

# **National Occupational Standards For Operating Engineers**

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## **PERSONNEL AND MATERIAL HOIST OPERATOR**



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## **Introduction**

The Construction Sector Council (CSC) is one of 40 sector councils in Canada. Sector councils are industry-led, labour/management partnership organizations designed to address human resource development issues within specific industries.

The primary objective of the CSC is the development of a highly-skilled workforce and a safe workplace environment, contributing to the organizational productivity and individual prosperity of the members of the construction industry. The development of national occupational standards for operating engineer occupations is one of the many ways the CSC is meeting this objective.

The CSC acknowledges all of the subject matter experts who provided their valuable time and efforts toward the definition and validation of these national occupational standards. Without their combined contributions, the development of these occupational analyses (OAs) would not have been possible. A complete list of the subject matter experts can be found at the back of this document.

An OA has the following objectives:

- to identify and group the tasks performed by skilled workers in particular occupations
- to identify those tasks that are performed by skilled workers in every province and territory
- to develop instruments for use in the assessment and training leading to the certification of skilled workers
- to facilitate the mobility, in Canada, of trainees and skilled workers
- to supply employers and employees, and their associations, industries, training institutions, and governments with analysis of the tasks performed in particular occupations

Therefore, the standards define the skills, knowledge, and abilities required for an occupation and against which the qualifications of an individual in that occupation can be assessed.

The vision of the Construction Sector Council is to reach a point where operators who demonstrate the skills, knowledge, and abilities in the national occupational standards will possess the nationally recognized credentials and those credentials will assist the operator in obtaining employment anywhere in Canada.

## Foreword

Operating engineer occupations can be grouped into three broad areas—hoist and crane operators, construction heavy equipment operators, and industrial equipment operators. Within each of these broad categories, there are several operating engineer occupations.

### **1. *Hoist and Crane Operators***

Crane operators' work tends to be centred in the construction industry. Operators work on a broad range of building sites including high-rise residential, institutional, and commercial structures, as well as most large industrial sites and many types of heavy engineering projects. The Statistics Canada Labour Force Survey (LFS) identifies around 4,000 crane operators in the construction industry across Canada. There are cyclical variations in employment, with low levels below 3,000 jobs in the mid-1990s and peak levels near 5,000.

### **2. *Construction Heavy Equipment Operators***

Heavy equipment operators are largely concentrated in the construction industry. Operators work on a variety of jobs from residential, institutional, and commercial structures to most large industrial sites and most types of heavy engineering. The LFS identifies around 37,000 equipment operators employed in the construction industry across Canada. This occupation is one of the larger trades in the industry, comparable in size to the workforce for electricians, pipe trades, and masonry trades. There are cyclical variations in employment, with low levels below 27,000 jobs in the early 1990s and peak levels near 40,000.

### **3. *Industrial Equipment Operators***

Industrial equipment operators encompass a variety of occupations ranging from forklift operators and environmental workers to tractor trailer drivers. The demand for environmental workers is increasing as knowledge, awareness, and regulations proliferate. Forklift training has taken on added importance due to safety regulations that require trained or certified forklift operators.

The mobility and accessibility of operating engineers is difficult if not impossible if there are no jurisdictional agreements on national occupational standards. The project to develop occupational analyses for national occupational standards for 29 operating engineer occupations began in January 2004 and was completed in March 2005.

## **Development of the Occupational Analysis**

A draft analysis was developed by a knowledgeable team of consultants (process experts) who, with the assistance of a committee of subject matter experts in the field, identified all the tasks performed in the occupation. In order to facilitate an efficient and effective process, the 29 occupations were grouped according to commonalities. Profile meetings, with both process and subject matter experts, were held for each grouping between January and March 2004 in:

- Edmonton, Alberta
  - Excavating, Feb 5 & 6
  - Paving, Feb 9 & 10
- Morrisburg, Ontario
  - Grading, Feb 24 & 25
  - Crane and Hoisting, Mar 1 & 2
  - HAZMAT, Mar 3 & 4
  - Plant Operations, Mar 23 & 24
  - Concrete Pumping, Mar 25 & 26
- Montreal, Quebec
  - Hauling, Feb 26 & 27
- Vancouver, British Columbia
  - Utilities, Mar 16 & 17
  - Material Handling, Mar 18 & 19
- Quebec City, Quebec
  - Profile Completion Forum, Mar 29 – 31

The draft OAs were then distributed to more subject matter experts and stakeholders across Canada for review and input between June and September 2004. They were also posted on a website where subject matter experts were invited to provide feedback.

