National Occupational Analyses

Construction Craft Worker

2015

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FOREWORD

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

Background

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to cooperate with provincial and territorial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, 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.

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

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

Trades and Apprenticeship Division
Labour Market Integration Directorate
Employment and Social Development Canada
140 Promenade du Portage, Phase IV, 5th Floor
Gatineau, Quebec K1A 0J9
Email: redseal-sceaurouge@hrsdc-rhdcc.gc.ca

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STRUCTURE OF ANALYSIS

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

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

The analysis also provides the following information:

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

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

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

DEVELOPMENT AND VALIDATION OF ANALYSIS

Development of Analysis

A draft analysis is developed by a committee of industry experts in the field led by a team of facilitators from ESDC. This draft analysis breaks down all the tasks performed in the occupation and describes the knowledge and abilities required for a tradesperson to demonstrate competence in the trade.

Draft Review

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

Validation and Weighting

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

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

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

This method for the validation of the NOA also identifies common core sub-tasks across Canada for the occupation. If at least 70% of the responding jurisdictions perform a sub-task, it shall be considered common core. Interprovincial Red Seal Examinations are based on the common core sub-tasks identified through this validation process.

Definitions for Validation and Weighting

YES	sub-task performed by qualified workers in the occupation in a specific jurisdiction
NO	sub-task not performed by qualified workers in the occupation in a specific jurisdiction
NV	analysis Not Validated by a province/territory
ND	trade Not Designated in a province/territory
NOT COMMON CORE (NCC)	sub-task, task or block performed by less than 70% of responding jurisdictions; these will not be tested by the Interprovincial Red Seal Examination for the trade
NATIONAL AVERAGE %	average percentage of questions assigned to each block and task in Interprovincial Red Seal Examination for the trade

Provincial/Territorial Abbreviations

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

ANALYSIS

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

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

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

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

SCOPE OF THE CONSTRUCTION CRAFT WORKER TRADE

"Construction Craft Worker" is this trade's official Red Seal occupational title approved by the Canadian Council of Directors of Apprenticeship. This analysis covers tasks performed by construction craft workers 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
Construction Craft Labourer								✓	✓				
Construction Craft Worker	✓	✓	✓	✓	✓	✓	✓			✓			

Construction craft workers work mostly on construction sites; their tasks include site preparation and cleanup, setting up and removing access equipment, and working on concrete, masonry, steel, wood and pre-cast erecting projects. They handle materials and equipment and perform demolition, excavation and compaction activities. They may also perform site safety and security checks.

Construction craft workers work on a wide variety of structures such as residential, and industrial, commercial and institutional (ICI) sites, as well as hydroelectric dams, roadways, bridges, tunnels, mines and railways. In some jurisdictions, they may also work on utility, landscape and pipeline projects. Construction craft workers may work for private companies as well as municipal, provincial and federal governments.

With experience, construction craft workers who complete additional training may specialize in different areas of construction. This can include operating off-road vehicles, drilling, blasting, scaling, sandblasting, high-pressure washing, diving, tunnelling and performing emergency rescue. Another common responsibility is the management of pedestrian and vehicular traffic in situations involving potential hazards and public trust.

Construction craft workers work primarily outdoors, in all weather conditions. They are often required to work at heights, over water and in confined spaces and excavations. Their job settings may be in densely-populated urban settings or at remote locations. They often work overtime during peak construction periods.

Key attributes for workers in this trade are mechanical aptitude, manual dexterity and an ability to do hard physical work. They must also be able to work both as team members, and sometimes, to interact directly with the public where considerations such as safety and legal liability are at issue. Organizational, leadership, problem solving and document interpretation skills are assets for anyone wanting to progress in this trade.

This analysis acknowledges similarities with many construction trades. With experience construction craft workers may have opportunities to advance.

OCCUPATIONAL OBSERVATIONS

Due to more stringent environmental regulations, the industry is seeing an increased emphasis upon recycling requirements and other environmental protection activities. To meet these standards, construction craft workers are seeing an increase in duties, requiring a larger skilled workforce. These new standards are also associated with increased diversification of tasks undertaken by this trade, heightened demands for resourcefulness on the jobsite and capacity to function year-round rather than on a merely seasonal basis. Also, new green construction methods adhering to Leadership in Energy and Environmental Design (LEED), such as building green roofs and other aspects of work in the power sector work (e.g. wind turbines, solar) require construction craft workers to expand their skills.

There is increased pressure from industry to accomplish tasks in a shorter time period even as year-round rather than seasonal work increasingly becomes a standard requirement of this trade.

Increased technological advances such as digital equipment, pipe remediation and robotics are leading to an increased emphasis on training. The use of global positioning systems (GPS) is becoming more popular for layout, grading and locates. Increased safety and technical training is being supported in the construction industry.

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.

Tools are available online or for order at: http://www.esdc.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
Construction craft workers read a variety of material such as safety data sheets (SDS) and pre-job safety instructions (PSI). They also may refer to instructions and procedures for guidelines on mixing mortars and cleaning parts, and manuals for guidelines on inspecting and operating mobile and stationary equipment including load charts. Construction craft workers may read trade journals, brochures and website articles to learn about new products and construction technologies.

Document Use
Construction craft workers interpret labels on product packaging and equipment to locate specifications, times, safety information and identification numbers. They also interpret technical drawings such as floor plans, schematics and assembly drawings. They complete documents including orientation and equipment inspection forms.

Writing
Construction craft workers use writing skills to complete logbooks to record the outcome of safety inspections and write notes to co-workers concerning items such as defective equipment. They may be required to prepare short reports, such as describing events leading up to a workplace accident.

Oral Communication
Construction craft workers exchange information with co-workers and other tradespeople. They talk to supervisors to learn about job assignments and to coordinate activities and schedules. Construction craft workers participate in staff meetings to discuss safety, goals, procedures, job time-frames and projects. They speak to suppliers to determine policies, prices and delivery schedules.

Numeracy
Construction craft workers take measurements using a range of tools and compare measurements to specifications. They estimate quantities and weights. Construction craft workers perform calculations including calculating material requirements.

Thinking Skills
Construction craft workers use thinking skills to organize their work. They decide on the order of tasks and how to work around issues that can arise such as material shortages and equipment breakdowns. They evaluate the safety of worksites by identifying hazards. They evaluate the quality of work by taking measurements and checking alignment. Construction craft workers may attempt to troubleshoot equipment problems. They may also recommend whether parts are reusable or can be rebuilt.

Working with Others
Construction craft workers may work independently or with a journeyperson or apprentice to accomplish their assigned tasks. On large jobs, they may work as a member of a team.

Digital Technology
Construction craft workers use digital tools such as multimeters and scan tools to measure current, voltage and resistance. They use calculators to complete numeracy related tasks. Construction craft workers use communication software/devices to exchange information. They may access online information such as bulletins and training courses. They may also use computers to complete topographical surveys and generate diagrams as well as to view blueprints.

Continuous Learning
Construction craft workers have a recurring requirement to learn. This includes learning about new work materials and construction procedures. They may take part in company or jobsite safety training and training to remain up to date in first aid practices.

Trends There is an increased emphasis on safety in all aspects of a construction craft worker's job. In an effort to increase safety and to track performance, more documentation and training is required.

Related Components All components apply.

Tools and Equipment See Appendix A.

Task 1 Performs safety-related functions.

Context Construction craft workers must perform safety-related functions in order to be safe in the workplace.

Required Knowledge

K 1	WHMIS
K 2	locations of SDS documents
K 3	workers' rights and responsibilities
K 4	company safety manuals, policies and procedures, and codes of practice
K 5	transportation of dangerous goods (TDG) procedures
K 6	training and certification requirements such as traffic control, fall protection, working at heights, and confined space
K 7	emergency procedures and muster area
K 8	disposal and recycling procedures
K 9	Canadian Standards Association (CSA) approved personal protective equipment (PPE) such as high-visibility vests, eye protection, safety boots, hard hats, harnesses, hearing protection and respirators
K 10	types of safety equipment such as fire extinguishers, first aid kits, safety tape and barricades
K 11	PPE and safety equipment operations
K 12	training and certification requirements for using PPE and safety equipment
K 13	location of PPE and safety equipment

K 14	OH&S regulations regarding the use of PPE and safety equipment
K 15	limitations of PPE such as respirators and fall protection equipment
K 16	types and operation of fire extinguishing equipment
K 17	authorities having jurisdiction (AHJ)
K 18	lock-out and tag-out procedures
K 19	housekeeping practices

Sub-task

A-1.01 Maintains safe work environment.

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

Key Competencies

A-1.01.01	apply safety procedures
A-1.01.02	apply WHMIS procedures such as record keeping of SDS, and product identification, handling and disposal
A-1.01.03	install barricades, signage and tape-off areas to isolate work area, to bring attention to potential hazardous situations, and to prevent entry of workers and public on site
A-1.01.04	remove all tripping hazards such as debris, material and equipment
A-1.01.05	participate in job-site specific orientation prior to working on a new jobsite
A-1.01.06	participate in safety, Joint Occupational Health and Safety (JOHS), job hazard analysis and tool box (tailgate) meetings
A-1.01.07	recognize personal injury hazards
A-1.01.08	report and prevent potential hazards such as defective equipment, not tying off ladders, uncovered man holes and open hatches
A-1.01.09	recognize, correct and report unsafe work practices, near misses or conditions
A-1.01.10	perform lock-out and tag-out procedures
A-1.01.11	apply site safety plan that is posted on the jobsite to locate safety equipment such as eye wash stations, first aid kits and rooms, and decontamination showers

Sub-task

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

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

Key Competencies

A-1.02.01	identify and select types of PPE according to task, jurisdictional regulations and jobsite specifications
A-1.02.02	inspect PPE and safety equipment for damage and defects
A-1.02.03	store PPE and safety equipment
A-1.02.04	tag defective PPE and safety equipment, and remove from service

A-1.02.05	verify certification of PPE and safety equipment prior to use
A-1.02.06	maintain safety equipment by cleaning according to manufacturers' specifications
A-1.02.07	use fall protection equipment following guidelines such as proper lanyard length and anchoring points
A-1.02.08	follow manufacturers' guidelines on lifespan and proper use of PPE

Task 2 Uses and maintains tools and equipment.

Context Construction craft workers use a wide variety of tools and equipment in order to carry out their daily tasks. Special training or certification may be required to operate some of these tools and equipment.

Required Knowledge

K 1	types of hand tools such as hammers, pry bars and screwdrivers
K 2	types of electric and gas power tools such as chippers, quick-cut saws, circular saws, reciprocating saws, grinders and drills
K 3	types of hydraulic power tools such as jacks, hammers and rock splitters
K 4	types of pneumatic power tools such as jackhammers and breakers
K 5	types of powder-actuated tools such as manual and trigger-operated
K 6	applications of powder-actuated tools
K 7	training and certification requirements
K 8	types of rigging equipment such as shackles, swivel hooks, cradles, turnbuckles and slings
K 9	types of hoisting equipment such as come-alongs, chainfalls and grip hoists
K 10	uses and limitations of rigging and hoisting equipment
K 11	rigging and hoisting equipment regulations
K 12	types of loads such as liquid, reinforcing steel, fly tables and tilt-up panels
K 13	load radius and center of gravity
K 14	rated capacity of hardware
K 15	stationary equipment such as water pumps, concrete pumps, heaters, generators, compressors and light towers
K 16	types of pumps such as electric, hydraulic, pneumatic and fuel-powered
K 17	types of heaters such as electric, fuel-fired, glycol and steam
K 18	operation of equipment
K 19	sandblasters

K 20	types of mobile equipment such as skidsteers, mini-excavators and telescopic forklifts (telehandlers)

Sub-task

A-2.01 Maintains hand, power and powder-actuated tools.

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

Key Competencies

A-2.01.01	clean tools
A-2.01.02	organize tools by grouping like tools together
A-2.01.03	sharpen hand tools such as scrapers and chisels
A-2.01.04	store tools in tool crib
A-2.01.05	replace components such as springs, bits and blades
A-2.01.06	recognize worn, damaged or defective tools and tag for removal from service
A-2.01.07	lubricate moving parts as required
A-2.01.08	verify battery packs are charged

Sub-task

A-2.02 Uses rigging and hoisting equipment.

