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EXCELLENCE
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National Occupational Analysis

Heavy Equipment Operator (Dozer)

2015

CANADIAN STANDARD OF EXCELLENCE FOR SKILLED TRADES

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National Occupational Analyses

Heavy Equipment Operator (Dozer)

2015

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FOREWORD

The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this National Occupational Analysis (NOA) as the national standard for the occupation of Heavy Equipment Operator (Dozer).

Background

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to cooperate with provincial and territorial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Employment and Social Development Canada (ESDC) sponsors a program, under the guidance of the CCDA, to develop a series of NOAs.

The NOAs have the following objectives:

- to describe and group the tasks performed by skilled workers;
- to identify which tasks are performed in every province and territory;
- to develop instruments for use in the preparation of Interprovincial Red Seal Examinations and curricula for training leading to the certification of skilled workers;
- to facilitate the mobility of apprentices and skilled workers in Canada; and,
- to supply employers, employees, associations, industries, training institutions and governments with analyses of occupations.

ACKNOWLEDGEMENTS

The CCDA and ESDC wish to express sincere appreciation for the contribution of the many tradespersons, industrial establishments, professional associations, labour organizations, provincial and territorial government departments and agencies, and all others who contributed to this publication.

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Joe Williams	Nova Scotia

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

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

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STRUCTURE OF ANALYSIS

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

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

The analysis also provides the following information:

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

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

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

DEVELOPMENT AND VALIDATION OF ANALYSIS

Development of Analysis

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

Draft Review

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

Validation and Weighting

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

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

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

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

Definitions for Validation and Weighting

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

Provincial/Territorial Abbreviations

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

ANALYSIS

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

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

It is imperative to apply and be familiar with the Occupational Health and Safety (OH&S) Acts and Workplace Hazardous Materials Information System (WHMIS) Regulations as well as all other applicable regulations and legislation that may be sector specific including, for example; mining, construction and industrial requirements. As well, it is essential to determine workplace hazards and take measures to protect oneself, co-workers, the public and the environment.

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

SCOPE OF THE HEAVY EQUIPMENT OPERATOR (DOZER) TRADE

"Heavy Equipment Operator (Dozer)" is this trade's official Red Seal occupational title approved by the CCDA. This analysis covers tasks performed by heavy equipment operators whose occupational title has been identified by some provinces and territories of Canada under the following names:

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
Heavy Equipment Operator (Dozer)			✓	✓	✓					✓			

These heavy equipment operators operate dozers used in the construction and maintenance of roads, bridges, airports and utilities, and the construction of gas and oil pipelines, tunnels, buildings and other structures. They also operate equipment in surface mining, quarrying, and land clearing activities.

Heavy equipment operators (dozer) are employed by construction companies, heavy equipment contractors, public works departments and pipeline, logging, mining, oil, cargo-handling and other industries.

Heavy equipment operators operate dozers to move, spread and strip earth, rock, gravel or other materials during construction and related activities. Dozers along with other heavy equipment are used to clear brush and stumps prior to logging activities and to build roads at logging and surface mining sites. Heavy equipment operators (dozer) also maintain winter roads, create slopes and ditches, level surfaces and clear land using dozers. They are also responsible for preparing their equipment for transportation, conducting pre-operational checks on their equipment before each shift/daily and post-operational checks at the end of each shift/daily, and for cleaning, oiling and refueling their equipment.

Noise from machinery and equipment hinders communication at the work site. Often hand signals and flags are the only practical forms of communication. Distance between workers, the need to wear ear protection and the presence of dust and blind spots blocking eye contact with other workers also make communication difficult.

Key attributes for people entering this trade are good eye-hand coordination, mechanical aptitude, alertness and safety consciousness. Heavy equipment operators (dozer) sit in vehicles for extended periods of time. Adjusting equipment or co-ordinating activities with other workers may require some walking, lifting and bending.

The computer is increasingly being used for precision control to optimize heavy equipment operator (dozer) efficiencies. The use of computerized equipment has raised the level of ability of heavy equipment operators to perform more precise work resulting in higher productivity and quality of project. This in turn requires a higher and more complete level of training.

Satellite monitoring and diagnosing of equipment has been introduced and is becoming more widespread. The use of Global Positioning System (GPS) and wireless technology has been introduced to improve equipment operation. The use of remote control equipment is increasing in the industry, which produces more precise control and efficiencies. More training is typical in the industry which improves operating techniques and increases safety, reduces downtime and improves efficiency. A wide variety of new attachments are being developed and introduced to help improve efficiencies.

New ergonomic controls are continually adapted and improved for ease of use and to reduce heavy equipment operator (dozer) fatigue and injury, which in turn improves production. New cab designs featuring more open and improved visibility in heavy equipment operator stations, increases heavy equipment operator awareness and safety. New technology that is being introduced with more efficient engines and transmissions such as hydrostatic drive transmissions and electric powertrains, results in smoother transitions and operations, which also reduces heavy equipment operator fatigue. Advancements in technology are allowing heavy equipment operators to work in all environmental conditions, such as extreme temperature conditions.

More emphasis through due diligence is being placed on safety. Changes to regulations and standards will have an impact on the duties and the way industry and heavy equipment operators (dozer) deal with situations that arise on site. With increased emphasis on eco-friendly practices, operators are required to practice environmental stewardship (i.e. spill clean-up, erosion and emissions control).

ESSENTIAL SKILLS SUMMARY

Essential skills are needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.

Through extensive research, the Government of Canada and other national and international agencies have identified and validated nine essential skills. These skills are used in nearly every occupation and throughout daily life in different ways.

A series of CCDA-endorsed tools have been developed to support apprentices in their training and to be better prepared for a career in the trades. The tools can be used independently or with the assistance of a tradesperson, trainer, employer, teacher or mentor to:

- understand how essential skills are used in the trades;
- learn about individual essential skills strengths and areas for improvement; and
- improve essential skills and increase success in an apprenticeship program.

The tools are available online or for order at: http://www.hrsdc.gc.ca/essentialskills.

The essential skills profile for the heavy equipment operator (dozer) trade indicates that the most important essential skills are **numeracy** and **thinking skills**, such as **problem solving**.

The application of these skills may be described throughout this document within the competency statements which support each subtask of the trade. The following are summaries of the requirements in each of the essential skills, taken from the essential skills profile. A link to the complete essential skills profile can be found at www.red-seal.ca.

