

National Occupational Analysis

Bricklayer

2016

**CANADIAN
STANDARD
OF EXCELLENCE
FOR SKILLED TRADES**



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Employment and
Social Development Canada

Emploi et
Développement social Canada

Canada 

Bricklayer

2016

Trades and Apprenticeship Division

Division des métiers et de l'apprentissage

Labour Market Integration Directorate

Direction de l'intégration au marché du travail

National Occupational Classification:

7281

Disponible en français sous le titre :

Briqueur-maçon/briqueuse-maçonne

You can download this publication by going online: publiccentre.esdc.gc.ca. This document is available on demand in multiple formats by contacting 1 800 O-Canada (1-800-622-6232), teletypewriter (TTY), 1-800-926-9105.

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PDF

Cat. No.: Em15-1/26-2016E-PDF

ISBN: 978-0-660-04310-4

ESDC

Cat. No. : LM-518-01-16E

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

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. Employment and Social Development Canada (ESDC) 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.

ACKNOWLEDGEMENTS

The CCDA and ESDC wish to express sincere appreciation for the contribution of the many tradespersons, industrial establishments, professional associations, labour organizations, provincial and territorial government departments and agencies, and all others who contributed to this publication.

Special acknowledgement is extended by ESDC and the CCDA to the following representatives of the trade, and the apprenticeship bodies or national organizations that nominated them.

Gilbert Beausoleil
John Deleskie
Stephen Egan
Clarence Gallant
Brian Gebhardt

Michael Hazard
Clifford Kobelsky
Tim Maxson
Melvin Sparkes
Justin Stewart

Quebec
Nova Scotia
Manitoba
Prince Edward Island
Canadian Masonry Contractors
Association
British Columbia
Saskatchewan
Ontario
Newfoundland and Labrador
New Brunswick

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 Ontario also participated in the development of this NOA.

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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 <u>N</u> ot <u>V</u> alidated by a province/territory
ND	trade <u>N</u> ot <u>D</u> esignated 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 BRICKLAYER TRADE

“Bricklayer” is this trade’s official Red Seal occupational title approved by the CCDA. This analysis covers tasks performed by bricklayers 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
Brick and Stone Mason						✓							
Bricklayer	✓	✓	✓	✓			✓	✓	✓			✓	
Bricklayer - Mason					✓								
Mason										✓			

Bricklayers build and repair walls, floors, arches, pavings, partitions, fireplaces, chimneys, smokestacks, furnaces, kilns and other structures. They work with materials such as brick, natural stone, manufactured stone, tiles, precast masonry panels, glass blocks, concrete blocks, light-weight insulated panels, other masonry units, insulation and membranes. They erect, install, maintain, repair and alter various masonry. The structures vary in complexity from a simple masonry walkway to an ornate exterior on a multi-level building.

Bricklayers use wheelbarrows and forklifts to transport materials. They use hand and power tools to cut and trim masonry units to required size. Trowels are used to spread mortar to bond layers of masonry units together. Measuring and layout tools such as a plumb line, level and laser level are used to ensure proper alignment.

Bricklayers work on industrial, commercial, institutional and residential buildings. They may specialize in stone work, restoration work or ornamental work. They may also specialize in installing refractories in high-temperature environments or installing corrosion resistant materials to line corrosive environments such as tanks and vessels.

Key attributes for people in this trade are manual dexterity, mechanical aptitude, the ability to problem solve and think sequentially, and the ability to work at heights. Bricklaying is physically demanding work and requires considerable effort in lifting heavy materials, climbing, bending, kneeling, working in confined spaces and working on scaffolding. Bricklayers need to have an eye for detail in order to create accurate and aesthetically pleasing work.

Most of the work is performed outdoors exposing bricklayers to the elements. The winterization of job sites allows the work to continue year round. Construction safety and accident prevention is a priority.

This analysis recognizes similarities or overlaps with the work of other trades such as tilesetters, concrete finishers, carpenters, and drywall finisher and plasterers.

Experienced bricklayers may advance to supervisory positions for masonry contractors or in other related fields such as construction management, estimating or building inspection. They may also become contractors.

OCCUPATIONAL OBSERVATIONS

The trend away from fully masonry-veneered single-family homes continues. However, a new trend towards masonry in condominiums is increasing. Builders are starting to value the selling strength of brick and block construction. The advantages include energy efficiency, reduced maintenance, fire resistance, sound resistance, structural soundness and longevity of masonry. In the construction of housing, manufactured stone/thin veneers are being used more often due to ease of installation and consumer-driven interest.

Work practices and equipment are being designed with the bricklayer in mind, with consideration given to ergonomics and efficiency. Climbing scaffolding and tower scaffolding are designed to keep the bricklayer at a comfortable position to eliminate excessive bending and lifting. Cordless power tools such as drills, grinders and jackhammers are allowing greater mobility and efficiency. The use of dustless cutting and drilling technologies is being embraced by industry.

Specifications and documentation, owing to Leadership in Energy and Environmental Design (LEED), have become more complex. Energy efficiency and environmental awareness affect this trade as new regulations are imposed on building processes and materials. The masonry industry is a leader in compliance with LEED requirements. Bricklayers must keep up-to-date with these guidelines and requirements. There is a trend of increased safety documentation requirements on job sites.

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:

<http://www.edsc.gc.ca/eng/jobs/les/tools/index.shtml>.

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

Bricklayers require strong reading skills to read a variety of documentation such as job specifications, manufacturers' directions for product preparation and application, job site, company and jurisdictional safety requirements, and correspondence from suppliers and contractors.

Document Use

Bricklayers interpret blueprints, read assembly drawings and make sketches of items to be built. They complete forms such as time sheets, incident reports, request for information (RFI), personal safety information (PSI) and field level risk assessments (FLRA).

Writing

Bricklayers use writing skills to complete documents such as lists of materials, incident reports, and time sheets. They may correspond in writing with co-workers regarding supplies or work to be done.

Oral Communication

Bricklayers talk with suppliers, delivery personnel, customers and co-workers, and co-ordinate activities with other trades. They give directions to apprentices, liaise with supervisors and participate in meetings.

Numeracy

Bricklayers measure the length, height and width of structures to be built and calculate angles of arches when constructing openings. They estimate mix ratios by weight and volume. Bricklayers estimate the amount of time and material required to complete a job.

Thinking Skills

Bricklayers use problem solving skills to address issues that may arise on the job such as design changes or omissions. Bricklayers plan the materials and equipment they need for a job and schedule tasks according to priority, sequence and to meet the needs of other trades on site.

Working with Others

Bricklayers usually work in a team environment although they may work alone on some jobs. Many jobs are done with a fellow worker. Therefore, they must cooperate and coordinate with others to ensure consistent work. Bricklayers may perform supervisory functions and guide or monitor the work performance of others.

Digital Technology

Bricklayers may use digital devices to complete numeracy related tasks and to communicate with others. They may access online information posted by suppliers and manufacturers to stay current on industry trends and practices. Bricklayers may also access databases to retrieve forms such as change orders and to retrieve architectural drawings. Bricklayers may use computer controlled layout equipment such as surveying equipment and smart levels to measure distances and horizontal and vertical angles of brick structures.

Continuous Learning

Bricklayers learn continuously through experience and creativity on the job. They may attend sessions provided by manufacturers of new products. Bricklayers may also attend specialty in-person or online courses, for example safety or landscaping with bricks, blocks and stone, or reference pamphlets, booklets or manuals on specific topics. Bricklayers may need to expand their skills by getting additional certifications such as scaffold building, welding, hoisting and rigging and confined space.

BLOCK A

COMMON OCCUPATIONAL SKILLS

Trends	<p>The emphasis on safety continues to increase and there are more strict regulations to protect workers and the public. Related safety documentation has become more important. Equipment used by bricklayers such as dustless cutting systems has improved efficiency and safety.</p> <p>There is an increased use of mast climber scaffolding systems and scissor lifts resulting in a reduction in labour needs and an increase in production as a result of working at optimum heights.</p>
Related Components	All components apply.
Tools and Equipment	See Appendix A.

Task 1

Performs safety-related functions.

Context	Bricklayers integrate safety practices, such as wearing personal protective equipment (PPE), throughout every task included in the scope of their trade. They maintain a safe work environment through awareness of work surroundings. Compulsory safety training is standard practice.
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Required Knowledge

K 1	WHMIS
K 2	locations of WHMIS documents such as labels and safety data sheets (SDS)
K 3	safety and environmental regulations such as OH&S
K 4	company safety policies and procedures
K 5	workers' rights and responsibilities
K 6	hazards inherent in bricklaying and masonry materials such as sand, cement and chemicals
K 7	types of PPE such as high visibility apparel, safety glasses, noise protection, respirators, gloves and hard hats
K 8	location of PPE and safety equipment
K 9	types of safety equipment such as first aid kits and eyewash stations
K 10	types, operation and capacity of fire extinguisher equipment

K 11	training requirements for certain PPE, safety equipment and safety procedures such as fall arrest, first aid and confined space
K 12	emergency procedures, phone numbers and location of first aid stations and medical facilities
K 13	disposal and recycling procedures
K 14	Safe Operating Procedure (SOP)

Sub-task

A-1.01 Maintains safe work environment.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-1.01.01	handle, store and dispose of hazardous materials according to jurisdictional regulations and WHMIS
A-1.01.02	set up barricading devices and signage such as caution tape and tagging systems, fences and barriers to define work perimeters and contain contaminants or other hazards
A-1.01.03	follow tag procedures for access
A-1.01.04	participate in FLRA meetings prior to beginning a new task
A-1.01.05	maintain clean and organized work area
A-1.01.06	perform safety inspections to recognize and report potential hazards
A-1.01.07	acknowledge and inform surrounding co-workers concerning safety and well-being
A-1.01.08	identify and respect physical limitations of self and others
A-1.01.09	identify location of safety zone containing components such as first aid kit, fire extinguishers, SDS and eye wash stations
A-1.01.10	document items such as inspections, potential hazards, safety meetings, injuries and training according to jurisdictional regulations

Sub-task**A-1.02 Uses personal protective equipment (PPE) and safety equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-1.02.01	apply local, provincial, territorial and national safety regulations such as OH&S
A-1.02.02	identify company and site policies and site hazards requiring the use of PPE and safety equipment
A-1.02.03	select PPE and safety equipment appropriate for individual tasks and situations
A-1.02.04	maintain and store PPE and safety equipment according to OH&S and manufacturers' specifications
A-1.02.05	identify damaged PPE such as excessively worn boots, worn harnesses and cracked safety glasses
A-1.02.06	recognize PPE approved by the Canadian Standards Association (CSA) and applicable safety equipment
A-1.02.07	ensure proper fit of PPE such as fall arrest harnesses and face shields
A-1.02.08	participate in fit test to confirm respirator fit
A-1.02.09	report and replace damaged or faulty equipment

Task 2**Uses and maintains tools and equipment.**

Context Bricklayers must maintain all their tools to ensure that they work properly and safely. Rigging, hoisting and lifting equipment is used to move heavy material on the worksite. Access equipment is used to allow bricklayers to reach their work area.

