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RED SEAL · SCEAU ROUGE

National Occupational Analysis

Carpenter

2013

CANADIAN STANDARD OF EXCELLENCE FOR SKILLED TRADES

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Carpenter

2013

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FOREWORD

The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this National Occupational Analysis (NOA) as the national standard for the occupation of Carpenter.

Background

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to cooperate with provincial and territorial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources and Skills Development Canada (HRSDC) sponsors a program, under the guidance of the CCDA, to develop a series of NOAs.

The NOAs 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 curricula for training leading to the certification of skilled workers;
- to facilitate the mobility of apprentices and skilled workers in Canada; and,
- to supply employers, employees, associations, industries, training institutions and governments with analyses of occupations.

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This analysis was prepared by the Labour Market Integration Directorate of ESDC. The coordinating, facilitating and processing of this analysis were undertaken by employees of the NOA development team of the Trades and Apprenticeship Division. The host jurisdiction of New Brunswick also participated in the development of this NOA.

Comments or questions about National Occupational Analyses may be forwarded to:

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STRUCTURE OF ANALYSIS

To facilitate understanding of the occupation, the work performed by tradespersons is divided into the following categories:

Blocks	the largest division within the analysis that is comprised of a distinct set of trade activities
Tasks	distinct actions that describe the activities within a block
Sub-Tasks	distinct actions that describe the activities within a task
Key Competencies	activities that a person should be able to do in order to be called 'competent' in the trade

The analysis also provides the following information:

Trends	changes identified that impact or will impact the trade including work practices, technological advances, and new materials and equipment
Related Components	a list of products, items, materials and other elements relevant to the block
Tools and Equipment	categories of tools and equipment used to perform all tasks in the block; these tools and equipment are listed in Appendix A
Context	information to clarify the intent and meaning of tasks
Required Knowledge	the elements of knowledge that an individual must acquire to adequately perform a task

The appendices located at the end of the analysis are described as follows:

Appendix A — Tools and Equipment	a non-exhaustive list of tools and equipment used in this trade
Appendix B — Glossary	definitions or explanations of selected technical terms used in the analysis
Appendix C — Acronyms	a list of acronyms used in the analysis with their full name
Appendix D — Block and Task Weighting	the block and task percentages submitted by each jurisdiction, and the national averages of these percentages; these national averages determine the number of questions for each block and task in the Interprovincial exam
Appendix E — Pie Chart	a graph which depicts the national percentages of exam questions assigned to blocks
Appendix F — Task Profile Chart	a chart which outlines graphically the blocks, tasks and sub-tasks of this analysis

DEVELOPMENT AND VALIDATION OF ANALYSIS

Development of Analysis

A draft analysis is developed by a committee of industry experts in the field led by a team of facilitators from ESDC. This draft analysis 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.

Draft Review

The NOA development team then forwards a copy of the analysis and its translation to provincial and territorial authorities for a review of its content and structure. Their recommendations are assessed and incorporated into the analysis.

Validation and Weighting

The analysis is sent to all provinces and territories for validation and weighting. Participating jurisdictions consult with industry to validate and weight the document, examining the blocks, tasks and sub-tasks of the analysis as follows:

BLOCKS	Each jurisdiction assigns a percentage of questions to each block for an examination that would cover the entire trade.
TASKS	Each jurisdiction assigns a percentage of exam questions to each task within a block.
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 NOA development team who then analyzes the data and incorporates it into the document. The NOA provides the individual jurisdictional validation results as well as the national averages of all responses. The national averages for block and task weighting guide the Interprovincial Red Seal Examination plan for the trade.

This method for the validation of the NOA also identifies common core sub-tasks across Canada for the occupation. If at least 70% of the responding jurisdictions perform a sub-task, it shall be considered common core. Interprovincial Red Seal Examinations are based on 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 a specific jurisdiction
NO	sub-task not performed by qualified workers in the occupation in a specific jurisdiction
NV	analysis Not Validated by a province/territory
ND	trade Not Designated in a province/territory
NOT COMMON CORE (NCC)	sub-task, task or block performed by 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 block 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

ANALYSIS

Safe working procedures and conditions, accident prevention, and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers and employees. It is imperative that all parties become aware of circumstances that may lead to injury or harm. Safe learning experiences and work environments can be created by controlling the variables and behaviours that may contribute to accidents or injury.

It is generally recognized that safety-conscious attitudes and work practices contribute to a healthy, safe and accident-free work environment.

It is imperative to apply and be familiar with the Occupational Health and Safety (OH&S) Acts and Workplace Hazardous Materials Information System (WHMIS) regulations. As well, it is essential to determine workplace hazards and take measures to protect oneself, co-workers, the public and the environment.

Safety education is an integral part of training in all jurisdictions. As safety is an imperative part of all trades, it is assumed and therefore it is not included as a qualifier of any activities. However, the technical safety tasks and sub-tasks specific to the trade are included in this analysis.

SCOPE OF THE CARPENTER TRADE

"Carpenter" is this trade's official Red Seal occupational title approved by the CCDA. This analysis covers tasks performed by carpenters whose occupational title has been identified by some provinces and territories of Canada under the following names:

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
Carpenter	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
General Carpenter						✓							
Carpenter – Joiner					✓								

Carpenters construct, 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 who specialize in such areas of trade practice as concrete forming, framing, finishing, interior systems and renovation. Carpenters are employed in a variety of job environments, including houses under construction or renovation, ICI and infrastructure projects, and plants that pre-fabricate buildings. They must be prepared to work in a variety of working environments.

Safety is of prime importance 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. Carpentry is a physically demanding occupation requiring the lifting of heavy tools and materials. Journeyperson carpenters are expected to mentor apprentices given the hands-on nature of the trade.

This analysis recognizes similarities and overlaps with the work of other tradespersons such as roofers, lathers (interior systems mechanics), drywall finisher 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.

The carpenter trade is constantly evolving with advanced innovations and technology for increased accuracy and efficiency. There is an increase in the use of specialized power tools that are taking the place of some hand tools. Such tools as detail sanders, layout instruments (total stations) and laser levels are making the carpenters' work more accurate and 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. Scissor lifts, rolling platforms and zoom booms are replacing scaffolding and ladders on many job sites. Cordless tools are now commonplace and are improving in longevity, durability and torque. Lithium ion technology for cordless tools is becoming more common.

Some concrete forming systems are now made of plastics, composites and aluminium, making concrete forming more versatile and efficient. New engineered forming systems such as insulated concrete forms (ICF) have emerged in the industry.

Triple glazed windows and UV rated glass are becoming more popular due to thermal efficiency. For ease of installation and pricing consideration, engineered hardwood and laminate flooring are increasing in popularity. Soundproofing systems are evolving with the introduction of sound transmission class (STC) assemblies including insulation products such as mineral wool insulation (Roxul®). Countertop materials have diversified with materials such as stone, composite stone and concrete.

There are a number of "green building" certification systems becoming commonplace in the governmental and private construction industry. 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. Low volatile organic compound (VOC) building products are increasingly being demanded by the public.

Many companies in the construction industry are providing leadership in safety awareness and in the enforcement of safety policies on the job site. Safety training and the development of safety policies and procedures are being done by many companies in excess of regulations.

The renovation sector has ballooned and condo development has increased. Carpenters are becoming more specialized in specific fields of carpentry. The mentoring of entry level workers is becoming more pronounced in the worksite and at apprenticeship technical training.

ESSENTIAL SKILLS SUMMARY

Essential skills are needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.

Through extensive research, the Government of Canada and other national and international agencies have identified and validated nine essential skills. These skills are used in nearly every occupation and throughout daily life in different ways.

A series of CCDA-endorsed tools have been developed to support apprentices in their training and to be better prepared for a career in the trades. The tools can be used independently or with the assistance of a tradesperson, trainer, employer, teacher or mentor to:

- understand how essential skills are used in the trades;
- learn about individual essential skills strengths and areas for improvement; and
- improve essential skills and increase success in an apprenticeship program.

The tools are available online or for order at: www.hrsdc.gc.ca/essentialskills

The application of these skills may be described throughout this document within the competency statements which support each subtask of the trade. The following are summaries of the requirements in each of the essential skills, taken from the essential skills profile. A link to the complete essential skills profile can be found at www.red-seal.ca.

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 and building permit applications.

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 for example. They may also write accident or incident reports depending on the jurisdiction.

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 and customers, 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, 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 they calculate runs and rises to build stairs and rafters. Carpenters estimate material and time requirements to complete a project.

Thinking Skills
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 pairs 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 job through combined effort and organized co-operation.

Digital Technology
Carpenters use digital survey equipment, calculators and portable electronic devices to complete numeracy-related tasks such as calculating material requirements. They may use a variety of software such as word processing, spreadsheets, databases, accounting, communication and estimating software. 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.

Trends

In the carpentry trade, the use of technology has increased. More tools and equipment have become digitalized.

There is greater emphasis on safety practices on job sites due to more stringent jurisdictional regulations and the competitive nature of bidding and winning project contracts.

The availability of environmentally friendly building materials has increased.

Related Components

All components apply.

Tools and Equipment

See Appendix A.

Task 1 Uses and maintains tools and equipment.

Context

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

Required Knowledge

K 1	manufacturers' specifications
K 2	types of hand tools such as boring, cutting, abrading, planing, assembly, dismantling, measuring, squaring, marking and clamping tools
K 3	RPM ratings for blades and discs and the importance of matching this rating to power tool RPM
K 4	types of portable power tools such as electric, pneumatic, battery-powered and gas-powered
K 5	types of stationary tools such as table saws, planers and jointers
K 6	types of powder-actuated tools and shots
K 7	safe operating procedures for powder-actuated tools
K 8	licensing and training requirements for the use of powder-actuated tools, chainsaws and power elevated work platforms
K 9	types of fasteners
K 10	safety precautions, hazards, risks and safe work procedures

K 11	types of lifting, rigging and hoisting equipment
K 12	components of lifting, rigging and hoisting equipment
K 13	hand signals for lifting, rigging and hoisting
K 14	rigging and hoisting practices such as load weight calculations, working load limits (WLL) and sling angles
K 15	knots and hitches
K 16	regulations and requirements for the operation of material handling and access equipment such as zoom booms, skid steers and fork lifts
K 17	types of layout instruments/equipment such as total stations, digital theodolites, laser levels and builder's levels
K 18	basic survey theory and terminology
K 19	tack welding techniques and practices
K 20	training requirements for tack welding equipment
K 21	torch cutting techniques and practices

Sub-task

A-1.01 Maintains hand, power and pneumatic tools.

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

Key Competencies

A-1.01.01	organize and store tools in clean, dry, ventilated and secure area to prevent damage
A-1.01.02	add protective coating to hand tools such as wrenches and block planes
A-1.01.03	lubricate gas powered and pneumatic tools such as chainsaws and nailers according to manufacturers' specifications to prevent rusting and corrosion, and to protect internal components
A-1.01.04	sharpen tools such as planes, drill bits, chainsaws and chisels
A-1.01.05	recognize worn, damaged and defective tools, and tag and remove from service
A-1.01.06	charge batteries according to manufacturers' specifications to avoid damage to battery
A-1.01.07	clean tools for ease of operation and longevity
A-1.01.08	inspect tools, hoses and safety connections (whip checks) to prevent damage to tools and injury to workers

A-1.01.09	change oil and filter of pneumatic tools according to manufacturers' specifications
A-1.01.10	drain compressor tank after use to prevent corrosion of tank and damage to tools

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Sub-task

A-1.02 Maintains stationary tools.

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

Key Competencies

A-1.02.01	remove, sharpen or replace dull or damaged knives on planers and jointers
A-1.02.02	adjust and align belts and cutting blades of stationary tools such as jointers, planers and table saws according to manufacturers' specifications to prevent wear and to maintain proper operation
A-1.02.03	maintain guards such as anti-kickback devices and belt guards to prevent injury
A-1.02.04	clean tools to ensure smooth operation and to eliminate cutting hazards and injuries
A-1.02.05	recognize damaged and worn components such as knives and blades, and tag and remove from service

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Sub-task

A-1.03 Uses powder-actuated tools.

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

Key Competencies

A-1.03.01	inspect powder-actuated tools prior to use to detect faults and defects
A-1.03.02	dismantle, lubricate, clean and re-assemble powder-actuated tools according to manufacturers' specifications
A-1.03.03	store tools, pins and shots in a secure, clean and dry location
A-1.03.04	handle powder-actuated tools according to manufacturers' specifications and jurisdictional requirements

Sub-task

A-1.04 Uses lifting, rigging and hoisting equipment.

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

Key Competencies

A-1.04.01	select and use hand signals for lifting, rigging and hoisting loads
A-1.04.02	select and tie knots according to load and application
A-1.04.03	select lifting and rigging equipment according to load and application
A-1.04.04	set up load using dunnage to enable access for lifting chains and slings, and for storage
A-1.04.05	secure load using rigging methods such as choking, slinging and securing hooks
A-1.04.06	locate lifting points to ensure proper sling angle and to balance and secure the load
A-1.04.07	use tag lines to guide and control the load
A-1.04.08	follow daily procedures such as inspection of rigging equipment and storage

Sub-task

A-1.05 Uses layout equipment.

