

# Red Seal Occupational Standard

## Construction Craft Worker



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# **Red Seal Occupational Standard**

## **Construction Craft Worker**



Title: Construction Craft Worker

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## **Foreword**

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

# Background

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

Standards have the following objectives:

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

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

Trades and Apprenticeship Division  
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- Jeffrey Anders – Saskatchewan
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This standard was prepared by the Apprenticeship and Sectoral Initiatives Directorate of ESDC. The coordinating, facilitating and processing of this standard were undertaken by employees of the standards development team of the Trades and Apprenticeship Division and of Ontario, the host jurisdiction for this trade.

# Structure of the Occupational Standard

This standard contains the following sections:

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

**Description of the Construction Craft Worker Trade:** an overview of the trade's duties, work environment, job requirements, similar occupations and career progression

**Trends in the Construction Craft Worker Trade:** some of the trends identified by industry as being the most important for workers in this trade

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

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

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

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

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

**Task Matrix and Weightings:** a chart which outlines graphically the major work activities, tasks and sub-tasks of this standard and the national percentages of exam questions assigned to the major work activities and tasks

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

**Major Work Activity (MWA):** the largest division within the standard that is comprised of a distinct set of trade activities

- **Task:** distinct actions that describe the activities within a major work activity
- **Task Descriptor:** a general description of the task
  - **Sub-task:** distinct actions that describe the activities within a task

- **Skills:**
  - **Performance Criteria:** description of the activities that are done as the sub-task is performed
  - **Evidence of Attainment:** proof that the activities of the sub-task meet the expected performance of a tradesperson who has reached journey person level
  - **Range of Variables:** elements and examples (not all-inclusive) that provide a more in-depth description of a term used in the performance criteria and evidence of attainment
- **Knowledge:**
  - **Learning Outcomes:** describes what should be learned relating to a sub-task while participating in technical or in-school training
  - **Learning Objectives:** topics to be covered during technical or in-school training in order to meet the learning outcomes for the sub-task
  - **Range of Variables:** elements and examples (not all-inclusive) that provide a more in-depth description of a term used in the learning outcomes and learning objectives
- **Appendix A – Acronyms:** a list of acronyms used in the standard with their full name
- **Appendix B – Tools and Equipment / Outils et Équipement:** a bilingual non-exhaustive list of tools and equipment used in this trade
- **Appendix C – Glossary / Glossaire:** bilingual definitions or explanations of selected technical terms used in the standard

# **Methodology**

## **Development of the Standard**

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

## **Harmonization of Apprenticeship Training**

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

## **Online Survey**

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

## **Draft Review**

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

## Validation and Weighting

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

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

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

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

## Definitions for Validation and Weighting

<b>yes</b>	sub-task performed by qualified workers in the occupation in that province or territory
<b>no</b>	sub-task not performed by qualified workers in the occupation in that province or territory
<b>NV</b>	standard <u>N</u> ot <u>V</u> alidated by that province or territory
<b>ND</b>	trade <u>N</u> ot <u>D</u> esignated in a province or territory
<b>Not Common Core (NCC)</b>	sub-task, task or MWA performed less than 70% of responding jurisdictions; these will not be tested by the Interprovincial Red Seal Examination for the trade
<b>National Average %</b>	average percentage of questions assigned to each MWA and task in Interprovincial Red Seal Examination for the trade

## **Provincial/Territorial Abbreviations**

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

# Description of the Construction Craft Worker Trade

“Construction Craft Worker” is this trade’s official Red Seal occupational title approved by the CCDA. This standard covers tasks performed by construction craft workers.

Construction craft workers work mostly on construction sites; their tasks include site preparation, environmental protection 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 drilling, blasting, scaling, media blasting, 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, being fit for duty and an ability to do hard physical work. They also support a variety of different trades on the construction site to complete their tasks. They sometimes 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 standard acknowledges similarities with many construction trades. With experience construction craft workers may have opportunities to advance.

# **Trends in the Construction Craft Worker Trade**

## **Technology**

There is an increase in the utilization of simulators and robotics to aid construction craft workers build their competencies on using new equipment on a jobsite to keep themselves and others safe.

Paperwork such as timesheets, locates, jobsite drawings or plans are communicated using electronic devices. Drones and other remote-controlled robots are being used for surveying, inspections, layout and demolition. Competency in the use of data collectors with total station and global positioning system (GPS) equipment, uploading and sending files of jobsite data are tasks that are commonly performed by construction craft workers.

Artificial intelligence is used to troubleshoot problems that construction craft workers may encounter on a jobsite. Quick response (QR) codes are more frequently used to access field information. QR codes may also be used to document employee attendance for safety reasons.

## **Health and Safety**

A prevailing trend is evident across industries where there is a shift towards a proactive approach to health and safety, steering away from reactive measures emphasizing a forward-thinking stance in the pursuit of enhanced safety standards.

Silica dust is now being recognized as a dangerous substance, equal to asbestos. Uncontrolled exposure is being minimized due to its serious health hazards. Different medias are being used in place of silica containing materials when possible.

## **Tools and Equipment**

Tools have evolved to become lighter and more versatile, having ergonomic designs that prioritize user comfort. Additionally, the incorporation of user-friendly visual elements enhances the accessibility and efficiency of these tools, elevating the overall user experience.

## **Products/Materials**

New products and materials are constantly being introduced in the trade. Construction craft workers need to continually learn about these new materials and how to work with them.

There is a trend towards progressively more environmentally friendly products becoming available.

## **Environmental, Legislative and Regulatory**

In some jurisdictions, an environmental impact assessment, a traditional land use study and permits must be obtained and followed before and during work. Construction craft workers must work hand in hand with conservation authorities and environmental regulations to prevent or mitigate downstream environmental impacts of construction activities.

# Skills for Success Summary

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

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

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

## Reading

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 stationary and mobile 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, blueprints, utility locates, traffic control plans, schematics and assembly drawings. They complete documents including safety documentation, orientation and equipment inspection forms.

## Writing

Construction craft workers use writing skills to complete logbooks and time sheets, and to record the outcome of safety inspections. They also 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 and toolbox/tailgate talks to discuss safety, goals, procedures, job time-frames and projects.

## **Numeracy**

Construction craft workers take measurements using a range of tools and compare measurements to specifications. They estimate and calculate quantities, weights and material requirements.

## **Thinking**

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 with other trades and 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 and portable devices such as smartphones and tablets to generate diagrams as well as to view drawings.

They use drones for surveying and inspection, as well as use data collectors with GPS and total station equipment to process, handle and share jobsite information.

## **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 to remain up-to-date.

# Roles and Opportunities for Skilled Trades in a Sustainable Future

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

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

For example:

- Construction tradespeople need to consider the materials they are using, building methods, and improvements to mechanical and electrical installations. There are important changes to codes and standards to help meet the climate change goals and commitments set for 2030 and 2050. Retrofits and new construction of low-energy buildings provide enormous opportunities for workers in this sector. Concepts, such as energy efficiency and regarding buildings as systems are foundational.
- Automotive and mechanical trades are seeing a shift towards the electrification of vehicles and equipment. As a result, new skills and knowledge will be required for tradespeople working in this sector. There are mandates for sales of new light-duty zero-emission vehicles (ZEV) in Canada, with the goal of achieving 100% ZEV sales by 2035. Due to this mandate, the demand for these vehicles is growing quickly among consumers and fleets. With this escalating demand, the need for skilled workers to maintain and repair these vehicles is also increasing.
- In industrial and resource sectors, there is pressure to move towards increased electrification of industrial processes. Many industrial and commercial facilities are also being upgraded to improve energy efficiency in areas such as lighting systems, and new production processes and technologies. There are also opportunities in carbon capture, utilization and storage (CCUS), as well as the production and export of low-carbon hydrogen.
- Trades in the service sector may also need to be aware of responsible sourcing, as well as efficient use of products and materials. New ways of working better are always a part of the job.

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

- *National Energy Code of Canada for Buildings (NECB).*
- *Canadian Net-Zero Emissions Accountability Act (CNZEAA).*
- Programs that encourage sustainable building design and construction such as Leadership in Energy and Environmental Design (LEED) and the Zero Carbon Building (ZCB) standards.
- Montreal Protocol for phasing out R22 refrigerants.

- Energy efficiency programs such as ENERGY STAR.
- Principles of the United Nations Declaration for the Rights of Indigenous Peoples pertaining to energy sector development.
- Canada Building Trades Union awareness courses: Building it Green (energy and conservation) and Protecting the Natural Environment.

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

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

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

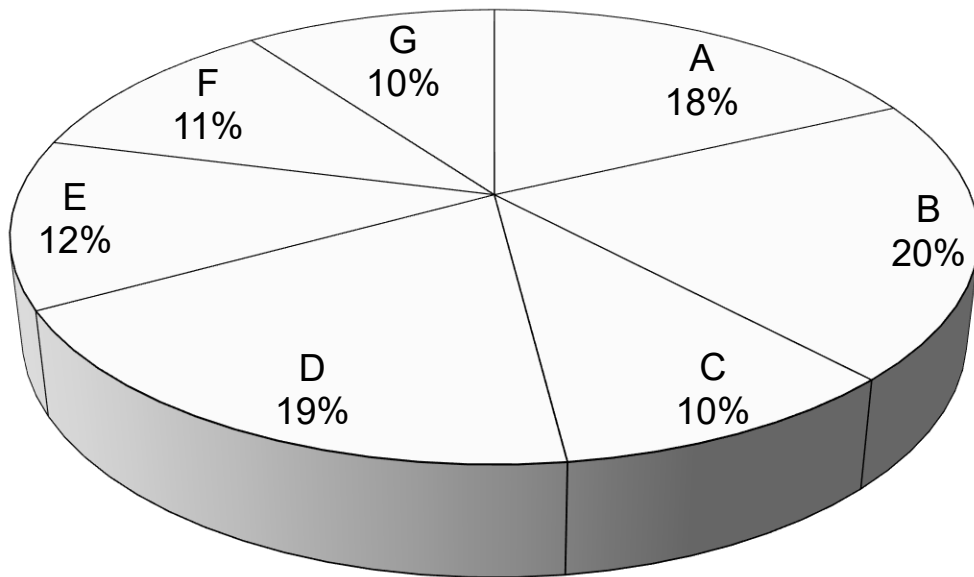
## **Industry Expected Performance**

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

## **Language Requirements**

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

## Pie Chart of Red Seal Examination and Weightings



Major Work Activity	Percentage
A - Performs common occupational skills	18%
B - Performs site work	20%
C - Uses scaffolding and access equipment	10%
D - Performs concrete work	19%
E - Performs masonry work	12%
F - Performs utility and pipeline work	11%
G - Performs roadwork	10%

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

# Task Matrix and Weightings

## Major Work Activity A – Performs common occupational skills

18%

<b>Task A-1</b> <b>Maintains safe and healthy workplace</b> <b>19%</b>	Sub-task A-1.01 Maintains safe work environment	Sub-task A-1.02 Uses personal protective equipment (PPE) and safety equipment	Sub-task A-1.03 Participates in healthy and respectful work environment
	Sub-task A-2.01 Uses hand, pneumatic, power and powder-actuated tools	Sub-task A-2.02 Uses rigging and hoisting equipment	Sub-task A-2.03 Uses stationary and portable equipment
<b>Task A-2</b> <b>Uses and maintains tools and equipment</b> <b>27%</b>	Sub-task A-2.04 Uses media blasting equipment	Sub-task A-2.05 Uses mobile equipment	
	Sub-task A-3.01 Uses documentation	Sub-task A-3.02 Handles construction materials	Sub-task A-3.03 Performs site housekeeping and maintenance
<b>Task A-3</b> <b>Organizes work</b> <b>18%</b>	Sub-task A-4.01 Erects hoarding/enclosures	Sub-task A-4.02 Installs membranes	Sub-task A-4.03 Installs insulating materials
<b>Task A-4</b> <b>Performs routine trade activities</b> <b>30%</b>	Sub-task A-4.04 Establishes grades and elevations	Sub-task A-4.05 Performs traffic control	Sub-task A-4.06 Installs permanent and temporary fencing

<b>Task A-5</b> <b>Maintains continuous learning</b> <b>3%</b>	Sub-task A-5.01 Upskills in new trade practices and procedures	Sub-task A-5.02 Upskills in emerging technologies
<b>Task A-6</b> <b>Uses communication and mentoring techniques</b> <b>3%</b>	Sub-task A-6.01 Uses communication techniques	Sub-task A-6.02 Uses mentoring techniques

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## Major Work Activity B – Performs site work

**20%**

<b>Task B-7</b> <b>Prepares site</b> <b>22%</b>	Sub-task B-7.01 Clears site	Sub-task B-7.02 Sets up site facilities	Sub-task B-7.03 Assists in installation of pilings and caissons
	Sub-task B-7.04 Builds access and egress roads		
<b>Task B-8</b> <b>Performs groundwork</b> <b>24%</b>	Sub-task B-8.01 Locates underground utilities	Sub-task B-8.02 Performs excavation	Sub-task B-8.03 Installs excavation shoring and shielding
	Sub-task B-8.04 Performs backfill and compaction		

<b>Task B-9</b> <b>Services site</b> <b>19%</b>	Sub-task B-9.01 Addresses suspected hazardous materials	Sub-task B-9.02 Controls water runoff	Sub-task B-9.03 Sets up temporary lighting
	Sub-task B-9.04 Sets up generators and compressors	Sub-task B-9.05 Performs site restoration	Sub-task B-9.06 Manages tool crib
	Sub-task B-9.07 Recycles materials		
<b>Task B-10</b> <b>Performs basic demolition</b> <b>18%</b>	Sub-task B-10.01 Cuts materials	Sub-task B-10.02 Dismantles existing structures and components	
<b>Task B-11</b> <b>Performs safety watches</b> <b>17%</b>	Sub-task B-11.01 Monitors hazardous gases and atmospheres	Sub-task B-11.02 Performs fire watch	Sub-task B-11.03 Performs bottle watch
	Sub-task B-11.04 Performs confined space watch	Sub-task B-11.05 Monitors heaters	

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## Major Work Activity C – Uses scaffolding and access equipment **10%**

<b>Task C-12</b> <b>Uses scaffolding</b> <b>54%</b>	Sub-task C-12.01 Erects scaffolding	Sub-task C-12.02 Inspects scaffolding	Sub-task C-12.03 Maintains scaffolding
	Sub-task C-12.04 Tends to scaffold erectors	Sub-task C-12.05 Dismantles scaffolding	

<b>Task C-13</b> <b>Uses access equipment</b> <b>46%</b>	Sub-task C-13.01 Uses ladders	Sub-task C-13.02 Uses stationary and mobile elevating work platforms (MEWP)	Sub-task C-13.03 Inspects access equipment
	Sub-task C-13.04 Maintains access equipment		

## Major Work Activity D – Performs concrete work

**19%**

<b>Task D-14</b> <b>Forms concrete</b> <b>26%</b>	Sub-task D-14.01 Installs formwork and shoring	Sub-task D-14.02 Inspects assembled formwork	Sub-task D-14.03 Dismantles formwork
<b>Task D-15</b> <b>Places and finishes concrete</b> <b>35%</b>	Sub-task D-15.01 Mixes concrete	Sub-task D-15.02 Transports concrete on site	Sub-task D-15.03 Places concrete
	Sub-task D-15.04 Installs embedded components in concrete	Sub-task D-15.05 Assists with finishing concrete	Sub-task D-15.06 Controls concrete curing process
<b>Task D-16</b> <b>Modifies concrete</b> <b>23%</b>	Sub-task D-16.01 Drills/cores/cuts concrete	Sub-task D-16.02 Prepares concrete for resurfacing	Sub-task D-16.03 Performs concrete repair and refinishing
	Sub-task D-16.04 Creates expansion, control and isolation joints		
<b>Task D-17</b> <b>Places/Applies grout, epoxies, caulking and chemical materials</b> <b>16%</b>	Sub-task D-17.01 Places/Applies grout	Sub-task D-17.02 Places/Applies epoxies and chemical materials	Sub-task D-17.03 Applies caulking

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**Major Work Activity E – Performs masonry work****12%**

<b>Task E-18</b> <b>Prepares for masonry work</b> <b>44%</b>	Sub-task E-18.01 Sets up masonry materials	Sub-task E-18.02 Mixes mortars and grouts	
<b>Task E-19</b> <b>Tends to bricklayers</b> <b>56%</b>	Sub-task E-19.01 Cuts masonry units	Sub-task E-19.02 Assists with installation of lintels and rough bucks	Sub-task E-19.03 Washes masonry units
	Sub-task E-19.04 Installs refractory materials	Sub-task E-19.05 Uses fireproofing materials	

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**Major Work Activity F – Performs utility and pipeline work****11%**

<b>Task F-20</b> <b>Installs piping for utilities</b> <b>61%</b>	Sub-task F-20.01 Installs pipe for water systems	Sub-task F-20.02 Installs pipe for sanitary and storm sewer systems	Sub-task F-20.03 Installs pipe for other utility infrastructure
	Sub-task F-20.04 Installs catch basins, utility vaults, weeping tile and maintenance holes	Sub-task F-20.05 Modifies existing pipe	Sub-task F-20.06 Assists with testing water, sanitary and storm sewer lines
<b>Task F-21</b> <b>Performs pipeline activities</b> <b>39%</b>	Sub-task F-21.01 Constructs right of ways	Sub-task F-21.02 Performs pipeline installation	Sub-task F-21.03 Performs pipeline maintenance

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## Major Work Activity G – Performs roadwork

**10%**

<b>Task G-22</b> <b>Prepares and builds roads</b> <b>57%</b>	Sub-task G-22.01 Prepares earth for right of way	Sub-task G-22.02 Places layers and road surface materials for roadwork	Sub-task G-22.03 Repairs road surfaces
<b>Task G-23</b> <b>Installs roadwork components</b> <b>43%</b>	Sub-task G-23.01 Installs barriers	Sub-task G-23.02 Installs road markings and signs	Sub-task G-23.03 Installs culverts

# Harmonization of Apprenticeship Training

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

## 1. Trade Name

The official Red Seal name for this trade is Construction Craft Worker.

## 2. Number of Levels of Apprenticeship

The number of levels of technical training recommended for this trade is two (2).

## 3. Total Training Hours

The total hours of training, including both on-the-job and in-school training for this trade is 3600.

## 4. Sequencing Topics and Related Sub-tasks

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

Level 1	Level 2
	Context
	Safe and Healthy Workplaces

		<b>Tools and Equipment</b>
		<b>Communication Techniques</b>
<b>Safe and Healthy Workplaces</b> 1.01 Maintains safe work environment 1.02 Uses personal protective equipment (PPE) and safety equipment 1.03 Participates in healthy and respectful work environment		
<b>Tools and Equipment</b> 2.01 Uses hand, pneumatic, power and powder-actuated tools 2.02 Uses rigging and hoisting equipment 2.03 Uses stationary and portable equipment 2.04 Uses media blasting equipment 2.05 Uses mobile equipment		
<b>Organizes Work</b> 3.01 Uses documentation 3.02 Handles construction materials 3.03 Performs site housekeeping and maintenance	<b>Organizes Work</b> 3.01 Uses documentation 3.02 Handles construction materials 3.03 Performs site housekeeping and maintenance	
<b>Routine Trade Activities</b> 4.01 Erects hoarding/enclosures 4.02 Installs membranes 4.03 Installs insulating materials 4.04 Establishes grades and elevations 4.05 Performs traffic control 4.06 Installs permanent and temporary fencing	<b>Routine Trade Activities</b> 4.01 Erects hoarding/enclosures 4.02 Installs membranes 4.03 Installs insulating materials 4.04 Establishes grades and elevations 4.05 Performs traffic control 4.06 Installs permanent and temporary fencing	
	<b>Continuous Learning</b> 5.01 Upskills in new trade practices and procedures 5.02 Upskills in emerging technologies	

<b>Communication Techniques</b> 6.01 Uses communication techniques	<b>Mentoring Techniques</b> 6.02 Uses mentoring techniques
<b>Site Preparation</b> 7.01 Clears site 7.02 Sets up site facilities 7.03 Assists in installation of pilings and caissons 7.04 Builds access and egress roads	<b>Site Preparation</b> 7.01 Clears site 7.02 Sets up site facilities 7.03 Assists in installation of pilings and caissons 7.04 Builds access and egress roads
<b>Groundwork</b> 8.01 Locates underground utilities 8.02 Performs excavation 8.03 Installs excavating shoring and shielding 8.04 Performs backfill and compaction	
<b>Site (Services)</b> 9.01 Addresses suspected hazardous materials 9.02 Controls water runoff 9.03 Sets up temporary lighting 9.04 Sets up generators and compressors 9.05 Performs site restoration 9.06 Manages tool crib 9.07 Recycles materials	<b>Site (Services)</b> 9.01 Addresses suspected hazardous materials 9.05 Performs site restoration
<b>Demolition</b> 10.01 Cuts materials 10.02 Dismantles existing structures and components	<b>Demolition</b> 10.01 Cuts materials 10.02 Dismantles existing structures and components
<b>Safety Watches</b> 11.01 Monitors hazardous gases and atmospheres 11.02 Performs fire watch 11.03 Performs bottle watch 11.04 Performs confined space watch 11.05 Monitors heaters	

<p><b>Scaffolding</b></p> <p>12.01 Erects scaffolding</p> <p>12.02 Inspects scaffolding</p> <p>12.03 Maintains scaffolding</p> <p>12.04 Tends to scaffold erectors</p> <p>12.05 Dismantles scaffolding</p>	<p><b>Scaffolding</b></p> <p>12.01 Erects scaffolding</p> <p>12.02 Inspects scaffolding</p> <p>12.03 Maintains scaffolding</p> <p>12.04 Tends to scaffold erectors</p> <p>12.05 Dismantles scaffolding</p>
<p><b>Access Equipment</b></p> <p>13.01 Uses ladders</p> <p>13.02 Uses stationary and mobile elevating work platforms (MEWP)</p> <p>13.03 Inspects access equipment</p> <p>13.04 Maintains access equipment</p>	
<p><b>Concrete (Forms)</b></p> <p>14.01 Installs formwork and shoring</p> <p>14.02 Inspects assembled formwork</p> <p>14.03 Dismantles formwork</p>	<p><b>Concrete (Forms)</b></p> <p>14.01 Installs formwork and shoring</p> <p>14.02 Inspects assembled formwork</p> <p>14.03 Dismantles formwork</p>
<p><b>Concrete (Places and Finishes)</b></p> <p>15.01 Mixes concrete</p> <p>15.02 Transports concrete on site</p> <p>15.03 Places concrete</p> <p>15.04 Installs embedded components in concrete</p> <p>15.05 Assists with finishing concrete</p> <p>15.06 Controls concrete curing process</p>	<p><b>Concrete (Places and Finishes)</b></p> <p>15.01 Mixes concrete</p> <p>15.02 Transports concrete on site</p> <p>15.03 Places concrete</p> <p>15.04 Installs embedded components in concrete</p> <p>15.05 Assists with finishing concrete</p> <p>15.06 Controls concrete curing process</p>
	<p><b>Concrete (Modifies)</b></p> <p>16.01 Drills/cores/cuts concrete</p> <p>16.02 Prepares concrete for resurfacing</p> <p>16.03 Performs concrete repair and refinishing</p> <p>16.04 Creates expansion, control and isolation joints</p>

**Grout, Epoxies, Caulking and Chemical Materials**

- 17.01 Places/Applies grout
- 17.02 Places/Applies epoxies and chemical materials
- 17.03 Applies caulking

**Grout, Epoxies, Caulking and Chemical Materials**

- 17.01 Places/Applies grout
- 17.02 Places/Applies epoxies and chemical materials
- 17.03 Applies caulking

**Masonry Work (Preparation)**

- 18.01 Sets up masonry materials
- 18.02 Mixes mortars and grouts

**Bricklayer (Tends to)**

- 19.01 Cuts masonry units
- 19.02 Assists with installation of lintels and rough bucks
- 19.03 Washes masonry units
- 19.04 Installs refractory materials
- 19.05 Uses fireproofing materials

**Bricklayer (Tends to)**

- 19.01 Cuts masonry units
- 19.02 Assists with installation of lintels and rough bucks
- 19.03 Washes masonry units
- 19.04 Installs refractory materials
- 19.05 Uses fireproofing materials

**Utility Piping Installations**

- 20.01 Installs pipe for water systems
- 20.02 Installs pipe for sanitary and storm sewer systems
- 20.03 Installs pipe for other utility infrastructure
- 20.04 Installs catch basins, utility vaults, weeping tile and maintenance holes
- 20.05 Modifies existing pipe
- 20.06 Assists with testing water, sanitary and storm sewer lines

**Utility Piping Installations**

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- 20.04 Installs catch basins, utility vaults, weeping tile and maintenance holes
- 20.05 Modifies existing pipe
- 20.06 Assists with testing water, sanitary and storm sewer lines

**Pipeline Activities**

- 21.01 Constructs right of ways
- 21.02 Performs pipeline installation
- 21.03 Performs pipeline maintenance

**Roadwork (Prepares and Builds)**

22.01 Prepares earth for right of way  
22.02 Places layers and road surface materials for roadwork  
22.03 Repairs road surfaces

**Roadwork (Prepares and Builds)**

22.01 Prepares earth for right of way  
22.02 Places layers and road surface materials for roadwork  
22.03 Repairs road surfaces

**Roadwork Components**

23.01 Installs barriers  
23.02 Installs road markings and signs  
23.03 Installs culverts

# Major Work Activity A - Performs common occupational skills

## Task A-1 Maintains safe and healthy workplace

### Task Descriptor

Construction craft workers must be able to recognize hazards and protect themselves and others. They must also protect property and the environment. They must participate in ensuring a healthy and inclusive workplace.

### A-1.01 Maintains safe work environment

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-1.01.01P	follow <b>safe work procedures</b>	<b>safe work procedures</b> are followed according to company policies, manufacturers' specifications, <b>industry standards and regulations</b>
A-1.01.02P	apply Workplace Hazardous Materials Information System <b>(WHMIS) procedures</b>	<b>WHMIS procedures</b> are applied according to manufacturers' specifications
A-1.01.03P	use <b>barrier equipment and structures</b>	<b>barrier equipment and structures</b> are used to isolate work area, to bring attention to potential hazardous situations, and to prevent entry of workers and public on site
A-1.01.04P	remove and signal <b>tripping hazards</b>	<b>tripping hazards</b> are removed when possible or made more visible with signage and caution tape according to company policies

Reference Code	Performance Criteria	Evidence of Attainment
A-1.01.05P	participate in jobsite-specific orientation prior to working on new jobsite	jobsite-specific orientation is attended prior to working on new jobsite according to client and company policies, and jurisdictional regulations
A-1.01.06P	participate in safety, Occupational Health and Safety (OHS), job hazard analysis (JHA) and toolbox/tailgate meetings	safety, OHS, JHA and toolbox/tailgate meetings are attended, and attendance is signed off according to jurisdictional regulations
A-1.01.07P	identify and report <b>hazards</b>	<b>hazards</b> are identified and reported according to company policies, <b>industry standards and regulations</b> to prevent incidents
A-1.01.08P	recognize and correct unsafe work practices, near misses or hazardous conditions	unsafe work practices, near misses or hazardous conditions are recognized and corrected according to company policies, <b>industry standards and regulations</b>
A-1.01.09P	identify location of <b>safety equipment</b>	location of <b>safety equipment</b> is identified according to site safety plan posted on project site

**Range of Variables (include, but not limited to)**

<b>safe work procedures</b>	fall protection, confined space, lock-out and tag-out, material handling, access and egress, control zones, rescue plan, work on or near water, select and wear appropriate PPE
<b>industry standards and regulations</b>	Canadian Standards Association (CSA), OHS, building codes (National Building Code [NBC], local), TDG, Joint Health and Safety Committees, site-specific (company or client), jurisdictional requirements
<b>WHMIS procedures</b>	record keeping of SDS; product identification, handling and disposal; use of PPE; medical response to contact with hazardous materials
<b>barrier equipment and structures</b>	barricades, signage, caution tape, ropes, chains, wires, rails, pylons, temporary fencing, enclosures
<b>tripping hazards</b>	debris, material, equipment

<b>hazards</b>	defective equipment, not tying off ladders, uncovered maintenance holes, open hatches, flammable fuels, exhaust gases, airborne particulates (dust, silica particles), high pressure hydraulic lines, flying abrasives and debris, blind spots, pedestrian traffic, obstacles, power lines, poor air circulation, melting tarpaulins, fires, leaks, wildlife, insects, falling trees, weather, hazardous materials, working from heights, falling objects, struck by objects, open excavations, mobile equipment, poor visibility, cave-ins, electrocution, shock, burns, impalement, pinch/crush points, sharp objects (cuts, abrasions)
<b>safety equipment</b>	eye wash stations, first aid kits and rooms, decontamination showers, fire extinguishers, caution tape, barricades, fall arrest equipment, tool lanyards, confined space rescue equipment

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-1.01.01L	demonstrate knowledge of maintaining safe work environment	<ul style="list-style-type: none"> <li>a. identify <b>barrier equipment and structures</b>, and describe their characteristics and applications</li> <li>b. describe <b>WHMIS procedures</b>, and describe their characteristics and applications</li> <li>c. describe workers' rights and responsibilities of workplace parties</li> </ul>
A-1.01.02L	demonstrate knowledge of procedures to maintain safe work environment	<ul style="list-style-type: none"> <li>a. identify <b>safe work procedures</b>, and describe their characteristics and applications</li> <li>b. describe procedures to install <b>barrier equipment and structures</b></li> <li>c. identify <b>hazards</b> and describe associated reporting procedures</li> <li>d. describe procedures to locate SDS documents and safety equipment</li> <li>e. describe procedures for Transportation of Dangerous Goods (TDG)</li> <li>f. describe emergency procedures and muster area</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
A-1.01.03L	demonstrate knowledge of <b>training and certification requirements</b> for maintaining safe work environment	a. identify <b>training and certification requirements</b> to maintain safe work environment
A-1.01.04L	demonstrate knowledge of regulatory requirements for maintaining safe work environment	a. identify safety manuals, codes of practice, <b>industry standards and regulations</b> for maintaining safe work environment

**Range of Variables (include, but not limited to)**

<b>barrier equipment and structures</b>	barricades, signage, caution tape, ropes, chains, wires, rails, pylons, temporary fencing, enclosures
<b>WHMIS procedures</b>	record keeping of SDS; product identification, handling and disposal; use of PPE; medical response to contact with hazardous materials
<b>safe work procedures</b>	fall protection, confined space, lock-out and tag-out, material handling, access and egress, control zones, rescue plan, work on or near water, select and wear appropriate PPE
<b>hazards</b>	defective equipment, not tying off ladders, uncovered maintenance holes, open hatches, flammable fuels, exhaust gases, airborne particulates (dust, silica particles), high pressure hydraulic lines, flying abrasives and debris, blind spots, pedestrian traffic, obstacles, power lines, poor air circulation, melting tarpaulins, fires, leaks, wildlife, insects, falling trees, weather, hazardous materials, working from heights, falling objects, struck by objects, open excavations, mobile equipment, poor visibility, cave-ins, electrocution, shock, burns, impalement, pinch/crush points, sharp objects (cuts, abrasions)
<b>training and certification requirements</b>	traffic control, fall protection, working at heights, confined space, TDG, first aid, stationary and mobile elevated work platform (MEWP), mobile equipment, lock-out/tag-out, trench safety, propane heating (CHO <sub>2</sub> ) and propane cylinder exchange, jurisdictional safety training, safety watch training
<b>industry standards and regulations</b>	Canadian Standards Association (CSA), OHS, building codes (National Building Code [NBC], local), TDG, Joint Health and Safety Committees, site-specific (company or client), jurisdictional requirements

## 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	yes	NV	yes	NV	yes	yes	yes	yes	yes	ND	NV	ND

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-1.02.01P	select and use <b>PPE</b> and <b>safety equipment</b>	<b>PPE</b> and <b>safety equipment</b> are selected and used according to task, manufacturers' specifications, OHS and jurisdictional regulations, and jobsite specifications
A-1.02.02P	inspect <b>PPE</b> and <b>safety equipment</b>	<b>PPE</b> and <b>safety equipment</b> are inspected for damage and defects
A-1.02.03P	store <b>PPE</b> and <b>safety equipment</b>	<b>PPE</b> and <b>safety equipment</b> are stored according to manufacturers' specifications
A-1.02.04P	tag defective <b>PPE</b> and <b>safety equipment</b> , and remove from service	defective <b>PPE</b> and <b>safety equipment</b> are tagged and removed from service according to manufacturers' specifications and company policies
A-1.02.05P	verify certification of <b>PPE</b> and <b>safety equipment</b> prior to use	certification of <b>PPE</b> and <b>safety equipment</b> is verified prior to use and documented
A-1.02.06P	maintain <b>PPE</b> and <b>safety equipment</b>	<b>PPE</b> and <b>safety equipment</b> are maintained according to manufacturers' specifications and company policies
A-1.02.07P	use <b>fall protection equipment</b>	<b>fall protection equipment</b> is used according to manufacturers' specifications, site specifications and jurisdictional regulations

## Range of Variables (include, but not limited to)

<b>PPE</b>	high-visibility vests, eye protection, safety boots, hard hats, fall protection equipment, hearing protection, respirators, gloves, face shields, coveralls, flame-retardant clothing, human augmentation and exoskeleton devices
<b>safety equipment</b>	eye wash stations, first aid kits and rooms, decontamination showers, fire extinguishers, caution tape, barricades, tie-off points, tool lanyards
<b>fall protection equipment</b>	harnesses, lanyards, restraining cables, rope grabs, lifelines (static, self-retracting), anchorage, softeners