The combined input from the review was collated in October 2004. Recommendations were assessed and incorporated into the final draft, which included the identification of common core tasks performed in all occupations. Validation meetings were held for each grouping, with process and subject matter experts, between October 2004 and January 2005 in:

2004:

- Saskatoon, Saskatchewan
  - Utilities, Oct 20 – 22
  - Material Handling (including HAZMAT), Oct 26 – 29
- Halifax, Nova Scotia
  - Grading, Nov 2 – 5
- St John's, Newfoundland
  - Crane and Hoisting (including Concrete Pump), Nov 15 – 19
- Winnipeg, Manitoba
  - Excavating, Nov 23 – 25
  - Hauling, Nov 30 – Dec 3

2005:

- Vancouver, British Columbia
  - Paving, Jan 5 – 7
  - Plant Operations, Jan 10 – 12
- Victoria, British Columbia
  - Validation Forum, Feb 21 – 23

The OAs were then edited, translated, and published in both official languages.

## **Scope of the Occupational Analysis**

This occupational analysis identifies all of the tasks that a qualified operator must be able to perform. The performance of these tasks is dependent on a range of related activities, described in the body of the analysis as subtasks. The analysis is composed mainly of tasks that operators perform frequently, including such tasks as cleaning, driving, and maintenance.

Most operators have a range of experience on different types of equipment. Regardless of the type of equipment, the duties of the operator remain relatively constant. Accomplishment of the operator's tasks depends largely on knowledge of the equipment and its components, experience in a wide variety of situations, and an ability to determine the most appropriate means of proceeding with the work.

Though not described in the analysis, other important attributes of operators include mechanical aptitude, mathematical ability, excellent vision, and a high degree of physical coordination. Operators are also often called upon to perform their jobs in extremely difficult conditions.

Although this analysis is not a training document, it is worthwhile noting that aspiring operators may find it useful to reflect on their own abilities to deal with lengthy periods of physical restriction and isolation coupled with frequent subjection to pressures of time and productivity. Operators are often required to demonstrate the ability to concentrate for long periods of time while enduring physical discomfort and inclement weather conditions.

Heavy equipment is used in virtually every facet of the construction sector. In some cases, an operator may work for years on a single site, such as a plant, and may, during that time, operate only one type of equipment and therefore perform similar and relatively constant tasks. Operators who work for contractors may rarely work on the same site more than once and may perform a tremendous variety of tasks using a wide range of equipment types and sizes. The work of an operator often overlaps with that of other equipment operators.

## **Structure of the Occupational Analysis**

To facilitate the understanding of the nature of the occupation, the work performed is divided into the following divisions:

- A. BLOCK**            the largest division within the analysis and reflects a distinct operation relevant to the occupation
- B. TASK**             the distinct activity that, combined with others, makes up the logical and necessary steps the operator is required to perform to complete a specific assignment within a BLOCK
- C. SUBTASK**        the smallest distinct, measurable, and observable activities into which it is practical to divide any work activity; combined with other SUBTASKS, these fully describe the logical steps required to complete a TASK

The importance of a task describes the benefits that operators, employers, and the public receive as a result of an operator's ability to perform the task.

*Trends* are any shifts or changes that are occurring in the industry and affect the task.

*Supporting Knowledge and Abilities* are the elements of skill and knowledge that an individual must acquire to perform the task adequately.

*Tools and Supplies* are those items that are needed to perform the skill.



**BLOCK A      PROFESSIONALISM**  
**Task 1        Acts Professionally**

This task is important because it helps to:

- present positive image of industry
- demonstrate personal integrity and competence
- instill confidence and maintain relations with general public, site personnel, owners/clients, and their clients
- maintain employment and advance in industry

Trends:

- Employers and employees are placing more emphasis on company/personnel fit in relation to attitudes and values.
- There is less tolerance for unprofessional behaviour, including workplace violence, substance abuse, and harassment.
- There is increased awareness of the importance of a balanced lifestyle.
- There is an increasing demand for knowledgeable and experienced operators that have the interpersonal skills and desire to advance to supervisory and management levels.
- Individuals need to continually upgrade their knowledge and skills because of technological advances and new methodologies.