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

Key Competencies

A-2.02.01	select rigging and hoisting equipment such as chains, slings, cradles, spreader bars, cables, shackles, softeners and tag lines
A-2.02.02	estimate load weights and verify that rigging equipment is rated for the load weight according to inspection tags
A-2.02.03	rig loads considering factors such as designated lift points and stability triangle, and ensure the load is stable
A-2.02.04	control load using tag lines
A-2.02.05	inspect rigging and hoisting equipment for wear, damage and defects, tagging any equipment designated for removal
A-2.02.06	maintain hoisting equipment by replacing safety clips and lubricating

A-2.02.07	store rigging equipment such as nylon straps and slings in dry area
A-2.02.08	store rigging and hoisting equipment in designated area

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Sub-task

A-2.03 Uses stationary equipment.

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

Key Competencies

A-2.03.01	select equipment such as light towers, generators, compressors and discharge (water) pumps and their components such as electrical cords, hoses, shut off valves and ground fault circuit interrupters (GFCI)
A-2.03.02	recognize hazards of using stationary equipment such as flammable fuels and exhaust gases
A-2.03.03	operate stationary equipment according to manufacturers' specifications
A-2.03.04	place, set up and secure stationary equipment in well-ventilated area and on level ground
A-2.03.05	check, monitor and maintain fluids such as oil, fuel and engine coolant
A-2.03.06	complete daily maintenance logbooks according to company policy or jobsite requirements
A-2.03.07	inspect and monitor stationary equipment and components for damage and faults such as abraded hoses, frayed electrical cords and leaks
A-2.03.08	start diesel and gasoline engines according to manufacturers' specifications
A-2.03.09	shut down stationary equipment according to manufacturers' specifications
A-2.03.10	store and maintain stationary equipment according to manufacturers' specifications

Sub-task

A-2.04 Uses sandblaster.

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

Key Competencies

A-2.04.01	select sandblaster components and materials such as hoses, nozzles, abrasives and shut off valves
A-2.04.02	recognize hazards such as dust and high pressure flying abrasives and debris
A-2.04.03	operate sandblaster according to manufacturers' specifications and using a ventilation hood
A-2.04.04	establish and adjust abrasive and airflow mixture according to task requirements
A-2.04.05	inspect and monitor sandblaster and components for damage
A-2.04.06	coordinate use of sandblaster with pot attendant for operating and shut-down procedures according to manufacturers' specifications
A-2.04.07	store sandblaster pot and abrasives in a dry location and maintain equipment according to manufacturers' specifications
A-2.04.08	identify containment and safe work area for sandblasting

Sub-task

A-2.05 Uses mobile equipment.

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

Key Competencies

A-2.05.01	operate and maintain mobile equipment such as skidsteers, mini-excavators and telescopic forklifts (telehandlers) according to manufacturers' specifications
A-2.05.02	recognize hazards such as blind spots, pedestrian traffic, obstacles, power lines, flammable fuels and exhaust gases
A-2.05.03	check, monitor and maintain fluids such as oil, fuel and engine coolant
A-2.05.04	complete daily maintenance logbooks according to company policy or jobsite requirements
A-2.05.05	inspect and monitor mobile equipment and components for damage and faults such as hydraulic hoses and leaks

A-2.05.06	start and shut down diesel and gasoline engines according to manufacturers' specifications
A-2.05.07	work with spotters in congested work areas to mitigate hazards such as blind spots, pedestrian traffic, obstacles and power lines

Task 3 Organizes work.

Context Construction craft workers must use a variety of documents, communicate with others and plan their specific tasks in order to organize their work. Communication on the work site is crucial in order to complete the work in a safe and efficient manner.

Required Knowledge

K 1	types of documentation such as work records, job hazard analysis (JHA), codes and regulations
K 2	safety documentation such as SDS, WHMIS symbols and monitoring sheets for safety watches
K 3	site-specific documentation such as safe work permits and job procedure manuals
K 4	requirements for task
K 5	limitations of equipment and material
K 6	hazards of task
K 7	sequence of construction tasks
K 8	jobsite roles and responsibilities
K 9	different formats of documents such as paper or digital
K 10	communication methods such as oral, written, digital, electronic and international hand signals

Sub-task

A-3.01 Uses documentation.

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

Key Competencies

A-3.01.01	interpret drawings such as blueprints, engineering drawings and sketches
A-3.01.02	interpret work orders
A-3.01.03	locate and remain current with information such as job procedures, OH&S regulations, and SDS
A-3.01.04	reference manufacturers' specifications and safe operating procedures for equipment
A-3.01.05	sketch diagrams to visualize work
A-3.01.06	complete work-related records such as incident reports, daily logs, JHA and PSI according to jurisdictional requirements
A-3.01.07	check material received against work orders and specifications
A-3.01.08	obtain jobsite work permits for activities such as excavation, hot work and confined space entry

Sub-task

A-3.02 Communicates with others.

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

Key Competencies

A-3.02.01	acquire information through questioning
A-3.02.02	use communication systems such as hand held radios, international hand signals, posted signs and ribbons for control zones
A-3.02.03	share knowledge and experience with others including mentoring
A-3.02.04	consult with supervisors, coworkers, other trades people and AHJ
A-3.02.05	share PSI documentation
A-3.02.06	participate in jobsite meetings such as tailgates and other safety meetings

Task 4 Performs routine trade activities.

Context

Construction craft workers perform various routine tasks throughout all major areas of the trade. Establishing and maintaining grades and elevations is an important part of a construction craft worker's duties.

Some of the activities within this section, especially using grades and elevations, and traffic control require specialized training or certification. Traffic control applies to vehicular, pedestrian and co-worker traffic.

Required Knowledge

K 1	types of materials such as lumber, soil, piping, concrete and masonry units
K 2	required and available storage area such as lay down areas, sea cans and tool cribs
K 3	effects of environmental and chemical exposure on workers and materials
K 4	manual lifting procedures
K 5	equipment such as forklifts, wheelbarrows and telescoping booms
K 6	types of hoarding material such as insulated tarpaulins, polyethylene and plywood
K 7	applications of hoarding/enclosures such as enclosing scaffolding, concrete formwork and soil
K 8	environmental conditions such as wind, snow and rain, and their potential impact
K 9	types of framework for hoarding/enclosures such as scaffolding, existing structures and wood
K 10	types of membranes such as polyethylene, waterproofing membranes and landscaping fabric
K 11	membrane application methods such as gluing, torching and spraying
K 12	types of insulating materials such as styrofoam, fireproofing materials, straw and fiberglass
K 13	applications of insulating materials such as preventing underground piping, sewers and concrete from freezing
K 14	manufacturers' and engineering specifications
K 15	job requirements for insulation
K 16	applications where grades and elevations must be established such as roadwork, utilities and concrete placement
K 17	required grades and elevations according to plans and specifications
K 18	types of temporary benchmarks such as marks on fire hydrants, nail and ribbon, and grade stakes

K 19	use of permanent monuments and benchmarks
K 20	worksites requiring traffic control such as roadwork, utility installation and concrete placement
K 21	types of travel restrictive systems such as barricades, flagging and barriers
K 22	regulations regarding traffic control
K 23	training and certification requirements
K 24	fencing types such as snow, chain link, silt and temporary
K 25	applications that require fencing such as limiting access, environmental protection and security purposes

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Sub-task

A-4.01 Handles construction materials.

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

Key Competencies

A-4.01.01	load and unload project materials, and secure for transport
A-4.01.02	handle, store and secure materials such as propane cylinders and oxy-acetylene tanks according to regulations
A-4.01.03	store materials such as lumber, formwork and masonry products for easy access and egress
A-4.01.04	maintain a continuous supply of materials to ensure efficient flow of work

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Sub-task

A-4.02 Performs site housekeeping and maintenance.

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

Key Competencies

A-4.02.01	select and use housekeeping tools and equipment such as brooms, shovels, skidsteers and garbage bins
A-4.02.02	pick up loose material for recycling and garbage
A-4.02.03	control dust using dust control measures such as water, calcium and sweeping compound

A-4.02.04	clear walkways, platforms, entrances/exits, stairways and parking area of snow, ice, water and mud, using water pumps, sand and skidsteers
A-4.02.05	clean trailers and washrooms to maintain a healthy environment for all workers
A-4.02.06	supply fresh drinking water and maintain coolers for workers
A-4.02.07	maintain spill kits and drip pans ensuring fully stocked in case of spill
A-4.02.08	check, tag and replace fire extinguishers as needed

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Sub-task

A-4.03 Erects hoarding/enclosures.

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

Key Competencies

A-4.03.01	cover hoarding/enclosures such as concrete piles, scaffolding and concrete pours with materials such as insulated tarps, polyethylene and screening
A-4.03.02	secure hoarding/enclosures with materials such as wire, nails, rope, cable and weights
A-4.03.03	install access and egress to hoarding/enclosures according to engineers specifications
A-4.03.04	provide heat and ventilation in hoarding/enclosures according to code
A-4.03.05	dismantle hoarding/enclosures
A-4.03.06	identify when hoarding/enclosure becomes a confined space

Sub-task

A-4.04 Installs membranes.

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

Key Competencies

A-4.04.01	inspect walls for deformities prior to installation to ensure placement and adhesion
A-4.04.02	prepare concrete using methods such as "roughing up", washing, grinding high spots and priming
A-4.03.03	apply membranes according to manufacturers' specifications
A-4.03.04	protect membranes with materials such as treated wood, styrofoam and fiberboard according to job specifications

Sub-task

A-4.05 Installs insulating materials.

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

Key Competencies

A-4.05.01	select and use tools and equipment such as powder-actuated tools, trowels, hammers and drills
A-4.05.02	cut, secure and tape insulating materials according to manufacturers' and job specifications
A-4.05.03	apply insulation according to manufacturers' and job specifications

Sub-task

A-4.06 Establishes grades and elevations.

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

Key Competencies

A-4.06.01	find monuments and benchmarks according to engineering blueprint
A-4.06.02	select and use tools and equipment such as metal detectors, builders' and laser levels
A-4.06.03	assist surveyor to establish sub-grade and final-grade according to engineered blueprints
A-4.06.04	establish temporary benchmarks
A-4.06.05	work from temporary benchmarks to set up elevations, slopes and layouts

Sub-task

A-4.07 Performs traffic control.

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

Key Competencies

A-4.07.01	control pedestrian and vehicular traffic on work site
A-4.07.02	install temporary signs, signals, pylons, barriers and barricades according to job specifications and AHJ
A-4.07.03	instruct and place flagpersons according to jurisdictional regulations
A-4.07.04	drive pilot vehicle through construction area and communicate with flagpersons by radio to ensure flow of traffic
A-4.07.05	set up detours and closures for vehicles and pedestrians according to job specifications

Sub-task

A-4.08 Installs permanent and temporary fencing.

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

Key Competencies

A-4.08.01	select and locate fencing for application and according to engineering and job specifications
A-4.08.02	select and use tools and equipment such as augers, skidsteers, post pounders and backfill equipment
A-4.08.03	place and secure permanent posts and fencing such as wood, chain-link, sound barriers, metal and vinyl using anchors and backfill materials according to engineering specifications
A-4.08.04	place and secure temporary fencing such as snow, silt, metal, wood and net using existing structures, anchors and backfill materials to protect and secure workers and public according to job specifications
A-4.08.05	construct temporary guardrails and covered walkways according to job specifications

Trends

New technology requires a broader range of knowledge and skills. This increases the training necessary for construction craft workers to perform their tasks.

Safety concerns within the industry are leading to increased safety-related duties such as monitoring hazardous environments and confined spaces.

Stricter environmental regulations are changing the way construction material is handled. This requires more stringent methods for the disposal and recycling of existing material or components.

Related Components

All components apply.

Tools and Equipment

See Appendix A.

Task 5 Prepares site.

Context

Construction craft workers are the first and last workers on a construction site. They clear sites and set up temporary facilities and utilities, allowing other trades to perform their tasks. This is also called mobilization.

If required, depending on soil conditions, pilings are placed after the site is cleared.

Required Knowledge

K 1	jurisdictional regulations
K 2	safe work permit requirements
K 3	environmental requirements
K 4	pre-existing site conditions and existing utilities
K 5	work site and set-up requirements such as locations of temporary buildings and fencing
K 6	employer requirements such as pre-JHA and safety considerations
K 7	areas to protect prior to work being performed

K 8	location of pilings such as on land or in water
K 9	safety and rescue regulations and requirements
K 10	soil types and their designations
K 11	types of machinery such as pile drivers, pile drillers and cranes
K 12	types of pilings such as concrete, H-beam, sheet and steel
K 13	rigging requirements
K 14	colour codes of flags or stakes

Sub-task

B-5.01 Clears site.

