

# **National Occupational Standards For Operating Engineers**

Copyright © 2005 Construction Sector Council

All rights reserved. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without written permission.

Every effort has been made to make this manual complete and as accurate as possible. The authors shall have neither liability nor responsibility to any person or entity with respect to any loss or damages in connection with or arising from the information contained in this manual.

April 2005

## **VERTICAL MAST FORKLIFT OPERATOR**



## **Table of Contents**

<b>INTRODUCTION</b>	<b>2</b>
<b>FOREWORD</b>	<b>3</b>
<b>DEVELOPMENT OF THE OCCUPATIONAL ANALYSIS</b>	<b>4</b>
<b>SCOPE OF THE OCCUPATIONAL ANALYSIS</b>	<b>5</b>
<b>STRUCTURE OF THE OCCUPATIONAL ANALYSIS</b>	<b>6</b>
<b>A. PROFESSIONALISM</b>	
1. Acts Professionally	7
2. Uses Communication Skills	10
<b>B. SAFETY</b>	
3. Interprets Applicable Legislation and Policies	12
4. Works Safely	14
5. Complies with Site Emergency Plan	16
<b>C. EQUIPMENT</b>	
6. Describes Equipment and Attachments	18
<b>D. MAINTENANCE</b>	
7. Performs Pre-operational Inspection and Daily Service with Power Off	20
8. Performs Pre-operational Inspection and Daily Service with Power On	27
9. Complies with Scheduled Maintenance Requirements	29
<b>E. OPERATING PROCEDURES</b>	
10. Plans Work Procedures	30
11. Operates Vertical Mast Forklift	34
12. Follows Shut-down Procedures	39
<b>F. TRANSPORTATION</b>	
13. Transports Vertical Mast Forklift	41
14. Drives Vertical Mast Forklift on Public Roads	43
<b>DACUM CHART</b>	<b>45</b>
<b>ACKNOWLEDGEMENTS</b>	<b>49</b>

## **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.

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
1.01	Demonstrates work ethic  Knowledge of: <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> Ability to: <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  Knowledge of: <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  Knowledge of: <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	<p>Speaks and listens effectively</p> <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	<p>Uses documentation</p> <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

Ability to:

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

*Communication devices*

**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	Knowledge of: <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> Ability to: <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	Knowledge of: <ul style="list-style-type: none"> <li>• applicable permits, licences, and insurance requirements</li> <li>• authorities having jurisdiction</li> </ul> Ability to: <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 and Attachments**

This task is important because it helps to:

- use equipment properly and safely
- select equipment and attachments suited to materials being handling and working conditions

Trends:

- The variety of types and sizes of vertical mast forklifts and attachments has increased.
- There is an increasing amount of technology involved in the operation of equipment.

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
6.01      Describes types and sizes of vertical mast forklifts	<ul style="list-style-type: none"> <li>• Knowledge of:                             <ul style="list-style-type: none"> <li>• manufacturers' specifications for different systems (such as power, traction, steering, carriage) for types and sizes of vertical mast forklifts</li> <li>• manufacturers' specifications for capacities and/or capabilities of different types and sizes of vertical mast forklifts</li> <li>• most appropriate vertical mast forklift for particular job</li> </ul> </li> </ul>	<i>Manufacturers' manuals and literature</i>
6.02      Describes major components of vertical mast forklift	<ul style="list-style-type: none"> <li>• Knowledge of:                             <ul style="list-style-type: none"> <li>• major components such as mast, counterweights, hydraulic cylinders, power source, rollover and falling object protection</li> <li>• functions of major components</li> </ul> </li> </ul>	<i>Manufacturers' manuals and literature</i>
6.03      Describes attachments	<ul style="list-style-type: none"> <li>• Knowledge of:                             <ul style="list-style-type: none"> <li>• common attachments (such as drum handlers, forks and fork extensions, booms, barrel clamps, 3-position clamps, work platforms, side shifters, snow blades, carpet booms, shrew reaches, pallet pullers) and purposes</li> <li>• most appropriate attachment for particular job</li> <li>• where to find information about capacity of attachments, such as stamps, capacity plates</li> </ul> </li> </ul>	<i>Manufacturers' manuals and literature for equipment and attachments, load charts</i>
6.04      Describes basic tools and supplies associated with vertical mast forklift	<ul style="list-style-type: none"> <li>• Knowledge of:                             <ul style="list-style-type: none"> <li>• manufacturers' specifications for tools and supplies</li> </ul> </li> </ul>	<i>Manufacturers' manuals and literature for tools and supplies</i>