Reading
Heavy equipment operators (dozer) use reading skills to refer to manuals on the operation and maintenance of machinery. They are required to read material safety data sheets (MSDS) when working with products such as cleaners, oils, fuels and other chemicals. Heavy equipment operators (dozer) may read pamphlets explaining regulations and codes, bulletins from unions, employers or other regulatory bodies, and memos or work orders with information on the nature of the work to be performed.

Document Use
Heavy equipment operators (dozer) work on a daily basis with documents such as labels on hazardous materials, signs, lists, operator's manuals, inspection forms, hazard assessment forms, log books and time sheets. They may read or mark stakes with station numbers and slope ratios, mark off caution areas on maps and make sketches or drawings. They may also be required to consult surveyor charts and blueprints.

Writing
Heavy equipment operators (dozer) may record information about work performed, time it took, materials used and problems encountered. They make entries in daily equipment reports (logbooks) during pre- and post-operational inspections. They also keep an equipment maintenance log to note repairs made and service schedules. They may write accident and incident reports describing details.

Oral Communication
Heavy equipment operators (dozer) use oral communication skills to give directions to, and listen to co-workers, interact with fuel suppliers, truck drivers and mechanics, and participate in safety committees and discussions at the work site concerning how to do a particular job. They may discuss job assignments, equipment problems and material shortages with supervisors, contractors or union dispatchers.

Numeracy
A heavy equipment operator's skills in numeracy are used to calculate, for example, the number of loads required to remove the sand and the weight distribution of a load being lifted. They may also measure and calculate the slope and ratio of ditches. Heavy equipment operators (dozer) estimate distances between the machine and various obstacles, width of ramps for space on either side of a machine and how many truckloads of fill are required. They may also be required to convert between the imperial and metric systems of measurement.

Thinking Skills
Heavy equipment operators (dozer) use their problem solving skills to deal with machinery breakdowns, ground conditions and difficult manoeuvring situations where space to move machinery is tight or objects stand in the way of completing jobs.

Decision making skills are required for determining materials and equipment needed, appropriate and safe preventative maintenance cycles to be performed on equipment, and when to make suggestions to supervisors such as about changes to soil cover specified on blueprints.

Heavy equipment operators (dozer) require job task planning skills to coordinate their work with their co-workers. They may also be required to determine task sequencing or prioritization of tasks considering factors such as terrain, schedules of truck drivers and other suppliers, and unexpected factors such as maintenance emergencies or changing weather conditions.

Heavy equipment operators (dozer) use thinking skills to understand and assess soil types and how weather affects soil conditions.

Working with Others
Although heavy equipment operators (dozer) work alone while operating their machines, on construction sites they are members of a team. They work to co-ordinate job tasks with others and must be aware of where other crew members, machines and general public are at all times.

Computer Use
Heavy equipment operators (dozer) use computer-controlled equipment such as electronic scales, GPS and advanced operating systems.

Continuous Learning
Heavy equipment operators (dozer) are expected to take courses throughout their career to stay up to date with regulations, health and safety procedures and new technology. These may include courses such as in hazmat, confined spaces and fall protection. They may be required to obtain or renew certificates or licenses such as WHMIS certificates, cardiopulmonary resuscitation (CPR) certificates, ground disturbance certificates, and radio operator and driver's licences. Specific training may also be required to work in areas such as oil field, mining and forestry industries.

BLOCK A COMMON OCCUPATIONAL SKILLS

Trends Technology is becoming more complex and being included as part of new equipment. Heavy equipment operators (dozer) are required to become more versatile in their skills and in the kinds of equipment they operate.

Related Components All components apply.

Tools and Equipment See Appendix A.

Task 1 Uses and maintains tools and equipment.

Context This task involves the maintenance of hand tools, power tools, and measuring and testing equipment. It also includes the use of grade checking and tracking, rigging, and safety and personal protective equipment (PPE).

Required Knowledge

K 1	capacity and configuration of rigging materials and hardware
K 2	OH&S *Acts*, WHMIS, local and municipal regulations and legislation
K 3	company policies and procedures
K 4	types of tools and equipment required for specific tasks
K 5	communication including hand signals and radio communication
K 6	symbols used to identify potential hazards
K 7	manufacturers' specifications
K 8	emergency preparedness such as first aid and working near water

Sub-task

A-1.01 Maintains hand and power tools.

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

Key Competencies

A-1.01.01	clean hand tools to ensure optimum operation
A-1.01.02	lubricate tools according to manufacturers' specifications
A-1.01.03	store tools in designated areas such as tool boxes or cabinets
A-1.01.04	use tools for their intended purpose
A-1.01.05	inspect tools for defects and take remedial action such as repairing, replacing, tagging and disposing

Sub-task

A-1.02 Maintains measuring and testing equipment.

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

Key Competencies

A-1.02.01	clean and dry measuring and testing equipment before storing according to manufacturers' specifications
A-1.02.02	store measuring and testing equipment in a safe location according to company policy
A-1.02.03	service measuring instruments according to manufacturers' specifications
A-1.02.04	verify calibration levels according to manufacturers' specifications
A-1.02.05	recharge laser levels and batteries at the end of each shift

Sub-task

A-1.03 Uses grade checking and tracking instruments.

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

Key Competencies

A-1.03.01	verify calibration of equipment such as electronic equipment and laser levels before use at the beginning of each shift and throughout the shift
A-1.03.02	verify that project data file being used corresponds to the project
A-1.03.03	troubleshoot instruments for failures
A-1.03.04	monitor and verify accuracy of the instruments
A-1.03.05	install mobile signal receiver onto equipment and remove after use
A-1.03.06	interpret measurement data on tracking instruments and make necessary adjustments or responses

Sub-task

A-1.04 Uses winches and rigging equipment.

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

Key Competencies

A-1.04.01	inspect winches and rigging equipment for deficiencies or damage such as cuts, tears, wear and fraying before each use and according to manufacturers' specifications
A-1.04.02	maintain winches and rigging equipment according to manufacturers' specifications
A-1.04.03	determine weight of load to be winched
A-1.04.04	select rigging materials and configuration suited to the winching task
A-1.04.05	check rigging arrangement such as blocks, spars and haul-backs to ensure secure winching
A-1.04.06	respond to directions given by signal person
A-1.04.07	replace, tag or remove and dispose of rigging equipment as needed and according to manufacturers' specifications

Sub-task

A-1.05 Uses personal protective equipment (PPE) and safety equipment.