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

Key Competencies

B-5.01.01	select and use tools and equipment such as chain saws, surveying equipment, shovels, drills and picks
B-5.01.02	interpret colour-coded flags and markers used to locate utilities
B-5.01.03	bring site to working condition by performing actions such as removing buildings, debris and material, clearing brush, moving dirt and rocks, and stripping existing asphalt and concrete

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Sub-task

B-5.02 Sets up site facilities.

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

Key Competencies

B-5.02.01	select and use tools and equipment such as shovels, rakes, wrenches, chains and telescopic forklifts (telehandlers)
B-5.02.02	determine site layout taking into consideration excavations and location of buildings
B-5.02.03	strategically place and level facilities such as work and warehouse trailers, lunch rooms and washrooms according to jobsite specifications
B-5.02.04	install stairs and temporary connecting platforms to trailers according to specifications

B-5.02.05	assist other certified tradespersons in the set-up of temporary utilities such as water, sewer and electrical
B-5.02.06	place safety equipment such as fire extinguishers, eye wash stations and first aid kits in specified locations
B-5.02.07	set up equipment such as photocopiers, tables, chairs and refrigerators
B-5.02.08	display site permits in specific location such as main site office or main gate
B-5.02.09	set up muster points and emergency meeting points

Sub-task

B-5.03 Assists in installation of pilings.

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

Key Competencies

B-5.03.01	assist in setting up, refueling and dismantling piling machines
B-5.03.02	set up machinery by connecting hoses and compressors
B-5.03.03	establish and set up a safe work area
B-5.03.04	adjust to changing work environments such as working on boats and barges, and off sheet pilings
B-5.03.05	select and use tools and equipment such as measuring tapes, levels, grinders and cutting torches
B-5.03.06	assist with drilling piling holes and clear debris out according to job specifications
B-5.03.07	measure, modify and place rebar cages in pile holes
B-5.03.08	direct machine operator to install pilings into position using piling machine according to site specifications
B-5.03.09	inspect piles to ensure they are plumb and in position using leveling instruments
B-5.03.10	inform supervisors of problems as they arise and provide progress report

Sub-task

B-5.04 Builds access and egress roads.

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

Key Competencies

B-5.04.01	select and use tools and equipment such as compaction equipment and hand tools
B-5.04.02	assist in removing existing material such as soil or gravel down to hard pan
B-5.04.03	select material according to specifications for road base, backfill and grades
B-5.04.04	compact road according to site specifications
B-5.04.05	guide road building machinery including installing offset stake lines and benchmarks

Task 6 Performs ground work.

Context

Ground work is done on ICI, residential, and civil sites (roads, bridges, railways).

Excavation is a procedure to break ground, remove existing material and allow components to be installed within the excavation site.

Backfilling is the activity of filling an excavation.

Compaction is an action required to consolidate backfill.

Required Knowledge

K 1	safe work and excavation permit requirements
K 2	soil conditions
K 3	pre-existing site conditions and existing utilities
K 4	jurisdictional regulations
K 5	types of soil such as clay, sand and gravel
K 6	reclamation of contaminated soils
K 7	types of sub-grades
K 8	depth and angle of repose of excavation and trench
K 9	certification and inspection requirements for shoring and trench boxes (cages)
K 10	types of shoring such as sheet pilings, wood structures, steel structures and trench boxes

K 11	types of material used for backfill such as gravel, sand and fill-crete
K 12	type and thickness of finished road surface to be placed
K 13	moisture content and compaction rates
K 14	required equipment and corresponding safety requirements
K 15	use of water during compaction
K 16	rigging and hoisting procedures for lifting shoring

Sub-task

B-6.01 Locates underground utilities.

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

Key Competencies

B-6.01.01	select and use tools and equipment such as scan and hand tools, and mobile equipment
B-6.01.02	identify type and depth of underground utilities using scan tools and "call before you dig" services
B-6.01.03	interpret meaning of colour-coded flags or stakes to identify type and area of utilities
B-6.01.04	interpret as-built drawings for underground utility locations
B-6.01.05	expose utilities by hand digging (daylighting), using hydro-vac equipment and by assisting machine operator in removal of soil

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Sub-task

B-6.02 Performs excavation.

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

Key Competencies

B-6.02.01	select and use tools and equipment such as shovels, pick axes, levels, lasers, mini excavators and skidsteers
B-6.02.02	use excavation methods according to application
B-6.02.03	guide heavy equipment operator to accomplish required tasks such as digging to required depth and slope
B-6.02.04	perform hand excavations and machine-assisted excavations

B-6.02.05 install temporary access and egress to trenches and other excavations

B-6.02.06 take measurements of excavations to ensure size, depth and slope of excavation are according to job and OH&S specifications

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Sub-task

B-6.03 Installs excavation shoring.

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

Key Competencies

B-6.03.01 select and use tools and equipment such as shovels, chain saws and mobile equipment

B-6.03.02 assemble and place shoring and trench boxes (cage) according to jurisdictional regulations

B-6.03.03 guide heavy equipment operator to accomplish required tasks such as picking up shoring and digging to required depth

B-6.03.04 install temporary access and egress to excavation

Sub-task

B-6.04 Performs backfill and compaction.

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

Key Competencies

B-6.04.01 select and use tools and equipment such as compacting, mobile and measuring equipment, and shovels

B-6.04.02 assess type and amount of backfill material needed according to dimension of excavation

B-6.04.03 install excavation components such as weeping tiles, culverts, manholes and piping

B-6.04.04 guide heavy equipment operator in operations such as finishing roadwork sub-grade and compactable lifts

B-6.04.05 follow backfill and compaction procedures according to applications such as covering utilities, installing shoring and preparing to pour concrete, and to meet job specifications

Task 7 Services site.

Context Construction craft workers perform general maintenance activities. This helps to ensure a safe, clean and efficient workplace within jurisdictional regulations and jobsite-specific rules.

Required Knowledge

K 1	materials used in construction
K 2	WHMIS
K 3	company- or site-specific procedures for controlled materials
K 4	types of facilities to be cleaned and corresponding procedures to be used
K 5	hazards associated with cleaning products
K 6	hazardous materials such as oil, radiation, liquids, plutonium, asbestos, lead-based materials, silica in concrete and bio-hazards
K 7	types of PPE required
K 8	jurisdictional regulations regarding handling hazardous materials, recycling and noise levels
K 9	site-specific rules regarding handling hazardous materials, recycling and vaccination
K 10	uses of settling ponds
K 11	types of temporary lighting such as string lights, quartz lighting, light plants and tower lights
K 12	installation and maintenance procedures for temporary lighting
K 13	GFCI use
K 14	training and certification requirements
K 15	types of fuel used in generators and compressors such as gas and diesel
K 16	sizes and uses of generators and compressors
K 17	ventilation requirements
K 18	start-up and shut-down procedures for generators and compressors
K 19	site conditions
K 20	areas protected prior to work being performed
K 21	activities that require additional protection such as controlled zones and shielding
K 22	types of restoration activities such as replacing landscaping and replacing removed material and equipment
K 23	tools, equipment, supplies and consumables

K 24	security requirements for tool crib
K 25	materials that can be recycled

Sub-task

B-7.01 Addresses suspected hazardous materials.

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

Key Competencies

B-7.01.01	select and use tools and equipment such as PPE, spill kits, hand tools and mobile equipment
B-7.01.02	identify hazardous materials
B-7.01.03	handle, store and dispose of hazardous materials according to established procedures and jurisdictional regulations
B-7.01.04	clean spill by using spill kit according to type of hazardous material
B-7.01.05	notify appropriate authority according to jurisdictional regulations

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Sub-task

B-7.02 Controls water runoff.

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

Key Competencies

B-7.02.01	select and use tools and equipment such as hand tools, pumps and mobile equipment
B-7.02.02	select environmental material such as silt fencing, filtered cloths and straw bales
B-7.02.03	apply preventative measures such as installing silt fencing, filtered cloths and other barriers to prevent environmental contamination or to control damage
B-7.02.04	assist in building settling ponds, dig trenches and build berms to direct water runoff

Sub-task

B-7.03 Sets up temporary lighting.

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

Key Competencies

B-7.03.01	select and use tools and equipment such as mobile equipment and hand tools
B-7.03.02	level and stabilize tower lights
B-7.03.03	inspect and maintain temporary lighting according to manufacturers' specifications
B-7.03.04	start and maintain gas- or diesel-powered light plants (tower lights) and string lights according to manufacturers' specifications and jurisdictional regulations

Sub-task

B-7.04 Sets up generators and compressors.

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

Key Competencies

B-7.04.01	select spill tray to prevent spills according to environmental regulations
B-7.04.02	maintain generators and compressors according to manufacturers' specifications using methods such as checking oil and fuel levels, replacing valve handles and bleeding condensation from tank
B-7.04.03	position and level generators and compressors
B-7.04.04	connect compressor fittings such as quick couplings, air hoses and safety pins, according to specifications
B-7.04.05	interpret and adjust gauges on compressors
B-7.04.06	select attachment hoses and appropriate whip checks
B-7.04.07	select and place compressors and attachments used for tool operation ensuring adequate ventilation

Sub-task

B-7.05 Performs site restoration.

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

Key Competencies

B-7.05.01	refer to documentation of original conditions of jobsite for restoration and other purposes
B-7.05.02	select and use tools and equipment such as hand tools and mobile equipment
B-7.05.03	return site to original condition within acceptable parameters by performing activities such as landscaping and replacing removed material and equipment

Sub-task

B-7.06 Manages tool crib.

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

Key Competencies

B-7.06.01	organize tool crib
B-7.06.02	sign out and sign in tools and equipment manually or electronically
B-7.06.03	inspect and maintain tools and equipment and do minor repairs
B-7.06.04	perform inventory control

Sub-task

B-7.07 Recycles materials.

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

Key Competencies

B-7.07.01	sort and store recycled materials such as cardboard, plastics, glass, reclaimed concrete and metals in designated area according to jurisdictional regulations and jobsite specifications
B-7.07.02	organize recycled materials for shipping
B-7.07.03	identify materials that can be reused onsite such as forms, plywood, lumber and steel

Task 8 Performs basic demolition.

Context Construction craft workers dismantle and remove components, structures and buildings on ICI, residential, and civil sites. The process of dismantling changes according to site rules and conditions. Some construction craft workers can specialize in areas such as hazardous waste demolition or hydro-demolition.

Required Knowledge

K 1	types of material being cut
K 2	types of cutting techniques according to application
K 3	dismantling techniques
K 4	hazards associated with cutting material
K 5	jurisdictional regulations and jobsite rules
K 6	safety equipment and PPE required
K 7	operating methods of oxy-acetylene and propane torches such as selecting tip types, setting regulators and igniting
K 8	material to be removed from specific jobsites
K 9	removal techniques according to application

Sub-task

B-8.01 Cuts materials.

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

Key Competencies

B-8.01.01	select and use cutting tools and equipment such as torches, grinders and saws
B-8.01.02	read gauges on oxy-acetylene torches and apply spark-control methods
B-8.01.03	select attachments for cutting tools and equipment taking into consideration the thickness and type of material being cut
B-8.01.04	select and use dust control methods to keep dust levels within permissible limits
B-8.01.05	turn off utilities such as water and electrical
B-8.01.06	verify electrical systems to ensure they are de-energized, and lock out and tag out equipment

Sub-task

B-8.02 Dismantles existing structures and components.

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

Key Competencies

B-8.02.01	select and use tools and equipment such as hand tools and mobile equipment
B-8.02.02	select attachments for tools and equipment such as jackhammer bits, spade bits and saw blades
B-8.02.03	recognize load bearing walls and other structural components
B-8.02.04	set up chutes, drop areas and bins for disposal of material
B-8.02.05	recognize hazardous materials such as radioactive and lead-based materials, asbestos and silica in concrete
B-8.02.06	set up containment areas and establish PPE requirements for handling hazardous materials
B-8.02.07	isolate or lock out and tag out utilities such as water and electrical
B-8.02.08	verify electrical systems to ensure they are de-energized

Task 9 Performs safety watches.

Context Safety watches are done by construction craft workers when co-workers are working in conditions that require monitoring. In some areas, performing these tasks may require additional training and certification.