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-1.02.01L	demonstrate knowledge of <b>PPE</b> and <b>safety equipment</b> , their characteristics, applications and limitations	<ul style="list-style-type: none"> <li>a. identify types of <b>PPE</b> and <b>safety equipment</b>, and describe their characteristics, applications and limitations</li> <li>b. describe operating principles of <b>safety equipment</b></li> <li>c. interpret information pertaining to <b>PPE</b> and <b>safety equipment</b> found in manufacturers' specifications</li> </ul>
A-1.02.02L	demonstrate knowledge of procedures to select and use <b>PPE</b> and <b>safety equipment</b>	<ul style="list-style-type: none"> <li>a. describe procedures to select and use <b>PPE</b> and <b>safety equipment</b></li> <li>b. describe procedures to inspect <b>PPE</b> and <b>safety equipment</b></li> <li>c. describe procedures to maintain <b>PPE</b> and <b>safety equipment</b></li> <li>d. describe procedures to tag and remove from service defective or damaged <b>PPE</b> and <b>safety equipment</b></li> </ul>
A-1.02.03L	demonstrate knowledge of training and certification requirements for <b>fall protection equipment</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements for <b>fall protection equipment</b></li> </ul>
A-1.02.04L	demonstrate knowledge of regulatory requirements for <b>PPE</b> and <b>safety equipment</b>	<ul style="list-style-type: none"> <li>a. identify safety manuals, <b>industry standards and regulations</b> for <b>PPE</b> and <b>safety equipment</b></li> </ul>

## Range of Variables (include, but not limited to)

<b>PPE</b>	high-visibility vests, eye protection, safety boots, hard hats, fall protection equipment, hearing protection, respirators, gloves, face shields, coveralls, flame-retardant clothing, human augmentation and exoskeleton devices
<b>safety equipment</b>	eye wash stations, first aid kits and rooms, decontamination showers, fire extinguishers, caution tape, barricades, tie-off points, tool lanyards
<b>fall protection equipment</b>	harnesses, lanyards, restraining cables, rope grabs, lifelines (static, self-retracting), anchorage, softeners
<b>industry standards and regulations</b>	CSA, OHS, building codes (NBC, local), site-specific (company or client), jurisdictional regulations

## A-1.03 Participates in healthy and respectful work environment

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

### Skills

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
A-1.03.01P	perform self-assessment of physical and mental health	self-assessment of physical and mental health is performed, and signs and symptoms of fatigue and stress are identified
A-1.03.02P	identify <b>supports and resources</b> for personal mental health	<b>supports and resources</b> for personal mental health are identified
A-1.03.03P	identify <b>techniques to manage health and wellness</b>	<b>techniques to manage health and wellness</b> are identified
A-1.03.04P	assess <b>personal job satisfaction</b>	<b>personal job satisfaction</b> is assessed, and concerns are discussed with management
A-1.03.05P	create plan to manage work-life balance	plan is created to manage work-life balance and discussed with supervisors

Reference Code	Performance Criteria	Evidence of Attainment
A-1.03.06P	support and promote anti- <b>harassment</b> and anti- <b>discrimination</b> practices in workplace	workplace is <b>harassment</b> and <b>discrimination</b> -free

**Range of Variables (include, but not limited to)**

<b>supports and resources</b>	professional networks and associations, addiction and rehabilitation services, collaboration with colleagues and community members, counselling, mentoring, peer support groups
<b>techniques to manage health and wellness</b>	practicing techniques for remaining physically, mentally and emotionally “fit for work”; managing personal and work life; recognizing effects and consequences of alcohol, over-the-counter drugs, prescription drugs or illegal drugs before, during and after work; using personal hygiene habits
<b>personal job satisfaction</b>	financial, hours, flexibility, supports, working conditions
<b>harassment</b>	as defined by the Canadian and jurisdictional Human Rights Commissions
<b>discrimination</b>	as defined by the Canadian Human Rights Act and jurisdictional human rights laws

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
A-1.03.01L	demonstrate knowledge of personal health and well-being	<ul style="list-style-type: none"> <li>a. describe how personal health and well-being impacts professional practice and healthy work environments</li> <li>b. identify and describe physical and emotional requirements of trade</li> <li>c. identify workplace stressors</li> <li>d. describe elements of healthy organizational cultures and importance of sense of collaboration and community</li> <li>e. identify <b>behaviors</b> that affect physical and mental health</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
A-1.03.02L	demonstrate knowledge of techniques to manage personal health and well-being	<ul style="list-style-type: none"> <li>a. describe stress and time management techniques</li> <li>b. describe <b>techniques to manage health and wellness</b></li> </ul>
A-1.03.03L	demonstrate knowledge of professionalism and <b>professional ethics</b>	<ul style="list-style-type: none"> <li>a. identify characteristics and purpose of professionalism and <b>professional ethics</b></li> <li>b. describe <b>factors</b> that impact professionalism</li> <li>c. identify <b>elements of codes of ethics, codes of conduct and other professional standards</b>, and describe their characteristics and applications</li> </ul>
A-1.03.04L	demonstrate knowledge of value of diversity, equity, inclusion and belonging in workplace	<ul style="list-style-type: none"> <li>a. define diversity and differences between individuals</li> <li>b. define equity and importance of individual's access to same opportunities and resources</li> <li>c. define inclusion and creation of respectful work environments</li> <li>d. identify communication that constitutes <b>harassment and discrimination</b></li> </ul>

**Range of Variables (include, but not limited to)**

<b>behaviors</b>	diet, fitness, sleep, managing stress and emotions
<b>techniques to manage health and wellness</b>	practicing techniques for remaining physically, mentally and emotionally "fit for work"; managing personal and work life; recognizing effects and consequences of alcohol, over-the-counter drugs, prescription drugs or illegal drugs before, during and after work; using personal hygiene habits
<b>professional ethics</b>	are personal and/or corporate standards of behavior expected by professionals; values and guiding principles to guide individuals in performing job functions
<b>factors</b>	presentation of self (appearance, hygiene), communication (verbal, written, body language, social media profile), conduct

<b>elements of codes of ethics, codes of conduct and other professional standards</b>	professional obligations; how to engage in practice in professional ways, signals accountability to public; maintain public trust and credibility of profession; defines misconduct; support and promote anti-harassment and anti-discrimination practices
<b>harassment</b>	as defined by Canadian and jurisdictional Human Rights Commissions
<b>discrimination</b>	as defined by Canadian Human Rights Act and jurisdictional human rights laws

## Task A-2 Uses and maintains tools and equipment

### Task Descriptor

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

### A-2.01 Uses hand, pneumatic, power and powder-actuated tools

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

#### Skills

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
A-2.01.01P	select tools	tools are selected according to task
A-2.01.02P	clean tools	tools are cleaned according to manufacturers' specifications
A-2.01.03P	organize tools by grouping like tools together	tools are organized by grouping like-tools together
A-2.01.04P	sharpen hand tools	hand tools are sharpened according to manufacturers' specifications
A-2.01.05P	store tools	tools are stored according to manufacturers' specifications, and company policies and specifications

Reference Code	Performance Criteria	Evidence of Attainment
A-2.01.06P	replace <b>components</b>	<b>components</b> are replaced according to manufacturers' specifications
A-2.01.07P	inspect tools for wear, damage and defects, and tag tools designated for removal	tools are inspected for wear, damage and defects, and tagged for removal from service according to company policies
A-2.01.08P	lubricate moving parts	moving parts are lubricated according to manufacturers' specifications
A-2.01.09P	verify battery packs are charged	battery packs are charged

**Range of Variables (include, but not limited to)**

<b>components</b>	springs, bits, blades, bolts
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**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
A-2.01.01L	demonstrate knowledge of hand tools, pneumatic tools, power tools and powder-actuated tools, their <b>components</b> , characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify types of hand tools, pneumatic tools, power tools and powder-actuated tools, and their <b>components</b>, and describe their characteristics and applications</li> <li>b. describe operating principles of hand tools, pneumatic tools, power tools and powder-actuated tools</li> <li>c. interpret information pertaining to hand tools, pneumatic tools, power tools and powder-actuated tools found in manufacturers' specifications</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
A-2.01.02L	demonstrate knowledge of procedures to use hand tools, pneumatic tools, power tools and powder-actuated tools	a. describe procedures to use hand tools, pneumatic tools, power tools and powder-actuated tools b. describe procedures to inspect hand tools, pneumatic tools, power tools and powder-actuated tools c. describe procedures to maintain hand tools, pneumatic tools, power tools and powder-actuated tools d. describe procedures to store hand tools, pneumatic tools, power tools and powder-actuated tools
A-2.01.03L	demonstrate knowledge of training and certification requirements to use powder-actuated tools	a. identify training and certification requirements to use powder-actuated tools

**Range of Variables (include, but not limited to)**

<b>components</b>	springs, bits, blades, bolts
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## A-2.02 Uses rigging and hoisting equipment

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-2.02.01P	determine <b>load</b> weights	<b>load</b> weights are determined according to industry standards
A-2.02.02P	identify <b>load</b> capacity of <b>rigging and hoisting equipment</b>	<b>load</b> capacity is identified according to tags on <b>rigging and hoisting equipment</b> or manufacturers' specifications

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
A-2.02.03P	select <b>rigging and hoisting equipment</b>	<b>rigging and hoisting equipment</b> is selected according to task and manufacturers' specifications
A-2.02.04P	inspect <b>rigging and hoisting equipment</b> for wear, damage and defects, and tag equipment designated for removal	<b>rigging and hoisting equipment</b> is inspected for wear, damage and defects, and faulty equipment is removed and tagged according to manufacturers' specifications, company policies and jurisdictional regulations
A-2.02.05P	rig <b>load</b>	<b>load</b> is rigged according to <b>factors</b> and industry standards, and <b>load</b> is stable
A-2.02.06P	control <b>load</b>	<b>load</b> is controlled using tag lines
A-2.02.07P	maintain <b>rigging and hoisting equipment</b>	<b>rigging and hoisting equipment</b> is maintained according to manufacturers' specifications and company policies
A-2.02.08P	store <b>rigging and hoisting equipment</b>	<b>rigging and hoisting equipment</b> is stored according to manufacturers' specifications and company policies

**Range of Variables (include, but not limited to)**

<b>rigging and hoisting equipment</b>	chains, cradles, spreader bars, cables, shackles, softeners, tag lines, swivel hooks, turnbuckles, come-alongs, chain falls, grip hoists, straps, slings, ropes, clutches, pulleys
<b>loads</b>	liquid, reinforcing steel, fly tables, tilt-up panels, scaffolding, equipment, machines, construction building materials
<b>factors</b>	designated lift points, stability triangle, calculations, sling configurations, weather

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-2.02.01L	demonstrate knowledge of <b>rigging and hoisting equipment</b> , their characteristics, applications, limitations and operation	<ul style="list-style-type: none"> <li>a. identify types of <b>rigging and hoisting equipment</b>, and describe their characteristics, applications and limitations</li> <li>b. describe operating principles of <b>rigging and hoisting equipment</b></li> <li>c. interpret information pertaining to <b>rigging and hoisting equipment</b> found in manufacturers' specifications</li> </ul>
A-2.02.02L	demonstrate knowledge of procedures to use <b>rigging and hoisting equipment</b>	<ul style="list-style-type: none"> <li>a. describe procedures to use <b>rigging and hoisting equipment</b></li> <li>b. describe procedures to inspect <b>rigging and hoisting equipment</b></li> <li>c. describe procedures to maintain <b>rigging and hoisting equipment</b></li> <li>d. describe procedures to store <b>rigging and hoisting equipment</b></li> </ul>
A-2.02.03L	demonstrate knowledge of rigging and hoisting practices	<ul style="list-style-type: none"> <li>a. identify types of <b>loads</b>, and describe their characteristics and applications</li> <li>b. explain <b>load</b> radius and center of gravity</li> <li>c. explain rated capacity of hardware</li> <li>d. explain working <b>load</b> limits</li> <li>e. identify <b>factors</b> to consider when rigging <b>loads</b></li> </ul>
A-2.02.04L	demonstrate knowledge of training and certification requirements to use <b>rigging and hoisting equipment</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to use <b>rigging and hoisting equipment</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
A-2.02.05L	demonstrate knowledge of regulatory requirements pertaining to <b>rigging and hoisting equipment</b>	a. identify codes, industry standards and regulations pertaining to <b>rigging and hoisting equipment</b>

**Range of Variables (include, but not limited to)**

<b>rigging and hoisting equipment</b>	chains, cradles, spreader bars, cables, shackles, softeners, tag lines, swivel hooks, turnbuckles, come-alongs, chain falls, grip hoists, straps, slings, ropes, clutches, pulleys
<b>loads</b>	liquid, reinforcing steel, fly tables, tilt-up panels, scaffolding, equipment, machines, construction building materials
<b>factors</b>	designated lift points, stability triangle, calculations, sling configurations, weather

## A-2.03 Uses stationary and portable equipment

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-2.03.01P	select <b>stationary and portable equipment</b> , and their <b>components</b>	<b>stationary and portable equipment</b> , and their <b>components</b> are selected according to task
A-2.03.02P	place, set up and secure <b>stationary and portable equipment</b>	<b>stationary and portable equipment</b> are placed, set up and secured in well-ventilated area and on level ground
A-2.03.03P	operate <b>stationary and portable equipment</b>	<b>stationary and portable equipment</b> are operated according to manufacturers' specifications
A-2.03.04P	identify hazards of using <b>stationary and portable equipment</b>	hazards of using <b>stationary and portable equipment</b> are identified and mitigated

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
A-2.03.05P	check, monitor and maintain <b>fluids</b>	<b>fluids</b> are checked, monitored and maintained according to manufacturers' specifications
A-2.03.06P	complete daily maintenance logbooks	daily maintenance logbooks are completed according to company policies and site specifications
A-2.03.07P	inspect and monitor <b>stationary and portable equipment</b> , and <b>components</b> for <b>damage and faults</b>	<b>stationary and portable equipment</b> , and <b>components</b> are inspected and monitored for <b>damage and faults</b>
A-2.03.08P	start diesel and gasoline engines	diesel and gasoline engines are started according to manufacturers' specifications
A-2.03.09P	shut down <b>stationary and portable equipment</b>	<b>stationary and portable equipment</b> are shut down according to manufacturers' specifications
A-2.03.10P	store and maintain <b>stationary and portable equipment</b> according to manufacturers' specifications	<b>stationary and portable equipment</b> are stored and maintained according to manufacturers' specifications and company policies

**Range of Variables (include, but not limited to)**

<b>stationary and portable equipment</b>	water pumps, concrete pumps, heaters, generators, compressors, light towers, hydraulic power packs
<b>components</b>	electrical cords, hoses, shut-off valves, ground fault circuit interrupters (GFCI), whip check
<b>fluids</b>	oil, fuel, engine coolant, lubricant
<b>damage and faults</b>	abraded hoses, frayed electrical cords, leaks

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-2.03.01L	demonstrate knowledge of <b>stationary and portable equipment</b> , their <b>components</b> , characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify types of <b>stationary and portable equipment</b>, and their <b>components</b>, and describe their characteristics and applications</li> <li>b. describe operating principles of <b>stationary and portable equipment</b>, and their <b>components</b></li> <li>c. interpret information pertaining to <b>stationary and portable equipment</b>, and their <b>components</b> found in manufacturers' specifications</li> </ul>
A-2.03.02L	demonstrate knowledge of procedures to use <b>stationary and portable equipment</b>	<ul style="list-style-type: none"> <li>a. describe procedures to set up and secure <b>stationary and portable equipment</b></li> <li>b. describe procedures to use <b>stationary and portable equipment</b></li> <li>c. describe procedures to inspect and monitor <b>stationary and portable equipment</b>, and their <b>components</b></li> <li>d. describe procedures to maintain <b>stationary and portable equipment</b>, and their <b>components</b></li> <li>e. describe procedures to shut down and store <b>stationary and portable equipment</b>, and their <b>components</b></li> </ul>
A-2.03.03L	demonstrate knowledge of regulatory requirements pertaining to use of <b>stationary and portable equipment</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to use of <b>stationary and portable equipment</b></li> </ul>
A-2.03.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

## Range of Variables (include, but not limited to)

<b>stationary and portable equipment</b>	water pumps, concrete pumps, heaters, generators, compressors, light towers, hydraulic power packs
<b>components</b>	electrical cords, hoses, shut-off valves, ground fault circuit interrupters (GFCI), whip check

## A-2.04 Uses media blasting equipment

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-2.04.01P	select media blasting equipment, <b>components</b> and <b>materials</b>	media blasting equipment, <b>components</b> and <b>materials</b> are selected according to task
A-2.04.02P	identify hazards using media blasting equipment	hazards using media blasting equipment are identified and controlled
A-2.04.03P	operate media blasting equipment	media blasting equipment is operated according to manufacturers' specifications and using ventilation hood
A-2.04.04P	establish and adjust abrasive and airflow mixture	abrasive and airflow mixture is established and adjusted according to task requirements
A-2.04.05P	inspect and monitor media blasting equipment and <b>components</b> for damage and faults	media blasting equipment and <b>components</b> are inspected and monitored for damage and faults
A-2.04.06P	identify containment and safe work area for media blasting	containment and safe work area are identified for media blasting
A-2.04.07P	coordinate use of media blasting equipment with pot attendant for operating and shut-down procedures	use of media blasting equipment is coordinated with pot attendant for operating and shut-down procedures according to manufacturers' specifications

Reference Code	Performance Criteria	Evidence of Attainment
A-2.04.08P	maintain media blasting equipment	media blasting equipment is maintained according to manufacturers' specifications
A-2.04.09P	store media blasting equipment, pot and abrasives	media blasting equipment, pot and abrasives are stored according to manufacturers' specifications and company policies

**Range of Variables (include, but not limited to)**

<b>components</b>	hoses, nozzles, abrasives, shut-off valves, pots
<b>materials</b>	walnut shell, silica sand, caustic soda, crushed glass

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
A-2.04.01L	demonstrate knowledge of media blasting equipment, their <b>components</b> and <b>materials</b> , characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify media blasting equipment and their <b>components</b> and <b>materials</b>, and describe their characteristics and applications</li> <li>b. describe operating principles of media blasting equipment and their <b>components</b> and <b>materials</b></li> <li>c. interpret information pertaining to media blasting equipment and their <b>components</b> and <b>materials</b> found in manufacturers' specifications</li> <li>d. identify and describe hazardous byproducts resulting from <b>materials</b> being blasted</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
A-2.04.02L	demonstrate knowledge of procedures to use media blasting equipment	a. describe procedures to operate media blasting equipment b. describe procedures to inspect and monitor media blasting equipment and their <b>components</b> and <b>materials</b> c. describe procedures to maintain media blasting equipment d. describe procedures to shut down media blasting equipment e. describe procedures to store media blasting equipment
A-2.04.03L	demonstrate knowledge of training and certification requirements to operate media blasting equipment	a. identify training and certification requirements to operate media blasting equipment
A-2.04.04L	demonstrate knowledge of regulatory requirements pertaining to operation of media blasting equipment	a. identify codes, industry standards and regulations pertaining to operation of media blasting equipment
A-2.04.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>components</b>	hoses, nozzles, abrasives, shut-off valves, pots
<b>materials</b>	walnut shell, silica sand, caustic soda, crushed glass

## A-2.05 Uses mobile equipment

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-2.05.01P	select and operate <b>mobile equipment</b>	<b>mobile equipment</b> is selected according to task and operated according to manufacturers' specifications
A-2.05.02P	inspect and monitor <b>mobile equipment</b> and components for <b>damage and faults</b>	<b>mobile equipment</b> and components are inspected and monitored for <b>damage and faults</b>
A-2.05.03P	complete daily maintenance logbooks	daily maintenance logbooks are completed according to company policies and site specifications
A-2.05.04P	check, monitor and maintain <b>fluids</b>	<b>fluids</b> are checked, monitored and maintained according to manufacturers' specifications
A-2.05.05P	maintain <b>mobile equipment</b>	<b>mobile equipment</b> is maintained according to manufacturers' specifications
A-2.05.06P	identify hazards using <b>mobile equipment</b>	hazards using <b>mobile equipment</b> are identified and mitigated
A-2.05.07P	work with spotters	spotters are used to mitigate hazards according to industry standards
A-2.05.08P	start and shut down diesel and gasoline engines	diesel and gasoline engines are started and shut down according to manufacturers' specifications
A-2.05.09P	store <b>mobile equipment</b> and components	<b>mobile equipment</b> and components are stored according to manufacturers' specifications and company policies

**Range of Variables (include, but not limited to)**

<b>mobile equipment</b>	skid steers, mini excavators, telescopic forklifts (telehandlers), MEWP, forklifts, directional drills
<b>damage and faults</b>	wear and tear of hydraulic hoses, leaks, tire condition, track condition
<b>fluids</b>	oil, fuel, engine coolant, lubricant

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
A-2.05.01L	demonstrate knowledge of <b>mobile equipment</b> , their components, characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify types of <b>mobile equipment</b> and their components, and describe their characteristics and applications</li> <li>b. describe operating principles of <b>mobile equipment</b> and their components</li> <li>c. identify <b>fluids</b> used in <b>mobile equipment</b></li> <li>d. interpret information pertaining to <b>mobile equipment</b> and their components found in manufacturers' specifications</li> </ul>
A-2.05.02L	demonstrate knowledge of procedures to use <b>mobile equipment</b>	<ul style="list-style-type: none"> <li>a. describe procedures to operate <b>mobile equipment</b></li> <li>b. describe procedures to inspect and monitor <b>mobile equipment</b> and their components</li> <li>c. identify <b>damage and faults</b> found in <b>mobile equipment</b></li> <li>d. describe procedures to maintain <b>mobile equipment</b> and their components</li> <li>e. describe procedures to start and shut down <b>mobile equipment</b> and their components</li> <li>f. describe procedures to store <b>mobile equipment</b> and their components</li> </ul>

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
A-2.05.03L	demonstrate knowledge of training and certification requirements to operate <b>mobile equipment</b>	a. identify training and certification requirements to operate <b>mobile equipment</b>
A-2.05.04L	demonstrate knowledge of regulatory requirements pertaining to operation of <b>mobile equipment</b>	a. identify codes, industry standards and regulations pertaining to operation of <b>mobile equipment</b>
A-2.05.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>mobile equipment</b>	skid steers, mini excavators, telescopic forklifts (telehandlers), MEWP, forklifts, directional drills
<b>fluids</b>	oil, fuel, engine coolant, lubricant
<b>damage and faults</b>	wear and tear of hydraulic hoses, leaks, tire condition, track condition

## Task A-3 Organizes work

### Task Descriptor

Construction craft workers must use and interpret a variety of documents on a daily basis to plan their tasks and organize their work. They handle construction materials in a safe and efficient manner to ensure that they are well organized and easily accessible. They perform housekeeping tasks to maintain clean and tidy worksites.

### A-3.01 Uses documentation

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-3.01.01P	complete <b>work-related records</b>	<b>work-related records</b> are completed according to jurisdictional regulations and company policies
A-3.01.02P	interpret <b>drawings</b>	<b>drawings</b> are interpreted
A-3.01.03P	interpret work orders	work orders are interpreted
A-3.01.04P	locate and remain current with <b>documentation</b>	<b>documentation</b> is located and read regularly to remain current
A-3.01.05P	reference manufacturers' specifications and safe operating procedures for equipment	manufacturers' specifications and safe operating procedures for equipment are referenced
A-3.01.06P	sketch diagrams	diagrams are sketched according to <b>drawings</b> and task to visualize work to be done
A-3.01.07P	verify jobsite work permits for <b>activities</b>	jobsite work permits for <b>activities</b> are obtained according to jurisdictional regulations and company policies

### Range of Variables (include, but not limited to)

<b>work-related records</b>	incident reports, daily logs, jurisdiction having authority, pre-job safety instructions (PSI), pre-job inspections, as-built information
<b>drawings</b>	blueprints, engineered drawings, sketches
<b>documentation</b>	drawings, work records, JHA, codes, regulations (e.g., OHS), SDS, safe work permits, job procedure manuals, manufacturers' specifications, grade sheets, survey note keeping
<b>activities</b>	excavation, hot work, confined space entry (CSE)

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-3.01.01L	demonstrate knowledge of <b>documentation</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>documentation</b>, and describe their characteristics and applications</li> <li>b. identify <b>formats of documents</b></li> </ul>
A-3.01.02L	demonstrate knowledge of procedures to use and interpret <b>documentation</b>	<ul style="list-style-type: none"> <li>a. describe procedures to use and interpret <b>documentation</b></li> <li>b. describe procedures to complete <b>work-related records</b></li> <li>c. describe procedures to verify and obtain work permits for <b>activities</b></li> </ul>
A-3.01.03L	demonstrate knowledge of regulatory requirements pertaining to <b>work-related records</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to <b>work-related records</b></li> </ul>
A-3.01.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

### Range of Variables (include, but not limited to)

<b>documentation</b>	drawings, work records, JHA, codes, regulations (e.g., OHS), SDS, safe work permits, job procedure manuals, manufacturers' specifications, grade sheets, survey note keeping
<b>formats of documents</b>	paper, digital
<b>work-related records</b>	incident reports, daily logs, jurisdiction having authority, pre-job safety instructions (PSI), pre-job inspections, as-built information
<b>activities</b>	excavation, hot work, confined space entry (CSE)

## A-3.02 Handles construction materials

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-3.02.01P	manually lift <b>construction materials</b>	<b>construction materials</b> are manually lifted according to OHS regulations and industry standards to avoid personal injury and damage to materials
A-3.02.02P	mechanically lift <b>construction materials</b>	<b>construction materials</b> are mechanically lifted using <b>equipment</b> according to manufacturers' specifications, company policies and jurisdictional regulations to avoid personal injury and damage to materials
A-3.02.03P	secure <b>construction materials</b> for transport	<b>construction materials</b> are secured for transport according to company policies, jurisdictional regulations, manufacturers' specifications and site conditions to avoid personal injury and damage to materials
A-3.02.04P	check <b>construction materials</b> received	<b>construction materials</b> are checked for damages and defects, and quantities are verified against work orders and specifications
A-3.02.05P	use <b>construction materials</b>	<b>construction materials</b> are used according to pre-job inspections, company policies and jurisdictional regulations
A-3.02.06P	store <b>construction materials</b>	<b>construction materials</b> are stored for easy access and egress, to prevent damage, deterioration, discharge or theft according to company policies, jurisdictional regulations, manufacturers' specifications and site conditions

Reference Code	Performance Criteria	Evidence of Attainment
A-3.02.07P	maintain continuous supply of <b>construction materials</b>	supply of <b>construction materials</b> is maintained continuously to ensure efficient flow of work
A-3.02.08P	dispose of waste <b>construction materials</b>	waste <b>construction materials</b> are disposed of according to company policies, jurisdictional regulations and site conditions

**Range of Variables (include, but not limited to)**

<b>construction materials</b>	lumber, formwork, masonry products, concrete, soil, piping, scaffolding, propane cylinders, oxy-acetylene tanks
<b>equipment</b>	forklifts, wheelbarrows, telescopic forklifts (telehandlers), skid steers, mini excavators, concrete buggies, cranes

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
A-3.02.01L	demonstrate knowledge of procedures to handle <b>construction materials</b>	<ul style="list-style-type: none"> <li>a. identify <b>equipment</b> used to handle <b>construction materials</b>, and describe their procedures for use</li> <li>b. identify sources of information relevant to handling <b>construction materials</b></li> <li>c. describe hazards and considerations for handling <b>construction materials</b></li> <li>d. describe procedures to lift <b>construction materials</b> manually and mechanically</li> <li>e. describe effects of environmental and chemical exposure on workers from <b>construction materials</b></li> <li>f. describe procedures to store <b>construction materials</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
A-3.02.02L	demonstrate knowledge of training and certification requirements to handle <b>construction materials</b>	a. identify training and certification requirements to handle <b>construction materials</b>
A-3.02.03L	demonstrate knowledge of regulatory requirements pertaining to handling of <b>construction materials</b>	a. identify codes, industry standards and regulations pertaining to handling of <b>construction materials</b>
A-3.02.04L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>construction materials</b>	lumber, formwork, masonry products, concrete, soil, piping, scaffolding, propane cylinders, oxy-acetylene tanks
<b>equipment</b>	forklifts, wheelbarrows, telescopic forklifts (telehandlers), skid steers, mini excavators, concrete buggies, cranes

**A-3.03 Performs site housekeeping and maintenance**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
A-3.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
A-3.03.02P	pick up loose material	loose material is picked up for recycling or garbage
A-3.03.03P	control dust using <b>dust control measures</b>	dust is controlled using <b>dust control measures</b>

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
A-3.03.04P	clear walkways, platforms, entrances/exits, stairways and parking area of snow, ice, water and mud	walkways, platforms, entrances/exits, stairways and parking area are cleared of snow, ice, water and mud using sand and <b>tools and equipment</b>
A-3.03.05P	clean trailers and washrooms	trailers and washrooms are cleaned to maintain healthy environments for all workers
A-3.03.06P	supply fresh drinking water and maintain coolers for workers	fresh drinking water is supplied, and coolers are maintained for workers
A-3.03.07P	maintain spill kits and drip pans	spill kits and drip pans are maintained by keeping fully stocked in case of spill
A-3.03.08P	check, tag and replace fire extinguishers	fire extinguishers are checked, tagged and replaced as needed according to company policies, manufacturers' specifications and jurisdictional regulations

**Range of Variables (include, but not limited to)**

<b>dust control measures</b>	water, calcium, sweeping compound
<b>tools and equipment</b>	brooms, shovels, skid steers, garbage bins, water pumps

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
A-3.03.01L	demonstrate knowledge of procedures to perform site housekeeping and maintenance	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to perform site housekeeping and maintenance, and describe their procedures for use</li> <li>b. describe procedures to perform site housekeeping and maintenance</li> <li>c. describe procedures to dispose of and recycle materials</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
A-3.03.02L	demonstrate knowledge of regulatory requirements pertaining to site housekeeping and maintenance	a. identify codes, industry standards and regulations pertaining to site housekeeping and maintenance
A-3.03.03L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	brooms, shovels, skid steers, garbage bins, water pumps
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## Task A-4 Performs routine trade activities

### Task Descriptor

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.

