain
yokes	ties or clamping devices installed around column forms or over the top of wall or footing forms to keep them from spreading because of pressure imposed by concrete placement	**colliers**	installation d’attaches ou de dispositifs de serrage autour de coffrages à colonnes ou à la partie supérieure du coffrage d’un mur ou d’une fondation pour empêcher les coffrages de s’écarter à cause de la pression exercée par le coulage du béton