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

Key Competencies

A-1.05.01	wear PPE such as hard hats, safety boots, eye protection, reflective clothing and hearing protection according to site and company policies and safety regulations
A-1.05.02	inspect and maintain PPE according to manufacturers' specifications
A-1.05.03	place or store PPE in a safe location when not in use to prevent damage
A-1.05.04	store safety equipment such as fall protection equipment and gas monitors according to manufacturers' specifications
A-1.05.05	use safety equipment such as fall protection equipment, fire extinguishers and first aid kits according to manufacturers' specifications and jurisdictional regulations

Task 2 Maintains safe work environment.

Context This task involves assessing potential hazards, planning worksite safety strategies, securing unattended equipment, performing spill and sediment control procedures, and handling materials.

Communicating with others is vital to maintaining a safe work environment.

Required Knowledge

K 1	good housekeeping practices
K 2	contact information for local utilities
K 3	Transportation of Dangerous Goods (TDG) regulations, OH&S Acts, and WHMIS
K 4	colour codes for utility markings and locates
K 5	site and company policies and procedures
K 6	procedures to control spills of hazardous materials
K 7	environmental legislation and regulatory requirements
K 8	safe handling of hazardous materials

K 9	soil types and how they affect the approach to the job
K 10	capabilities and limitations of different types of equipment

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Sub-task

A-2.01 Assesses potential hazards.

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

Key Competencies

A-2.01.01	review site plan and/or demolition plan and visually inspect the work area on a continual basis to identify potential hazards such as ground conditions, overhead hazards, proximity to obstructions, pedestrian and vehicle traffic, and manholes
A-2.01.02	ensure locate sheet is provided and current
A-2.01.03	identify the location of utilities
A-2.01.04	identify and mark location of potential hazards such as manholes and water valves using tools such as cones, ribbons and stakes
A-2.01.05	assess ground and environmental conditions such as rapidly changing weather to determine adverse effects on work location
A-2.01.06	inspect structure to avoid injury to co-workers and general public, or to prevent damage to surrounding property

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Sub-task

A-2.02 Plans worksite safety strategies.

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

Key Competencies

A-2.02.01	provide input into the emergency response plan (ERP)
A-2.02.02	practice good housekeeping by ensuring work area is clear of hazards
A-2.02.03	provide input into the location of garbage receptacles, fuel storage and temporary buildings
A-2.02.04	provide input into the layout of worksite materials, such as bedding sand, pipes and excavated fill

A-2.02.05	assess soil, ground and weather conditions to plan daily activities accordingly
A-2.02.06	remove visual barriers and obstructions to ensure eye contact with others, and intended path of travel is clear
A-2.02.07	identify hazards related to soil stability such as potential cave in, and report to supervisor
A-2.02.08	ensure underground utilities are verified and exposed according to government legislation and regulations

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Sub-task

A-2.03 Secures unattended equipment.

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

Key Competencies

A-2.03.01	perform post-operational inspection including locking doors, turning off and locking the master switch, and cycling hydraulics
A-2.03.02	park on a level location wherever possible
A-2.03.03	lower implements and attachments to the ground, apply park brakes, apply chocks, engage lockouts, lock windows and doors, remove key from the ignition, and place guards on windows of unattended equipment
A-2.03.04	affix lockout tags to equipment that has been removed from service
A-2.03.05	store equipment in a designated location such as a building, compound, and fenced or delineated areas

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Sub-task

A-2.04 Communicates with others.

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

Key Competencies

A-2.04.01	participate in the documentation of potential hazards
A-2.04.02	use pre-determined language and hand signals according to site and jurisdictional regulations and legislation to communicate with other personnel and prevent errors on the worksite

A-2.04.03	use communication equipment such as cell or satellite phones, 2-way radios, and equipment horns for signalling
A-2.04.04	use equipment to provide instruction to others, such as to indicate dump location to other heavy equipment operators (dozer)
A-2.04.05	communicate with truck drivers for tasks such as unloading, loading and equipment placement
A-2.04.06	signal driver that truck is loaded and ready to go
A-2.04.07	mentor and provide instruction to apprentices or new personnel
A-2.04.08	provide input to estimate materials such as aggregate or soil required to achieve specified elevations

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Sub-task

A-2.05 Performs spill control procedures.

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

Key Competencies

A-2.05.01	prioritize spill control measures for factors such as health, environment and clean up according to the site specific spill control plan/procedures
A-2.05.02	use spill kits to contain hazardous materials such as oil, fuel and antifreeze
A-2.05.03	prevent contamination of manholes or waterways and other potentially affected areas using methods such as digging a trench or dyke, diverting and blocking
A-2.05.04	use alternate methods or materials to contain spills, such as sawdust, sand, straw, and plastic
A-2.05.05	remove and dispose of contaminated material according to environmental regulations

Sub-task

A-2.06 Performs sediment control procedures.

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

Key Competencies

A-2.06.01	assist in installing sediment control materials such as silt fences and blankets to protect surrounding vegetation and waterways
A-2.06.02	seal up spoil piles to prevent erosion
A-2.06.03	plan work to minimize damage to the environment caused by sedimentation
A-2.06.04	perform operations away from riparian zones to avoid environmental damage
A-2.06.05	consult supervisors or authority having jurisdiction to determine riparian regulation for the jobsite

Sub-task

A-2.07 Handles materials.

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

Key Competencies

A-2.07.01	use, store and dispose of materials such as used oil, antifreeze, fuel and other materials that may influence environmental factors such as vegetation, insects, emissions, noise, animals and sun, in accordance with environmental legislation and regulations
A-2.07.02	move material on barges according to best practices and regulations

Task 3 Organizes work.

Context This task includes the use of documentation such as time sheets, inspection checklists, health and safety forms, reporting forms and logbooks. It also includes interpreting survey indicators and data as well as determining method of approach.

Required Knowledge

K 1	metric and imperial measurement systems
K 2	basic abbreviations and symbols used in survey markings
K 3	construction drawing (blueprint) reading
K 4	equipment capabilities and limitations
K 5	expressions of slope and grade
K 6	colour codes for utility markings and locates

Sub-task

A-3.01 Checks grade.

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

Key Competencies

A-3.01.01	attach string line to survey stakes from the markings on the survey stakes and use a line level and measuring tape to check grade
A-3.01.02	use grade checking devices such as GPS, laser levels, digital machine systems, batter boards and string line to verify that the correct grade is achieved
A-3.01.03	express slopes using percent, ratio and degree

Sub-task

A-3.02 Uses documentation.

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

Key Competencies

A-3.02.01	complete forms such as time sheets, pre- and post-operational inspection checklists, health and safety forms, logbooks, and injury, illness or incident reporting forms, work orders and hazard analysis reports
A-3.02.02	read and interpret documents such as maps, drawings, memos, charts, labels, locate sheets and MSDS
A-3.02.03	draw sketches to clarify job tasks

Sub-task

A-3.03 Interprets survey indicators and data.