- basic tools, such as pliers (including self-locking and needle-nose), hammer, screwdrivers, wrenches (including adjustable and combination), utility knives, scraper, grease gun, flashlight, whisk broom
- basic supplies, such as rags, paper towels, window cleaner, grease, oils

**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, company policies and procedures, and legislation
- work safely and productively
- prevent damage to equipment
- reduce unscheduled downtime

Trends:

N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
7.01 Inspects and services engine lubrication system	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications, such as correct engine oil</li> <li>• company policies and procedures</li> <li>• applicable legislation</li> <li>• engine lubrication system, components, and functions</li> <li>• normal operating conditions</li> <li>• spill kit 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 dip stick</li> <li>• select and use appropriate tools</li> <li>• perform basic service, such as clean dirty filler caps, add oil</li> <li>• perform or arrange for repair or replacement of defective components, such as seals, gaskets, hoses</li> <li>• use spill kit</li> </ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, spill kit</i>
7.02 Inspects and services electrical 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>• electrical system, components (such as alternator belt, battery, battery connections), and functions</li> <li>• normal operating conditions</li> </ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>

Ability to:

- locate components to be inspected
- identify service needs, defects, and hazardous conditions by performing visual inspection
- select and use appropriate tools
- perform or arrange for service, repair, or replacement of defective components, such as alternator belts, batteries

7.03 Inspects and services hydraulic system

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- applicable legislation
- hydraulic system, components, and functions, such as steering, lifting
- normal operating conditions
- risk of injury due to high pressure and/or high temperature of hydraulic fluids
- spill kit procedures

*Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, spill kit, hoses*

Ability to:

- locate components to be inspected
- identify service needs, defects, and hazardous conditions by performing visual inspection
- select and use appropriate tools
- perform basic service, such as adjust hydraulic fluid level
- perform or arrange for repair or replacement of defective components, such as lines, cylinder seals
- use spill kit

7.04 Inspects and services cooling system

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- applicable legislation
- cooling system, components (such as belts, hoses, radiator, coolant), and functions
- normal operating conditions
- spill kit procedures

*Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, spill kit, coolant, hydrometer*

Ability to:

- locate components to be inspected
- identify service needs, defects, and hazardous conditions (such as restricted air flow, incorrect belt tension) by performing visual inspection
- select and use appropriate tools

- perform basic service, such as adjust belt tension, add coolant
- perform or arrange for repair or replacement of defective components, such as belts, hoses
- use spill kit

7.05 Inspects and services air intake system

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- applicable legislation
- air intake system, components (such as pre-cleaner, air intake hoses, air filter indicator), and functions
- normal operating conditions

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

Ability to:

- locate components to be inspected
- identify service needs, defects, and hazardous conditions by performing visual inspection
- select and use appropriate tools
- perform basic service, such as empty pre-cleaner
- perform or arrange for repair or replacement of defective components, such as air filters, pre-cleaner, intake hoses

7.06 Inspects and services power system

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- applicable legislation
- power system, components (such as battery, diesel, propane, gasoline, dual), and functions
- refuelling and recharging procedures
- risk of static build up during refuelling
- normal operating conditions
- spill kit procedures

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

Ability to:

- locate components to be inspected
- identify service needs, defects, and hazardous conditions by performing visual inspection
- select and use appropriate tools
- perform basic service, such as fuelling equipment, remove contamination from sediment bowls, change propane tank

		<ul style="list-style-type: none"><li>• perform or arrange for repair or replacement of defective components, such as hoses</li><li>• use spill kit</li></ul>	
7.07	Inspects and services suspension system	<ul style="list-style-type: none"><li>• Knowledge of:<ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• suspension system, components, and functions</li><li>• normal operating conditions</li></ul></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</li><li>• select and use appropriate tools</li><li>• perform basic service, such as grease fittings</li><li>• perform or arrange for repair or replacement of missing or defective components</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>
7.08	Inspects and services drive train	<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, components (such as engine, rear end, transmission, tires, rims, lugs, differential, steering functions), and functions</li><li>• different types of tires, such as pneumatic, solid, cushion</li><li>• normal operating conditions</li><li>• spill kit 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</li><li>• select and use appropriate tools</li><li>• perform basic service, such as adjust oil levels for transmission and differential, adjust tire pressure</li><li>• perform or arrange for repair or replacement of defective components, such as universal joint, O-rings, tires</li><li>• use spill kit</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, spill kit, tire gauge</i>