Required Knowledge

K 1	types of hand tools such as trowels, hammers, levels and jointers
K 2	hand tool operating procedures and limitations
K 3	types of power tools such as electric and gas powered
K 4	power tool operating procedures and limitations
K 5	hazards of power tools

K 6	powder-actuated tool operating procedures and limitations
K 7	jurisdictional and company training and certification requirements for powder-actuated tools
K 8	types of pneumatic tools such as grinders, air guns and jackhammers
K 9	types of hydraulic tools such as brick splitters and saws
K 10	hazards of pneumatic and hydraulic tools
K 11	types of measuring equipment such as bricklayer tapes, laser levels and storey poles
K 12	layout tools such as transits, laser levels, gauge rod/storey pole and mason's line
K 13	measuring and layout equipment operating procedures
K 14	types of rigging, hoisting and lifting equipment such as forklifts, cranes, block and tackles, chain hoists and electric winches
K 15	types of material handling equipment such as wheelbarrows and pallet jacks
K 16	applications of rigging, hoisting and lifting equipment
K 17	regulations regarding licensing and training requirements of rigging, hoisting, lifting and material handling equipment
K 18	limitations of rigging, hoisting, lifting and material handling equipment
K 19	types of access equipment such as scissor lifts, and articulated and telescopic boom lifts, their operating procedures and limitations

Sub-task

A-2.01 Maintains tools and equipment.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-2.01.01	repair or replace defective or damaged tools and equipment according to manufacturers' specifications
A-2.01.02	clean and store tools and equipment according to manufacturers' specifications
A-2.01.03	document tool and equipment maintenance
A-2.01.04	recognize worn, damaged and defective tools, and tag and remove from service
A-2.01.05	lubricate equipment such as chain hoists and gin wheels when necessary
A-2.01.06	sharpen tools such as chisels and hammers when necessary

Sub-task**A-2.02 Uses rigging, hoisting and lifting equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-2.02.01	select rigging, hoisting and lifting equipment such as shackles, spreader bars and chain hoists according to task, load size and capacity
A-2.02.02	locate centre of gravity of load
A-2.02.03	secure load to rigging using equipment such as slings, shackles, bridle hitches and lifting clamps
A-2.02.04	communicate with personnel involved in lift using methods such as hand signals and two-way radios
A-2.02.05	recognize safe lifting locations or points
A-2.02.06	calculate weight of material
A-2.02.07	operate forklift according to jurisdictional regulations
A-2.02.08	stabilize load during lift using tag lines
A-2.02.09	inspect rigging, hoisting and lifting equipment according to maintenance schedule
A-2.02.10	maintain and store rigging, hoisting and lifting equipment according to manufacturers' specifications
A-2.02.11	remove worn, damaged or expired rigging, hoisting and lifting equipment from service

Sub-task**A-2.03 Uses access equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-2.03.01	select access equipment such as scissor lifts, and articulated and telescopic boom lifts according to task, load size and capacity
A-2.03.02	recognize safe lifting locations such as stable surface and safe distance from overhead electrical wires

A-2.03.03	inspect access equipment according to maintenance schedule and tag and remove from service if defective
A-2.03.04	operate access equipment according to jurisdictional regulations

Task 3

Uses scaffolding.

Context This task is a crucial part of a bricklayer's job since the majority of bricklaying is performed on scaffolding. The knowledge of the proper setup and maintenance of scaffolding are important to ensure the safety of bricklayers and other tradespeople on the jobsite.

Required Knowledge

K 1	types of scaffolding such as frame, tubular, hydraulic, swing stage and jack-up
K 2	scaffolding components such as pins, braces, decks, planks, outriggers and cross braces
K 3	applications of various types of scaffolding
K 4	OH&S considerations as they apply to scaffolding and scaffolding systems
K 5	load limitations
K 6	possible defects such as rusting, damage and split planks
K 7	counter weight requirements according to safety regulations and job requirements
K 8	sequence of assembly
K 9	sequence of dismantling

Sub-task**A-3.01 Erects scaffolding.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-3.01.01	select scaffolding for the job taking into consideration size, site conditions and task being performed
A-3.01.02	inspect scaffolding for damage and missing components, and tag and remove from service
A-3.01.03	identify hazards such as excess loads when erecting access equipment
A-3.01.04	use scaffolding within operating limitations as indicated on manufacturers' tags and in compliance with OH&S regulations
A-3.01.05	lay out scaffolding ensuring substrate is level and stable
A-3.01.06	install scaffolding mud sills, scaffold jacks and other components according to assembly sequence and regulations
A-3.01.07	set up swing stage components according to manufacturers' specifications and job requirements
A-3.01.08	level and secure scaffolding according to jurisdictional regulations
A-3.01.09	install means of access and egress
A-3.01.10	install kickboard, debris net, guardrails and mid-rails according to OH&S regulations

Sub-task**A-3.02 Dismantles scaffolding.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-3.02.01	lower components to lower levels or to ground
A-3.02.02	remove tie-ins as scaffolding is lowered
A-3.02.03	remove components with equipment such as forklifts, cranes and roof winches according to dismantling sequence
A-3.02.04	sort and prepare equipment for transportation

Sub-task**A-3.03 Maintains scaffolding.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-3.03.01	inspect scaffolding for damage and missing components, and tag and remove from service
A-3.03.02	replace damaged or missing scaffolding components
A-3.03.03	clean and store scaffolding

Task 4**Organizes work.**

Context This task describes activities that bricklayers perform in order to organize their daily work.

Required Knowledge

K 1	types of documentation such as specifications, sketches and change orders
K 2	safety documentation such as SDS, WHMIS symbols and OH&S acts
K 3	documentation specific to work sites such as refineries and paper mills
K 4	types of materials such as membranes, primers, fuels and masonry materials
K 5	loading limitations of storage location
K 6	tarp systems such as insulated tarps, debris screens and shrink wraps
K 7	types of heaters such as salamanders, furnaces and construction heaters
K 8	types of heater power sources such as propane, diesel, electric, natural gas and kerosene
K 9	company safety procedures
K 10	methods for protecting surrounding areas such as setting up barriers and covering with tarp
K 11	environmental protection regulations and guidelines
K 12	job site hazards such as overhead and underground power lines
K 13	types of drawings such as architectural, structural, mechanical and electrical

Sub-task**A-4.01 Uses drawings and specifications.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-4.01.01	interpret drawings to identify requirements such as layout and material requirements
A-4.01.02	interpret specifications such as architectural, structural and manufacturers'
A-4.01.03	draw sketches to communicate work coordinates and details

Sub-task**A-4.02 Plans daily tasks and activities.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-4.02.01	schedule tasks according to deadlines
A-4.02.02	sequence tasks in coordination with co-workers and other trades
A-4.02.03	estimate amount of time required for tasks

Sub-task**A-4.03 Prepares job site and materials.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-4.03.01	estimate and confirm amount of material required
A-4.03.02	coordinate delivery of materials
A-4.03.03	perform site assessment to identify hazards
A-4.03.04	set up mixing area in location accessible to power and water supply

A-4.03.05	place materials on job site for convenience and to avoid interference with other trades
A-4.03.06	store and protect materials such as sand, cement, sealants and masonry
A-4.03.07	weatherize installation location by installing tarp system and temporary roof, and setting up heaters and fuel tanks
A-4.03.08	ensure adequate ventilation for heaters
A-4.03.09	store hazardous materials such as fuels and primers in marked designated area

Sub-task

A-4.04 Protects surrounding areas.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

A-4.04.01	determine surrounding areas requiring protection such as finished work, personal property, vegetation and traffic areas
A-4.04.02	assess risks to surrounding areas such as airborne debris, excess mortar and fumes
A-4.04.03	restrict dust creation using techniques such as wet sawing, vacuuming and mixing in a separate area
A-4.04.04	set up protective materials such as tarps, plywood sheeting and construction fence

BLOCK B

GENERAL MASONRY PRACTICES

Trends

There are new types of insulation and membranes such as spray-on.
There are more environmentally-friendly types of sealers being used.
There is increased awareness of containment practices. In some jurisdictions, the size of masonry units is getting larger for cost reduction.

Related Components

All components apply.

Tools and Equipment

See Appendix A.

Task 5 Performs substrate preparation.

Context

Substrate needs to be prepared to receive and support masonry.
Membranes, flashing and insulation are installed to maintain a complete building envelope.

Required Knowledge

- K 1 types of anchoring/tie systems such as fastened-in-place and embedded
- K 2 anchoring/tie systems, adhesives and insulation application techniques
- K 3 substrate condition
- K 4 types of anchors such as drop-in, pin bolts, wedge, screws and self-tapping
- K 5 types of ties such as wire, adjustable and corrugated metal
- K 6 sequence of levelling, plumbing and aligning
- K 7 tools and equipment required
- K 8 types of flashings such as polyvinyl chloride (PVC), rigid, self-adhesive and rubber
- K 9 location of flashings
- K 10 counter flashing and step flashing
- K 11 building envelope systems
- K 12 types of membranes such as torch-on, self-adhesive and trowelled
- K 13 effect of ultraviolet rays and moisture on membranes

K 14	types of insulation such as ceramic fibre, vermiculite, extruded, fibreglass, spray-on, rock wool and mineral-refractory grade
K 15	jurisdictional and national codes and specifications

Sub-task

B-5.01 Prepares vertical substrates and foundations.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	no	yes	yes	yes	NV	NV	ND

Key Competencies

B-5.01.01	remove glues, old membranes and accessories to ensure smooth substrate
B-5.01.02	replace deteriorated material such as broken block or brick and nails
B-5.01.03	wash and dry substrate to improve product adhesion
B-5.01.04	fill holes and cracks in substrate using mortar and other filler materials matching existing substrate
B-5.01.05	fasten mesh to substrate using mechanical fasteners according to manufacturers' specifications and building code
B-5.01.06	prime substrate according to manufacturers' specifications

Sub-task

B-5.02 Applies parging.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	no	yes	yes	yes	no	yes	NV	NV	ND

Key Competencies

B-5.02.01	dampen substrate to improve bonding
B-5.02.02	apply bonding agents to substrate
B-5.02.03	mix parging material according to application and manufacturers' instructions
B-5.02.04	trowel on parging material to substrate maintaining a uniform thickness according to specifications

Sub-task**B-5.03 Installs anchoring/tie systems.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-5.03.01	select type of system according to engineering specifications, codes and standards
B-5.03.02	determine vertical and horizontal spacing of anchors and ties according to specifications, codes, coursing and layout
B-5.03.03	attach or place anchors to substrate using tools and materials such as drills and fasteners
B-5.03.04	attach ties to anchors

Sub-task**B-5.04 Installs membrane and flashing.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-5.04.01	select base flashing according to specifications, codes and standards
B-5.04.02	attach base flashing and membrane
B-5.04.03	seal seams and tears to membrane, and cuts and joints in flashing to avoid compromising the building envelope
B-5.04.04	overlap below grade membranes to complete the building envelope

Sub-task**B-5.05 Installs insulation.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-5.05.01	select insulation according to specifications, codes and standards
B-5.05.02	cut and fit insulation to fully insulate the wall and seal joints according to manufacturers' specifications
B-5.05.03	secure insulation to substrate and membrane ensuring as tight a fit as possible

Task 6**Performs fundamental masonry tasks.**

Context This task describes typical methods used in masonry construction.