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

Key Competencies

A-3.03.01	clarify abbreviations and symbols by consulting with surveyors or supervisor
A-3.03.02	identify markings on survey indicators such as survey stakes, benchmarks and hubs
A-3.03.03	set up survey stakes as offsets for excavation lines and gridlines
A-3.03.04	verify survey data such as grade elevation and location to ensure accuracy of data
A-3.03.05	notify immediate supervisor of inaccuracies or inconsistencies of survey data such as in GPS coordinates and elevations

Sub-task

A-3.04 Determines method of approach.

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

Key Competencies

A-3.04.01	use information from drawings and plans to assess method of approach
A-3.04.02	assess underground and overhead obstacles such as building protrusions, roof overhangs, overhead power lines, snow, bridges and overpasses, and determine if an alternate approach is plausible or needed
A-3.04.03	provide assistance with gathering historical or anecdotal information, and as-built records from local authorities for undocumented conditions
A-3.04.04	adapt operation based on site conditions and environmental information such as proximity to waterways, soil conditions and weather conditions
A-3.04.05	adapt operation based on equipment capability, limitations and availability
A-3.04.06	adapt operation based on number and types of equipment onsite
A-3.04.07	assess site conditions for haulage equipment

BLOCK B HEAVY EQUIPMENT (DOZER) INSPECTION AND BASIC MAINTENANCE

Trends Documentation of daily operations is becoming increasingly rigorous. Heavy equipment operator (dozer) responsibilities for maintenance and inspection are changing as technology advances. Computerization is reducing the need for manual checks and maintenance by heavy equipment operators, and requiring specialized mechanics to perform the maintenance.

Related Components All components apply.

Tools and Equipment See Appendix A.

Task 4 Performs scheduled maintenance.

Context This task encompasses any maintenance tasks that a heavy equipment operator (dozer) must know about or perform to ensure the daily operation of the machine.

Required Knowledge

K 1	good housekeeping practices
K 2	gauges and monitoring systems such as computer monitoring systems (CMS), attachment specific computers and their use
K 3	pre-oilers and auto-grease systems
K 4	glow plugs, pre-heat and ether start systems
K 5	safety equipment such as fire extinguishers, fire suppression systems, seat belts, warning devices and backup alarms
K 6	roll over protective structures (ROPS) and falling objects protective structures (FOPS)
K 7	undercarriage components such as rollers, sprockets and idlers
K 8	correct track tension
K 9	manufacturers' specifications according to operation and maintenance manuals (OMM)

K 10	re-fuelling and greasing
K 11	TDG certification
K 12	tier 4 exhaust procedures such as Diesel Exhaust Fluid (DEF) and regeneration

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Sub-task

B-4.01 Maintains heavy equipment operator (dozer) station.

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

Key Competencies

B-4.01.01	clean cab using tools such as hand brooms, rags and cleaners to remove dust
B-4.01.02	secure loose items to ensure safety
B-4.01.03	clean windows, mirrors and camera to ensure visibility
B-4.01.04	adjust cab components to individual heavy equipment operator's ergonomics
B-4.01.05	lubricate cab components such as throttle pedal, door hinges and seat

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Sub-task

B-4.02 Maintains undercarriage, drive train system and tracks.

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

Key Competencies

B-4.02.01	adjust track tension according to manufacturers' specifications
B-4.02.02	tighten undercarriage component mounting bolts according to manufacturers' specifications
B-4.02.03	clean tracks and rollers of dirt and debris

Sub-task

B-4.03 Performs preventative maintenance.

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

Key Competencies

B-4.03.01	top up fluids as needed according to manufacturers' specifications
B-4.03.02	lubricate all fittings according to manufacturers' specifications
B-4.03.03	change and clean filters according to manufacturers' specifications
B-4.03.04	rotate and change tips and shanks, cutting edges and corner bits according to manufacturers' specifications

Sub-task

B-4.04 Performs basic maintenance on attachments.

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

Key Competencies

B-4.04.01	grease attachments such as winch, blade assembly, jib booms, rock pickers and compactors according to manufacturers' specifications
B-4.04.02	ensure hydraulic lines are capped during storage
B-4.04.03	change and rotate ground-engaging components, cutting edges and teeth according to manufacturers' specifications to increase longevity of the parts
B-4.04.04	unwind winch and visually inspect wire rope for broken strands and wires, and kinking
B-4.04.05	check winch assembly for unusual wear, secure cable connection and oil levels
B-4.04.06	visually inspect attachments such as jib/side booms, rippers and winch, for unusual wear, damage, cracks, oil leakage and broken welds
B-4.04.07	visually inspect bolts and pins on all attachments for security
B-4.04.08	check mounted systems such as GPS and laser systems, and make adjustments such as tightening clamps, electric lines, supports and receivers

Task 5 Performs inspections.

Context Performing pre- and post-operational inspections are an important part of ensuring the machine is prepared and safe for daily operations.

Required Knowledge

K 1	machine-mounted laser levels and GPS
K 2	fuel, lubrication, electrical, hydraulic, cooling, air intake, suspension, brake and drive train systems
K 3	computer systems
K 4	OMM
K 5	heavy equipment operator's daily report
K 6	safety features
K 7	start-up and shut-down procedures
K 8	cold weather starting and operation
K 9	attachments
K 10	undercarriages
K 11	safety equipment such as fire extinguishers, fire suppression systems, seat belts, first aid kits, warning devices and backup alarms

Sub-task

B-5.01 Performs pre-operational inspections.

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

Key Competencies

B-5.01.01	inspect engine compartment for maintenance items such as engine oil level, belts, hoses, debris build-up, coolant and exhaust system according to manufacturers' check list
B-5.01.02	check air intake system components such as air filters, dust bowls and air-restriction indicators
B-5.01.03	inspect undercarriage components for loose mounting bolts, uneven and excessive wear such as grooves, flat spots, unusual wear marks, cracks, and final drives and rollers for oil leakage
B-5.01.04	perform walk-around inspection of overall machine for damage, unnecessary wear, leakage and fluid levels such as hydraulic and fuel

B-5.01.05	inspect heavy equipment operator's station for seat belt adjustment and expiry date, cleanliness, loose debris and alternate escape routes
B-5.01.06	check to ensure controls such as transmission and hydraulic lockouts are in locked or neutral position according to manufacturers' specifications
B-5.01.07	turn on unit, visually inspect gauges for operation, continue start-up procedures according to manufacturers' specifications and continue to monitor gauges
B-5.01.08	cycle controls for operation, conduct warm-up procedures, and recheck gauges and hydraulic levels according to manufacturer's specifications
B-5.01.09	conduct brake check and check operation of lockout devices
B-5.01.10	inspect safety equipment by testing horn, backup alarm, rear view camera and lights for operation, and checking first aid kits and emergency shut-down and fire suppression system, if equipped
B-5.01.11	check ROPS and FOPS for damage

Sub-task

B-5.02 Performs post-operational inspections.