## **Vertical Mast Forklift Operator Occupational Analysis**

---

7.09	Inspects and services braking 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>• braking system types (such as mechanical, hydraulic, pneumatic), components (such as lines, reservoir, linkage, tanks), and functions</li><li>• normal operating conditions</li><li>• spill kit 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</li><li>• select and use appropriate tools</li><li>• perform basic service, such as adjust fluid levels, drain air tanks, adjust parking brake</li><li>• perform or arrange for repair or replacement of defective components, such as lines, belts, brake pads</li><li>• use spill kit</li></ul>	<p><i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, spill kit</i></p>
7.10	Inspects and services load-bearing structure	<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>• load-bearing components (such as mast, chains, rollers, guides, forks, backrest, pivot pins) and functions</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 by performing visual inspection</li><li>• select and use appropriate tools</li><li>• perform basic service, such as reposition backrest; grease mast, roller, and pivot pins</li><li>• perform or arrange for repair or replacement of defective components, such as forks, mast, backrest</li></ul>	<p><i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i></p>

7.11	Inspects and services operator station	<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>• cab, components (such as instrument panel, controls, communication devices, load charts, seat belt, operator protection structure, seat adjustment), and functions</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 (such as missing or defective controls) by performing visual inspection</li><li>• select and use appropriate tools</li><li>• perform basic service, such as clean windows and mirrors, adjust mirrors</li><li>• perform or arrange for repair or replacement of missing or defective components, such as mirrors, controls</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>
7.12	Inspects safety 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>• required safety equipment, such as reflectors, fire extinguisher, pylons, decals</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>• ensure safety equipment is present and securely mounted</li><li>• identify service needs, defects, and hazardous conditions through visual inspection</li><li>• arrange for repair or replacement of defective or missing components, such as fire extinguisher</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>
7.13	Inspects and services attachments	<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>• attachments, components, and functions</li><li>• normal operating conditions</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>

Ability to:

- locate components to be inspected
- identify service needs, defects, and hazardous conditions through visual inspection
- select and use appropriate tools
- perform basic service
- perform or arrange for repair or replacement of defective components

**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 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 Starts and warms up equipment	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• monitoring and warning systems (such as pressure gauges, indicator lights, back-up alarms, axle locks, load moment indicator), components, and functions</li> <li>• impact of weather and seasonal conditions on start-up procedures, equipment functions, and fluids</li> <li>• warm-up procedures</li> <li>• starting aids</li> <li>• normal operating conditions</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• adjust start-up procedures according to weather conditions, such as use block heater or other starting aid</li> <li>• engage ignition</li> <li>• interpret information from gauges, lights, and sensors</li> <li>• select and use appropriate tools</li> <li>• inspect, adjust, and set components, such as zero load moment indicator</li> </ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, starting aids</i>
8.02 Cycles equipment functions	<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 controls</li> <li>• normal operating characteristics</li> <li>• impact of weather and seasonal conditions on equipment functions and fluids</li> </ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, spill kit, engine oil</i>

Ability to:

- activate all functions (such as brakes, steering, lights, wipers, hydraulics) according to weather conditions and manufacturers' instructions
- identify problems with functions
- select and use appropriate tools
- arrange for or perform required maintenance

**BLOCK D      MAINTENANCE**

**Task 9          Complies with Scheduled Maintenance Requirements**

This task is important because it helps to:

- ensure continuous and safe operation of equipment
- validate manufacturers' equipment warranties
- work productively and safely
- prevent damage to equipment
- reduce unscheduled downtime

Trends:

N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
9.01      Arranges for or performs scheduled maintenance	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers specifications</li> <li>• factors that affect scheduled maintenance and service, such as site-specific working conditions</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• comply with safety requirements</li> <li>• read indicators that signal need for replacement of components, such as air filter, air cleaner</li> <li>• read equipment maintenance documentation</li> <li>• arrange for or perform manufacturers' scheduled maintenance and service, such as change air, oil, and fuel filters</li> </ul>	<p><i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, spill kit, fuel and air filters and fluids</i></p>