Required Knowledge

K 1	measuring and layout equipment and practices
K 2	sequence of layout procedures
K 3	drawings, specifications, codes and standards
K 4	wall systems
K 5	bonds and patterns
K 6	types of joints such as concave, raked and flush
K 7	when to finish joints
K 8	environmental hazards
K 9	types of cleaners such as acids, alkali-based, water and detergent
K 10	sequence of cleaning procedures
K 11	mixing sequence and mixing ratio for cleaning materials
K 12	applications of waterproofing and dampproofing
K 13	types of waterproofing and dampproofing materials such as silicone-based, solvent-based and alkaline-based

Sub-task**B-6.01 Lays out wall and coursing.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-6.01.01	determine wall location and floor grade
B-6.01.02	perform layout using techniques such as snapping chalk lines, laying out units dry, and measuring with a tape
B-6.01.03	mark off location of units to guide placement
B-6.01.04	adjust bond to suit openings such as windows, doors and accessories

Sub-task**B-6.02 Finishes joints.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-6.02.01	select type of joint finishes such as concave, convex, flush, raked, weather and extruded according to specifications
B-6.02.02	assess by touch mortar readiness for finishing (thumbprint method)
B-6.02.03	tool joints in order to achieve uniformity and straightness, and to avoid damage to masonry units
B-6.02.04	fill voids in joints
B-6.02.05	remove excess mortar and retool joint to achieve finished look

Sub-task**B-6.03 Cleans new masonry surfaces.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-6.03.01	rub down wall using like material to remove excess mortar
B-6.03.02	match cleaning material to masonry surface to be cleaned according to manufacturers' specifications
B-6.03.03	prepare cleaning material by mixing to required proportions
B-6.03.04	pre-soak, brush and scrub surfaces
B-6.03.05	clean using pressure washer according to manufacturers' specifications
B-6.03.06	rinse surface
B-6.03.07	check surface to ensure uniform cleanliness

Sub-task**B-6.04 Seals masonry surfaces.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-6.04.01	select sealant according to existing masonry and locations such as above grade and below grade
B-6.04.02	verify that the surface is clean and dry in order to ensure sealant adhesion and prevent trapping visible stains
B-6.04.03	apply sealant using methods such as brushing, spraying and rolling according to manufacturers' specifications

Task 7**Uses mortars, grouts and adhesives.**

Context Mortars, grouts and adhesives hold and structurally support masonry units and accessories. Concrete and grouts are materials containing cementitious materials, aggregate and water, and are used to secure reinforcing within block walls. Mortars, grouts and adhesives are used in every aspect of masonry. Bricklayers must be able to safely handle, prepare and apply these products.

Required Knowledge

K 1	types of mortars such as M, S, N, O and K, and their properties
K 2	admixtures such as accelerators, retardants, dyes and waterproofing components
K 3	codes and regulations
K 4	mixing equipment and procedures
K 5	testing such as strength tests, slump tests and bond tests
K 6	types of concrete or grout and their properties
K 7	reinforcing materials such as fibre and rebar
K 8	grout consistency required to fill masonry cavities
K 9	grouting methods and procedures
K 10	types and uses of adhesives such as polymers, epoxies, resins, caulking and latex
K 11	shelf and pot life of adhesives and mortars
K 12	reinforcement requirements when pouring concrete and grout

Sub-task**B-7.01 Mixes mortar, concrete, grout and adhesives.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-7.01.01	select mortar, concrete, grout and adhesive according to job specification
B-7.01.02	verify that water supply is clean and potable to avoid contamination of mixture
B-7.01.03	adjust mixing conditions such as heating sand and water according to code requirements

B-7.01.04	measure components according to ratio and proportions required by specifications
B-7.01.05	add admixture to achieve required properties
B-7.01.06	add aggregate such as sand and gravel
B-7.01.07	use mixing equipment such as barrel mixer, shovel and paddle mixer
B-7.01.08	time mixing according to specifications
B-7.01.09	visually assess readiness of product for consistency and moisture content

Sub-task

B-7.02 Uses mortars.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-7.02.01	apply mortar using methods such as buttering and spreading
B-7.02.02	assess mortar condition and usability, and adjust consistency for particular use

Sub-task

B-7.03 Uses concrete and grout.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-7.03.01	assess wall prior to filling
B-7.03.02	prime holes according to size of block and jurisdictional regulations
B-7.03.03	place grout and concrete using processes such as high-lift and low-lift grouting
B-7.03.04	place grout and concrete using equipment such as buckets, hoppers and pumps
B-7.03.05	consolidate grout to fill voids

Sub-task**B-7.04 Uses adhesives.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

B-7.04.01	select adhesives such as two-part epoxies and primers
B-7.04.02	prepare surface to receive adhesives
B-7.04.03	apply adhesives using methods such as trowelled, brushed on, injected and caulked

Trends

There is an increasing trend in using surface-bonded units on the outside of commercial and residential buildings. There is a greater variety of surface-bonded masonry products being used such as thin cut brick and natural stone, and manufactured stone.

Prefabricated masonry units are slowly becoming more common.

**Related
Components
(including, but not
limited to)**

Masonry units, air and vapour barrier, insulation, flashing, vertical/horizontal reinforcing, base plates, expansion and contraction joints, soft joints, grout, fastening and anchoring systems, ties (anchors), adjustable veneer ties, mortars, nails, adhesives, bonding agents, epoxies, stone bond, rigid insulation, steel wire cables, stickclips, caulking, parging, compressive backer rod, insulation tape, air ventilation accessories, draining systems, lateral support system, lintel supports, lintel reinforcements, sills and soffits, water repellents, waterproofing, cleaning agents, shelf angles, fire stops, wedges, batter boards.

**Tools and
Equipment**

See Appendix A.

Task 8

Builds masonry walls.

Context Non-load-bearing masonry walls include veneer walls, interior partitions and exterior curtain walls. This task describes the proper method of installing these walls using brick, block and full-bed manufactured stone, and accessories. Stone walls are described in Block D. Load-bearing walls, columns and pilasters are designed to carry loads in addition to their own load. Load-bearing walls include structural and cavity walls which are above grade, and foundation walls which are below grade. They also include retaining walls which resist lateral forces. Reinforcing systems in load-bearing walls are always included and are critical as they carry or resist stresses and forces.

Required Knowledge

- K 1 applicable sections of National Building Code (NBC)
- K 2 types of masonry units such as clay brick, concrete brick, sand-lime brick, concrete block and full-bed manufactured stone
- K 3 sizes and shapes of masonry units such as bricks and blocks
- K 4 types of non-load-bearing walls such as curtain walls, garden walls and partition walls
- K 5 types of load-bearing walls such as retaining walls, cavity walls and windload walls
- K 6 columns, pilasters and buttresses
- K 7 bonds and patterns
- K 8 types and consistencies of mortars
- K 9 construction joints such as expansion and control (movement joints)
- K 10 masonry wall drainage and ventilation systems such as weep and vent holes
- K 11 horizontal and vertical coursing
- K 12 ground conditions and grades
- K 13 retaining wall systems and designs
- K 14 footings and foundations
- K 15 building envelope components such as membranes and insulation
- K 16 types of reinforcing material such as rebar and reinforcement wire
- K 17 reinforced wall systems
- K 18 specifications for reinforcing
- K 19 accessories such as anchors, plates and bolts
- K 20 finished height of column and pilaster

K 21	regional reinforcement requirements such as seismic and hurricane
K 22	use of cleanouts

Sub-task

C-8.01 Builds non-load-bearing walls.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

C-8.01.01	select and use tools and equipment
C-8.01.02	determine wall properties such as finished height, length and location according to drawings
C-8.01.03	install reinforcements according to specifications for additional wall stability
C-8.01.04	build lead to establish each course and height
C-8.01.05	cut units using hand and power tools to required sizes and shapes
C-8.01.06	maintain bond
C-8.01.07	lay units to the top of the line
C-8.01.08	adjust joint thickness within code requirements to allow for openings
C-8.01.09	install lintels such as cast-in-place, precast and angle iron to support units over openings
C-8.01.10	build in accessories such as electrical, mechanical and plumbing
C-8.01.11	brace and support walls at required intervals

Sub-task

C-8.02 Builds load-bearing walls.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

C-8.02.01	select and use tools and equipment
C-8.02.02	determine wall properties such as finished height, length and location according to drawings
C-8.02.03	install reinforcements and structural accessories according to specifications for additional wall stability and load-bearing requirements

C-8.02.04	build lead to establish each course and height
C-8.02.05	cut units using hand and power tools to required sizes and shapes
C-8.02.06	maintain bond
C-8.02.07	lay units to the top of the line
C-8.02.08	adjust joint thickness within code requirements to allow for openings
C-8.02.09	shore up openings to receive and support lintels
C-8.02.10	install lintels such as cast-in-place, precast and angle iron to support units over openings
C-8.02.11	build in accessories such as electrical, mechanical and plumbing
C-8.02.12	batter and slope retaining walls in order to offset lateral forces
C-8.02.13	brace and support walls at specified intervals
C-8.02.14	install drainage systems on retaining walls

Task 9

Builds horizontal masonry surfaces.

Context Bricklayers build horizontal surfaces such as patios, walkways, stairways and driveways. These surfaces must be built to specifications. Bricklayers may use various types of masonry units such as brick, flagstones and pavers to build flexible or rigid surfaces.

Required Knowledge

K 1	excavations
K 2	soil conditions
K 3	drainage
K 4	membranes
K 5	codes and regulations
K 6	slope and grade
K 7	assemblies in mortared and mortarless applications (rigid and flexible)
K 8	types of masonry units for horizontal surfaces such as brick, pavers and flagstones
K 9	bonds and patterns
K 10	mortars and aggregates
K 11	bonding agents and additives

K 12	sealants
K 13	required tools and equipment such as a tamper, screed poles and guillotines (brick splitter)

Sub-task

C-9.01 Prepares horizontal substrate.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

C-9.01.01	clean, clear and excavate area
C-9.01.02	layer and compact aggregate to grade and slope
C-9.01.03	install landscape fabric
C-9.01.04	determine borders according to job requirements
C-9.01.05	install edge restraints
C-9.01.06	select required mixture of concrete for application such as stairs and patios
C-9.01.07	form and pour concrete to required thickness
C-9.01.08	screed and finish surfaces to maintain and produce even surfaces

Sub-task

C-9.02 Lays masonry units on horizontal surfaces.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

C-9.02.01	determine and layout pattern such as basket weave, herring bone and running bond
C-9.02.02	cut masonry units to fit required space and create uniform joints
C-9.02.03	place and align units to be aesthetically pleasing and according to bond used
C-9.02.04	apply sand and use tamper to compact masonry unit
C-9.02.05	sweep to remove excess sand and to fill voids
C-9.02.06	finish joints in mortared systems

C-9.02.07	incorporate construction joints to allow movement
C-9.02.08	seal assemblies

Task 10

Builds and installs prefabricated masonry units.