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

Key Competencies

A-1.05.01	select layout equipment according to task
A-1.05.02	select location of setup to avoid high traffic areas and to ensure efficiency and accuracy of layout
A-1.05.03	transport, set up, secure and level equipment to ensure accuracy of layout and good access for operator
A-1.05.04	check for accuracy of builders' levels by using back sighting and fore sighting
A-1.05.05	determine elevations and angles
A-1.05.06	record layout information such as elevations, grid lines and offsets

A-1.05.07	clean, dry and store equipment in a clean, dry and secure location after each use
A-1.05.08	set out building points using layout equipment such as a theodolite, a laser level or a total station according to information on project drawings

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Sub-task

A-1.06 Uses tack welding equipment. (NOT COMMON CORE)

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

Key Competencies

A-1.06.01	identify unsafe conditions such as frayed cables and damaged ground clamps and stingers
A-1.06.02	perform daily checks on equipment to maintain fuel and oil levels
A-1.06.03	select and use tack welding equipment for basic tasks
A-1.06.04	store equipment and rods in a clean and dry location

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Sub-task

A-1.07 Uses torch cutting equipment. (NOT COMMON CORE)

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

Key Competencies

A-1.07.01	inspect hoses, gauges, compressed gas cylinders and connections for leaks and damage
A-1.07.02	clean tips with tip cleaner to ensure even flow of gas
A-1.07.03	set gauges to required pressures for efficient cutting
A-1.07.04	follow procedures and sequences for lighting and operation according to welding trade practice
A-1.07.05	select and use torch cutting equipment for tasks such as cutting rebar and cutting holes in metal
A-1.07.06	store equipment securely such as compressed gas cylinders and hoses according to OH&S regulations
A-1.07.07	maintain striker by replacing the flint

Task 2 Performs safety related activities.

Context 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.

Required Knowledge

K 1	types of PPE and safety equipment such as hard hats, fall protection, hand protection, eye protection, respiratory protection and hearing protection
K 2	PPE and safety equipment operation
K 3	training requirements for PPE and safety equipment
K 4	jurisdictional health and safety acts and regulations
K 5	Canadian Standards Association (CSA) Standards
K 6	safety manuals and procedures
K 7	safety training requirements such as for confined space entry, working near high voltage and on elevated work platforms, and equipment operation
K 8	lock-out and tag-out procedures
K 9	location of first aid stations

Sub-task

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	yes	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Key Competencies

A-2.01.01	identify damage to PPE such as respiratory equipment, hard hats, face shields and fall protection equipment in order to tag and remove from service
A-2.01.02	select fall protection equipment appropriate for work conditions, regulations and company policies
A-2.01.03	follow manufacturers' guidelines on lifespan and proper use of PPE
A-2.01.04	select and use eye and ear protection and respiratory equipment according to task, company policies and CSA Standards
A-2.01.05	adjust PPE such as respiratory equipment, hard hats and fall protection equipment to ensure proper fit according to CSA Standards
A-2.01.06	wear approved safety boots according to task, weather conditions and company policies

A-2.01.07	locate safety equipment such as first aid stations, fire extinguishers and evacuation boxes
A-2.01.08	wear appropriate clothing such as sleeved shirts, long pants and task-appropriate gloves according to company policies and OH&S
A-2.01.09	use fall protection equipment following guidelines such as proper lanyard length and anchoring points
A-2.01.10	use site-specific safety equipment such as air horns and fire extinguishers according to manufacturers' instructions, site instructions and company policies
A-2.01.11	store PPE such as respiratory equipment and fall protection equipment in a clean and dry location

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Sub-task

A-2.02 Maintains safe work environment.

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

Key Competencies

A-2.02.01	use barrier equipment and structures such as barricades, caution tape and bump ropes to bring attention to potential hazardous situations, and to prevent entry of workers and public on site
A-2.02.02	install temporary lighting, environmental protection and hoarding
A-2.02.03	follow safe work procedures such as fall protection, confined space, lock-out and tag-out, material handling, and access and egress
A-2.02.04	identify and report hazards to prevent incidents
A-2.02.05	apply WHMIS procedures such as record keeping of material safety data sheets (MSDS), and product identification, handling and disposal
A-2.02.06	comply with regulations such as OH&S and other jurisdictional regulations
A-2.02.07	keep worksite clean to ensure a safe, organized worksite environment
A-2.02.08	block, cover, fasten and label openings to avoid injury to workers and public
A-2.02.09	use and write pre-job safety instructions and hazard assessments to determine the hazards and risks of task being performed
A-2.02.10	use site safety plan that is posted on the job site to identify location of safety equipment such as first aid stations, eye wash stations and muster stations

Task 3 Uses building materials.

Context Carpenters must select and use various building materials to complete several tasks and functions.

Required Knowledge

K 1	wood defects
K 2	wood characteristics
K 3	wood properties such as composition, moisture content, sizing, strength and grain
K 4	handling and storage procedures
K 5	acclimatization requirements of materials
K 6	WHMIS and MSDS
K 7	types of fasteners, adhesives and connectors
K 8	structural materials such as wood, concrete, metals and masonry
K 9	non-structural materials such as insulation, plastic and gypsum
K 10	types of protective membranes such as air/weather barriers, vapour barriers, waterproofing barriers and damp-proofing barriers
K 11	types of sealants such as acoustic, silicone and expanding foam
K 12	types of fire rated and sound dampening materials
K 13	air and vapour related problems
K 14	moisture-related problems
K 15	building science principles (air, moisture and vapour flow)
K 16	types of foundation protection
K 17	soil conditions and backfill procedures
K 18	drainage principles
K 19	insect and pest damage prevention
K 20	parging
K 21	types of insulating materials
K 22	energy considerations such as the R-2000 technical standard and insulation levels prescribed by jurisdictional codes
K 23	regulations and requirements for the operation of material handling and access equipment such as telescopic booms, skid steers and fork lifts
K 24	concrete design requirements
K 25	jurisdictional codes

K 26	material applications
K 27	thermal bridging practices and techniques

Sub-task

A-3.01 Installs fasteners, adhesives and connectors.

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

Key Competencies

A-3.01.01	select fasteners for applications such as roofing, exterior sheathing, framing, interior/exterior finishing and concrete
A-3.01.02	select fastener size and gauge according to applications, codes and specifications
A-3.01.03	locate position for, and attach, fasteners such as shingle nails and screws according to application, manufacturers' specifications, codes and project drawings
A-3.01.04	select adhesives according to materials, manufacturers' specifications, and codes
A-3.01.05	apply adhesives such as subfloor adhesive, wood glue and epoxies according to climate conditions such as extreme cold and heat, and moisture
A-3.01.06	locate position for, and attach, connectors such as joist hangers, seismic and tie-down anchors, and sill plate bolts

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Sub-task

A-3.02 Installs membranes and sealants.

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

Key Competencies

A-3.02.01	select and place sill plate gaskets to seal the joint between building materials such as concrete or wood and to prevent rotting of wood
A-3.02.02	select and apply sealants such as fire stop caulking, silicones, architectural/structural caulking and expanding foam insulation according to specifications
A-3.02.03	apply bituminous membrane to structures such as walls, window and door openings, and roofs to prevent penetration of moisture

A-3.02.04	select and apply exterior air/weather barriers according to manufacturers' application procedures and specifications
A-3.02.05	select and apply interior vapour barriers with tools such as staplers, caulking and tape according to jurisdictional requirements
A-3.02.06	apply vapour barrier strips during framing at top wall plates, joists and interior walls to ensure continuous vapour diffusion retarder (VDR) according to jurisdictional requirements
A-3.02.07	seal vapour barrier to penetrations such as electrical boxes, vents and windows and doors using sealants such as acoustical and butyl caulk
A-3.02.08	apply eave protection to roofs according to jurisdictional requirements

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Sub-task

A-3.03 Installs foundation protection.

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

Key Competencies

A-3.03.01	select foundation protection materials according to project drawings, manufacturers' specifications and jurisdictional requirements
A-3.03.02	install weeping tile and aggregate to allow for proper drainage
A-3.03.03	seal tie holes and joints in concrete foundations using materials such as caulking, liquid damp-proofing and grout
A-3.03.04	apply bituminous caulking to joints, nail holes and knots in preserved wood foundations according to jurisdictional requirements
A-3.03.05	install drainage plane membrane protection
A-3.03.06	apply liquid damp-proofing to concrete and preserved wood foundations from footing to grade level using tools and equipment such as brushes, rollers and sprayers to prevent penetration of moisture
A-3.03.07	apply solid membrane damp-proofing and water proofing such as peel-and-stick or dimple wrap to prevent penetration of moisture

Sub-task

A-3.04 Installs insulating materials.

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

Key Competencies

A-3.04.01	select insulating materials according to specifications and location
A-3.04.02	fasten rigid insulating materials to roofs, foundations, under slabs and exterior walls using fasteners such as nails and approved adhesives
A-3.04.03	install ceiling insulation and baffles to allow for proper air ventilation from soffit to roof vents
A-3.04.04	install wall insulation such as batt or loose to ensure all cavities are filled
A-3.04.05	install insulation such as fibreglass, spray foam and backer rod around exterior doors and windows to ensure a thermal break and reduced air leakage
A-3.04.06	install sound board and acoustic panels

Task 4 Builds and uses temporary access structures.

Context 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.

Required Knowledge

K 1	types of stationary access equipment such as ladders, ramps and temporary stairs
K 2	types of mobile access equipment such as elevating work platforms, and telescoping and articulated booms
K 3	common scaffold systems such as wood, platform and frame
K 4	specialty scaffolding such as system scaffolding, tube-and-clamp and pump-jack scaffolds
K 5	specialty scaffolding components such as transoms, ledgers and standards
K 6	specialty access equipment such as swing stages and boatswain's (bosun's) chairs
K 7	applicable standards, regulations and specifications

K 8	soil types and conditions
K 9	scaffolding drawings
K 10	inspection and maintenance procedures
K 11	training and certification requirements
K 12	hand signals appropriate for scaffolding practices

Sub-task

A-4.01 Uses stationary access equipment.

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

Key Competencies

A-4.01.01	construct, install and secure site-built access equipment according to project and jurisdictional requirements
A-4.01.02	install and secure prefabricated access equipment according to project and jurisdictional requirements
A-4.01.03	maintain stationary access equipment using methods such as proper storage, use and handling
A-4.01.04	inspect stationary access equipment for defects according to project and jurisdictional requirements

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Sub-task

A-4.02 Uses mobile access equipment.

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

Key Competencies

A-4.02.01	select appropriate mobile access equipment required for project task
A-4.02.02	set-up and operate mobile access equipment according to manufacturers' guidelines
A-4.02.03	maintain mobile access equipment using methods such as proper operation and application, storage and transportation
A-4.02.04	inspect mobile access equipment for defects according to manufacturers' specifications and jurisdictional requirements

Sub-task

A-4.03 Erects/dismantles scaffolding.

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

Key Competencies

A-4.03.01	select types of common or specialized scaffold systems and components for task
A-4.03.02	attach scaffolding components in proper sequence according to jurisdictional requirements
A-4.03.03	tie-in scaffold according to jurisdictional requirements and manufacturers' specifications
A-4.03.04	disassemble scaffolding components in proper sequence according to manufacturers' specifications and jurisdictional requirements
A-4.03.05	identify and use approval systems to inform others of condition of scaffolding, when applicable
A-4.03.06	ensure damaged scaffold components are marked then removed from service

Sub-task

A-4.04 Modifies specialized scaffolding.

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

Key Competencies

A-4.04.01	identify location and types of support required for altering existing scaffold structure
A-4.04.02	select components to be used for modification of scaffold
A-4.04.03	plan scaffold modification sequences taking into consideration existing scaffold design, according to manufacturers' specifications and jurisdictional requirements
A-4.04.04	remove or install scaffold components according to established modification sequence

Trends

The tools and methods used for planning and layout are becoming easier to use with the advance of modern technology. Project planning for instance is often completely outlined prior to the start of a project using software with respect to time, labour and materials. Recent advancements in layout equipment and techniques are paving the way for improved accuracies and efficiencies in construction.

Related Components

All components apply.

Tools and Equipment

See Appendix A.

Task 5 Interprets documentation.

Context

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

Required Knowledge

K 1	types of drawings such as site, architectural, structural, mechanical and as-builts
K 2	drawing components such as lines, symbols, legends and schedules
K 3	client and manufacturers' specifications
K 4	location of specifications and drawings on work site
K 5	types of specification tables such as span, lintel and snow load
K 6	jurisdictional building codes and regulations
K 7	reports such as soils, hazardous materials, inspection and revision requests
K 8	workplace documentation such as requests for information (RFI), site instructions, change orders and building permits
K 9	safety documentation such as MSDS, safety manuals and operating manuals
K 10	OH&S regulations

K 11	risk assessment documentation
K 12	importance of maintaining accurate and thorough records

Sub-task

B-5.01 Interprets project drawings.

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

Key Competencies

B-5.01.01	use drafting instruments such as protractors and scale rulers to determine measurements from project drawings
B-5.01.02	locate information such as details, elevations, sections, door and window schedules and other locations for layout
B-5.01.03	relay drawing information to co-workers or others using sketches
B-5.01.04	recognize conflicts within a set of project drawings taking into consideration the priority of different drawings such as structural, architectural, electrical and mechanical drawings
B-5.01.05	visualize two-dimensional information into a three-dimensional space
B-5.01.06	identify grid lines to determine the distances and locations of key building components for layout

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Sub-task

B-5.02 Interprets specifications.

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

Key Competencies

B-5.02.01	identify products, materials and installation procedures to use
B-5.02.02	determine when acceptable alternatives can be used to satisfy project requirements
B-5.02.03	cross reference various documents such as code books, contract specifications and manufacturers' specifications to satisfy project requirements

Sub-task

B-5.03 Interprets safety documentation.