**BLOCK E      OPERATING PROCEDURES**  
**Task 10      Plans Work Procedures**

This task is important because it helps to:

- ensure proper pick up, transportation, and placement of load
- prevent damage to load and equipment
- work productively and safely
- prevent unscheduled downtime

Trends:  
N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
10.01    Assesses actual and potential site hazards	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• authorities having jurisdiction, such as Occupational Health and Safety</li> <li>• factors that affect stability of equipment, such as ground and supporting conditions</li> <li>• danger posed by utilities, such as overhead, underground, and guide wires</li> <li>• location of other equipment, personnel, and vehicular traffic</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• inspect site visually</li> <li>• communicate with site personnel and authorities having jurisdiction</li> </ul>	<i>PPE</i>
10.02    Discusses environmental concerns of site with site personnel	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• company policies and procedures</li> <li>• applicable legislation, such as transportation of dangerous goods, spill reporting</li> <li>• environmental concerns</li> <li>• site characteristics and boundaries</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• identify environmental concerns, such as proximity to water courses, allowable noise levels, fuel leaks, hazardous materials</li> <li>• communicate environmental concerns to employer or site personnel</li> </ul>	<i>PPE</i>

10.03	Reviews job specifications and safety considerations with site personnel	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• job specifications</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• industry terms</li><li>• actual and potential site hazards, such as overhead wires, ground conditions</li><li>• job- or site-specific PPE and training</li><li>• site requirements, such as type of tires</li><li>• site conditions, such as wind speed and direction</li><li>• other construction equipment on site</li><li>• roles of personnel on site, such as foreman, inspector, other tradespeople</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• communicate with site personnel to confirm job specifications and safety procedures</li><li>• sequence tasks to co-ordinate activities with other site personnel</li><li>• review hand signals with signaller</li></ul>	<i>PPE, utility locate document</i>
10.04	Plans or confirms travel route	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• job specifications</li><li>• productive work cycle</li><li>• traffic patterns</li><li>• terrain (such as railway tracks, ramps, inclines), hazards, and obstructions, including utilities</li><li>• space requirements to manoeuvre equipment and loads</li><li>• when signaller is required</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• follow manufacturers' specifications</li><li>• plan or confirm route with consideration of relevant factors, such as traffic patterns, hazards</li></ul>	<i>Manufacturers' manuals and literature, PPE site drawings, utility locate document</i>
10.05	Assesses load	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• load characteristics, such as weight, dimensions, configuration, container type, centre of gravity, texture, state (i.e., gas, liquid, solid), fragility</li></ul>	<i>Manufacturers' manuals and literature, PPE, bill of lading</i>

- integrity of container (such as concrete tray/bucket, pallet) that load is in or on
- hazardous materials

Ability to:

- assess load to determine if it is within lifting capacity of equipment
- determine how load should be secured on equipment
- identify loads that contain hazardous materials

10.06 Assesses load pick-up location

Knowledge of:

- company policies and procedures
- proper pick-up procedures for different locations, such as scaffolding, railway cars, trucks, docks, ground, floors, elevators, trailers
- limitations of pick-up locations, such as safe de-stack height, stability

*PPE*

Ability to:

- identify need for signaller and barricades
- plan pickup with consideration of proper procedures and limitations of pick-up location, such as use other equipment to overcome overhead obstacles

10.07 Assesses load placement location

Knowledge of:

- manufacturers' specifications, including load chart
- proper unloading procedures for different placement locations, such as scaffolding, railway cars, trucks, docks, ground, floors
- limitations of where load is placed, such as safe stacking/de-stacking height, stability

*Manufacturers' manuals and literature, PPE*

Ability to:

- identify need for signaller and barricades
- plan placement with consideration of characteristics of load placement location, such as height stability, load bearing capacity

10.08 Carries out dry run

Knowledge of:

- manufacturers' specifications
- company policies and procedures

*Manufacturers' manuals and literature, PPE*

- purposes of dry run, such as height clearance, equipment turning radius
- when dry run is required for safety and efficiency

Ability to:

- confirm safety and efficiency of lift

**BLOCK E      OPERATING PROCEDURES**  
**Task 11      Operates Vertical Mast Forklift**

This task is important because it helps to:

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

Trends:  
 N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
11.01    Complies with equipment safety requirements	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• applicable legislation</li> <li>• safety controls and functions</li> <li>• safety equipment, such as fire extinguisher</li> <li>• caution, warning, and hazard decals, lights, and symbols</li> <li>• load moment indicator</li> </ul> Ability to: <ul style="list-style-type: none"> <li>• use safety controls and equipment</li> <li>• respond to caution, warning, and hazard decals, lights, and symbols</li> <li>• respond to load moment indicator</li> </ul>	<i>Manufacturers' manuals and literature, PPE</i>
11.02    Installs attachments	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• job specifications</li> <li>• certification requirements for after-market attachments, such as professional engineering seal</li> <li>• installation procedures and quick-attachment mechanisms</li> <li>• risk of injury due to high pressure and/or high temperature of hydraulic fluids</li> <li>• hand signals</li> </ul> Ability to: <ul style="list-style-type: none"> <li>• follow manufacturers' specifications</li> <li>• select and use appropriate tools</li> <li>• position equipment and attachments for installation</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies</i>

		<ul style="list-style-type: none"><li>• use quick-attachment mechanisms</li><li>• follow installation procedures, such as depressurize hydraulic lines</li><li>• use and respond to hand signals</li></ul>	
11.03	Operates forklift with different attachments	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications, such as load capacity with attachment being used</li><li>• safe rigging and hoisting techniques for attachment</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• follow manufacturers' specifications</li><li>• interpret load charts and capacity plates for different types of attachments</li><li>• position attachments to handle different loads</li><li>• operate forklift efficiently and safely with different types of attachments</li></ul>	<i>Manufacturers' manuals and literature, PPE</i>
11.04	Uses operating controls	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• operating controls and functions</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• comply with manufacturers' specifications</li><li>• use operating controls to start, stop, turn, and lift load, considering type of attachment and load</li><li>• use operating controls in manner that is smooth and co-ordinated</li></ul>	<i>Manufacturers' manuals and literature, PPE</i>
11.05	Picks up load	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• planned work procedures</li><li>• techniques for securing load, such as shrink wrap, straps</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• secure work area with barricades as required</li><li>• position equipment</li><li>• position and secure load on attachment</li><li>• pick up load in safe and secure manner using different attachments</li></ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies</i>

		<ul style="list-style-type: none"><li>• position attachment with load in transport position</li><li>• use and respond to hand signals</li></ul>	
11.06	Transports load	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• planned work procedures</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• adjust operation of equipment to site conditions, such as uneven terrain, ice, changes in grade</li><li>• use and respond to hand signals</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE</i>
11.07	Places load	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• planned work procedures</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• secure work area with barricades as required</li><li>• position equipment</li><li>• place load accurately and safely</li><li>• use and respond to hand signals</li></ul>	<i>Manufacturers' manuals and literature, PPE</i>
11.08	Lifts, lowers, and supports personnel	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• attachment and PPE requirements for lifting, lowering, and supporting personnel according to authorities having jurisdiction</li><li>• safe operating practices</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• follow safe operating practices when lifting, lowering, and supporting personnel</li><li>• use and respond to hand signals</li></ul>	<i>Manufacturers' manuals and literature, PPE</i>

11.09	Monitors equipment performance	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• normal operating characteristics</li><li>• monitoring and warning systems</li><li>• operator aid devices, such as load moment indicator</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• read and interpret information from monitoring and warning system and operator aids</li><li>• use senses to monitor equipment performance</li><li>• troubleshoot equipment problems</li><li>• communicate equipment concerns with site personnel</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE</i>
11.10	Troubleshoots equipment problems	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• mechanical operation of equipment</li><li>• normal operating characteristics</li><li>• equipment systems</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• identify possible sources and solutions</li><li>• communicate problems accurately to others, such as mechanic, supervisor</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, communication devices</i>
11.11	Optimizes equipment capabilities	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• job specifications</li><li>• impact of attachment and load on rated load capacity</li><li>• factors affecting capacity, such as limitations of attachment, characteristics of load, site conditions, weather conditions</li><li>• factors affecting stability triangle and centre of gravity, such as height of forks, position of load on forks, turns (i.e., centrifugal force), momentum</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• follow planned work procedure and adjust as necessary</li><li>• adjust to factors, such as limitations of attachments, characteristics of load, site conditions</li><li>• keep centre of gravity within stability triangle</li><li>• use operating controls</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE</i>