Context Prefabricated masonry is usually fabricated off-site and delivered to be assembled and/or mechanically fastened. They are made of masonry units, reinforcing steel, grout and mortar. Bricklayers are involved in both the fabrication and installation of these components. They may be used for greater efficiency of installation or for situations where masonry cannot easily be built on site.

Required Knowledge

K 1	form release agents
K 2	storage, stacking and transport
K 3	colour matching and inspection for installation
K 4	effects of temperature and humidity on the prefabrication curing process
K 5	fastening systems
K 6	grouting and caulking procedures
K 7	rigging and hoisting

Sub-task

C-10.01 Builds prefabricated masonry. (NOT COMMON CORE)

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
no	yes	no	no	yes	no	yes	yes	yes	yes	NV	NV	ND

Key Competencies

C-10.01.01	align and level units of prefabricated masonry according to engineered design
C-10.01.02	build panel to gauge according to installation location and specifications
C-10.01.03	prepare forms or jigs to accept materials by applying form release agent and adding materials such as reinforcing, anchoring and bearing plates

C-10.01.04	add masonry materials to forms to complete prefabrication
C-10.01.05	remove forms or jigs

Sub-task

C-10.02 Erects prefabricated masonry.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	no	yes	yes	yes	yes	NV	NV	ND

Key Competencies

C-10.02.01	verify that substrate has been prepared using required anchoring systems
C-10.02.02	align and set panels and anchors in place for welding or bolting
C-10.02.03	repair damaged masonry on site, if necessary
C-10.02.04	seal joints using materials such as caulking and mortar

Task 11

Installs surface-bonded masonry units.

Context	Surface-bonded masonry units are thin masonry components applied to a variety of surfaces. They are used for aesthetic purposes using a variety of applied components.
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Required Knowledge

K 1	mortar and bonding agents
K 2	standards (CSA and NBC) and manufacturers' specifications
K 3	types of material such as brick, stone and cement products
K 4	layout dimensions
K 5	types of bonds and patterns

Sub-task**C-11.01 Prepares substrate for surface-bonded masonry units.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

C-11.01.01	install weatherproofing components to allow for drainage according to jurisdictional regulations
C-11.01.02	install backing material using specified mechanical fasteners over entire substrate area to support masonry unit
C-11.01.03	apply scratch coat into wire mesh to ensure full coverage

Sub-task**C-11.02 Applies surface-bonded masonry units.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

C-11.02.01	dampen the substrate and back of the surface-bonded masonry unit to improve bonding
C-11.02.02	butter back of surface-bonded masonry units
C-11.02.03	apply and finish joints for surface-bonded masonry units
C-11.02.04	clean and seal surface-bonded masonry units according to manufacturers' specifications

BLOCK D

NATURAL STONE SYSTEMS

Trends	There are more advanced anchoring systems to improve strength and longevity.
Related Components (including, but not limited to)	Masonry units, air barriers, insulation, flashing, vertical/horizontal reinforcing, movement joints, soft joints, grout, fastening and anchoring systems, mortars, adhesives, bonding agents, epoxies and resins, rigid insulation, stickclips, caulking, parging, compressive backer rod, weep holes, vents, air ventilation accessories, draining systems, lateral support system, lintel supports, lintel reinforcement, sills and soffits, water repellents, waterproofing products, cleaning agents, shelf angles, fire stops, wedges, batter boards.
Tools and Equipment	See Appendix A.

Task 12

Builds natural stone walls.

Context	Stone walls may be load-bearing or non-load-bearing. Examples include veneers, multi-wythe, garden walls and retaining walls. Stones may be natural, quarried, or produced in a stone-cutting and finishing facility. Size, shape and type of stone vary greatly; therefore, correct selection and preparation are critical to maintain integrity of the wall.
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Required Knowledge

K 1	classifications, types and properties of natural stone
K 2	types of mortars
K 3	mortar consistencies according to stone
K 4	types of bonds and patterns
K 5	bedding planes
K 6	anchoring systems
K 7	flashing materials and procedures
K 8	supporting backup wall
K 9	rigging and hoisting
K 10	caulking, epoxies and other bonding agents
K 11	cleaning materials and procedures for natural stone

K 12	types of wall systems such as veneers, multi-wythe, garden walls and retaining walls
K 13	components of building envelope
K 14	installation procedures for building envelope
K 15	damp curing requirements

Sub-task

D-12.01 Prepares natural stone.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

D-12.01.01	cull stones that are either defective or otherwise undesirable to prevent failures or to enhance aesthetics of the finished assembly
D-12.01.02	remove debris to prevent bonding failures or to enhance aesthetics of the finished assembly
D-12.01.03	resize units using methods such as cutting, grinding, dressing and pitching to suit design and to ensure proper fit
D-12.01.04	dress unit surfaces to suit design and for aesthetic purposes
D-12.01.05	determine anchoring system according to job specifications
D-12.01.06	determine style and pattern for stone and joint finish according to specifications

Sub-task

D-12.02 Lays natural stone.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

D-12.02.01	select colour, strength and consistency of mortar, according to specifications
D-12.02.02	apply sufficient mortar bed to support stone
D-12.02.03	set stone on mortar bed to required degree of alignment and plumb using tools such as levels and tape measures

D-12.02.04	use temporary supports such as wedges or bracing to maintain joint size and alignment
D-12.02.05	follow established bonding and pattern practices
D-12.02.06	tool joints according to specifications to maintain integrity of assembly or for aesthetic purposes

Sub-task

D-12.03 Damp cures walls.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

D-12.03.01	mist completed assembly at required intervals according to specifications to ensure adequate curing
D-12.03.02	apply and secure moist burlap or plastic according to specifications and weather conditions to ensure adequate curing

Task 13

Installs natural stone cladding.

Context	Bricklayers apply stone cladding by mechanically fastening stone to a structural backup wall. Stone used for cladding is typically large and pre-finished in a stone-cutting and finishing facility. Stone cladding is not load-bearing and has an aesthetic and a protective function.
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Required Knowledge

K 1	sizes and types of stone cladding such as granite, marble and limestone
K 2	supporting backup wall
K 3	rigging and hoisting
K 4	stone properties such as mass, density and porosity
K 5	anchoring systems
K 6	caulking, epoxies and other bonding agents
K 7	cleaning materials and procedures for natural stone
K 8	type of wall system
K 9	components of building envelope

K 10	installation procedures for building envelope
K 11	flashing materials and installation procedures

Sub-task

D-13.01 Prepares substrate for cladding.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

D-13.01.01	recognize deficiencies in backup to determine necessary repairs or potential incompatibility with design
D-13.01.02	remove debris by brushing, scraping or grinding to create a continuous smooth surface
D-13.01.03	fill voids in masonry or concrete backup by trowelling or grouting to create a continuously smooth surface
D-13.01.04	apply air or waterproof membrane and insulation according to job specifications
D-13.01.05	set horizontal and vertical grid lines to ensure positioning of anchors according to specifications and drawings
D-13.01.06	install anchoring system on substrate as specified

Sub-task

D-13.02 Prepares natural stone for cladding.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

D-13.02.01	inspect stone for presence of stains, defects or debris to prevent failures or to enhance aesthetics of the finished panel
D-13.02.02	resize units by cutting, grinding and chiselling to suit design
D-13.02.03	reface granite surface using a torch to achieve rough finish

D-13.02.04	drill holes for dowels or kerf to accommodate anchors
D-13.02.05	prefabricate sections by joining units and adhering them with products such as epoxies to satisfy requirements

Sub-task

D-13.03 **Installs natural stones.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

D-13.03.01	set units on anchors manually or using rigging and hoisting equipment for support
D-13.03.02	align and temporarily stabilize units with shims using vertical and horizontal string lines as reference
D-13.03.03	adjust anchoring system to secure units, correct potential incompatibility with design and ensure aesthetically pleasing final alignment
D-13.03.04	finish joints according to specifications

BLOCK E

CHIMNEYS AND FIREPLACES

Trends	The market has seen an emergence of fireplace inserts, wood stoves and direct vent gas fireplaces. There is also an increase of outdoor fireplaces, fire pits and pizza ovens.
Related Components (including, but not limited to)	Masonry units, air barriers, insulation, flashing, firebrick, anchoring systems, membrane, vertical/horizontal reinforcing, grout, ties (anchors), adhesives, mortars, ceramic insulation, rigid insulation, caulking, compressive backer rod, insulation tape, weep holes, wood forms, air ventilation accessories, draining systems, lateral support systems, lintel supports, water repellents, cleaning agents, fire stops, spark arresters, liners, clean-out doors, metal caps, metal flashings, flue liners, cast iron doors, grills, dampers, fireclay, ceramic blanket, angle irons, arch centre, sheet metal, ash pan, ash dump, fresh air kit, facing material, mantel.
Tools and Equipment	See Appendix A.

Task 14 Builds chimneys.

Context	Chimneys vent gases from combusted materials. They can be residential and industrial. Chimneys can be decorative and installed in most areas of the building.
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Required Knowledge

K 1	foundation materials such as concrete, concrete blocks and bricks
K 2	codes and regulations such as NBC and CSA
K 3	fireplace and chimney operation
K 4	flue liners
K 5	materials such as fireclay or refractory mortar and mortar types
K 6	expansion and contraction of installation materials
K 7	types and sizes of flues and fireboxes
K 8	types of insulation and flashings
K 9	backup and veneer materials such as brick, stone and tile

K 10	types of bonds
K 11	types and sizes of appliances such as heaters and furnaces

Sub-task

E-14.01 Builds foundation supports for chimneys.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-14.01.01	select tools and equipment such as levels, trowels and squares
E-14.01.02	select materials such as blocks, mortars and concrete according to plans and job specifications
E-14.01.03	inspect excavation or specified area to ensure adequate for building foundation, according to jurisdictional regulations and task requirements
E-14.01.04	modify excavation or specified area to meet jurisdictional regulations and task requirements
E-14.01.05	calculate dimensions of chimney and lay out for formwork or block work for footings and foundations according to plans and job specifications
E-14.01.06	install reinforcing steel and connections according to job specifications
E-14.01.07	place concrete in footing forms according to job specifications and jurisdictional regulations, and allow curing time
E-14.01.08	form or build foundation wall on footing according to job specifications
E-14.01.09	build-in clean-outs and flue liners according to appliance requirements
E-14.01.10	ensure foundation is adequate to support the weight of the chimney