For the purposes of this document, company policies and procedures refers to those of the employer and the equipment owner.

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
1.01	Demonstrates work ethic	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• principles of work ethic and expectations, such as be punctual, prepared for work, co-operative, honest, productive, and respectful</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• follow principles of work ethic in all situations</li> </ul>	
1.02	Is aware of factors affecting personal health	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• factors affecting personal health</li> <li>• own current mental, emotional, and physical state</li> <li>• own limitations</li> <li>• factors/situations/conditions that cause stress in professional and personal life</li> <li>• working conditions on construction site</li> <li>• impact of fatigue on job performance</li> </ul>	
1.03	Resolves problems or disagreements with others	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• company policies and procedures</li> <li>• applicable legislation, such as harassment</li> <li>• conflict resolution techniques</li> </ul>	

Ability to:

- communicate effectively
- use calm approach
- be open-minded and flexible
- determine cause of problem or disagreement
- discuss and resolve issues
- walk away from conflict if necessary

1.04 Participates in professional development

Knowledge of:

- industry trends
- areas requiring ongoing learning, such as new equipment, technologies, techniques, and industry practices

Ability to:

- assess own knowledge and skills
- acquire information about training opportunities
- learn through various methods, such as on-the-job training, reading, courses, co-workers

1.05 Works with others

Knowledge of:

- own role and responsibilities
- roles and responsibilities of others in industry

Ability to:

- work as team member to achieve common goals
- keep open mind
- participate in workplace meetings
- communicate clearly and accurately
- co-ordinate job-related activities
- co-operate with others

1.06 Works independently

Knowledge of:

- company policies and procedures, such as work-alone plan
- applicable legislation, such as responsibilities of supervisor/owner and site personnel
- own role and responsibilities
- own capabilities and limitations
- work assignment, location, and working conditions

Ability to:

- confirm and clarify assignment
- take initiative, such as anticipate and prepare for next steps in job
- identify and resolve potential and actual problems
- communicate with other site personnel
- co-ordinate work with others
- complete assignment

**BLOCK A      PROFESSIONALISM**  
**Task 2        Uses Communication Skills**

This task is important because it helps to:

- work safely and efficiently
- reduce errors and miscommunication
- comply with applicable legislation and insurance requirements
- represent company and industry in professional manner
- summon help in emergency
- prevent injury, save lives, and limit damage to equipment and property

Trends:

- There is an increased use of communication devices to increase productivity and improve safety.
- There is an increasing legislative requirement for documentation and participation in job site meetings.

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
2.01	Speaks and listens effectively	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• importance of effective communication</li> <li>• industry terms</li> <li>• roles of individuals on job site, such as supervisor, inspector, other tradespeople</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• listen carefully to what is said</li> <li>• confirm understanding, such as repeat or paraphrase instructions</li> <li>• communicate message clearly and accurately to others</li> <li>• exchange information with others, such as supervisor, signaller, general public, inspectors, other operators and tradespeople</li> </ul>	
2.02	Uses documentation	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• company policies and procedures</li> <li>• applicable legislation, such as Access to Information Act</li> <li>• own role and responsibilities</li> <li>• types of documentation required, such as log books, safety reports, maintenance reports, inspection reports, time cards</li> <li>• importance of complete, legible, and accurate documentation</li> <li>• where documentation is stored</li> <li>• industry terms</li> </ul>	

Ability to:

- access and store documents as required
- provide complete, legible, and accurate information in documents in timely manner
- read and interpret equipment inspection documentation from previous shifts before conducting pre-operational inspection

2.03 Communicates using signals

Knowledge of:

- company policies and procedures
- applicable legislation
- role and responsibilities of signallers
- signallers on job site
- audible and warning signals used on job site
- hand signals

Ability to:

- identify and work with signallers
- communicate using audible signals, such as back-up alarm, site emergency horn
- communicate using hand signals

2.04 Uses electronic communication equipment

Knowledge of:

- manufacturers' specifications and operating instructions
- company policies and procedures
- applicable legislation
- types of communication equipment used on job site

*Communication devices*

Ability to:

- check communication devices to verify operating condition, such as complete radio check
- deliver and receive messages using communication equipment
- follow communication protocol

**BLOCK B SAFETY**  
**Task 3 Interprets Applicable Legislation and Policies**

This task is important because it helps to:

- ensure health and safety of workers and public
- comply with applicable legislation
- prevent damage to property and environment
- decrease potential of litigation

Trends:

- There is an increasing amount of training and documentation required by amended and new legislation.
- There is an increasing demand for standardized national legislation to reduce confusion and duplication caused by differences between jurisdictions. Lack of standardized legislation may lead to fatalities and accidents, and to damage of equipment, property, and the environment.
- There is an increasing expectation that operators will be knowledgeable about relevant legislation.

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
3.01	Interprets federal, provincial/territorial, and municipal legislation	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• applicable federal, provincial/territorial, and municipal legislation, such as Highway Traffic Act, Occupational Health and Safety Act</li> <li>• where relevant legislation can be located</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• locate relevant sections in legislation</li> <li>• read legislation</li> <li>• seek clarification of legislation</li> </ul>	
3.02	Interprets permits, licences, and insurance requirements	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• applicable permits, licences, and insurance requirements</li> <li>• authorities having jurisdiction</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• locate permits, licences, and insurance documentation, such as over-dimensional permits, ground disturbance permits, air emissions permits, water use permits</li> <li>• read permits, licences, and insurance documentation</li> <li>• seek clarification on permits, licences, and insurance documentation</li> </ul>	<i>Permits, licences, insurance documentation</i>

3.03 Interprets environmental legislation

Knowledge of:

- relevant environmental legislation
- authorities having jurisdiction, such as department of fisheries, ministry of environment, municipality
- potential environmental damage caused by construction activities

Ability to:

- locate applicable permits on job site
- read environmental legislation
- seek clarification of environmental legislation

3.04 Interprets company policies and procedures

Knowledge of:

- where copies of company policies and procedures can be located

Ability to:

- read company policies and procedures
- stay current with company policies and procedures
- seek clarification on company policies and procedures

**BLOCK B SAFETY**  
**Task 4 Works Safely**

This task is important because it helps to:

- protect self and others from injury or death
- comply with applicable legislation
- prevent damage to equipment and environment
- reduce unscheduled downtime

Trends:

- Legislation relating to PPE and training is frequently being amended to protect employees, employers, the environment, and the general public.
- The industry is involved in improving safety on job sites to reduce accidents.

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
4.01	Uses personal protective equipment (PPE)	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• company policies and procedures</li> <li>• applicable legislation</li> <li>• PPE required/recommended by manufacturers' manuals</li> <li>• PPE required for construction sites, such as footwear, hard hats, safety vests, safety glasses</li> <li>• PPE required for specific conditions, such as breathing apparatus for hazardous breathing conditions, dielectric boots and gloves for protection from electrical shock</li> <li>• inspection, care, and use of PPE</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• identify PPE required for job site and situation</li> <li>• ensure PPE meets safety standard requirements, such as Canadian Standards Association (CSA)</li> <li>• inspect PPE for damage, and repair or replace as necessary</li> <li>• ensure PPE fits correctly</li> </ul>	<p><i>Steel-toed footwear, hard hat, safety gloves, appropriate safety glasses, high visibility vest, hearing protection, breathing apparatus, fall protection, and other applicable PPE</i></p>
4.02	Completes required health and safety training	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications, such as recommended operating procedures</li> <li>• company policies and procedures</li> <li>• applicable legislation</li> </ul>	



Ability to:

- take required health and safety training, such as confined space entry, Workplace Hazardous Materials Information System (WHMIS), first aid, cardiopulmonary resuscitation (CPR)

**BLOCK B SAFETY**  
**Task 5 Complies with Site Emergency Plan**

This task is important because it helps to:

- protect self
- prevent property damage
- ensure safety of public and job site personnel
- evacuate and secure area efficiently and effectively

Trends:

- Emergency exercises and preparedness activities are becoming more common.