### A-4.01 Erects hoarding/enclosures

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-4.01.01P	cover <b>hoarding/enclosures</b> with <b>materials</b>	<b>hoarding/enclosures</b> are covered with <b>materials</b> according to company policies and jurisdictional regulations

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
A-4.01.02P	secure <b>hoarding/enclosures</b> with <b>securing materials</b>	<b>hoarding/enclosures</b> are secured with <b>securing materials</b>
A-4.01.03P	install access and egress to <b>hoarding/enclosures</b>	access and egress to <b>hoarding/enclosures</b> are installed according to company policies, industry standards and engineered specifications
A-4.01.04P	provide heat and ventilation in <b>hoarding/enclosures</b>	heat and ventilation in <b>hoarding/enclosures</b> is provided according to jurisdictional regulations
A-4.01.05P	identify when <b>hoarding/enclosure</b> becomes a confined space	<b>hoarding/enclosure</b> is identified as a confined space, work is stopped, and work permit obtained
A-4.01.06P	dismantle <b>hoarding/enclosures</b>	<b>hoarding/enclosures</b> are dismantled according to company policies and industry standards

**Range of Variables (include, but not limited to)**

<b>hoarding/enclosures</b>	scaffolding, panels, reinforced polystyrene, insulated tarps
<b>materials</b>	insulated tarps, polyethylene, screening
<b>securing materials</b>	wire, nails, rope, cables, weights

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-4.01.01L	demonstrate knowledge of <b>hoarding/enclosures</b> , their characteristics and <b>applications</b>	<ul style="list-style-type: none"> <li>a. identify types of <b>hoarding/enclosures</b>, and describe their characteristics and <b>applications</b></li> <li>b. identify types of <b>materials</b> and <b>securing materials</b> used to cover and secure <b>hoarding/enclosures</b></li> <li>c. interpret information pertaining to <b>hoarding/enclosures</b> found on drawings and specifications</li> <li>d. describe impact of <b>weather conditions</b> on <b>hoarding/enclosure</b> installations</li> <li>e. identify <b>types of framework for hoarding/enclosures</b></li> </ul>
A-4.01.02L	demonstrate knowledge of procedures to erect <b>hoarding/enclosures</b>	<ul style="list-style-type: none"> <li>a. identify tools and equipment used to erect <b>hoarding/enclosures</b>, and describe their procedures for use</li> <li>b. describe procedures to erect <b>hoarding/enclosures</b></li> </ul>
A-4.01.03L	demonstrate knowledge of regulatory requirements pertaining to erection of <b>hoarding/enclosures</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to erection of <b>hoarding/enclosures</b></li> </ul>
A-4.01.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

## Range of Variables (include, but not limited to)

<b>hoarding/enclosures</b>	scaffolding, panels, reinforced polystyrene, insulated tarps
<b>applications (of hoarding/enclosures)</b>	enclosing scaffolding, concrete formwork and soil, electrical work, welding
<b>materials</b>	insulated tarps, polyethylene, screening
<b>securing materials</b>	wire, nails, rope, cables, weights
<b>weather conditions</b>	wind, snow, rain
<b>types of frameworks for hoarding/enclosures</b>	scaffolding, existing structures, wood

## A-4.02 Installs membranes

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

### Skills

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
A-4.02.01P	select and use tools and equipment	tools and equipment are selected and used according to task and manufacturers' specifications
A-4.02.02P	inspect walls for deformities prior to installation	walls are inspected for deformities prior to installation to ensure placement and adhesion
A-4.02.03P	prepare concrete	concrete is prepared using <b>methods</b> according to manufacturers' specifications
A-4.02.04P	apply <b>membranes</b>	<b>membranes</b> are applied using <b>methods</b> according to manufacturers' specifications
A-4.02.05P	protect <b>membranes</b> with <b>materials</b>	<b>membranes</b> are protected with <b>materials</b> according to job specifications and industry standards

### Range of Variables (include, but not limited to)

<b>methods (to prepare concrete)</b>	roughing up, washing, grinding high spots, priming
<b>membranes</b>	polyethylene, waterproofing membranes, landscaping fabric
<b>methods (to apply membranes)</b>	gluing, torching, spraying, nailing
<b>materials</b>	treated wood, expanded polystyrene (EPS) foam, fiberboard, soil, gravel, plastic

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-4.02.01L	demonstrate knowledge of <b>membranes</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>membranes</b>, and describe their characteristics and applications</li> <li>b. identify types of <b>materials</b> used to protect <b>membranes</b></li> <li>c. interpret information pertaining to <b>membranes</b> found on drawings and specifications</li> </ul>
A-4.02.02L	demonstrate knowledge of procedures and <b>methods</b> to apply <b>membranes</b>	<ul style="list-style-type: none"> <li>a. identify tools and equipment used to apply <b>membranes</b> and <b>materials</b>, and describe their procedures for use</li> <li>b. describe procedures to inspect walls prior to installation of <b>membranes</b></li> <li>c. describe procedures and <b>methods</b> to prepare concrete prior to installation of <b>membranes</b></li> <li>d. describe procedures and <b>methods</b> to apply <b>membranes</b> and <b>materials</b></li> </ul>
A-4.02.03L	demonstrate knowledge of manufacturers' training requirements to apply <b>membranes</b>	<ul style="list-style-type: none"> <li>a. identify manufacturers' training to apply <b>membranes</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
A-4.02.04L	demonstrate knowledge of regulatory requirements pertaining to application of <b>membranes</b>	a. identify codes, industry standards and regulations pertaining to application of <b>membranes</b>
A-4.02.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>membranes</b>	polyethylene, waterproofing membranes, landscaping fabric
<b>materials</b>	treated wood, expanded polystyrene (EPS) foam, fiberboard, soil, gravel, plastic
<b>methods (to apply membranes)</b>	gluing, torching, spraying, nailing
<b>methods (to prepare concrete)</b>	roughing up, washing, grinding high spots, priming

### A-4.03 Installs insulating materials

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-4.03.01P	select and use tools and equipment	tools and equipment are selected and used according to task, company policies and manufacturers' specifications
A-4.03.02P	cut, secure and tape <b>insulating materials</b>	<b>insulating materials</b> are cut, secured and taped according to manufacturers' and job specifications

Reference Code	Performance Criteria	Evidence of Attainment
A-4.03.03P	apply <b>insulating materials</b>	<b>insulating materials</b> are applied according to manufacturers' and job specifications

**Range of Variables (include, but not limited to)**

<b>insulating materials</b>	expanded polystyrene (EPS) foam, extruded polystyrene (XPS) foam, fireproofing materials, straw, fiberglass, insulating tarps
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**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
A-4.03.01L	demonstrate knowledge of <b>insulating materials</b> , their characteristics and <b>applications</b>	a. identify types of <b>insulating materials</b> and describe their characteristics and <b>applications</b> b. interpret information pertaining to <b>insulating materials</b> found on drawings and specifications
A-4.03.02L	demonstrate knowledge of procedures to install <b>insulating materials</b>	a. identify tools and equipment used to install <b>insulating materials</b> , and describe their procedures for use b. describe procedures to install <b>insulating materials</b>
A-4.03.03L	demonstrate knowledge of regulatory requirements pertaining to installation of <b>insulating materials</b>	a. identify codes, industry standards and regulations pertaining to installation of <b>insulating materials</b>
A-4.03.04L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>insulating materials</b>	expanded polystyrene (EPS) foam, extruded polystyrene (XPS) foam, fireproofing materials, straw, fiberglass, insulating tarps
<b>applications</b>	preventing underground piping and concrete from freezing, temperature control, walls and attics

## A-4.04 Establishes grades and elevations

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-4.04.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
A-4.04.02P	find <b>monuments and benchmarks</b>	<b>monuments and benchmarks</b> are found according to engineered drawings
A-4.04.03P	assist surveyor to establish sub-grade and final grade	sub-grade and final grade are established according to engineered drawings
A-4.04.04P	establish <b>temporary benchmarks</b>	<b>temporary benchmarks</b> are established according to company policies and industry standards
A-4.04.05P	set up elevations, slopes and layouts	elevations, slopes and layouts are set up according to engineered drawings using <b>temporary benchmarks</b>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	metal detectors, levels (builders', laser), GPS, total station
<b>monuments and permanent benchmarks</b>	brass cap, concrete structure, standard iron bar with cap, crosses in existing concrete structures
<b>temporary benchmarks</b>	marks on fire hydrants, nail and ribbon, grade stakes, crosses in existing concrete

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-4.04.01L	demonstrate knowledge of grades and elevations, their characteristics and <b>applications</b>	<ul style="list-style-type: none"> <li>a. identify grades and elevations, and describe their characteristics and <b>applications</b></li> <li>b. identify types of <b>temporary benchmarks, monuments and permanent benchmarks</b> and describe their characteristics and applications</li> <li>c. describe use of <b>temporary benchmarks, monuments and permanent benchmarks</b></li> <li>d. interpret information pertaining to grades and elevations found on drawings and specifications</li> </ul>
A-4.04.02L	demonstrate knowledge of procedures to establish grades and elevations	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to establish grades and elevations, and describe their procedures for use</li> <li>b. describe procedures to establish grades and elevations</li> <li>c. describe procedures to assist surveyor</li> <li>d. describe procedures to establish <b>temporary benchmarks</b></li> </ul>

### Range of Variables (include, but not limited to)

<b>applications</b>	roadwork, utilities, concrete placement
<b>temporary benchmarks</b>	marks on fire hydrants, nail and ribbon, grade stakes, crosses in existing concrete
<b>monuments and permanent benchmarks</b>	brass cap, concrete structure, standard iron bar with cap, crosses in existing concrete structures
<b>tools and equipment</b>	metal detectors, levels (builders', laser), GPS, total station

## A-4.05 Performs traffic control

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-4.05.01P	control pedestrian and vehicular traffic on work site	pedestrian and vehicular traffic is controlled on work site
A-4.05.02P	install temporary <b>barrier equipment and structures</b>	temporary <b>barrier equipment and structures</b> are installed according to job specifications, industry standards and jurisdictional regulations
A-4.05.03P	instruct and place traffic control persons	traffic control persons are instructed and placed according to jurisdictional regulations
A-4.05.04P	drive pilot vehicle through construction area, and communicate with traffic control persons by radio	pilot vehicle is driven through construction area, and traffic control persons are communicated with by radio to ensure flow of traffic
A-4.05.05P	set up detours and closures for vehicles and pedestrians	detours and closures for vehicles and pedestrians are set up according to job specifications and jurisdictional regulations

### Range of Variables (include, but not limited to)

<b>barrier equipment and structures</b>	barricades, signage, caution tape, rails, pylons, arrow boards, sign boards
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## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-4.05.01L	demonstrate knowledge of traffic control, their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>barrier equipment and structures</b> used for traffic control, and describe their characteristics and applications</li> <li>b. interpret information pertaining to traffic control found in specifications and jurisdictional regulations</li> <li>c. identify <b>worksites requiring traffic control</b></li> <li>d. describe role and importance of traffic control persons relating to traffic control</li> </ul>
A-4.05.02L	demonstrate knowledge of procedures to perform traffic control	<ul style="list-style-type: none"> <li>a. describe procedures to perform traffic control</li> <li>b. describe procedures to install <b>barrier equipment and structures</b></li> </ul>
A-4.05.03L	demonstrate knowledge of training and certification requirements to perform traffic control	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to perform traffic control</li> </ul>
A-4.05.04L	demonstrate knowledge of regulatory requirements pertaining to traffic control	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to traffic control</li> </ul>

### Range of Variables (include, but not limited to)

<b>barrier equipment and structures</b>	barricades, signage, caution tape, rails, pylons, arrow boards, sign boards
<b>worksites requiring traffic control</b>	roadwork, utility installations, concrete placement

## A-4.06 Installs permanent and temporary fencing

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-4.06.01P	select and use tools and equipment	tools and equipment are selected and used according to task and manufacturers' specifications
A-4.06.02P	select and place fencing for application	fencing is selected and placed according to engineered and job specifications
A-4.06.03P	secure <b>permanent posts and fencing</b>	<b>permanent posts and fencing</b> are secured using anchors and backfill materials according to engineered and manufacturers' specifications
A-4.06.04P	secure <b>temporary fencing</b>	<b>temporary fencing</b> is secured using existing structures, anchors and backfill materials to protect and secure workers and public according to job and site specifications
A-4.06.05P	construct temporary guardrails and covered walkways	temporary guardrails and covered walkways are constructed according to job specifications, industry standards and jurisdictional regulations

### Range of Variables (include, but not limited to)

<b>permanent posts and fencing</b>	wood, chain-link, sound barriers, metal, vinyl
<b>temporary fencing</b>	snow, silt, metal, wood, net, construction

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-4.06.01L	demonstrate knowledge of <b>permanent posts and fencing</b> , and <b>temporary fencing</b> , their characteristics and <b>applications</b>	<ul style="list-style-type: none"> <li>a. identify types of <b>permanent posts and fencing</b>, and describe their characteristics and <b>applications</b></li> <li>b. identify types of <b>temporary fencing</b>, and describe their characteristics and <b>applications</b></li> <li>c. interpret information pertaining to <b>permanent posts and fencing</b>, and <b>temporary fencing</b> found in specifications</li> </ul>
A-4.06.02L	demonstrate knowledge of procedures to install <b>permanent posts and fencing</b> , and <b>temporary fencing</b>	<ul style="list-style-type: none"> <li>a. identify tools and equipment used to install <b>permanent posts and fencing</b>, and <b>temporary fencing</b>, and describe their procedures for use</li> <li>b. describe procedures to install <b>permanent posts and fencing</b>, and <b>temporary fencing</b></li> </ul>
A-4.06.03L	demonstrate knowledge of regulatory requirements pertaining to <b>permanent posts and fencing</b> , and <b>temporary fencing</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to <b>permanent posts and fencing</b>, and <b>temporary fencing</b></li> </ul>
A-4.06.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

### Range of Variables (include, but not limited to)

<b>permanent posts and fencing</b>	wood, chain-link, sound barriers, metal, vinyl
<b>temporary fencing</b>	snow, silt, metal, wood, net, construction
<b>applications</b>	limiting access, environmental protection, security purposes

## Task A-5 Maintains continuous learning

### Task Descriptor

Construction craft workers must stay current on building science principles, sustainable practices and learn about new emerging technologies being introduced in the trade. They need to keep informed on new types of equipment, safety practices, industry procedures and materials.

### A-5.01 Upskills in new trade practices and procedures

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-5.01.01P	apply <b>continuous learning methods</b>	<b>continuous learning methods</b> are applied
A-5.01.02P	develop and maintain personal and professional development plan	personal and professional development plan is developed and maintained with established learning goals (short and long term) and time frames
A-5.01.03P	identify available <b>supports and resources</b> for learning	available <b>supports and resources</b> for learning are identified

#### Range of Variables (include, but not limited to)

<b>continuous learning methods</b>	actively engaging in performance review processes and taking action to address feedback; seeking out and actively participating in and embracing learning opportunities (i.e., seminars, webinars, trainings, podcasts, independent research); maintaining all required certifications and training; upgrading and maintaining computer and technology skills; sharing learning outcomes and concepts with others; transferring knowledge into practice
<b>supports and resources</b>	professional networks and associations, manufacturers' seminars, collaboration with colleagues and community members, counselling, mentoring, peer support groups, online resources, trade shows

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-5.01.01L	demonstrate knowledge of upskilling in new trade practices and procedures	<ul style="list-style-type: none"> <li>a. identify <b>continuous learning methods</b></li> <li>b. explain importance of staying current on new trade practices and procedures</li> <li>c. identify <b>supports and resources</b> for learning</li> </ul>
A-5.01.02L	demonstrate knowledge of personal and professional development plans	<ul style="list-style-type: none"> <li>a. identify <b>elements of a professional portfolio</b></li> <li>b. identify link between professionalism and continuous learning</li> <li>c. describe how to assess personal learning needs</li> <li>d. identify <b>factors</b> that may impact learning needs and goals</li> </ul>

### Range of Variables (include, but not limited to)

<b>continuous learning methods</b>	actively engaging in performance review processes and taking action to address feedback; seeking out and actively participating in and embracing learning opportunities (i.e., seminars, webinars, trainings, podcasts, independent research); maintaining all required certifications and training; upgrading and maintaining computer and technology skills; sharing learning outcomes and concepts with others; transferring knowledge into practice
<b>supports and resources</b>	professional networks and associations, manufacturers' seminars, collaboration with colleagues and community members, counselling, mentoring, peer support groups, online resources, trade shows
<b>elements of a professional portfolio</b>	resume, certificates, licenses, diplomas, degrees, transcripts, marketable skills, professional accomplishments, work samples, awards, references
<b>factors</b>	new technology, sector trends and practices, skills updating, legislative and regulatory changes

## A-5.02 Upskills in emerging technologies

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-5.02.01P	read <b>information</b> about latest advancements and emerging technologies	<b>information</b> about latest advancements and emerging technologies is read to stay informed
A-5.02.02P	attend seminars, webinars and information sessions	seminars, webinars and information sessions organized by equipment manufacturers, suppliers, unions and employers are attended
A-5.02.03P	share information with colleagues and management on new energy-efficient equipment and explain their advantages	information on new energy-efficient equipment is shared with colleagues and management, and advantages are explained

### Range of Variables (include, but not limited to)

<b>information</b>	manufacturers' literature, online resources, trade journals, magazines
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### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
A-5.02.01L	demonstrate knowledge of upskilling in emerging technologies	a. identify types of <b>information</b> on emerging technologies b. explain importance of staying current on emerging technologies

### Range of Variables (include, but not limited to)

<b>information</b>	manufacturers' literature, online resources, trade journals, magazines
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## Task A-6 Uses communication and mentoring techniques

### Task Descriptor

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

### A-6.01 Uses communication techniques

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
A-6.01.01P	demonstrate communication practices with individuals or in a group	instructions and messages are interpreted by all parties involved in communication
A-6.01.02P	listen using <b>active listening</b> practices	<b>active listening</b> practices are utilized
A-6.01.03P	speak clearly using correct industry terminology to ensure understanding	understanding of message is confirmed by both parties
A-6.01.04P	receive and respond to instructions	response to instructions indicates understanding
A-6.01.05P	receive and respond to feedback on work completed or performed	response to feedback indicates understanding and corrective measures are taken
A-6.01.06P	explain and provide feedback	explanation and feedback is provided, and task is carried out as directed
A-6.01.07P	communicate understanding and comfort level in performing trade tasks	opportunities for practice and gradual exposure to new tasks is offered and understanding is confirmed
A-6.01.08P	use questions to improve communication	questions are used to enhance understanding, on-the-job training and goal setting

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
A-6.01.09P	participate in safety and information meetings	safety and information meetings are attended, information is relayed to employees, and is applied
A-6.01.10P	send and receive <b>electronic messages</b>	<b>electronic messages</b> are sent and received using professionalism, plain language and clear expressions according to company policies and procedures
A-6.01.11P	use <b>communication systems</b> for control zones	<b>communication systems</b> are used for control zones

**Range of Variables (include, but not limited to)**

<b>active listening</b>	hearing, interpreting, reflecting, responding, paraphrasing
<b>electronic messages</b>	email, text messages
<b>communication systems</b>	handheld radios, international hand signals, posted signs, ribbons

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
A-6.01.01L	demonstrate knowledge of trade terminology	a. define terminology used in trade

Reference Code	Learning Outcomes	Learning Objectives
A-6.01.02L	demonstrate knowledge of effective communication practices	<ul style="list-style-type: none"> <li>a. describe importance of using effective verbal and non-verbal communication with <b>people in the workplace</b></li> <li>b. describe importance of teamwork</li> <li>c. identify <b>sources of information</b> to effectively communicate</li> <li>d. identify communication and <b>learning styles</b></li> <li>e. describe effective listening and speaking skills</li> <li>f. describe how to receive and give instructions effectively</li> <li>g. identify <b>personal responsibilities and attitudes</b> that contribute to on-the-job success</li> <li>h. identify communication that constitutes bullying, <b>harassment</b> and <b>discrimination</b></li> <li>i. identify communication styles appropriate to different systems and applications of <b>electronic messages</b></li> <li>j. identify <b>communication systems</b> used for control zones</li> </ul>

**Range of Variables (include, but not limited to)**

<b>people in the workplace</b>	other tradespeople, colleagues, apprentices, supervisors, clients, jurisdictional representatives, manufacturers, office administrators, pedestrians, civilians
<b>sources of information</b>	regulations, codes, OHS requirements, jurisdictional requirements, prints, drawings, specifications, company and client documentation
<b>learning styles</b>	visual, auditory, kinesthetic, read/write
<b>personal responsibilities and attitudes</b>	asking questions, working safely, accepting constructive feedback, time management and punctuality, respect for authority, good stewardship of materials, tools and property, efficient work practice
<b>harassment</b>	as defined by the Canadian and jurisdictional Human Rights Commissions
<b>discrimination</b>	as defined by the Canadian Human Rights Act and jurisdictional human rights laws

<b>electronic messages</b>	email, text messages
<b>communication systems</b>	handheld radios, international hand signals, posted signs, ribbons

## A-6.02 Uses mentoring techniques

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

### Skills

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
A-6.02.01P	identify and communicate learning objective and point of lesson	apprentice or learner can explain objective and point of lesson
A-6.02.02P	link lesson to other lessons and project	lesson order and unplanned learning opportunities are defined
A-6.02.03P	demonstrate performance of a skill to an apprentice or learner	<b>steps required to demonstrate a skill</b> are performed
A-6.02.04P	set up conditions required for apprentice or learner to practice a skill	<b>practice conditions</b> are set up so that skill can be practiced safely by apprentice or learner
A-6.02.05P	set up conditions where apprentice or learner feels comfortable communicating and asking questions	conditions are such that apprentice or learner feels comfortable communicating and asking questions
A-6.02.06P	recognize and discuss multiple possible techniques for performing trade tasks and options that may be best for apprentice or learner	multiple possible techniques for performing trade tasks and options that may be best for apprentice or learner are recognized and discussed
A-6.02.07P	assess apprentice or learner's ability to perform tasks with increasing independence	performance of apprentice or learner improves with practice to a point where task can be done with little supervision
A-6.02.08P	give supportive and constructive feedback	apprentice or learner adopts best practice after having been given supportive or constructive feedback

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
A-6.02.09P	support apprentices or learners in pursuing technical training opportunities	technical training is completed within timeframe prescribed by apprenticeship authority
A-6.02.10P	support accommodations and alternate work practices that are appropriate for apprentice or learner	accommodations and alternate work practices that are appropriate for apprentice or learner are supported
A-6.02.11P	assess apprentice or learner suitability to trade during probationary period	apprentice or learner is given constructive feedback that helps them identify their own strengths and weaknesses, and suitability for trade

**Range of Variables (include, but not limited to)**

<b>steps required to demonstrate a skill</b>	understanding who, what, where, when, why, and how; explaining, showing, giving encouragement; following up to ensure skill is performed correctly
<b>practice conditions</b>	guided, limited independence, full independence

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
A-6.02.01L	demonstrate knowledge of strategies for learning skills in workplace	<ul style="list-style-type: none"> <li>a. describe importance of individual experience</li> <li>b. describe shared responsibilities for workplace learning</li> <li>c. determine one's own learning preferences and explain how these relate to learning new skills</li> <li>d. describe importance of different types of skills in workplace</li> <li>e. describe importance of <b>skills for success (essential skills)</b> in workplace</li> <li>f. identify different <b>learning styles</b></li> <li>g. identify different <b>learning needs</b> and strategies to meet them</li> <li>h. identify <b>strategies to assist in learning a skill</b></li> </ul>

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
A-6.02.02L	demonstrate knowledge of strategies for teaching workplace skills	<ul style="list-style-type: none"> <li>a. identify different roles played by workplace mentor</li> <li>b. explain importance of identifying point of lesson</li> <li>c. identify how to choose a good time to present lesson</li> <li>d. explain importance of linking lessons</li> <li>e. identify context for learning skills</li> <li>f. describe considerations in setting up opportunities for skill practice</li> <li>g. explain importance of providing feedback</li> <li>h. identify techniques for giving effective feedback</li> <li>i. describe a skills assessment</li> <li>j. identify methods of assessing progress</li> <li>k. explain how to adjust lesson to different situations</li> </ul>

**Range of Variables (include, but not limited to)**

<b>skills for success (essential skills) are</b>	adaptability, collaboration, communication, creativity and innovation, digital, numeracy, problem solving, reading, writing
<b>learning styles</b>	visual, auditory, kinesthetic, read/write
<b>learning needs</b>	learning disabilities, learning preferences, language proficiency
<b>strategies to assist in learning a skill</b>	understanding basic principles of instruction, developing coaching skills, being mature and patient, providing feedback

# Major Work Activity B - Performs site work

## Task B-7 Prepares site

### Task Descriptor

Construction craft workers are the first and last workers on a construction site. They clear sites, set up temporary facilities, utilities and environmental protections, and depending on soil conditions, may install pilings. This is also called mobilization and demobilization and allows for other trades to perform their tasks.

### B-7.01 Clears site

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-7.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task and manufacturers' specifications
B-7.01.02P	interpret colour-coded flags and markers used to locate utilities, clearing limits and property lines	colour-coded flags and markers are interpreted to locate utilities, clearing limits and property lines
B-7.01.03P	bring site to working condition	site is brought to working condition by performing <b>actions</b>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	chainsaws, surveying equipment, shovels, drills, picks, paint, stakes, laser levels, telescopic forklifts (telehandlers), skid steers, counter-balance forklifts (CBFL)
<b>actions</b>	removing building debris and material, clearing brush, moving dirt and rocks, stripping existing asphalt and concrete, dewatering, removing contaminated soil, establishing grades and elevations, establishing site limits from layout, verifying locations of utilities from locates

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-7.01.01L	demonstrate knowledge of procedures to clear sites	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to clear sites, and describe their procedures for use</li> <li>b. describe procedures and <b>actions</b> performed to clear sites</li> <li>c. interpret colour-coded flags and markers used to locate utilities, clearing limits and property lines</li> <li>d. identify safe work permit requirements</li> <li>e. identify environmental requirements</li> </ul>
B-7.01.02L	demonstrate knowledge of training and certification requirements to clear sites	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to clear sites</li> </ul>
B-7.01.03L	demonstrate knowledge of regulatory requirements pertaining to clearing of sites	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to clearing of sites</li> </ul>
B-7.01.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>a. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	chainsaws, surveying equipment, shovels, drills, picks, paint, stakes, laser levels, telescopic forklifts (telehandlers), skid steers, counter-balance forklifts (CBFL)
<b>actions</b>	removing building debris and material, clearing brush, moving dirt and rocks, stripping existing asphalt and concrete, dewatering, removing contaminated soil, establishing grades and elevations, establishing site limits from layout, verifying locations of utilities from locates

## B-7.02 Sets up site facilities

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-7.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-7.02.02P	determine site layout	site layout is determined taking into consideration excavations and location of buildings
B-7.02.03P	strategically place and level <b>facilities</b>	<b>facilities</b> are strategically placed and leveled according to site specifications
B-7.02.04P	install stairs, breezeways and temporary connecting platforms to trailers	stairs, breezeways and temporary connecting platforms are installed to trailers according to industry standards and specifications
B-7.02.05P	assist other tradespersons in set-up of <b>temporary utilities</b>	set-up of <b>temporary utilities</b> is completed according to code, industry standards and site specifications
B-7.02.06P	place <b>safety equipment</b> in specified locations	<b>safety equipment</b> is placed in specified locations according to company policies, jurisdictional regulations and emergency response plan
B-7.02.07P	set up <b>equipment</b>	<b>equipment</b> is set up according to site specifications
B-7.02.08P	display site permits in specific <b>location</b>	site permits are displayed in specific <b>location</b> according to jurisdictional regulations and site specifications
B-7.02.09P	set up muster points and emergency meeting points	muster points and emergency meeting points are set up according to emergency response plan

## Range of Variables (include, but not limited to)

<b>tools and equipment</b>	power tools, rigging and hoisting equipment, skid steers
<b>facilities</b>	work and warehouse trailers, lunchrooms, washrooms, tool cribs
<b>temporary utilities</b>	water, sewer, electrical, telecommunications
<b>safety equipment</b>	fire extinguishers, eye wash stations, first aid kits, delineators, barricades, decontamination showers, light towers
<b>equipment</b>	office equipment, refrigerators
<b>locations</b>	main site office, main gate

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-7.02.01L	demonstrate knowledge of <b>facilities, temporary utilities, safety equipment</b> and <b>equipment</b> to be set up on sites, their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>facilities, temporary utilities, safety equipment</b> and <b>equipment</b> to be set up on sites, and describe their characteristics and applications</li> <li>b. interpret information pertaining to <b>facilities, temporary utilities, safety equipment</b> and <b>equipment</b> to be set up on sites found on drawings and specifications</li> </ul>
B-7.02.02L	demonstrate knowledge of procedures to set up site <b>facilities</b>	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to set up site <b>facilities</b>, and describe their procedures for use</li> <li>b. describe procedures to set up site <b>facilities</b></li> <li>c. identify <b>employer requirements</b></li> <li>d. identify areas to protect prior to work being performed</li> <li>e. identify pre-existing site conditions and existing utilities</li> <li>f. identify <b>work site and set-up requirements</b></li> </ul>
B-7.02.03L	demonstrate knowledge of training and certification requirements to set up site <b>facilities</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to set up site <b>facilities</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
B-7.02.04L	demonstrate knowledge of regulatory requirements pertaining to site <b>facilities</b>	a. identify codes, industry standards and regulations pertaining to site <b>facilities</b>
B-7.02.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>facilities</b>	work and warehouse trailers, lunchrooms, washrooms, tool cribs
<b>temporary utilities</b>	water, sewer, electrical, telecommunications
<b>safety equipment</b>	fire extinguishers, eye wash stations, first aid kits, delineators, barricades, decontamination showers, light towers
<b>equipment</b>	office equipment, refrigerators
<b>tools and equipment</b>	power tools, rigging and hoisting equipment, skid steers
<b>employer requirements</b>	pre-JHA, safety considerations
<b>work site and set-up requirements</b>	locations of temporary buildings, fencing and fuel containment

**B-7.03 Assists in installation of pilings and caissons**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
B-7.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
B-7.03.02P	assist in setting up, refueling and dismantling piling machines	piling machines are set up, refueled and dismantled according to manufacturers' specifications
B-7.03.03P	assist operator in setting up <b>machinery</b>	operator is assisted in setting up <b>machinery</b> by leveling ground and placing outrigging pads
B-7.03.04P	establish and set up safe work area	safe work area is set up to allow crane and piling machine to work safely
B-7.03.05P	adjust to changing <b>work environments</b>	changing <b>work environments</b> are considered and work is adjusted accordingly
B-7.03.06P	assist with drilling holes and clearing debris out	holes are drilled and debris is cleared out according to job specifications
B-7.03.07P	measure, modify and place rebar cages in holes	rebar cages are measured, modified and placed in holes
B-7.03.08P	direct machine operator to install pilings into position	machine operator is directed to install pilings into position using piling machine according to site specifications
B-7.03.09P	assess piles	piles are assessed to ensure they are plumb and level, at correct elevation and in position according to drawings and using leveling instruments
B-7.03.10P	inform supervisors of problems and provide progress report	supervisors are informed of problems as they arise, and progress report is provided

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	measuring tapes, shovels, levels, grinders, cutting torches, hoisting and rigging equipment
<b>machinery</b>	pile drivers, caisson drillers, cranes
<b>work environments</b>	boats and barges, off sheet pilings, depths, tides, weather conditions, personnel on site

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-7.03.01L	demonstrate knowledge of pilings and caissons, their characteristics and applications	a. identify <b>types of pilings and caissons</b> , and describe their characteristics and applications b. interpret information pertaining to pilings and caissons found on drawings and specifications c. identify <b>locations of pilings and caissons</b>
B-7.03.02L	demonstrate knowledge of procedures to assist in installation of pilings and caissons	a. identify <b>tools and equipment</b> used to install pilings and caissons, and describe their procedures for use b. describe procedures to assist in installation of pilings and caissons c. describe procedures to assess pilings and caissons
B-7.03.03L	demonstrate knowledge of regulatory requirements pertaining to pilings and caissons	a. identify codes, industry standards and regulations pertaining to pilings and caissons
B-7.03.04L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

### Range of Variables (include, but not limited to)

<b>types of pilings and caissons</b>	concrete, H-beam, sheet, steel
<b>locations of pilings and caissons</b>	on land, in water
<b>tools and equipment</b>	measuring tapes, shovels, levels, grinders, cutting torches, hoisting and rigging equipment

## B-7.04 Builds access and egress roads

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-7.04.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-7.04.02P	assist in removing existing <b>material</b>	existing <b>material</b> is removed according to site specifications
B-7.04.03P	select <b>material</b>	<b>material</b> is selected according to job specifications for road base, backfill and grades
B-7.04.04P	compact road	road is compacted according to site specifications
B-7.04.05P	guide road building machinery operator including installing offset stake lines and grades	road building machinery operator is guided, and offset stake lines and grades are installed according to job specifications

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	compaction equipment, skid steers, surveying equipment, hand tools, levels, paint, stakes
<b>materials</b>	soil, gravel, geo-textiles, access matts (swamp matts)

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-7.04.01L	demonstrate knowledge of procedures to build access and egress roads	<ol style="list-style-type: none"> <li>identify <b>tools and equipment</b> used to build access and egress roads, and describe their procedures for use</li> <li>identify <b>materials</b> used to build access and egress roads</li> <li>describe procedures to build access and egress roads</li> </ol>

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
B-7.04.02L	demonstrate knowledge of training and certification requirements to build access and egress roads	a. identify training and certification requirements to build access and egress roads
B-7.04.03L	demonstrate knowledge of regulatory requirements pertaining to access and egress roads	a. identify codes, industry standards and regulations pertaining to access and egress roads
B-7.04.04L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	compaction equipment, skid steers, surveying equipment, hand tools, levels, paint, stakes
<b>materials</b>	soil, gravel, geo-textiles, access matts (swamp matts)

## Task B-8 Performs groundwork

### Task Descriptor

Groundwork is done on ICI, residential, and civil sites (roads, bridges, railways) to prepare a site for construction activities. This includes excavation to break the ground and remove existing material, allowing for the installation of components within the excavation site. Backfilling and compaction are often performed to fill in the excavation and consolidate the backfill.