11.12 Monitors activities of other personnel, equipment, and traffic	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• company policies and procedures</li><li>• applicable legislation</li><li>• site traffic patterns</li><li>• actual and potential site hazards, such as personnel, other equipment</li><li>• blind spots and when to use signaller</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• work with signaller</li><li>• communicate with other work crews</li><li>• observe and respond to movement of others around work area while performing tasks</li><li>• avoid collisions</li></ul>	<i>PPE</i>
11.13 Performs housekeeping	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• housekeeping practices, such as return items to proper storage place, pick up debris</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• follow housekeeping practices, such as ensure that hand controls are free of grease and oil, clean windows</li></ul>	<i>Manufacturers' manuals and literature, PPE</i>

**BLOCK E      OPERATING PROCEDURES**  
**Task 12      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 movement of equipment

Trends:  
 N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
12.01    Parks equipment in appropriate location	Knowledge of: <ul style="list-style-type: none"> <li>• company policies and procedures</li> <li>• suitable and safe parking area, such as out of traffic routes, level, not near emergency access routes, dry and clean surface, secure area, away from fuel storage</li> </ul> Ability to: <ul style="list-style-type: none"> <li>• identify appropriate location</li> <li>• position equipment</li> </ul>	<i>PPE</i>
12.02    Cleans equipment	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• importance of cleaning components</li> </ul> Ability to: <ul style="list-style-type: none"> <li>• clean components, such as wheels, rims, attachments, steps, handrails</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies</i>
12.03    Shuts down and secures equipment	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• applicable legislation</li> </ul> Ability to: <ul style="list-style-type: none"> <li>• shut down equipment according to manufacturers' specifications, such as lower forks to ground with tips down, idle before shutting off, follow procedures appropriate to power system (including electric, diesel, gas, propane)</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies</i>

- secure equipment against movement, theft, and vandalism, such as engage park brakes, place transmission in neutral, block wheels, remove keys

12.04 Performs post-operational inspection

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- applicable legislation
- normal operating conditions

Ability to:

- perform circle check to identify existing or potential problems
- communicate concerns to appropriate personnel, such as supervisor, mechanic

*Manufacturers' manuals and literature, basic tools and supplies, PPE*

**BLOCK F      TRANSPORTATION**  
**Task 13      Transports Vertical Mast Forklift**

This task is important because it helps to:

- comply with transportation legislation
- ensure safety of public and equipment

Trends:

N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
13.01    Prepares to load forklift and attachments	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications of forklift and attachments</li> <li>• company policies and procedures</li> <li>• applicable legislation</li> <li>• how to load forklift on to different types of transport vehicles, such as beavertail, folding or power gooseneck</li> <li>• impact of weather conditions</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• assess hazards in loading area, such as uneven ground, utility lines</li> <li>• clean equipment for transport, such as wheels, tires, attachments</li> <li>• position forklift components and attachments for transport</li> <li>• protect equipment, such as cover exhaust pipes and windows</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies, crow bar, sledge hammer</i>
13.02    Loads or assists with loading forklift and attachments	<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>• loading techniques, such as winch, hoist</li> <li>• transport vehicle characteristics, such as carrying capacity</li> <li>• how to position forklift on transport vehicle</li> <li>• hazards in area</li> <li>• weather conditions</li> <li>• deck conditions</li> <li>• blocking</li> <li>• hand signals</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies</i>

Ability to:

- load or assist with loading and placing of forklift and attachments
- use and respond to hand signals

13.03 Secures forklift and attachments for transport

Knowledge of:

- manufacturers' specifications
- tie-down points
- weather conditions

*Manufacturers' manuals and literature, PPE, basic tools and supplies*

Ability to:

- protect equipment, such as exhaust pipe, windows
- secure equipment against movement, such as lock wheels, apply brakes, put transmission in neutral
- assist with securing equipment to transport vehicle
- attach oversize signage, flags, and lights as required

13.04 Unloads or assists with unloading forklift and attachments

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- unloading techniques
- hazards in area
- weather, deck, and ground conditions
- blocking
- hand signals