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
5.01	Prepares for emergencies	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications, such as equipment emergency shut-down procedure</li> <li>• company policies and procedures</li> <li>• site emergency response plan, such as evacuation routes, procedures, contact protocol</li> <li>• types of fires, i.e., Class A, B, C, and D</li> <li>• types of extinguishers</li> <li>• potential and actual hazards on work site</li> <li>• location of fire extinguishers and first aid stations (on equipment and site) and how to use them</li> <li>• inspection requirements for safety equipment and supplies, such as fire extinguisher, first aid kit</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• take emergency response training, such as emergency response exercises, first aid, CPR</li> </ul>	<p><i>Site emergency response plan, fire extinguishers, fire blankets, respirators, masks, fire hoses, first aid kits, stretchers, WHMIS book, and other related tools and gear</i></p>
5.02	Responds to emergencies	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications, such as equipment emergency shut-down procedure</li> <li>• company policies and procedures</li> <li>• site emergency response plan, such as evacuation routes, procedures, contact protocol</li> <li>• types of fires, i.e., Class A, B, C, and D</li> <li>• types of extinguishers</li> <li>• potential and actual hazards on work site</li> <li>• location of fire extinguishers and first aid stations (on equipment and site) and how to use them</li> </ul>	<p><i>Fire extinguishers, fire blankets, respirators, masks, fire hoses, first aid kits, stretchers, and other related tools and gear</i></p>

- inspection requirements for safety equipment and supplies, such as fire extinguisher, first aid kit

Ability to:

- follow emergency plan
- communicate or follow instructions
- assess risks and determine course of action
- operate emergency equipment and supplies

**BLOCK C      EQUIPMENT**  
**Task 6        Describes Equipment**

This task is important because it helps to:

- use equipment properly and safely
- communicate about equipment accurately using proper terms

Trends:

N/A

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
6.01	Describes types and sizes of personnel and material hoists	Knowledge of: <ul style="list-style-type: none"> <li>• different types and sizes of personnel and material hoists, such as different power systems and heights</li> </ul>	<i>Manufacturers' manuals and literature</i>
6.02	Describes functions of major personnel and material hoist components	Knowledge of: <ul style="list-style-type: none"> <li>• major components of personnel and material hoists, such as mast, cage, counterweight and cables, power source, limit switches, landing gates, brakes</li> <li>• operating systems, such as hydraulic, electrical, lubrication</li> <li>• functions of major components, such as that mast and standoffs serve as supports, cage is for carrying personnel and material, limit switches are for setting safety parameters</li> </ul>	<i>Manufacturers' manuals and literature</i>
6.03	Describes capacities and capabilities of types and sizes of hoists	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications for capacities and capabilities of common types and sizes of personnel and material hoists</li> </ul>	<i>Manufacturers' manuals and literature</i>
6.04	Describes basic tools and supplies associated with personnel and material hoist	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications, such as operating safety manuals, load and capacity charts/plates</li> <li>• company policies and procedures</li> <li>• inspection and service documents (either with equipment or on site)</li> </ul>	<i>Manufacturers' manuals and literature for tools and supplies</i>

- basic tools required by personnel and material hoist operator, such as self-locking pliers, hammer, screwdrivers, wrenches (e.g., adjustable, Allen), grease gun, flashlight
- basic supplies required by personnel and material hoist operator, such as rags, grease

**BLOCK D MAINTENANCE**

**Task 7 Performs Pre-Operational Inspection and Daily Service with Power Off**

This task is important because it helps to:

- ensure continuous and safe operation of equipment
- meet manufacturers' specifications, owner's policies and procedures, and legislation
- prevent damage to equipment
- reduce unscheduled downtime

Trends:

- Use of new types of drive systems (such as linear induction) will require that operators have knowledge of different types of components and their impacts on pre-operational inspections.

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
7.01	Confirms rated load capacity of equipment	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• applicable legislation</li> <li>• engineering standards</li> <li>• authority having jurisdiction's capacity rating plate</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• interpret manufacturers' specifications, engineering standards, and capacity rating plate</li> </ul>	<i>Manufacturers' manuals and literature, PPE</i>
7.02	Inspects and services hydraulic system	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• applicable legislation</li> <li>• hydraulic system, components (such as hydraulic fluid, filters, lines, pumps, fittings), and functions, such as operating traction gear, brakes</li> <li>• normal operating conditions</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• locate components to be inspected</li> <li>• identify service needs, defects, and hazardous conditions through visual inspection</li> <li>• check sight glass or use dip stick to check hydraulic fluid levels</li> <li>• select and use appropriate tools and fluids</li> <li>• perform basic service, such as adding hydraulic fluid</li> <li>• arrange for repair or replacement of defective components</li> </ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, hydraulic fluid</i>