Sub-task**E-14.02 Lays masonry units to build chimneys.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-14.02.01	select and use tools and equipment such as trowels, levels, plumb lines and measuring tapes
E-14.02.02	select mortar according to job specifications and mortar type
E-14.02.03	calculate the chimney height for draft according to manufacturers' specifications, jurisdictional regulations and surrounding environment
E-14.02.04	install masonry units to predetermined dimensions
E-14.02.05	finish mortar joints according to job specifications

Sub-task**E-14.03 Installs flue lining.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-14.03.01	select and use tools and equipment and specified mortar
E-14.03.02	calculate placement of flue lining according to appliance, manufacturers' specifications and jurisdictional regulations
E-14.03.03	calculate flue liner height and size to ensure proper draft
E-14.03.04	create hole for thimble to receive appliance
E-14.03.05	place and secure flue lining using specified mortar, according to jurisdictional regulations

Sub-task**E-14.04 Installs related flashings.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-14.04.01	select and use tools and equipment such as tin snips, grinders and measuring tapes
E-14.04.02	determine type of flashing method to be used such as reglet or step flashing according to application
E-14.04.03	cut reglet to receive counter flashing where roof material intersects chimney
E-14.04.04	cut, install and seal flashing while building new chimney at roof intersections

Sub-task**E-14.05 Installs caps.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-14.05.01	select and use tools and equipment such as hammers, tape measures, trowels and power tools
E-14.05.02	construct cap to direct water away from the chimney
E-14.05.03	install cap flashing and bond break between chimney and cap to avoid water penetration
E-14.05.04	form, create drip edge and pour reinforced concrete cap
E-14.05.05	place pre-fabricated caps such as concrete, stone or metal
E-14.05.06	insulate and seal between chimney cap and flue lining with non-combustible materials to protect against expansion and contraction, and water penetration

Task 15**Builds fireplaces.**

Context Fireplaces combust material to provide heat and vent smoke and gases to the chimney. Bricklayers may have to consider location of fireplaces in relation to prevailing winds and surrounding obstacles.

Required Knowledge

K 1	codes and regulations such as NBC and CSA
K 2	types of fireplaces
K 3	fireplace and chimney operation
K 4	firebox materials such as firebrick and fireclay, and their assembly
K 5	expansion and contraction of installation materials
K 6	size of openings required for room size
K 7	size of liner based on opening size
K 8	backup and veneer materials such as brick, stone, block and tile
K 9	types of bonds
K 10	foundation supports for hearth
K 11	base construction for hearth
K 12	damper installation and function
K 13	smoke shelf and smoke chamber
K 14	types and sizes of inserts such as electrical, gas and wood

Sub-task**E-15.01 Builds foundation for hearth, firebox, backup material and veneer.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-15.01.01	select and use tools and equipment such as measuring tapes, trowels and levels
E-15.01.02	select and install materials such as concrete blocks and reinforced concrete
E-15.01.03	calculate dimensions such as projection, width and height of hearth, firebox and veneer
E-15.01.04	install openings required for ash dump and fresh air intake
E-15.01.05	form and pour concrete to build foundation, according to job specifications

E-15.01.06	place masonry units to build foundation, according to job specifications
E-15.01.07	form and pour concrete slab on top of foundation to accommodate firebox and hearth

Sub-task

E-15.02 Builds hearth, firebox and backup.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-15.02.01	select and use tools and equipment such as measuring tapes, trowels and levels
E-15.02.02	lay out dimensions of firebox to ensure proper proportion, according to plans
E-15.02.03	lay firebricks for inner hearth
E-15.02.04	lay backup bricks for outer hearth
E-15.02.05	install ash dump and air intake
E-15.02.06	cut firebricks and install walls of firebox
E-15.02.07	lay masonry units to build backup with smoke shelf behind firebox and install anchoring system for veneer, according to NBC and CSA

Sub-task

E-15.03 Installs damper.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-15.03.01	assemble damper according to manufacturers' specifications
E-15.03.02	position non-combustible material between damper and top of firebox to allow for expansion and contraction
E-15.03.03	set damper in place and ensure that it is leveled, and sealed but not bonded to the firebox

Sub-task**E-15.04 Builds smoke chamber.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-15.04.01	select and use tools and equipment such as levels, measuring tapes and trowels
E-15.04.02	lay out dimensions of smoke chamber according to job specifications
E-15.04.03	install lintels over the damper
E-15.04.04	corbel brick to create smoke chamber to meet flue liner according to NBC and CSA
E-15.04.05	parge smoke chamber and smoke shelf with mortar to allow for a smooth transition

Sub-task**E-15.05 Prepares existing fireplace for insert.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-15.05.01	select and use tools and equipment such as trowels, levels and hammers
E-15.05.02	verify structural integrity of existing fireplace and chimney
E-15.05.03	create rough opening to manufacturers' specifications
E-15.05.04	make modifications to existing fireplace components to meet job requirements
E-15.05.05	install inserts in fireplace according to manufacturers' specifications

Sub-task**E-15.06 Faces fireplaces and inserts.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

E-15.06.01	select and use tools and equipment such as trowels, levels, saws and bevel squares
E-15.06.02	select materials such as brick, stone and tile according to client specifications and desired finished appearance
E-15.06.03	determine mantel dimensions according to code and client specifications
E-15.06.04	install mantel
E-15.06.05	install lintels over opening
E-15.06.06	install accessories such as fans, vents, clean-outs, doors and intake
E-15.06.07	complete masonry veneer
E-15.06.08	complete facing on outer hearth

Trends

Refractories and corrosion resistant materials are constantly evolving for cost effectiveness and longevity. Safety procedures continue to improve. Environmental considerations are being emphasized in the selection, application and disposal of materials.

Related Components (including, but not limited to)

Insulation (ceramic modules, ceramic blankets, boards), firebrick, brick (insulation, thermal, ceramic, lead, carbon, magnesia chrome, alkaline resistant, acid-resistant), corrosion resistant tile, carbon and high temperature mortars, bracing, vessels, anchoring systems, lock-out box, membranes, vertical/horizontal reinforcing, embedded plates, grout, ties (anchors), adhesives, resin injections, stickclips, plastics, wood forms, draining systems, lateral support systems, lintel supports, sills and soffits, water repellents, fire stops, cast iron doors, fireclay, angle iron, castables, arch centre, arch templates, sheet metal, lumber, polyethylene (plastic sheets), metal shims.

Tools and Equipment

See Appendix A.

Task 16**Installs and maintains refractories.**

Context Refractories are used in various settings such as refineries, pulp mills, steel mills, crematoriums and incinerators. Refractory materials are used to contain the burning process and retain or refract heat. Refractory materials are selected according to criteria such as ease of installation, cost effectiveness and durability. The skills involved in installing refractories encompass many of the general masonry skills as well as specialized knowledge of these materials and applications. Due to the use of products containing refractory ceramic fibres (RCFs) and the need to work in confined spaces, maintaining personal safety is paramount.

Required Knowledge

K 1	safety regulations
K 2	safety procedures such as lockout, confined space, fall arrest, FLRA, emergency evacuation and temporary bracing
K 3	types of PPE for refractory material installation and material removal (tear-outs)
K 4	types of refractory materials such as bricks (alumina/silica, insulating, carbon), accessories and blanket, board insulation, castables and plastics
K 5	types of refractory mortar such as air setting and heat setting
K 6	sequence of installation of brick and tile according to number and application
K 7	types and use of insulations
K 8	forms and arches

Sub-task**F-16.01 Prepares for installation of refractories and accessories.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

F-16.01.01	select and use tools and equipment such as dead blow hammers, rawhide hammers, knives, trowels, wet saws, hand saws, air compressors and gunite equipment
F-16.01.02	establish points and grid lines for anchors such as V-ties, stick pins and threaded studs to maintain integrity of wall
F-16.01.03	position and secure accessories such as nuts, clips and V-ties

F-16.01.04	cut and shape insulation such as modules, blanket and j-paper for installation
F-16.01.05	cut and shape refractory units such as insulating, ceramic and arch bricks for installation
F-16.01.06	build and install forms and arch centre for specific application

Sub-task

F-16.02 Prepares mortar for refractories.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

F-16.02.01	select, set up and use tools and equipment such as mixing drills, pails and mixers
F-16.02.02	select and measure admixtures such as needles, resins and epoxies according to manufacturers' specifications
F-16.02.03	select, measure and mix mortars such as silica, high alumina mortar and fireclays according to manufacturers' specifications

Sub-task

F-16.03 Removes existing refractories.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

F-16.03.01	select and use tools and equipment such as pneumatic hammers, chisels and grinders
F-16.03.02	cut, grind and hammer to remove specified material
F-16.03.03	clean up and dispose of materials according to site requirements

Sub-task**F-16.04 Installs refractories.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

F-16.04.01	select and use hand tools such as trimming trowels, dead blow hammers, ratchet wrenches and curry combs specific to refractories
F-16.04.02	select and use equipment such as reed guns and high-pressure hoses specific to refractories
F-16.04.03	pour and vibrate castables to consolidate
F-16.04.04	apply castables using methods such as hand packing, gunning and casting to protect the substrate
F-16.04.05	install insulation such as blanket and modules and materials such as rigidizer
F-16.04.06	lay and sequence the installation of refractory material such as brick and tile according to number and application
F-16.04.07	ram plastics to consolidate and vent plastics to remove moisture
F-16.04.08	install movement joints as specified
F-16.04.09	place material separation such as j-paper and blanket insulation to accommodate expansion and contraction of materials

Sub-task**F-16.05 Repairs refractories.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

F-16.05.01	select and use tools and equipment such as pneumatic, hydraulic, power and hand tools specific to refractory
F-16.05.02	isolate and remove damaged material
F-16.05.03	cut and shape replacement material to required dimensions

- | | |
|------------|--|
| F-16.05.04 | apply castables using methods such as hand packing, gunning and casting to protect the substrate |
| F-16.05.05 | install replacement material according to deficiency identified such as damaged insulation, deteriorated bricks, damaged anchors, cracks and refractory mortar erosion |

Task 17

Installs and maintains corrosion resistant materials.

Context Corrosion resistant applications are used in sites such as pulp mills, food processing plants and gas plants. The materials are used to protect containment units such as vessels, towers and chests, and the surrounding environment. The skills involved in installing and maintaining corrosion resistant materials encompass many of the general masonry skills as well as specialized knowledge of these materials and applications. Due to the presence of carcinogens and the need to work in confined spaces, maintaining personal safety is paramount.