Required Knowledge

K 1	types and characteristics of gases such as hydrogen sulphide (H_2S), carbon monoxide (CO) and methane (lower explosion limit [LEL] and upper explosion limit [UEL])
K 2	areas to be monitored
K 3	types of monitoring equipment
K 4	PPE and safety equipment
K 5	permissible exposure levels
K 6	time weighted averages
K 7	jurisdictional regulations and site-specific rules
K 8	evacuation plans
K 9	area where work is being performed and equipment in use in the area
K 10	work being performed such as welding, cutting, grinding and media blasting
K 11	combustible and non-combustible materials
K 12	types of compressed gases that need to be monitored such as breathable air and propane
K 13	meaning of gauge readings
K 14	what defines a confined space according to jurisdictional regulations, or site rules and specifications
K 15	training and certification required to perform confined space watch and bottle watch duties
K 16	characteristics of the areas to be monitored
K 17	emergency rescue and evacuation plans
K 18	rescue and evacuation equipment such as tripods, harnesses and lifelines
K 19	communication methods such as hand signals, rope signals and using radios
K 20	entry permits and certification requirements such as TDG and propane
K 21	types of heaters such as propane, electric, radiant and glycol
K 22	fire watch procedures

Sub-task

B-9.01 Monitors hazardous gases.

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

Key Competencies

B-9.01.01	select and use monitoring equipment and gas testers (sniffer)
B-9.01.02	function check monitoring equipment according to manufacturers' specifications and AHJ
B-9.01.03	interpret readings and alarms on monitoring equipment
B-9.01.04	document readings and alert others when atmospheric conditions change

Sub-task

B-9.02 Performs fire watch.

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

Key Competencies

B-9.02.01	select and use tools and equipment such as fire extinguishing equipment, fire blankets and monitors
B-9.02.02	assess conditions and apply measures such as using fire extinguishers, alerting others to evacuate jobsite and calling emergency services

Sub-task

B-9.03 Performs bottle watch.

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

Key Competencies

B-9.03.01	select and use tools and equipment such as hand and mobile tools
B-9.03.02	read and understand gauge readings to recognize when bottles need to be changed or when alternate sources need to be activated
B-9.03.03	change bottles when they are getting near critical levels
B-9.03.04	communicate to confined space attendee of changed or changing conditions

Sub-task

B-9.04 Performs confined space watch.

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

Key Competencies

B-9.04.01	use confined space entry and safety equipment
B-9.04.02	select and use tools such as monitoring equipment
B-9.04.03	function check monitoring equipment according to manufacturers' specifications and AHJ
B-9.04.04	interpret readings and alarms on monitoring equipment
B-9.04.05	ventilate or purge confined space to remove hazardous gas and test air quality
B-9.04.06	alert others of changes in working conditions such as atmospheric changes, environmental changes and hazardous activities around work area
B-9.04.07	record readings
B-9.04.08	assess conditions and apply appropriate measures such as calling emergency and rescue services, and following a pre-determined rescue plan

Sub-task

B-9.05 Monitors heaters.

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

Key Competencies

B-9.05.01	read and understand readings from gauges and hand-held digital thermometers
B-9.05.02	select heaters according to application
B-9.05.03	keep heaters operating taking into consideration temperature and applications
B-9.05.04	inspect heaters and their surroundings for leaks
B-9.05.05	recognize hazards of using heaters such as poor air circulation, melting tarpaulins, fires and leaks
B-9.05.06	maintain heaters according to manufacturers' specifications

BLOCK C SCAFFOLDING AND ACCESS EQUIPMENT

Trends

Scaffolding and ladders are being constructed with lighter and stronger materials. They are designed for easier setup and use.

New designs of scaffolding and access equipment such as mast climber scaffolding systems are becoming more common.

Power elevated platforms have been introduced with longer reach and more mechanized equipment. They have more safety features such as warning signals and automatic stops for unsafe operating conditions.

Related Components (including, but not limited to)

Scaffolding: platforms, cross bracing, base plates, screw jacks, outriggers, brackets, safety pins, tubes, clamps, beam clamps, aluminum beams, bolts, castors, u-heads, legs, wheels, safety gates.

Ladders: extension, platform, stepladders.

Power elevated work platforms: scissor lifts, manlifts, swing stages, articulating booms.

Tools and Equipment

See Appendix A.

Task 10 Uses scaffolding.

Context

Scaffolding is used as a work platform to access work areas at heights. It is important for construction craft workers to be competent in its use to perform many of their tasks safely. It can also be used as overhead protection and to frame hoarding/enclosures.

Required Knowledge

K 1	applicable jurisdictional codes and regulations, and jobsite specific rules
K 2	types of scaffolding such as systems, baker's, frame and brace, mast climber system, and tube and clamp
K 3	mobile and stationary scaffolding
K 4	brace and platform sizes
K 5	scaffolding components such as clamps (swivel and right-angle), hardware, planking, outriggers and fasteners
K 6	overhang limitations when working with planking
K 7	tagging requirements for access

K 8	safety inspection requirements for scaffolding
K 9	knot tying techniques
K 10	communication methods such as hand signals, rope signals and using radios
K 11	maintenance requirements
K 12	PPE and safety equipment

Sub-task

C-10.01 Erects scaffolding.

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

Key Competencies

C-10.01.01	select and use tools and equipment such as levels, wrenches, sockets, drills and hammers
C-10.01.02	interpret engineered plan
C-10.01.03	select scaffolding according to job specifications
C-10.01.04	fasten scaffolding components by aligning scaffold connectors
C-10.01.05	select and install bracing for the specific job
C-10.01.06	secure scaffolding for stability according to manufacturers' and engineering specifications
C-10.01.07	determine location of scaffolding taking into consideration obstacles such as stairwells, open holes and columns
C-10.01.08	secure and level base using methods such as installing mud sills and bases, outriggers and shimming
C-10.01.09	raise scaffolding components using manual and mechanical techniques
C-10.01.10	place and use counterweights, and secure scaffold systems
C-10.01.11	tag scaffolding to indicate readiness

Sub-task

C-10.02 Inspects scaffolding.

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

Key Competencies

C-10.02.01	visually check welds, bracing components and planks for damages and faults
C-10.02.02	visually identify faults such as stress cracks, warps, and bent bracing and frames
C-10.02.03	tag components for repair or replacement
C-10.02.04	remove defective components and scaffolding from service
C-10.02.05	maintain platforms by visually checking for defects

Sub-task

C-10.03 Maintains scaffolding.

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

Key Competencies

C-10.03.01	select and use cleaning tools such as wire brushes, scrapers, hammers and shovels
C-10.03.02	clean scaffolding by removing debris, tools and materials
C-10.03.03	lubricate motorized and mechanical scaffolding

Sub-task

C-10.04 Tends to scaffold erectors.

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

Key Competencies

C-10.04.01	recognize brace and platform sizes for specific work deck
C-10.04.02	select and use tools and equipment such as measuring tapes, wedges, levels, adjustable wrenches, hammers and mobile equipment
C-10.04.03	pass tools, equipment and components to scaffold erectors

Sub-task

C-10.05 Dismantles scaffolding.

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

Key Competencies

C-10.05.01	select and use tools and equipment such as adjustable wrenches, hammers, personnel lifts and pry bars
C-10.05.02	determine starting point and follow procedure for dismantling
C-10.05.03	lower scaffolding components using techniques such as hand bombing and rigging
C-10.05.04	inventory, organize, stack and band scaffolding components in designated area for shipping

Task 11 Uses access equipment.

Context Access equipment includes ladders as well as power elevated work platforms. It is used to access work areas at heights and for ease of mobility. It is important for construction craft workers to be competent in its use to perform many of their tasks safely.

Required Knowledge

K 1	types of ladders such as extension, platform and stepladder
K 2	jurisdictional regulations for using ladders such as placement, 3-point contact, overhang, tie-off and kickplates
K 3	capabilities and applications of types of ladders
K 4	limitations and hazards of using ladders
K 5	types of power-elevated work platforms such as mast climber systems, scissor lifts, boom lifts and swing stages
K 6	training and certification requirements
K 7	limitations and procedures for use of power-elevated work platforms
K 8	weight capacities of power-elevated work platforms and extensions
K 9	applicable jurisdictional codes and regulations
K 10	PPE and safety equipment
K 11	safety inspection requirements for power-elevated work platforms
K 12	location of gas/propane switches and emergency switches on power-elevated work platforms

Sub-task

C-11.01 Uses ladders.

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

Key Competencies

C-11.01.01	select ladder according to application
C-11.01.02	set ladder according to slope ratio and overhang requirements
C-11.01.03	assess and prepare the ground before using ladder
C-11.01.04	tie-off ladder at top and bottom according to OH&S regulations
C-11.01.05	use three-point contact when climbing and working on ladder

Sub-task

C-11.02 Uses power-elevated work platforms.

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

Key Competencies

C-11.02.01	assess and prepare the ground before using power-elevated work platforms
C-11.02.02	perform a pre-trip inspection and ensure work area is clear of material, equipment and debris
C-11.02.03	operate power-elevated work platform by using controls such as boom-up/boom-down, telescoping and drive controls
C-11.02.04	set and use outriggers and pads to stabilize the power-elevated work platform
C-11.02.05	use counterweights on support beams for swing stages to ensure ratio of load for the suspended work platform

Sub-task

C-11.03 Inspects access equipment.

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

Key Competencies

C-11.03.01	visually examine components such as hydraulic lines, batteries, nuts, bolts, cables, outriggers and work platforms, before and after use
C-11.03.02	identify faults such as cracking, leaks in lines, corrosion, fraying cables, and deflated or damaged tires
C-11.03.03	identify ladder defects such as bent rungs, split rails and cracks
C-11.03.04	tag components for repair or replacement
C-11.03.05	check emergency shut-off to ensure it is operational

Sub-task

C-11.04 Maintains access equipment.

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

Key Competencies

C-11.04.01	clean work platforms and ladder rungs
C-11.04.02	lubricate power-elevated work platform components
C-11.04.03	maintain fluids such as hydraulic fluids and oils
C-11.04.04	maintain equipment batteries by charging and maintaining water level
C-11.04.05	refuel gas- and diesel-powered work platforms
C-11.04.06	activate locking arm to prevent access equipment from descending during maintenance

Trends	New materials used to construct forms are available to make them lighter and easier to use and to improve productivity and longevity. For example, aluminium, fibreglass and plastic forms are being used in commercial and residential applications. Use of insulated concrete forms (ICF) is becoming more popular because of its energy efficiency. Concrete is increasingly used for aesthetic applications such as countertops and signage.
Related Components (including, but not limited to)	**Formwork:** shoring, shoring hardware, bracing, mud sills, strongbacks, turnbuckles, walers, clamps, wedges, ties, clips, embeds. Concrete, grout, epoxies, caulking, admixtures (plasticizers, accelerators, colours, hardeners), bonding agents, acids, polyethylene, burlap, curing compounds, sealers, form release agents.
Tools and Equipment	See Appendix A.

Task 12 Forms concrete.

Context Concrete forms are the beginning structure in most construction projects. They are used for architectural and structural applications. They hold and support concrete until it is set.

Required Knowledge

K 1	types of shoring such as fixed, telescoping and scaffold
K 2	shoring hardware such as anchor pins, spring clips and base plates
K 3	shoring ratings and regulations
K 4	spacing of shoring
K 5	types of forms such as steel, handset (loose), fly table, fly form and void (for openings)
K 6	formwork components such as bracing, shoring, falsework, strongbacks, turnbuckles, walers, clamps, wedges, ties and clips
K 7	ratings and applications of types of formwork
K 8	materials used to create forms

K 9	locations requiring inspection such as steps, bulkheads and corners
K 10	dismantling procedures and sequences

Sub-task

D-12.01 Installs formwork and shoring.

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

Key Competencies

D-12.01.01	select and use tools and equipment such as measuring tapes, hammers, levels, plumb bobs and saws
D-12.01.02	verify location and size of concrete structure such as walls, slabs and columns to be poured according to job specifications
D-12.01.03	verify formwork system to be used such as wooden panels, pre-fabricated, free-form, metal fabricated and ICF
D-12.01.04	determine installation procedures and materials required according to job and manufacturers' specifications
D-12.01.05	assemble and fasten formwork components according to manufacturers' or engineering specifications
D-12.01.06	recognize and correct defects in formwork such as misalignment and spacing
D-12.01.07	modify formwork to accommodate design alterations
D-12.01.08	apply form release agents to prevent damage and for ease of releasing formwork
D-12.01.09	install shoring and bracing according to specifications to support concrete structures
D-12.01.10	secure shoring near slab edge
D-12.01.11	adjust shoring as required according to engineering specifications
D-12.01.12	plumb and straighten walls using bracing and turnbuckles

Sub-task

D-12.02 Inspects assembled formwork.