### B-8.01 Locates underground utilities

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-8.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-8.01.02P	identify type and depth of <b>underground utilities</b>	type and depth of <b>underground utilities</b> are identified using <b>tools and equipment</b> and “call before you dig” services
B-8.01.03P	interpret meaning of colour-coded flags or stakes	meaning of colour-coded flags or stakes are interpreted to identify type and area of utilities
B-8.01.04P	interpret as-built drawings and locate documents for <b>underground utility</b> locations	as-built drawings and locate documents for <b>underground utility</b> locations are interpreted
B-8.01.05P	expose utilities	utilities are exposed by hand digging (daylighting), using hydrovac equipment and by assisting machine operator in removal of <b>soil</b>

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	hand tools, locating equipment (electromagnetic locator, ground penetrating radar, metal detector), levels (builder's, laser), mobile equipment, hydrovac equipment
<b>underground utilities</b>	water, electrical, gas, communications, sewer lines
<b>soils</b>	clay, sand, gravel, silt

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
B-8.01.01L	demonstrate knowledge of <b>underground utilities</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>underground utilities</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to <b>underground utilities</b> found on drawings and specifications</li> <li>c. identify and interpret colour-coded flags or stakes used to identify types and locations of <b>underground utilities</b></li> </ul>
B-8.01.02L	demonstrate knowledge of procedures to locate <b>underground utilities</b>	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to locate <b>underground utilities</b>, and describe their procedures for use</li> <li>b. describe procedures to locate <b>underground utilities</b></li> <li>c. describe procedures to expose utilities</li> <li>d. explain importance of “call before you dig” services</li> </ul>
B-8.01.03L	demonstrate knowledge of training and certification requirements to locate <b>underground utilities</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to locate <b>underground utilities</b></li> </ul>
B-8.01.04L	demonstrate knowledge of regulatory requirements pertaining to <b>underground utilities</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to <b>underground utilities</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
B-8.01.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>underground utilities</b>	water, electrical, gas, communications, sewer lines
<b>tools and equipment</b>	hand tools, locating equipment (electromagnetic locator, ground penetrating radar, metal detector), levels (builder's, laser), mobile equipment, hydrovac equipment

**B-8.02 Performs excavation**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
B-8.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-8.02.02P	guide heavy equipment operator to accomplish required <b>tasks</b>	heavy equipment operator is guided to accomplish required <b>tasks</b>
B-8.02.03P	perform excavations	excavations are performed using <b>excavation methods</b> according to application and jurisdictional regulations
B-8.02.04P	install temporary access and egress to trenches and other excavations	temporary access and egress to trenches and other excavations are installed

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
B-8.02.05P	take measurements of excavations	measurements of excavations are taken to ensure correct location, size, depth and slope of excavation according to task and jurisdictional regulations

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	shovels, pickaxes, levels, lasers, mini excavators, skid steers
<b>tasks</b>	digging in desired location and to required line, grade and elevation
<b>excavation methods</b>	mechanical, manual, using hydrovac equipment

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
B-8.02.01L	demonstrate knowledge of excavations, their characteristics, purpose and applications	<ul style="list-style-type: none"> <li>a. identify excavations, and describe their characteristics, purpose and applications</li> <li>b. interpret information pertaining to excavations found on drawings and specifications</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
B-8.02.02L	demonstrate knowledge of procedures to perform excavations	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to perform excavations, and describe their procedures for use</li> <li>b. identify permit requirements to perform excavations</li> <li>c. describe procedures to evaluate pre-existing site conditions and existing utilities</li> <li>d. describe procedures to evaluate evolving site conditions</li> <li>e. describe procedures to perform excavations</li> <li>f. describe <b>excavation methods</b></li> <li>g. describe procedures to install temporary access and egress to trenches and other excavations</li> <li>h. describe procedures to take measurements of excavations</li> </ul>
B-8.02.03L	demonstrate knowledge of training and certification requirements to perform excavations	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to perform excavations</li> </ul>
B-8.02.04L	demonstrate knowledge of regulatory requirements pertaining to excavations	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to excavations</li> </ul>
B-8.02.05L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>b. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	shovels, pickaxes, levels, lasers, mini excavators, skid steers
<b>excavation methods</b>	mechanical, manual, using hydrovac equipment

## B-8.03 Installs excavation shoring and shielding

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-8.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-8.03.02P	assemble, place and disassemble <b>shoring and shielding</b>	<b>shoring and shielding</b> are assembled, placed and disassembled according to manufacturers' specifications and jurisdictional regulations
B-8.03.03P	guide heavy equipment operator	heavy equipment operator is guided to accomplish required <b>tasks</b>
B-8.03.04P	install temporary access and egress to excavation	temporary access and egress to excavation is installed according to jurisdictional regulations

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	hand tools, shovels, chainsaws, mobile equipment, rigging and hoisting equipment
<b>shoring and shielding</b>	sheet pilings, wood structures, steel structures, trench boxes, air shores, pneumatic and hydraulic jacks, cut-back method
<b>tasks</b>	digging to required depth; picking up, assembling, placing and disassembling shoring and shielding

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-8.03.01L	demonstrate knowledge of <b>shoring and shielding</b> , their characteristics, purpose and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>shoring and shielding</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to excavation <b>shoring and shielding</b> found on drawings and specifications</li> </ul>
B-8.03.02L	demonstrate knowledge of procedures to install excavation <b>shoring and shielding</b>	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to install excavation <b>shoring and shielding</b>, and describe their procedures for use</li> <li>b. describe procedures to guide heavy equipment operators</li> <li>c. describe procedures to assemble, place and disassemble excavation <b>shoring and shielding</b></li> <li>d. describe procedures to install temporary access and egress to excavation</li> <li>e. identify rigging and hoisting procedures to lift excavation <b>shoring and shielding</b></li> </ul>
B-8.03.03L	demonstrate knowledge of training and certification requirements to install excavation <b>shoring and shielding</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to install excavation <b>shoring and shielding</b></li> </ul>
B-8.03.04L	demonstrate knowledge of regulatory requirements pertaining to excavation <b>shoring and shielding</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to excavation <b>shoring and shielding</b></li> <li>b. identify certification and inspection requirements for excavation <b>shoring and shielding</b></li> </ul>

## Range of Variables (include, but not limited to)

<b>shoring and shielding</b>	sheet pilings, wood structures, steel structures, trench boxes, air shores, pneumatic and hydraulic jacks, cut-back method
<b>tools and equipment</b>	hand tools, shovels, chainsaws, mobile equipment, rigging and hoisting equipment

## B-8.04 Performs backfill and compaction

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-8.04.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-8.04.02P	assess type and amount of <b>backfill material</b> and <b>components</b> needed	type and amount of <b>backfill material</b> and <b>components</b> needed are assessed according to dimension of excavation and drawings
B-8.04.03P	guide heavy equipment operator to accomplish required tasks	heavy equipment operator is guided to accomplish required tasks
B-8.04.04P	follow backfill and compaction procedures for <b>applications</b>	backfill and compaction procedures for <b>applications</b> are followed according to job specifications
B-8.04.05P	assist with testing of <b>soil</b> compaction	testing of <b>soil</b> compaction is completed according to codes, industry standards, jurisdictional regulations and job specifications

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	compacting, mobile and measuring equipment; shovels, rakes
<b>backfill materials</b>	gravel, crushed concrete, sand, fillcrete
<b>backfill components</b>	geo textile cloth, geo grid, identifying markers
<b>applications</b>	covering utilities, installing shoring and shielding, preparing to pour concrete, building roads, grading sites
<b>soils</b>	clay, sand, gravel, silt

### Knowledge

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
B-8.04.01L	demonstrate knowledge of procedures to perform backfill and compaction	<ul style="list-style-type: none"> <li>a. interpret information pertaining to backfills and compactions found on drawings and specifications</li> <li>b. identify <b>tools and equipment</b> used to perform backfill and compaction, and describe their procedures for use</li> <li>c. describe procedures to assess type and amount of <b>backfill material</b> and <b>components</b> needed</li> <li>d. describe procedures to guide heavy equipment operators</li> <li>e. describe procedures to perform backfill and compaction</li> <li>f. identify sub-grades</li> <li>g. identify depth and angle of repose of excavation and trench</li> <li>h. identify types of <b>backfill materials</b> and <b>components</b></li> <li>i. identify moisture content and compaction rates</li> <li>j. explain purpose of using water during compaction</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
B-8.04.02L	demonstrate knowledge of regulatory requirements pertaining to backfill and compaction	a. identify codes, industry standards and regulations pertaining to backfill and compaction
B-8.04.03L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

#### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	compacting, mobile and measuring equipment; shovels, rakes
<b>backfill materials</b>	gravel, crushed concrete, sand, fillcrete
<b>backfill components</b>	geo textile cloth, geo grid, identifying markers

## Task B-9 Services site

### Task Descriptor

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

### B-9.01 Addresses suspected hazardous materials

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-9.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task

Reference Code	Performance Criteria	Evidence of Attainment
B-9.01.02P	identify <b>hazardous materials</b>	<b>hazardous materials</b> are identified
B-9.01.03P	handle, store and dispose of <b>hazardous materials</b>	<b>hazardous materials</b> are handled, stored and disposed of according to company policies, SDS, site-specific requirements and jurisdictional regulations
B-9.01.04P	clean spills	spills are cleaned using spill kit according to type of <b>hazardous material</b>
B-9.01.05P	notify appropriate authority of <b>hazardous materials</b>	appropriate authority is notified of <b>hazardous material</b> according to jurisdictional regulations

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	PPE, spill kits, hand tools, mobile equipment, caution and danger tape
<b>hazardous materials</b>	oil, radioactive, liquids, plutonium, asbestos, lead-based materials, silica, biohazards

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
B-9.01.01L	demonstrate knowledge of <b>hazardous materials</b> , their characteristics and applications	a. identify types of <b>hazardous materials</b> , and describe their characteristics and applications
B-9.01.02L	demonstrate knowledge of procedures to address suspected <b>hazardous materials</b>	a. identify <b>tools and equipment</b> used to handle <b>hazardous materials</b> , and describe their procedures for use b. describe procedures to address suspected <b>hazardous materials</b> c. describe procedures to clean <b>hazardous material</b> spills d. describe procedures to dispose of and report <b>hazardous materials</b>

Reference Code	Learning Outcomes	Learning Objectives
B-9.01.03L	demonstrate knowledge of training and certification requirements to handle and dispose of <b>hazardous materials</b>	a. identify training and certification requirements to handle and dispose of <b>hazardous materials</b>
B-9.01.04L	demonstrate knowledge of regulatory requirements pertaining to handling and disposal of <b>hazardous materials</b>	a. identify codes, industry standards and regulations pertaining to handling and disposal of <b>hazardous materials</b>
B-9.01.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>hazardous materials</b>	oil, radioactive, liquids, plutonium, asbestos, lead-based materials, silica, biohazards
<b>tools and equipment</b>	PPE, spill kits, hand tools, mobile equipment, caution and danger tape

**B-9.02 Controls water runoff**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
B-9.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-9.02.02P	select <b>environmental material</b>	<b>environmental material</b> is selected according to jurisdictional regulations and job specifications

Reference Code	Performance Criteria	Evidence of Attainment
B-9.02.03P	apply <b>preventative measures</b>	<b>preventative measures</b> are applied to prevent environmental contamination or to control damage
B-9.02.04P	assist in building settling ponds, berms and swales, and dig trenches	settling ponds, berms and swales are built, and trenches are dug to direct water runoff

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	hand tools, pumps, de-watering equipment, mobile equipment, generators, surveying equipment, sandbags, inflatable berms
<b>environmental materials</b>	silt fencing, filtered cloths, straw bales, rip-rap stone
<b>preventative measures</b>	installing silt fencing, filtered cloths and other barriers

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
B-9.02.01L	demonstrate knowledge of <b>environmental materials</b> , their characteristics, applications and operation	a. identify <b>environmental materials</b> used to control water runoff, and describe their characteristics and applications
B-9.02.02L	demonstrate knowledge of procedures to control water runoff	a. identify <b>tools and equipment</b> used to control water runoff, and describe their procedures for use b. describe procedures to control water runoff c. describe <b>preventative measures</b> used to prevent environmental contamination or to control damage
B-9.02.03L	demonstrate knowledge of training and certification requirements to control water runoff	a. identify training and certification requirements to control water runoff
B-9.02.04L	demonstrate knowledge of regulatory requirements pertaining to water runoff	a. identify codes, industry standards and regulations pertaining to water runoff

Reference Code	Learning Outcomes	Learning Objectives
B-9.02.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>environmental materials</b>	silt fencing, filtered cloths, straw bales, rip-rap stone
<b>tools and equipment</b>	hand tools, pumps, de-watering equipment, mobile equipment, generators, surveying equipment, sandbags, inflatable berms
<b>preventative measures</b>	installing silt fencing, filtered cloths and other barriers

## B-9.03 Sets up temporary lighting

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-9.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-9.03.02P	level and stabilize light towers	light towers are leveled and stabilized according to manufacturers' specifications
B-9.03.03P	inspect and maintain <b>temporary lighting</b>	<b>temporary lighting</b> is inspected and maintained according to manufacturers' specifications
B-9.03.04P	select spill tray when using gas- or diesel-powered light towers and string lights	spill tray is selected to prevent spills according to environmental regulations

Reference Code	Performance Criteria	Evidence of Attainment
B-9.03.05P	start and maintain gas- or diesel-powered light towers and string lights	gas- or diesel-powered light towers and string lights are started and maintained according to manufacturers' specifications and jurisdictional regulations

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	mobile equipment, hand tools, extension cords, power tools, spill trays
<b>temporary lighting</b>	string lights, quartz lighting, light towers, wobble lights

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
B-9.03.01L	demonstrate knowledge of <b>temporary lighting</b> , their characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify types of <b>temporary lighting</b>, and describe their characteristics and applications</li> <li>b. describe operating principles of <b>temporary lighting</b></li> <li>c. interpret information pertaining to <b>temporary lighting</b> found in specifications</li> </ul>
B-9.03.02L	demonstrate knowledge of procedures to set up <b>temporary lighting</b>	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to set up <b>temporary lighting</b>, and describe their procedures for use</li> <li>b. describe procedures to set up <b>temporary lighting</b></li> <li>c. describe procedures to inspect and maintain <b>temporary lighting</b></li> </ul>
B-9.03.03L	demonstrate knowledge of training and certification requirements to set up <b>temporary lighting</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to set up <b>temporary lighting</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
B-9.03.04L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>temporary lighting</b>	string lights, quartz lighting, light towers, wobble lights
<b>tools and equipment</b>	mobile equipment, hand tools, extension cords, power tools, spill trays

**B-9.04 Sets up generators and compressors**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
B-9.04.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-9.04.02P	select and place compressors and attachments used for tool operation	compressors and attachments used for tool operation are selected and placed ensuring adequate ventilation
B-9.04.03P	select spill tray	spill tray is selected to prevent spills according to environmental regulations
B-9.04.04P	<b>maintain</b> generators and compressors	generators and compressors are <b>maintained</b> according to manufacturers' specifications
B-9.04.05P	<b>position</b> and level generators and compressors	generators and compressors are <b>positioned</b> and leveled
B-9.04.06P	connect <b>compressor fittings</b>	<b>compressor fittings</b> are connected

Reference Code	Performance Criteria	Evidence of Attainment
B-9.04.07P	interpret and adjust gauges on compressors	gauges on compressors are interpreted and adjusted

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	power tools, pneumatic tools (e.g., scabblers, jackhammers, pavement breakers, rock drills)
<b>maintenance</b>	checking oil and fuel levels, replacing valve handles, bleeding condensation from tank, checking tire pressure, inspecting hoses and couplers
<b>positioning</b>	chocking tires, ensuring that exhaust is free from obstruction and facing away from work area, ensuring that ground is stable and level
<b>compressor fittings</b>	quick couplings, air hoses, safety pins, whip checks

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
B-9.04.01L	demonstrate knowledge of generators and compressors, their characteristics, sizes, applications and operation	<ul style="list-style-type: none"> <li>a. identify types of generators and compressors, and describe their characteristics, sizes and applications</li> <li>b. describe operating principles of generators and compressors</li> <li>c. interpret information pertaining to generators and compressors found in specifications</li> <li>d. identify <b>types of fuels</b> used in generators and compressors</li> <li>e. identify ventilation requirements for generators and compressors</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
B-9.04.02L	demonstrate knowledge of procedures to set up generators and compressors	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to set up generators and compressors, and describe their procedures for use</li> <li>b. describe procedures to set up generators and compressors</li> <li>c. describe procedures to start up and shut down generators and compressors</li> <li>d. describe procedures to <b>maintain</b> and <b>position</b> generators and compressors</li> </ul>
B-9.04.03L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>b. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

**Range of Variables (include, but not limited to)**

<b>types of fuels</b>	gas, diesel, mixed gas, propane, alkylate (used in generators)
<b>tools and equipment</b>	power tools, pneumatic tools (e.g., scabblers, jackhammers, pavement breakers, rock drills)
<b>maintenance</b>	checking oil and fuel levels, replacing valve handles, bleeding condensation from tank, checking tire pressure, inspecting hoses and couplers
<b>positioning</b>	chocking tires, ensuring that exhaust is free from obstruction and facing away from work area, ensuring that ground is stable and level

## B-9.05 Performs site restoration

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-9.05.01P	refer to <b>documentation</b> of original conditions of jobsite	<b>documentation</b> of original conditions of jobsite are referred to for restoration and other purposes
B-9.05.02P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-9.05.03P	perform <b>activities</b> to return site to original condition	<b>activities</b> are performed to return site to original condition within acceptable parameters

### Range of Variables (include, but not limited to)

<b>documentation</b>	photos, drawings, field books
<b>tools and equipment</b>	hand tools, mobile equipment, power tools
<b>activities</b>	replacing landscaping, replacing removed material and equipment, replacing fencing, replacing signage

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-9.05.01L	demonstrate knowledge of procedures to perform site restoration	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to perform site restoration, and describe their procedures for use</li> <li>b. describe procedures and <b>activities</b> performed to restore site</li> <li>c. identify types of <b>documentation</b> used to restore sites</li> </ul>

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
B-9.05.02L	demonstrate knowledge of training and certification requirements to perform site restoration	a. identify training and certification requirements to perform site restoration
B-9.05.03L	demonstrate knowledge of regulatory requirements pertaining to site restoration	a. identify codes, industry standards and regulations pertaining to site restoration
B-9.05.04L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	hand tools, mobile equipment, power tools
<b>activities</b>	replacing landscaping, replacing removed material and equipment, replacing fencing, replacing signage
<b>documentation</b>	photos, drawings, field books

**B-9.06 Manages tool crib**

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

**Skills**

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
B-9.06.01P	organize tool crib	tool crib is organized according to jurisdictional regulations, company policies and industry standards
B-9.06.02P	sign out and sign in tools and equipment manually or electronically	tools and equipment are signed out and signed in manually or electronically according to company policies

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
B-9.06.03P	inspect and maintain tools and equipment, and perform minor repairs	tools and equipment are inspected and maintained, and minor repairs are performed
B-9.06.04P	perform inventory control	inventory control is performed

### **Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
B-9.06.01L	demonstrate knowledge of tool cribs, their characteristics and applications	a. identify tool cribs, and describe their characteristics and applications
B-9.06.02L	demonstrate knowledge of procedures to manage tool cribs	a. describe procedures to sign out and sign in tools and equipment b. describe procedures to inspect and maintain tools and equipment c. describe procedures to perform minor repairs on tools and equipment d. describe procedures to perform inventory e. identify security requirements for tool cribs
B-9.06.03L	demonstrate knowledge of regulatory requirements pertaining to tool cribs	a. identify codes, industry standards and regulations pertaining to tool cribs

## B-9.07 Recycles materials

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-9.07.01P	sort and store <b>recycled materials</b> and <b>materials that can be reused onsite</b> in designated area	<b>recycled materials</b> and <b>materials that can be reused onsite</b> are sorted and stored in designated area according to jurisdictional regulations and site specifications
B-9.07.02P	organize <b>recycled materials</b> for shipping	<b>recycled materials</b> are organized for shipping
B-9.07.03P	identify and organize <b>materials that can be reused onsite</b>	<b>materials that can be reused onsite</b> are identified and organized

### Range of Variables (include, but not limited to)

<b>recycled materials</b>	cardboard, plastics, glass, reclaimed asphalt, reclaimed concrete, metals, drywall, electronics, chemicals, fuels, electric cables, wood
<b>materials that can be reused onsite</b>	forms, plywood, lumber, steel, building fixtures and appliances

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-9.07.01L	demonstrate knowledge of procedures to recycle materials	<ul style="list-style-type: none"> <li>a. describe procedures to organize <b>recycled materials</b></li> <li>b. describe procedures to sort and store <b>recycled materials</b></li> <li>c. describe procedures to identify, organize and store <b>materials that can be reused onsite</b></li> </ul>

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
B-9.07.02L	demonstrate knowledge of regulatory requirements pertaining to recycling of materials	a. identify codes, industry standards and regulations pertaining to recycling of materials
B-9.07.03L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>recycled materials</b>	cardboard, plastics, glass, reclaimed asphalt, reclaimed concrete, metals, drywall, electronics, chemicals, fuels, electric cables, wood
<b>materials that can be reused onsite</b>	forms, plywood, lumber, steel, building fixtures and appliances

## Task B-10 Performs basic demolition

### Task Descriptor

Construction craft workers dismantle and remove components, structures and buildings on construction 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.

### B-10.01 Cuts materials

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-10.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task and manufacturers' specifications
B-10.01.02P	read gauges on torches and apply spark-control methods	gauges on torches are read, and spark-control methods are applied
B-10.01.03P	select attachments for cutting tools and equipment	attachments for cutting tools and equipment are selected according to thickness and type of material being cut
B-10.01.04P	select and use dust control methods	dust control methods are selected and used to keep dust levels within permissible limits
B-10.01.05P	verify <b>utilities</b> are off	<b>utilities</b> are verified they are off
B-10.01.06P	verify electrical systems, and lock out and tag out equipment	electrical systems are verified to ensure they are de-energized, and equipment is locked out and tagged out

#### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	PPE, torches, grinders, saws, wrecking bars, sledgehammers, snips, bolt cutters, fire blanket
<b>utilities</b>	water, electrical, natural gas

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-10.01.01L	demonstrate knowledge of <b>tools and equipment</b> , their attachments, characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify types of <b>tools and equipment</b> and their attachments, and describe their characteristics and applications</li> <li>b. describe operating principles of <b>tools and equipment</b> and their attachments</li> <li>c. interpret information pertaining to <b>tools and equipment</b> and their attachments found in specifications</li> </ul>
B-10.01.02L	demonstrate knowledge of procedures to cut materials	<ul style="list-style-type: none"> <li>a. identify types of materials being cut</li> <li>b. describe procedures and techniques to cut materials</li> <li>c. identify dust control methods</li> <li>d. identify types of permits required to do hot work</li> </ul>
B-10.01.03L	demonstrate knowledge of training and certification requirements to cut materials	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to cut materials</li> </ul>
B-10.01.04L	demonstrate knowledge of regulatory requirements pertaining to cutting materials	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to cutting materials</li> </ul>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	PPE, torches, grinders, saws, wrecking bars, sledgehammers, snips, bolt cutters, fire blanket
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## B-10.02 Dismantles existing structures and components

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-10.02.01P	select and use <b>tools and equipment</b> and <b>attachments</b>	<b>tools and equipment</b> and <b>attachments</b> are selected and used according to task and manufacturers' specifications
B-10.02.02P	identify load bearing walls and other structural components	load bearing walls and other structural components are identified
B-10.02.03P	set up chutes, drop areas and bins for disposal of material	chutes, drop areas and bins for disposal of material are set up according to site specifications
B-10.02.04P	identify <b>hazardous materials</b>	<b>hazardous materials</b> are identified
B-10.02.05P	set up containment areas and establish PPE requirements for handling <b>hazardous materials</b>	containment areas are set up and PPE requirements for handling <b>hazardous materials</b> are established
B-10.02.06P	isolate or lock out and tag out <b>utilities</b>	<b>utilities</b> are isolated, locked out and tagged out
B-10.02.07P	verify electrical systems to ensure they are de-energized	electrical systems are verified to ensure they are de-energized

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	hand tools, mobile equipment, power tools, pneumatic tools, fans, air filters, PPE
<b>attachments</b>	jackhammer bits, spade bits, saw blades
<b>hazardous materials</b>	radioactive and lead-based materials, asbestos, silica
<b>utilities</b>	water, electrical, gas, communications, sewer lines

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-10.02.01L	demonstrate knowledge of procedures to dismantle existing structures and components	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> and <b>attachments</b> used to dismantle structures and components, and describe their procedures for use</li> <li>b. describe procedures to identify load bearing walls and other structural components</li> <li>c. describe procedures and techniques used to dismantle structures and components</li> <li>d. identify types of material to be removed from jobsites</li> <li>e. describe procedures and techniques used for removal of materials from jobsites</li> </ul>
B-10.02.02L	demonstrate knowledge of training and certification requirements to dismantle existing structures and components	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to dismantle existing structures and components</li> </ul>
B-10.02.03L	demonstrate knowledge of regulatory requirements pertaining to <b>hazardous materials</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to <b>hazardous materials</b></li> </ul>
B-10.02.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>b. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	hand tools, mobile equipment, power tools, pneumatic tools, fans, air filters, PPE
<b>attachments</b>	jackhammer bits, spade bits, saw blades
<b>hazardous materials</b>	radioactive and lead-based materials, asbestos, silica

## Task B-11 Performs safety watches

### Task Descriptor

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

### B-11.01 Monitors hazardous gases and atmospheres

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-11.01.01P	select and use monitoring equipment and gas testers (sniffers)	monitoring equipment and gas testers (sniffers) are selected and used according to task and manufacturers' specifications
B-11.01.02P	function check monitoring equipment	monitoring equipment is function checked according to manufacturers' specifications and jurisdictional regulations
B-11.01.03P	interpret readings and alarms on monitoring equipment	readings and alarms on monitoring equipment are interpreted
B-11.01.04P	document readings and alert others when atmospheric conditions change	readings are documented and others are alerted when atmospheric conditions change

#### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-11.01.01L	demonstrate knowledge of hazardous <b>gases and atmospheres</b> , their characteristics and applications	a. identify types of hazardous <b>gases and atmospheres</b> , and describe their characteristics and applications

Reference Code	Learning Outcomes	Learning Objectives
B-11.01.02L	demonstrate knowledge of monitoring equipment, their characteristics, applications and procedures for use	<ul style="list-style-type: none"> <li>a. identify types of monitoring equipment used to monitor hazardous <b>gases and atmospheres</b>, and describe their procedures for use</li> <li>b. interpret readings and alarms on monitoring equipment</li> </ul>
B-11.01.03L	demonstrate knowledge of procedures to monitor hazardous <b>gases and atmospheres</b>	<ul style="list-style-type: none"> <li>a. identify areas to be monitored</li> <li>b. identify permissible exposure levels</li> <li>c. identify time weighted averages (TWA)</li> <li>d. identify atmospheric hazard levels</li> </ul>
B-11.01.04L	demonstrate knowledge of training and certification requirements pertaining to hazardous <b>gases and atmospheres</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements pertaining to hazardous <b>gases and atmospheres</b></li> </ul>
B-11.01.05L	demonstrate knowledge of regulatory requirements pertaining to hazardous <b>gases and atmospheres</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to hazardous <b>gases and atmospheres</b></li> </ul>
B-11.01.06L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>b. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

**Range of Variables (include, but not limited to)**

<b>gases and atmospheres</b>	hydrogen sulfide (H <sub>2</sub> S), carbon monoxide (CO), methane (lower explosion limit [LEL] and upper explosion limit [UEL]), oxygen (O <sub>2</sub> )
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## B-11.02 Performs fire watch

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-11.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-11.02.02P	assess conditions and apply <b>measures</b>	conditions are assessed and <b>measures</b> are applied

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	fire extinguishing equipment, fire blankets, monitors, two-way radios
<b>measures</b>	mitigating potential fires, using fire extinguishers, alerting others to evacuate jobsite, calling emergency services

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-11.02.01L	demonstrate knowledge of procedures to perform fire watch	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to perform fire watch, and describe their procedures for use</li> <li>b. describe procedures to perform fire watch</li> <li>c. identify combustible and non-combustible materials</li> <li>d. identify areas where <b>work is being performed</b> and equipment in use that require fire watch</li> <li>e. identify evacuation plans</li> <li>f. identify <b>measures</b> taken in case of fire</li> <li>g. identify classes of fire and fire tetrahedron</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
B-11.02.02L	demonstrate knowledge of training and certification requirements to perform fire watch	a. identify training and certification requirements to perform fire watch
B-11.02.03L	demonstrate knowledge of regulatory requirements pertaining to performing fire watch	a. identify company policies, codes, industry standards and regulations pertaining to performing fire watch
B-11.02.04L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	fire extinguishing equipment, fire blankets, monitors, two-way radios
<b>work being performed</b>	welding, cutting, grinding, media blasting
<b>measures</b>	mitigating potential fires, using fire extinguishers, alerting others to evacuate jobsite, calling emergency services

**B-11.03 Performs bottle watch**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
B-11.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
B-11.03.02P	interpret gauge readings	gauge readings are interpreted to recognize when bottles need to be changed or when alternate sources need to be activated

Reference Code	Performance Criteria	Evidence of Attainment
B-11.03.03P	change bottles when they are getting near critical levels	bottles are changed when they are getting near critical levels
B-11.03.04P	communicate to confined space attendee of changed or changing conditions	confined space attendee is communicated with when conditions have changed or are changing

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	hand and mobile tools, regulators, gauges
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**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
B-11.03.01L	demonstrate knowledge of bottles, their characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify types of bottles, and describe their characteristics and applications</li> <li>b. describe operating principles of bottles</li> </ul>
B-11.03.02L	demonstrate knowledge of procedures to perform bottle watch	<ul style="list-style-type: none"> <li>a. identify areas that require bottle watch</li> <li>b. describe procedures to perform bottle watch</li> <li>c. describe procedures to change bottles</li> <li>d. describe <b>communication methods</b> and procedures used to alert attendees of changing conditions</li> <li>e. interpret gauge readings</li> </ul>
B-11.03.03L	demonstrate knowledge of training and certification requirements to perform bottle watch	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to perform bottle watch</li> </ul>
B-11.03.04L	demonstrate knowledge of regulatory requirements pertaining to performing bottle watch	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to performing bottle watch</li> </ul>

**Range of Variables (include, but not limited to)**

<b>communication methods</b>	hand signals, rope signals, using two-way radios
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**B-11.04 Performs confined space watch**

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

**Skills**

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
B-11.04.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task and manufacturers' specifications
B-11.04.02P	interpret and use <b>documentation</b>	<b>documentation</b> is interpreted and used
B-11.04.03P	function check monitoring equipment	monitoring equipment is function checked according to manufacturers' specifications and jurisdictional regulations
B-11.04.04P	interpret readings and alarms on monitoring equipment	readings and alarms on monitoring equipment are interpreted
B-11.04.05P	ventilate or purge confined space	confined space is ventilated or purged to remove hazardous gas and test air quality
B-11.04.06P	alert others of changes in <b>working conditions</b>	others are alerted of changes in <b>working conditions</b>
B-11.04.07P	assess conditions and apply <b>measures</b>	conditions are assessed and <b>measures</b> are applied

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	monitoring equipment, rescue equipment (tripods, harnesses, lifelines, winches, backboards), temporary lighting, ladders, ventilation equipment, timing devices
<b>documentation</b>	CSE permit, testing log, CSE checklists
<b>working conditions</b>	atmospheric changes, environmental changes, hazardous activities around work area
<b>measures</b>	evacuate personnel from confined space; calling emergency and rescue services; following pre-determined rescue plan; purging, ventilating and inerting space

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
B-11.04.01L	demonstrate knowledge of confined spaces, their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify confined spaces, and describe their characteristics and applications</li> <li>b. interpret information pertaining to confined spaces found in jurisdictional regulations and site specifications</li> </ul>
B-11.04.02L	demonstrate knowledge of confined space monitoring equipment, their characteristics, applications and procedures for use	<ul style="list-style-type: none"> <li>a. identify confined space monitoring equipment, and describe their characteristics, applications and procedures for use</li> <li>b. interpret readings and alarms</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
B-11.04.03L	demonstrate knowledge of procedures to perform confined space watch	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b>, and describe their procedures for use</li> <li>b. describe procedures to perform confined space watch</li> <li>c. describe procedures to ventilate or purge confined spaces</li> <li>d. describe procedures to document monitoring equipment readings</li> <li>e. identify changes in <b>working conditions</b> that require alerting others</li> <li>f. describe <b>communication methods</b> used to alert attendees of changing conditions</li> <li>g. identify <b>measures</b> taken in case of an evacuation</li> </ul>
B-11.04.04L	demonstrate knowledge of training and certification requirements to perform confined space watch	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to perform confined space watch</li> </ul>
B-11.04.05L	demonstrate knowledge of regulatory requirements pertaining to performing confined space watch	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to performing confined space watch</li> </ul>

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	monitoring equipment, rescue equipment (tripods, harnesses, lifelines, winches, backboards), temporary lighting, ladders, ventilation equipment, timing devices
<b>working conditions</b>	atmospheric changes, environmental changes, hazardous activities around work area
<b>communication methods</b>	hand signals, rope signals, using two-way radios
<b>measures</b>	evacuate personnel from confined space; calling emergency and rescue services; following pre-determined rescue plan; purging, ventilating and inerting space

## B-11.05 Monitors heaters

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
B-11.05.01P	interpret readings from gauges and hand-held digital thermometers	readings from gauges and hand-held digital thermometers are interpreted
B-11.05.02P	keep heaters operating	heaters are kept operating taking into consideration temperature and applications
B-11.05.03P	inspect heaters and their surroundings for leaks	heaters and their surroundings are inspected for leaks
B-11.05.04P	recognize <b>hazards</b> of using heaters	<b>hazards</b> of using heaters are recognized
B-11.05.05P	maintain heaters	heaters are maintained according to manufacturers' specifications and jurisdictional regulations

### Range of Variables (include, but not limited to)

<b>hazards</b>	CO, potential fire, compressed gas, lack of ventilation, low O2 levels
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### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
B-11.05.01L	demonstrate knowledge of heaters, their characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify types of heaters, and describe their characteristics and applications</li> <li>b. describe operating principles of heaters</li> <li>c. interpret information pertaining to heaters found in specifications</li> <li>d. interpret gauge readings</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
B-11.05.02L	demonstrate knowledge of procedures to monitor heaters	a. describe procedures to inspect and maintain heaters b. identify potential <b>hazards</b> pertaining to heaters
B-11.05.03L	demonstrate knowledge of training and certification requirements to monitor heaters	a. identify training and certification requirements to monitor heaters
B-11.05.04L	demonstrate knowledge of regulatory requirements pertaining to monitoring heaters	a. identify codes, industry standards and regulations pertaining to monitoring heaters
B-11.05.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>hazards</b>	CO, potential fire, compressed gas, lack of ventilation, low O2 levels
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# Major Work Activity C – Uses scaffolding and access equipment

## Task C-12 Uses scaffolding

### Task Descriptor

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.