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

Key Competencies

B-5.02.01	park equipment in the service position on level surface to check fluid levels at next start-up
B-5.02.02	allow equipment to cool down prior to shut-down according to manufacturers' specifications
B-5.02.03	perform post-operational inspection of overall equipment for damage such as excessive wear, cracks and leakage
B-5.02.04	clean tracks and remove debris from machine

Sub-task

B-5.03 Completes daily equipment logbook.

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

Key Competencies

B-5.03.01	fill out daily equipment logbook during pre-operational inspection according to company policy and jurisdictional regulations, and store according to company policy
B-5.03.02	complete daily equipment logbook during post-operational inspection according to company policy and jurisdictional regulations, and store according to company policy
B-5.03.03	ensure report is ready to be viewed or signed by foreman according to company policy and jurisdictional regulations

BLOCK C HEAVY EQUIPMENT OPERATOR (DOZER) TASKS

Trends

Heavy equipment operator (dozer) functions are becoming more complex and precise, for example joy sticks which incorporate multiple control functions, and electrical over hydraulic functions.

Advancements in technology are allowing workers to perform their duties with improved efficiency and safety. New ergonomic controls and new cab designs not only improve ease of use and heavy equipment operator awareness, but also reduce their fatigue and injury. More efficient engines and transmissions, the use of GPS, wireless technology, and remote control equipment have helped improve worker efficiency.

There are more stringent regulations around the spread of contaminants such as noxious weeds, bugs and other biological contaminants. These regulations affect what a heavy equipment operator has to do to the equipment before it can be moved.

Related Components

All components apply.

Tools and Equipment

See Appendix A.

Task 6 Performs basic heavy equipment operator (dozer) functions.

Context

This task involves smooth operation of equipment controls, effective set-up of machine for task at hand, the installation and removal of attachments, and monitoring of equipment performance. It also covers troubleshooting and emergency procedures.

Required Knowledge

K 1	three-point contact when entering and exiting machine
K 2	function and location of controls and gauges on various equipment such as parking brakes, shut-offs and throttles
K 3	limitations of equipment and attachments
K 4	communication methods such as hand signals and radio
K 5	content of OMM
K 6	significance of warning symbols and labels on equipment

K 7	emergency procedures such as fire suppression systems, fire extinguishers, muster points and ERP
K 8	contractor and company safety policies, OH&S Acts and other applicable regulations and legislation
K 9	lock-out and tag-out procedures
K 10	procedures for installing various attachments
K 11	compatibility of attachments to carriers
K 12	gear and speed selection based on grade and roughness of terrain
K 13	centre of gravity
K 14	work area
K 15	right-of-way
K 16	compaction density and swell factors
K 17	pull-type compacting equipment such as smooth drums, rubber tires, sheep's foots, rollers and packers
K 18	types of soil such as granular aggregates, clay, organic, top soil and rock
K 19	factors that affect soil stability such as weather, vibration and surcharge
K 20	traveling on icy or slippery surfaces with dozers
K 21	snow and ice removal procedures

Sub-task

C-6.01 Maintains control of equipment.

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

Key Competencies

C-6.01.01	enter and exit machine using three-point contact while facing machine
C-6.01.02	adjust seat and controls for ease of operation
C-6.01.03	adjust gear, throttle and track speed according to grade and roughness of terrain to meet safety and production requirements
C-6.01.04	manipulate controls for smooth operation of equipment
C-6.01.05	maintain centre of gravity while manoeuvring equipment
C-6.01.06	maintain prescribed clearance between equipment, and obstacles and utilities

Sub-task

C-6.02 Positions equipment for task.

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

Key Competencies

C-6.02.01 determine location for set-up taking into consideration factors such as working in conjunction with other equipment, hazards, obstacles and the need for access/egress

C-6.02.02 stabilize equipment taking into consideration capabilities and limitations of equipment and ground conditions of work area

Sub-task

C-6.03 Monitors performance of equipment.

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

Key Competencies

C-6.03.01 visually scan gauges for temperature and oil pressure to confirm that they are within safe operating range

C-6.03.02 identify signs of fluid leaks, loss of power or other equipment problems using senses such as sight, smell and feel

C-6.03.03 identify signs of equipment or component failure by feeling for vibration or listening for unusual sounds

Sub-task

C-6.04 Troubleshoots equipment problems.

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

Key Competencies

C-6.04.01	identify faulty components and fault codes in order to explain problem to service personnel or to order parts
C-6.04.02	interpret fault codes and monitor warning in order to determine course of action such as changes in operation or removal of debris off the cooling system
C-6.04.03	report extent of problem to supervisor to determine how production, safety and environment will be affected (major vs. minor shut-down)

Sub-task

C-6.05 Installs attachments.

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

Key Competencies

C-6.05.01	select type of attachment needed for job and equipment
C-6.05.02	select tools needed to complete installation
C-6.05.03	follow installation and removal procedures based on type of attachment and equipment being installed or removed according to manufacturers' and job specifications
C-6.05.04	lubricate attachment according to manufacturers' specifications and job conditions
C-6.05.05	inspect attachment for faults such as cracks, missing bolts and loose hoses before and after installation, and before use
C-6.05.06	test equipment to ensure proper installation of attachment
C-6.05.07	remove and store attachments according to established procedures

Sub-task

C-6.06 Performs emergency procedures.

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

Key Competencies

C-6.06.01	assess emergency to determine course of action
C-6.06.02	stop equipment, lower implement and attachment, lock-out (hydraulics, transmission, brakes) and perform engine shut-down
C-6.06.03	initiate established ERP according to assessed situation
C-6.06.04	inform supervisor, co-workers and general public of hazards

Sub-task

C-6.07 Compacts material.