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

Key Competencies

D-12.02.01	select and use measuring tools such as measuring tapes and levels
D-12.02.02	recognize defects in formwork such as misalignment and spacing
D-12.02.03	verify elevations and layout such as location of rough bucks (door openings), window block outs and beam pockets
D-12.02.04	check all shoring and bracing to ensure formwork is secure, plumb and stable according to job specifications

Sub-task

D-12.03 Dismantles formwork.

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

Key Competencies

D-12.03.01	prepare plan for dismantling formwork considering factors such as starting point, sequence and placement of material
D-12.03.02	select and use tools and equipment such as pry bars, wrenches and hammers
D-12.03.03	remove fasteners such as nails, bolts and formwork components while ensuring formwork does not fall by leaving some ties in place
D-12.03.04	stack components for reuse or transport

Sub-task

D-12.04 Maintains formwork.

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

Key Competencies

D-12.04.01	inspect disassembled formwork components for deficiencies and damage
D-12.04.02	select and use tools and equipment such as grinders for metal formwork, rollers and sprayers
D-12.04.03	scrape and clean formwork components
D-12.04.04	apply form release agents or materials
D-12.04.05	grease taper ties to facilitate ease of removal
D-12.04.06	place formwork in designated lay down area

Task 13 Places and finishes concrete.

Context

Proper mixing of concrete is very important to ensure the desired strength and consistency. Concrete needs to be transported for installation using methods such as concrete pumps, line pumps and cranes. Placing of the concrete includes pouring, vibrating to eliminate voids and establishing a rough-grade. It is then finished to achieve the final grade and appearance. Concrete cures by holding moisture; it is important to keep concrete hydrated during this curing process to avoid shrinkage and cracking.

Required Knowledge

K 1	types of concrete and their uses such as air entrained, shotcrete and high flow
K 2	strengths of concrete and slump
K 3	concrete aggregates
K 4	concrete additives such as plasticizers, accelerators and retarders
K 5	access and egress considerations
K 6	components such as dowels, safety lines, key ways, anchor bolts and steel plates
K 7	component installation methods for freshly placed concrete such as wet dowelling and installing anchor bolts

K 8	cured concrete component installation methods such as drilling, chipping and saw cuts
K 9	pour rates
K 10	concrete transportation and placing equipment such as line pumps and boom pumps
K 11	height from which concrete may be placed
K 12	surface preparation requirements
K 13	types of finishes such as hard float, broomed, polished, exposed aggregate and burn finish
K 14	finishing processes such as floating, trowelling and edging
K 15	timing for finishing processes
K 16	weather and environmental conditions such as heat, cold, exhaust fumes and dust that may affect the curing process
K 17	rate of curing time
K 18	PPE and safety equipment

Sub-task

D-13.01 Mixes concrete.

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

Key Competencies

D-13.01.01	select and use tools and equipment such as mixers, drills, mixing paddles, pails and trowels
D-13.01.02	select materials such as aggregates, water and cement
D-13.01.03	mix according to work schedule and weather conditions
D-13.01.04	use additives such as pigments, accelerators and retarders according to specifications
D-13.01.05	combine ingredients according to predetermined instructions such as ratios, mixing times and compatibilities

Sub-task

D-13.02 Transports concrete on site.

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

Key Competencies

D-13.02.01	plan placement of the concrete truck
D-13.02.02	plan route from truck to site of placement to avoid obstacles and to allow for ease of access
D-13.02.03	select, position and use transporting equipment such as wheelbarrows, concrete pumps, power buggies, concrete buckets and skidsteers
D-13.02.04	monitor and communicate the rate of pour

Sub-task

D-13.03 Places concrete.

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

Key Competencies

D-13.03.01	select and use tools and equipment such as concrete vibrators, stationary pumps, rakes, shovels and screeding tools
D-13.03.02	plan the sequence of placement
D-13.03.03	monitor and communicate the rate of pour
D-13.03.04	vibrate, spread and screed floor slabs to desired height or level
D-13.03.05	place and vibrate wall to desired height
D-13.03.06	ensure level pour with methods such as wet screeding, using tools and equipment such as height sticks, laser levels and grade nails
D-13.03.07	recognize and rectify surface irregularities such as dips, high spots and holes

Sub-task

D-13.04 Installs components in concrete.

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

Key Competencies

D-13.04.01 select and use tools and equipment such as measuring tapes, string lines, hammers, levels and drills

D-13.04.02 measure, lay out and position components such as anchor plates, anchor bolts, water stops, control joints, key ways and reinforcing material, according to specifications

Sub-task

D-13.05 Assists with finishing concrete.

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

Key Competencies

D-13.05.01 select and use finishing tools and equipment such as floats, hand trowels, power trowels, edgers and brooms

D-13.05.02 work concrete at different stages of setting with various finishing tools to reach desired finish according to job specifications

Sub-task

D-13.06 Controls concrete curing process.

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

Key Competencies

D-13.06.01	hydrate concrete using materials and equipment such as burlap, polyethylene, soaker hoses and sprinklers to control curing process according to specifications and weather conditions
D-13.06.02	trap moisture in concrete to avoid evaporation using curing compounds
D-13.06.03	prevent heat loss and freezing in cold weather by using insulated tarps or heaters
D-13.06.04	use squeegees, power vac and other methods to control bleed water

Task 14 Modifies concrete.

Context Concrete may be modified after it has been installed. These tasks may be done to create openings, maintain structural integrity, control expansion and contraction or simply for aesthetic reasons.

Required Knowledge

K 1	wet and dry drilling/coring procedures
K 2	types and properties of concrete to be drilled/cored
K 3	reasons for drilling/coring concrete such as adding components, running sleeves, fastening items and demolition
K 4	embedded items such as water lines, electrical conduit and rebar
K 5	products and chemical agents used for repair and refinishing such as bonding agents, epoxies, grout, patching materials and acids
K 6	deficiencies in concrete that can be repaired
K 7	finishing requirements
K 8	reasons for installing concrete joints
K 9	types of joints such as expansion, control and isolation
K 10	depth and spacing of joints
K 11	types of cuts such as green cuts, wet cuts and dry cuts

K 12	refinishing methods such as painting, epoxy coating, parging, acid staining and acid etching
K 13	PPE and safety equipment

Sub-task

D-14.01 Drills/cores concrete.

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

Key Competencies

D-14.01.01	select tools and equipment such as core and rotary hammer drills and their bits
D-14.01.02	lay out and mark hole according to specifications
D-14.01.03	verify embedded items in concrete such as post tension cables, rebar and conduit by x-ray or blueprints
D-14.01.04	anchor base of core drill
D-14.01.05	listen and feel for obstructions during drilling process
D-14.01.06	control speed, pressure and water flow during drilling process
D-14.01.07	control dust using water and/or by tarping, ventilating and vacuuming
D-14.01.08	control slurry while drilling by using methods such as damming and vacuuming

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Sub-task

D-14.02 Prepares concrete for resurfacing.

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

Key Competencies

D-14.02.01	select and use tools and equipment such as PPE, bush hammers, scarifiers and floor grinders
D-14.02.02	mechanically remove finish using methods such as chipping, bush hammering, media blasting and scarifying
D-14.02.03	chemically remove finish using acids
D-14.02.04	clean surface by vacuuming, blowing, sandblasting or washing

Sub-task

D-14.03 Performs concrete repair and refinishing.

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

Key Competencies

D-14.03.01	select tools and equipment such as trowels, sponges, grinders, sanders, brushes, brooms and chipping guns
D-14.03.02	apply bonding agents according to job specifications
D-14.03.03	apply materials according to job specifications to repair honeycombs, voids and other deficiencies to achieve desired finishes

Sub-task

D-14.04 Creates expansion, control and isolation joints.

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

Key Competencies

D-14.04.01	select and use tools and equipment such as saws and groovers (two-sided edgers, dividers)
D-14.04.02	select materials such as dowels according to type of joint and job specifications
D-14.04.03	control cracking by cutting concrete, installing plastic strips or installing sill gaskets, according to engineering specifications

Task 15 Places/Applies grout, epoxies and caulking.

Context Grout and epoxies provide structural integrity. Caulking is used to seal against leaks and for an aesthetic finish.

Required Knowledge

K 1	types of grout products and their applications
K 2	types of epoxies such as liquid and paste
K 3	hazards and precautions to be considered when working with epoxies
K 4	types of caulking such as firestop, exterior and interior
K 5	manufacturers' specifications
K 6	time constraints and product properties
K 7	PPE and SDS

Sub-task

D-15.01 Places/Applies grout.

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

Key Competencies

D-15.01.01	select and use tools and equipment for grouting such as mixing paddles, trowels, shovels, drills, funnels, sponges and brushes
D-15.01.02	mix grout according to engineering and manufacturers' specifications
D-15.01.03	grout components such as door frames, anchor bolts, machine bases, walls, beams and columns using dry packing or pouring method
D-15.01.04	trowel and shape grout to a smooth finish for aesthetic purposes

Sub-task

D-15.02 Places/Applies epoxies.

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

Key Competencies

D-15.02.01	pre-plan for work considering time constraints of applying epoxies
D-15.02.02	prepare surfaces using cleaning equipment
D-15.02.03	mix epoxies according to manufacturers' specifications
D-15.02.04	apply epoxies using epoxy guns, or placing and spreading according to job specifications

Sub-task

D-15.03 Applies caulking.

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

Key Competencies

D-15.03.01	select and use tools and equipment such as caulking guns and cleaning equipment
D-15.03.02	clean exposed surfaces using methods such as applying solvents, pressure washing and sandblasting according to job specifications
D-15.03.03	use fillers such as insulation and backing rod
D-15.03.04	apply a steady bead and ensure voids are filled by tooling caulking

Trends	There is a trend towards the use of mega mixers and mast climber scaffolding systems. Composite blocks have been introduced to the industry. Worker certification to use equipment and to work with fireproofing materials continues to be an important requirement.
Related Components (including, but not limited to)	Masonry units, scaffolding, fireproofing materials, refractory materials, lintels, mortars, grouts, ties and anchors, rough bucks.
Tools and Equipment	See Appendix A.

Task 16 Prepares for masonry work.

Context

Preparing for masonry work is an important task for the construction craft worker trade. This must be done to ensure productivity and safety on masonry projects and is often done prior to the arrival of bricklayers on the site.

This task includes setting up masonry materials, scaffolding, transporting materials to and around the site, organizing the materials, and mixing mortar and grout.

Required Knowledge

K 1	materials and products required for masonry tasks
K 2	placement of raw materials
K 3	types of mortars and grouts
K 4	rigging and lifting equipment such as forklifts and swing stages
K 5	required certification and licensing for operating lift equipment such as forklifts, swing stages and mast climber scaffolding systems
K 6	tools and equipment such as saws and mixers

Sub-task

E-16.01 Sets up masonry materials.

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

Key Competencies

E-16.01.01	distribute masonry materials onto scaffolding according to amounts needed and scaffolding capacities
E-16.01.02	lay out polyethylene sheets under mixing equipment to contain spillage
E-16.01.03	prepare and organize masonry work area to bring materials close at hand
E-16.01.04	prepare power tools and equipment such as saws, mixing drills and mortar, or concrete mixers
E-16.01.05	select and use transportation equipment such as forklifts, skidsteers, telescopic forklifts (telehandler) and wheelbarrows
E-16.01.06	load and unload masonry materials from scaffolding and trucks
E-16.01.07	cut masonry reinforcing material to required length and size using tools such as concrete, table and quick saws to avoid waste

Sub-task

E-16.02 Mixes mortars and grouts.

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

Key Competencies

E-16.02.01	select and use tools and equipment such as mortar and concrete mixers
E-16.02.02	follow instructions for ratios, mixing time and compatibilities to ensure materials are usable
E-16.02.03	mix required amounts of mortars and grouts for work planned
E-16.02.04	determine consistency of mortar and grout and adjust mix to weather conditions
E-16.02.05	continuously work mortar to maintain desired consistency
E-16.02.06	colour mortars and grout with dyes and aggregates according to job specifications
E-16.02.07	include additives such as anti-freezing agents, polymers and bonding agents to ensure desired consistency and adhesion

Task 17 Tends to bricklayers.

