

CONSTRUCTION  
SECTOR COUNCIL



CONSEIL SECTORIEL  
DE LA CONSTRUCTION

# National Occupational Standards For Operating Engineers

## SIDEBOOM OPERATOR





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

The Construction Sector Council (CSC) gratefully acknowledges the support and involvement of the members and staff of the Canadian Operating Engineers Joint Apprenticeship and Training Council (COEJATC)



Funding for this project is provided by the Government of Canada's Sector Council Program.

Canada

## **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 Engine Off	20
8. Performs Pre-operational Inspection and Daily Service with Engine Running	27
9. Complies with Scheduled Maintenance Requirements	29
<b>E. OPERATING PROCEDURES</b>	
10. Plans Work Procedures	30
11. Operates Sideboom	33
12. Follows Shut-down Procedures	42
<b>F. TRANSPORTATION</b>	
13. Transports Sideboom	43
14. Drives Rubber-tired Sideboom	45
<b>DACUM CHART</b>	<b>47</b>
<b>ACKNOWLEDGEMENTS</b>	<b>51</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

*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	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 and supplies properly and safely
- select correct attachments and accessories for different working conditions, situations, and tasks

Trends:  
 N/A

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
6.01	Describes types and sizes of sidebooms	Knowledge of: <ul style="list-style-type: none"> <li>• difference between types and sizes, such as rubber tire versus track, live versus hydraulic draw works</li> </ul>	<i>Manufacturers' manuals and literature</i>
6.02	Describes components and functions	Knowledge of: <ul style="list-style-type: none"> <li>• major components, such as tractor, draw works, boom, counterweight</li> <li>• operating systems, such as hydraulic, electrical, lubrication</li> <li>• functions of major components, such as that draw works is used for hoisting loads</li> </ul>	<i>Manufacturers' manuals and literature</i>
6.03	Describes capacities/capabilities of sidebooms	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications for capacities and capabilities</li> <li>• appropriate sideboom for job, such as rubber tire sideboom is used to install distribution/gathering pipe</li> </ul>	<i>Manufacturers' manuals and literature</i>
6.04	Describes attachments and functions	Knowledge of: <ul style="list-style-type: none"> <li>• common types of attachments, such as jibs, tail winches, stringing boom</li> <li>• manufacturers' specifications for applications of attachments, such as that jib is used as extension on boom to lift welding shacks (i.e., enclosures)</li> </ul>	<i>Manufacturers' manuals and literature for equipment and attachments</i>
6.05	Describes rigging equipment	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• applicable legislation</li> <li>• types of rigging hardware, such as spreader bars, lifting and equalizing beams, chain spreaders, shackles</li> </ul>	<i>Manufacturers' manuals and literature for rigging equipment</i>

## Sideboom Operator Occupational Analysis

---

		<ul style="list-style-type: none"><li>• types of slings, such as synthetics, wire rope, chain</li><li>• configuration of rigging, such as basket, multi-legged bridle, choking</li><li>• capacity and appropriate use of rigging hardware</li></ul>	
6.06	Describes accessories associated with sidebooms	Knowledge of: <ul style="list-style-type: none"><li>• types of accessories, such as extra wide pads, fenders, mirrors, umbrella</li><li>• manufacturers' specifications for functions of accessories</li></ul>	<i>Manufacturers' manuals and literature</i>
6.07	Describes basic tools and supplies associated with sidebooms	Knowledge of: <ul style="list-style-type: none"><li>• manufacturers' specifications for tools</li><li>• basic tools required by sideboom operators, such as ball peen hammer, adjustable wrenches, utility knives, pry bar, oil squirt can, various types and sizes of screwdrivers, pliers, flashlight, grease gun</li><li>• basic supplies required by sideboom operators, such as rags, grease, oil, tie-down gear, rope, rigging and rigging hardware, spill kit</li></ul>	<i>Manufacturers' manuals and literature for tools and supplies</i>

**BLOCK D MAINTENANCE**

**Task 7 Performs Pre-operational Inspection and Daily Service with Engine Off**

This task is important because it helps to:

- ensure continuous and safe operation of equipment
- meet applicable legislation
- prevent damage to equipment
- reduce downtime