*Manufacturers' manuals and literature, PPE, basic tools and supplies*

Ability to:

- assess and adjust to area hazards, such as overhead power lines, unstable ground, narrow landing areas, shallow underground facilities
- unload or assist with unloading of equipment and attachments
- remove protection from equipment, such as exhaust pipes, windows
- remove any oversize load signage, flags, and lights
- use and respond to hand signals

**BLOCK F      TRANSPORTATION**  
**Task 14      Drives Vertical Mast Forklift on Public Roads**

This task is important because it helps to:

- ensure that equipment arrives safely
- ensure public safety
- comply with transportation legislation

Trends:

N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
14.01    Prepares forklift for road travel	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• applicable legislation</li> <li>• proper positioning of attachments for transport</li> <li>• destination and route</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• secure attachments in proper position for road travel</li> <li>• complete inspection, including brakes, steering, lights, tires, back-up warning, flashers</li> <li>• clean equipment</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies</i>
14.02    Drives forklift on public roads	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• applicable legislation, such as traffic laws</li> <li>• road and weather conditions</li> <li>• limitations on public roads, such as speed, size of equipment</li> <li>• actual and potential hazards</li> <li>• blind spots</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• comply with legislation, such as possess appropriate and valid driver's licence, use warning flashers, display slow-moving vehicle sign</li> <li>• read maps</li> <li>• follow route to destination</li> <li>• adjust to road, weather, and traffic conditions</li> <li>• recognize hazards, such as bridge capacity, poor road conditions</li> </ul>	<i>Manufacturers' manuals and literature; PPE; basic tools and supplies; map, permits, and licences as required</i>



### Vertical Mast Forklift 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				

### Vertical Mast Forklift Operator DACUM Chart

Block	Task	Subtask						
<b>C. EQUIPMENT</b>	<b>6. Describes Equipment and Attachments</b>	6.01 Describes types and sizes of vertical mast forklifts	6.02 Describes major components of vertical mast forklift	6.03 Describes attachments	6.04 Describes basic tools and supplies associated with vertical mast forklift			
<b>D. MAINTENANCE</b>	<b>7. Performs Pre-operational Inspection and Daily Service with Power Off</b>	7.01 Inspects and services engine lubrication system	7.02 Inspects and services electrical system	7.03 Inspects and services hydraulic system	7.04 Inspects and services cooling system	7.05 Inspects and services air intake system	7.06 Inspects and services power system	
		7.07 Inspects and services suspension system	7.08 Inspects and services drive train	7.09 Inspects and services braking system	7.10 Inspects and services load-bearing structure	7.11 Inspects and services operator station	7.12 Inspects safety equipment	
		7.13 Inspects and services attachments						
		<b>8. Performs Pre-operational Inspection and Daily Service with Power On</b>		8.01 Starts and warms up equipment	8.02 Cycles equipment functions			
		<b>9. Complies with Scheduled Maintenance Requirements</b>		9.01 Arranges for or performs scheduled maintenance				

### Vertical Mast Forklift Operator DACUM Chart

Block	Task	Subtask					
<b>E. OPERATING PROCEDURES</b>	<b>10. Plans Work Procedures</b>	10.01 Assesses actual and potential site hazards	10.02 Discusses environmental concerns of site with site personnel	10.03 Reviews job specifications and safety considerations with site personnel	10.04 Plans or confirms travel route	10.05 Assesses load	10.06 Assesses load pick-up location
		10.07 Assesses load placement location	10.08 Carries out dry run				
	<b>11. Operates Vertical Mast Forklift</b>	11.01 Complies with equipment safety requirements	11.02 Installs attachments	11.03 Operates forklift with different attachments	11.04 Uses operating controls	11.05 Picks up load	11.06 Transports load
		11.07 Places load	11.08 Lifts, lowers, and supports personnel	11.09 Monitors equipment performance	11.10 Troubleshoots equipment problems	11.11 Optimizes equipment capabilities	11.12 Monitors activities of other personnel, equipment, and traffic
11.13 Performs housekeeping							
<b>12. Follows Shut-down Procedures</b>	12.01 Parks equipment in appropriate location	12.02 Cleans equipment	12.03 Shuts down and secures equipment	12.04 Performs post-operational inspection			