Context

Construction craft workers work with bricklayers by performing a variety of tasks. They mix and supply materials such as bricks, blocks, mortar, refractory and fireproofing. This is physically demanding work and requires constant stocking of masonry units. Construction craft workers may be required to operate powered equipment such as telescopic forklifts (telehandler) and pallet jacks.

Required Knowledge

K 1	types of masonry units such as bricks, refractory materials, tiles and blocks
K 2	types of brick such as keyed, insulating and fire
K 3	types of block such as acoustical, veneer, bullnose and rough-faced
K 4	cutting procedures and related safety requirements
K 5	confined space hazards, required training and regulations
K 6	types of lintels such as channel iron, wood, and pre-cast and poured concrete
K 7	applications of rough bucks such as openings for windows and door frames
K 8	cleaning agents used such as muriatic acid and water
K 9	cleaning methods such as removing mortar, and excess efflorescence, epoxy and grouts
K 10	environmental concerns of using muriatic acid
K 11	types of refractory material such as bricks, gunnite and ram
K 12	locations using refractory materials such as boilers, furnaces and kilns
K 13	mortars used in refractory applications
K 14	hazards and precautions to be considered when working with refractory materials
K 15	types of fireproofing materials such as mineral wool, caulking and cement-like materials
K 16	applications for fireproofing materials such as surface penetrations, and protecting beams, columns and walls
K 17	training and certification requirements

Sub-task

E-17.01 Cuts masonry units.

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

Key Competencies

E-17.01.01	select and operate tools and equipment such as tile cutters, brick saws, block/brick guillotines and wet saws
E-17.01.02	perform cut according to measurements

Sub-task

E-17.02 Installs lintels and rough bucks.

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

Key Competencies

E-17.02.01	select and use tools such as saws, cutters, hammers and wedges
E-17.02.02	cut and form bracing according to opening
E-17.02.03	place and secure rough buck to prevent movement of material according to job specifications
E-17.02.04	measure and cut lintel according to job specifications
E-17.02.05	remove rough bucks after material is cured

Sub-task

E-17.03 Washes masonry units.

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

Key Competencies

E-17.03.01	select and use tools and equipment such as pressure washers, scissor lifts, scrub brushes and curry combs
E-17.03.02	mix chemicals according to manufacturers' specifications referring to SDS
E-17.03.03	wash and rinse surface of masonry unit to remove all damaging chemicals and contaminants

Sub-task

E-17.04 Installs refractory materials.

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

Key Competencies

E-17.04.01	mix refractory materials such as mud and cement-like materials according to manufacturers' specifications and referring to SDS
E-17.04.02	install refractory materials according to jurisdictional regulations and job specifications
E-17.04.03	clean up after refractory applications according to site specifications

Sub-task

E-17.05 Uses fireproofing materials.

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

Key Competencies

E-17.05.01	select and use tools and equipment such as mixers, trowels and spray equipment
E-17.05.02	mix fireproofing materials using manual or electric paddles according to manufacturers' specifications
E-17.05.03	apply fireproofing materials using methods such as spray-on and trowel-on according to job specifications

Trends

There is an increased use of robotic cameras for the inspection of water and sewer pipes in order to ensure quality of pipe and to detect leaks.

More relining of the interior part of piping is being used to reduce the need for replacement and there is an increased practice of reconditioning of pipes in order to extend their lifespan.

The practice of tapping into new and existing water lines to provide water to different areas is becoming a common task.

Green practices are changing the way construction craft workers work. For example, they need to return work areas back to their natural state, and avoid cross pollination as part of green environmental practices.

Related Components (including, but not limited to)

Utilities: piping, catch basins, manholes, grade rings, shims, rubber seals, valves, hydrants, pressure chambers, clamps, T's, elbows, Y's, culverts, thrust blocks, insulation, grouts.

Pipeline: blocking, coatings, rock shields, silt fencing, filter fabrics.

Tools and Equipment

See Appendix A.

Task 18 Installs utility piping for water and sewer installations.

Context

Construction craft workers work with a wide variety of pipe, components and application techniques when installing utility piping for water and sewer installations. Knowledge of grade and elevations is crucial when working with this type of utility piping. Hazardous materials such as asbestos and lead may be encountered when repairing existing pipe.

Required Knowledge

K 1	types of pipe used for water and sewage systems such as plastic, cast iron, concrete, composite, ceramic and ductile
K 2	connecting methods such as fused, clamps, and bell and spigot
K 3	design grades for pipe
K 4	types of sewer lines such as raw sewer and storm sewers

K 5	components such as manholes and catch basins, grade rings, rubber seals and covers
K 6	types of water pipe components such as valves and hydrants
K 7	reasons for modification such as leaks, repairs, upgrades and additions
K 8	specifications related to water pressures
K 9	backfilling and compacting methods
K 10	codes and specifications

Sub-task

F-18.01 Installs pipe for water systems.

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

Key Competencies

F-18.01.01	select and use tools and equipment such as laser levels, hand levels and pinch bars
F-18.01.02	install bedding material according to material specifications
F-18.01.03	level and compact bedding to height specifications
F-18.01.04	install thrust blocks to stabilize the line and eliminate breaks
F-18.01.05	select, cut and fit sections according to plans and specifications
F-18.01.06	connect pipe sections, including fusing, using components such as clamps, bell and spigot, and rubber seals according to job specifications and types of pipe
F-18.01.07	install fire hydrants and valves according to job specifications
F-18.01.08	backfill and compact pipe, and insulate if needed according to job specifications
F-18.01.09	remove excess mud and pump water to perform directional drilling to avoid disruptions on highways and rivers
F-18.01.10	pressurize lines to test for leaks
F-18.01.11	assist in tapping into main lines to provide temporary service while replacing lines

Sub-task

F-18.02 Installs pipe for sewer systems.

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

Key Competencies

F-18.02.01	select and use tools and equipment such as laser levels, hand levels and pinch bars
F-18.02.02	install bedding material according to material specifications
F-18.02.03	level and compact bedding to height specifications
F-18.02.04	select, cut and fit sections according to plans and specifications
F-18.02.05	connect pipe sections using components such as clamps, bell and spigot, and rubber seals according to job specification for the type of pipe
F-18.02.06	backfill and compact pipe, and insulate if needed according to job specifications
F-18.02.07	remove excess mud and pump water to assist in directional drilling to avoid disruptions on highways and rivers

Sub-task

F-18.03 Installs catch basins and manholes.

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

Key Competencies

F-18.03.01	verify and maintain grades of components according to job specifications
F-18.03.02	install bases such as pre-cast and poured concrete, and compact soil according to job specifications
F-18.03.03	cut holes in catch basins and manholes to connect pipes using tools such as quick-cut saw and bolt cutters
F-18.03.04	level and plumb components such as manholes and catch basins to ensure drainage
F-18.03.05	connect pipe to components using materials such as grout, concrete and rubber seals

F-18.03.06 place manholes using rigging and hoisting equipment according to site specifications

F-18.03.07 install and grout shims and grade rings to bring last installed component to final-grade

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Sub-task

F-18.04 Modifies existing pipe.

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

Key Competencies

F-18.04.01 isolate section of pipe using bladders to stop the flow going through pipe

F-18.04.02 repair defective pipe to test for leaks

F-18.04.03 replace with upgraded pipe according to new codes or specifications

F-18.04.04 tap pipes for additional water or sewer lines

F-18.04.05 insulate, backfill and compact around pipe according to job specifications

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Sub-task

F-18.05 Assists with testing water and sewer lines.

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

Key Competencies

F-18.05.01 select and assist with use of tools and equipment such as cameras, compressors and water taps

F-18.05.02 isolate sections of pipe using bladders or shut offs for testing

F-18.05.03 hydrotest water and sewer lines for leaks

F-18.05.04 monitor gauge readings for drops in pressure

Task 19 Performs pipeline activities.

Context Working on pipeline construction is a specialty area for construction craft workers. There are more construction craft workers on pipeline construction than any other trade workers.

Required Knowledge

K 1	environmental considerations such as highways, rivers, farmlands, existing wetlands and wildlife
K 2	municipal, provincial and federal regulations and jobsite specific rules
K 3	rigging equipment and methods for pipeline
K 4	cribbing methods
K 5	sandblasting and coating methods
K 6	maintenance techniques
K 7	required pipeline certifications such as Pipeline Construction Safety Training (PCST) and Ground Disturbance

Sub-task

F-19.01 Constructs right of ways.

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

Key Competencies

F-19.01.01	clear brush using tools and equipment such as bush saws and chain saws
F-19.01.02	set up cleaning station such as bleach, blow and pressure wash stations for prevention of cross-pollination and tracking of mud from movement of equipment
F-19.01.03	identify hazards such as domestic animals, wildlife, insects and falling trees to maintain safe work environment
F-19.01.04	minimize disturbance to wildlife and public land including fencing by returning to original state
F-19.01.05	set up silt fence, filter cloth for water pumps and top soil to minimize environmental damage to waterways
F-19.01.06	install and interpret clearance markers and signage to prevent damage to power lines when moving heavy equipment

Sub-task

F-19.02 Performs pipeline installation.

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

Key Competencies

F-19.02.01	stockpile pipes in established area
F-19.02.02	load pipes on trucks to be unloaded on right of way
F-19.02.03	place pipe and skids (stringing) in order according to job specifications
F-19.02.04	measure and mark pipe to ensure location of bends according to engineering specifications
F-19.02.05	place and remove pipe to assist set-up and bending crew
F-19.02.06	perform blocking and cribbing to assist welding crew
F-19.02.07	select and use tools and equipment such as media blasters, jeeping and coating equipment to coat pipe
F-19.02.08	blast pipe to ensure coating adheres to surface
F-19.02.09	coat pipe to protect welds
F-19.02.10	jeep pipe to find imperfections
F-19.02.11	assist and guide pipe lowering operation

Sub-task

F-19.03 Performs pipeline maintenance.

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

Key Competencies

F-19.03.01	assist to test pipeline using electronic pipeline pig to determine location and type of defect
F-19.03.02	assist to locate and expose defective area by hydrovac truck and daylighting
F-19.03.03	scrap and clean pipe to remove existing coating using scrapers, chippers and sandblasters
F-19.03.04	assist boom operator to set-up sleeve for welders
F-19.03.05	blast and coat pipe to protect welded sleeve before backfilling

Trends	Road surface materials used are now more environmentally friendly. There is a trend towards using recycled materials in road construction. Placing asphalt over concrete is becoming more common as well.
Related Components (including, but not limited to)	Aggregates, signage, barriers, culverts, manholes, catch basins, piping.
Tools and Equipment	See Appendix A.

Task 20 Installs road surface materials.

Context Construction craft workers work with paving machines to spread concrete, asphalt and other sub-base materials. They manually spread, shovel and rake asphalt where the machines cannot operate. They also apply adhesives and primers, and modify and repair all road surfaces.

Required Knowledge

K 1	types of chemical additives
K 2	location of manholes and catch basins
K 3	amount of paving materials to remove when repairing
K 4	types of road surface materials such as concrete, asphalt, interlocking brick and chip seal
K 5	types of sub-bases
K 6	types of tools and equipment
K 7	related hazards such as traffic and material temperatures
K 8	sidewalk and pedestrian walkway construction

Sub-task

G-20.01 Places road surface materials.

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

Key Competencies

G-20.01.01	prepare and compact sub-base according to grade using compacting equipment
G-20.01.02	apply adhesives and primers such as tack and water
G-20.01.03	rake and compact road surface material to finish-grade
G-20.01.04	feather and finish around manholes, catch basins and curbs according to road surface material being used
G-20.01.05	manually compact road surfacing material using hand compactors
G-20.01.06	place, lay, or spread road surfacing material such as concrete, asphalt and composite materials according to engineering specifications
G-20.01.07	finish concrete using bull and hand floats to smooth surface in order to broom

Sub-task

G-20.02 Repairs road surfaces.

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

Key Competencies

G-20.02.01	select and use tools and equipment such as quick-cut saws, walk-behind saws, jackhammers and plate tampers
G-20.02.02	cut paving materials to install utilities and components
G-20.02.03	repair defects such as pot holes, cracks, wash-outs and heaved areas
G-20.02.04	break surface materials and remove debris to prepare for resurfacing
G-20.02.05	compact base, drill into existing concrete and install dowels using adhesives according to engineering specifications
G-20.02.06	pour, lay, or spread road surfacing material such as concrete, asphalt and composite materials according to engineering specifications
G-20.02.07	apply adhesives and primers to potholes to prepare for fill materials such as gravel and asphalt
G-20.02.08	cut cracks with up-cut flat saw (walk-behind or road saw)
G-20.02.09	remove debris using sandblaster and compressor
G-20.02.10	seal joints using sealants according to engineering specifications

Task 21 Installs roadwork components.