Trends:

N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
7.01 Inspects 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 (such as oil, filters), 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 through visual inspection</li> <li>• select and use appropriate tools</li> <li>• arrange for repair or replacement of defective components, such as oil, filters</li> <li>• use spill kit</li> </ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</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, starters, regulators, wiring, fuses), 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 through visual inspection</li> <li>• select and use appropriate tools</li> <li>• perform or arrange for repair or replacement of defective components, such as alternator belt</li> </ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>

7.03	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</li><li>• normal operating conditions</li><li>• spill kit procedures</li><li>• safety precautions when working with pressurized fluids</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>• select and use appropriate tools</li><li>• read sight gauges, such as hydraulic fluid levels</li><li>• perform basic service, such as adjust hydraulic fluid levels</li><li>• perform or arrange for repair or replacement of defective components, such as filters, cartridges, hydraulic fluid lines</li><li>• use spill kit</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>
7.04	Inspects and services cooling system	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications, such as correct belt tension, lubrication points</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• cooling system, components (such as belts, hoses, radiator, coolant), 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 through visual inspection</li><li>• select and use appropriate tools</li><li>• perform basic service, such as adjust belt tension, apply grease to lubrication points, adjust coolant levels</li><li>• perform or arrange for repair or replacement of defective components, such as hoses, belts</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>

7.05	Inspects and services air intake 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>• air intake system, components (such as pre-cleaner, air intake hoses, air filter indicator), 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 through visual inspection</li><li>• select and use appropriate tools</li><li>• perform basic service, such as empty pre-cleaner, change air filters</li><li>• perform or arrange for repair or replacement of defective components, such as pre-cleaner, intake hoses</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>
7.06	Inspects and services fuel 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>• fuel types, such as gas, diesel</li><li>• fuel systems, components (such as fuel pump, injector lines, fuel filters, water separator), and functions</li><li>• re-priming fuel procedures (for diesel only)</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 through visual inspection</li><li>• read fuel gauge (on smaller equipment) or use dip stick (on larger equipment)</li><li>• select and use appropriate tools</li><li>• refuel smaller equipment</li><li>• perform or arrange for repair or replacement of defective components, such as fuel hose, pump</li><li>• use spill kit</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>

7.07	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 idlers, engine, transmission, differential, track, tires), 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 through visual inspection</li><li>• read gauges, such as engine oil pressure gauge</li><li>• select and use appropriate tools</li><li>• perform basic service, such as tighten slack tracks</li><li>• perform or arrange for repair or replacement of defective components, such as tracks, pads</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>
7.08	Inspects and services braking system (for rubber-tired equipment only)	<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 air brake endorsement, adjustment certification</li><li>• braking system, components (such as brake chambers, air hoses, slack adjusters, air dryers, air tank), 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 through tests and visual inspection</li><li>• select and use appropriate tools</li><li>• perform basic service, such as adjust brakes</li><li>• perform or arrange for repair or replacement of defective components, such as fuel line, fitting</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>
7.09	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 structure, components (such as boom pins, undercarriage), 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, such as tighten loose bolts
- perform or arrange for repair or replacement of defective components, such as bolts, cracked welds

7.10 Inspects and services operator station

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- applicable legislation
- components, such as seat, controls, seat belt
- normal operating conditions
- importance of housekeeping

Ability to:

- identify service needs, defects, and hazardous conditions through visual inspection
- select and use appropriate tools
- adjust controls for ease of operation
- adjust seat properly
- perform or arrange for repair or replacement of defective components, such as lights, controls

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

7.11 Inspects safety equipment

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- applicable legislation
- required safety equipment, such as reflectors, fire extinguisher, pylons, 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*

## Sideboom Operator Occupational Analysis

---

7.12	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> <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>• select and use appropriate tools</li><li>• perform basic maintenance, such as grease bushings, bearings, and pins</li><li>• perform or arrange for repair or replacement of defective components</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>
7.13	Inspects and services boom components	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications, such as lubrication points</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• boom components (such as boom sections, connecting bolts, pins) and functions</li><li>• safety devices, such as boom lock</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>• select and use appropriate tools</li><li>• perform basic service, such as apply grease to lubrication points</li><li>• perform or arrange for repair or replacement of defective components, such as hoses, cylinders, booms, retainers, heel and boom pins</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>
7.14	Inspects and services hoisting system (live draw works only)	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications, such as lubrication points, correct amount of grease and oil to use</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• hoisting systems, components (such as wire rope, fittings, drums, hook, sheaves, winch mount), and functions</li></ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies, punch, cable cutter</i>