Required Knowledge

- | | |
|-----|--|
| K 1 | safety regulations |
| K 2 | safety procedures such as lockout, confined space, fall arrest, FLRA, emergency evacuation and temporary bracing |
| K 3 | types of PPE for corrosion resistant material installation and material removal (tear outs) |
| K 4 | types of hazards such as ammonia, chlorine and hydrogen sulphate |
| K 5 | types of corrosion resistant units, mortars, accessories, membranes and concrete |
| K 6 | causes of corrosion such as friction and chemicals |
| K 7 | sequence of installation of brick and tile according to number and application |
| K 8 | forms and arches |

Sub-task**F-17.01 Prepares for installation of corrosion resistant materials and accessories.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	no	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

F-17.01.01	select and use tools and equipment such as wet saws and trowels specific to application and chisels for acid tile
F-17.01.02	establish points for anchors to maintain integrity of wall
F-17.01.03	position and secure accessories such as anchors
F-17.01.04	prepare the vessel surface for installation using methods such as sandblasting, chemical etching and coating
F-17.01.05	select membrane according to application
F-17.01.06	cut and shape corrosion resistant materials such as brick, tile and membranes for installation
F-17.01.07	build and install forms and arch centre for specific application

Sub-task**F-17.02 Prepares mortar for corrosion resistant materials.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	no	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

F-17.02.01	select, set up and use tools and equipment such as mixing drills, pails and mixers
F-17.02.02	select and measure admixtures such as resins and epoxies according to manufacturers' specifications
F-17.02.03	select, measure and mix mortar ingredients such as resins and epoxies according to manufacturers' specifications

Sub-task**F-17.03 Removes existing corrosion resistant materials.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	no	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

F-17.03.01	select and use tools and equipment such as pneumatic hammers, grinders, chisels and hand tools
F-17.03.02	cut, grind and hammer existing material
F-17.03.03	clean up and dispose of materials according to site requirements

Sub-task**F-17.04 Installs corrosion resistant materials.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	no	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

F-17.04.01	select and use tools and equipment such as gunite machines, concrete pumps, wet saws and vibrators
F-17.04.02	pour and vibrate to consolidate
F-17.04.03	apply castables using methods such as hand packing, gunning and casting to protect the substrate
F-17.04.04	lay and sequence the installation of corrosion resistant materials such as brick and tile according to number and application
F-17.04.05	form and pour concrete to create base for containment area

Sub-task**F-17.05 Repairs corrosion resistant materials.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	no	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

F-17.05.01	select and use tools and equipment such as pneumatic, hydraulic, power and hand tools specific to corrosion resistant materials
F-17.05.02	isolate and remove damaged material
F-17.05.03	cut and shape replacement material to required dimensions
F-17.05.04	apply castables using methods such as hand packing, gunning and casting to protect the substrate
F-17.05.05	install corrosion resistant materials according to deficiency identified such as the erosion of brick, tile, membrane and refractory mortar

Trends	Restoration work is increasing as original masonry in Canada has reached the age where repairs are necessary. Large restoration projects have been initiated on historical buildings across Canada. The use of lasers for cleaning surfaces is being introduced into restoration projects.
Related Components (including, but not limited to)	Stone, brick, concrete, mortars, sealants, aggregate sand, lime, cement, epoxies, acrylics, dyes, colouring agents, grouts, steel angles, ties (anchors), structural steel, flashing, sheet metal, weepers, vents, insulation, membranes, lumber, fibreglass reinforcing, injection systems.
Tools and Equipment	See Appendix A.

Task 18 **Rebuilds masonry work.**

Context	This task describes the process of removing and reinstalling selected masonry work ranging from small areas to entire assemblies. It involves using proper equipment, support and bracing, as well as matching the existing structure.
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Required Knowledge

K 1	historical and current masonry construction techniques
K 2	masonry load patterns
K 3	types and colours of mortars
K 4	types of anchoring systems
K 5	effect of natural, mechanical or chemical processes on the materials
K 6	site, personnel and public safety measures
K 7	rigging and hoisting
K 8	storage practices for salvaged units
K 9	documentation methods for rebuilding such as tagging and photography

Sub-task**G-18.01 Disassembles unit masonry.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

G-18.01.01	determine plan of action based on assessed cause of deterioration and safe approach
G-18.01.02	shore surrounding masonry to prevent collapse or further damage during disassembly and reassembly
G-18.01.03	record placement of units using methods such as photography, tagging and sketches to ensure accuracy of future placement
G-18.01.04	remove mortar and units using tools according to method of disassembly selected
G-18.01.05	clean salvaged masonry units for reassembly using tools and cleaning agents according to specifications
G-18.01.06	store salvaged masonry units in a secure dry area to protect against damage and theft

Sub-task**G-18.02 Prepares restoration work area.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

G-18.02.01	remove remaining mortar from standing wall and backup wall
G-18.02.02	clean and restore components such as anchors, ties and shelf angles
G-18.02.03	repair backup wall and existing membrane according to deficiencies identified

Sub-task**G-18.03 Reinstalls masonry and accessories.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

G-18.03.01	place and secure related components such as flashings, ties, angle irons and electrical boxes
G-18.03.02	match appearance and composition of new material to existing material
G-18.03.03	lay new or salvaged masonry units based on recorded placement to match appearance of existing or recently disassembled work

Task 19**Repairs and cleans existing masonry work.**

Context	<p>This task describes non-destructive methods of restoring masonry work, including repointing and repairing of individual units. Repairs may be done in place or after removal and may range from historic fabric to relatively new construction.</p> <p>Bricklayers clean existing masonry surfaces as part of restoration or after restoration work has been performed so that the surfaces are returned to their original appearance.</p>
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Required Knowledge

K 1	mechanical repair techniques such as stitching, pinning or dowelling, using spiral ties and dispersed hydrated lime (DHL) injections
K 2	non-mechanical repair techniques such as composite repair, Dutchman repair, cutting and refacing
K 3	types of components such as bricks, stones and terracotta
K 4	loss of moisture from mortar due to evaporation and absorption in the masonry (curing)
K 5	types and bonding properties of mortar
K 6	preparation techniques of mortar
K 7	admixtures such as colouring, air entrainment agents, waterproofing and bonding agents
K 8	historic and conventional construction methods
K 9	types of materials used for refacing such as epoxies and acrylics

K 10	epoxy anchoring systems
K 11	masonry materials that may be affected by the cleaning, sealing or waterproofing/dampproofing processes
K 12	abrasive materials such as sand, water, nut shells, baking soda and glass
K 13	cleaning methods to avoid damage
K 14	operating procedures for cleaning equipment
K 15	restoration cleaning agents such as acids and non-acid stain removers
K 16	safety practices when cleaning surfaces and handling products or equipment
K 17	waterproofing/dampproofing materials such as silicone and solvent-based
K 18	application methods to clean such as brushing, rolling and spraying
K 19	practices to protect surrounding materials or assemblies during and after cleaning and waterproofing/dampproofing
K 20	types of soiling and stains
K 21	environmental regulations

Sub-task

G-19.01 Removes deteriorated components.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

G-19.01.01	determine and follow plan of action based on assessed cause of deterioration and safe approach
G-19.01.02	shore surrounding masonry to prevent collapse or further damage during removal and re-installation
G-19.01.03	record placement of units using methods such as photography and sketching to ensure accuracy of future placement
G-19.01.04	document shape, size and finished face of non-salvageable units to create templates
G-19.01.05	remove mortar, entire unit or damaged portion of a unit, using tools according to method of removal selected
G-19.01.06	document failures in material such as hairline cracks, spalling and delamination for record keeping

G-19.01.07	clean salvaged masonry units for re-installation according to specifications using tools and cleaning agents
G-19.01.08	store salvaged masonry units in a secure dry area to protect against damage

Sub-task

G-19.02 Repoints joints.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

G-19.02.01	remove deteriorated mortar from existing joints
G-19.02.02	clean void after removal of defective mortar using water or air pressure
G-19.02.03	pre-moisten area to be repointed to ensure adhesion of new mortar
G-19.02.04	fill, compress and tool joints following established procedures to ensure integrity of new joints
G-19.02.05	mist joints or cover them with wet burlap to prevent joint failure
G-19.02.06	protect surfaces from environmental conditions such as rain, wind and sun

Sub-task

G-19.03 Repairs masonry units.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

G-19.03.01	determine and follow plan of action based on assessed cause of deterioration
G-19.03.02	drill masonry for pinning and stitching
G-19.03.03	mix repair compound according to manufacturers' specifications
G-19.03.04	fill voids, rebuild portions of existing material, or mould units to match original features of the units
G-19.03.05	rejoin severed or cracked units using materials such as dowels, threaded pins or epoxies
G-19.03.06	reattach units to backup wall

G-19.03.07	replace deteriorated unit face with newly cut face using mortar or adhesives
G-19.03.08	support refaced units using wedges until initial set

Sub-task

G-19.04 Reinstalls masonry units and accessories.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

G-19.04.01	match appearance and composition of existing mortar
G-19.04.02	pre-moisten adjacent surfaces to ensure correct adhesion of new mortar
G-19.04.03	lay repaired masonry units based on recorded placement to match appearance of existing or recently disassembled work
G-19.04.04	apply mortar to unit and adjacent surfaces to ensure total joint integrity
G-19.04.05	compress and tool joints to match original
G-19.04.06	mist joints or cover them with wet burlap to prevent joint failure

Sub-task

G-19.05 Cleans existing masonry surfaces.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

G-19.05.01	determine cleaning method according to surface condition
G-19.05.02	test cleaning method on a small area
G-19.05.03	mix and apply cleaning agents according to manufacturers' specifications and in compliance with environmental regulations
G-19.05.04	pre-soak area to prevent absorption of the cleaning agent
G-19.05.05	use micro-abrasive cleaners such as soda, sand, water and nutshells according to material to avoid damage
G-19.05.06	rinse cleaned area with water to eliminate any traces of cleaning agents

Trends	Stone and brick are increasingly being used for decorative accents such as house numbers and accents for brick fronts. There is an increase in the use of accent arches over windows and doors in most jurisdictions.
Related Components (including, but not limited to)	Masonry units, specialized and regular mortars, caulking compounds, different aggregates, wire reinforcement, concrete, electrical components, mechanical components, spacers, tracks, expansion strips, anchoring systems, membranes, pigments, fasteners, fastening agents, insulation tape, adhesives, adjustable veneer ties, rigid insulation, stickclips, additives, epoxies and resins, bonding agents, lumber, plastic spacers, weepers, cleaning agents, insulation, backer rod, wire mesh, cement board, expansion and control joints, soft joints, air barriers, flashing, air ventilation accessories, draining systems, lateral support systems, lintel supports, sills, water repellents, shelf angles, fire stop materials.
Tools and Equipment	See Appendix A.

Task 20**Installs glass blocks.**

Context	Glass blocks are manufactured in various shapes (square, rectangular, corner), sizes, colours, fire ratings and clarities. They have insulating and light transmission properties. They are used for aesthetics, for security and privacy, and as waterproof partitions such as showers.
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Required Knowledge

K 1	types, shapes and sizes of glass blocks
K 2	types of mortars and associated additives
K 3	types of reinforcement and anchors

K 4	uses of expansion strips
K 5	installation procedures and methods for glass blocks

Sub-task

H-20.01 Prepares work area.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

H-20.01.01	determine the size of the opening or dimension of wall for laying up glass blocks
H-20.01.02	verify and adjust the base surface to ensure that it is level
H-20.01.03	prepare a sill surface according to manufacturers' specifications
H-20.01.04	install track to set glass block according to manufacturers' specifications

Sub-task

H-20.02 Lays glass blocks.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

H-20.02.01	maintain mortar consistency as glass blocks do not absorb moisture
H-20.02.02	install spacers and expansion strips in a uniform manner to keep the mortar joints consistent
H-20.02.03	lay up glass blocks to pattern and design to create a level and plumb finished product
H-20.02.04	insert joint reinforcing and anchors to ensure structural integrity
H-20.02.05	joint glass blocks to create an aesthetically pleasing product
H-20.02.06	clean glass blocks to remove excess mortar and dust while not scratching or damaging the surface

Task 21**Installs ornamental and sculpted masonry.**

Context Ornamental and sculpted masonry can be made from, or designed with, many types of materials such as brick, manufactured or sculpted stone. They are used as decorative additions to buildings. They are assembled into structures such as columns, sound reduction fences, cornices and hand rails.