### C-12.01 Erects scaffolding

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
C-12.01.01P	select and use tools and equipment	tools and equipment are selected and used according to task
C-12.01.02P	interpret engineered drawings	engineered drawings are interpreted and applied
C-12.01.03P	select <b>scaffolding</b>	<b>scaffolding</b> is selected according to job specifications and engineered drawings
C-12.01.04P	fasten <b>scaffolding components</b>	<b>scaffolding components</b> are fastened by aligning scaffold connectors
C-12.01.05P	select and install bracing for specific job	bracing is selected and installed according to job specifications, engineered drawings and industry standards
C-12.01.06P	secure <b>scaffolding</b>	<b>scaffolding</b> is secured for stability according to manufacturers' specifications, and engineered specifications and drawings

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
C-12.01.07P	determine location of <b>scaffolding</b> taking into consideration <b>obstacles</b>	location of <b>scaffolding</b> is determined taking into consideration <b>obstacles</b>
C-12.01.08P	secure and level base	base is secured and leveled using <b>methods</b> according to industry standards
C-12.01.09P	raise <b>scaffolding components</b>	<b>scaffolding components</b> are raised using manual and mechanical techniques
C-12.01.10P	place and use counterweights	counterweights are placed and used according to manufacturers' specifications, and engineered specifications and drawings
C-12.01.11P	tag <b>scaffolding</b>	<b>scaffolding</b> is tagged to indicate <b>access and safety information</b>

**Range of Variables (include, but not limited to)**

<b>scaffolding</b>	systems, baker's, frame and brace, mast climber system, tube and clamp
<b>components</b>	ladders, platforms, cross bracing, base plates, screw jacks, outriggers, brackets, safety pins, tubes, clamps (swivel and right-angle), beam clamps, aluminum beams, bolts, castors, u heads, legs, wheels, safety gates, ledgers, standards
<b>obstacles</b>	stairwells, open holes, columns, uneven surfaces
<b>methods</b>	installing mud sills and bases, outriggers and shimming
<b>access and safety information</b>	readiness, hazards, usage specifications

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
C-12.01.01L	demonstrate knowledge of <b>scaffolding</b> , their <b>components</b> , characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>scaffolding</b> and their <b>components</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to <b>scaffolding</b> found on manufacturers' specifications, and engineered specifications and drawings</li> <li>c. identify brace and platform sizes</li> <li>d. identify overhang limitations when working with planking</li> </ul>
C-12.01.02L	demonstrate knowledge of procedures to erect <b>scaffolding</b>	<ul style="list-style-type: none"> <li>a. identify tools and equipment used to erect <b>scaffolding</b>, and describe their procedures for use</li> <li>b. describe procedures to erect <b>scaffolding</b></li> <li>c. describe procedures and <b>methods</b> to secure <b>scaffolding</b> and bases</li> <li>d. describe <b>access and safety information</b> found on tags</li> <li>e. describe procedures and requirements to tag <b>scaffolding</b></li> </ul>
C-12.01.03L	demonstrate knowledge of training and certification requirements to erect <b>scaffolding</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to erect <b>scaffolding</b></li> </ul>
C-12.01.04L	demonstrate knowledge of regulatory requirements pertaining to <b>scaffolding</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to <b>scaffolding</b></li> </ul>

## Range of Variables (include, but not limited to)

<b>scaffolding</b>	systems, baker's, frame and brace, mast climber system, tube and clamp
<b>components</b>	ladders, platforms, cross bracing, base plates, screw jacks, outriggers, brackets, safety pins, tubes, clamps (swivel and right-angle), beam clamps, aluminum beams, bolts, castors, u heads, legs, wheels, safety gates, ledgers, standards
<b>methods</b>	installing mud sills and bases, outriggers and shimming
<b>access and safety information</b>	readiness, hazards, usage specifications

## C-12.02 Inspects scaffolding

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
C-12.02.01P	visually inspect welds, bracing components and planks	welds, bracing components and planks are visually inspected to identify damages and <b>faults</b>
C-12.02.02P	tag <b>components</b> for repair or replacement	<b>components</b> are tagged for repair or replacement according to company policies
C-12.02.03P	remove defective <b>components</b> and <b>scaffolding</b> from service	defective <b>components</b> and <b>scaffolding</b> are removed from service according to company policies
C-12.02.04P	complete documentation and tags	documentation and tags are completed daily according to jurisdictional regulations and company policies

### Range of Variables (include, but not limited to)

<b>faults</b>	stress cracks, warps, bent bracing and frames
<b>components</b>	ladders, platforms, cross bracing, base plates, screw jacks, outriggers, brackets, safety pins, tubes, clamps (swivel and right-angle), beam clamps, aluminum beams, bolts, castors, u-heads, legs, wheels, safety gates, ledgers, standards
<b>scaffolding</b>	systems, baker's, frame and brace, mast climber system, tube and clamp

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
C-12.02.01L	demonstrate knowledge of <b>scaffolding</b> , their <b>components</b> , characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>scaffolding</b> and their <b>components</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to <b>scaffolding</b> found on manufacturers' specifications, and engineered specifications and drawings</li> <li>c. identify brace and platform sizes</li> <li>d. identify overhang limitations when working with planking</li> </ul>
C-12.02.02L	demonstrate knowledge of procedures to inspect <b>scaffolding</b> and their <b>components</b>	<ul style="list-style-type: none"> <li>a. identify tools and equipment used to inspect <b>scaffolding</b> and their <b>components</b>, and describe their procedures for use</li> <li>b. describe procedures to inspect <b>scaffolding</b> and their <b>components</b></li> <li>c. identify damages and <b>faults</b> in <b>scaffolding</b></li> <li>d. identify documentation and tags to be completed after inspection</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
C-12.02.03L	demonstrate knowledge of training and certification requirements to inspect <b>scaffolding</b> and their <b>components</b>	a. identify training and certification requirements to inspect <b>scaffolding</b> and their <b>components</b>
C-12.02.04L	demonstrate knowledge of regulatory requirements pertaining to inspection of <b>scaffolding</b> and their <b>components</b>	a. identify codes, industry standards and regulations pertaining to inspection of <b>scaffolding</b> and their <b>components</b>

**Range of Variables (include, but not limited to)**

<b>scaffolding</b>	systems, baker's, frame and brace, mast climber system, tube and clamp
<b>components</b>	ladders, platforms, cross bracing, base plates, screw jacks, outriggers, brackets, safety pins, tubes, clamps (swivel and right-angle), beam clamps, aluminum beams, bolts, castors, u-heads, legs, wheels, safety gates, ledgers, standards
<b>faults</b>	stress cracks, warps, bent bracing and frames

**C-12.03 Maintains scaffolding**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
C-12.03.01P	select and use tools and equipment	tools and equipment are selected and used according to task
C-12.03.02P	clean <b>scaffolding</b>	<b>scaffolding</b> is cleaned by removing debris, tools and materials

Reference Code	Performance Criteria	Evidence of Attainment
C-12.03.03P	maintain platforms	platforms are maintained throughout job by visually inspecting for defects regularly according to company policies, jurisdictional regulations and industry standards
C-12.03.04P	lubricate motorized and mechanical <b>scaffolding</b>	motorized and mechanical <b>scaffolding</b> is lubricated according to manufacturers' specifications

**Range of Variables (include, but not limited to)**

<b>scaffolding</b>	systems, baker's, frame and brace, mast climber system, tube and clamp
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**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
C-12.03.01L	demonstrate knowledge of <b>scaffolding</b> , their <b>components</b> , characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>scaffolding</b> and their <b>components</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to <b>scaffolding</b> found on manufacturers' specifications, engineered specifications and drawings</li> <li>c. identify brace and platform sizes</li> <li>d. identify overhang limitations when working with planking</li> <li>e. calculate load limitations for scaffolding</li> </ul>
C-12.03.02L	demonstrate knowledge of procedures to maintain <b>scaffolding</b>	<ul style="list-style-type: none"> <li>a. identify tools and equipment used to maintain <b>scaffolding</b>, and describe their procedures for use</li> <li>b. describe procedures to clean <b>scaffolding</b></li> <li>c. describe procedures to lubricate motorized and mechanical <b>scaffolding</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
C-12.03.03L	demonstrate knowledge of training and certification requirements to maintain <b>scaffolding</b>	a. identify training and certification requirements to maintain <b>scaffolding</b>
C-12.03.04L	demonstrate knowledge of regulatory requirements pertaining to maintenance of <b>scaffolding</b>	a. identify codes, industry standards and regulations pertaining to maintenance of <b>scaffolding</b>

**Range of Variables (include, but not limited to)**

<b>scaffolding</b>	systems, baker's, frame and brace, mast climber system, tube and clamp
<b>components</b>	ladders, platforms, cross bracing, base plates, screw jacks, outriggers, brackets, safety pins, tubes, clamps (swivel and right-angle), beam clamps, aluminum beams, bolts, castors, u-heads, legs, wheels, safety gates, ledgers, standards

**C-12.04 Tends to scaffold erectors**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
C-12.04.01P	determine brace and platform sizes for specific work deck	brace and platform sizes for specific work deck are determined according to engineered drawings and industry standards
C-12.04.02P	select and use tools and equipment	tools and equipment are selected and used according to task
C-12.04.03P	pass tools, equipment, materials and <b>components</b> to scaffold erectors	tools, equipment, materials and <b>components</b> are passed to scaffold erectors

Reference Code	Performance Criteria	Evidence of Attainment
C-12.04.04P	organize and store materials and <b>components</b>	materials and <b>components</b> are organized and stored according to company policies and industry standards

**Range of Variables (include, but not limited to)**

<b>components</b>	ladders, platforms, cross bracing, base plates, screw jacks, outriggers, brackets, safety pins, tubes, clamps (swivel and right-angle), beam clamps, aluminum beams, bolts, castors, u heads, legs, wheels, safety gates, ledgers, standards
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**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
C-12.04.01L	demonstrate knowledge of <b>scaffolding</b> , their <b>components</b> , characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>scaffolding</b> and their <b>components</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to <b>scaffolding</b> found on manufacturers' specifications, and engineered specifications and drawings</li> <li>c. identify brace and platform sizes</li> <li>d. identify overhang limitations when working with planking</li> </ul>
C-12.04.02L	demonstrate knowledge of procedures to tend to scaffold erectors	<ul style="list-style-type: none"> <li>a. identify tools and equipment used to tend to scaffold erectors, and describe their procedures for use</li> <li>b. describe procedures to tend to scaffold erectors</li> <li>c. describe procedures to store materials and <b>components</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
C-12.04.03L	demonstrate knowledge of training and certification requirements to erect <b>scaffolding</b>	a. identify training and certification requirements to erect <b>scaffolding</b>
C-12.04.04L	demonstrate knowledge of regulatory requirements pertaining to erection of <b>scaffolding</b>	a. identify codes, industry standards and regulations pertaining to erection of <b>scaffolding</b>

**Range of Variables (include, but not limited to)**

<b>scaffolding</b>	systems, baker's, frame and brace, mast climber system, tube and clamp
<b>components</b>	ladders, platforms, cross bracing, base plates, screw jacks, outriggers, brackets, safety pins, tubes, clamps (swivel and right-angle), beam clamps, aluminum beams, bolts, castors, u heads, legs, wheels, safety gates, ledgers, standards

**C-12.05 Dismantles scaffolding**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
C-12.05.01P	select and use tools and equipment	tools and equipment are selected and used according to task
C-12.05.02P	determine starting point and follow procedure for dismantling	starting point is determined and procedure for dismantling is followed according to industry standards

Reference Code	Performance Criteria	Evidence of Attainment
C-12.05.03P	lower <b>scaffolding components</b>	<b>scaffolding components</b> are lowered using <b>techniques</b>
C-12.05.04P	inventory, organize, stack and band <b>scaffolding components</b> in designated area for shipping	<b>scaffolding components</b> are inventoried, organized, stacked and banded in designated area for shipping according to company policies and industry standards

**Range of Variables (include, but not limited to)**

<b>scaffolding</b>	systems, baker's, frame and brace, mast climber system, tube and clamp
<b>components</b>	ladders, platforms, cross bracing, base plates, screw jacks, outriggers, brackets, safety pins, tubes, clamps (swivel and right-angle), beam clamps, aluminum beams, bolts, castors, u heads, legs, wheels, safety gates, ledgers, standards
<b>techniques</b>	hand bombing, rigging

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
C-12.05.01L	demonstrate knowledge of <b>scaffolding</b> , their <b>components</b> , characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>scaffolding</b> and their <b>components</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to <b>scaffolding</b> found on manufacturers' specifications, and engineered specifications and drawings</li> <li>c. identify brace and platform sizes</li> <li>d. identify overhang limitations when working with planking</li> </ul>

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
C-12.05.02L	demonstrate knowledge of procedures to dismantle <b>scaffolding</b>	<ul style="list-style-type: none"> <li>a. identify tools and equipment used to dismantle <b>scaffolding</b>, and describe their procedures for use</li> <li>b. describe procedures to dismantle <b>scaffolding</b></li> <li>c. identify <b>techniques</b> to lower <b>scaffolding components</b></li> <li>d. describe procedures to inventory, organize, stack and band <b>scaffolding components</b></li> </ul>
C-12.05.03L	demonstrate knowledge of training and certification requirements to dismantle <b>scaffolding</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to dismantle <b>scaffolding</b></li> </ul>
C-12.05.04L	demonstrate knowledge of regulatory requirements pertaining to dismantling of <b>scaffolding</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to dismantling of <b>scaffolding</b></li> </ul>

**Range of Variables (include, but not limited to)**

<b>scaffolding</b>	systems, baker's, frame and brace, mast climber system, tube and clamp
<b>components</b>	ladders, platforms, cross bracing, base plates, screw jacks, outriggers, brackets, safety pins, tubes, clamps (swivel and right-angle), beam clamps, aluminum beams, bolts, castors, u heads, legs, wheels, safety gates, ledgers, standards
<b>techniques</b>	hand bombing, rigging

## Task C-13 Uses access equipment

### Task Descriptor

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.

### C-13.01 Uses ladders

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
C-13.01.01P	select <b>ladder</b>	<b>ladder</b> is selected according to application
C-13.01.02P	assess and prepare ground before setting <b>ladder</b>	ground is assessed and prepared before setting <b>ladder</b> according to jurisdictional regulations
C-13.01.03P	set <b>ladder</b>	<b>ladder</b> is set using slope ratio and overhang requirements according to jurisdictional regulations
C-13.01.04P	tie-off <b>ladder</b> at top and bottom	<b>ladder</b> is tied off at top and bottom according to jurisdictional regulations
C-13.01.05P	use three-point contact when climbing <b>ladder</b>	three-point contact is used when climbing <b>ladder</b> according to jurisdictional regulations

#### Range of Variables (include, but not limited to)

<b>ladders</b>	extension, platform, stepladders, fixed, job-built
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## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
C-13.01.01L	demonstrate knowledge of <b>ladders</b> , their characteristics, applications and limitations	a. identify types of <b>ladders</b> , and describe their characteristics, applications and limitations b. interpret information pertaining to <b>ladders</b> found in specifications
C-13.01.02L	demonstrate knowledge of procedures to use <b>ladders</b>	a. describe procedures to use <b>ladders</b>
C-13.01.03L	demonstrate knowledge of training and certification requirements to use <b>ladders</b>	a. identify training and certification requirements to use <b>ladders</b>
C-13.01.04L	demonstrate knowledge of regulatory requirements pertaining to using <b>ladders</b>	a. identify codes, industry standards and jurisdictional regulations pertaining to using <b>ladders</b>

### Range of Variables (include, but not limited to)

<b>ladders</b>	extension, platform, stepladders, fixed, job-built
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## C-13.02 Uses stationary and mobile elevating work platforms (MEWP)

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

## Skills

Reference Code	Performance Criteria	Evidence of Attainment
C-13.02.01P	assess and prepare ground before using <b>stationary and MEWP</b>	ground is assessed and prepared before using <b>stationary and MEWP</b> according to manufacturers' specifications and jurisdictional regulations
C-13.02.02P	select <b>stationary and MEWP</b>	<b>stationary and MEWP</b> is selected according to application

Reference Code	Performance Criteria	Evidence of Attainment
C-13.02.03P	perform pre-operational inspection and complete documentation	pre-operational inspection is performed, and documentation is completed according to company policies
C-13.02.04P	operate <b>stationary and MEWP</b>	<b>stationary and MEWP</b> are operated using <b>controls</b> according to manufacturers' specifications
C-13.02.05P	set and use outriggers and pads	outriggers and pads are set and used according to manufacturers' specifications to stabilize <b>stationary and MEWP</b>
C-13.02.06P	use counterweights on support beams for swing stages	counterweights on support beams are used for swing stages according to manufacturers' specifications to ensure ratio of load for suspended work platform

**Range of Variables (include, but not limited to)**

<b>stationary and MEWP</b>	mast climbers, scissor lifts, boom lifts, swing stages
<b>controls</b>	boom-up/boom-down, telescoping, drive controls

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
C-13.02.01L	demonstrate knowledge of <b>stationary and MEWP</b> , their characteristics, applications, limitations and operation	<ul style="list-style-type: none"> <li>a. identify types of <b>stationary and MEWP</b>, and describe their characteristics, applications and limitations</li> <li>b. describe operating principles of <b>stationary and MEWP</b></li> <li>c. interpret information pertaining to <b>stationary and MEWP</b> found in manufacturers' specifications</li> <li>d. identify weight capacities and extension limitations of <b>stationary and MEWP</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
C-13.02.02L	demonstrate knowledge of procedures to use <b>stationary and MEWP</b>	<ul style="list-style-type: none"> <li>a. describe procedures to assess and prepare ground before using <b>stationary and MEWP</b></li> <li>b. describe procedures to perform pre-operational inspection and identify documentation to be completed</li> <li>c. describe procedures and equipment used to stabilize loads</li> <li>d. describe characteristics and applications of swing stages</li> <li>e. describe procedures to use <b>stationary and MEWP</b></li> </ul>
C-13.02.03L	demonstrate knowledge of training and certification requirements to use <b>stationary and MEWP</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to use <b>stationary and MEWP</b></li> </ul>
C-13.02.04L	demonstrate knowledge of regulatory requirements pertaining to use of <b>stationary and MEWP</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to use of <b>stationary and MEWP</b></li> </ul>
C-13.02.05L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

**Range of Variables (include, but not limited to)**

<b>stationary and MEWP</b>	mast climbers, scissor lifts, boom lifts, swing stages
<b>controls</b>	boom-up/boom-down, telescoping, drive controls

### C-13.03 Inspects access equipment

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
C-13.03.01P	visually inspect <b>access equipment</b> and their <b>components</b> before and after use	<b>access equipment</b> and their <b>components</b> are visually inspected before and after use to identify <b>faults and defects</b>
C-13.03.02P	tag <b>access equipment</b> and their <b>components</b> for repair or replacement	<b>access equipment</b> and their <b>components</b> are tagged for repair or replacement
C-13.03.03P	inspect emergency shut-off	emergency shut-off is inspected to ensure it is operational according to manufacturers' specifications

#### Range of Variables (include, but not limited to)

<b>access equipment</b>	ladders, stationary and MEWP
<b>components</b>	hydraulic lines, batteries, nuts, bolts, cables, outriggers, work platforms, electrical cords
<b>faults and defects</b>	stationary and MEWP (i.e., cracking, leaks in lines, corrosion, fraying cables, deflated or damaged tires), ladders (i.e., bent rungs, split rails, cracks)

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
C-13.03.01L	demonstrate knowledge of <b>access equipment</b> , their <b>components</b> , characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify types of <b>access equipment</b> and their <b>components</b>, and describe their characteristics and applications</li> <li>b. describe operating principles of <b>access equipment</b> and their <b>components</b></li> <li>c. interpret information pertaining to <b>access equipment</b> found in manufacturers' specifications</li> </ul>
C-13.03.02L	demonstrate knowledge of procedures to inspect <b>access equipment</b> and their <b>components</b>	<ul style="list-style-type: none"> <li>a. describe procedures to inspect <b>access equipment</b> and their <b>components</b></li> <li>b. identify <b>faults and defects</b> found in <b>access equipment</b> and their <b>components</b></li> <li>c. describe procedures to tag <b>access equipment</b> and their <b>components</b> for repair or replacement</li> <li>d. identify safety inspection requirements for stationary and MEWP</li> <li>e. identify location of gas/propane switches and emergency switches on stationary and MEWP</li> </ul>
C-13.03.03L	demonstrate knowledge of training and certification requirements to inspect <b>access equipment</b> and their <b>components</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to inspect <b>access equipment</b> and their <b>components</b></li> </ul>
C-13.03.04L	demonstrate knowledge of regulatory requirements pertaining to inspection of <b>access equipment</b> and their <b>components</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to inspection of <b>access equipment</b> and their <b>components</b></li> </ul>
C-13.03.05L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

### Range of Variables (include, but not limited to)

<b>access equipment</b>	ladders, stationary and MEWP
<b>components</b>	hydraulic lines, batteries, nuts, bolts, cables, outriggers, work platforms, electrical cords
<b>faults and defects</b>	stationary and MEWP (i.e., cracking, leaks in lines, corrosion, fraying cables, deflated or damaged tires), ladders (i.e., bent rungs, split rails, cracks)

### C-13.04 Maintains access equipment

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
C-13.04.01P	select and use tools and equipment	tools and equipment are selected and used according to task
C-13.04.02P	clean <b>access equipment</b>	<b>access equipment</b> is cleaned according to industry standards
C-13.04.03P	lubricate stationary and MEWP <b>components</b>	stationary and MEWP <b>components</b> are lubricated according to manufacturers' specifications
C-13.04.04P	maintain <b>fluids</b>	<b>fluids</b> are maintained according to manufacturers' specifications
C-13.04.05P	maintain equipment batteries	<b>equipment batteries are maintained</b> according to manufacturers' specifications
C-13.04.06P	refuel gas- and diesel-powered stationary and MEWP	gas- and diesel-powered stationary and MEWP are refueled
C-13.04.07P	activate locking arm on stationary and MEWP	locking arm is activated to prevent stationary and MEWP from descending during maintenance

**Range of Variables (include, but not limited to)**

<b>access equipment</b>	ladders, stationary and MEWP
<b>components</b>	hydraulic lines, batteries, nuts, bolts, cables, outriggers, work platforms, electrical cords
<b>fluids</b>	hydraulic, oils, anti-freeze
<b>maintenance of equipment batteries</b>	charging, maintaining water level, clean connections

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
C-13.04.01L	demonstrate knowledge of <b>access equipment</b> , their <b>components</b> , characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify types of <b>access equipment</b> and their <b>components</b>, and describe their characteristics and applications</li> <li>b. describe operating principles of <b>access equipment</b> and their <b>components</b></li> <li>c. interpret information pertaining to <b>access equipment</b> found in manufacturers' specifications</li> <li>d. identify types of <b>fluids</b> used for <b>access equipment</b></li> </ul>
C-13.04.02L	demonstrate knowledge of procedures to maintain <b>access equipment</b>	<ul style="list-style-type: none"> <li>a. identify tools and equipment used to maintain <b>access equipment</b>, and describe their procedures for use</li> <li>b. describe procedures to maintain <b>access equipment</b></li> </ul>
C-13.04.03L	demonstrate knowledge of regulatory requirements pertaining to maintenance of <b>access equipment</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to maintenance of <b>access equipment</b></li> </ul>
C-13.04.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

**Range of Variables (include, but not limited to)**

<b>access equipment</b>	ladders, stationary and MEWP
<b>components</b>	hydraulic lines, batteries, nuts, bolts, cables, outriggers, work platforms, electrical cords
<b>fluids</b>	hydraulic, oils, anti-freeze

# Major Work Activity D - Performs concrete work

## Task D-14 Forms concrete

### Task Descriptor

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.

### D-14.01 Installs formwork and shoring

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-14.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-14.01.02P	verify location and size of <b>concrete structure</b> to be poured	location and size of <b>concrete structure</b> to be poured are verified according to job specifications
D-14.01.03P	identify <b>formwork system</b> to be used	<b>formwork system</b> to be used is identified according to job and engineered specifications and <b>industry standards</b>
D-14.01.04P	determine installation procedures and materials required	installation procedures and materials required are determined according to job and manufacturers' specifications, and <b>industry standards</b>
D-14.01.05P	assemble and fasten <b>formwork components</b>	<b>formwork components</b> are assembled and fastened according to manufacturers' and engineered specifications
D-14.01.06P	recognize and correct <b>defects</b> in formwork	<b>defects</b> in formwork are recognized and corrected

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
D-14.01.07P	modify formwork to accommodate design alterations	formwork is modified to accommodate design alterations according to job specifications
D-14.01.08P	apply form release agents	form release agents are applied to prevent damage and for ease of releasing formwork according to application
D-14.01.09P	install <b>shoring</b> and bracing	<b>shoring</b> and bracing are installed according to specifications to support <b>concrete structures</b>
D-14.01.10P	secure <b>shoring</b> near slab edge	<b>shoring</b> is secured near slab edge
D-14.01.11P	adjust <b>shoring</b> as required	<b>shoring</b> is adjusted as required according to engineered specifications
D-14.01.12P	plumb and straighten <b>concrete structures</b>	<b>concrete structures</b> are plumbed and straightened using bracing and turnbuckles

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	measuring tapes, hammers, levels, squares, plumb bobs, saws, nail pullers, linesman pliers, chalk lines, string lines, pry bars
<b>concrete structures</b>	walls, slabs, columns, footings, stairs
<b>formwork systems</b>	wooden panels, prefabricated, free-form, metal fabricated, plastic, architectural liners, insulated concrete forms (ICF), flying forms
<b>industry standards</b>	CSA, American Concrete Institute (ACI)
<b>formwork components</b>	bracing, shoring, falsework, strongbacks, turnbuckles, walers, clamps, wedges, ties, clips, embedded components, taper ties
<b>defects</b>	misalignment, spacing, lack of plumbness, weak points, poor tension
<b>shoring</b>	fixed, telescoping, scaffold

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-14.01.01L	demonstrate knowledge of concrete <b>formwork systems</b> , their <b>components</b> , characteristics, applications and ratings	<ul style="list-style-type: none"> <li>a. identify types of <b>formwork systems</b> and their <b>components</b>, and describe their characteristics, applications and ratings</li> <li>b. interpret information pertaining to <b>formwork systems</b> found in specifications</li> <li>c. identify types of materials used to create <b>formwork systems</b></li> <li>d. identify form release agents, and describe their characteristics and applications</li> <li>e. identify possible <b>defects</b> in <b>formwork systems</b></li> <li>f. identify types of <b>concrete structures</b> created using <b>formwork systems</b></li> </ul>
D-14.01.02L	demonstrate knowledge of <b>shoring</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>shoring</b>, and describe their characteristics and applications</li> <li>b. identify types of <b>shoring hardware</b>, and describe their characteristics and applications</li> <li>c. identify <b>shoring</b> ratings and regulations</li> </ul>
D-14.01.03L	demonstrate knowledge of procedures to install formwork and <b>shoring</b>	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to install formwork and <b>shoring</b>, and describe their procedures for use</li> <li>b. describe procedures to install formwork and <b>shoring</b></li> <li>c. describe procedures to plumb and straighten <b>concrete structures</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
D-14.01.04L	demonstrate knowledge of regulatory requirements pertaining to installation of formwork and <b>shoring</b>	a. identify codes, <b>industry standards</b> and regulations pertaining to installation of formwork and <b>shoring</b>
D-14.01.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>formwork systems</b>	wooden panels, prefabricated, free-form, metal fabricated, plastic, architectural liners, insulated concrete forms (ICF), flying forms
<b>formwork components</b>	bracing, shoring, falsework, strongbacks, turnbuckles, walers, clamps, wedges, ties, clips, embedded components, taper ties
<b>defects</b>	misalignment, spacing, lack of plumbness, weak points, poor tension
<b>concrete structures</b>	walls, slabs, columns, footings, stairs
<b>shoring</b>	fixed, telescoping, scaffold
<b>shoring hardware</b>	anchor pins, spring clips, base plates
<b>tools and equipment</b>	measuring tapes, hammers, levels, squares, plumb bobs, saws, nail pullers, linesman pliers, chalk lines, string lines, pry bars
<b>industry standards</b>	CSA, American Concrete Institute (ACI)

## D-14.02 Inspects assembled formwork

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-14.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-14.02.02P	identify <b>defects</b> in formwork	<b>defects</b> in formwork are identified through visual inspection
D-14.02.03P	verify elevations and <b>layout</b>	elevations and <b>layout</b> are verified and checked against job specifications
D-14.02.04P	check <b>shoring</b> and bracing	<b>shoring</b> and bracing is checked to ensure formwork is secure, plumb and stable according to job specifications

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	measuring tapes, levels
<b>defects</b>	misalignment, spacing, inadequate bracing, crooked or unlevelled formwork, improper grading, form deterioration, splinters
<b>layout</b>	location of rough bucks (door openings), window block-outs, beam pockets, embedded components
<b>shoring</b>	fixed, telescoping, scaffold

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-14.02.01L	demonstrate knowledge of procedures to inspect assembled formwork	a. identify <b>tools and equipment</b> used to inspect assembled formwork, and describe their procedures for use b. describe procedures to inspect assembled formwork, <b>shoring</b> and bracing c. describe procedures to inspect elevations and <b>layout</b> d. identify possible <b>defects</b> in formwork
D-14.02.02L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	measuring tapes, levels
<b>shoring</b>	fixed, telescoping, scaffold
<b>layout</b>	location of rough bucks (door openings), window block-outs, beam pockets, embedded components
<b>defects</b>	misalignment, spacing, inadequate bracing, crooked or unlevelled formwork, improper grading, form deterioration, splinters

## D-14.03 Dismantles formwork

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-14.03.01P	prepare plan for dismantling formwork	plan for dismantling formwork is prepared considering <b>factors</b>
D-14.03.02P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-14.03.03P	remove <b>fasteners</b> and formwork components	<b>fasteners</b> and formwork components are removed according to specifications
D-14.03.04P	clean formwork components	formwork components are cleaned before concrete residue is dried
D-14.03.05P	stack components for reuse or transport	components are stacked for reuse or transport

### Range of Variables (include, but not limited to)

<b>factors</b>	starting point, sequence, placement of material
<b>tools and equipment</b>	pry bars, wrenches, hammers, breakers, grinders, chipping guns, point trowels
<b>fasteners</b>	nails, bolts

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-14.03.01L	demonstrate knowledge of procedures to dismantle formwork	a. identify <b>tools and equipment</b> used to dismantle formwork, and describe their procedures for use b. identify <b>factors</b> to consider when preparing plan for dismantling formwork c. describe procedures to remove <b>fasteners</b> and formwork components d. describe procedures to dismantle formwork e. describe procedures to clean formwork components f. describe procedures to stack formwork components
D-14.03.02L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify <b>practices that contribute to environmental protection</b>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	pry bars, wrenches, hammers, breakers, grinders, chipping guns, point trowels
<b>factors</b>	starting point, sequence, placement of material
<b>fasteners</b>	nails, bolts
<b>practices that contribute to environmental protection</b>	recycling, disposal

## Task D-15 Places and finishes concrete

### Task Descriptor

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. Installation of the concrete includes placing, vibrating to eliminate voids, and striking off (screeding). 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.