- draw works braking components (such as bushings, linkages, latch springs, brake bands) and functions
- draw works clutch adjustments and lubrication requirements
- proper spooling of wire rope on drum
- normal operating conditions

Ability to:

- locate components to be inspected
- identify service needs, defects, and hazardous conditions through visual inspection
- ensure brake shields are in place
- select and use appropriate tools
- perform basic service, such as adjust brake band; lubricate draw works chain; make clutch adjustments; change grease fittings, blocks, and shackles
- perform or arrange for repair or replacement of defective components, such as sheaves, bushings, wire rope

7.15 Inspects and services counterweight system

Knowledge of:

- manufacturers' specifications, such as lubrication points
- company policies and procedures
- applicable legislation
- safe inspection and servicing procedures, such as positioning on level surface
- counterweight system, components (such as counterweight lever, return system, weights), and functions
- normal operating conditions

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

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, such as apply grease to lubrication points, tighten counterweight plates
- perform or arrange for repair or replacement of defective components, such as counterweight plates

**BLOCK D MAINTENANCE**

**Task 8 Performs Pre-operational Inspection and Daily Service with Engine Running**

This task is important because it helps to:

- identify problems not evident when engine is off
- get fluids to operating temperature
- prolong equipment life
- ensure that equipment is ready to operate

Trends:

N/A

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
8.01	Starts engine and checks monitoring and warning systems	<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>• monitoring and warning systems, components (such as low air pressure auditory signal), and functions</li> <li>• battery-boosting procedures</li> <li>• impact of weather and seasonal conditions on start-up procedures</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• adjust start-up procedures to accommodate weather conditions</li> <li>• engage ignition</li> <li>• assist with boosting batteries or starting aids, such as block heater, fuel heater</li> <li>• interpret information from gauges, lights, and sensors</li> <li>• select and use appropriate tools</li> <li>• perform or arrange for repair or replacement of defective components, such as lights, fuses</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies, starting aids</i>
8.02	Warms up engine	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• impact of weather and seasonal conditions on equipment functions and fluids</li> <li>• warm-up procedures</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• read gauges</li> <li>• adjust warm-up procedures to weather conditions</li> </ul>	<i>Manufacturers' manuals and literature, PPE</i>

8.03 Cycles equipment functions

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- equipment controls
- normal operating characteristics

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

Ability to:

- activate all functions to ensure that components are operational, such as counterweight lever, return system
- dry off boom brake linings and load line brake by constantly raising and lowering boom or load line
- identify problems with functions, such as leaks, unusual sounds
- perform or arrange for repair or replacement of defective components

**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
- 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>• company policies and procedures</li> <li>• applicable legislation</li> <li>• factors (such as severe working conditions) affecting need to alter maintenance schedule</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• comply with safety requirements</li> <li>• perform periodic maintenance, such as apply grease to lubrication points</li> <li>• read and complete maintenance records and documentation relating to service on equipment, such as log books</li> <li>• select and use appropriate tools</li> <li>• arrange for or perform scheduled maintenance and service</li> </ul>	<i>Manufacturers' manuals and literature, equipment maintenance documentation, PPE, basic tools and supplies</i>

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

This task is important because it helps to:

- ensure proper installation of product
- prevent downtime

Trends:  
 N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
10.01    Assesses actual and potential site hazards	Knowledge of: <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• job specifications</li> <li>• company policies and procedures</li> <li>• applicable legislation, such as Occupational Health and Safety</li> <li>• authorities having jurisdiction</li> <li>• impact of terrain on operations</li> <li>• hazards posed by utilities (such as buried tanks); other equipment; personnel; vehicular traffic; and overhead, underground, and guide wires</li> <li>• hot-line locations</li> </ul> Ability to: <ul style="list-style-type: none"> <li>• inspect site visually</li> <li>• communicate with site personnel and authorities having jurisdiction</li> </ul>	<i>Manufacturers' manuals and literature, PPE</i>
10.02    Discusses environmental concerns of site with site personnel	Knowledge of: <ul style="list-style-type: none"> <li>• company policies and procedures</li> <li>• applicable legislation</li> <li>• environmental concerns</li> <li>• site characteristics and boundaries</li> </ul> Ability to: <ul style="list-style-type: none"> <li>• identify potential environmental concerns, such as noise levels, fuel leaks, hazardous materials, proximity to water courses</li> <li>• communicate questions and concerns to employer, site personnel, or authorities having jurisdiction</li> </ul>	<i>PPE</i>

## Sideboom Operator Occupational Analysis

---

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>• actual and potential site hazards</li><li>• traffic patterns and procedures</li><li>• other construction equipment on site</li><li>• roles of personnel on site, such as foreman, inspector, other tradespeople</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• communicate with site personnel to confirm job specifications and to determine traffic patterns and procedures</li><li>• follow directions of traffic control person</li></ul>	<i>Job- or site-specific PPE and training, utility locate document</i>
10.04	Describes impact of terrain on operations	<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>• affect of ground conditions on stability, traction, and mobility</li><li>• impact of slope on lifting and carrying loads</li><li>• steering techniques</li></ul>	<i>Manufacturers' manuals and literature</i>
10.05	Plans lifts	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications, such as capacity and capability of equipment</li><li>• job specifications, such as loading and unloading locations</li><li>• company policies and procedures</li><li>• applicable legislation</li><li>• load characteristics, such as weight, dimensions, centre of gravity</li><li>• factors that impact lift, such as load weight, wind</li><li>• rigging and hardware components and functions</li><li>• blind spots and hazards</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• determine load weight</li><li>• identify radius requirements</li><li>• identify rigging requirements</li><li>• read and interpret capacity charts</li><li>• determine most efficient way to lift load</li></ul>	<i>Manufacturers' manuals and literature, PPE</i>

- determine when signaller is required
- confirm lift procedures with site personnel

10.06 Determines best production work cycle

Knowledge of:

- manufacturers' specifications
- job specifications
- company policies and procedures
- actual and potential site hazards
- scheduling requirements for materials to co-ordinate with personnel

*Manufacturers' manuals and literature, PPE*

Ability to:

- determine extent of work area or scope of work
- identify optimal position or starting point of equipment in order to complete tasks with least number of moves
- sequence job tasks to co-ordinate activities with other site personnel

**BLOCK E OPERATING PROCEDURES**  
**Task 11 Operates Sideboom**

This task is important because it helps to:

- prevent damage to products, property, and equipment
- prevent injury to personnel

Trends:

N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
11.01 Complies with equipment safety requirements	<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>• safety controls and equipment, such as boom kick-out pin, fire extinguishers</li> <li>• caution, warning, and hazard decals, lights, and symbols</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• use safety controls and equipment</li> <li>• activate emergency shut off</li> <li>• respond to caution, warning, and hazard decals, lights, and symbols</li> </ul>	<i>Manufacturers' manuals and literature, PPE, fire extinguisher</i>
11.02 Monitors work area	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• company policies and procedures</li> <li>• ground conditions</li> <li>• hazards</li> <li>• locations of co-workers, other equipment, and vehicles in proximity of equipment</li> <li>• locations of traffic and pedestrian routes</li> <li>• blind spots</li> <li>• when to use signaller</li> <li>• hand signals</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• observe activities while carrying out tasks</li> <li>• avoid collisions</li> <li>• communicate with signaller</li> </ul>	<i>PPE, basic tools and supplies</i>
11.03 Assists with installation of attachments	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications for equipment and attachments</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies</i>

- job specifications
- installation procedures, such as jib or stringing boom installation procedures
- hand signals

Ability to:

- select and use appropriate tools
- position equipment and attachments for installation
- follow installation procedures
- use and respond to hand signals

11.04 Uses safe rigging techniques

Knowledge of:

- manufacturers' specifications of rigging hardware and slings
- load assessment
- appropriate rigging hardware and slings for load
- rigging configurations
- load hook-up points
- hand signals

*Manufacturers' literature for rigging hardware and slings, PPE, basic tools and supplies*

Ability to:

- select appropriate rigging and slings for load
- inspect rigging components for wear and defects
- identify best rigging configuration
- inspect hook-up points before lifting
- use and respond to hand signals

11.05 Picks and carries loads

Knowledge of:

- manufacturers' specifications
- job specifications
- applicable legislation
- operating controls and functions
- lift plan
- rigging techniques
- multiple-lift procedures
- characteristics of terrain
- hand signals

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

Ability to:

- ensure that load is properly rigged
- position equipment at appropriate distance from load

## Sideboom Operator Occupational Analysis

---

		<ul style="list-style-type: none"><li>• carry load to destination</li><li>• minimize load drift</li><li>• participate in multiple lifts</li><li>• use and respond to hand signals</li></ul>	
11.06	Sets loads down	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• lift plan</li><li>• load characteristics</li><li>• specifications to secure load at destination, such as blocking</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• set load down on appropriate surface</li><li>• use and respond to hand signals</li></ul>	<i>Manufacturers' manuals and literature, PPE, blocking</i>
11.07	Monitors equipment performance	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• normal operating characteristics</li><li>• gauges, sensors, and warning lights on equipment</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• read and interpret information from gauges, sensors, and warning lights</li><li>• use senses to monitor equipment performance, such as visually check keeper and boom pins, check cable spooling on drum</li><li>• identify performance problems</li></ul>	<i>Manufacturers' manuals and literature, PPE</i>
11.08	Troubleshoots problems	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• mechanical operation of equipment</li><li>• normal operating characteristics</li><li>• previous problems and solutions</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• identify possible sources of problems and solutions</li><li>• implement solutions, such as adjust draw works for load</li><li>• communicate problems accurately to others, such as mechanic, foreman</li><li>• record equipment problems in equipment maintenance documentation</li></ul>	<i>Manufacturers' manuals and literature, PPE</i>

## Sideboom Operator Occupational Analysis

---

11.09	Optimizes equipment capabilities	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• job specifications</li><li>• operating controls and functions</li><li>• principles of motion, balance, and stability, such as fulcrum points, leverage, centre of gravity, horizontal and vertical stability, effects of speed, centrifugal force, acceleration, dynamic loading</li><li>• safe rigging and hoisting techniques</li><li>• impact of weather conditions on capabilities of equipment</li><li>• impact of ground conditions on stability of equipment</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• use operating controls to synchronize operational components and carry out tasks smoothly and simultaneously</li><li>• minimize swing</li><li>• co-ordinate equipment operation to work with other equipment, such as feed pipe into bending machine</li></ul>	<i>Manufacturers' manuals and literature, PPE</i>
11.10	Stockpiles products	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• job specifications</li><li>• company policies and procedures</li><li>• rigging and handling requirements</li><li>• stacking techniques</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• position equipment and vehicle with product for maximum efficiency</li><li>• off-load product and place in stockpile using proper blocking and stacking techniques</li><li>• use and respond to hand signals</li></ul>	<i>PPE, basic tools and supplies, rigging hardware, blocking</i>
11.11	Strings pipe	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• skid pile building and blocking techniques</li><li>• equipment capabilities and limitations with stringing boom</li><li>• hand signals</li></ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies</i>

Ability to:

- identify when blocking has been done properly
- manoeuvre with stringing boom attachment
- use and respond to hand signals

11.12 Bends pipe

Knowledge of:

- company policies and procedures
- how bending equipment works
- rigging techniques
- hand signals

*PPE, basic tools and supplies, slings*

Ability to:

- roll pipe to set seams for appropriate bend
- feed bending equipment, allowing for mandrel entry
- maintain pipe's radial axis while feeding bending equipment
- retrieve pipe from bending equipment, allowing for mandrel exit
- pick up pipe, allowing for change in configuration
- co-ordinate work with bending equipment operator and others
- return pipe to original position in string line
- use and respond to hand signals

11.13 Sets up pipe

Knowledge of:

- company policies and procedures
- skid pile building techniques
- rigging techniques, such as choking left or right to orient seams
- hand signals

*PPE, basic tools and supplies, slings*

Ability to:

- set pipe in correct orientation for in-line welding
- chain pipe in, such as position joint in correct location
- carry bent pieces of pipe
- set up sections and start joints, such as river or road crossings
- use and respond to hand signals

11.14 Performs pipe gang operations

For carrying end-prep equipment:

*PPE, basic tools and supplies*

Knowledge of:

- company policies and procedures
- end-prep equipment
- hand signals

Ability to:

- operate equipment with jib extension
- co-ordinate work with prep equipment operator
- feed prep equipment into end of pipe with tight tolerances
- feather controls for increment adjustments
- retrieve prep equipment from completed pipe end
- traverse prep equipment to next pipe end
- use and respond to hand signals

For pipe set-in:

Knowledge of:

- company policies and procedures
- internal welding equipment
- hand signals

Ability to:

- co-ordinate work with pipefitters
- feed internal welding equipment into pipe at start of section
- feather controls for increment adjustments for pipe spacing
- carry and stow internal welding equipment
- use and respond to hand signals

- For carrying welding enclosures (also known as shack packing):

Knowledge of:

- company policies and procedures
- welding sequence
- hand signals

Ability to:

- run equipment with jib extension
- co-ordinate work with welding crew and designated signaller
- work with loads around sidebooms with electrical umbilical lines

		<ul style="list-style-type: none"><li>• work with two-part hoist line</li><li>• position welding enclosures over weld</li><li>• use and respond to hand signals</li></ul>	
11.15	Performs lower-in operations	<p>For ditch pump operations:</p> <p>Knowledge of:</p> <ul style="list-style-type: none"><li>• company policies and procedures</li><li>• ditch pump</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• position pump into ditch</li><li>• use and respond to hand signals</li></ul> <p>Lower-in crew:</p> <p>Knowledge of:</p> <ul style="list-style-type: none"><li>• company policies and procedures</li><li>• behaviour of welded pipeline, such as ability of pipe to flex and allow positioning</li><li>• lower-in procedures</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• co-ordinate work with skid pick-up crew</li><li>• work with roller cradles</li><li>• tow and manoeuvre skid sloop and equipment sleigh</li><li>• get on and off section</li><li>• work with other sidebooms to perform lowering-in procedures</li><li>• use and respond to hand signals</li></ul>	<p><i>PPE, basic tools and supplies, rigging hardware</i></p>
11.16	Places swamp weights	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• job specifications</li><li>• company policies and procedures</li><li>• purpose of swamp weights</li><li>• types of swamp weights</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• co-ordinate work with at least three co-workers</li><li>• work off swamp mats or unstable ground</li><li>• off-load swamp weights</li></ul>	<p><i>PPE, basic tools and supplies, weight hooks</i></p>

## Sideboom Operator Occupational Analysis

---

		<ul style="list-style-type: none"><li>• place weights onto pipe smoothly and gently</li><li>• use and respond to hand signals</li></ul>	
11.17	Ties in pipe	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• company policies and procedures</li><li>• welding process</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• compensate for load weight fluctuations</li><li>• perform multi-sideboom lifts</li><li>• disconnect slings without help of personnel</li><li>• maintain pipe in level position</li><li>• position line-up welding clamps</li><li>• retrieve and move welding line-up clamps to next welding site</li><li>• use and respond to hand signals</li></ul>	<i>PPE, basic tools and supplies, rigging hardware</i>
11.18	Carries boring equipment	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• company policies and procedures</li><li>• boring process</li><li>• potential risk to personnel on bore equipment</li><li>• hand signals</li></ul> <p>Ability to:</p> <ul style="list-style-type: none"><li>• co-ordinate work with bore equipment operator</li><li>• compensate for changing load factors</li><li>• maintain straight and level approach to bore pit</li><li>• work with multiple sidebooms</li><li>• feed augers into bore casing</li><li>• load bore equipment for next bore</li><li>• use and respond to hand signals</li></ul>	<i>PPE, basic tools and supplies, rigging hardware</i>
11.19	Performs fabrication operations	<p>Knowledge of:</p> <ul style="list-style-type: none"><li>• manufacturers' specifications</li><li>• company policies and procedures</li><li>• fabrication operations, such as placing valves and regulator runs</li><li>• hand signals</li></ul>	<i>PPE, basic tools and supplies, rigging hardware</i>