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

Key Competencies

C-6.07.01	operate pull-type compacting equipment such as smooth drum, rubber tire and sheep's foot to achieve required densities and rolling pattern
C-6.07.02	coordinate water application with co-workers
C-6.07.03	offset equipment to avoid rutting
C-6.07.04	avoid disturbing compaction while manoeuvring around obstacles such as utilities, manholes and fire hydrants
C-6.07.05	shut off vibratory function while stopping and changing directions to avoid creating divots in surface
C-6.07.06	operate track or wheel equipment to aid in compaction of material

Sub-task

C-6.08 Performs cut and fill operations.

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

Key Competencies

C-6.08.01	identify reference points to delineate the perimeter of the work area
C-6.08.02	adjust operation based on material and changing ground conditions
C-6.08.03	visually assess ground elevations for highs and lows
C-6.08.04	select and use ground engaging tools and equipment such as blade and ripper
C-6.08.05	use equipment functions such as pitch, angle, and tilt to obtain correct slope and grade
C-6.08.06	maintain a profile according to site plan
C-6.08.07	determine action to be taken when encountering obstacles such as rocks, logs and debris
C-6.08.08	remove and disperse excess materials
C-6.08.09	synchronize operation of equipment with other heavy equipment operators such as two dozers pushing bulk material together

Sub-task

C-6.09 Clears snow and ice. (NOT COMMON CORE)

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

Key Competencies

C-6.09.01	use appropriate blade for snow removal such as V-plow and one-way plow
C-6.09.02	prepare equipment for snow and ice conditions such as installing tire chains, lightings and hazard warnings
C-6.09.03	adjust speed of equipment according to road conditions
C-6.09.04	apply appropriate down pressure on snow removal attachments to prevent damage to surface being plowed and blade, and to maintain steering and traction control
C-6.09.05	move snow to designated area within large areas such as a parking lot using slot method, if possible

C-6.09.06	adjust snow wing position according to obstacles, conditions and manufacturers' specifications
C-6.09.07	identify obstacles and use caution
C-6.09.08	maintain control of equipment when clearing snow and ice taking into consideration adverse weather conditions

Task 7 Transports equipment.

Context This task involves mobilization and demobilization of equipment. It includes preparing, loading and securing equipment for transportation as well as unloading. Driving equipment on public roads is also part of this task.

Required Knowledge

K 1	licensing (equipment and driver) and permitting requirements
K 2	road regulations
K 3	jurisdictional regulations and company policies for loading and unloading of equipment
K 4	lighting requirements such as beacons, flashing lights and head/tail lights
K 5	signage requirements such as "slow vehicle" and "over dimension" signs
K 6	types of trailers and their uses and limitations
K 7	loading and unloading techniques according to type of trailer used
K 8	weight and size of attachments for safe placement on trailer
K 9	height, width and weight restrictions for load
K 10	necessary disassembly of equipment
K 11	positioning of equipment on trailer
K 12	changes to centre of gravity of equipment after removal of attachments
K 13	cleaning requirements of equipment before transport
K 14	tie-down points and procedures
K 15	rigging and winching techniques

Sub-task

C-7.01 Prepares equipment for transportation.

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

Key Competencies

C-7.01.01	clean equipment to prevent debris from falling during transportation, or to prevent contamination of next site
C-7.01.02	remove attachments and components according to manufacturers' specifications
C-7.01.03	remove cleats or install planking to protect haul unit
C-7.01.04	ensure haul unit is clean (free of mud and snow) and is on stable and level ground

Sub-task

C-7.02 Loads equipment and attachments for transportation.

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

Key Competencies

C-7.02.01	manoeuvre equipment onto haul unit while maintaining stability
C-7.02.02	position equipment based on the directions of the transport person
C-7.02.03	set parking brakes, lower implements and attachments, engage hydraulic lock-out, and shut down engine depending on weather conditions, manufacturers' specifications and jurisdictional regulations

Sub-task

C-7.03 Assists in securing equipment for transportation.

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

Key Competencies

C-7.03.01	help tie down equipment and attachments as required
C-7.03.02	close and cover windows and doors to prevent damage during transport
C-7.03.03	engage steering lock to prevent articulation during transport
C-7.03.04	cover exhaust on stopped engines according to manufacturers' specifications to prevent turbo damage during transport

Sub-task

C-7.04 Unloads equipment and attachments.

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

Key Competencies

C-7.04.01	identify hazards such as overhead power lines, underground utilities, slippery decks and unlevel ground
C-7.04.02	remove tie-downs
C-7.04.03	remove exhaust coverings
C-7.04.04	perform a walk-around inspection to identify any potential damage during transport
C-7.04.05	start-up engine, disengage lock-out bar, lift attachments and disengage parking brakes
C-7.04.06	manoeuvre equipment off of haul unit while maintaining stability and following directions of transport person

Task 8 Operates dozers.

Context This task involves using dozers to move mass material, strip surface materials, and spread materials. It also includes backfilling trenches and excavations, and creating slopes and ditches as well as clearing land, levelling demolition materials, pushing scrapers, and maintaining dumpsite areas.

Required Knowledge

K 1	limitations and capabilities of dozers and attachments to ensure equipment suitability for existing site and soil conditions
K 2	grade stakes, worksite plans and GPS
K 3	soil types and factors affecting soil stability
K 4	slope ratios for various soil types
K 5	effects of environmental conditions on materials
K 6	operational functions of equipment and attachments
K 7	basic preventative maintenance practices
K 8	jurisdictional and environmental regulations and policies
K 9	safety regulations
K 10	methods to prevent segregation of aggregates
K 11	dozer attachments such as rippers, mulchers, discs, winches, brushcutters (hydro-axes), root rakes and side booms
K 12	heavy equipment operator (dozer) station components such as gauges, levers and switches
K 13	effects of external and operational factors on the centre of gravity of the dozer
K 14	change in centre of gravity and reduction in equipment capacity when using various attachments
K 15	effect of weight of machine on loose fill and trench
K 16	multiple operations being performed at the same time in various locations and levels at dumpsite
K 17	colour codes for utility markings and locates
K 18	precautions necessary when working around buried or overhead utilities
K 19	rigging requirements for job at hand
K 20	compaction and swell factors, and proctor tests

Sub-task

C-8.01 Moves mass material.

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

Key Competencies

C-8.01.01	identify the volume of material to move and the site conditions
C-8.01.02	identify the type of material to move such as snow, rock and topsoil
C-8.01.03	estimate distance the material is to be moved to determine the type of method such as stockpile, slot method and short push
C-8.01.04	perform ongoing visual inspection of site to ensure minimal disturbance to underlying soils and surfaces
C-8.01.05	determine the depth of blade cut required to operate the dozer in a fluid manner to obtain optimum productivity
C-8.01.06	adjust tilt, pitch and angle of blade to support an optimum blade cut
C-8.01.07	synchronize operation of equipment with other heavy equipment operators such as two dozers pushing bulk material together

Sub-task

C-8.02 Strips surface material.