Required Knowledge

K 1	materials such as stone, tile, brick and block
K 2	types of bonds and patterns such as running, stack, herringbone and basket weave
K 3	types of mortars
K 4	factors affecting durability such as weather, expansion joints, flashing and capping
K 5	unique anchoring systems associated with ornamental and sculpted units

Sub-task**H-21.01 Prepares for installation of ornamental and sculpted masonry.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

H-21.01.01	determine placement of unit or pattern according to drawings
H-21.01.02	verify the size, shape and weight of units
H-21.01.03	prepare the surface area to receive the unit to ensure proper anchoring and good fit
H-21.01.04	determine the size of the opening or dimension of wall for laying up ornamental patterns

Sub-task

H-21.02 Installs ornamental and sculpted masonry units.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

H-21.02.01	select mortar according to job specifications
H-21.02.02	match mortar to material for an aesthetically pleasing finished product
H-21.02.03	lay up units according to bonding and patterns in the drawing
H-21.02.04	finish joints to complete installation

Task 22 Builds arches.

Context Arches can be built for ornamental and structural purposes. They are built in various styles such as gothic, roman, segmental or jack arch. Arches are built to span areas and distribute the loads above them.

Required Knowledge

K 1	materials for arch such as brick, stone and block
K 2	types, styles and sizes of arches
K 3	template materials such as wood and steel
K 4	geometric and arch mathematical concepts
K 5	construction techniques for templates
K 6	mortar setting times
K 7	tray and step flashing

Sub-task**H-22.01 Prepares location.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

H-22.01.01	determine location of arch by referring to drawing
H-22.01.02	lay up wall to abutment height (spring line) to receive the arch
H-22.01.03	determine and install reinforcing in surrounding masonry buttresses, columns, piers and abutments
H-22.01.04	build support system for template to accept the weight of the arch

Sub-task**H-22.02 Builds template.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

H-22.02.01	determine type, location, span, rise and depth of arch template by referring to architectural drawing
H-22.02.02	determine structural strength requirements for template to ensure it will hold the arch while mortar sets
H-22.02.03	lay out and cut template according to specifications
H-22.02.04	assemble the template using various materials such as wood or steel

Sub-task**H-22.03 Places template.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

H-22.03.01	position template on support system
H-22.03.02	adjust and shim template to achieve required degree of level and plumb
H-22.03.03	shore template to temporarily secure it while arch is being built

Sub-task**H-22.04 Installs arch masonry units.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

H-22.04.01	verify centre of arch to determine material lay-up requirements and keystone location
H-22.04.02	calculate and cut skewback according to type of arch
H-22.04.03	calculate the spacing to determine lay out of masonry unit
H-22.04.04	calculate number, size and shape of voussoirs when building a gauged arch
H-22.04.05	shape masonry voussoirs by cutting material to fit gauged arch
H-22.04.06	lay arch masonry units according to calculations
H-22.04.07	cut creepers while laying up materials to create a uniform extrados
H-22.04.08	install tray and step flashings according to specifications

Sub-task**H-22.05 Removes template.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	NV	NV	ND

Key Competencies

H-22.05.01	verify the mortar has cured sufficiently and has enough strength to hold once template has been removed
H-22.05.02	remove any shoring materials and shims to release template
H-22.05.03	remove template without damaging arch material
H-22.05.04	clean and point joints in arch soffit to finish arch

APPENDICES

Hand Tools

adjustable wrench	line trigs
banker bench	manual splitter
boltcutter	mortar board
brick tongs	mortar hoe
brooms	pick axe
brushes	pliers
caulking gun	plug and feather (wedges and shims)
caulking tool	pogo stick
C-clamps	portable sprayer
chisels	pry bar
- pointed	
- flat	
- brick set	
- pitching	
- straight	
- splitting	
- toothed	
- plugging	
curry comb	raker (wheel type)
grout bag	sandbox
hammers	sandscreen
- brick	
- mash	
- refractory	
- ball peen	
- axe	
- bush	
- claw	
- dead blow	
- rawhide	
- rubber mallet	
- 71cotch	
- sledge hammer	
hawk	scrapers
jointer	screwdrivers
knives	shims/spacers
line blocks	shovels
line pins	slicker (tuck pointer)
line stretchers/line holders	socket set/wrench
sponges	

staple gun
tarpaulin
templates
trammel points
trimmers
trowels
- mason's
- margin
- pointing
- bucket
- buttering
- duck billed

venting tool
water bucket
water drum
water hose
wheelbarrow
wire snips

Power, Hydraulic, Pneumatic, Powder-actuated, and Welding Tools and Equipment

air socks
chain block
chop saw
circular saw
compressors
concrete vibrator
couplers
diamond or abrasive disk
dollies/pump jacks
drill
dustless saw and vacuum
extension cord
generators
grease gun
grinder
grout guns
grout pump
gunite machine and hoses
hammer drill
hydraulic splitter

hydraulic winches
jackhammer
jig saw
laser cleaner
masonry table saw
mortar box
mortar buggy
mortar mixer
mortar silos
oscillating saw
pneumatic chisel
pneumatic gun
pneumatic hammer
pneumatic hoses
portable masonry saw (quick cut saw)
powder-actuated fastening tool
pressure washers
propane and diesel heater
tiger torch
vacuum cleaner

Personal Protective Equipment and Safety Equipment

apron
eye protection
face shields
fire blankets
fire extinguisher
hearing protection

first aid kit
fresh air respirator
gas detection equipment
gloves
hardhat

heat and cold protection
insulated gloves
knee pads
lock-out tags/locks
respiratory protection

safety boots/footwear
safety harness and fall arrest system
safety vest
skin barrier cream

Measuring and Layout Tools and Equipment

bricklayer's tape
chalk line
gauge rod / storey pole
laser level
line block
mason's level
mason's line

mason's spacing rule
measuring tape
plumb-bob
square (bevel, triangle)
straightedge
transit

Rigging, Hoisting and Lifting Equipment, Access Equipment and Scaffolding

block and tackle
boom lifts
bosun's chair
bracing
cranes
elevators
fork extensions
forklift/telehandler
handcart
hydraulic scaffolding
ladders
lewis pins
mud sills
planks
powered boom platform

powered platforms
push-around powered platforms
scaffolds and their components
scissor lifts
screw jacks
shackles
shoring
slings
spreader beam
stairs
stone clamps
suspended platforms
suspended scaffolds
swing stage
work cages

accelerator	a material that speeds the initial setting time of concrete or mortar.
air barrier	a material used in the building envelope to retard the passage of air.
alumina	a mineral contained in clay used for brickmaking.
angle iron	a structural section of steel in the form of a 90 degree angle used, in certain situations, to support brickwork.
ash dump	a trap door for ashes in the floor of a fireplace leading to a chute.
backup wall	the part of a masonry wall behind the exterior facing.
batter	recessing or sloping masonry in successive courses; the opposite of a corbel
buttering	applying mortar to a masonry unit with a trowel.
castables	a refractory concrete that can be installed by pouring, gunning, shotcreting and hand tamping
cavity wall	a multi-wythe wall built of masonry units arranged to provide a continuous air space.
cement	a burned mixture of clay and limestone pulverized (crushed) for making mortar or concrete.
control joint	a joint or space to allow for dimensional change of parts of a structure due to expansion, shrinkage, temperature variations or other causes.
corbel	to build a projection or one of a series of projections, of masonry, brick, or concrete built into a wall or any standing member, each projecting progressively farther from its anchoring point and used to support an overhanging member above.
course	one of the continuous horizontal layers of units, bonded with mortar in masonry
curtain wall	a non- load-bearing wall built for the enclosure of a building.
dowels	straight metal bars used to connect two sections of masonry.
Dutchman repair	a repair involving carefully fitting a new piece of stone into a pocket cut into the existing stone and finishing the new piece to match the surrounding existing stone.
expansion joint	a joint in a concrete or masonry structure designed to permit expansion without damage to the structure.
extrados	the upper or exterior curve of an arch.
face	the exposed surface of a wall or masonry unit.

flashing	shielding material (often sheet metal) put around building openings to prevent water penetration and/or provide water drainage.
footing	the broadened base of a foundation wall or other superstructure.
foundation wall	that portion of a load-bearing wall below the level of the adjoining grade, or below first floor beams or joists.
grout	a glue like component of high water-cement ratio that permits it to be poured into spaces within masonry walls. Grout consists of water, Portland cement, lime and aggregate.
gunite machine	a pressurized applicator machine for refractory
hearth	that portion of a fireplace level with the floor, upon which the fire is built.
high temperature mortar	a mortar used for refractories.
insulation	a material with above-average thermal resistance, that inhibits the flow of heat.
joint	the narrow space between adjacent stones, bricks or other building blocks usually filled with mortar.
kerf	to slot into the edge of stone with a saw blade for the insertion of anchors.
keystone	wedge-shaped stone at the crown of an arch.
lateral support	means whereby walls are braced either vertically or horizontally by columns, pilasters, crosswalls, beams, floors and roofs.
lime	the result of limestone burned in a kiln until the carbon dioxide has been driven off.
lintel	a beam placed over an opening in a load-bearing wall.
masonry	brick, tile and stone or combination thereof, bonded with mortar.
mortar	a plastic mixture of glue-like materials, fine aggregate and water.
parging	the process of applying a coat of cement mortar on masonry.
pilaster	a pillar of brick work, rectangular in form, used as a supplement to a pier, usually projecting one-third of the thickness of the wall.
pointing	pushing mortar into a joint after the masonry units are laid.
reglet	a groove in material or structure to accept flashing.
reinforcing	steel bars, wire mesh and reinforcement wire which are embedded in concrete to give extra tensile strength to resist movement in concrete slabs, walls, beams and columns.

retardant	a set inhibitor to delay the setting and curing time of concrete and mortar.
smoke chamber	the space in a fireplace immediately above the throat where the smoke gathers before passing into the flue.
stone cladding	masonry units that are mechanically fastened to a structural backup wall. Stone used for cladding are typically large and are pre-finished in a stone-cutting and finishing shop.
template	any form or pattern, such as centring, over which brickwork may be formed.
tie	any unit of material that connects masonry units or other materials.
veneer wall	a non-load-bearing wall securely anchored to a non-masonry backup wall.
voussoir	wedge-shaped masonry units which form an arch ring.
waterproofing	a coating used to treat the surface of the substrate, preventing liquid from entering, but allowing water vapour to pass.
weep holes	small openings left in the outer walls of masonry construction as an outlet for water to move outside the wall and evaporate.
winterization	the process of organizing the work site for winter operation, which include heating and hoarding of work area, providing proper storage of materials, warming sand and water and protecting masonry work in progress.
wythe	a continuous vertical section of masonry, one unit in thickness.