7.03	Inspects and services rack and pinion drive train system	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• drive train system, components (such as rack and pinion drive, gear box, power source), and functions</li><li>• normal operating conditions</li><li>• approved lock-out and tag procedures</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• locate components to be inspected</li><li>• identify service needs, defects, and hazardous conditions through visual inspection, such as inspect gear boxes for overheating, check oil levels</li><li>• perform basic service, such as add oil, grease rack and pinion</li><li>• arrange for repair or replacement of defective components</li><li>• follow lock-out and tag procedures as required</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, oil</i>
7.04	Inspects traction drive system	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• traction drive system, components (such as winches, lift cable, electric control cable, sheaves, counterweight, brakes), and functions</li><li>• normal operating conditions</li><li>• approved lock-out and tag procedures</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• locate components to be inspected</li><li>• identify service needs, defects, and hazardous conditions by performing visual inspection, such as check cables, sheaves, and guide rollers for wear</li><li>• arrange for repair or replacement of defective components, such as cables, limit switches</li><li>• follow lock-out and tag procedures as required</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE</i>

7.05 Inspects safety equipment

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- applicable legislation
- required safety equipment, such as reflectors, fire extinguisher, decals
- normal operating conditions

Ability to:

- locate components to be inspected
- identify missing safety equipment
- identify service needs, defects, and hazardous conditions through visual inspection
- arrange for repair or replacement of defective components, such as fire extinguisher, safety decals

*Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, safety equipment*



**BLOCK D MAINTENANCE**

**Task 8 Performs Pre-operational Inspection and Daily Service with Power On**

This task is important because it helps to:

- identify problems that are not evident when power is off
- ensure that equipment is ready to operate
- prolong equipment life
- prevent unscheduled downtime

Trends:

N/A

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
8.01	Energizes power supply	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• applicable legislation</li> <li>• power system, components (such as motors, power supply cables), and functions</li> <li>• start-up procedures</li> <li>• impact of weather on start-up procedures</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• energize system following start-up procedures</li> <li>• adjust start-up procedures according to weather conditions</li> </ul>	<i>Manufacturers' manuals and literature, PPE</i>
8.02	Performs inspection run	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• applicable legislation</li> <li>• operating controls</li> <li>• normal operating conditions of landing gates and operating controls</li> <li>• weather conditions that affect equipment functions, such as freezing rain, high wind</li> <li>• lock-out and tag procedures</li> <li>• intercom system</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• locate components to be inspected</li> <li>• identify service needs, defects, and hazardous conditions through visual inspection, such as inspect limit switches, interlock switches on each gate, and intercom system on every floor</li> <li>• use operating controls</li> </ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>

- assess weather conditions to determine if it is safe to operate equipment
- identify problems and determine possible solutions
- arrange for repair or replacement of defective components
- follow lock-out and tag procedures as required

**BLOCK E OPERATING PROCEDURES**  
**Task 9 Plans Work Procedures**

This task is important because it helps to:

- ensure smooth flow of personnel and materials to required job locations
- avoid overloading equipment
- prevent unscheduled downtime

Trends:  
 N/A

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
9.01	Assesses actual and potential site hazards	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• applicable legislation</li> <li>• authorities having jurisdiction</li> <li>• mast foundation requirements</li> <li>• site hazards, such as slippery wet plywood ramps and decks, missing hand rails, decks bumped out of line by trucks</li> <li>• danger posed by materials being handled, such as hazardous materials</li> <li>• other equipment operating on job site, such as tower crane, forklifts, cement trucks, delivery trucks</li> <li>• activities of other personnel, such as welders</li> </ul> Ability to: <ul style="list-style-type: none"> <li>• inspect site visually</li> <li>• communicate with site personnel</li> <li>• identify site hazards and deficiencies</li> <li>• inform site safety officer and/or supervisor of hazards</li> </ul>	<i>Manufacturers' manuals and literature, PPE</i>
9.02	Plans runs	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• job specifications</li> <li>• company policies and procedures, such as documentation requirements</li> <li>• site policies, such as transport of non-construction personnel</li> <li>• applicable legislation</li> <li>• construction stages</li> <li>• safe operating practices</li> </ul>	<i>Manufacturers' manuals and literature, PPE</i>