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

Key Competencies

C-8.02.01	determine the depth of blade cut required to operate the dozer in a fluid manner to obtain optimum productivity
C-8.02.02	move stripped material to final location based on established method of approach, for example using slot/dozing method
C-8.02.03	adjust tilt, pitch and angle of blade to support an optimum blade cut
C-8.02.04	perform ongoing visual inspection of site to ensure minimal disturbance to underlying soils

Sub-task

C-8.03 Creates slopes and ditches.

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

Key Competencies

C-8.03.01	use dozer functions to obtain correct slope and grade, such as tilt, pitch, and angle
C-8.03.02	adjust operation or technique based on type of material and to ensure slope ratio for soil type according to regulation
C-8.03.03	maintain a profile as required according to site plan
C-8.03.04	determine action to be taken when encountering obstacles such as rocks, logs and debris
C-8.03.05	remove and disperse excess materials

Sub-task

C-8.04 Spreads material.

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

Key Competencies

C-8.04.01	determine the depth of blade cut required to operate the dozer in a fluid manner to obtain optimum productivity
C-8.04.02	adjust pitch, angle and tilt of blade to achieve specified elevation
C-8.04.03	synchronize operation of equipment with other heavy equipment operators such as two dozers pushing bulk material together

Sub-task

C-8.05 Clears land.

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

Key Competencies

C-8.05.01	check the site for existence of utilities and get locates
C-8.05.02	remove materials such as trees, stumps and brush using attachments such as stump splitters, root rakes and rippers depending on size of material
C-8.05.03	fall trees in an orderly manner, keeping trees and soils separate, to facilitate clean-up and increase operator safety
C-8.05.04	remove designated material taking precautions to prevent damage to wildlife or plant life
C-8.05.05	move cleared material to final location according to the worksite plan
C-8.05.06	adjust tilt, pitch and angle of rake or blade to support an optimum push
C-8.05.07	perform ongoing visual inspection of site to ensure awareness of potential hazards
C-8.05.08	pile up debris (vegetation, rocks) using attachments such as rakes to prevent dirt contamination

Sub-task

C-8.06 Pushes scrapers.

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

Key Competencies

C-8.06.01	use attachments such as push blades and cushion blades required to perform tasks
C-8.06.02	align the dozer to position the scraper for subsequent cuts
C-8.06.03	synchronize operation of equipment with other heavy equipment operators such as two dozers pushing bulk material together and other scrapers to keep level cutting/excavation area

Sub-task

C-8.07 Backfills trenches and excavations.

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

Key Competencies

C-8.07.01	confirm installation is complete and safe for backfilling by checking that workers and tools are out of the trench, joints are completed and service connections are completed
C-8.07.02	perform preventative actions such as diverting water or re-sloping to prevent cave-ins, trench collapse and utility damage
C-8.07.03	determine the blade pitch, angle, tilt and depth of cut required to operate the dozer in a fluid manner to obtain optimum productivity and to establish lift size of engineered fill
C-8.07.04	synchronize operation of equipment with other heavy equipment operators such as two dozers pushing bulk material together
C-8.07.05	return excavated material to point of origin as required

Sub-task

C-8.08 Levels demolition materials.

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

Key Competencies

C-8.08.01	perform preventative actions to prevent hazards while moving materials such as airborne metals, wood flip-ups and protruding rebar
C-8.08.02	adjust the blade pitch, angle and tilt to achieve specified elevation and required compaction
C-8.08.03	maintain a firm and level materials receiving pad

Sub-task

C-8.09 Maintains dumpsite area.

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

Key Competencies

C-8.09.01	adjust the pitch, angle and tilt of the blade to achieve specified elevation and required compaction
C-8.09.02	maintain a firm and level work area

APPENDICES

APPENDIX A TOOLS AND EQUIPMENT

Hand and Power Tools and Accessories

adjustable wrenches
air compressors
battery chargers
booster cables
brooms
chain saws
circular saws
cold chisels
combination wrenches
cutting torches
drills (electric and cordless)
extension cords
fuel transfer pump
generator
grease guns (manual, electric and cordless)
grinders (electric and cordless)
hack saws
hammers (ball peen, claw, sledge)
hydraulic jacks
load binders and chains
oil cans
oil filter wrenches
pliers
pneumatic impact wrenches
pressure washers
pry bars
pumps (water, discharge, fire)
punches
ratchet straps
scrapers
screwdrivers
skid tanks
socket sets
squeegees
tiger torch
tire inflation tools
tire pressure gauges
tool boxes
torque wrenches
track shovels
trouble lights
welder
wire brushes
whisk brooms
wood blockings

Measuring, Testing and Diagnostic Equipment

anti-freeze testers
battery testers
digital hand levels
electronic and laser levels
eye levels
global positioning system (GPS)
grade stakes
line levels
measuring tapes
oil sample kits
slope meters
string boxes
string levels
test lights
transit levels and rods

Rigging and Lifting Equipment

come-alongs
hold down chains
hooks
slings (synthetic, chain, wire rope)
shackles
tag lines

Personal Protective Equipment (PPE) and Safety Equipment

coveralls
ear plugs and muffs
eye wash stations
face shields
fall arrest systems
fire axes and shovels
fire backpack
fire blankets
fire extinguishers
fire-retardant clothing
first aid kits
gas monitors
gloves
hard hats
life jackets
reflectors
respirators
safety boots
safety glasses
safety pants
safety vests
self-contained breathing apparatus (SCBA)
spill kits
travel alarms
trench boxes
truck under guard (lateral) protection

Attachments

blades (chuck, dozer, ice)
brushcutters (hydro-axes) and mulchers
jib booms (stingers)
landscape rakes
rippers
scarifiers (forestry and earth moving)
sloper blades
winches

Related Heavy Equipment Machinery

backhoes
boom trucks
cold planers
compact rollers
compactors
concrete pavers
concrete pump
crawler-tractor (dozer)
directional drill
dragline
forklift
front end loaders
front shovels (conventional and hydraulic)
graders
hydraulic excavators
industrial tractors
loaders (knuckleboom, log, track, rubber-tired)
material handlers
paving equipment (asphalt pavers, shuttle buggies)
pipelayers
road reclaimers
scrapers (pull-type, self-propelled)
screeds
skid steer loaders
soil stabilizers
tandem dump trucks
telehandlers
track loaders
track-type tractors
trenchers
wheel dozers
wheel loaders
motor graders
multi-terrain loaders
off highway tractors
off highway trucks (articulated and rigid framed)