CSA	Canadian Standards Association
DHL	dispersed hydrated lime
FLRA	field level risk assessments
LEED	Leadership in Energy and Environmental Design
NBC	National Building Code of Canada
OH&S	Occupational Health and Safety
PPE	personal protective equipment
PVC	polyvinyl chloride
RCF	refractory ceramic fibres
SDS	safety data sheet
SOP	Safe Operating Procedures
WHMIS	Workplace Hazardous Materials Information System

APPENDIX D

BLOCK AND TASK WEIGHTING

BLOCK A COMMON OCCUPATIONAL SKILLS

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	10	9	12	11	13	15	10	10	10	10	NV	NV	ND	11%

Task 1 Performs safety-related functions.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	30	25	25	25	30	20	25	25	25	20	NV	NV	ND	25%

Task 2 Uses and maintains tools and equipment.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	20	25	25	25	30	40	25	23	25	15	NV	NV	ND	25%

Task 3 Uses scaffolding.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	20	25	25	25	25	20	25	24	25	25	NV	NV	ND	24%

Task 4 Organizes work.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	30	25	25	25	15	20	25	28	25	40	NV	NV	ND	26%

BLOCK B GENERAL MASONRY PRACTICES

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	30	10	20	12	19	20	25	20	15	21	NV	NV	ND	19%

Task 5 Performs substrate preparation.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	20	30	20	28	17	20	15	40	30	20	NV	NV	ND	24%

Task 6 **Performs fundamental masonry tasks.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	50	38	60	46	70	40	70	40	50	45	NV	NV	ND	51%

Task 7 **Uses mortars, grouts and adhesives.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	30	32	20	26	13	40	15	20	20	35	NV	NV	ND	25%

BLOCK C MASONRY SYSTEMS

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	20	18	21	29	18	40	25	25	25	30	NV	NV	ND	25%

Task 8 **Builds masonry walls.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	60	30	40	54	50	70	30	60	60	63	NV	NV	ND	52%

Task 9 **Builds horizontal masonry surfaces.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	10	30	40	23	20	10	30	10	10	18	NV	NV	ND	20%

Task 10 **Builds and installs prefabricated masonry units.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	10	10	5	5	10	0	30	10	5	9	NV	NV	ND	9%

Task 11 **Installs surface-bonded masonry units.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	20	30	15	18	20	20	10	20	25	10	NV	NV	ND	19%

BLOCK D NATURAL STONE SYSTEMS

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	5	10	10	12	8	10	10	15	10	8	NV	NV	ND	10%

Task 12 **Builds natural stone walls.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	50	55	50	51	50	50	70	60	60	60	NV	NV	ND	56%

Task 13 **Installs natural stone cladding.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	50	45	50	49	50	50	30	40	40	40	NV	NV	ND	44%

BLOCK E CHIMNEYS AND FIREPLACES

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	10	13	15	13	11	5	5	5	15	11	NV	NV	ND	10%

Task 14 **Builds chimneys.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	30	45	50	61	40	30	30	60	40	30	NV	NV	ND	42%

Task 15 **Builds fireplaces.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	70	55	50	39	60	70	70	40	60	70	NV	NV	ND	58%

BLOCK F REFRACTORIES AND CORROSION RESISTANT MATERIALS

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	5	15	2	6	7	3	5	5	5	5	NV	NV	ND	6%

Task 16 **Installs and maintains refractories.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	60	55	100	50	75	50	50	50	75	60	NV	NV	ND	63%

Task 17 **Installs and maintains corrosion resistant materials.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	40	45	0	50	25	50	50	50	25	40	NV	NV	ND	37%

BLOCK G REFRACTORIES AND CORROSION RESISTANT MATERIALS

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	15	15	10	9	14	5	10	5	10	10	NV	NV	ND	11%

Task 18 **Rebuilds masonry work.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	60	60	60	60	50	50	50	40	50	40	NV	NV	ND	52%

Task 19 **Repairs and cleans existing masonry work.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	40	40	40	40	50	50	50	60	50	60	NV	NV	ND	48%

BLOCK H ADDITIONAL MASONRY

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	5	10	10	8	10	2	10	5	10	10	NV	NV	ND	8%

Task 20 **Installs glass blocks.**

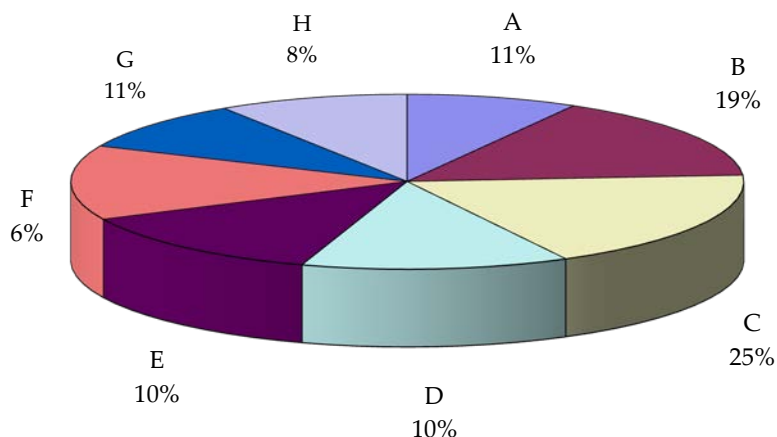
	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	20	30	35	33	20	30	40	40	20	20	NV	NV	ND	29%

Task 21 **Installs ornamental and sculpted masonry.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	40	30	10	17	30	20	20	20	20	10	NV	NV	ND	22%

Task 22 **Builds arches.**

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	40	40	55	50	50	50	40	40	60	70	NV	NV	ND	49%



TITLES OF BLOCKS

BLOCK A	Common occupational skills	BLOCK E	Chimneys and fireplaces
BLOCK B	General masonry practices	BLOCK F	Refractories and corrosion resistant materials
BLOCK C	Masonry systems	BLOCK G	Restoration
BLOCK D	Natural stone systems	BLOCK H	Additional masonry

*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 – Bricklayer

BLOCKS	TASKS	SUB-TASKS				
A - COMMON OCCUPATIONAL SKILLS	1. Performs safety related functions.	1.01 Maintains safe work environment.	1.02 Uses personal protective equipment (PPE) and safety equipment.			
	2. Uses and maintains tools and equipment.	2.01 Maintains tools and equipment.	2.02 Uses rigging, hoisting and lifting equipment.	2.03 Uses access equipment.		
	3. Uses scaffolding.	3.01 Erects scaffolding.	3.02 Dismantles scaffolding.	3.03 Maintains scaffolding.		
	4. Organizes work.	4.01 Uses drawings and specifications.	4.02 Plans daily tasks and activities.	4.03 Prepares job site and materials.	4.04 Protects surrounding areas.	
B - GENERAL MASONRY PRACTICES	5. Performs substrate preparation.	5.01 Prepares vertical substrates and foundations.	5.02 Applies parging.	5.03 Installs anchoring/tie systems.	5.04 Installs membrane and flashing.	5.05 Installs insulation.
	6. Performs fundamental masonry tasks.	6.01. Lays out wall and coursing.	6.02 Finishes joints.	6.03 Cleans new masonry surfaces.	6.04. Seals masonry surfaces.	
	7. Uses mortars, grouts and adhesives.	7.01 Mixes mortar, concrete, grout and adhesives.	7.02 Uses mortars.	7.03 Uses concrete and grout.	7.04 Uses adhesives.	

BLOCKS	TASKS	SUB-TASKS				
C - MASONRY SYSTEMS	8. Builds masonry walls.	8.01 Builds non-load-bearing walls.	8.02. Builds load-bearing walls.			
	9. Builds horizontal masonry surfaces.	9.01 Prepares horizontal substrate.	9.02 Lays masonry units on horizontal surfaces.			
	10. Builds and installs prefabricated masonry units.	10.01 Builds prefabricated masonry. (NOT COMMON CORE)	10.02 Erects prefabricated masonry.			
	11. Installs surface-bonded masonry units.	11.01 Prepares substrate for surface-bonded masonry units.	11.02 Applies surface-bonded masonry units.			
D - NATURAL STONE SYSTEMS	12. Builds natural stone walls.	12.01 Prepares natural stone.	12.02 Lays natural stone.	12.03 Damp cures walls.		
	13. Installs natural stone cladding.	13.01 Prepares substrate for cladding.	13.02 Prepares natural stone for cladding.	13.03 Installs natural stones.		
E - CHIMNEYS AND FIREPLACES	14. Builds chimneys.	14.01 Builds foundation supports for chimneys.	14.02 Lays masonry units to build chimneys.	14.03 Installs flue lining.	14.04 Installs related flashings.	14.05 Installs caps.
	15. Builds fireplaces.	15.01 Builds foundation for hearth, firebox, backup material and veneer.	15.02 Builds hearth, firebox and backup.	15.03 Installs damper.	15.04 Builds smoke chamber.	15.05 Prepares existing fireplace for insert.

BLOCKS	TASKS	SUB-TASKS				
F - REFRACTORIES AND CORROSION RESISTANT MATERIALS		15.06 Faces fireplaces and inserts.				
	16. Installs and maintains refractories.	16.01 Prepares for installation of refractories and accessories.	16.02 Prepares mortar for refractories.	16.03 Removes existing refractories.	16.04 Installs refractories.	16.05 Repairs refractories.
	17. Installs and maintains corrosion resistant materials.	17.01 Prepares for installation of corrosion resistant materials and accessories.	17.02 Prepares mortar for corrosion resistant materials.	17.03 Removes existing corrosion resistant materials.	17.04 Installs corrosion resistant materials.	17.05 Repairs corrosion resistant materials.
	18. Rebuilds masonry work.	18.01 Disassembles unit masonry.	18.02 Prepares restoration work area.	18.03 Reinstalls masonry and accessories.		
	19. Repairs and cleans existing masonry work.	19.01 Removes deteriorated components.	19.02 Repoints joints.	19.03 Repairs masonry units.	19.04 Reinstalls masonry units and accessories.	19.05 Cleans existing masonry surfaces.
G - RESTORATION						
H - ADDITIONAL MASONRY	20. Installs glass blocks.	20.01 Prepares work area.	20.02 Lays glass blocks.			
	21. Installs ornamental and sculpted masonry.	21.01 Prepares for installation of ornamental and sculpted masonry.	21.02 Installs ornamental and sculpted masonry units.			
	22. Builds arches.	22.01 Prepares location.	22.02 Builds template.	22.03 Places template.	22.04 Installs arch masonry units.	22.05 Removes template.