### D-15.01 Mixes concrete

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-15.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-15.01.02P	select <b>materials</b>	<b>materials</b> are selected according to specifications and <b>industry standards</b>
D-15.01.03P	mix <b>materials</b>	<b>materials</b> are mixed according to work schedule and weather conditions
D-15.01.04P	use <b>concrete admixtures</b>	<b>concrete admixtures</b> are used according to specifications and <b>industry standards</b>
D-15.01.05P	combine ingredients	ingredients are combined according to <b>job specifications</b>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	mixers, drills, mixing paddles, pails, trowels, mixing boxes, shovels, mortar hoes
<b>materials</b>	aggregates (e.g., sand, gravel, glass), water, cement
<b>industry standards</b>	CSA, ACI
<b>concrete admixtures</b>	pigments, accelerators, retarders, plasticizers, fibers
<b>job specifications</b>	ratios, mixing times, compatibilities

### Knowledge

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
D-15.01.01L	demonstrate knowledge of concrete, its <b>characteristics</b> and applications	<ul style="list-style-type: none"> <li>a. identify <b>types of concrete</b>, and describe their <b>characteristics</b> and applications</li> <li>b. identify types of concrete <b>materials</b> and describe their characteristics and applications</li> <li>c. identify types of <b>concrete admixtures</b> and describe their characteristics and applications</li> <li>d. interpret information pertaining to <b>materials</b> found in manufacturers' specifications</li> </ul>
D-15.01.02L	demonstrate knowledge of procedures to mix concrete	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to mix concrete, and describe their procedures for use</li> <li>b. describe procedures to mix concrete</li> </ul>
D-15.01.03L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>b. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

**Range of Variables (include, but not limited to)**

<b>types of concrete</b>	air entrained, shotcrete, high flow, other modified concretes
<b>characteristics</b>	strength, slump, air content, fly ash content, silica fume content
<b>materials</b>	aggregates (e.g., sand, gravel, glass), water, cement
<b>concrete admixtures</b>	pigments, accelerators, retarders, plasticizers, fibers
<b>tools and equipment</b>	mixers, drills, mixing paddles, pails, trowels, mixing boxes, shovels, mortar hoes

**D-15.02 Transports concrete on site**

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

**Skills**

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
D-15.02.01P	plan placement of concrete truck	placement of concrete truck is planned according to <b>considerations</b>
D-15.02.02P	plan route from truck to site of placement	route from truck to site of placement is planned to avoid obstacles and to allow for ease of access
D-15.02.03P	select, position and use <b>transporting equipment</b>	<b>transporting equipment</b> is selected, positioned and used

**Range of Variables (include, but not limited to)**

<b>considerations</b>	location of pump, access to work site, distance from other trades and utilities
<b>transporting equipment</b>	wheelbarrows, concrete pumps, power buggies, concrete buckets, skid steers, buckets, chutes, forklifts, elephant trunks

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-15.02.01L	demonstrate knowledge of <b>transporting equipment</b> , their characteristics, applications and operation	a. identify <b>transporting equipment</b> , and describe their characteristics and applications b. describe operating principles of <b>transporting equipment</b> c. interpret information pertaining to <b>transporting equipment</b> found in manufacturers' specifications
D-15.02.02L	demonstrate knowledge of procedures to transport concrete on site	a. identify procedures and considerations for access and egress b. describe procedures to transport concrete on site
D-15.02.03L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

### Range of Variables (include, but not limited to)

<b>transporting equipment</b>	wheelbarrows, concrete pumps, power buggies, concrete buckets, skid steers, buckets, chutes, forklifts, elephant trunks
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## D-15.03 Places concrete

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

## Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-15.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-15.03.02P	plan sequence of placement	sequence of placement is planned according to industry standards and type of concrete

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
D-15.03.03P	monitor and communicate rate of placement	rate of placement is monitored and communicated to pump operator
D-15.03.04P	monitor for blowouts	blowouts are monitored by performing visual inspection during placement
D-15.03.05P	adjust placement procedure	procedure for placement is adjusted to prevent blowouts and movement of forms
D-15.03.06P	vibrate and spread floor slabs	floor slabs are vibrated and spread to desired height or level
D-15.03.07P	level placement	placement is leveled using <b>methods</b>
D-15.03.08P	place and vibrate wall	wall is placed and vibrated to desired height
D-15.03.09P	recognize and rectify <b>surface irregularities</b>	<b>surface irregularities</b> are recognized and rectified

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	concrete vibrators, stationary and mobile pumps, rakes, shovels, screeding tools, floats, height sticks, laser levels, grade nails
<b>methods</b>	wet screeding, floating, using concrete roller and power screeds (roller, truss, vibratory, robotic)
<b>surface irregularities</b>	dips, high spots, holes

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-15.03.01L	demonstrate knowledge of procedures to place concrete	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to place concrete, and describe their procedures for use</li> <li>b. identify height from which concrete may be placed</li> <li>c. explain placement rates</li> <li>d. describe procedures to plan sequence of placement of concrete</li> <li>e. describe procedures to place concrete</li> <li>f. describe procedures to vibrate and spread floor slabs</li> <li>g. identify <b>methods</b> to level placement</li> <li>h. describe procedures to vibrate concrete walls</li> <li>i. identify possible <b>surface irregularities</b></li> <li>j. describe procedures to rectify <b>surface irregularities</b></li> </ul>
D-15.03.02L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	concrete vibrators, stationary and mobile pumps, rakes, shovels, screeding tools, floats, height sticks, laser levels, grade nails
<b>methods</b>	wet screeding, floating, using concrete roller and power screeds (roller, truss, vibratory, robotic)
<b>surface irregularities</b>	dips, high spots, holes

## D-15.04 Installs embedded components in concrete

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-15.04.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-15.04.02P	measure, lay out and position <b>embedded components</b>	<b>embedded components</b> are measured, laid out and positioned according to drawings and job specifications

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	measuring tapes, string lines, hammers, levels, templates
<b>embedded components</b>	anchor plates, anchor bolts, water stops, control joints, keyways, reinforcing material, expansion joints

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-15.04.01L	demonstrate knowledge of <b>embedded components</b> , their characteristics and applications	a. identify <b>embedded components</b> , and describe their characteristics and applications b. interpret information pertaining to <b>embedded components</b> found on drawings and specifications

Reference Code	Learning Outcomes	Learning Objectives
D-15.04.02L	demonstrate knowledge of procedures to install <b>embedded components</b> in concrete	a. identify <b>tools and equipment</b> used to install <b>embedded components</b> in concrete, and describe their procedures for use b. describe procedures used to install <b>embedded components</b> in concrete c. identify time limits for installing <b>embedded components</b> (while concrete is in wet or plastic state)

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	measuring tapes, string lines, hammers, levels, templates
<b>embedded components</b>	anchor plates, anchor bolts, water stops, control joints, keyways, reinforcing material, expansion joints

**D-15.05 Assists with finishing concrete**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
D-15.05.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-15.05.02P	work concrete at different stages of setting	concrete is worked at different stages of setting to reach desired <b>finish</b> according to job specifications

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	floats, hand trowels, power trowels, edgers, brooms, tining tools
<b>finishes</b>	hand float, broomed, polished, exposed aggregate, burnished, textured

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-15.05.01L	demonstrate knowledge of concrete <b>finishes</b> , their characteristics and applications	a. identify types of concrete <b>finishes</b> , and describe their characteristics and applications b. interpret information pertaining to <b>finishes</b> found in job specifications
D-15.05.02L	demonstrate knowledge of procedures to assist with finishing concrete	a. identify <b>tools and equipment</b> used to finish concrete, and describe their procedures for use b. describe procedures to assist with finishing concrete c. identify <b>surface preparation requirements</b> d. identify types of <b>finishing processes</b>
D-15.05.03L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

### Range of Variables (include, but not limited to)

<b>finishes</b>	hand float, broomed, polished, exposed aggregate, burnished, textured
<b>tools and equipment</b>	floats, hand trowels, power trowels, edgers, brooms, tining tools
<b>surface preparation requirements</b>	applying retardants, green cutting (pressure washer)
<b>finishing processes</b>	floating, trowelling, edging, grooving, applying decorative joints, texturing, polishing, burnishing

## D-15.06 Controls concrete curing process

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-15.06.01P	use <b>materials, tools and equipment</b>	<b>materials, tools and equipment</b> are used to hydrate concrete to control curing process according to specifications and <b>weather and environmental conditions</b>
D-15.06.02P	use curing compounds	curing compounds are used to trap moisture in concrete and avoid evaporation
D-15.06.03P	use insulated tarps and heaters	insulated tarps and heaters are used to prevent heat loss and freezing in cold weather

### Range of Variables (include, but not limited to)

<b>materials</b>	burlap, polyethylene
<b>tools and equipment</b>	squeegees, soaker hoses, sprinklers, mops
<b>weather and environmental conditions</b>	heat, cold, exhaust fumes, dust

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-15.06.01L	demonstrate knowledge of procedures to control concrete curing process	<ul style="list-style-type: none"> <li>a. identify <b>materials, tools and equipment</b> used to control concrete curing process, and describe their procedures for use</li> <li>b. describe concrete curing and its importance in achieving desired concrete strength</li> <li>c. describe procedures to control concrete curing process</li> <li>d. identify curing compounds used to trap moisture in concrete</li> <li>e. identify <b>materials used to prevent heat loss and freezing</b> in cold weather</li> <li>f. identify <b>weather and environmental conditions</b> that may affect curing process</li> </ul>

### Range of Variables (include, but not limited to)

<b>materials</b>	burlap, polyethylene
<b>tools and equipment</b>	squeegees, soaker hoses, sprinklers, mops
<b>materials used to prevent heat loss and freezing</b>	insulated tarps, heaters
<b>weather and environmental conditions</b>	heat, cold, exhaust fumes, dust

## Task D-16 Modifies concrete

### Task Descriptor

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.

### D-16.01 Drills/cores/cuts concrete

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-16.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-16.01.02P	lay out and mark hole	hole is laid out and marked according to drawings and specifications
D-16.01.03P	verify <b>embedded items</b> in concrete	<b>embedded items</b> in concrete are verified by x-ray and drawings
D-16.01.04P	anchor base of cutting and coring equipment	base of cutting and coring equipment is anchored according to manufacturers' specifications
D-16.01.05P	listen and feel for obstructions during drilling/coring/cutting processes	obstructions are identified during drilling/coring/cutting processes
D-16.01.06P	control speed, pressure and water flow during drilling/coring/cutting processes	speed, pressure and water flow are controlled during drilling/coring/cutting processes
D-16.01.07P	control dust	dust is controlled using water and by tarping, ventilating and vacuuming

#### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	core and rotary hammer drills and their bits, saws
<b>embedded items</b>	post tension cables, rebar, electrical conduit, water lines

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-16.01.01L	demonstrate knowledge of procedures to drill/core/cut concrete	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to drill/core/cut concrete, and describe their procedures for use</li> <li>b. describe procedures to lay out and mark holes</li> <li>c. describe procedures to inspect concrete for <b>embedded items</b></li> <li>d. describe procedures to dry and wet drill/core/cut concrete</li> <li>e. describe procedures to control dust and slurry while drilling/coring/cutting</li> <li>f. identify types and properties of concrete to be drilled/cored/cut</li> <li>g. identify <b>reasons for drilling/coring/cutting concrete</b></li> </ul>
D-16.01.02L	demonstrate knowledge of training and certification requirements to drill/core/cut concrete	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to drill/core/cut concrete</li> </ul>
D-16.01.03L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	core and rotary hammer drills and their bits, saws
<b>embedded items</b>	post tension cables, rebar, electrical conduit, water lines
<b>reasons for drilling/coring/cutting concrete</b>	adding components, installing sleeves, fastening items, demolition

## D-16.02 Prepares concrete for resurfacing

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-16.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-16.02.02P	mechanically remove finish	finish is mechanically removed using <b>methods</b>
D-16.02.03P	chemically remove finish	finish is removed using acids
D-16.02.04P	clean surface	surface is cleaned using <b>cleaning methods</b>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	PPE, bush hammers, scarifiers, floor grinders, scabblers, concrete saws, concrete surfacing profile (CSP) samples
<b>methods</b>	chipping, bush hammering, media blasting, scarifying, scoring, grooving, grinding
<b>cleaning methods</b>	vacuuming, blowing, media blasting, washing, brush blasting, sweeping

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-16.02.01L	demonstrate knowledge of procedures to prepare concrete for resurfacing	a. identify <b>tools and equipment</b> used to prepare concrete for resurfacing, and describe their procedures for use b. describe procedures and <b>methods</b> to remove finish mechanically c. describe procedures and methods to remove finish chemically d. describe surface <b>cleaning methods</b>
D-16.02.02L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	PPE, bush hammers, scarifiers, floor grinders, scabblers, concrete saws, concrete surfacing profile (CSP) samples
<b>methods</b>	chipping, bush hammering, media blasting, scarifying, scoring, grooving, grinding
<b>cleaning methods</b>	vacuuming, blowing, media blasting, washing, brush blasting, sweeping

## D-16.03 Performs concrete repair and refinishing

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

## Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-16.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task

Reference Code	Performance Criteria	Evidence of Attainment
D-16.03.02P	apply bonding agents	bonding agents are applied according to engineered, manufacturers' and job specifications
D-16.03.03P	apply <b>materials</b> to repair <b>deficiencies</b>	<b>materials</b> are applied according to manufacturers' and job specifications to repair <b>deficiencies</b> to achieve desired finishes

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	trowels, shovels, mixing paddles, sponges, grinders, sanders, brushes, brooms, chipping guns, chipping hammers, gunite nozzles, shotcrete nozzles, carousel pumps
<b>materials</b>	epoxies, grout, cementitious patching materials
<b>deficiencies</b>	honeycombs, voids, cracks

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
D-16.03.01L	demonstrate knowledge of <b>materials</b> used to repair concrete <b>deficiencies</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>materials</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to <b>materials</b> found in manufacturers' specifications</li> </ul>
D-16.03.02L	demonstrate knowledge of procedures to perform concrete repair and refinishing	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to perform concrete repair and refinishing, and describe their procedures for use</li> <li>b. identify <b>deficiencies</b> in concrete that can be repaired</li> <li>c. describe procedures to apply bonding agents to concrete</li> <li>d. describe procedures to perform concrete repair and refinishing</li> <li>e. identify <b>refinishing methods</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
D-16.03.03L	demonstrate knowledge of training and certification requirements to perform concrete repair and refinishing	a. identify training and certification requirements to perform concrete repair and refinishing
D-16.03.04L	demonstrate knowledge of regulatory requirements pertaining to concrete repair and refinishing	a. identify codes, industry standards and regulations pertaining to concrete repair and refinishing
D-16.03.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>materials</b>	epoxies, grout, cementitious patching materials
<b>deficiencies</b>	honeycombs, voids, cracks
<b>tools and equipment</b>	trowels, shovels, mixing paddles, sponges, grinders, sanders, brushes, brooms, chipping guns, chipping hammers, gunite nozzles, shotcrete nozzles, carousel pumps
<b>refinishing methods</b>	painting, epoxy coating, parging, acid staining, grout coating

**D-16.04 Creates expansion, control and isolation joints**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
D-16.04.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-16.04.02P	control cracking	cracking is controlled using <b>methods</b> according to engineered specifications

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	saws, groovers (two-sided edgers, dividers)
<b>methods</b>	cutting concrete, installing plastic strips, installing asphalt-impregnated board, installing control joints

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
D-16.04.01L	demonstrate knowledge of expansion, control and isolation joints, their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify reasons for installing expansion, control and isolation joints</li> <li>b. identify depth and spacing of joints</li> </ul>
D-16.04.02L	demonstrate knowledge of procedures to create expansion, control and isolation joints	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to create expansion, control and isolation joints, and describe their procedures for use</li> <li>b. describe procedures to create expansion, control and isolation joints</li> <li>c. describe procedures and <b>methods</b> used to control concrete from cracking</li> <li>d. identify <b>types of cuts</b></li> <li>e. identify timing for creating expansion, control and isolation joints (while concrete is in wet or plastic state)</li> </ul>
D-16.04.03L	demonstrate knowledge of regulatory requirements pertaining to expansion control and isolation joints	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to expansion control and isolation joints</li> </ul>
D-16.04.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	saws, groovers (two-sided edgers, dividers)
<b>methods</b>	cutting concrete, installing plastic strips, installing asphalt-impregnated board, installing control joints
<b>types of cuts</b>	green, wet, dry

## Task D-17 Places/Applies grout, epoxies, caulking and chemical materials

### Task Descriptor

Grout and epoxies provide structural integrity. Caulking is used to seal against leaks and for an aesthetic finish. Chemical materials can be used for a variety of purposes, such as re-facing surfaces, waterproofing and installing anchor bolts.

### D-17.01 Places/Applies grout

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

### Skills

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
D-17.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-17.01.02P	mix grout	grout is mixed according to engineered and manufacturers' specifications
D-17.01.03P	grout <b>structural components</b>	<b>structural components</b> are grouted using dry packing or placing method
D-17.01.04P	trowel and shape grout to smooth finish	grout is troweled and shaped to smooth finish for aesthetic purposes and for drainage

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	mixers, mixing paddles, pumps, wheelbarrows, trowels, hammers, shovels, drills, funnels, pails, piping bag, grout (head) boxes, sponges, brushes
<b>structural components</b>	door and window frames, anchor bolts, machine bases, walls, beams, columns, floors, ceilings, vessels

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
D-17.01.01L	demonstrate knowledge of grout, its characteristics and applications	<ul style="list-style-type: none"> <li>a. identify <b>types of grout</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to grout found in manufacturers' specifications</li> </ul>
D-17.01.02L	demonstrate knowledge of procedures to place/apply grout	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to place/apply grout, and describe their procedures for use</li> <li>b. describe procedures to mix grout</li> <li>c. describe procedures to place/apply grout</li> </ul>
D-17.01.03L	demonstrate knowledge of training and certification requirements to place/apply grout	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to place/apply grout</li> </ul>
D-17.01.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

**Range of Variables (include, but not limited to)**

<b>types of grouts</b>	cementitious, epoxy-based, synthetic
<b>tools and equipment</b>	mixers, mixing paddles, pumps, wheelbarrows, trowels, hammers, shovels, drills, funnels, pails, piping bag, grout (head) boxes, sponges, brushes

## D-17.02 Places/Applies epoxies and chemical materials

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
D-17.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-17.02.02P	pre-plan for work considering time constraints of applying <b>epoxies</b> and <b>chemical materials</b>	time constraints are considered when pre-planning to apply <b>epoxies</b> and <b>chemical materials</b>
D-17.02.03P	prepare surfaces	surfaces are prepared using cleaning equipment
D-17.02.04P	mix <b>epoxies</b> and <b>chemical materials</b>	<b>epoxies</b> and <b>chemical materials</b> are mixed according to manufacturers' specifications and guidelines
D-17.02.05P	apply <b>epoxies</b> and <b>chemical materials</b>	<b>epoxies</b> and <b>chemical materials</b> are applied using epoxy guns, or by placing and spreading according to manufacturers' specifications and guidelines

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	epoxy guns, screed boxes, trowels, power trowels, spike rollers, barrel mixers, heat guns, torches
<b>epoxies</b>	liquid, paste, resins
<b>chemical materials</b>	resins, polyurea, polyurethanes, vinyl esters, methyl methacrylate

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-17.02.01L	demonstrate knowledge of <b>epoxies</b> and <b>chemical materials</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>epoxies</b> and <b>chemical materials</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to <b>epoxies</b> and <b>chemical materials</b> found in manufacturers' specifications</li> </ul>
D-17.02.02L	demonstrate knowledge of procedures to place/apply <b>epoxies</b> and <b>chemical materials</b>	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to place/apply <b>epoxies</b> and <b>chemical materials</b>, and describe their procedures for use</li> <li>b. describe procedures to prepare surfaces prior to placing/applying <b>epoxies</b> and <b>chemical materials</b></li> <li>c. describe procedures to mix <b>epoxies</b> and <b>chemical materials</b></li> <li>d. explain time constraints to consider when planning to place/apply <b>epoxies</b> and <b>chemical materials</b></li> <li>e. describe procedures to place/apply <b>epoxies</b> and <b>chemical materials</b></li> </ul>
D-17.02.03L	demonstrate knowledge of training and certification requirements to place/apply <b>epoxies</b> and <b>chemical materials</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to place/apply <b>epoxies</b> and <b>chemical materials</b></li> </ul>
D-17.02.04L	demonstrate knowledge of regulatory requirements pertaining to <b>epoxies</b> and <b>chemical materials</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to <b>epoxies</b> and <b>chemical materials</b></li> </ul>
D-17.02.05L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	epoxy guns, screed boxes, trowels, power trowels, spike rollers, barrel mixers, heat guns, torches
<b>epoxies</b>	liquid, paste, resins
<b>chemical materials</b>	resins, polyurea, polyurethanes, vinyl esters, methyl methacrylate

**D-17.03 Applies caulking**

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

**Skills**

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
D-17.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
D-17.03.02P	clean exposed surfaces	exposed surfaces are cleaned using <b>methods</b> according to manufacturers' specifications
D-17.03.03P	use <b>fillers</b>	<b>fillers</b> are used according to manufacturers' specifications
D-17.03.04P	apply steady bead and ensure voids are filled	steady bead is applied, and voids are filled by tooling caulking

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	caulking guns, backing rod gauges, trowels, putty knives, cleaning equipment
<b>methods</b>	applying solvents, pressure washing, media blasting, wire brushing
<b>fillers</b>	insulation, backing rods

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
D-17.03.01L	demonstrate knowledge of <b>caulking</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>caulking</b>, and describe their characteristics and applications</li> <li>b. identify types of <b>fillers</b> used prior to <b>caulking</b>, and describe their characteristics and applications</li> <li>c. interpret information pertaining to <b>caulking</b> found in manufacturers' specifications</li> <li>d. explain time constraints to consider when planning to apply <b>caulking</b></li> </ul>
D-17.03.02L	demonstrate knowledge of procedures to apply <b>caulking</b>	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to apply <b>caulking</b>, and describe their procedures for use</li> <li>b. describe procedures and <b>methods</b> used to clean surfaces prior to applying <b>caulking</b></li> <li>c. describe procedures to apply <b>caulking</b></li> </ul>
D-17.03.03L	demonstrate knowledge of training and certification requirements to apply <b>caulking</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to apply <b>caulking</b></li> </ul>
D-17.03.04L	demonstrate knowledge of regulatory requirements pertaining to <b>caulking</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to <b>caulking</b></li> </ul>
D-17.03.05L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>b. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

### Range of Variables (include, but not limited to)

<b>caulking</b>	firestop, exterior, interior, specialty
<b>fillers</b>	insulation, backing rods
<b>tools and equipment</b>	caulking guns, backing rod gauges, trowels, putty knives, cleaning equipment
<b>methods</b>	applying solvents, pressure washing, media blasting, wire brushing

# Major Work Activity E – Performs masonry work

## Task E-18 Prepares for masonry work

### Task Descriptor

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.

### E-18.01 Sets up masonry materials

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
E-18.01.01P	distribute masonry materials onto scaffolding	masonry materials are distributed onto scaffolding according to amounts needed and scaffolding capacities
E-18.01.02P	lay out polyethylene sheets under mixing equipment	polyethylene sheets are laid out under mixing equipment to contain spillage
E-18.01.03P	prepare and organize masonry work area to bring materials close at hand	masonry work area is prepared and organized to bring materials close at hand
E-18.01.04P	prepare <b>power tools and equipment</b>	<b>power tools and equipment</b> are prepared according to task
E-18.01.05P	select and use <b>transportation equipment</b>	<b>transportation equipment</b> is selected and used according to task
E-18.01.06P	load and unload masonry materials from scaffolding and trucks	masonry materials are loaded and unloaded from scaffolding and trucks

**Range of Variables (include, but not limited to)**

<b>power tools and equipment</b>	saws (concrete, table, quick-cut), mixing drills, concrete mixers, hammer drills, chipping hammers
<b>transportation equipment</b>	forklifts, skid steers, telescopic forklifts (telehandlers), wheelbarrows

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
E-18.01.01L	demonstrate knowledge of masonry materials, their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of masonry materials, and describe their characteristics and applications</li> <li>b. interpret information pertaining to masonry materials found in specifications</li> </ul>
E-18.01.02L	demonstrate knowledge of procedures to set up masonry materials	<ul style="list-style-type: none"> <li>a. identify <b>transportation equipment</b> used to set up masonry materials, and describe their procedures for use</li> <li>b. describe procedures to prepare <b>power tools and equipment</b></li> <li>c. describe procedures to load and unload masonry materials</li> </ul>
E-18.01.03L	demonstrate knowledge of training and certification requirements to set up masonry materials	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to set up masonry materials</li> </ul>
E-18.01.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

**Range of Variables (include, but not limited to)**

<b>transportation equipment</b>	forklifts, skid steers, telescopic forklifts (telehandlers), wheelbarrows
<b>power tools and equipment</b>	saws (concrete, table, quick-cut), mixing drills, concrete mixers, hammer drills, chipping hammers

## E-18.02 Mixes mortars and grouts

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
E-18.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
E-18.02.02P	follow instructions for ratios, mixing time and compatibilities	instructions for ratios, mixing time and compatibilities are followed to ensure materials are usable
E-18.02.03P	mix required amounts of mortars and grouts for work planned	required amounts of mortars and grouts are mixed for work planned
E-18.02.04P	determine consistency of mortars and grouts, and adjust mix	consistency of mortars and grouts are determined, and mix is adjusted according to weather conditions and specifications
E-18.02.05P	work mortar continuously to maintain desired consistency	mortar is worked continuously to maintain desired consistency
E-18.02.06P	colour mortars and grouts with dyes and aggregates	mortars and grouts are coloured with dyes and aggregates according to job specifications
E-18.02.07P	include <b>additives</b> to ensure desired consistency and adhesion	<b>additives</b> are included to ensure desired consistency and adhesion

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	mortar mixers, concrete mixers, shovels, wheelbarrows, buckets, mortar hoes, gin wheels
<b>additives</b>	anti-freezing agents, polymers, bonding agents, air entraining agents, plasticizers

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
E-18.02.01L	demonstrate knowledge of mortars and grouts, their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of mortars and grouts, and describe their characteristics and applications</li> <li>b. identify types of dyes and aggregates, and describe their characteristics and applications</li> <li>c. identify types of <b>additives</b>, and describe their characteristics and applications</li> <li>d. interpret information pertaining to mortars and grouts found on drawings and specifications</li> </ul>
E-18.02.02L	demonstrate knowledge of procedures to mix mortars and grouts	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to mix mortars and grouts, and describe their procedures for use</li> <li>b. describe procedures to mix mortars and grouts</li> </ul>
E-18.02.03L	demonstrate knowledge of regulatory requirements pertaining to mortars and grouts	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to mortars and grouts</li> </ul>
E-18.02.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

### Range of Variables (include, but not limited to)

<b>additives</b>	anti-freezing agents, polymers, bonding agents, air entraining agents, plasticizers
<b>tools and equipment</b>	mortar mixers, concrete mixers, shovels, wheelbarrows, buckets, mortar hoes, gin wheels

## Task E-19 Tends to bricklayers

### Task Descriptor

Construction craft workers work with bricklayers by performing a variety of tasks. They help bricklayers by cutting masonry units, cutting lintels and rough bucks, cleaning units and performing other masonry-related tasks. This is physically demanding work and requires constant stocking of masonry units. Construction craft workers may be required to operate mobile equipment such as forklifts and pallet jacks.

### E-19.01 Cuts masonry units

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

#### Skills

Reference Code	Performance Criteria	Evidence of Attainment
E-19.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
E-19.01.02P	cut <b>masonry units</b>	<b>masonry units</b> are cut according to measurements
E-19.01.03P	cut masonry reinforcing material to required length and size	masonry reinforcing material is cut to required length and size to avoid waste

#### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	tile cutters, brick saws, block/brick guillotines, wet saws, cut-off saws, measuring tapes, hammers, chisels, brick splitters
<b>masonry units</b>	bricks, refractory materials, tiles, blocks, stone

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
E-19.01.01L	demonstrate knowledge of <b>masonry units</b> , their characteristics and applications	a. identify types of <b>masonry units</b> , and describe their characteristics and applications b. identify types of <b>bricks</b> , and describe their characteristics and applications c. identify types of <b>blocks</b> , and describe their characteristics and applications
E-19.01.02L	demonstrate knowledge of procedures to cut <b>masonry units</b>	a. identify <b>tools and equipment</b> used to cut <b>masonry units</b> , and describe their procedures for use b. describe procedures to cut <b>masonry units</b>
E-19.01.03L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

### Range of Variables (include, but not limited to)

<b>masonry units</b>	bricks, refractory materials, tiles, blocks, stone
<b>bricks</b>	keyed, insulating, fire
<b>blocks</b>	acoustical, veneer, bullnose, rough-faced
<b>tools and equipment</b>	tile cutters, brick saws, block/brick guillotines, wet saws, cut-off saws, measuring tapes, hammers, chisels, brick splitters

## E-19.02 Assists with installation of lintels and rough bucks

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
E-19.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
E-19.02.02P	cut and form bracing	bracing is cut and formed according to opening
E-19.02.03P	place and secure <b>rough buck</b> to prevent movement of material	<b>rough buck</b> is placed and secured to prevent movement of material according to job specifications
E-19.02.04P	measure and cut <b>lintel</b>	<b>lintel</b> is measured and cut according to job specifications
E-19.02.05P	remove <b>rough bucks</b> after material is cured	<b>rough bucks</b> are removed after material is cured

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	saws, cutters, hammers, wedges
<b>rough bucks</b>	lumber, XPS foam, steel
<b>lintels</b>	channel iron, wood, pre-cast and poured concrete, stone

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
E-19.02.01L	demonstrate knowledge of <b>lintels</b> and <b>rough bucks</b> , their characteristics and applications	a. identify types of <b>lintels</b> and <b>rough bucks</b> , and describe their characteristics and applications b. identify fasteners used to install <b>lintels</b> and <b>rough bucks</b>

Reference Code	Learning Outcomes	Learning Objectives
E-19.02.02L	demonstrate knowledge of procedures to install <b>lintels</b> and <b>rough bucks</b>	a. identify <b>tools and equipment</b> used to install <b>lintels</b> and <b>rough bucks</b> , and describe their procedures for use b. describe procedures to measure and cut <b>lintels</b> c. describe procedures to install <b>lintels</b> and <b>rough bucks</b>
E-19.02.03L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>lintels</b>	channel iron, wood, pre-cast and poured concrete, stone
<b>rough bucks</b>	lumber, XPS foam, steel
<b>tools and equipment</b>	saws, cutters, hammers, wedges

**E-19.03 Washes masonry units**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
E-19.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
E-19.03.02P	mix <b>cleaning agents</b>	<b>cleaning agents</b> are mixed according to manufacturers' specifications and SDS
E-19.03.03P	wash and rinse surface of masonry unit	surface of masonry unit is washed and rinsed to remove damaging chemicals and contaminants

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	pressure washers, scrub brushes, hand stones
<b>cleaning agents</b>	muriatic acid, industrial detergents, water

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
E-19.03.01L	demonstrate knowledge of <b>cleaning agents</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>cleaning agents</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to <b>cleaning agents</b> found on specifications</li> </ul>
E-19.03.02L	demonstrate knowledge of procedures to wash masonry units	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to wash masonry units, and describe their procedures for use</li> <li>b. describe procedures to mix <b>cleaning agents</b></li> <li>c. describe procedures and <b>methods</b> used to wash masonry units</li> </ul>
E-19.03.03L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

**Range of Variables (include, but not limited to)**

<b>cleaning agents</b>	muriatic acid, industrial detergents, water
<b>tools and equipment</b>	pressure washers, scrub brushes, hand stones
<b>methods</b>	removing mortar, excess efflorescence and grouts

## E-19.04 Installs refractory materials

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
E-19.04.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
E-19.04.02P	mix <b>refractory materials</b>	<b>refractory materials</b> are mixed according to manufacturers' specifications and SDS
E-19.04.03P	installs <b>refractory materials</b>	<b>refractory materials</b> are installed according to jurisdictional regulations and job specifications
E-19.04.04P	clean up work area after refractory applications	work area is cleaned up after refractory applications according to site specifications

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	trowels, buckets, mortar mixers, hammers, pneumatic tools, air movers, thermometers
<b>refractory materials</b>	cementitious materials, bricks, gunite, sand, steel fibres

### Knowledge

Reference Code	Learning Outcomes	Learning Objectives
E-19.04.01L	demonstrate knowledge of <b>refractory materials</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>refractory materials</b>, and describe their characteristics and applications</li> <li>b. identify <b>locations using refractory materials</b></li> <li>c. identify mortars used in refractory applications</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
E-19.04.02L	demonstrate knowledge of procedures to install <b>refractory materials</b>	a. identify <b>tools and equipment</b> used to install <b>refractory materials</b> , and describe their procedures for use b. describe procedures to mix <b>refractory materials</b> c. describe procedures to install <b>refractory materials</b>
E-19.04.03L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>refractory materials</b>	cementitious materials, bricks, gunite, sand, steel fibres
<b>locations using refractory materials</b>	boilers, furnaces, kilns, smelters, chimneys
<b>tools and equipment</b>	trowels, buckets, mortar mixers, hammers, pneumatic tools, air movers, thermometers

**E-19.05 Uses fireproofing materials**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
E-19.05.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
E-19.05.02P	mix <b>fireproofing materials</b>	<b>fireproofing materials</b> are mixed using manual or electric paddles according to manufacturers' specifications

Reference Code	Performance Criteria	Evidence of Attainment
E-19.05.03P	apply <b>fireproofing materials</b>	<b>fireproofing materials</b> are applied using <b>methods</b> according to job specifications

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	mixers, trowels, spray equipment, caulking guns
<b>fireproofing materials</b>	mineral wool, caulking, cementitious materials
<b>methods</b>	spray-on, trowel-on, caulked, stuffed

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
E-19.05.01L	demonstrate knowledge of <b>fireproofing materials</b> , their characteristics and <b>applications</b>	a. identify types of <b>fireproofing materials</b> , and describe their characteristics and <b>applications</b> b. interpret information pertaining to <b>fireproofing materials</b> found in drawings and specifications
E-19.05.02L	demonstrate knowledge of procedures to apply <b>fireproofing materials</b>	a. identify <b>tools and equipment</b> used to apply <b>fireproofing materials</b> , and describe their procedures for use b. describe procedures to mix <b>fireproofing materials</b> c. describe procedures to apply <b>fireproofing materials</b>
E-19.05.03L	demonstrate knowledge of training and certification requirements to apply <b>fireproofing materials</b>	a. identify training and certification requirements to apply <b>fireproofing materials</b>
E-19.05.04L	demonstrate knowledge of regulatory requirements pertaining to <b>fireproofing materials</b>	a. identify codes, industry standards and regulations pertaining to <b>fireproofing materials</b>
E-19.05.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>fireproofing materials</b>	mineral wool, caulking, cementitious materials
<b>applications</b>	surface penetrations; protecting beams, columns and walls; fireproofing vessels
<b>tools and equipment</b>	mixers, trowels, spray equipment, caulking guns

# Major Work Activity F - Performs utility and pipeline work

## Task F-20 Installs piping for utilities

### Task Descriptor

Construction craft workers work with a wide variety of pipe, components and application techniques when installing utility piping for water, sanitary and storm sewers, and other utility infrastructure 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.