Context Construction craft workers are required to install culverts, barriers and signage. Additional certification may be required for the installation of roadwork signage. Safety is of the utmost importance when working on roadwork construction.

Required Knowledge

K 1	types of barriers such as pedestrian, guard and jersey (no post)
K 2	materials used for barriers such as concrete, steel and wood
K 3	regulations regarding installation of barriers, road markings and signage
K 4	applications of barriers such as temporary and permanent
K 5	training, certification and PPE requirements
K 6	types of road markings such as reflective tape and painted lines

K 7	types of temporary and permanent road signs
K 8	types of culverts such as galvanized steel, plastic and concrete
K 9	sizes of culverts
K 10	connection methods such as bell and spigot, clamped and butted

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Sub-task

G-21.01 Installs barriers.

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

Key Competencies

G-21.01.01	select and use tools and equipment such as forklifts, drills, pry bars, post augers, rigging and boom trucks
G-21.01.02	select barriers according to regulations and specifications
G-21.01.03	determine location for barriers according to engineering specifications
G-21.01.04	secure water-filled and sand-filled barriers using anchors and fasteners such as dowels and concrete piles

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Sub-task

G-21.02 Installs road markings and signs.

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

Key Competencies

G-21.02.01	select and use tools and equipment such as measuring tapes, post augers, and sledge hammers
G-21.02.02	place, paint or adhere road markings and signage according to jurisdictional regulations, and engineering specifications
G-21.02.03	auger (bore hole) and backfill signage to secure in place
G-21.02.04	place temporary signage and markings according to jurisdictional regulations

Sub-task

G-21.03 Installs culverts.

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

Key Competencies

G-21.03.01	select and use tools and equipment such as wrenches and levels
G-21.03.02	assemble culvert sections according to manufacturers' specifications
G-21.03.03	install and compact bedding for culverts to achieve the required grade to ensure drainage
G-21.03.04	backfill and secure culvert according to engineering specifications

APPENDICES

APPENDIX A TOOLS AND EQUIPMENT

Hand Tools

adjustable wrench
asphalt spreader
axe
bander
bar (wrecking, pin, crow, pry)
bolt cutter
broom
brush
bucket/pail
bull float
cable cutter
caulking gun
C-clamp
chisel
edger
file (flat, round)
float (wood, magnesium, steel, aluminium, rubber)
grease gun
guillotine
hammer (ball peen, claw, sledge, dead blow, axe, brass)
hammer stapler
hand auger
hand level
hand saw
hand trowel
knife
lining (line-up) bar
magnet
metal detectors
mop
pick axe
pinch bar
pliers (needle nose, slip joint, linesmen)
punch (knock-out type, various sizes)
rake (concrete, asphalt, landscaping, fan)
rubber mallet
scraper
screwdriver (flat, Phillips, Robertson)
shovel (square, truncheon, spade, scoop, snow)
sidewalk groover
snip (heavy duty wire cutting)
socket wrench set
speed wrench
sponge
spooler (for tie wire)
sprayer
squeegee
staple gun
tarpaulin
tool belt and apron
trowel
twister
utility knife
water drum
water hose
watering can
wire brush

Power Tools

angle grinder
blow torch
chain saw
chipping gun and bit
chipping hammer
circular saw and blade
concrete vibrator
cordless tools
coring machine and bit
diamond or abrasive disc
disc sander
electric drill
extension cord
flashlight

Power Tools (continued)

grinder
hand-held and stationary radio
hydraulic jack
impact wrench/gun (electric and pneumatic)
jig saw
lawn mower
light
mechanical spreader
media blaster
oxy-acetylene cutting torch
portable concrete mixer
portable sprayer
powder-actuated tool
power sprayer
pressure pump
pressure washer
pump
quick-cut saw
reciprocating saw
steam cleaner
tamper (vibratory, plate, roller)
up-cut flat saw (walk-behind saw)
vacuum cleaner
weed trimmer
wire wheel (component of grinder)

Stationary Equipment

cut-off saw
compressor
generator
heater
mixer
table saw
tool box
water pump

Pneumatic Tools and Equipment

auger
chipper
compactor
drill (stopper, jack-leg, ratchet)
floor sweeper/scrubber
grinder
hammer
jack hammer
media-blasting tool
pavement breaker (jackhammer)
pneumatic gun (needle, impact, air, paint)
portable compressor pump
rivet-buster
snowblower
wand

Rigging and Hoisting Equipment

block and tackle
bridle hitch
chain fall
chains
clevis
come-along (portable winching equipment)
cradles
gin wheel
grip hoist (Tirfors ™)
lifting clamp
lifting hook
pulley
roller
rope (nylon, steel, natural fibre, polypropylene)
shackle
sling (nylon, steel, chain, natural fibre, polypropylene)
snatch block
softener

Rigging and Hoisting Equipment (continued)

spreader bar
tag line
winch
work cage

Scaffolding and Access Equipment

aerial platform (cherry picker)
ladder (extension, platform, stepladder)
man lift
mobile scaffolding
powered elevated platform
scissor lift
stationary scaffolding
suspended platform
suspended scaffold
swing stage
rolling scaffold

Transport Equipment

atv
boat
conveyor
forklift
handcart
manual buggy
power buggy
skid steer
truck
wheelbarrow

Measuring and Layout Tools, Instruments and Equipment

calculator
carpenter's pencil
chalk line
dew point gun
laptop
level (laser, builders', precision)
marker
measuring tape
pipe locator
plumb bob
scale rule
square
straightedge
stringline
surveyor ribbon
template
theodolite
thermometer
tire pressure gauge
total station
trammel point
transit
tripod and mounting device

Masonry Tools

bolster
brick and stone cutter
brick tongs
corner block
curry comb
face hammer
hawk
jointer (rat tail)
line block
line holder
line pin
line trig
manual splitter
mason's trowel
masonry saw
masonry table saw

Masonry Tools (continued)

mason's chisel
mortar board
mortar box
mortar buggy
mortar hoe
mortar mixer
notched trowel
raker - wheel type
sandbox
sandscreen

Personal Protective Equipment and Safety Equipment

air horn
apron
barrier cream, sunscreen and insect repellent
bear spray
boots (safety, rubber, insulated, waders)
breathing apparatus
caution tape (red, yellow)
chaps (chain saw, other)
chin strap
coveralls (cloth, paper, chemical)
evacuation box
eye wash station
face shield
fall protection equipment (harness, lanyard, restraining cable, rope grabs, retractable lanyard)
fire blanket
fire extinguisher
fire hose
fire retardant clothing
first aid kit
fit tester kit
gas detection equipment
gloves
hard hat
hazmat protective suit
hearing protection
high visibility vest
knee board and pads
life jacket
megaphone
rain suit
respirator (particles, chemical and vapour)
safety goggles/glasses
self contained breathing apparatus
soap
spill kit
welding flash blind

APPENDIX B GLOSSARY

accelerator	speeds the setting time of concrete and allows the cure time to start earlier which allows concrete to be placed in winter with reduced risk of frost damage
admixture	material other than water, aggregates and Portland cement that is used as an ingredient of concrete and is added to the mix
aggregate	granular material, such as sand, gravel, crushed stone or recycled concrete aggregates used with cement and water to produce concrete
air entrained	agents introduced to the concrete which contains billions of microscopic air cells per cubic foot which relieves internal pressure on the concrete by providing tiny chambers for water to expand into when it freezes
anchor plate	large metal plate connected to a tie rod or bolt
angle of repose	angle at which material lies stable on an embankment of an excavation
base plate	solid piece of material that has enough strength and sturdiness to serve as the surface to which other things are attached to be supported
bedding	ravel material used to support the pipe which is usually less than 25mm in size
bell	the large end of a pipe which inserts over the small (spigot) end of the pipe when connecting
benchmarks	point of known elevation
berm	an embankment built to contain liquids and gases and prevent them from damaging the environment
bladder	rubber membrane used to isolate a section of pipe or component for testing or repair
bracing for concrete	supports which run at an angle on the form to provide support and keep the walls plumb
bull float	tool used to level concrete surfaces
catch basin	receptacle or reservoir that receives surface water runoff or drainage and is part of a storm drain or sewer system designed to trap debris before it enters the pipe

clearance markers (goal posts)	warning restraints set up to prevent vehicles or other machinery from getting too close to other objects, including excessive heights or limits of approach to electrical sources
compacting equipment	an engine-powered machine that results compaction of loose materials and asphalt
concrete	composition of a binding medium and aggregate; commonly consists of a mixture of cement, aggregate and water in varying proportions; mixture is worked into a plastic state and gains hardness through the hydration of cement with the water
confined space	an area not designed for continuous human occupancy, contains a hazard or the potential of a hazard, and has limited access and egress
control joints	intentional groove cut into a surface to control cracking by allowing the material to expand on its own and prevent cracking in an uncontrolled manner
cribbing	support made of timber, logs, concrete or steel to support a structure from below or the side
cross-pollination	transfer of pollen from the flower of one plant to the flower of a plant having a different genetic constitution. Workers must avoid causing cross-pollination when using tools and equipment in different areas due to increasing geo-engineering
curing	the maintenance of a satisfactory moisture content and temperature in concrete during its early stages so that desired properties may develop
curry comb	tool with rows of metal teeth made for grooming horses that can be used for cleaning bricks and blocks
daylighting utilities	exposing underground utilities by excavation so that work can be done on the utilities
ductile	type of pipe material
egress	the means of going out or leaving; an exit; an outlet
false work	temporary structure in which the main load bearing members are vertical and are used to support a permanent structure and associated elements during the erection until it is self-supporting
fill-crete	a mix of gravel and cement (small amount) used for backfill that does not require compaction (also known as flow-crete, tru-crete, controlled low strength material [CLSM])

filter cloth	cloth fabric used in excavation that helps to screen out soil and other contaminates while allowing the passage of water
floating	process of using a tool, usually wood or magnesium, in concrete finishing operations to create a relatively even, but still open texture to a fresh concrete surface
fly forms	system that can be used repetitively and moved in large sections not requiring disassembly and commonly used as a formwork shoring system to support typical cast-in-place concrete slabs in multi-level high-rise construction
fly tables	forming system assembled in various shapes and sizes depending on the particular needs of each building
form	a temporary structure or mould for the support of concrete while it is setting and gaining sufficient strength to be self-supporting
Ground Disturbance	training program that covers the safety aspects of trenching and excavating operations including locators and locating buried facilities
grout	mixture of cementitious material and water, with or without aggregate, which may be proportioned and mixed to produce a pourable consistency without segregation of the constituents
guillotine (brick and block)	device which generates a high amount of pressure to cut various types of blocks
gunnite	insulating material that is sprayed on and used in refractory applications
height stick	grade guide that is used during concrete placement to measure the pour height
high flow	highly flowable, non-segregating concrete that easily spreads into place, fills formwork, and encapsulates even the most congested reinforcement. It is placed purely by means of its own weight, with little or no mechanical vibration
hoarding	temporary enclosure to protect against damage, such as weather and debris, and to limit public access
honeycomb	concrete that, due to lack of proper amount of fines or vibration, contains abundant interconnected large voids or cavities
jeeping	a process using electronic current to detect deficiencies (cracks, pinholes) in pipe coatings

jersey barrier	modular concrete or plastic barrier employed to separate lanes of traffic and minimize vehicle damage in case of impact
joint "key ways"	type of joint between two individual concrete pours with a recess or groove in one end, and an equal protrusion on the other, which fit together providing shear strength to the joint
lintel	a beam placed across the top of a rough door or window opening; it supports the weight from above
monument	permanent established elevation used for surveying
manhole	small covered opening in a floor, pavement, or other surface to allow a person to enter, especially an opening in a city street leading to a sewer
media blasters	equipment that propels a certain type of media such as sand, glass bead and metal pellets to clean the surface of various materials
pile drivers	machine used to drive concrete, metal or wood piles
piling	structural column installed into the ground to anchor or support a building and other structures
pinch bars	kind of crowbar or lever with a projection that serves as a fulcrum
pipe coating	a coating either sleeved, taped or painted onto pipe to protect it from corrosion and other foreign materials
primer	a substance used to prepare a surface for adhesives or sealants
rate of pour	important process using scientific calculations based on the viscosity, temperature and depth of the concrete pour and the effects of pressure on the forms
rebar dowel	a piece of steel used to join different pours of concrete together they are either placed in fresh concrete, or a hole is drilled into existing concrete and they are epoxied in
refractory	material which can withstand very high temperatures without degrading or softening
retarder	an admixture which extends the setting time of cement paste and, therefore of mixtures such as concrete, mortar, and grout.
rough buck	temporary form to provide an opening in concrete and masonry
scarify	to roughen a surface of concrete using a scabbler