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

Key Competencies

B-5.03.01	locate OH&S requirements found in jurisdictional regulations and company policies
B-5.03.02	identify safety precautions and procedures found in documents such as MSDS, manufacturer labels and operating manuals
B-5.03.03	use information found in safety meeting documents to employ safe work procedures

Sub-task

B-5.04 Interprets workplace documentation.

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

Key Competencies

B-5.04.01	recognize how workplace documents such as RFI, change orders and engineers' reports impact project requirements
B-5.04.02	identify pertinent information on in-house documents such as work permits and operating manuals relative to the project

Task 6 Organizes work.

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

Required Knowledge

K 1	task requirements (material, tools, labour)
K 2	how to coordinate necessary components to be installed by other trades
K 3	project schedule and task sequence

K 4	material delivery and lead times
K 5	how site work impacts environment
K 6	the need to locate and identify utilities
K 7	excavation techniques, types of soil, water problems and shoring requirements
K 8	on-site conditions and requirements such as weather conditions, existing structures and pedestrian/vehicular traffic
K 9	building techniques or practices
K 10	physical and electronic estimating tools (estimating guides, software)
K 11	types and classifications of hazardous materials
K 12	storage and handling requirements for hazardous materials
K 13	certification requirements for material handling equipment (rough terrain forklifts, telescopic booms, skid steers, fork lifts)
K 14	lock-out/tag-out procedures
K 15	acclimatization of materials

Sub-task

B-6.01 Schedules work sequence.

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

Key Competencies

B-6.01.01	devise a sequence of steps to ensure an efficient and safe process, and a quality product
B-6.01.02	coordinate the delivery of materials to maintain schedule and sequencing of project
B-6.01.03	coordinate work with other trades
B-6.01.04	estimate time to complete tasks
B-6.01.05	adapt to changing conditions such as rain, snow and wind
B-6.01.06	develop alternate plans to account for changes in schedule

Sub-task

B-6.02 Performs site preparation.

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

Key Competencies

B-6.02.01	assess and locate existing utilities
B-6.02.02	plan access and egress to job site for safe movement of workers and efficient delivery of materials
B-6.02.03	construct and install temporary structures such as signage, guard rails, construction trailers and outbuildings
B-6.02.04	construct enclosures/supports for temporary utilities such as electrical, heating, water and toilets
B-6.02.05	set-up storage for building materials taking into consideration crane location, safety of workers and prefab area
B-6.02.06	prepare laydown area for materials and deliveries
B-6.02.07	remove obstructions
B-6.02.08	provide temporary protection of environment
B-6.02.09	install fencing, control gates and hoarding to prevent injury to the public and loss of materials and tools
B-6.02.10	lock-out/tag-out sources of potential energy

Sub-task

B-6.03 Performs quantity take off.

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

Key Competencies

B-6.03.01	perform calculations to determine required quantities of materials taking into account application of material, waste and reuse of available material
B-6.03.02	use project drawings and/or on-site measurements to determine required quantities of materials

Sub-task

B-6.04 Organizes materials.

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

Key Competencies

B-6.04.01	arrange delivered materials to maximize efficiency and productivity
B-6.04.02	protect materials to ensure product integrity
B-6.04.03	store and handle the different types of hazardous materials according to jurisdictional regulations
B-6.04.04	place materials to avoid excessive point loading on roofs and floors

Task 7 Performs layout.

Context Layout means to use information from 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.

Required Knowledge

K 1	basic geometry
K 2	basic survey theory
K 3	layout tools and equipment/instruments
K 4	building codes and jurisdictional regulations
K 5	types of materials
K 6	task requirements (material, tools, labour)
K 7	other trades/sub-trades
K 8	underground/hidden utilities
K 9	engineered building components such as floor systems and pre-fabricated trusses
K 10	stairwell calculations
K 11	project plans
K 12	types of stair, floor, wall, ceiling and roof systems
K 13	concrete formwork practices

K 14	framing techniques
K 15	site conditions such as soil types, water problems and shoring requirements
K 16	traditional deck components such as footings, columns, beams, joists, stairs, ramps and guards/rails
K 17	pre-engineered and pre-fabricated deck components such as glass railings, pre-cast steps and vinyl composite decking

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Sub-task

B-7.01 Performs site layout.

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

Key Competencies

B-7.01.01	determine location of building and other structures such as curbs, light standards and sidewalks from survey control points
B-7.01.02	place layout structures such as batter boards and string lines to identify location of buildings and other structures

---

Sub-task

B-7.02 Lays out concrete formwork.

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

Key Competencies

B-7.02.01	establish and maintain grid lines
B-7.02.02	use benchmarks to determine elevations of components such as beam pockets, height of concrete, embeds and tie spacing
B-7.02.03	determine locations of various penetrations, voids and openings in concrete
B-7.02.04	use batter boards and grid lines to locate building components such as beams, walls, footings and embeds
B-7.02.05	apply measurements from project drawings to structures
B-7.02.06	transfer control points as needed

B-7.02.07 determine elevation and location of falsework to ensure required camber and slope of concrete slabs

B-7.02.08 identify locations of temporary shoring

Sub-task

B-7.03 Lays out floor systems.

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

Key Competencies

B-7.03.01 determine quarter points for built-up beams

B-7.03.02 determine lengths and size of material required for built-up beams according to code and span tables

B-7.03.03 mark locations of building components such as columns, beams, joists, stairwells and chases

B-7.03.04 identify joist locations to ensure support for walls and to allow for openings

B-7.03.05 determine location of framing members according to project drawings and jurisdictional building codes

B-7.03.06 verify accuracy of layout by performing checks such as back check, Pythagorean theorem (3-4-5) and measuring cross-diagonals

B-7.03.07 determine locations of penetrations and openings such as for electrical, heating, ventilation and air conditioning (HVAC) and plumbing components

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Sub-task

B-7.04 Lays out deck systems.

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

Key Competencies

B-7.04.01 mark locations, and determine size, of traditional deck components according to plans, building codes and jurisdictional requirements

B-7.04.02 mark locations of pre-engineered or pre-fabricated deck components according to manufacturers' specifications and plans

B-7.04.03 determine locations of anchor points such as those required for ledgers

B-7.04.04 determine locations of penetrations and openings such as for vegetation and drainage

B-7.04.05 verify accuracy of layout by performing checks such as back check, Pythagorean theorem (3-4-5) and measuring cross-diagonals

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Sub-task

B-7.05 Lays out wall systems.

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

Key Competencies

B-7.05.01 determine key measurements such as lintel sizes, length of wall, height of wall and location of rough openings

B-7.05.02 identify stud locations and wall openings by marking wall plates

B-7.05.03 identify wall locations from project drawings

B-7.05.04 determine locations of framing members and various components to ensure structural integrity

B-7.05.05 determine locations of penetrations such as for electrical, HVAC and plumbing components

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Sub-task

B-7.06 Lays out ceiling systems.

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

Key Competencies

B-7.06.01 determine and mark locations of ceiling components such as joists, main tees, grids, furring and hangers

B-7.06.02 determine and mark locations of bulkheads and ceiling openings for mechanical fixtures and penetrations

B-7.06.03 determine and mark elevation of ceiling system using tools such as water levels and lasers

Sub-task

B-7.07 Lays out roof systems.

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

Key Competencies

B-7.07.01	select and use tools equipment such as squares, tape measures and calculators
B-7.07.02	mark locations of rafters and roof openings on walls according to project drawings
B-7.07.03	determine component measurements such as rafter size and length, overhangs and projections taking into account adjustments by performing calculations or referencing project drawings
B-7.07.04	mark measurements on lumber to create pattern by stepping off using tools such as squares or tape measures
B-7.07.05	mark locations of prefabricated roof systems on wall plates
B-7.07.06	mark bracing and blocking locations of roof systems
B-7.07.07	mark locations of roofing components such as rafters, (common, hip/valley and jacks), dormers and vents

Sub-task

B-7.08 Lays out stairs.

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

Key Competencies

B-7.08.01	measure total rise and run of stairs and length of stairwell opening
B-7.08.02	determine and mark measurements such as unit rise, unit run, length of stringer, allowable headroom and landing locations
B-7.08.03	mark stringers using layout tools taking into consideration adjustments for nosings, risers, tread and finished floor thicknesses
B-7.08.04	lay out stringers for exterior concrete stairs taking into account adjustments for water runoff
B-7.08.05	determine location of soffit for concrete stairs

B-7.08.06	determine placement of embeds in concrete stairs for components such as railings
B-7.08.07	determine and mark location and size of geometric stair components

Trends

Due to environmental concerns, some concrete mix designs and chemical compounds are being changed. Furthermore, concrete technology is constantly evolving with the use of new and different additives to improve strength and performance. There is a rise in the use of stamped, coloured and stained concrete due to consumer demand. There is also a rise in the use of concrete formwork such as ICF systems to replace traditional formwork and as an alternative to wood frame construction.

Related Components (including, but not limited to)

Strip footings, pier footings, column footings, battered footings, step footings, steel forms, fibre forms, wood forms, tilt-up forms, pan forms, pre-fabricated forms, gang forms, fly forms, core forms, built-in-place forms, ICFs, slip forms, non-slip stair inserts, void forms, dowels, angle irons, plates, form ties, reinforcing steel rods, welded wired mesh (WWM), miscellaneous inserts, chases, coil ties, snap ties, water stops, keyways, strongbacks, walers, taper ties, capitals, caissons, control joints, bracing, rough bucks, bulkheads, chamfer strips, shoring, shoring scaffolding, falsework, wire mesh, threaded rods, pencil rods, buttons, connectors, floor slabs, walls, slabs-on-grade, suspended slabs, grade beams, manufacturer-specific forms, underpinning, concrete, lightweight concrete, hollow core slabs, pre-cast, tilt-up walls, backer rods, caulking, grout, epoxies, steel shims, braces, anchors, accelerators, hardeners, plasticizers, retarders, air entrainment, form release agents, reinforcing additives (fibre and steel), self-consolidating concrete.

Tools and Equipment

See Appendix A.

Task 8 Constructs formwork.

Context

Carpenters construct formwork to create concrete structural and architectural components of structures.

Required Knowledge

K 1 types and components of shoring

K 2 shoring scaffolding components such as frame scaffolding, mud sills, bracing, u-heads and base jacks

K 3	shoring techniques for horizontal and vertical use
K 4	excavation shoring and underpinning
K 5	types of footing forms
K 6	types of piles such as steel, wood and concrete
K 7	formwork material such as wood, steel, aluminium, composite and foam
K 8	wall form systems such as slip forms, gang forms, ICF and tilt-up formwork
K 9	form release agents
K 10	building and stripping sequence of formwork
K 11	tie systems
K 12	void forms under grade beams and slabs
K 13	types of slab formwork
K 14	nailing requirements
K 15	manufacturers' specifications
K 16	formwork components such as capitals, piers, columns, pilasters, beams, girders and corbels
K 17	joints such as expansion, control and isolation joint construction
K 18	yoking (collaring)
K 19	types of stair and landing forms
K 20	form hardware
K 21	engineered forming systems such as Peri™, Doka™ or Efco™
K 22	local codes, building codes and regulation requirements
K 23	concrete properties
K 24	embedded steel placing procedures
K 25	grades of reinforcing steel
K 26	tension and compression related to reinforcing steel materials
K 27	pre-stressed and post-stressed concrete applications
K 28	accessories such as chairs, stirrups and sleeves
K 29	grouting and epoxies
K 30	stripping techniques
K 31	hoisting and rigging equipment and techniques
K 32	hazards associated with erecting and dismantling of formwork
K 33	layout procedures for embedments such as anchors
K 34	elevation according to project drawings
K 35	how to coordinate necessary components to be installed by other trades

Sub-task

C-8.01 Erects excavation shoring and underpinning.

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

Key Competencies

C-8.01.01	select and use tools such as picks, shovels, hammers and levels
C-8.01.02	select shoring materials such as wire mesh, plywood, timbers, chain links, fibre reinforced concrete and Shotcrete™ according to soil conditions, depth of excavation and specifications, and safety regulations
C-8.01.03	inspect materials for structural integrity
C-8.01.04	provide access and egress prior to erecting shoring
C-8.01.05	fasten excavation shoring firmly in place using fasteners such as rock anchors, bolts and pilings
C-8.01.06	place shoring to contain loose debris with appropriate materials
C-8.01.07	select shoring technique according to conditions such as depth of excavation, soil conditions, types of installation, project size and OH&S requirements
C-8.01.08	identify underpinning requirements according to location of new construction
C-8.01.09	build support under existing structure to conserve structural integrity

Sub-task

C-8.02 Erects concrete falsework.

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

Key Competencies

C-8.02.01	select and use tools such as levels, framing squares, wrenches and powder-actuated tools
C-8.02.02	determine soil conditions required for support of falsework to prevent settling and movement of structure
C-8.02.03	identify site-specific falsework requirements such as for suspended slab and stair formwork, according to engineered shoring and re-shoring drawings
C-8.02.04	prepare mud sills and sleepers where required for weight distribution

C-8.02.05	select materials required for falsework such as strongbacks, lateral bracing, standards, and shoring jacks and frames
C-8.02.06	place falsework and ensure components are plumb, level and square according to project demands
C-8.02.07	fasten components using fasteners such as duplex nails and threaded rods for ease of dismantling
C-8.02.08	re-shore forms according to engineers' requirements until curing of concrete has achieved desired strength
C-8.02.09	remove falsework after engineer-specified curing of concrete

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Sub-task

C-8.03 Constructs footing forms.