### F-20.01 Installs pipe for water systems

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
F-20.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
F-20.01.02P	install bedding material	bedding material is installed according to drawings and jurisdictional regulations
F-20.01.03P	level and compact bedding	bedding is leveled and compacted according to drawings and industry standards
F-20.01.04P	install thrust blocks and restraints	thrust blocks and restraints are installed according to drawings and industry standards to stabilize line and eliminate breaks
F-20.01.05P	select, cut and fit sections	sections are selected, cut and fitted according to drawings and specifications

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
F-20.01.06P	connect pipe sections	pipe sections are connected using <b>components</b> and <b>methods</b> according to drawings and <b>types of pipe</b>
F-20.01.07P	establish and confirm line, grade and elevation of pipe	line, grade and elevation of pipe are established and confirmed according to industry standards and drawings
F-20.01.08P	install fittings, fire hydrants and valves	fittings, fire hydrants and valves are installed according to drawings, regulations and specifications
F-20.01.09P	backfill and compact pipe, and insulate if needed	pipe is backfilled and compacted, and insulated if needed according to drawings
F-20.01.10P	remove excess mud and pump water	excess mud is removed, and water is pumped from excavation before bedding material is placed
F-20.01.11P	remove excess mud and pump water when performing directional drilling	excess mud is removed, and water is pumped to perform directional drilling to avoid disruptions on highways and rivers
F-20.01.12P	assist in tapping into main lines	main lines are tapped into to provide temporary service while replacing lines

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	hand levels, pinch bars, shovels, wrenches, hammers, hoisting and rigging equipment, mobile equipment, power tools, surveying equipment
<b>components (connecting)</b>	clamps, bell and spigot, rubber seals, fittings, mechanical joint restraints
<b>methods</b>	using bell and spigot, using butt fusion, using mechanical joints
<b>types of pipe</b>	polyvinyl chloride (PVC), cast iron, concrete, composite, ceramic, ductile, galvanized steel, high density polyethylene (HDPE), copper, bi-axially oriented PVC (PVC-O), cross-linked polyethylene (PEX)

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
F-20.01.01L	demonstrate knowledge of pipe used for water systems, their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify <b>types of pipe</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to pipe found on drawings, regulations and specifications</li> <li>c. identify design grades for pipe</li> </ul>
F-20.01.02L	demonstrate knowledge of procedures to install pipe for water systems	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to install pipe for water systems, and describe their procedures for use</li> <li>b. describe procedures to cut pipe for water systems</li> <li>c. describe procedures and <b>methods</b> to install and connect pipe for water systems</li> <li>d. describe procedures to insulate pipe</li> <li>e. describe backfilling and compacting methods</li> </ul>
F-20.01.03L	demonstrate knowledge of training and certification requirements to install pipe for water systems	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to install pipe for water systems</li> </ul>
F-20.01.04L	demonstrate knowledge of regulatory requirements pertaining to installation of pipe for water systems	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to installation of pipe for water systems</li> </ul>
F-20.01.05L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>b. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

## Range of Variables (include, but not limited to)

<b>tools and equipment</b>	hand levels, pinch bars, shovels, wrenches, hammers, hoisting and rigging equipment, mobile equipment, power tools, surveying equipment
<b>components (connecting)</b>	clamps, bell and spigot, rubber seals, fittings, mechanical joint restraints
<b>methods</b>	using bell and spigot, using butt fusion, using mechanical joints
<b>types of pipe</b>	PVC, cast iron, concrete, composite, ceramic, ductile, galvanized steel, HDPE, copper, PVC-O, PEX

## F-20.02 Installs pipe for sanitary and storm sewer systems

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

### Skills

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
F-20.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
F-20.02.02P	install bedding material	bedding material is installed according to drawings, regulations and specifications
F-20.02.03P	level and compact bedding	bedding is leveled and compacted according to drawings, regulations, specifications and industry standards
F-20.02.04P	select, cut and fit sections	sections are selected, cut and fitted according to drawings and specifications
F-20.02.05P	connect pipe sections	pipe sections are connected using <b>components</b> and <b>methods</b> according to drawings and <b>types of pipe</b>
F-20.02.06P	establish and confirm line, grade and elevation of pipe	line, grade and elevation of pipe are established and confirmed according to industry standards, drawings and specifications

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
F-20.02.07P	backfill, tamp and compact pipe, and insulate if needed	pipe is backfilled, tamped and compacted, and insulated if needed according to drawings and specifications
F-20.02.08P	remove excess mud and pump water	excess mud is removed, and water is pumped from excavation before bedding material is placed
F-20.02.09P	remove excess mud and pump water when performing directional drilling	excess mud is removed, and water is pumped to perform directional drilling to avoid disruptions on highways and rivers

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	hand levels, pinch bars, shovels, wrenches, hammers, hoisting and rigging equipment, mobile equipment, power tools, surveying equipment
<b>components (connecting)</b>	clamps, bell and spigot, rubber seals, fittings
<b>methods</b>	using bell and spigot, using butt fusion
<b>types of pipe</b>	PVC, cast iron, concrete, composite, ceramic, ductile, galvanized steel, HDPE

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
F-20.02.01L	demonstrate knowledge of pipe used for sanitary and storm sewer systems, their characteristics and applications	a. identify <b>types of pipe</b> , and describe their characteristics and applications b. interpret information pertaining to pipe found on drawings, regulations and specifications c. identify design grades for pipe

Reference Code	Learning Outcomes	Learning Objectives
F-20.02.02L	demonstrate knowledge of procedures to install pipe for sanitary and storm sewer systems	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to install pipe for sanitary and storm sewer systems, and describe their procedures for use</li> <li>b. describe procedures to cut pipe for sanitary and storm sewer systems</li> <li>c. describe procedures to establish and confirm line, grade and elevation of pipe</li> <li>d. describe procedures and <b>methods</b> to install and connect pipe for sanitary and storm sewer systems</li> <li>e. describe procedures to insulate pipe</li> <li>f. describe backfilling and compacting methods</li> </ul>
F-20.02.03L	demonstrate knowledge of training and certification requirements to install pipe for sanitary and storm sewer systems	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to install pipe for sanitary and storm sewer systems</li> </ul>
F-20.02.04L	demonstrate knowledge of regulatory requirements pertaining to installation of pipe for sanitary and storm sewer systems	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to installation of pipe for sanitary and storm sewer systems</li> </ul>
F-20.02.05L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>b. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	hand levels, pinch bars, shovels, wrenches, hammers, hoisting and rigging equipment, mobile equipment, power tools, surveying equipment
<b>methods</b>	using bell and spigot, using butt fusion

## F-20.03 Installs pipe for other utility infrastructure

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
F-20.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
F-20.03.02P	install bedding material	bedding material is installed according to drawings, regulations and specifications
F-20.03.03P	level and compact bedding	bedding is leveled and compacted according to drawings, industry standards and specifications
F-20.03.04P	select, cut and fit sections	sections are selected, cut and fitted according to drawings and specifications
F-20.03.05P	connect pipe sections	pipe sections are connected using <b>components</b> according to drawings and <b>types of pipe</b>
F-20.03.06P	check for line and grade of pipe	line and grade of pipe are checked according to industry standards, drawings and specifications
F-20.03.07P	backfill and compact pipe	pipe is backfilled and compacted according to drawings, industry standards and specifications
F-20.03.08P	remove excess mud and pump water	excess mud is removed, and water is pumped to perform directional drilling to avoid disruptions on highways and rivers

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	hand levels, pinch bars, shovels, wrenches, hammers, hoisting and rigging equipment, mobile equipment, power tools, surveying equipment, directional drills
<b>components (connecting)</b>	bell and spigot, gaskets, fittings
<b>types of pipe</b>	PVC, HDPE, PEX

### Knowledge

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
F-20.03.01L	demonstrate knowledge of pipe used for <b>other utility infrastructure</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify <b>types of pipe</b>, and describe their characteristics and applications</li> <li>b. interpret information pertaining to pipe found on drawings, regulations and specifications</li> <li>c. identify design grades for pipe</li> </ul>
F-20.03.02L	demonstrate knowledge of procedures to install pipe for <b>other utility infrastructure</b>	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to install pipe for <b>other utility infrastructure</b>, and describe their procedures for use</li> <li>b. describe procedures to cut pipe for <b>other utility infrastructure</b></li> <li>c. describe procedures to check line and grade of pipe</li> <li>d. describe procedures and methods to install and connect pipe for <b>other utility infrastructure</b></li> <li>e. describe backfilling and compacting methods</li> </ul>
F-20.03.03L	demonstrate knowledge of training and certification requirements to install pipe for <b>other utility infrastructure</b>	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to install pipe for <b>other utility infrastructure</b></li> </ul>
F-20.03.04L	demonstrate knowledge of regulatory requirements pertaining to installation of pipe for <b>other utility infrastructure</b>	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to installation of pipe for <b>other utility infrastructure</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
F-20.03.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>other utility infrastructure</b>	electrical, telecommunications, gas
<b>types of pipe</b>	PVC, HDPE, PEX
<b>tools and equipment</b>	hand levels, pinch bars, shovels, wrenches, hammers, hoisting and rigging equipment, mobile equipment, power tools, surveying equipment, directional drills

**F-20.04 Installs catch basins, utility vaults, weeping tile and maintenance holes**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
F-20.04.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
F-20.04.02P	verify and maintain elevations and locations of catch basins, utility vaults, weeping tile and maintenance holes	elevations and locations of catch basins, utility vaults, weeping tile and maintenance holes are verified and maintained according to drawings, industry standards, regulations and specifications
F-20.04.03P	install <b>bases</b> and compact soil	<b>bases</b> are installed and soil is compacted according to drawings, industry standards, regulations and specifications

Reference Code	Performance Criteria	Evidence of Attainment
F-20.04.04P	cut holes in catch basins, utility vaults and maintenance holes to connect pipes	holes in catch basins, utility vaults and maintenance holes are cut to connect pipes
F-20.04.05P	level and plumb catch basins, utility vaults, weeping tile and maintenance holes	catch basins, utility vaults, weeping tile and maintenance holes are leveled and plumbed to ensure drainage
F-20.04.06P	connect pipe or weeping tile to catch basins, utility vaults and maintenance holes	pipe or weeping tile is connected to catch basins, utility vaults and maintenance holes according to drawings, industry standards, regulations and specifications
F-20.04.07P	place maintenance holes, utility vaults and catch basins	maintenance holes, utility vaults and catch basins are placed using rigging and hoisting equipment
F-20.04.08P	install <b>components</b> to bring catch basins, utility vaults and maintenance holes to finished grade	<b>components</b> are installed to bring catch basins, utility vaults and maintenance holes to finished grade

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	quick-cut saws, bolt cutters, hoisting and rigging equipment, string lines, paint, mobile equipment, surveying equipment, hammers, shovels, levels, bars, power tools
<b>bases</b>	pre-cast concrete, poured concrete
<b>components</b>	shims, bricks, grade rings, castings, grout, gaskets, mastic, covers, lids

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
F-20.04.01L	demonstrate knowledge of catch basins, utility vaults, weeping tile and maintenance holes, their <b>components</b> , characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify catch basins, utility vaults, weeping tile and maintenance holes, and describe their characteristics and applications</li> <li>b. describe operating principles of catch basins, utility vaults, weeping tile and maintenance holes</li> <li>c. interpret information pertaining to catch basins, utility vaults, weeping tile and maintenance holes found on drawings, regulations and specifications</li> </ul>
F-20.04.02L	demonstrate knowledge of procedures to install catch basins, utility vaults, weeping tile and maintenance holes	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to install catch basins, utility vaults, weeping tile and maintenance holes, and describe their procedures for use</li> <li>b. describe procedures to install <b>bases</b> for catch basins, utility vaults and maintenance holes</li> <li>c. describe procedures to cut holes in catch basins, utility vaults and maintenance holes</li> <li>d. describe procedures to install catch basins, utility vaults and maintenance holes, and their <b>components</b></li> <li>e. describe procedures to connect pipe and weeping tile to catch basins, utility vaults and maintenance holes</li> <li>f. describe procedures to level and plumb catch basins, utility vaults and maintenance holes</li> </ul>
F-20.04.03L	demonstrate knowledge of training and certification requirements to install catch basins, utility vaults, weeping tile and maintenance holes	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to install catch basins, utility vaults, weeping tile and maintenance holes</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
F-20.04.04L	demonstrate knowledge of regulatory requirements pertaining to installation of catch basins, utility vaults, weeping tile and maintenance holes	a. identify codes, industry standards and regulations pertaining to installation of catch basins, utility vaults, weeping tile and maintenance holes
F-20.04.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>components</b>	shims, bricks, grade rings, castings, grout, gaskets, mastic, covers, lids
<b>tools and equipment</b>	quick-cut saws, bolt cutters, hoisting and rigging equipment, string lines, paint, mobile equipment, surveying equipment, hammers, shovels, levels, bars, power tools
<b>bases</b>	pre-cast concrete, poured concrete

**F-20.05 Modifies existing pipe**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
F-20.05.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
F-20.05.02P	isolate section of pipe	section of pipe is isolated using bladders or valves to stop flow going through pipe
F-20.05.03P	repair defective pipe	defective pipe is repaired to test for leaks
F-20.05.04P	replace with upgraded pipe	upgraded pipe is installed according to jurisdictional regulations

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
F-20.05.05P	tap pipes for additional water or sewer lines	pipes are tapped for additional water or sewer lines
F-20.05.06P	insulate, backfill and compact around pipe	pipe is insulated, backfilled and compacted according to drawings, industry standards, regulations and specifications

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	hand levels, pinch bars, shovels, wrenches, hammers, hoisting and rigging equipment, mobile equipment, power tools, surveying equipment, water pumps
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**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
F-20.05.01L	demonstrate knowledge of procedures to modify existing pipes	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to modify existing pipes, and describe their procedures for use</li> <li>b. interpret information pertaining to water pressures and modifying existing pipes found on drawings, regulations and specifications</li> <li>c. identify <b>reasons for modifying pipes</b></li> <li>d. describe procedures to repair and replace pipes</li> <li>e. describe procedures to tap pipes</li> <li>f. describe procedures to insulate pipes</li> <li>g. describe backfilling and compacting methods</li> </ul>
F-20.05.02L	demonstrate knowledge of training and certification requirements to modify existing pipes	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to modify existing pipes</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
F-20.05.03L	demonstrate knowledge of regulatory requirements pertaining to modifications of existing pipes	a. identify codes, industry standards and regulations pertaining to modifications of existing pipes
F-20.05.04L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	hand levels, pinch bars, shovels, wrenches, hammers, hoisting and rigging equipment, mobile equipment, power tools, surveying equipment, water pumps
<b>reasons for modifying pipes</b>	leaks, repairs, upgrades, additions

**F-20.06 Assists with testing water, sanitary and storm sewer lines**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
F-20.06.01P	select and assist with use of <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
F-20.06.02P	assist with isolating sections of pipe for testing	sections of pipe are isolated using bladders or valves for testing
F-20.06.03P	assist with testing water lines in sanitary sewers for leaks	water lines in sanitary sewers are tested for leaks according to jurisdictional regulations

Reference Code	Performance Criteria	Evidence of Attainment
F-20.06.04P	assist with testing and inspecting of sanitary and storm sewer lines	sanitary and storm sewer lines are tested and inspected according to jurisdictional regulations
F-20.06.05P	assist with monitoring of gauge readings	gauge readings are monitored for drops in pressure

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	cameras, compressors, water taps, test pumps, blanks, blinds
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**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
F-20.06.01L	demonstrate knowledge of water, sanitary and storm sewer lines, their characteristics, applications and operation	<ul style="list-style-type: none"> <li>a. identify water, sanitary and storm sewer lines, and describe their characteristics and applications</li> <li>b. describe operating principles of water, sanitary and storm sewer lines</li> <li>c. interpret information pertaining to water, sanitary and storm sewer lines found on drawings and specifications</li> </ul>
F-20.06.02L	demonstrate knowledge of procedures to assist with testing, inspecting and commissioning of water, sanitary and storm sewer lines	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to test, inspect and commission water, sanitary and storm sewer lines, and describe their procedures for use</li> <li>b. describe procedures to isolate sections of pipe</li> <li>c. describe procedures to test, inspect and commission water, sanitary and storm sewer lines</li> </ul>
F-20.06.03L	demonstrate knowledge of regulatory requirements pertaining to testing, inspecting and commissioning of water, sanitary and storm sewer lines	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to testing, inspecting and commissioning of water, sanitary and storm sewer lines</li> </ul>

## Range of Variables (include, but not limited to)

<b>tools and equipment</b>	cameras, compressors, water taps, test pumps, blanks, blinds
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## Task F-21 Performs pipeline activities

### Task Descriptor

Pipelines are used to transport products in bulk such as crude oil, liquid fuels, gases, raw water and potable drinking water.

Construction craft workers execute crucial tasks in pipeline construction and maintenance, including digging trenches, aligning pipes, and performing safety checks. Responsibilities encompass manual labor, equipment operation and adherence to safety protocols.

### F-21.01 Constructs right of ways

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

### Skills

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
F-21.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
F-21.01.02P	clear brush	brush is cleared using <b>tools and equipment</b>
F-21.01.03P	set up <b>cleaning station</b>	<b>cleaning station</b> is set up to prevent cross-pollination and tracking of mud from movement of equipment
F-21.01.04P	minimize disturbance to wildlife and public land	disturbance to wildlife and public land is minimized by returning to original state
F-21.01.05P	install water control and soil erosion measures	water control and soil erosion measures are installed according to jurisdictional regulations to minimize environmental damage to waterways

Reference Code	Performance Criteria	Evidence of Attainment
F-21.01.06P	install and interpret clearance markers and signage	clearance markers and signage are installed and interpreted to prevent damage to existing infrastructure when moving heavy equipment

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	brush saws, chainsaws, axes, all-terrain vehicles (ATV)
<b>cleaning stations</b>	bleach, blow, pressure

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
F-21.01.01L	demonstrate knowledge of right of ways, their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify right of ways, and describe their characteristics and applications</li> <li>b. interpret information pertaining to right of ways found on drawings and specifications</li> </ul>
F-21.01.02L	demonstrate knowledge of procedures to construct right of ways	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to construct right of ways, and describe their procedures for use</li> <li>b. identify <b>environmental considerations</b> when constructing right of ways</li> <li>c. describe procedures to construct right of ways</li> </ul>
F-21.01.03L	demonstrate knowledge of training and certification requirements to construct right of ways	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to construct right of ways</li> </ul>
F-21.01.04L	demonstrate knowledge of regulatory requirements pertaining to right of ways	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to right of ways</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
F-21.01.05L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection b. identify practices that contribute to net-zero and carbon neutral commitments

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	brush saws, chainsaws, axes, all-terrain vehicles (ATV)
<b>environmental considerations</b>	highways, rivers, farmlands, wetlands, wildlife, traditional indigenous territories

**F-21.02 Performs pipeline installation**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
F-21.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
F-21.02.02P	stockpile pipes	pipes are stockpiled according to job specifications
F-21.02.03P	load pipes on trucks to be unloaded on right of way	pipes are loaded on trucks to be unloaded on right of way
F-21.02.04P	place pipe and skids (stringing) in order	pipe and skids (stringing) are placed in order according to job specifications
F-21.02.05P	measure and mark pipe to ensure location of bends	pipe is measured and marked to ensure location of bends according to engineered specifications
F-21.02.06P	place and remove pipe	pipe is placed and removed to assist set-up and bending crew

Reference Code	Performance Criteria	Evidence of Attainment
F-21.02.07P	perform blocking and cribbing	blocking and cribbing is performed to assist welding crew
F-21.02.08P	blast pipe	pipe is blasted to ensure coating adheres to surface
F-21.02.09P	coat pipe	pipe is coated to protect welds and prevent corrosion according to industry standards
F-21.02.10P	jeep pipe	pipe is jeeped to find imperfections
F-21.02.11P	assist and guide pipe lowering operation	pipe lowering operation is conducted with assistance and guidance

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	media blasting equipment, jeeping and coating equipment, hoisting and rigging equipment, power tools, chainsaws, hand tools, shovels, rakes, surveying equipment
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**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
F-21.02.01L	demonstrate knowledge of pipelines, their characteristics and applications	a. identify <b>types of pipelines</b> , and describe their characteristics and applications b. interpret information pertaining to pipelines found on drawings and specifications

Reference Code	Learning Outcomes	Learning Objectives
F-21.02.02L	demonstrate knowledge of procedures to perform pipeline installations	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to perform pipeline installations, and describe their procedures for use</li> <li>b. describe procedures to load pipes</li> <li>c. describe procedures to measure and mark pipes</li> <li>d. describe blocking and cribbing methods</li> <li>e. describe procedures and methods used to blast and coat pipes</li> <li>f. describe procedures to perform pipe lowering operations</li> </ul>
F-21.02.03L	demonstrate knowledge of <b>training and certification</b> requirements to perform pipeline installations	a. identify <b>training and certification</b> requirements to perform pipeline installations
F-21.02.04L	demonstrate knowledge of regulatory requirements pertaining to performing pipeline installations	a. identify codes, industry standards and regulations pertaining to performing pipeline installations
F-21.02.05L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>b. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

**Range of Variables (include, but not limited to)**

<b>types of pipelines</b>	water, liquid natural gas (LNG), oil
<b>tools and equipment</b>	media blasting equipment, jeeping and coating equipment, hoisting and rigging equipment, power tools, chainsaws, hand tools, shovels, rakes, surveying equipment
<b>training and certifications</b>	Pipeline Construction Safety Training (PCST), Ground Disturbance, confined space (in some jurisdictions)

## F-21.03 Performs pipeline maintenance

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
F-21.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
F-21.03.02P	assist to test pipeline	pipeline is tested using pipeline pig to determine location and type of defect
F-21.03.03P	assist to locate and expose defective area	defective area is located and daylighted by hydrovac truck
F-21.03.04P	clean pipe to remove existing coating	pipe is cleaned to remove existing coating
F-21.03.05P	assist boom operator to set up sleeve for welders	boom operator is assisted to set up sleeve for welders
F-21.03.06P	blast and coat pipe	pipe is blasted and coated to protect welded sleeve before backfilling

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	media blasting equipment, hand tools, pipeline pig, jeep/holiday detector
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## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
F-21.03.01L	demonstrate knowledge of procedures to perform pipeline maintenance	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to perform pipeline maintenance, and describe their procedures for use</li> <li>b. describe procedures to test pipelines</li> <li>c. describe procedures to scrape and clean pipe</li> <li>d. describe procedures to set up sleeve for welders</li> <li>e. describe procedures and methods to blast and coat pipe</li> </ul>
F-21.03.02L	demonstrate knowledge of <b>training and certification</b> requirements to perform pipeline maintenance	<ul style="list-style-type: none"> <li>a. identify <b>training and certification</b> requirements to perform pipeline maintenance</li> </ul>
F-21.03.03L	demonstrate knowledge of regulatory requirements pertaining to performing pipeline maintenance	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to performing pipeline maintenance</li> </ul>
F-21.03.04L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> <li>b. identify practices that contribute to net-zero and carbon neutral commitments</li> </ul>

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	media blasting equipment, hand tools, pipeline pig, jeep/holiday detector
<b>training and certifications</b>	PCST, Ground Disturbance, confined space (in some jurisdictions)

# Major Work Activity G - Performs roadwork

## Task G-22 Prepares and builds roads

### Task Descriptor

The first step of road construction is to prepare earth for the right of way. Construction craft workers work with machines to place and compact sub-base, base and surface 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.

### G-22.01 Prepares earth for right of way

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
G-22.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
G-22.01.02P	assist surveyors with <b>land markers</b>	<b>land markers</b> are placed to define right of way
G-22.01.03P	clear right of way areas	right of way areas are cleared of <b>obstructions</b>
G-22.01.04P	tend to <b>heavy equipment operator needs</b>	<b>heavy equipment operator needs</b> are tended to
G-22.01.05P	set grades and direct heavy equipment operator	grades are set according to design specifications and heavy equipment operator is directed

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	shovels, rakes, picks, chainsaws, pry bars, wheelbarrows, sledgehammers, GPS, lasers, optical levels, total stations
<b>land markers</b>	benchmarks, offset stakes, standard iron bars, monuments
<b>obstructions</b>	trees, brush, rock
<b>heavy equipment operator needs</b>	supply of fuel and lubricants, basic maintenance of equipment, supply data

**Knowledge**

<b>Reference Code</b>	<b>Learning Outcomes</b>	<b>Learning Objectives</b>
G-22.01.01L	demonstrate knowledge of procedures to prepare earth for right of way	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to prepare earth for right of way, and describe their procedures for use</li> <li>b. describe procedures to prepare earth for right of way</li> <li>c. describe <b>land markers</b> for surveying</li> <li>d. identify <b>heavy equipment operator needs</b> while preparing earth for right of way</li> </ul>
G-22.01.02L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	shovels, rakes, picks, chainsaws, pry bars, wheelbarrows, sledgehammers, GPS, lasers, optical levels, total stations
<b>land markers</b>	benchmarks, offset stakes, standard iron bars, monuments
<b>heavy equipment operator needs</b>	supply of fuel and lubricants, basic maintenance of equipment, supply data

## G-22.02 Places layers and road surface materials for roadwork

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
G-22.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
G-22.02.02P	prepare and compact sub-base and layers	sub-base and layers are prepared and compacted according to grade
G-22.02.03P	apply <b>adhesives and primers</b>	<b>adhesives and primers</b> are applied according to specifications
G-22.02.04P	place, lay, spread, rake and compact <b>road surfacing material</b>	<b>road surfacing material</b> is placed, laid, spread, raked and compacted to finish-grade according to engineered specifications
G-22.02.05P	feather and finish around maintenance holes, catch basins and curbs	maintenance holes, catch basins and curbs are feathered and finished according to <b>road surfacing material</b> being used
G-22.02.06P	finish concrete to required surface	concrete is finished to required surface according to engineered specifications

### Range of Variables (include, but not limited to)

<b>tools and equipment</b>	compacting equipment, hand compactors, bull floats, hand floats, shovels, rakes (grading, landscaping, concrete placer), picks, sledgehammers, wheelbarrows
<b>adhesives and primers</b>	concrete bonding adhesives, concrete primers, tack
<b>road surfacing materials</b>	concrete, asphalt, composite materials, interlocking brick, chip seal

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
G-22.02.01L	demonstrate knowledge of road layers, sub-base, and <b>road surfacing materials</b> , their characteristics and applications	<ul style="list-style-type: none"> <li>a. describe road sub-bases and layers, and describe their characteristics and applications</li> <li>b. identify types of <b>road surfacing materials</b>, and describe their characteristics and applications</li> <li>c. identify <b>types of materials used to prepare road sub-base and layers</b></li> <li>d. interpret information pertaining to road layers, sub-base, and <b>road surfacing materials</b> found on drawings and specifications</li> </ul>
G-22.02.02L	demonstrate knowledge of procedures to place sub-bases, layers and <b>road surfacing materials</b>	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to place sub-bases, layers and <b>road surfacing materials</b>, and describe their procedures for use</li> <li>b. describe procedures to prepare and compact sub-bases and layers</li> <li>c. describe procedures to place <b>road surfacing materials</b></li> </ul>
G-22.02.03L	demonstrate knowledge of sustainability and environmental stewardship practices	<ul style="list-style-type: none"> <li>a. identify practices that contribute to environmental protection</li> </ul>

### Range of Variables (include, but not limited to)

<b>road surfacing materials</b>	concrete, asphalt, composite materials, interlocking brick, chip seal
<b>types of materials used to prepare sub-base and layers</b>	geotextiles, gravel, riprap, sand, crushed stone, cementitious materials (e.g., dry pack, flowable fill [fillcrete/flowcrete])
<b>tools and equipment</b>	compacting equipment, hand compactors, bull floats, hand floats, shovels, rakes (grading, landscaping, concrete placer), picks, sledgehammers, wheelbarrows

## G-22.03 Repairs road surfaces

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
G-22.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
G-22.03.02P	cut <b>road surfacing materials</b> to install <b>utilities and components</b>	<b>road surfacing materials</b> are cut to install <b>utilities and components</b>
G-22.03.03P	repair <b>defects</b>	<b>defects</b> are repaired according to specifications
G-22.03.04P	break surface materials and remove debris	surface materials are broken, and debris is removed to prepare for resurfacing
G-22.03.05P	compact base, drill into existing concrete and install dowels using adhesives	base is compacted, existing concrete is drilled into, and dowels are installed using adhesives according to engineered specifications
G-22.03.06P	place, lay, spread, rake and compact <b>road surfacing material</b>	<b>road surfacing material</b> is placed, laid, spread, raked and compacted according to engineered specifications
G-22.03.07P	apply <b>adhesives and primers</b> to potholes	<b>adhesives and primers</b> are applied to potholes to prepare for <b>fill materials</b>
G-22.03.08P	cut cracks, remove debris and seal joints using sealants	cracks are cut, debris is removed using media blasting equipment and compressor, and joints are sealed using sealants according to engineered specifications

## Range of Variables (include, but not limited to)

<b>tools and equipment</b>	shovels, wheelbarrows, saws (quick-cut, walk-behind, up-cut flat, road), jackhammers, hand tampers, plate tampers, rollers, media blasting equipment, compressors, tape, fluorescent paint, road reflectors
<b>road surfacing materials</b>	concrete, asphalt, composite materials, interlocking brick, chip seal
<b>utilities and components</b>	pressure pads/sensors, conduit, engineering plates
<b>defects</b>	potholes, cracks, washouts, heaved areas
<b>adhesives and primers</b>	tack, concrete bonding agents
<b>fill materials</b>	gravel, asphalt, concrete, specialty materials

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
G-22.03.01L	demonstrate knowledge of materials used for road repairs, their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>road surfacing materials</b>, and describe their characteristics and applications</li> <li>b. identify types of <b>fill materials</b>, and describe their characteristics and applications</li> <li>c. identify types of <b>adhesives and primers</b></li> <li>d. interpret information pertaining to <b>fill materials</b> and <b>road surfacing materials</b> found on drawings and specifications</li> </ul>
G-22.03.02L	demonstrate knowledge of procedures to repair road surfaces	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to repair road surfaces, and describe their procedures for use</li> <li>b. identify types of <b>defects</b> requiring repair</li> <li>c. describe procedures to prepare road surfaces for repairs</li> <li>d. describe procedures to repair road surfaces</li> <li>e. describe procedures to dispose of road debris</li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
G-22.03.03L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

**Range of Variables (include, but not limited to)**

<b>road surfacing materials</b>	concrete, asphalt, composite materials, interlocking brick, chip seal
<b>fill materials</b>	gravel, asphalt, concrete, specialty materials
<b>adhesives and primers</b>	tack, concrete bonding agents
<b>tools and equipment</b>	shovels, wheelbarrows, saws (quick-cut, walk-behind, up-cut flat, road), jackhammers, hand tampers, plate tampers, rollers, media blasting equipment, compressors, tape, fluorescent paint, road reflectors
<b>defects</b>	potholes, cracks, washouts, heaved areas

## Task G-23 Installs roadwork components

### Task Descriptor

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

### G-23.01 Installs barriers

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

### Skills

Reference Code	Performance Criteria	Evidence of Attainment
G-23.01.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task and manufacturers' specifications

Reference Code	Performance Criteria	Evidence of Attainment
G-23.01.02P	select <b>barriers</b>	<b>barriers</b> are selected according to regulations and specifications
G-23.01.03P	determine locations for <b>barriers</b>	locations for <b>barriers</b> are determined according to regulations and specifications
G-23.01.04P	secure water-filled and sand-filled <b>barriers</b>	water-filled and sand-filled <b>barriers</b> are secured using <b>anchors and fasteners</b>

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	forklifts, drills, pry bars, post augers, rigging, boom trucks, skid steers
<b>barriers</b>	pedestrian, guardrails, jersey (no post), cones, candlesticks
<b>anchors and fasteners</b>	dowels, concrete piles, cables

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
G-23.01.01L	demonstrate knowledge of <b>barriers</b> , their characteristics and <b>applications</b>	<ul style="list-style-type: none"> <li>a. identify types of <b>barriers</b> and describe their characteristics and <b>applications</b></li> <li>b. identify types of <b>materials used for barriers</b> and describe their characteristics and applications</li> <li>c. identify types of <b>anchors and fasteners</b> used to secure <b>barriers</b> and describe their characteristics and applications</li> <li>d. interpret information pertaining to <b>barriers</b> found on drawings and specifications</li> </ul>
G-23.01.02L	demonstrate knowledge of procedures to install <b>barriers</b>	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to install <b>barriers</b> and describe their procedures for use</li> <li>b. describe procedures to install <b>barriers</b></li> </ul>

Reference Code	Learning Outcomes	Learning Objectives
G-23.01.03L	demonstrate knowledge of training and certification requirements to install <b>barriers</b>	a. identify training and certification requirements to install <b>barriers</b>
G-23.01.04L	demonstrate knowledge of regulatory requirements pertaining to installation of <b>barriers</b>	a. identify codes, industry standards and regulations pertaining to installation of <b>barriers</b>

**Range of Variables (include, but not limited to)**

<b>barriers</b>	pedestrian, guardrails, jersey (no post), cones, candlesticks
<b>applications (of barriers)</b>	temporary, permanent
<b>materials used for barriers</b>	concrete, steel, wood, plastic
<b>anchors and fasteners</b>	dowels, concrete piles, cables
<b>tools and equipment</b>	forklifts, drills, pry bars, post augers, rigging, boom trucks, skid steers

**G-23.02 Installs road markings and signs**

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

**Skills**

Reference Code	Performance Criteria	Evidence of Attainment
G-23.02.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
G-23.02.02P	place, paint or adhere permanent and temporary <b>road markings</b> and signs	permanent and temporary <b>road markings</b> and signs are placed, painted or adhered according to jurisdictional regulations and engineered specifications

Reference Code	Performance Criteria	Evidence of Attainment
G-23.02.03P	auger (bore) and backfill signpost holes	signpost holes are augered (bored) and backfilled to secure in place

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	measuring tapes, post augers, sledgehammers, road sign banders, access equipment, wrenches
<b>road markings</b>	reflective tape, painted lines

**Knowledge**

Reference Code	Learning Outcomes	Learning Objectives
G-23.02.01L	demonstrate knowledge of <b>road markings</b> and signs, their characteristics and applications	<ul style="list-style-type: none"> <li>a. identify types of <b>road markings</b>, and describe their characteristics and applications</li> <li>b. identify types of signs, and describe their characteristics and applications</li> <li>c. interpret information pertaining to <b>road markings</b> and signs found on drawings and specifications</li> </ul>
G-23.02.02L	demonstrate knowledge of procedures to install <b>road markings</b> and signs	<ul style="list-style-type: none"> <li>a. identify <b>tools and equipment</b> used to install <b>road markings</b> and signs, and describe their procedures for use</li> <li>b. describe procedures to install <b>road markings</b> and signs</li> </ul>
G-23.02.03L	demonstrate knowledge of training and certification requirements to install <b>road markings</b> and signs	<ul style="list-style-type: none"> <li>a. identify training and certification requirements to install <b>road markings</b> and signs</li> </ul>
G-23.02.04L	demonstrate knowledge of regulatory requirements pertaining to installation of <b>road markings</b> and signs	<ul style="list-style-type: none"> <li>a. identify codes, industry standards and regulations pertaining to installation of <b>road markings</b> and signs</li> </ul>

**Range of Variables (include, but not limited to)**

<b>road markings</b>	reflective tape, painted lines
<b>tools and equipment</b>	measuring tapes, post augers, sledgehammers, road sign banders, access equipment, wrenches

**G-23.03 Installs culverts**

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

**Skills**

<b>Reference Code</b>	<b>Performance Criteria</b>	<b>Evidence of Attainment</b>
G-23.03.01P	select and use <b>tools and equipment</b>	<b>tools and equipment</b> are selected and used according to task
G-23.03.02P	assemble <b>culvert</b> sections	<b>culvert</b> sections are assembled using <b>connecting methods</b> according to manufacturers' specifications
G-23.03.03P	install and compact bedding for <b>culverts</b>	bedding for <b>culverts</b> are installed and compacted to achieve required grade and to ensure drainage
G-23.03.04P	backfill and secure <b>culvert</b>	<b>culvert</b> is backfilled and secured according to engineered specifications

**Range of Variables (include, but not limited to)**

<b>tools and equipment</b>	wrenches, levels, shovels, wheelbarrows, skid steers, mini excavators, plate tampers, jumping jacks
<b>culverts</b>	galvanized steel, plastic, concrete
<b>connection methods</b>	bell and spigot, clamped and butted

## Knowledge

Reference Code	Learning Outcomes	Learning Objectives
G-23.03.01L	demonstrate knowledge of <b>culverts</b> , their characteristics and applications	a. identify types and sizes of <b>culverts</b> , and describe their characteristics and applications b. interpret information pertaining to <b>culverts</b> found on drawings and specifications
G-23.03.02L	demonstrate knowledge of procedures to install <b>culverts</b>	a. identify <b>tools and equipment</b> used to install <b>culverts</b> , and describe their procedures for use b. describe procedures to compact bedding for <b>culverts</b> c. identify <b>connecting methods</b> used to connect <b>culverts</b> d. describe procedures to install <b>culverts</b>
G-23.03.03L	demonstrate knowledge of sustainability and environmental stewardship practices	a. identify practices that contribute to environmental protection