- site hazards, such as other construction equipment in close proximity to hoist, e.g., swing stages
- roles of personnel on site, such as supervisor, inspector, other tradespeople

Ability to:

- identify tasks required by site personnel, such as review delivery schedules, communicate with supervisor
- identify requirements of various tasks
- identify priorities
- determine most efficient schedule for different tasks
- communicate with site personnel to coordinate hoist runs

**BLOCK E OPERATING PROCEDURES**  
**Task 10 Operates Personnel and Material Hoist**

This task is important because it helps to:

- prevent damage to loads, property, and equipment
- prevent injury to personnel
- fulfill job specifications
- co-ordinate hoist operations with other construction activities on site

Trends:  
 N/A

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
10.01	Complies with equipment safety requirements	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures, such as need to complete orientation session</li> <li>• applicable legislation</li> <li>• safe operating practices</li> <li>• safety controls, decals, and safety equipment, such as fire extinguisher</li> </ul> Ability to: <ul style="list-style-type: none"> <li>• use safety controls (such as overspeed braking unit) and safety equipment (such as fire extinguisher)</li> <li>• interpret and comply with safety decals</li> <li>• use safe operating practices, such as keep materials and personnel inside cage</li> </ul>	Manufacturers' manuals and literature, PPE
10.02	Confirms capability to carry load	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• where to get information about load, such as weigh bills, suppliers, supervisors, manufacturers</li> <li>• reliability of different information sources, such as knowing that weight documented on weigh bills may not be accurate</li> </ul> Ability to: <ul style="list-style-type: none"> <li>• read information sources, such as load cells, weigh bills</li> <li>• judge accuracy of information</li> <li>• estimate, calculate, or verify load weight</li> </ul>	Manufacturers' manuals and literature, PPE

10.03	Receives materials and personnel	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications, such as load rating, carrying capacity</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• load characteristics, such as weight, dimensions, texture (e.g., flat versus sharp points), container type, state (i.e., gas, solid, liquid), chemical properties</li><li>• safe stack heights</li><li>• hazardous materials</li><li>• hazards posed to personnel, such as stacked paint pails that could fall, sharp edges of sheet metal, hazardous materials</li><li>• situations when personnel cannot be carried in hoist, such as emergencies, with certain hazardous materials</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• identify characteristics of load that affect use of space and safety</li><li>• configure load so that all items fit inside, load is balanced, and hoist capacity is maximized</li><li>• communicate with material deliverers and personnel to direct placement of loads</li><li>• ensure that operator's controls are accessible</li><li>• keep traffic way open for personnel to manoeuvre around materials in cage</li></ul>	Manufacturers' manuals and literature, equipment maintenance documentation, PPE
10.04	Optimizes equipment capabilities	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• job specifications</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• characteristics of load</li><li>• operating controls and functions</li><li>• capabilities and limitations of equipment</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• optimize equipment's capabilities</li><li>• use operating controls to start and stop at precise locations</li><li>• operate equipment smoothly, safely, and efficiently</li><li>• transport load in timely manner</li><li>• prioritize schedule changes</li><li>• communicate with on-site personnel</li></ul>	Manufacturers' manuals and literature, PPE

10.05	Operates equipment according to site conditions	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• construction activities taking place that may affect operator and hoist, such as excessive dust, noxious fumes</li><li>• how cage and load creates sail area</li><li>• how weather conditions can affect equipment, such as wind moving cage</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• adjust to site conditions, such as dressing appropriately</li><li>• determine when to proceed or not proceed with equipment operation</li></ul>	Manufacturers' manuals and literature, PPE, appropriate clothing
10.06	Monitors equipment performance	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• normal operating characteristics</li><li>• computer aid devices on equipment</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• read and interpret information from computer aid devices</li><li>• use own senses to monitor equipment performance</li></ul>	Manufacturers' manuals and literature, PPE
10.07	Troubleshoots problems	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• mechanical operation of equipment</li><li>• normal operating characteristics</li><li>• equipment systems</li><li>• lock-out and tag procedures</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• identify performance problems</li><li>• communicate problems accurately to others</li><li>• arrange for repair or replacement of defective components</li><li>• follow lock-out and tag procedures as required</li></ul>	Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, communication devices