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

Key Competencies

C-8.03.01	select materials according to site-specific requirements such as soil conditions and size of footing
C-8.03.02	place formwork and ensure components are plumb, level, square and accessible for steel reinforcement and finishing work
C-8.03.03	use benchmarks to determine elevations of footing in the excavation using tools such as laser levels, builders' levels and string lines off batter boards
C-8.03.04	place bracing to maintain square, straight and level footing
C-8.03.05	brace step footings to maintain plumb, square and level, and to prevent blowouts
C-8.03.06	build footing steps according to drawings and building code requirements
C-8.03.07	install required components such as keyways, water stops, templates, bulkheads and miscellaneous inserts
C-8.03.08	fasten components using fasteners such as duplex nails and threaded rods for ease of dismantling
C-8.03.09	inspect assembled formwork to ensure it is straight, square and level, and that it is adequately braced and correctly measured

Sub-task

C-8.04 Constructs wall and grade beam formwork.

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

Key Competencies

C-8.04.01	place sleepers and void forms under grade beams to allow for frost heave
C-8.04.02	follow chalk line to determine placement of formwork
C-8.04.03	determine formwork system according to concrete volume requirements, and system availability and capabilities
C-8.04.04	erect forms to achieve required measurement according to determined formwork system
C-8.04.05	assemble prefabricated forms according to manufacturers' specifications or engineering drawings
C-8.04.06	install keyways and control joints in wall forms
C-8.04.07	place formwork and ensure components are plumb, level, straight, square, and accessible for concrete placement and finishing
C-8.04.08	install window and door bucks, penetrations, water stops and bulkheads according to measurements and job specifications
C-8.04.09	install form restraints such as snap ties, coil ties and taper ties according to manufacturers' specifications
C-8.04.10	install bracing such as turnbuckles, standards, strongbacks and kickers in order to support formwork in place and according to specifications
C-8.04.11	install spreader bars, blocks or cleats at top of formwork in order to maintain required wall thickness
C-8.04.12	inspect formwork components and installation to prevent blowouts and distortion
C-8.04.13	determine finish elevation by using methods such as chamfer strips, brick ledge and grade nails

Sub-task

C-8.05 Constructs slab-on-grade formwork.

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

Key Competencies

C-8.05.01	ensure that substrate is prepared with granular fill and compacted according to specifications and code
C-8.05.02	place void forms for frost protection to allow for frost heave
C-8.05.03	select materials for formwork according to specifications
C-8.05.04	apply products such as polyethylene under the slab to serve as an air, soil, gas (radon) and vapour barrier
C-8.05.05	place formwork and ensure components are plumb, level, straight and square, and accessible for finishing work
C-8.05.06	measure for location and place embeds such as anchor bolts, sleeves and weld plates according to project drawings
C-8.05.07	install required components such as reinforcement steel, keyways, water stops, bulkheads, screed level pegs and miscellaneous inserts
C-8.05.08	apply products such as extruded polystyrene (XPS) under the slab to prevent heat loss
C-8.05.09	create joints such as construction and expansion joints according to project requirements
C-8.05.10	lock corners of forms in order to prevent blowouts and maintain required slab shape such as raft slabs (over size)
C-8.05.11	install bracing such as kickers and threaded rods in order to support formwork in place, and according to specifications
C-8.05.12	ensure that other trades have all below-grade services installed such as sump pit, drains, electrical conduit and hydronic heating
C-8.05.13	inspect assembled formwork for deficiencies such as inadequate bracing, crooked, unleveled formwork and improper grading
C-8.05.14	establish finish elevation according to benchmark and project drawings

Sub-task

C-8.06 Constructs column formwork.

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

Key Competencies

C-8.06.01	determine size and location of column forms according to specifications and project drawings
C-8.06.02	select materials such as wood, steel and round concrete forms (Sonotube®) according to project drawings and formwork design
C-8.06.03	place formwork components such as chamfer strips, reveal strips, form liners and embeds, and ensure all are plumb, level, square, and accessible for finishing work
C-8.06.04	brace column formwork in multiple directions in order to stabilize the formwork, prevent any movement when placing concrete and ensure that it is plumb, level and square
C-8.06.05	apply templates in column formwork according to project drawings
C-8.06.06	inspect assembled formwork for deficiencies such as inadequate bracing, out of plumb and incorrect elevation

Sub-task

C-8.07 Constructs stair formwork.

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

Key Competencies

C-8.07.01	place and secure formwork such as inverted stringers, soffits, risers and nosings, and ensure components are plumb, level, straight, square and accessible for finishing work
C-8.07.02	select materials for falsework according to site conditions and formwork design
C-8.07.03	apply bracing such as kickers and cleats in order to support formwork, and according to specifications

C-8.07.04	install formwork components such as chamfer strips, reveal strips and embeds
C-8.07.05	inspect assembled formwork for deficiencies such as improper rise, run and slope

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Sub-task

C-8.08 Installs embedded steel.

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

Key Competencies

C-8.08.01	select reinforcing steel material according to specifications
C-8.08.02	select and install chairs to ensure proper coverage of reinforcing steel
C-8.08.03	calculate overlaps required for reinforcing steel or wire mesh according to building code
C-8.08.04	cut and bend reinforcing steel or wire mesh on site using equipment such as benders, quick-cut saws and grinders
C-8.08.05	tie reinforcing steel to ensure spacing continuity according to structural drawings
C-8.08.06	place embeds such as angle irons, anchor bolts and structural steel weld plates
C-8.08.07	install reinforcing components such as stirrups, and vertical and horizontal bars
C-8.08.08	inspect reinforcing steel for defects such as dirt, debris, rust and corrosion before installation
C-8.08.09	place embedded steel according to project drawings and specifications

Sub-task

C-8.09 Dismantles formwork.

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

Key Competencies

C-8.09.01	remove nails and fasteners
C-8.09.02	remove bracing components such as walers, strongbacks and turnbuckles in reverse order from assembly
C-8.09.03	clean forms by scraping and sweeping excess concrete, and apply release agent
C-8.09.04	repair damaged forms by replacing components such as plywood, strongbacks and walers
C-8.09.05	remove forms with care to ensure quality of finish
C-8.09.06	store forms and forming materials in organized fashion for future use

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

Context

Carpenters install and apply concrete, cement-based and epoxy products to build and finish structures.

In this NOA, pre-cast components are understood to be concrete components built in different locations and installed on-site by carpenters.

Required Knowledge

K 1	types of concrete and mix designs
K 2	rate of pour
K 3	concrete placement and finishing procedures
K 4	testing procedures such as slump and compressive strength
K 5	concrete additives and admixtures
K 6	types of finishes such as broom, stamped and exposed aggregate
K 7	lateral pressures
K 8	compressive strength
K 9	hot and cold weather curing techniques such as ponding and insulating
K 10	climate protection techniques such as hoarding and heating

K 11	effects of climatic conditions
K 12	crane hand signals and rigging points
K 13	types of pre-cast systems
K 14	pre-stressed and post-stressed concrete
K 15	layout procedures
K 16	types of grout such as drypack, expanding and liquid grout
K 17	types of grouting procedures
K 18	grout additives
K 19	concrete repair materials and techniques
K 20	types of epoxy products such as paint and floor finish
K 21	types of concrete placing and finishing tools

Sub-task

C-9.01 Places concrete.

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

Key Competencies

C-9.01.01	plan pour taking into consideration factors such as weather conditions, location of equipment, starting point, sequence of pour and rate of pour and drop
C-9.01.02	select additives such as plasticizers, hardeners, accelerators and curing agents according to weather conditions and project requirements
C-9.01.03	ensure slump on concrete before starting pour to maintain integrity of desired mix design
C-9.01.04	select and use placement methods such as using concrete pump, crane and bucket, wheelbarrow and chute according to accessibility to location and size of job
C-9.01.05	vibrate concrete to consolidate and eliminate voids around locations such as beam pockets, chases and bucks, while avoiding over-vibrating, segregation and blowouts
C-9.01.06	recognize signs of an impending blowout such as deformation, deflection and leakage and take remedial measures

C-9.01.07	place joints in poured concrete such as expansion, isolation and control joints
C-9.01.08	double check after concrete is placed for straightness and dimensions of wall and column forms, and make adjustments to achieve plumb, level and square formwork

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Sub-task

C-9.02 Facilitates curing of concrete.

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

Key Competencies

C-9.02.01	assess environmental conditions to determine protection needed for curing
C-9.02.02	install temporary heating or cooling systems to meet seasonal conditions
C-9.02.03	lay out and create control joints according to project drawings and specifications
C-9.02.04	cover curing concrete with materials such as wet burlap, polyethylene or thermal blankets
C-9.02.05	set up water systems such as ponding and soaker hoses to maintain a wet cure
C-9.02.06	apply chemical curing compounds and sealants according to specifications

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Sub-task

C-9.03 Performs basic concrete finishing.

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

Key Competencies

C-9.03.01	screed, float and trowel concrete using specialized concrete finishing tools and equipment such as magnesium and bull floats
C-9.03.02	use finishing additives such as colouring, aggregates and hardeners
C-9.03.03	apply architectural finishing techniques such as stamped, exposed aggregate, broom finish and edging
C-9.03.04	apply appropriate patching products to patch/repair concrete
C-9.03.05	apply epoxy products by brushing, rolling or spraying, according to desired finish and protection

Sub-task

C-9.04 Installs pre-cast components.

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

Key Competencies

C-9.04.01	identify location of pick-points of pre-cast components and erection procedures using measuring tools and project drawings
C-9.04.02	measure distances according to project drawings to determine installation location
C-9.04.03	align, shim and brace pre-cast components using tools and equipment such as drills, hammers and pry bars
C-9.04.04	fasten pre-cast components securely using fastening methods such as applying epoxy products, welding and bolting
C-9.04.05	install isolation joints with specified sealants and caulking to prevent conditions such as fire and water infiltration

Sub-task

C-9.05 Installs grout.

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

Key Competencies

C-9.05.01	select and prepare grout and additives according to job requirements, project drawings and manufacturers' specifications
C-9.05.02	select, construct and install grout forms
C-9.05.03	prepare surface to be grouted by roughing, cleaning and applying a bonding agent
C-9.05.04	use grout placement methods such as using grout forms, pumping, hand trowelling and dry packing
C-9.05.05	apply appropriate backup material when installing grout on foam insulation products, such as those used for exterior insulated basements

Trends

There is an increased demand to use engineered products and off-site prefabricated systems for cost, installation, scheduling and energy efficiencies. The use of stack framing as a building method is gaining in popularity.

Related Components (including, but not limited to)

Floor Systems: Floor joists, headers, trimmers, beams, bridging, blocking, strongbacks (horizontal bracing), columns, sill plates, I-joists, trusses, sheathing, joist hangers, framing anchors, squash blocks, adhesives, cross-laminated timber.

Deck Systems: Joists, beams, columns, posts, hardware, handrails, guardrails, sheathing, stairs, foundation, blocks, ledger boards, hangers, fasteners and pressure-treated lumber.

Wall Systems: Plates, studs, cripples, blocking, furring/strapping, sheathing, bracing, back framing, lintels, tracks, stiffeners, fire stops, jacks, structural insulated panel systems (SIPS), post and beam components, connectors.

Roof and Ceiling Systems: Rafters, ridge board, collar ties, trusses, gable studs, soffits, fascias, roof joists, ceiling joists, gussets, blocking, attic access, dormers, bracing, flush beams, joist hangers, hurricane clips, strapping, sheathing, webs, saddles/crickets, scuppers, reglets, parapet walls, specialty framing, SIPS.

Tools and Equipment

See Appendix A.

Task 10 Constructs floor systems.

Context

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

Required Knowledge

K 1	types of floor systems such as engineered floors and dimensional lumber floors
K 2	manufacturers' specifications
K 3	jurisdictional building codes and regulations
K 4	beam supports such as steel, wood and concrete

K 5	types of beams such as steel, built-up and engineered
K 6	load bearing wall requirements
K 7	special connectors and supports such as joist hangers and manufacturer-specified fasteners
K 8	components such as blocking, backing, strapping and bridging
K 9	back framing requirements
K 10	species of wood and their properties
K 11	cantilever beams and joists
K 12	floor sheathing
K 13	components of post and beam framing

Sub-task

D-10.01 Installs engineered floor systems.

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

Key Competencies

D-10.01.01	assess and adjust floor systems for pre-existing conditions such as out-of-square and out-of-level foundations
D-10.01.02	build and install beams according to manufacturers' specifications (layout floor system)
D-10.01.03	follow specified sequence of installation for components such as plates, sill gaskets and anchor bolts
D-10.01.04	frame rough openings such as for stairwells and chimneys, according to drawings and specifications
D-10.01.05	follow engineering limitations and specifications for engineered floors
D-10.01.06	install lateral and vertical bracing such as strongback, blocking and backing according to manufacturer's specifications
D-10.01.07	install engineered flooring components such as hangers and fasteners in accordance with manufacturers' specifications
D-10.01.08	place and secure sheathing on joists to maintain squareness and strength

Sub-task

D-10.02 Constructs dimensional lumber floor framing.

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

Key Competencies

D-10.02.01	assess and adjust for pre-existing conditions such as out-of-square and out-of-level foundations
D-10.02.02	install floor members crown up
D-10.02.03	place bows in joists in opposition when attached to each other in order to cancel each other out
D-10.02.04	install joist restraints such as cross-bridging, blocking, strapping and backing according to building code and engineer specifications
D-10.02.05	frame rough openings such as for stairwells and chimneys according to drawings, specifications and building codes
D-10.02.06	notch and drill framing components according to building codes
D-10.02.07	follow code requirements and limitations for dimensional lumber floor framing
D-10.02.08	place and secure sheathing in staggered pattern on joists to ensure squareness and strength

Task 11 Constructs deck systems.