### Range of Variables (include, but not limited to)

<b>culverts</b>	galvanized steel, plastic, concrete
<b>tools and equipment</b>	wrenches, levels, shovels, wheelbarrows, skid steers, mini excavators, plate tampers, jumping jacks
<b>connection methods</b>	bell and spigot, clamped and butted

## Appendix A - Acronyms

ACI	American Concrete Institute
ATV	all-terrain vehicle
CBFL	counter-balance forklift
CLSM	controlled low strength material
CNZEAA	Canadian Net-Zero Emissions Accountability Act
CO	carbon monoxide
CSA	Canadian Standards Association
CSE	confined space entry
CSP	concrete surfacing profile
GFCI	ground fault circuit interrupter
GPS	Global Positioning System
HDPE	high density polyethylene
H <sub>2</sub> S	hydrogen sulfide
ICF	insulated concrete forms
ICI	industrial, commercial and institutional
JHA	job hazard analysis
LEED	Leadership in Energy and Environmental Design
LEL	lower explosion limit
LNG	liquid natural gas
MEWP	mobile elevating work platform
NBC	National Building Code
NECB	National Energy Code of Canada for Buildings
O <sub>2</sub>	oxygen
OHS	Occupational Health and Safety
PCST	Pipeline Construction Safety Training
PEX	cross-linked polyethylene
PPE	personal protective equipment
PSI	pre-job safety instructions
PVC	polyvinyl chloride
PVC-O	bi-axially oriented PVC
QR	quick response
SDS	safety data sheet
TDG	Transportation of Dangerous Goods
TWA	time weighted averages

UEL	upper explosion limit
WHMIS	Workplace Hazardous Materials Information System
ZCB	Zero Carbon Building

## **Appendix B - Tools and Equipment / Outils et équipement**

### **Personal Protective Equipment (PPE) and Safety Equipment / Équipement de protection individuelle et équipement de sécurité**

air horns	avertisseurs à air comprimé
aprons	tabliers
barricades	barrières
barrier creams, sunscreen and insect repellent	crèmes protectrice, écran solaire et insectifuge
bear spray	répulsif à ours
boots (safety, rubber, insulated, waders)	bottes (de sécurité, en caoutchouc, isolées, cuissardes)
breathing apparatus	appareil respiratoire
caution tape (red, yellow)	rubans de mise en garde (rouge, jaune)
chaps (chainsaw, other)	jambières-tablier (scie à chaîne, autre)
chin straps	jugulaires
coveralls (cloth, paper, chemical)	combinaisons (tissu, papier, chimique)
decontamination showers	douches de décontamination
delineators	délinéateurs
evacuation boxes	trousses en cas d'évacuation
eye protection	protection oculaire
eye wash stations	douches oculaire
face shields	masques
fall protection equipment (harnesses, lanyards, restraining cables, rope grabs, lifelines [static, self-retracting], anchorage, softeners)	équipement antichute (harnais, lanières de sécurité, câble de retenue, coulisseau de sécurité, câble de sécurité [longes statiques et rétractables], ancrages, protecteur d'élingue)
fire blankets	couvertures antifeu
fire extinguishers	extincteurs
fire hoses	boyaux d'incendie
fire retardant clothing	vêtements de protection
first aid kits and rooms	trousses de premiers soins

fit tester kits  
 flame-retardant clothing  
 gas detection equipment  
 gloves  
 hard hats  
 hazmat protective suit  
  
 hearing protection  
 high-visibility vests  
 human augmentation and exoskeleton devices  
 knee boards and pads  
 life jackets  
 megaphones  
 rain suits  
 respirators (particles, chemical, vapor)  
  
 safety goggles/glasses  
 self-contained breathing apparatus  
 soap  
 spill kits  
 tie-off points  
 tool lanyards  
 trench shields  
 two-way radios  
 welding flash blind

appareils d'essai d'ajustement  
 vêtements ignifuges  
 matériel de détection de gaz  
 gants  
 casques de sécurité  
 tenue de protection contre les matières dangereuses  
 protection auditive  
 gilets de haute visibilité  
 dispositifs d'augmentation humaine et exosquelettes  
 appuie-genoux et genouillères  
 gilets de sauvetage  
 porte-voix  
 habits de pluie  
 appareils respiratoire (particules, produits chimiques, vapeurs)  
 lunettes étanches/de protection  
 appareil respiratoire autonome  
 savon  
 poubelle pour rebuts chimiques  
 points d'ancrages  
 cordons pour outils  
 blindages de tranchées  
 radios avec émetteur-récepteur  
 écran protecteur

## Power Tools / Outils mécaniques

angle grinders  
 blow torches  
 chipping guns and bits  
 chipping hammers  
 concrete power trowels  
 concrete vibrators  
 cordless tools

meuleuses d'angle  
 chalumeaux  
 pistolets et mèches à burinage  
 marteaux burineur  
 truelles à béton mécaniques  
 vibrateurs à béton  
 outils sans fil

coring machines and bits	couronnes de sondage et machines de carottage
discs (diamond, abrasive)	disques (ponceur et à diamant)
disc sanders	ponceuses à disque
electric drills	perceuses électrique
extension cords	rallonges
flashlights	torches électrique, lampes de poche
gas-powered blowers	souffleuses à essence
grinders	ciseaux à boucharder
hammer drills	marteaux perforateurs
hydraulic jacks	vérins, crics, coins hydraulique
impact wrenches/guns (electric and pneumatic)	clés à choc/pistolets cloueur (électrique ou pneumatique)
lawn mowers	tondeuses à gazon
lights	lampes
mechanical spreaders	épandeurs mécanique
media blasting equipment	appareil de projection d'abrasif
oxyacetylene cutting torches	chalumeaux de coupe oxyacétylénique
portable concrete mixers	malaxeurs à béton portatif
portable sprayers	pulvérisateurs portatif
powder-actuated tools	outils à charge explosive
power screed	règles mécaniques
power sprayers	pulvérisateurs électriques
pressure pumps	pompes de pression
pressure washers	pulvérisateurs à jet d'eau sous pression
propane torches	chalumeaux au propane
pumps	pompes
radios (hand-held, stationary)	radios (fixe et portatif)
saws (chain, reciprocating, quick-cut, mitre, jig, cut-off, circular, concrete, oscillating, brick)	scies (à chaîne, alternatives, à coupe rapide, à onglets, sauteuse, ébouteuses, circulaires, à béton, oscillante, pour couper de la brique)
snowblowers	souffleuses à neige
steam cleaners	nettoyeurs à la vapeur
tampers (vibratory, plate, roller, sheepfoot)	dames (vibrante, à plaque, à rouleau, à pieds de mouton)
vacuum cleaners	aspirateurs

weed trimmers  
wire wheels (component of grinder)

tondeuses à fouet  
meules en fils métalliques (composant de la meuleuse)

## **Stationary and Portable Equipment / Équipement stationnaire et mobile**

concrete pumps  
compressors  
generators  
heaters  
light towers  
mixers  
saws (table, mitre, cut-off)  
  
toolboxes  
water pumps

pompes à béton  
compresseurs  
génératrices, groupe électrogène  
appareils de chauffage  
tours d'éclairage  
malaxeurs  
scies d'établi (circulaires à table, à onglets, ébouteuses)  
coffres à outils  
pompes à eau

## **Pneumatic Tools and Equipment / Outils et équipement pneumatiques**

air wands  
augers  
compactors  
drills (stopper, jack-leg, ratchet, rock)  
  
grinders  
hammers  
jackhammers  
media blasting tools  
pavement breakers  
pneumatic guns (needle, impact, air, paint, chippers)  
portable compressor pumps  
rivet-busters  
scabblers

soufflettes  
tarières  
compacteurs  
foreuses (marteau stopper, marteau perforateur sur béquille, à rochet)  
meuleuses  
marteaux  
marteaux-piqueur  
appareils à jet d'abrasif  
brise-bétons  
pistolets pneumatique (à aiguilles, cloueur, à air, à peinture, burineurs)  
compresseurs transportable  
coupe-rivets  
bouchardeuses

## **Rigging and Hoisting Equipment / Équipement de gréage et de levage**

block and tackle	moufles
bridle hitches	attaches à plusieurs élingues
cables	câbles
chain falls	palans à chaîne
chains	chaînes
clevis	maillons d'attache
come-alongs (portable winching equipment)	chaîne-entraves (équipement de treuillage portatif)
cradles	brides de fixation
eye bolts	boulons à œil
gin wheels	camions-grue
grip hoists	treuils
jibs	fléchettes
lifting clamps	brides de levage
lifting hooks	crochets de levage
pulleys	poulies
rollers	rouleaux
ropes (nylon, steel, natural fiber, polypropylene)	câbles (en nylon, en acier, en chaîne, en fibre naturelle, en polypropylène)
shackles	manilles
slings (nylon, steel, chain, natural fiber, polypropylene)	élingues (en nylon, en acier, en chaîne, en fibre naturelle, en polypropylène)
snatch blocks	poulies à chape ouvrante
softeners	adoucisseurs
spreader bars	barres d'écartement
straps	sangles
swivel hooks	crochets pivotant
tag lines	câbles stabilisateur
turnbuckles	tendeurs
winches	treuils
work cages	nacelle-cages

## **Scaffolding and Access Equipment / Échafaudage et équipement d'accès**

boom lifts	nacelles élévatrices
cherry pickers	élévateurs à nacelle
ladders (extension, platform, stepladder)	échelles (à coulisse, à plateforme, escabeaux)
mast climbers	plateformes de travail sur mât
mobile elevating work platforms (MEWP)	plateformes élévatrice motorisée
mobile scaffolding	échafaudage mobile
personnel lifts	monte-personnes
rolling scaffolds	échafaudages roulant
scissor lifts	plateformes élévatrices à ciseaux
stationary scaffolding	échafaudage volant
suspended platforms	plateformes de travail suspendue
suspended scaffolds	échafaudages suspendu
swing stages	échafaudages volant

## **Transport Equipment / Équipement de transport**

all-terrain vehicles (ATV)	véhicules tout-terrain
boats and barges	bateaux
boom trucks	camions à flèche
conveyors	convoyeurs
flatbed trucks and trailers	camions et remorques à plateforme
forklifts (telescopic, counter-balance)	chariots élévateurs à fourche (à flèche télescopique, à contrepoids)
handcarts	chariots à bras
manual buggies	chariots à main
mini excavators	mini-excavatrices
pallet jacks	transpalette à bras
power buggies	chariots à moteur
skid steers	chargeurs à direction à glissement
trucks	camions
wheelbarrows	brouettes

## Measuring and Layout Tools, Instruments and Equipment / Outils, instruments et équipement de mesure et de traçage

calculators	calculatrices
carpenter's pencils	crayons de charpentier
chalk lines	cordeaux à craie
electronic devices (laptops, smartphones, tablets)	appareils électroniques (ordinateurs portable, téléphones intelligents, tablettes)
electronic dew point guns	détecteurs de point de rosée
GPS equipment	équipement GPS
jeepet/holiday detector	balai électrique
levels (laser, builders', precision)	niveaux (laser, de menuisier, de précision)
markers	marqueurs
measuring tapes	rubans à mesurer
pipe locators	localisateurs de conduites
plumb bobs	fils à plomb
scale rulers	règles graduée
squares	équerres
straightedges	règles
stringlines	cordeaux
survey rods	mires de nivellement
surveyor ribbons	rubans d'arpentage
templates	gabarits
theodolites	théodolites
thermometers	thermomètres
tire pressure gauges	manomètres
total stations	stations totalisatrice
trammel points	pointes de compas à verge
tripods and mounting devices	trépieds et appareils de montage

## Masonry Tools / Outils de maçonnerie

bolsters	ciseaux de maçon
brick and stone cutters	couteaux pour tailler la brique et la pierre
brick tongs	pincettes à briques
corner blocks	blocs d'angle

curry combs  
edgers  
face hammers  
floats (bull, hand)  
groovers  
hawks  
jointers (rat tail)  
line blocks  
line holders  
line pins  
line trigs  
manual splitters  
masonry saws  
masonry table saws  
mason's chisels  
mortar boards  
mortar boxes  
mortar buggies  
mortar hoes  
mortar mixers  
rakers - wheel type  
sandboxes  
sand screens  
trowels

étrilles  
fers à bordure  
marteaux à panne  
taloches (pour sol et à main)  
rainureuses  
planches à mortier  
mirettes (queue de rat)  
blocs d'alignement  
supports à ligne  
piquets de cordeau  
baguettes  
fendeuses manuelle  
scies à maçonnerie  
scies de maçon sur table  
ciseaux de briqueteur  
planches à mortier  
boîtes de gâchage  
chariots à mortier  
ratissoires à mortier  
malaxeurs à mortier  
racloirs à roue  
boîtes à sable  
tamis à sable  
truelles

## Appendix C - Glossary / Glossaire

<b>accelerator</b>	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	<b>accélérateur de prise</b>	réduit le temps de prise du béton et permet au temps de durcissement de débuter plus tôt, ce qui permet au béton d'être posé en hiver avec un risque réduit de dommage causé par le gel
<b>aggregate</b>	granular material, such as sand, gravel, crushed stone or recycled concrete aggregates used with cement and water to produce concrete	<b>granulat</b>	matériau granulaire comme le sable, le gravier, la pierre concassée ou des granulats de béton recyclé utilisé avec du ciment et de l'eau pour fabriquer du béton
<b>air entrained</b>	agents introduced to the concrete which contain 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. It prevents the cracking and destructive effects of freeze thaw cycling - which includes shrinking and or expansion	<b>à air occlus</b>	agent ajouté au béton qui contient des milliards de cellules d'air microscopiques par pied carré, ce qui relâche la pression interne sur le béton en fournissant de minuscules chambres qui permettent à l'eau de prendre de l'expansion lorsqu'elle gèle. Il empêche la fissuration et les effets destructeurs du cycle gel-dégel, qui comprend le retrait ou l'expansion
<b>anchor plate</b>	large metal plate connected to a tie rod or bolt	<b>plaque d'ancrage</b>	grande plaque de métal connectée à une tige d'entretoise ou un boulon de liaison
<b>angle of repose</b>	maximum slope at which a conical pile of loose soils will remain stable and not collapse	<b>angle de repos</b>	pente maximale à laquelle un tas conique peut demeurer stable sans s'affaisser

<b>base plate</b>	solid piece of material that has enough strength and sturdiness to serve as the surface to which other things are attached to be supported	<b>plaque d'assise</b>	pièce de métal solide suffisamment forte et robuste pour servir de surface où attacher d'autres éléments qui ont besoin de support
<b>bedding</b>	aggregate material used to support the pipe	<b>assise</b>	agrégat utilisé pour soutenir la canalisation
<b>bell</b>	the large end of a pipe which inserts over the small (spigot) end of the pipe when connecting	<b>bout femelle</b>	bout large d'une canalisation qui s'insère par-dessus la petite partie de la canalisation (bout mâle) lorsqu'elles se connectent
<b>benchmark</b>	a point of known elevation	<b>repère</b>	point d'une élévation connue
<b>berm</b>	an embankment built to contain liquids and gases and prevent them from damaging the environment	<b>berme</b>	talus aménagé pour contenir les liquides et les gaz et empêcher leur libération dans l'environnement
<b>bladder</b>	rubber membrane used to isolate a section of pipe or component for testing or repair	<b>vessie</b>	membrane de caoutchouc qui sert à isoler un tronçon de conduite ou un composant durant un essai ou une réparation
<b>bracing (for concrete)</b>	supports which run at an angle on the form to provide support and keep the walls plumb	<b>contreventement (pour le béton)</b>	support qui se trouve à un angle du coffrage pour offrir du support et tenir les murs d'aplomb
<b>bull float</b>	tool used to flatten concrete surfaces	<b>taloche pour sol</b>	outil utilisé pour aplatir les surfaces en béton

<b>catch basin</b>	receptacle or reservoir that receives surface water runoff or drainage and is part of a storm drain designed to trap debris before it enters the pipe	<b>puisard</b>	receveur d'eau ou réservoir qui reçoit l'écoulement de surface ou le drainage des eaux de surface et qui fait partie d'un collecteur d'eaux pluviales conçu pour emprisonner les débris avant qu'ils ne pénètrent dans la canalisation
<b>clearance markers (goal posts)</b>	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	<b>balises (poteaux de but)</b>	avertissements mis en place pour empêcher les véhicules ou d'autre machinerie de trop s'approcher d'autres objets, y compris les hauteurs excessives ou les limites d'approche de sources électriques
<b>compacting equipment</b>	an engine-powered machine that is used to compact loose materials and asphalt	<b>équipement de compactage</b>	machine motorisée utilisée pour compacter les matériaux inconsistants et l'asphalte
<b>concrete</b>	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 water with the cement	<b>béton</b>	composé fait d'un agent liant et de granulats, généralement constitué d'un mélange de ciment, de granulat et d'eau en proportions variables; le mélange est travaillé jusqu'à l'obtention d'une consistance de plastique et se durcit ensuite lors du processus d'hydratation qui se produit entre l'eau et le ciment

<b>confined space</b>	an area not designed for continuous human occupancy, contains a hazard (e.g., deadly gas) or the potential of a hazard, and has limited access and egress	<b>espace clos</b>	espace qui n'a pas été conçu en vue d'une occupation permanente, qui présente un danger (p. ex., un gaz mortel) ou un risque et dont l'accès et l'évacuation sont restreints
<b>control joints</b>	intentional groove cut into a concrete surface to control cracking	<b>joint de retrait</b>	sillon gravé intentionnellement dans la surface de béton pour maîtriser les fissures
<b>cribbing</b>	support made of timber, logs, concrete or steel to support a structure from below or the side	<b>caisson</b>	support fait de bois d'œuvre, de billes, de béton ou d'acier qui se place sous une structure ou sur son côté pour la supporter
<b>cross-pollination</b>	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	<b>pollinisation croisée</b>	transfert de pollen de la fleur d'une plante à la fleur d'une plante qui a une constitution génétique différente. Les travailleurs doivent éviter la pollinisation croisée lorsqu'ils utilisent des outils et de l'équipement dans différents secteurs en raison de l'augmentation de la géo-ingénierie
<b>curing</b>	the maintenance of a satisfactory moisture content and temperature in concrete during its early stages so that desired properties may develop (i.e., reducing shrinkage)	<b>cure</b>	conservation d'un niveau satisfaisant d'humidité et de température du béton à jeune âge pour lui permettre de développer les propriétés voulues (p.ex., réduire le retrait)
<b>curry comb</b>	tool with rows of metal teeth that can be used for cleaning bricks and blocks	<b>étrille</b>	outil garni de dents de métal qui peut servir à nettoyer la brique et les blocs

<b>daylighting utilities</b>	exposing underground utilities by excavation so that work can be done on the utilities	<b>mise à découvert des infrastructures</b>	exposer les infrastructures de service par excavation pour pouvoir y effectuer des travaux
<b>ductile</b>	type of pipe material	<b>métal ductile</b>	type de matériau de confection des conduites
<b>egress</b>	the means of going out or leaving; an exit; an outlet	<b>évacuation</b>	moyen de sortie, issue
<b>falsework</b>	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	<b>fausse charpente</b>	structure temporaire dans laquelle la charge principale qui transporte les membres est verticale et est utilisée pour supporter une structure permanente et les éléments qui y sont associés au cours du montage jusqu'à ce que la structure permanente se supporte elle-même
<b>fillcrete</b>	a mix of gravel and cement (small amount) used for backfill that does not require compaction (also known as flowcrete, flowable fill, trucecrete, controlled low strength material [CLSM], lean fill, unshrinkable fill [U-fill])	<b>béton de remplissage</b>	mélange de gravier et de ciment (en petites quantités) servant de remblai et ne nécessitant pas de compactage
<b>filter cloth</b>	cloth fabric used in excavation that helps to screen out soil and other contaminants while allowing the passage of water	<b>tissu filtrant</b>	tissu utilisé lors de l'excavation qui aide à filtrer la terre et d'autres contaminants tout en permettant le passage de l'eau

<b>floating</b>	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	<b>aplanissage</b>	procédé utilisant un outil, habituellement fait de bois ou de magnésium, pour les opérations de finition afin d'obtenir une surface relativement uniforme, mais grossière, d'un béton frais
<b>flying forms</b>	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	<b>coffrage mobile</b>	système qui peut être utilisé à répétition et déplacé dans de grandes sections et qui n'a pas besoin d'être démonté. Il est couramment utilisé comme système d'étalement de coffrages pour supporter les dalles de béton coulées sur place dans les constructions élevées qui comptent plusieurs étages
<b>fly table</b>	forming system assembled in various shapes and sizes depending on the needs of each building	<b>table mobile</b>	système de coffrage assemblé en formes et tailles variées dépendamment des besoins particuliers de chaque immeuble
<b>form</b>	a temporary structure or mould for the support of concrete while it is setting and gaining sufficient strength to be self-supporting	<b>coffrage</b>	structure ou moule temporaire dans lequel le béton est mis en place; il supporte le béton pendant qu'il fait sa prise et développe suffisamment de résistance pour être autoportant

<b>Ground Disturbance training</b>	training program that covers the safety aspects of trenching and excavating operations including locators and locating buried facilities	<b>formation sur la perturbation du terrain</b>	programme de formation qui couvre les aspects de la sécurité lors des opérations de creusage et d'excavation, ce qui comprend les localisateurs et la localisation des installations enfouies
<b>grout</b>	mixture of cementitious material and water with aggregate which may be proportioned and mixed to produce a pourable consistency without segregation of the constituents	<b>coulis</b>	mélange de matériaux à base de ciment et d'eau, avec granulat, dosé pour produire un mélange fluide sans ségrégation
<b>guillotine (brick and block)</b>	device which generates a high amount of pressure to cut various types of blocks	<b>guillotine (brique et bloc)</b>	dispositif qui génère une quantité élevée de pression pour couper divers types de blocs
<b>gunite</b>	insulating material that is sprayed on and used in many applications, such as refractory and decorative	<b>gunite</b>	matériau d'isolation qui est pulvérisé et utilisé comme enduit réfractaire et décoratif
<b>height stick</b>	leveling guide that is used during concrete pour to measure the pour height	<b>bâton de mesure</b>	guide de nivelage utilisé durant le coulage du béton pour mesurer la hauteur du coulage
<b>high flow</b>	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	<b>haute fluidité</b>	béton très fluide non séparé qui s'étend facilement, remplit les coffrages et encapsule même l'armature la plus congestionnée. Il se place de lui-même grâce à son poids, avec peu ou pas de vibration mécanique

<b>hoarding</b>	temporary enclosure to protect against damage, such as weather and debris, and to limit public access	<b>palissade</b>	clôture temporaire pour protéger des dégâts que pourraient causer les conditions climatiques et les débris ainsi que pour limiter l'accès du public
<b>honeycomb</b>	voids or cavities that are left in the hardened concrete due to incomplete filling of the formwork or improper consolidation of the concrete	<b>nids d'abeille</b>	vides ou cavités qui demeurent dans le béton durci en raison d'un remplissage incomplet du coffrage ou d'une mauvaise consolidation du béton
<b>jeeping</b>	a process using electronic current to detect deficiencies (cracks, pinholes) in pipe coatings	<b>balayage électronique</b>	procédé de détection des défauts (fissures, trous d'épingle) dans les revêtements de conduits
<b>jersey barrier</b>	modular concrete or plastic barrier employed to separate lanes of traffic and minimize vehicle damage in case of impact	<b>barrière Jersey</b>	barrière modulaire en béton ou en plastique utilisée pour séparer des voies de circulation et minimiser les dégâts en cas d'impact
<b>keyway joints</b>	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	<b>rainure</b>	type de joint entre deux coulées de béton individuelles avec une enclave ou une rainure à une des extrémités, et une protrusion égale à l'autre extrémité, qui s'emboîtent en offrant une résistance au cisaillement
<b>lintel</b>	a beam placed across the top of a rough door or window opening; it supports the weight from above	<b>linteau</b>	poutre placée en travers de la partie supérieure d'une ouverture brute d'une porte ou d'une fenêtre; elle permet de soutenir le poids au-dessus d'elle
<b>monument</b>	permanent established control point used for surveying	<b>borne</b>	point de contrôle permanent connu servant à l'arpentage

<b>maintenance hole</b>	a precast concrete structure that allows access to underground pipes	<b>regard de visite</b>	structure de béton préfabriquée permettant l'accès aux conduites souterraines
<b>media blasting equipment</b>	equipment that propels a certain type of media such as sand, glass bead and metal pellets to clean the surface of various materials	appareil de projection d'abrasif	équipement qui propulse un jet de sable, de billes de verre ou de pastilles métalliques dans le but nettoyer la surface de divers matériaux
<b>pile driver</b>	machine used to drive concrete, metal or wood piles	<b>batteuse de pieux</b>	machine à battre les pieux en béton, en métal ou en bois
<b>piling</b>	structural column installed into the ground to anchor or support a building and other structures	<b>pieu</b>	colonne structurale fixée dans le sol pour ancrer ou soutenir un bâtiment ou une autre structure
<b>pinch bar</b>	kind of crowbar or lever with a projection that serves as a fulcrum	<b>barre levier</b>	sorte de pied-de-biche ou de levier avec projection qui sert de point d'appui
<b>pipe coating</b>	a coating either sleeved, taped or painted onto pipe to protect it from corrosion and other foreign materials	<b>revêtement de conduite</b>	matériau dont la conduite est chemisée, enrobée ou enduite pour la protéger de la corrosion et d'autres corps étrangers
<b>plastic</b>	a condition of freshly mixed concrete such that it is readily mouldable, workable and cohesive	<b>plastique</b>	un état du béton fraîchement mélangé dans lequel il est facilement moulable, façonnable et homogène
<b>primer</b>	a substance used to prepare a surface for adhesives or sealants	<b>apprêt</b>	substance utilisée pour préparer une surface en vue d'y étendre de l'adhésif ou un produit de scellement

<b>rate of pour</b>	important process using scientific calculations based on the viscosity, temperature and depth of the concrete pour and the effects of pressure on the forms	<b>taux de coulage</b>	processus important qui utilise des calculs scientifiques en s'appuyant sur la viscosité, la température et la profondeur du coulage du béton ainsi que les effets de la pression sur les coffrages
<b>rebar dowel</b>	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	<b>goujon pour barre d'armature</b>	pièce d'acier utilisée pour joindre différentes coulées de béton ensemble; elle est insérée dans du béton frais ou bien un trou percé dans le béton existant et elle y est fixée à l'aide de résine époxyde
<b>refractory</b>	material which can withstand very high temperatures without degrading or softening	<b>matériau réfractaire</b>	matériau pouvant supporter des températures très élevées sans se détériorer ou ramollir
<b>retarder</b>	an admixture which extends the setting time of cement paste and, therefore of mixtures such as concrete, mortar, and grout	<b>retardateur de prise</b>	adjuvant du béton qui allonge la durée requise pour la prise du ciment; il s'agit d'un mélange de béton, de mortier et de coulis

<b>right of way</b>	<p>in the construction of new roads, refers to energy and municipal-related easements such as utility corridors, power lines and gas/oil transmission lines</p> <p>on a pipeline project, is the legal right granted to the project developer or pipeline operator to use a specific strip of land for the construction, operation, inspection and maintenance of the pipeline</p> <p>in municipal road, refers to the municipal road allowance between private property lines on each side of the road</p>	<b>droit de passage</b>	<p>dans la construction de nouvelles routes, fait référence aux servitudes liées à l'énergie et aux municipalités, comme les couloirs de services publics, les lignes électriques et les lignes de transport de gaz et de pétrole</p> <p>dans un projet de pipeline, le droit légal accordé au développeur ou à l'opérateur du pipeline d'utiliser une bande de terre spécifique pour la construction, l'opération, l'inspection et l'entretien du pipeline</p> <p>sur les routes municipales, espacement entre les limites des propriétés de chaque côté de la route</p>
<b>rough buck</b>	temporary form to provide an opening in concrete and masonry	<b>faux-cadre</b>	coffrage temporaire servant à délimiter une ouverture dans les structures bétonnées et maçonneries
<b>scarify</b>	to roughen a surface of concrete	<b>scarifier</b>	décaper une surface de béton
<b>screeding</b>	the operation of forming a grade surface by use of a straightedge	<b>réglage</b>	opération de finition d'une surface faite avec une règle à araser
<b>settling pond</b>	water containment used to contain sediment before disposing of the water	<b>bassin de décantation</b>	bassin de retenue où se fait la sédimentation avant l'évacuation de l'eau

<b>sheet piling</b>	interlocking metal sheeting used as excavation support and for soil retention, especially around water	<b>palplanches</b>	panneaux métalliques s'emboîtant pour former une paroi utilisée comme appui à l'excavation et la rétention du sol, particulièrement près de l'eau
<b>shoring (concrete)</b>	supports built to hold concrete formwork	<b>étalement (béton)</b>	membres servant à soutenir les coffrages de béton
<b>shoring (excavation)</b>	supports built inside an excavation to retain soil to prevent cave-ins	<b>étalement (excavation)</b>	appuis logés sur les côtés d'un lieu excavé pour empêcher l'affaissement du sol
<b>shotcrete</b>	mortar or concrete conveyed through a hose and projected pneumatically onto a surface	<b>béton projeté</b>	mortier ou béton transporté par un boyau qui est projeté sur une surface de façon pneumatique
<b>silt fence</b>	a geo- textile containment fence used to filter the silt from run-off around a construction site	<b>barrière à sédiments</b>	clôture de confinement en géotextile utilisée pour filtrer le limon qui provient des chantiers de construction
<b>skid steer</b>	is a small rigid frame, engine-powered machine with lift arms used to attach a wide variety of labor-saving tools or attachments	<b>chargeur à direction à glissement</b>	pièce d'équipement motorisée, au cadre rigide, dont les bras de levage peuvent être utilisés pour y attacher des accessoires agricoles ou d'autres types
<b>slab</b>	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	<b>dalle</b>	couche moulée de béton renforcé ou lisse qui se pose à l'horizontale ou presque, habituellement uniforme mais parfois d'épaisseurs variables, soit sur le sol ou supportée par des poutres, des colonnes, des murs ou d'autres coffrages

<b>slump</b>	a measurement of consistency of mixed concrete	<b>affaissement</b>	mesure de la consistance d'un mélange de béton
<b>slurry</b>	a mixture of water and fine materials, such as Portland cement, slag, or soil in suspension	<b>laitance</b>	mélange d'eau et de matériaux fins tels que du ciment Portland, du laitier ou du sol en suspension
<b>spigot</b>	reduced diameter in the end of pipe able to lock into the bell end	<b>bout mâle</b>	diamètre réduit au bout d'un tuyau en mesure de se loger dans le bout femelle
<b>spring clip</b>	a fastener used to provide a screw hole for a sheet metal screw	<b>étrier de ressort</b>	fixation utilisée pour percer un trou pour une vis à tête
<b>stationary work platform</b>	a work platform that allows worker to adjust the work surface to ergonomically correct heights when working with height changes	<b>plateforme de travail stationnaire</b>	plateforme de travail permettant au travailleur de régler la surface de travail pour corriger la hauteur de façon ergonomique lorsque le travail demande des changements de hauteur
<b>stringing</b>	the process of dispersing the pipe in the pipe laying process	<b>déroulage</b>	processus de dispersion du tuyau lors de la pose de canalisations
<b>strongback</b>	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	<b>poutre d'appui</b>	membre continu, habituellement vertical, qui fait passer les charges du coffrage au système de resserrement des coffrages et qui tient les gros systèmes de panneaux de coffrage bien en place
<b>taper tie</b>	a long tapered bolt used in formwork	<b>ancrage à bord aminci</b>	long boulon conique utilisé pour le coffrage
<b>telehandler</b>	rough terrain type forklift	<b>appareil de manutention télescopique</b>	chariot élévateur pour terrain accidenté

<b>telescopic forklift</b>	a forklift with an extending boom	<b>chariot élévateur à flèche télescopique</b>	chariot élévateur à flèche dépliable
<b>thrust block</b>	poured concrete placed at a bend, tee or cap to prevent pipe movement	<b>massif de butée</b>	béton coulé sous une courbure, un té ou un capuchon pour l'empêcher de bouger
<b>tie</b>	a tensile unit holding forms against the lateral pressure from freshly placed concrete	<b>attaches</b>	éléments de traction qui tiennent les coffrages en place lors de la pression latérale exercée par le béton fraîchement mis en place
<b>tool crib</b>	facility that stores and organizes tools owned by the company	<b>atelier d'outils</b>	installation servant au rangement et à la gestion des outils de l'entreprise
<b>tooling</b>	use of an object to smooth and move the sealant into a position for both an acceptable appearance as well as a watertight seal	<b>jointolement</b>	usage d'un objet pour lisser et déplacer le scellant dans une position afin que l'apparence soit acceptable et que le scellant soit étanche à l'eau
<b>turnbuckles</b>	used to adjust the length of rigging chains	<b>tendeurs</b>	utilisés pour ajuster la longueur des chaînes de gréement
<b>waler</b>	a continuous member, usually horizontal which transfers loads from the form to the form-tying system or form-bracing system or both	<b>raidisseur</b>	membre continu, habituellement horizontal, qui fait passer les charges du coffrage au système de resserrement des coffrages ou au système de contreventement des coffrages ou bien aux deux
<b>wet screed</b>	placing concrete on finish-grade across two known points of elevation (called wet screeds)	<b>araser</b>	étendre le béton au niveau définitif à l'aide de deux repères de hauteur (appelés règles à araser)

**whip check**

small cable choker  
placed at pressure hose  
connections to prevent  
hose from whipping  
around for safety

**câble anti-fouet**

petit étrangleur de câble  
placé aux connexions de  
boyaux sous pression  
par mesure de sécurité,  
afin d'éviter les coups de  
fouet lors d'une rupture