**Vertical Mast Forklift Operator DACUM Chart**

Block	Task	Subtask			
-------	------	---------	--	--	--

<b>F. TRANSPORTATION</b>
--------------------------

<b>13. Transports Vertical Mast Forklift</b>
--

13.01 Prepares to load forklift and attachments	13.02 Loads or assists with loading forklift and attachments	13.03 Secures forklift and attachments for transport	13.04 Unloads or assists with unloading forklift and attachments
--	---	---	---

<b>14. Drives Vertical Mast Forklift on Public Roads</b>
--

14.01 Prepares forklift for road travel	14.02 Drives forklift on public roads
--	--

## Acknowledgements

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 analyses. Without their combined contributions, the development of these OAs would not have been possible.

### **Utilities:**

Dave Jurasek, ON  
George Lawrence, ON  
Allan MacDonald, ON  
Shawn McAdam, NB  
Hilford Morrell, AB  
Rae Munroe, ON  
Dave "Chatter" Prosofsky, AB  
Paul Weaver, AB

### **Material Handling:**

Bernie Elliott, ON  
Alain Jacques, QC  
Frank Jones, BC  
Bruno Malbasa, MB  
Shawn McAdam, NB  
John McIsaac, BC  
Rae Munroe, ON  
Jim Oleksyn, SK  
Bob Raymack, MB  
Terry Robichaud, NB  
Bob Tytko, ON

### **Grading:**

Guenther Bott, ON  
Gerry Chouinard, QC  
Alain Jacques, QC  
Grant Labrash, BC  
Richard Lagace, NB  
Blair Lentz, ON  
Rae Munroe, ON  
Daryl Sweetland, MB  
Darrell Tremblay, BC  
Ron Ward, ON

### **Crane:**

Harry Boon, NB  
Kevin Caines, NL  
Steve Deady, ON  
John Doherty, MB  
Joe Dowdall, ON  
Charlie Eddy, NL  
Oneil Lapointe, ON  
Marty McDonnell, AB

Craig McIntosh, BC  
Rae Munroe, ON  
Len Phelan, BC  
Len Poitras, SK  
Gary Snow, NL

### **Plant Operations:**

Reynold Amey, BC  
Roger Beck, NS  
Mervyn Benson, NS  
Vito DeFrancesco, ON  
Barry Dupres, MB  
Jeff Emimo, NS  
Nelson Fowler, NB  
Rae Munroe, ON  
Peter Serrette, MB  
Kent Walker, ON

### **HAZMAT:**

Bernie Elliott, ON  
Frank Jones, BC  
Dan O'Keefe, BC  
Bruno Malbasa, MB  
John McIsaac, BC  
Tom Miller, ON  
Rae Munroe, ON  
Jim Oleksyn, SK  
Bob Raymack, MB  
Randy Stegner, ON  
Bob Tytko, ON

### **Concrete Pumping:**

Mike Bruce, ON  
Kevin Caines, NL  
Steve Deady, ON  
Joe Dowdall, ON  
Charlie Eddy, NL  
Stan Fortune, ON  
Nelson Fowler, NB  
Wayne Hannah, ON  
Marty McDonnell, AB  
Craig McIntosh, BC  
Rae Munroe, ON  
Len Phelan, BC

Gary Snow, NL

### **Excavating:**

Archie Fontaine, BC  
Dan Johnson, MB  
Merv Marcynuk, MB  
Harold McBride, ON  
Robert Middleton, MB  
Rae Munroe, ON  
Vance Simpson, MB  
Jack Walker, AB  
Pat Watson, BC  
Gary Snow, NL

### **Hauling:**

Alain Jacques, QC  
Archie Fontaine, BC  
Bruce Hecht, AB  
Dan Henry, MB  
Richard Lagace, NB  
Robert Middleton, MB  
Rae Munroe, ON  
Shawn Robertson, ON  
Larry Smith, NL  
Scott Smith, ON  
Ernest Wainio, ON

### **Paving:**

David Alves, ON  
Gordon Biegler, AB  
Orest Cesmistruk, NS  
Frank Cardile, AB  
Peter Gamble, ON  
Rae Munroe, ON  
Greg Paciorka, MB  
Brian Parisien, MB  
Robert Parisien, MB  
Todd Paterson, ON  
Rick Spaidal, BC