Context Carpenters design and construct deck systems and install pre-engineered deck components according to customers' requests. They ensure that the deck systems comply with municipal, provincial, territorial and national codes.

Required Knowledge

K 1	types of materials
K 2	types of fasteners
K 3	types of building styles such as detached and attached
K 4	joists, beams and posts
K 5	types of floor systems
K 6	types of post bearings such as concrete piers, blocks and screw anchors
K 7	decking patterns

K 8	types and construction of railings
K 9	jurisdictional codes
K 10	manufacturers' specifications
K 11	stair construction sequence
K 12	ramp construction
K 13	pre-engineered deck components such as stairs, ramps and guardrails

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Sub-task

D-11.01 Constructs decks.

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

Key Competencies

D-11.01.01	select materials such as dimensional lumber, plywood and composite products according to exposure to elements and deck finish
D-11.01.02	select fasteners and connectors such as post saddles, hangers and strappings according to job specifications and building code
D-11.01.03	install structural members and fasteners such as column posts, stirrups and built-up beams to support deck according to building code and job specifications
D-11.01.04	build deck frame on structural members according to building code and job specifications
D-11.01.05	fasten rim board to structure according to building code
D-11.01.06	install joist to rim board using fasteners according to building code and manufacturers' specifications
D-11.01.07	slope deck to ensure water sheds away from building
D-11.01.08	install deck surface such as panel products, pressure-treated wood and composite to complete deck finish
D-11.01.09	install flashing according to the National Building Code (NBC)

Sub-task

D-11.02 Installs deck components.

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

Key Competencies

D-11.02.01	select guardrail material such as aluminium, wood and glass according to job specifications
D-11.02.02	select fasteners such as screws, lags and nails according to application
D-11.02.03	determine location of balustrades and railings according to code and job specifications
D-11.02.04	measure and cut material according to code and job specifications
D-11.02.05	fasten and space balustrades and railings according to code and job specifications
D-11.02.06	apply finish according to material being used and job specifications
D-11.02.07	construct, assemble and/or install optional accessories such as pergolas, arbour, lattice, skirting and benches according to jurisdictional codes and job requirements

Task 12 Constructs wall systems.

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

Required Knowledge

K 1	types of wall systems such as strapped, double-wall, platform, balloon, timber, steel stud, curtain and panel
K 2	materials used in wall systems
K 3	door and window rough opening clearances
K 4	blocking, backing and back framing requirements
K 5	preserved wood foundations
K 6	manufacturers' specifications and building codes
K 7	beam supports such as steel, wood and concrete
K 8	types of beams such as steel, built-up and engineered
K 9	load bearing wall requirements

K 10	framing requirements for openings
K 11	notching and drilling requirements
K 12	fastening requirements
K 13	fire protection systems
K 14	components of post and beam framing

Sub-task

D-12.01 Installs engineered wall systems.

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

Key Competencies

D-12.01.01	assess and adjust for pre-existing conditions such as out-of-square and out-of-level
D-12.01.02	follow engineering drawings, specifications and sequence of installation for engineered wall systems
D-12.01.03	frame rough openings such as for doors and windows according to specifications and project drawings
D-12.01.04	install bracing (lateral and temporary) to maintain plumb, level, square and consistency of stud centres
D-12.01.05	fit and secure panels together
D-12.01.06	place and secure sheathing on studs according to building code and engineer specifications to maintain squareness and strength
D-12.01.07	install engineered wall components such as hangers and fasteners according to manufacturers' specifications
D-12.01.08	install lintel bearing directly on supporting members according to engineer specifications
D-12.01.09	install pre-fabricated wall systems such as SIPS according to manufacturers' specifications
D-12.01.10	make allowances for, and install VDRs such as polyethylene and air barriers

Sub-task

D-12.02 Constructs dimensional lumber wall framing.

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

Key Competencies

D-12.02.01	follow specified sequence of installation and structural specifications
D-12.02.02	install wall members crown up
D-12.02.03	assess and adjust wall framing for existing site conditions such as out-of-square and out-of-level
D-12.02.04	install gaskets, sill plates and anchor bolts
D-12.02.05	frame rough openings such as for doors and windows according to drawings and specifications
D-12.02.06	notch and drill framing components according to code requirements
D-12.02.07	install stud restraints such as blocking and strapping
D-12.02.08	place and secure sheathing on studs to maintain squareness and strength according to building code and engineer specifications
D-12.02.09	install temporary bracing as required during erection
D-12.02.10	install backing in exterior and interior walls to provide proper support for interior finish components
D-12.02.11	make allowances for, and install VDRs such as polyethylene, air barriers and fire protection materials
D-12.02.12	square, level and plumb walls

Task 13 Constructs roof and ceiling systems.

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

Required Knowledge

K 1	types of roof and ceiling systems
K 2	types of roof members such as trusses and various rafters
K 3	types of ceiling members such as ceiling joists
K 4	framing requirements for openings
K 5	manufacturers' specifications

K 6	jurisdictional codes
K 7	beam supports such as steel, wood and concrete
K 8	types of beams such as steel, built-up and engineered
K 9	load bearing wall requirements
K 10	special connectors and supports such as joist hangers, hurricane clips and H-clips
K 11	roofing components such as blocking, backing, strapping and saddles/crickets
K 12	calculations associated with the layout of various roof components based on roof geometry
K 13	blocking, backing and back framing requirements
K 14	notching and drilling requirements
K 15	components of post and beam framing
K 16	safety requirements such as fall protection
K 17	sequence of assembly for engineered timber components
K 18	environmental consideration for unfinished timber components

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Sub-task

D-13.01 Installs engineered trusses.

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

Key Competencies

D-13.01.01	follow specified sequence of truss installation according to structural specifications and engineering limitations
D-13.01.02	assess and adjust for pre-existing conditions such as out-of-square and out-of-level walls
D-13.01.03	fit and secure girders and sections together according to engineering specifications
D-13.01.04	align trusses to ensure straight roof
D-13.01.05	install fascia boards
D-13.01.06	install temporary bracing to maintain plumb, level, square and secure trusses
D-13.01.07	install permanent lateral and angle bracing according to engineering specifications
D-13.01.08	frame rough openings such as for attic access, skylights and chimneys according to specifications, project drawings and building code

D-13.01.09 install truss components such as hangers and fasteners according to manufacturers' specifications

D-13.01.10 install components within trusses such as insulation stops, drywall backing and directional blocking

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Sub-task

D-13.02 Constructs roof and ceiling framing.

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

Key Competencies

D-13.02.01 select species and size of lumber according to jurisdictional requirements and engineering specifications

D-13.02.02 follow specified sequence of installation and structural specifications

D-13.02.03 assess and adjust for pre-existing conditions such as out-of-square and out-of-level walls

D-13.02.04 cut members to calculated measurements

D-13.02.05 align tails of roof members to ensure straight fascia

D-13.02.06 install temporary bracing to maintain plumb, level, square and secure roof members

D-13.02.07 install permanent lateral and angle bracing such as collar ties and purlins to maintain structural integrity

D-13.02.08 frame rough openings such as for attic access, skylights and chimneys according to project drawings and specifications

D-13.02.09 back frame using materials such as insulation stops, fire protection, cross-bracing and directional blocking

D-13.02.10 install equal and unequal slope intersecting roof components

D-13.02.11 install fascia boards

D-13.02.12 place strappings and sheathing perpendicular to rafters to maintain structural integrity

D-13.02.13 construct and install parapet walls and cant strips for flat roofs

D-13.02.14 ensure adequate venting and proper drainage according to building code and engineering specifications

Trends

The requirement for barrier-free access has become a standard in commercial and public buildings. The trend towards energy efficient and maintenance free products for installing doors and windows continues. Composite and synthetic materials that imitate the natural product are becoming more popular due to cost effectiveness, easier installation and lower maintenance requirements.

Related Components (including, but not limited to)

Exterior Doors and Windows: Overhead doors, sliding doors, swinging doors, weather stripping, hinges, closers, electronic devices, window operators, locksets, thresholds, emergency exit devices, protection plates, door stops, kick plates, astragal, barrier-free devices, fixed windows, double-hung windows, casement windows, awning windows, hopper windows, sliding windows, inserts, pivoting windows, flush bolts, templates, insulation (backer rod, expanding foam, batt), sealants.

Roofing: Eave protection, felt paper, flashing, insulation, caulking, ventilation, furring, cant strips, drip edges, tar paper, low slope roofing, glass panels, skylights, membrane systems, metal roofs, shingles (asphalt, metal, wood), scuppers.

Exterior Wall Finishes: Eaves, vents, flashing, awnings, trim accessories, cladding (metal, wood, vinyl, composite, cementitious), soffits, panelized insulation, shingles, air/weather barriers, soffit venting, fascia, frieze boards, stucco, rain screens.

Tools and Equipment

See Appendix A.

Task 14 Installs exterior doors and windows.

Context

The proper installation of exterior doors and windows is essential to the aesthetics, comfort and proper functioning of the building.

Required Knowledge

K 1	types of window and door jambs/frames, and their applications
K 2	types of exterior doors and windows, and their applications
K 3	window and door installation procedures

K 4	exterior door components
K 5	weather protection techniques such as installing flashing and weather stripping
K 6	air and vapour barriers
K 7	types and styles of exterior door and window hardware such as locks, latches and electronic systems
K 8	exterior door and window schedules
K 9	jurisdictional requirements
K 10	barrier-free access requirements
K 11	manufacturers' specifications

Sub-task

E-14.01 Installs exterior jambs/frames.

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

Key Competencies

E-14.01.01	select and use tools and equipment such as levels, tape measures, hammers and cordless drills
E-14.01.02	assess and adjust rough openings for existing conditions as out-of-square, out-of-level and wrong size or location
E-14.01.03	prepare hinges and bolt locations on metal door frames to protect from grout
E-14.01.04	brace metal door frame to ensure plumb and square with adequate support
E-14.01.05	ensure adjacent jambs or frames are aligned with each other
E-14.01.06	level head jamb and plumb side jambs
E-14.01.07	secure jambs/frames by shimming and fastening to steel, wood and masonry
E-14.01.08	insulate cavity around jambs/frames to create a thermal break
E-14.01.09	install membrane and flashing around outside exterior jamb's trim

Sub-task

E-14.02 Installs exterior doors.

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

Key Competencies

E-14.02.01	select and use tools and equipment such as levels, chisels, hole saws, screwdrivers, cordless drills, drill bits and routers with templates
E-14.02.02	select door type and size, and determine swing according to door schedule and project drawings
E-14.02.03	mark door slab and jamb for hinge location
E-14.02.04	mortise hinge gains on slab and jambs
E-14.02.05	secure door to jamb using fasteners such as screws and hinges
E-14.02.06	install weather protection devices such as weather stripping and door sweeps
E-14.02.07	install door accessories such as astragals, kick plates and stops
E-14.02.08	verify proper operation such as latching, spacing and alignment

Sub-task

E-14.03 Installs specialty exterior doors.

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

Key Competencies

E-14.03.01	select and use tools and equipment such as levels, chisels, hole saws, screwdrivers, cordless drills, drill bits and routers with templates
E-14.03.02	identify type of specialty exterior doors such as overhead doors, access hatch and bypass doors to determine scope of task
E-14.03.03	assess and adjust rough openings for existing conditions such as out-of-square, out-of-level and wrong size or location
E-14.03.04	secure door components using fasteners such as screws, bolts and anchors, according to manufacturers' specifications
E-14.03.05	install weather protection devices such as weather stripping and door sweep according to manufacturers' specifications and site requirements

E-14.03.06 verify proper operation such as latching, spacing and alignment

E-14.03.07 coordinate with other trades to ensure considerations are made for components such as exterior finishes, flooring and access hardware

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Sub-task

E-14.04 Installs exterior windows.

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

Key Competencies

E-14.04.01 select and use tools and equipment such as levels, tape measures, hammers and cordless drills

E-14.04.02 assess and adjust rough openings for existing conditions such as out-of-square, out-of-level and wrong size or location

E-14.04.03 ensure adjacent jambs or frames are aligned with each other and other units

E-14.04.04 place and secure window in rough opening using shims and fasteners to level and plumb

E-14.04.05 verify proper operation such as latching, spacing and alignment

E-14.04.06 install membrane and flashing at top and membrane around casing

---

Sub-task

E-14.05 Installs exterior door and window hardware.

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

Key Competencies

E-14.05.01 select and use tools and equipment such as levels, tape measures, hammers and cordless drills

E-14.05.02 select hardware such as locks, closers and emergency devices according to jurisdictional requirements

E-14.05.03 position hardware using equipment such as templates and mortising jigs

E-14.05.04 secure hardware to door or window according to manufacturers' specifications

E-14.05.05 adjust hardware to ensure smooth operation

Task 15 Installs roofing.

Context The proper installation of a roof assembly is essential to the aesthetics, comfort and proper functioning of the building. Careful attention to specifications and site conditions is critical in preventing roofing issues.

Required Knowledge

K 1	types of roofing materials such as asphalt, wood and metal
K 2	roofing installation and repair procedures
K 3	types of components such as vents, flashings and underlayments, and their applications
K 4	types of fasteners
K 5	adhesion requirements for site conditions
K 6	jurisdictional requirements
K 7	sequence of installation
K 8	safety requirements such as fall protection (toe boards on scaffolding and 3-point contact on ladders)
K 9	handling and placement requirements for roofing materials

Sub-task

E-15.01 Installs roofing components.