10.08 Performs housekeeping tasks

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- applicable legislation
- housekeeping practices, such as pick up debris

Ability to:

- follow manufacturers' specifications
- follow policies and procedures
- follow housekeeping practices, such as sweep cage floor and deck area

Manufacturers' manuals and literature, PPE, broom



**BLOCK E      OPERATING PROCEDURES**  
**Task 11      Follows Shut-down Procedures**

This task is important because it helps to:

- ensure that equipment is ready for next shift
- prevent unscheduled downtime
- prevent vandalism and unauthorized use of equipment

Trends:

N/A

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
11.01	Shuts down equipment	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• applicable legislation</li> <li>• equipment components and functions</li> <li>• lock-out and tag procedures</li> <li>• housekeeping practices</li> <li>• short- and long-term shut-down procedures</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• position equipment appropriately</li> <li>• perform visual inspection</li> <li>• identify service and maintenance needs</li> <li>• secure hoist against movement, theft, and vandalism, such as follow lock-out and tag procedures</li> <li>• perform housekeeping tasks</li> <li>• follow short- and long-term shut-down procedures</li> </ul>	<i>Manufacturers' manuals and literature, PPE</i>



**Personnel and Material Hoist Operator DACUM Chart**

Block	Task	Subtask					
<b>A. PROFESSIONALISM</b>	<b>1. Acts Professionally</b>	1.01 Demonstrates work ethic	1.02 Is aware of factors affecting personal health	1.03 Resolves problems or disagreements with others	1.04 Participates in professional development	1.05 Works with others	1.06 Works independently
	<b>2. Uses Communication Skills</b>	2.01 Speaks and listens effectively	2.02 Uses documentation	2.03 Communicates using signals	2.04 Uses electronic communication equipment		
<b>B. SAFETY</b>	<b>3. Interprets Applicable Legislation and Policies</b>	3.01 Interprets federal, provincial/territorial, and municipal legislation	3.02 Interprets permits, licenses, and insurance requirements	3.03 Interprets environmental legislation	3.04 Interprets company policies and procedures		
	<b>4. Works Safely</b>	4.01 Uses personal protective equipment (PPE)	4.02 Completes required health and safety training				
	<b>5. Complies with Site Emergency Plan</b>	5.01 Prepares for emergencies	5.02 Responds to emergencies				

**Personnel and Material Hoist Operator DACUM Chart**

Block	Task	Subtask					
<b>C. EQUIPMENT</b>	<b>6. Describes Equipment</b>	6.01 Describes types and sizes of personnel and material hoists	6.02 Describes functions of major personnel and material hoist components	6.03 Describes capacities and capabilities of types and sizes of hoists	6.04 Describes basic tools and supplies associated with personnel and material hoist		
<b>D. MAINTENANCE</b>	<b>7. Performs Pre-operational Inspection and Daily Service with Power Off</b>	7.01 Confirms rated load capacity of equipment	7.02 Inspects and services hydraulic system	7.03 Inspects and services rack and pinion drive train system	7.04 Inspects traction drive system	7.05 Inspects safety equipment	
	<b>8. Performs Pre-operational Inspection and Daily Service with Power On</b>	8.01 Energizes power supply	8.02 Performs inspection run				
<b>E. OPERATING PROCEDURES</b>	<b>9. Plans Work Procedures</b>	9.01 Assesses actual and potential site hazards	9.02 Plans runs				
	<b>10. Operates Personnel and Material Hoist</b>	10.01 Complies with equipment safety requirements	10.02 Confirms capability to carry load	10.03 Receives materials and personnel	10.04 Optimizes equipment capabilities	10.05 Operates equipment according to site conditions	10.06 Monitors equipment performance
		10.07 Troubleshoots problems	10.08 Performs housekeeping tasks				

**Personnel and Material Hoist Operator DACUM Chart**

<b>Block</b>	<b>Task</b>	<b>Subtask</b>
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<b>E. OPERATING PROCEDURES, cont'd</b>
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<b>11. Follows Shut-down Procedures</b>
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11.01 Shuts down equipment
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