Ability to:

- co-ordinate work with pipefitters
- place large valves on concrete pads
- position pipe for welding
- use and respond to hand signals

11.20 Installs testing equipment

Knowledge of:

- company policies and procedures
- testing process
- safety procedures when working with highly pressurized lines
- hand signals

*PPE, basic tools and supplies, rigging hardware*

Ability to:

- co-ordinate work with fitters
- install test equipment
- install dewatering and diffusing systems
- install water supply lines
- use and respond to hand signals

**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 downtime
- prevent vandalism and unauthorized movement of equipment

Trends:

N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
12.01    Cleans wheels/tracks and attachments before parking	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• company policies and procedures</li> <li>• idlers and rollers on track equipment</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• clean wheels or tracks and attachments</li> </ul>	<i>PPE, basic tools and supplies, track shovel</i>
12.02    Parks and secures equipment	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• characteristics of appropriate parking location</li> <li>• shut-down procedures</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• select appropriate location</li> <li>• lower attachments</li> <li>• secure equipment against movement, damage, theft, and vandalism</li> <li>• follow shut-down procedures</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies, wheel chocks</i>
12.03    Performs housekeeping tasks	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• remove garbage from operator station</li> <li>• clean hand controls to ensure that controls are free of grease and oil</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies, whisk broom, small garbage bag</i>

**BLOCK F      TRANSPORTATION**  
**Task 13      Transports Sideboom**

This task is important because it helps to:

- ensure that equipment arrives safely
- ensure public safety

Trends:

N/A

Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
13.01    Prepares to load equipment and attachments	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• transport vehicles, such as beavertail, folding or power gooseneck</li> <li>• weather conditions</li> <li>• hand signals</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• clean equipment for transport, such as remove mud and debris from undercarriage</li> <li>• use and respond to hand signals</li> </ul>	<p><i>Manufacturers' manuals and literature, PPE, basic tools and supplies, sledge hammer, pry bars, chains, binders, slings</i></p>
13.02    Loads or assists with loading equipment and attachments	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• company policies and procedures</li> <li>• loading techniques</li> <li>• transport vehicles, such as carrying capacities</li> <li>• deck conditions</li> <li>• blocking</li> <li>• hand signals</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• assist in disassembly for transport, such as remove boom and counterweights, spool boom and load lines, stow boom and load line blocks properly, replace heel pins and boom pins in designated place to prevent loss</li> <li>• secure equipment against movement</li> <li>• protect equipment, such as cover exhaust pipe</li> <li>• assist with attaching warning flags, reflectors, and beacon/clearance lights</li> <li>• use and respond to hand signals</li> </ul>	<p><i>Manufacturers' manuals and literature, PPE, basic tools and supplies, blocking, chains, binders, slings, rigging hardware</i></p>

13.03 Unloads or assists with unloading equipment and attachments

Knowledge of:

- manufacturers' specifications
- company policies and procedures
- unloading techniques
- weather conditions
- ground conditions
- blocking
- hand signals

Ability to:

- assess area hazards
- unload equipment and attachments
- unload boom
- assist with components, such as attach boom and counterweights, replace boom and load line blocks
- remove protection from equipment, such as exhaust pipe covers
- assist with removing warning flags, reflectors, and beacon/clearance lights
- use and respond to hand signals

*Manufacturers' manuals and literature, PPE, basic tools and supplies, blocking, chains, binders, slings, rigging hardware*

**BLOCK F      TRANSPORTATION**  
**Task 14      Drives Rubber-tired Sideboom**

This task is important because it helps to:

- ensure that equipment arrives safely
- ensure public safety

Trends:

N/A

	Subtasks	Supporting Knowledge and Abilities	Tools and Supplies
14.01	Prepares to drive rubber-tired sideboom	<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 pilot truck; oversize load signs, flags, and lights; slow moving vehicle sign requirements</li> <li>• route and destination</li> <li>• proper positioning of attachments for road travel</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• secure attachments in proper position for road travel</li> <li>• attach oversize load signs, flags, and lights</li> <li>• check brakes, steering, lights, and flashers</li> <li>• clean equipment</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies, blocking, chains, binders, signs</i>
14.02	Drives rubber-tired sideboom	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>• manufacturers' specifications</li> <li>• applicable legislation, such as class/endorsement of driver's licence, traffic laws</li> <li>• road conditions</li> <li>• potential hazards</li> <li>• limitations on public roads, such as traveling speeds</li> <li>• blind spots</li> </ul> <p>Ability to:</p> <ul style="list-style-type: none"> <li>• lock left and right brake pedals to work as one unit</li> <li>• comply with applicable legislation, such as possess appropriate and valid driver's licence</li> <li>• follow route to destination</li> <li>• adjust to road and weather conditions, such as regulate speed</li> </ul>	<i>Manufacturers' manuals and literature, PPE, basic tools and supplies</i>

- make adjustments to avoid hazards, such as lower boom when passing under power lines

### Sideboom 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				

### Sideboom Operator DACUM Chart

Block	Task	Subtask					
<b>C. EQUIPMENT</b>	<b>6. Describes Equipment and Attachments</b>	6.01 Describes types and sizes of sidebooms	6.02 Describes components and functions	6.03 Describes capacities/capabilities of sidebooms	6.04 Describes attachments and functions	6.05 Describes rigging equipment	6.06 Describes accessories associated with sidebooms
		6.07 Describes basic tools and supplies associated with sidebooms					
<b>D. MAINTENANCE</b>	<b>7. Performs Pre-operational Inspection and Daily Service with Engine Off</b>	7.01 Inspects 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 fuel system
		7.07 Inspects and services drive train	7.08 Inspects and services braking system	7.09 Inspects and services load-bearing structure	7.10 Inspects and services operator station	7.11 Inspects safety equipment	7.12 Inspects and services attachments
		7.13 Inspects and services boom components	7.14 Inspects and services hoisting system	7.15 Inspects and services counterweight system			
	<b>8. Performs Pre-operational Inspection and Daily Service with Engine Running</b>	8.01 Starts engine and checks monitoring and warning systems	8.02 Warms up engine	8.03 Cycles equipment functions			

### Sideboom Operator DACUM Chart

Block	Task	Subtask					
<b>D. MAINTENANCE, cont'd</b>	<b>9. Complies with Scheduled Maintenance Requirements</b>	9.01 Arranges for or performs scheduled maintenance					
<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 Describes impact of terrain on operations	10.05 Plans lifts	10.06 Determines best production work cycle
	<b>11. Operates Sideboom</b>	11.01 Complies with equipment safety requirements	11.02 Monitors work area	11.03 Assists with installation of attachments	11.04 Uses safe rigging techniques	11.05 Picks and carries loads	11.06 Sets loads down
		11.07 Monitors equipment performance	11.08 Troubleshoots problems	11.09 Optimizes equipment capabilities	11.10 Stockpiles products	11.11 Strings pipe	11.12 Bends pipe
		11.13 Sets up pipe	11.14 Performs pipe gang operations	11.15 Performs lower-in operations	11.16 Places swamp weights	11.17 Ties in pipe	11.18 Carries boring equipment
		11.19 Performs fabrication operations	11.20 Installs testing equipment				

### Sideboom Operator DACUM Chart

Block	Task	Subtask		
<b>E. OPERATING PROCEDURES, cont'd</b>	<b>12. Follows Shut-down Procedures</b>	12.01 Cleans wheels/ tracks and attachments before parking	12.02 Parks and secures equipment	12.03 Performs housekeeping tasks
<b>F. TRANSPORTATION</b>	<b>13. Transports Sideboom</b>	13.01 Prepares to load equipment and attachments	13.02 Loads or assists with loading equipment and attachments	13.03 Unloads or assists with unloading equipment and attachments
	<b>14. Drives Rubber-tired Sideboom</b>	14.01 Prepares to drive rubber-tired sideboom	14.02 Drives rubber-tired sideboom	

## 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