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

Key Competencies

E-15.01.01	select and use tools and equipment such as staplers, chalk lines, knives, metal shears and hammers
E-15.01.02	select roof venting products according to location, specifications, and type and size of roof
E-15.01.03	select strapping according to specifications and product requirements
E-15.01.04	select flashing such as drip edges, step flashing and cap flashing according to location, specifications and type of roof
E-15.01.05	apply underlayment materials to prevent damage such as ice damming and water penetration

E-15.01.06	apply flashing components using fasteners and sealants, according to manufacturers' specifications, to direct water and prevent moisture penetration,
E-15.01.07	mount roof ventilation components such as ridge vents and exhaust vents according to manufacturers' specifications
E-15.01.08	install skylights according to manufacturers' specifications

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Sub-task

E-15.02 Installs roof coverings.

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

Key Competencies

E-15.02.01	select and use tools and equipment such as staplers, chalk lines, knives, metal shears, air nailers and hammers
E-15.02.02	select roofing materials such as asphalt shingles and metal according to site requirements, conditions and specifications
E-15.02.03	secure metal roofing materials such as corrugated and steel tile according to specifications
E-15.02.04	secure wood roofing materials such as shakes and shingles according to building code and manufacturer's specifications
E-15.02.05	secure asphalt roofing materials such as shingles and rolled roofing according to manufacturers' specifications
E-15.02.06	install starter strip, drip edge, flashing and caulking according to site requirements, conditions and specifications
E-15.02.07	install ridge and hip caps according to specifications

Task 16 Installs exterior finishes.

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

Required Knowledge

K 1	types of cladding such as siding and shingles
K 2	effects of weather on exterior walls and protection such as rain screens and flashings
K 3	types of exterior trims such as frieze boards, starter strips and mouldings
K 4	installation sequence and procedures for exterior cladding
K 5	cornices and soffit/fascia, and their installation procedures
K 6	types of fasteners such as sheathing tape, electro-galvanized nails and ring nails
K 7	safety requirements such as fall protection (toe boards on scaffolding and 3-point contact on ladders)
K 8	types of wall membranes, adhesives and sealants such as air barrier, tar paper and silicone caulking
K 9	speciality tools such as snap-lock punch, zip tool and slot punch

Sub-task

E-16.01 Installs exterior wall components.

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

Key Competencies

E-16.01.01	select and use tools and equipment such as metal brakes and vinyl siding tools according to task
E-16.01.02	select wall components such as air barriers, corner boards and flashings according to specifications and wall covering
E-16.01.03	select wall trims such as vinyl, wood and composite products according to specifications
E-16.01.04	check for plumb, level and square structure and compensate to ensure efficient use of material and aesthetics

E-16.01.05	apply furring, continuous air barrier and insulation according to manufacturers' specifications to provide weather protection (rain screen) and for energy efficiency
E-16.01.06	install flashing over top of windows, doors, openings and trims according to jurisdictional requirements to provide weather protection (rain screen) and re-direct water
E-16.01.07	install coverings for cornice (soffit/fascia) according to specifications

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Sub-task

E-16.02 Installs exterior wall coverings.

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

Key Competencies

E-16.02.01	select and use tools and equipment such as air compressors, nailers, metal brakes and metal siding tools according to task
E-16.02.02	select wall coverings such as vinyl, wood and composite products according to specifications
E-16.02.03	apply wall coverings for aesthetics and weather protection, according to manufacturers' specifications using methods such as staggered joints, storey pole, laser level and string lines
E-16.02.04	prepare joints such as butt, scarf, mitre and lap according to wall covering being installed

Trends

The use of foam board waterproofing systems rather than wall board for showers and raised tubs is increasing in popularity. Renewable and environmentally friendly products, such as bamboo and synthetic flooring, are becoming more prevalent. The demand for access flooring is decreasing. In many jurisdictions, medium density fibreboard (MDF) is replacing wood interior finishes.

Related Components (including, but not limited to)

Wall/Ceiling Systems: Gypsum board, sound (acoustical) panels, cork, fibreglass reinforced panels (FRP), vinyl panels, plywood, solid wood, book match panels, metal panels, ceiling grids, sound baffles, resilient channels, vinyl wall boards, aluminium door frames (as they apply to demountable walls), adhesives, screws, nails, anchors, mouldings, main-tees, cross-tees, splines, carrying channels, hat tracks (furring/resilient channels), tie wire, hanger wire, steel studs, track clips, threaded rods, I-beam clips.

Flooring: Tiles, hardwood flooring, access flooring, laminate flooring, adhesives, screws, nails, trims, underlayment.

Doors and Windows: Sliding doors, swinging doors, pocket doors, bi-fold doors, accordion doors, fixed windows, operating windows, hinges, closers, locksets, thresholds, emergency exit devices, protection plates, door stops, kick plates, astragals, barrier-free devices, dead bolts, fire-rated doors, escutcheons, mullions, sashes, transoms.

Stairs: Risers, treads, stringers, wedges, balustrades, skirt boards, newel posts, half-newel posts.

Finish Components: Casing (doors and windows), chair rails, shelving, washroom accessories, putty, wood plugs, hinges, mantles, slides, pulls, closers, casework, trim, laminates, biscuits, dowels, adhesives, draw bolts, anchors, valance, washroom partitions, cabinets, counter tops, display cases, grab bars, closet rods, mirrors, blinds, hand rails.

Tools and Equipment

See Appendix A.

Task 17 Applies wall and ceiling finishes.

Context The proper installation of interior finishes is essential to the 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 workmanship.

Required Knowledge

K 1	types of wallboard
K 2	types of wall systems such as shaft wall, fire-rated wall and STC rated wall
K 3	sequence of installation
K 4	fire stopping and fire proofing requirements such as 1-hour and 2-hour ratings
K 5	blocking requirements
K 6	sound proofing methods such as resilient channels, sound batts and baffles
K 7	types of panels and tiles such as hardboard, laminate and acoustic tiles
K 8	types of ceiling systems such as suspended
K 9	manufacturers' specifications
K 10	cutting methods for wallboard
K 11	solid wood finishes
K 12	requirements of other trades
K 13	fire rating of types of suspended ceilings
K 14	bulkheads
K 15	types of demountable wall systems such as curtain walls and office partitions
K 16	speciality tools such as rotary cut out tools, rasps, notched trowels and laminate rollers
K 17	jurisdictional requirements
K 18	methods to scribe and fit panels and tiles
K 19	adhesive and fasteners such as contact cement, mastic and tile staples
K 20	safe work practices such as dust control and respiratory protection
K 21	taping and filling applications and requirements
K 22	proper consistency of compound according to coat being applied
K 23	compound application techniques

Sub-task

F-17.01 Installs wallboard.

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

Key Competencies

F-17.01.01	select and use equipment such as screw guns, cut out tools, knives, straightedges and tape measures
F-17.01.02	select wallboard such as gypsum, cement and fibre board according to specifications and jurisdictional requirements
F-17.01.03	prepare wall or ceiling surface, such as aligning studs or adding material to receive wallboard
F-17.01.04	cut wallboard to fit wall or ceiling and for openings such as electrical, plumbing, windows and HVAC
F-17.01.05	place wallboard staggering joints, placing factory edges together and avoiding joints over the lock side of door openings
F-17.01.06	secure wallboard using fasteners such as screws, adhesives and ring nails according to jurisdictional requirements

Sub-task

F-17.02 Applies wall compound.

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

Key Competencies

F-17.02.01	select and use tools and equipment such as trowels, putty knives, hawks, automatic taping tools and sand paper
F-17.02.02	select compound and tapes according to application such as fireproofing, sound proofing and finish coat
F-17.02.03	mix compound according to manufacturers' specifications
F-17.02.04	cut back joints to receive compound
F-17.02.05	install corner beads
F-17.02.06	tape joints and corner beads
F-17.02.07	fill joints and seams with appropriate compound

F-17.02.08 sand surface

F-17.02.09 repeat compound application and sanding until smooth surface is achieved

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Sub-task

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	yes	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Key Competencies

F-17.03.01 prepare wall or ceiling surface according to finish to be applied

F-17.03.02 measure and cut panels, tiles and wood to fit wall/ceiling/corners and for penetrations such as electrical outlets, plumbing pipes and heating ducts

F-17.03.03 place panels and tiles using tools such as laminate rollers, trimmers and notched trowels so that they are aligned for appearance and fit

F-17.03.04 secure panels, tiles and wood using fasteners such as finish nails, brad nails adhesives and staples

F-17.03.05 secure finished trim according to manufacturers' specifications

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Sub-task

F-17.04 Installs suspended ceilings.

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

Key Competencies

F-17.04.01 select and use tools and equipment such as metal shears, laser levels, wire cutters, dry lines and cordless drills

F-17.04.02 select suspended product such as tiles and wallboard according to specifications and building code

F-17.04.03 measure and cut suspended ceiling components such as wall channels, wallboard, main-tees and cross-tees according to specifications and site requirements

F-17.04.04 secure suspended ceiling components such as eyelets, support drops, tee tracks and hangers

F-17.04.05 align and level grid to ensure uniformity and square alignment

F-17.04.06 measure and cut openings in panels and wallboard to accommodate fixtures such as electrical, sprinkler and HVAC

Sub-task

F-17.05 Installs demountable wall systems.

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

Key Competencies

F-17.05.01 select and use tools and equipment such as stud crimpers, levels and cordless screw guns

F-17.05.02 place demountable wall system according to manufacturers' specifications, and site and building code requirements

F-17.05.03 adjust demountable wall system for alignment

F-17.05.04 install clips on panels according to manufacturers' specifications

F-17.05.05 attach panels to wall framing

F-17.05.06 verify system components are functioning and appearance is in accordance with manufacturers' specifications

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Task 18 Installs flooring.

Context The proper installation of flooring is essential to the aesthetics, comfort and proper functioning of the building. A floor should look and feel level and minimize transitions to prevent tripping.

Required Knowledge

K 1 types of underlayment such as plywood sheathing, cement board and isolation membrane

K 2 types of floor finishes to be applied on underlayment

K 3 fastening devices

K 4 types of floor coverings such as tile, hardwood and laminate

K 5 effects of expansion and contraction

K 6 types of access flooring and components

K 7 sequence of installation

K 8	requirements of other trades
K 9	specialty floors such as gymnasium and bowling alley floors

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Sub-task

F-18.01 Installs underlayment.

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

Key Competencies

F-18.01.01	select and use tools and equipment such as scrapers, belt sanders and trowels
F-18.01.02	prepare substrate according to site conditions such as applying floor leveling compound, cleaning and scraping to receive underlayment
F-18.01.03	select type and size of underlayment sheets such as hardboard and plywood
F-18.01.04	measure, cut, place and secure underlayment over substrate according to building code and manufacturers' specifications

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Sub-task

F-18.02 Installs floor coverings.

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

Key Competencies

F-18.02.01	select and use tools and equipment such as scrapers, belt sanders, trowels, nailers, tile cutters and saws
F-18.02.02	prepare substrate according to site conditions such as applying floor leveling compound, cleaning and scraping to receive coverings
F-18.02.03	select floor covering to ensure quality and uniformity
F-18.02.04	measure, cut and place floor covering to fit allowing for floor expansion and contraction
F-18.02.05	install floor trim and accessories such as transition strips, expansion joints and stops
F-18.02.06	secure floor covering according to manufacturers' specifications
F-18.02.07	stagger joints to provide strength and aesthetics
F-18.02.08	place strip flooring using fasteners and adhesives

Sub-task

F-18.03 Installs access flooring.

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

Key Competencies

F-18.03.01	select and use tools and equipment such as levels, masonry drills and concrete fastening tools
F-18.03.02	adapt access flooring to site requirements by measuring, cutting, fitting and assembling materials and components according to manufacturers' specifications
F-18.03.03	level and secure access flooring to substrate and perimeter walls according to manufacturers' specifications using fasteners and adhesive such as concrete anchors, inserts and clips

Task 19 Installs interior doors and windows.

Context Interior doors are installed for privacy. They reflect the desired style of the building and are often custom ordered. Interior windows are commonly installed to provide light, for viewing or for aesthetic purposes.

Required Knowledge

K 1	types of interior window and door jambs/frames and their application
K 2	installation procedures and code requirements
K 3	types of interior doors such as swing, fire, hollow and louvered, and their components application
K 4	types of interior windows and their application
K 5	interior window components and glazing systems
K 6	types and styles of interior door and window hardware
K 7	door and window schedules
K 8	specialty interior doors such as rolling shutter, bi-fold partition and accordion

Sub-task

F-19.01 Installs interior jambs/frames.

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

Key Competencies

F-19.01.01	select and use tools and equipment such as levels, drills and nailers
F-19.01.02	verify rough opening according to type of door, size and swing to ensure fit and to allow for finished flooring
F-19.01.03	level head jamb, and plumb and square side jambs
F-19.01.04	align adjacent jambs or frames with each other
F-19.01.05	secure jambs/frames by shimming and fastening
F-19.01.06	insulate cavity around jambs/frames to create an acoustical break or fire stop according to building code
F-19.01.07	assemble steel and wood door frames prior to installation according to site requirements

Sub-task

F-19.02 Installs interior doors.

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

Key Competencies

F-19.02.01	select and use tools and equipment such as levels, chisels, templates and routers
F-19.02.02	determine door size, swing, bevel and location according to schedule
F-19.02.03	lay out door slab and jamb for hinge location
F-19.02.04	mortise hinge gains on slab and jambs
F-19.02.05	hang door level and plumb with shims
F-19.02.06	secure door and jamb using fasteners
F-19.02.07	install tracks and/or pivots for doors such as pocket, bypass and bi-fold

Sub-task

F-19.03 Installs interior windows.