scan tools	electronic devices used to locate different types of utilities
screeding	the operation of forming a grade surface by the use of a straightedge
sea-can	lockable, steel containers commonly used in shipping on ocean liners, also used in construction for storage of tools and materials on a jobsite
settling pond	water containment used to contain sediment before disposing of the water
sheet piling	interlocking metal sheeting used to prevent water movement in an excavation around water ways
shoring (concrete)	supports built to hold concrete formwork
shoring (excavation)	supports built inside an excavation to retain soil to prevent cave-ins
shotcrete	mortar or concrete conveyed through a hose and projected pneumatically onto a surface
silt fence	a geo- textile containment fence used to filter the silt from run-off around a construction site
skidsteer	a small rigid frame, engine-powered machine with lift arms used to attach a wide variety of tools or attachments
slab	a flat horizontal or nearly so, molded layer of plain or reinforced concrete, usually uniform but sometimes of variable thickness, either on the ground or supported by beams, columns, walls, or other formwork
slump	a measure of consistency
slurry	a mixture of water and fine materials, such as Portland cement, slag or soil in suspension
spigot	reduced diameter in the end of pipe able to lock into the bell end
spring clip	a fastener used to provide a screw hole for a sheet metal screw
stringing	the process of dispersing the pipe in the pipe laying process
strongback	a continuous member, usually vertical which transfers loads from the form to the form-tying system and which holds large formwork panel systems adequately in place
taper ties	a long tapered bolt used in formwork

telescopic forklift (telehandler)	forklift with an extended boom
thrust block	cast-in-place concrete to prevent pipe movement
ties	a tensile unit holding forms against the lateral pressure from freshly placed concrete
tool crib	facility that stores and organizes tools owned by the company
tooling	use of an object to smooth and move the sealant into a position for both an acceptable appearance as well as a watertight seal
turnbuckles	used to adjust the length of rigging chains
walers	a continuous member, usually horizontal which transfers loads from the form to the form-tying system or form-bracing system or both
wet screed	placing concrete on finish-grade across two known points of elevation (called wet screeds)
whip check	small cable choker placed at pressure hose connections to prevent hose from whipping around

APPENDIX C ACRONYMS

AHJ	authority having jurisdiction
CO	carbon monoxide
CSA	Canadian Standards Association
GFCI	ground fault circuit interrupters
GPS	global positioning system
H_2S	hydrogen sulphide
ICF	insulated concrete forms
ICI	industrial, institutional and commercial
JHA	job hazard analysis
JOHS	Joint Occupational Health and Safety
LEED	Leadership in Energy and Environmental Design
LEL	lower explosion limit
OH&S	Occupational Health and Safety
PCST	Pipeline Construction Safety Training
PPE	personal protective equipment
PSI	pre-job safety instructions
SDS	safety data sheet
TDG	transportation of dangerous goods
UEL	upper explosion limit
WHMIS	Workplace Hazardous Materials Information System

APPENDIX D BLOCK AND TASK WEIGHTING

BLOCK A COMMON OCCUPATIONAL SKILLS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	NV	NV	23	NV	50	15	15	20	15	ND	ND	ND	23%

Task 1 Performs safety-related functions.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	29	NV	40	20	20	25	10	ND	ND	ND	24%

Task 2 Uses and maintains tools and equipment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	21	NV	30	30	30	25	40	ND	ND	ND	29%

Task 3 Organizes work.

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

Task 4 Performs routine trade activities.

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

BLOCK B SITE WORK

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

Task 5 Prepares site.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	21	NV	20	20	25	20	15	ND	ND	ND	20%

Task 6 Performs ground work.

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

Task 7 Services site.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	15	NV	50	30	15	20	30	ND	ND	ND	27%

Task 8 Performs basic demolition.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	19	NV	10	10	20	15	10	ND	ND	ND	14%

Task 9 Performs safety watches.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	23	NV	0	15	15	25	15	ND	ND	ND	15%

BLOCK C SCAFFOLDING AND ACCESS EQUIPMENT

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	NV	NV	12	NV	10	10	14	5	5	ND	ND	ND	9%

Task 10 Uses scaffolding.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	49	NV	50	40	50	40	60	ND	ND	ND	48%

Task 11 Uses access equipment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	51	NV	50	60	50	60	40	ND	ND	ND	52%

BLOCK D CONCRETE WORK

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	NV	NV	13	NV	15	25	20	15	20	ND	ND	ND	18%

Task 12 Forms concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	24	NV	80	10	20	10	15	ND	ND	ND	27%

Task 13 Places and finishes concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	38	NV	10	40	30	50	50	ND	ND	ND	36%

Task 14 Modifies concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	20	NV	5	20	20	10	10	ND	ND	ND	14%

Task 15 Places/Applies grout, epoxies and caulking.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	18	NV	5	30	30	30	25	ND	ND	ND	23%

BLOCK E MASONRY WORK

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	NV	NV	14	NV	4	10	10	15	5	ND	ND	ND	10%

Task 16 Prepares for masonry work.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	57	NV	55	50	50	50	50	ND	ND	ND	52%

Task 17 Tends to bricklayers.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	43	NV	45	50	50	50	50	ND	ND	ND	48%

BLOCK F UTILITIES AND PIPELINE

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	NV	NV	10	NV	1	10	12	15	20	ND	ND	ND	11%

Task 18 Installs utility piping for water and sewer installations.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	39	NV	60	50	60	50	50	ND	ND	ND	52%

Task 19 Performs pipeline activities.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	61	NV	40	50	40	50	50	ND	ND	ND	48%

BLOCK G ROADWORK

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

Task 20 Installs road surface material.

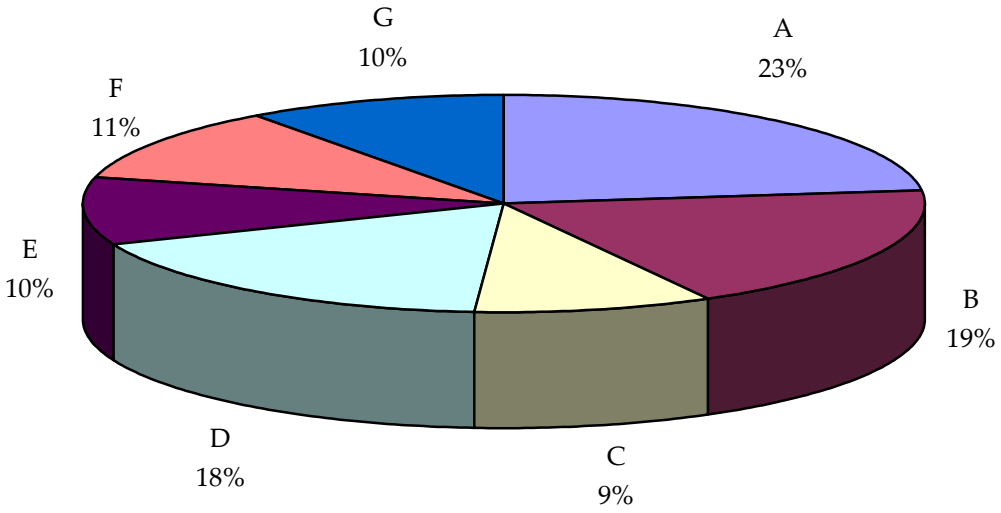
	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	40	NV	50	50	50	35	70	ND	ND	ND	49%

Task 21 Installs roadwork components.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	NV	NV	60	NV	50	50	50	65	30	ND	ND	ND	51%

APPENDIX E

PIE CHART*



TITLES OF BLOCKS

BLOCK A	Common Occupational Skills	BLOCK E	Masonry Work
BLOCK B	Site Work	BLOCK F	Utilities and Pipeline
BLOCK C	Scaffolding and Access Equipment	BLOCK G	Roadwork
BLOCK D	Concrete Work		

*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 — Construction Craft Worker

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 hand, power and powder-actuated tools.	2.02 Uses rigging and hoisting equipment.	2.03 Uses stationary equipment.	2.04 Uses sandblaster.	2.05 Uses mobile equipment.
	3. Organizes work.	3.01 Uses documentation.	3.02 Communicates with others.			
	4. Performs routine trade activities.	4.01 Handles construction materials.	4.02 Performs site housekeeping and maintenance.	4.03 Erects hoarding / enclosures.	4.04 Installs membranes.	4.05 Installs insulating materials.
		4.06 Establishes grades and elevations.	4.07 Performs traffic control.	4.08 Installs permanent and temporary fencing.		
B – SITE WORK	5. Prepares site.	5.01 Clears site.	5.02 Sets up site facilities.	5.03 Assists in installation of pilings.	5.04 Builds access and egress roads.	
	6. Performs ground work.	6.01 Locates underground utilities.	6.02 Performs excavation.	6.03 Installs excavating shoring.	6.04 Performs backfill and compaction.	

BLOCKS	TASKS	SUB-TASKS				
	7. Services site.	7.01 Addresses suspected hazardous materials.	7.02 Controls water runoff.	7.03 Sets up temporary lighting.	7.04 Sets up generators and compressors.	7.05 Performs site restoration.
		7.06 Manages tool crib.	7.07 Recycles materials.			
	8. Performs basic demolition.	8.01 Cuts materials.	8.02 Dismantles existing structures and components.			
	9. Performs safety watches.	9.01 Monitors hazardous gases.	9.02 Performs fire watch.	9.03 Performs bottle watch.	9.04 Performs confined space watch.	9.05 Monitors heaters.
C – SCAFFOLDING AND ACCESS EQUIPMENT	10. Uses scaffolding.	10.01 Erects scaffolding.	10.02 Inspects scaffolding.	10.03 Maintains scaffolding.	10.04 Tends to scaffold erectors.	10.05 Dismantles scaffolding.
	11. Uses access equipment.	11.01 Uses ladders.	11.02 Uses power-elevated work platforms.	11.03 Inspects access equipment.	11.04 Maintains access equipment.	
D – CONCRETE WORK	12. Forms concrete.	12.01 Installs formwork and shoring.	12.02 Inspects assembled formwork.	12.03 Dismantles formwork.	12.04 Maintains formwork.	
	13. Places and finishes concrete.	13.01 Mixes concrete.	13.02 Transports concrete on site.	13.03 Places concrete.	13.04 Installs components in concrete.	13.05 Assists with finishing concrete.

BLOCKS	TASKS	SUB-TASKS				
		13.06 Controls concrete curing process.				
	14. Modifies concrete.	14.01 Drills/cores concrete.	14.02 Prepares concrete for resurfacing.	14.03 Performs concrete repair and refinishing.	14.04 Creates expansion, control and isolation joints.	
	15. Places/Applies grout, epoxies and caulking.	15.01 Places/Applies grout.	15.02 Places/Applies epoxies.	15.03 Applies caulking.		
E – MASONRY WORK	16. Prepares for masonry work.	16.01 Sets up masonry materials.	16.02 Mixes mortars and grouts.			
	17. Tends to bricklayers.	17.01 Cuts masonry units.	17.02 Installs lintels and rough bucks.	17.03 Washes masonry units.	17.04 Installs refractory materials.	17.05 Uses fireproofing materials.
F – UTILITIES AND PIPELINE	18. Installs utility piping for water and sewer installations.	18.01 Installs pipe for water systems.	18.02 Installs pipe for sewer systems.	18.03 Installs catch basins and manholes.	18.04 Modifies existing pipe.	18.05 Assists with testing water and sewer lines.
	19. Performs pipeline activities.	19.01 Constructs right of ways.	19.02 Performs pipeline installation.	19.03 Performs pipeline maintenance.		

BLOCKS	TASKS	SUB-TASKS		
G – ROADWORK	20. Installs road surface material.	20.01 Places road surface materials.	20.02 Repairs road surfaces.	
	21. Installs roadwork components.	21.01 Installs barriers.	21.02 Installs road markings and signs.	21.03 Installs culverts.