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

Key Competencies

F-19.03.01	select and use tools and equipment such as levels, drills, nailers and mitre saws
F-19.03.02	verify and adjust rough opening to ensure fit
F-19.03.03	select window according to schedule
F-19.03.04	place window in rough opening using shims to level and plumb
F-19.03.05	secure window using fasteners
F-19.03.06	insert and secure glass into frame according to site requirements

Sub-task

F-19.04 Installs interior door and window hardware.

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

Key Competencies

F-19.04.01	select hardware such as locks, closers and emergency devices according to schedule, site requirements and building code
F-19.04.02	position hardware using equipment such as templates and mortising jigs
F-19.04.03	install hardware to doors and windows according to manufacturers' specifications, schedule and site requirements
F-19.04.04	adjust hardware to ensure smooth and proper operation
F-19.04.05	coordinate with other trades to ensure considerations are made for other components to be installed such as interior finishes, flooring and access hardware

Task 20 Constructs and installs finish components and stairs.

Context 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.

Required Knowledge

K 1	boring techniques
K 2	abrasives and adhesives
K 3	wood finish requirements such as paint, stain or clear
K 4	types of components and accessories such as casing, baseboards , crown moulding, towel bars and mirrors
K 5	fasteners and anchors
K 6	speciality tools such as plug cutters, biscuit joiners and mortise joiners
K 7	types of joinery such as coped, mitre and butt joint
K 8	constructing and using jigs
K 9	types of stairs such as straight, spiral and circular
K 10	marking techniques
K 11	stair geometry and calculations
K 12	stair components such as glue blocks, wedges and handrails
K 13	jurisdictional requirements
K 14	types of stringers such as open, housed and laminated
K 15	lamination processes to create stair components
K 16	characteristics of aesthetically appealing interior finishes

Sub-task

F-20.01 Fabricates finish components.

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

Key Competencies

F-20.01.01	select and use tools and equipment such as nailers, table saws, routers and planers
F-20.01.02	select stock for quality and uniformity
F-20.01.03	cut, measure and assemble components such as custom doors, access hatches and handrails according to manufacturers' specifications or site requirements
F-20.01.04	cut, measure and assemble built-in units such as cabinets, shelves, walk-in closets, mantels and counter tops according to manufacturers' specifications or site requirements
F-20.01.05	cut, measure and assemble special trims such as jamb extensions, window sills and aprons according to manufacturers' specifications or site requirements
F-20.01.06	construct jigs for repetitive fabrication

Sub-task

F-20.02 Installs finish components and accessories.

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

Key Competencies

F-20.02.01	select and use tools and equipment such as coping saws, jigs, nailers and mitre saws
F-20.02.02	select components and accessories to be installed according to specifications
F-20.02.03	secure finish components such as trim, casing, baseboards and crown mouldings ensuring they are level, plumb, aligned and visually appealing
F-20.02.04	secure accessories such as towel bars, shower rods and mirrors ensuring they are level, plumb, aligned and visually appealing
F-20.02.05	secure barrier-free components according to manufacturers' specifications and jurisdictional requirements
F-20.02.06	attach built-in components such as cabinets, shelves, mantels and counter tops ensuring they are level, plumb, aligned and visually appealing

F-20.02.07	attach hand rails and guard rails such as hallway rails and window rails according to jurisdictional requirements
F-20.02.08	attach balustrade components such as newels, balusters and hand rails according to jurisdictional requirements

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Sub-task

F-20.03 Constructs stairs.

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

Key Competencies

F-20.03.01	select and use tools and equipment such as stair gauges, templates and jig saws
F-20.03.02	confirm stairwell dimensions such as openings, total rise and allowable headroom according to jurisdictional requirements and specifications
F-20.03.03	select stock to ensure quality and uniformity
F-20.03.04	measure and cut stair components according to specifications
F-20.03.05	install stringers to give support and structure
F-20.03.06	position the stair unit in place by shimming and levelling
F-20.03.07	secure stair unit using fasteners such as lag bolts, screws and adhesives
F-20.03.08	install skirt boards, mouldings and risers
F-20.03.09	install finished treads so that they are consistent and level

Trends

More and more carpenters are finding employment within the renovation sector of the construction industry. This is mainly being driven by the country's aging buildings and infrastructures. Other factors contributing to the growth of this sector are improved building codes, the nation's desire to preserve heritage structures as well as continually evolving considerations being given to health and the environment. Economic forces are also having an effect on the building renovations industry with more and more building owners opting to renovate their existing properties rather than purchasing new.

Related Components (including, but not limited to)

Hoarding, shoring, underpinning, foundations, interior walls and floors, exterior walls and roofs, exterior wall and roof finishes, windows and doors.

Tools and Equipment

See Appendix A.

Task 21 Performs renovation-specific support activities.

Context

Carpenters must be able to recognize and understand the differences between the requirements of a renovation project compared to new construction. Shoring is done to provide temporary support to the existing structure while undergoing renovations, whereas hoarding is done to enclose or separate the work site.

Required Knowledge

K 1	appearance and effects of conditions such as rot, mold/mildew and moisture
K 2	removal and disposal methods of materials such as insulation, concrete, wood and shingles
K 3	tarps, hoardings and separations
K 4	new and old framing systems such as balloon, platform, advanced framing, and post and beam
K 5	interior and exterior finishing systems such as lath and plaster, masonry, siding and stucco
K 6	techniques to protect project such as hoarding and heating

K 7	beam supports such as steel, wood and concrete
K 8	load bearing wall requirements
K 9	methods of containment and abatement of carcinogenic materials such as asbestos and PCBs by a certified contractor
K 10	destructive and non-destructive methods of identifying and assessing existing structures
K 11	types of carcinogenic materials and steps that should be followed
K 12	methods of temporary shoring
K 13	material removal methods that prevent damage to adjacent structures and/or components
K 14	jurisdictional requirements
K 15	historical building conservation requirements

Sub-task

G-21.01 Removes existing material.

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

Key Competencies

G-21.01.01	identify materials that require removal due to conditions such as rot/mold, damage, undersized materials and hazardous materials (lead-based paints, asbestos)
G-21.01.02	identify structures such as doors and windows, exterior walls and concrete foundations that need to be removed or repaired as per project requirements
G-21.01.03	identify material that may be reclaimed and reused
G-21.01.04	remove components that no longer meet code requirements such as lintels, beams, windows and insulation
G-21.01.05	report, abate and/or contain hazardous materials and substances such as lead-based paint, asbestos and mold according to jurisdictional requirements
G-21.01.06	remove components such as roofs, grade beams and walls according to project drawings while maintaining structural integrity
G-21.01.07	remove existing materials with care to allow for reuse and reclamation
G-21.01.08	dispose of removed materials such as wood, concrete, insulation and glass according to jurisdictional and project requirements

Sub-task

G-21.02 Protects structure during renovations.

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

Key Competencies

G-21.02.01	identify location and types of temporary support required according to loading conditions and/or project drawings
G-21.02.02	identify location and types of hoarding and coverings needed such as tarps, drop cloths and plywood, to meet project and/or jurisdictional requirements
G-21.02.03	construct and/or install temporary supports such as scaffolding, pipe jacks, pilings, beams and posts, to meet project and/or jurisdictional requirements
G-21.02.04	install hoarding and coverings to protect materials, areas and structures such as finished floors and ceilings that may be compromised or damaged during renovation activities

Task 22 Performs renovation-specific construction activities.

Context Renovation-specific construction tasks include joining additions 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.

Required Knowledge

K 1	interior and exterior finishing systems such as lath and plaster, masonry, siding and stucco
K 2	building interior finishes such as panelling, and lath and plaster
K 3	new and old building techniques and materials
K 4	energy efficient retrofit techniques
K 5	materials that may be reclaimed and reused
K 6	material installation methods that prevent damage to existing structures and components
K 7	tie-in methods to accommodate conditions such as structure not plumb, level, or square

K 8	consequences of adding or removing components such as interior walls, beams and floor joists
K 9	consequences of modifying the layout of components

Sub-task

G-22.01 Joins new to existing construction.

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

Key Competencies

G-22.01.01	select materials that are compatible with existing materials, and that meet current standards
G-22.01.02	install exterior components such as flashing and sheathing to make a weatherproof transition from new construction to existing
G-22.01.03	take steps to ensure a continuous building envelope is maintained, where possible, such as joining new windows and doors to existing vapour and air barriers
G-22.01.04	install new materials using methods that prevent damage to adjacent structure and/or components of the structure
G-22.01.05	transition new material to existing material such as concrete and tile flooring, and siding for aesthetic purposes
G-22.01.06	ensure a good bond from new material to existing materials such as concrete, thinset, mortar and stucco

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Sub-task

G-22.02 Changes existing structure during renovations.

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

Key Competencies

G-22.02.01	change existing openings such as stairwells, exterior and interior doors and windows to accommodate new components
G-22.02.02	change existing structures to increase energy efficiency using methods such as adding insulation and replacing cladding, windows and doors

G-22.02.03	relocate components such as walls, stairs and built-ins like cabinets and shelves
G-22.02.04	perform adjustments to structural supports such as columns and beams without causing unnecessary damage

APPENDICES

APPENDIX A TOOLS AND EQUIPMENT

Hand Tools

adjustable wrench
aviation snip
bars (pry, wrecking, aligning)
brad driver
broom
brushes
bull float
butt gauge
carpenter's apron
caulking gun
chalk line
circle cutter
clamps
cold chisel
concrete edgers
cone/tie wrench
dry line
drywall t-square
file
finish trowel
framing square
hammers (framing, finishing, dead blow, rubber mallet, wood mallet, sledge, roofing, drywall)
hand float
hand level (24", 48", 6-ft., 8-ft., torpedo, line)
hand saws (pull, hack, keyhole, drywall, coping, rip, hole, cross cut, back, pruning)
hatchet
knives (utility, drywall)
measuring tape (various)
multi-driver screwdriver
nail puller
nail set
pencil/marking instrument
pipe wrench
planes (various)
pliers and side cutters
plumb bob
rakes
rasps
rollers
scrapers (cabinet, floor, form)
screwdrivers (Robertson, Phillips, straight, Torx, hexagonal)
shovels
siding shears
slide hammer
sliding t-bevel
spud wrench
staplers (hammer, hand, electric)
string lines
tarps
tile cutter
tin snips
trowels
wall jack
wheelbarrow
wood chisels

Portable Power Tools and Accessories

biscuit joiner
calculator
chainsaw
circular saw
cordless drill
coring drill and bits
cut-off saw (metal)
cut-out tools
concrete bits
concrete cutting saw
concrete vibrators
construction heaters
drywall gun
electric chipping hammer
electric drill and bits
electric shears
extension cords
fan-forced heater
fuel cell nailer
generator
grinders
hammer drill
hydraulic jacks
jackhammer
jigsaw
laminate trimmer
mini-grinder
mitre saw
oscillating multi tool
planer
porta power
powder-actuated tools
reciprocating saw
router and bits
sanders (palm, belt, random, detail)
staplers
tiger torch
tile wet saw
wet/dry vacuum
wood boring bits
wood spade bit set

Stationary Power Tools

band saw
disk sander/drum sander
drill press
dust collection equipment
grinder
jointer
mortiser
power feeder
radial arm saw
router table
shaper
table saw
thickness planer
wood lathe

Pneumatic Tools and Equipment

air compressor
air dryers
drills
fittings
gauges
hoses
impact gun
nailers
sandblasters
shears
staplers
wrenches

Rigging, Hoisting and Access Equipment

aerial work platforms
blocks and tackles
cables
chokers
come-alongs
eyebolts
forklifts (variable reach forklifts)
guardrails
grip hoist (tirfors)
ladders
ladder hoist
ladder jacks
lifting beam
pinch bar
pulleys
scaffolding
ropes
skid ramps
skid steers
slings
spreader bar
synthetic lifting straps
tag lines
turnbuckles
wire rope

Layout Instruments

builder's levels
chalk lines
combination squares
dividers
drawing instruments
dry lines
framing squares
jigs
laser levels
laser measuring systems
measuring tapes
plumb bobs
robotic survey equipment
scale rulers
scribers
scribing compasses
sliding T-bevels
speed squares
stair gauges
templates
theodolites
total stations
transits
try squares

Personal Protective Equipment (PPE) and Safety Equipment

fall arrest anchor points
fall protection equipment
first aid kits
full body harness
gloves
hard hat
hearing protection
knee pads
lanyard
reflective vest
respiratory equipment, dust mask and respirators
roof jack
rope grab
safety boots
safety glasses and shields
safety lifeline
solar protection

APPENDIX B GLOSSARY

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.
acclimatization	to make or become used to new climates or new conditions
astragal	provides a solid edge for the operating door to seal onto in a double door application
back framing	the secondary non-structural framing done after the structural framing is completed; includes such items as grab bars valances, drop ceilings, chases and boxing for utilities, attic access, backing, etc.
balustrade	railing consisting of a series of balusters connected at the top by a rail
batter boards	boards at each corner (at right angles) of an excavation and at grid lines, used to indicate the location and alignment of footing and foundation walls and columns
beam	a main horizontal structural member constructed of wood, steel or concrete used to support secondary vertical loads
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
caisson	water tight box or enclosure used for construction work below grade or water level
cladding	the covering of one material with another
column	a vertical structural member that supports the weight of other members
cornice	the entire finished assembly where the walls of a structure meet the roof; sometimes called the eaves
curing	a process of maintaining adequate moisture content during hydration for quality concrete
dunnage	wood strips or crating between materials that provides air circulation and lifting space; waste material

demountable wall	a wall or partition system designed to be removed from a mounting, setting or place of support
embedded steel	steel components that are an integral part of concrete structures; this includes reinforcing steel, anchor bolts, angle iron and miscellaneous hardware
falsework	the structural supports and the necessary bracing required for the support of temporary loads during 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
fly ash	used as a substitute for Portland cement and sand in concrete mixtures
footing	supporting element at the base or bottom of a foundation wall, pier or column used to distribute weight
formwork	temporary structures constructed to the shape of the finished structural member, to support freshly poured concrete
foundation	the lower part that rests on and extends into the ground, providing support for the structure above it
geometric stairs	stair systems that include elliptical, curved or spiral stairs
grout	a cementitious or epoxy-based mixture, installed in a plastic state, to fill structural (column base plates) and non-structural voids (tile joints)
header	a joist or rafter that is perpendicular to the trimmer joists or rafters, used to support and frame openings
hydration	a chemical reaction of cement and water causing concrete or mortar to harden
hoarding	temporary structure or fencing around a construction site for safety, weather or to maintain heat
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
insulating	the installation of various materials used to resist heat, sound and cold transmission through walls, floors, ceilings and foundations

jack (trimmer) stud	a framing member that supports the lintel and is used to provide added strength and stiffness around framed openings
joist	one of a series of horizontal members used to support a floor, ceiling or roof
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
lintel	wood, stone or steel member placed across the top of a rough door or window opening; it supports the weight from above
load bearing wall	a wall that supports primary vertical loads
maintenance	activities required for the proper functioning of power tools such as inspecting, oiling, tensioning of chains or belts, adjusting, dusting air filters, etc.
pier	a foundation which distributes the weight of a column
ponding (wet curing)	a method of curing a concrete slab by flooding its surface with water
powder –actuated tool	device that drives fasteners by means of an explosive charge
rafter	one of a series of structural members of a roof designed to support roof loads
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"
rise	vertical measurement on stairs, ramps and roofs
run	horizontal measurement on stairs, ramps and roofs
shoring	v. describes the process of supporting a structure in order to prevent collapse so that construction can continue; n. refers to the material used in the process to support a structure; during excavation, shoring systems provide safety for workers in a trench and speeds up excavation
siding	boards and panels used as an exterior wall covering

structural insulted panel systems (SIPS)	structural insulated panel systems; insulating material sandwiched between two layers of oriented strand board (OSB) or plywood, prefabricated in a factory
site layout	location of primary building components on the building site via construction drawing interpretation in relation to property lines
soffit	underside of a part of a building or a structural component such as an arch, beam, stair or cornice
square	having two sides that are at right angels (90 degrees to each other)
stud	one of a series of vertical structural members used as support in walls and partitions
subfloor	boards or sheet material laid on joists under a finished floor
temporary structure	any structure erected during construction that is removed upon completion of the project
tile	thin building material made of cement, plastic or other resilient material used as a finish for walls, floors, ceilings or roofs
trimmer	see jack stud
yoking	installation of ties or clamping devices around column forms or over the top of wall or footing forms to keep them from spreading because of pressure imposed by concrete placement

APPENDIX C ACRONYMS

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
MSDS	Material safety data sheet
NBC	National Building Code
OH&S	Occupational Health and Safety
OSB	Oriented strand board
PPE	Personal protective equipment
RFI	Request for information
SIPS	Structural insulated panel system
STC	Sound transmission class
VDR	Vapour diffusion retarder
VOC	Volatile organic compound
WLL	Working load limit
WHMIS	Workplace Hazardous Materials Information System
WWM	Welded wired mesh
XPS	Extruded polystyrene

APPENDIX D BLOCK AND TASK WEIGHTING

BLOCK A COMMON OCCUPATIONAL SKILLS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	20	10	6	14	NV	15	20	11	20	5	NV	12	NV	14%

Task 1 Uses and maintains tools and equipment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	20	23	30	25	NV	25	30	45	25	30	NV	35	NV	29%

Task 2 Performs safety related activities.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	20	26	25	27	NV	25	40	10	25	10	NV	20	NV	23%

Task 3 Uses building materials.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	28	30	25	NV	25	15	35	25	40	NV	25	NV	28%

Task 4 Builds and uses temporary access structures.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	23	15	23	NV	25	15	10	25	20	NV	20	NV	20%

BLOCK B PLANNING AND LAYOUT

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	10	10	11	33	NV	25	15	30	16	20	NV	8	NV	18%

Task 5 Interprets documentation.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	40	38	35	17	NV	33	33	20	35	15	NV	40	NV	31%

Task 6 Organizes work.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	25	22	20	16	NV	34	33	40	30	25	NV	25	NV	27%

Task 7 Performs layout.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	35	40	45	67	NV	33	34	40	35	60	NV	35	NV	42%

BLOCK C CONCRETE

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	10	13	17	10	NV	15	15	15	19	20	NV	20	NV	15%

Task 8 Constructs formwork.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	70	75	75	62	NV	70	50	70	70	75	NV	70	NV	69%

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

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	25	25	38	NV	30	50	30	30	25	NV	30	NV	31%

BLOCK D FRAMING

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	15	15	23	14	NV	15	15	14	19	15	NV	22	NV	17%

Task 10 Constructs floor systems.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	25	30	30	32	NV	25	25	33	25	25	NV	30	NV	28%

Task 11 Constructs deck systems.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	25	15	15	18	NV	25	25	7	30	10	NV	15	NV	19%

Task 12 Constructs wall systems.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	25	25	25	22	NV	20	25	30	20	25	NV	25	NV	24%

Task 13 Constructs roof and ceiling systems.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	25	30	30	28	NV	30	25	30	25	40	NV	30	NV	29%

BLOCK E EXTERIOR FINISH

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	15	18	12	12	NV	10	10	12	10	20	NV	14	NV	13%

Task 14 Installs exterior doors and windows.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	25	33	35	32	NV	45	40	35	32	55	NV	35	NV	37%

Task 15 Installs roofing.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	40	33	40	36	NV	20	20	30	32	10	NV	30	NV	29%

Task 16 Installs exterior finishes.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	35	34	25	32	NV	35	40	35	36	35	NV	35	NV	34%

BLOCK F INTERIOR FINISH

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	15	18	15	11	NV	10	10	14	10	15	NV	15	NV	13%

Task 17 Applies wall and ceiling finishes.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	20	18	25	19	NV	20	15	25	20	20	NV	20	NV	20%

Task 18 Installs flooring.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	20	20	21	NV	20	15	10	20	10	NV	20	NV	19%

Task 19 Installs interior doors and windows.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	20	32	20	28	NV	20	35	20	30	25	NV	30	NV	26%

Task 20 Constructs and installs finish components and stairs.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	30	35	32	NV	40	35	45	30	45	NV	30	NV	35%

BLOCK G RENOVATIONS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	15	16	16	6	NV	10	15	4	6	5	NV	9	NV	10%

Task 21 Performs renovation-specific support activities.

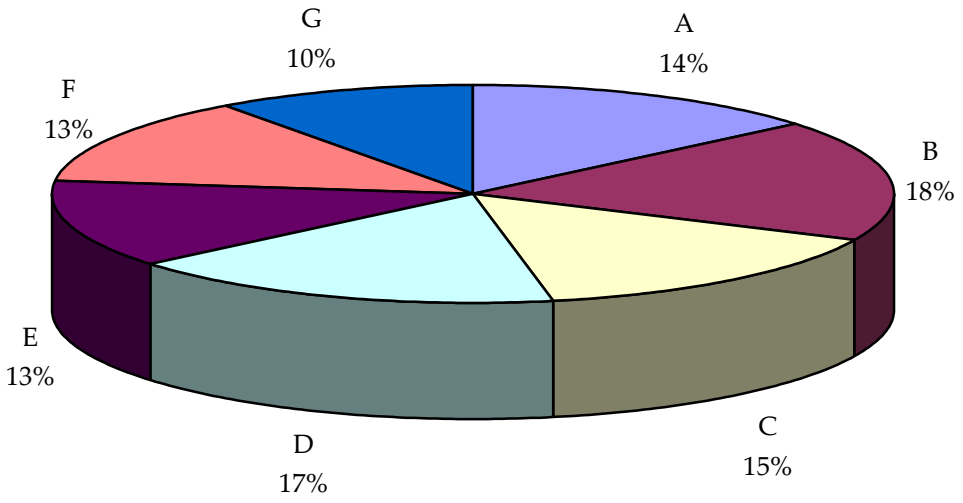
	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	40	50	40	56	NV	40	50	30	50	50	NV	35	NV	44%

Task 22 Performs renovation-specific construction activities.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	60	50	60	44	NV	60	50	70	50	50	NV	65	NV	56%

APPENDIX E

PIE CHART*



TITLES OF BLOCKS

BLOCK A	Common Occupational Skills	BLOCK E	Exterior Finish
BLOCK B	Planning and Layout	BLOCK F	Interior Finish
BLOCK C	Concrete	BLOCK G	Renovations
BLOCK D	Framing		

*Average percentage of the total number of questions on an interprovincial examination, assigned to assess each block of the analysis, as derived from the collective input from workers within the occupation from all areas of Canada. Interprovincial examinations typically have from 100 to 150 multiple-choice questions.

APPENDIX F

TASK PROFILE CHART — Carpenter

BLOCKS	TASKS	SUB-TASKS				
A – COMMON OCCUPATIONAL SKILLS	1. Uses and maintains tools and equipment.	1.01 Maintains hand, power and pneumatic tools.	1.02 Maintains stationary tools.	1.03 Uses powder-actuated tools.	1.04 Uses lifting, rigging and hoisting equipment.	1.05 Uses layout instruments.
		1.06 Uses tack welding equipment. (NOT COMMON CORE)	1.07 Uses torch cutting equipment. (NON COMMON CORE)			
	2. Performs safety related activities.	2.01 Uses personal protective equipment (PPE) and safety equipment.	2.02 Maintains safe work environment.			
	3. Uses building materials.	3.01 Installs fasteners, adhesives and connectors.	3.02 Installs membranes and sealants.	3.03 Installs foundation protection.	3.04 Installs insulating materials.	
	4. Builds and uses temporary access structures.	4.01 Uses stationary access equipment.	4.02 Uses mobile access equipment.	4.03 Erects/ dismantles scaffolding.	4.04 Modifies specialized scaffolding.	
B – PLANNING AND LAYOUT	5. Interprets documentation.	5.01 Interprets project drawings.	5.02 Interprets specifications.	5.03 Interprets safety documentation.	5.04 Interprets workplace documentation.	
	6. Organizes work.	6.01 Schedules work sequence.	6.02 Performs site preparation.	6.03 Performs quantity take off.	6.04 Organizes material.	

BLOCKS	TASKS	SUB-TASKS				
	7. Performs layout.	7.01 Performs site layout.	7.02 Lays out concrete formwork.	7.03 Lays out floor systems.	7.04 Lays out deck systems.	7.05 Lays out wall systems.
		7.06 Lays out ceiling systems.	7.07 Lays out roof systems.	7.08 Lays out stairs.		
C – CONCRETE	8. Constructs formwork.	8.01 Erects excavation shoring and underpinning.	8.02 Erects concrete falsework.	8.03 Constructs footing forms.	8.04 Constructs wall and grade beam formwork.	8.05 Constructs slab-on-grade formwork.
		8.06 Constructs column formwork.	8.07 Constructs stair formwork.	8.08 Installs embedded steel.	8.09 Dismantles formwork.	
	9. Installs concrete, cement-based and epoxy products.	9.01 Places concrete.	9.02 Facilitates curing of concrete.	9.03 Performs basic concrete finishing.	9.04 Installs pre-cast components.	9.05 Installs grout.
D – FRAMING	10. Constructs floor systems.	10.01 Installs engineered floor systems.	10.02 Constructs dimensional lumber floor framing.			
	11. Constructs deck systems.	11.01 Constructs decks.	11.02 Installs decks components.			
	12. Constructs wall systems.	12.01 Installs engineered wall systems.	12.02 Constructs dimensional lumber wall framing.			

BLOCKS	TASKS	SUB-TASKS				
	13. Constructs roof and ceiling systems.	13.01 Installs engineered trusses.	13.02 Constructs roof and ceiling framing.			
E – EXTERIOR FINISH	14. Installs exterior doors and windows.	14.01 Installs exterior jambs/frames.	14.02 Installs exterior doors.	14.03 Installs specialty exterior doors.	14.04 Installs exterior windows.	14.05 Installs exterior door and window hardware.
	15. Installs roofing.	15.01 Installs roofing components.	15.02 Installs roofing coverings.			
	16. Installs exterior finishes.	16.01 Installs exterior wall components.	16.02 Installs exterior wall coverings.			
F – INTERIOR FINISH	17. Applies wall and ceiling finishes.	17.01 Installs wallboard.	17.02 Applies wall compound.	17.03 Installs panels, tiles and solid wood finishes.	17.04 Installs suspended ceilings.	17.05 Installs demountable wall systems.
	18. Installs flooring.	18.01 Installs underlayment.	18.02 Installs floor coverings.	18.03 Installs access flooring.		
	19. Installs 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.	
	20. Constructs and installs finish components and stairs.	20.01 Fabricates finish components.	20.02 Installs finish components and accessories.	20.03 Constructs stairs.		

BLOCKS	TASKS	SUB-TASKS	
G – RENOVATIONS	21. Performs renovation-specific support activities.	21.01 Removes existing material.	21.02 Protects structure during renovations.
	22. Performs renovation-specific construction activities.	22.01 Joins new to existing construction.	22.02 Changes existing structure during renovations.