APPENDIX B GLOSSARY

attachment	an accessory attached or designed to be attached to a machine
aggregates	broad category of coarse particulate material used in construction, including sand, gravel, crushed stone, slag, recycled concrete and geosynthetic aggregates
bedding	material placed under and around pipe for support and protection
cycle time	time it takes to accomplish a task such as moving bucket out of a ditch and back again
falling objects protective structure (FOPS)	heavy duty structure for protection of the machine operator from falling objects. Usually has four posts and a strong roof
locate sheet	document from utility authorities which provides the location of underground utilities such as gas, sewer and electrical
logbook	book of documented history of maintenance and inspections done on a piece of equipment
pile	small assemblage of material
proctor test	test to measure density of compacted soils
riparian zone	areas that surround water bodies in the watershed that are composed of moist to saturated soils, water-loving plant species and their associated ecosystems
roll over protective structure (ROPS)	roll bar or similar device to help protect the driver in case the machine tips over
segregation	when fine and coarse materials separate
stockpile	supply of materials such as aggregates, wood or other materials, gathered and held in reserve for use
swell factors	increase of bulk in soil or rock when it is dug or blasted
trench box	engineered steel or aluminum structures that are used to help protect workers who work inside trenches

APPENDIX C ACRONYMS

CMS	computer monitoring system
CPR	cardiopulmonary resuscitation
DEF	Diesel Exhaust Fluid
ERP	emergency response plan
FOPS	falling objects protective structure
GPS	Global Positioning System
MSDS	Material Safety Data Sheet
OH&S	Occupational Health and Safety
OMM	operation and maintenance manual
PPE	personal protective equipment
ROPS	roll over protective structure
SCBA	self-contained breathing apparatus
TDG	Transportation of Dangerous Goods
WHMIS	Workplace Hazardous Materials Information System

APPENDIX D BLOCK AND TASK WEIGHTING

BLOCK A COMMON OCCUPATIONAL SKILLS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	30	10	30	25	NV	35	15	ND	ND	20	ND	ND	ND	23%

Task 1 Uses and maintains tools and equipment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	20	31	60	44	NV	20	20	ND	ND	15	ND	ND	ND	30%

Task 2 Maintains safe work environment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	50	42	20	33	NV	60	40	ND	ND	42	ND	ND	ND	41%

Task 3 Organizes work.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	27	20	23	NV	20	40	ND	ND	43	ND	ND	ND	29%

BLOCK B HEAVY EQUIPMENT (DOZER) INSPECTION AND BASIC MAINTENANCE

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	20	28	40	25	NV	35	40	ND	ND	20	ND	ND	ND	30%

Task 4 Performs scheduled maintenance.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	70	38	50	60	NV	30	50	ND	ND	65	ND	ND	ND	52%

Task 5 Performs inspections.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	62	50	40	NV	70	50	ND	ND	35	ND	ND	ND	48%

BLOCK C HEAVY EQUIPMENT OPERATOR (DOZER) TASKS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	50	62	30	50	NV	30	45	ND	ND	60	ND	ND	ND	47%

Task 6 Performs basic heavy equipment operator (dozer) functions.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	45	32	30	33	NV	40	40	ND	ND	35	ND	ND	ND	36%

Task 7 Transports equipment.

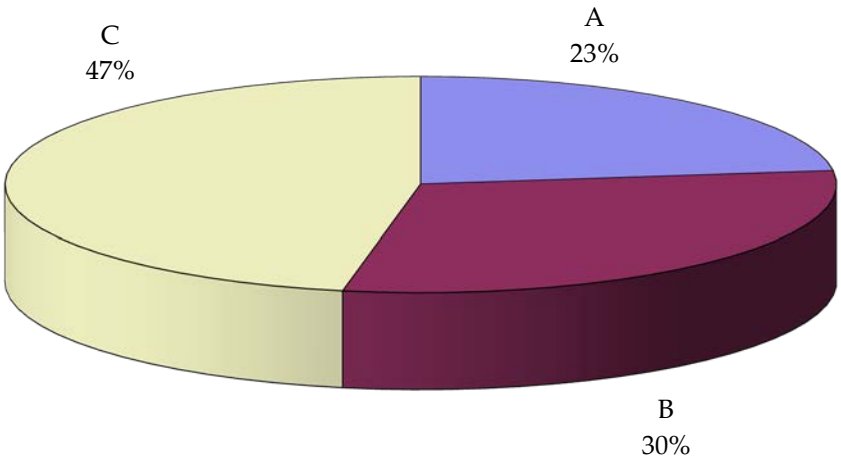
	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	10	20	30	20	NV	15	20	ND	ND	10	ND	ND	ND	18%

Task 8 Operates dozers.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	45	48	40	47	NV	45	40	ND	ND	55	ND	ND	ND	46%

APPENDIX E

PIE CHART*



TITLES OF BLOCKS

BLOCK A	Common Occupational Skills	BLOCK C	Heavy Equipment Operator (Dozer) Tasks
BLOCK B	Heavy Equipment (Dozer) Inspection and Basic Maintenance		

*Average percentage of the total number of questions on an interprovincial examination, assigned to assess each block of the analysis, as derived from the collective input from workers within the occupation from all areas of Canada. Interprovincial examinations typically have from 100 to 150 multiple-choice questions.

APPENDIX F

TASK PROFILE CHART — Heavy Equipment Operator (Dozer)

BLOCKS	TASKS	SUB-TASKS				
A - COMMON OCCUPATIONAL SKILLS	1. Uses and maintains tools and equipment.	1.01 Maintains hand and power tools.	1.02 Maintains measuring and testing equipment.	1.03 Uses grade checking and tracking instruments.	1.04 Uses winches and rigging equipment.	1.05 Uses personal protective equipment (PPE) and safety equipment.
	2. Maintains safe work environment.	2.01 Assesses potential hazards.	2.02 Plans worksite safety strategies.	2.03 Secures unattended equipment.	2.04 Communi-cates with others.	2.05 Performs spill control procedures.
		2.06 Performs sediment control procedures.	2.07 Handles material.			
	3. Organizes work.	3.01 Checks grade.	3.02 Uses documentation.	3.03 Interprets survey indicators and data.	3.04 Determines method of approach.	
B - HEAVY EQUIPMENT (DOZER) INSPECTION AND BASIC MAINTENANCE	4. Performs scheduled maintenance.	4.01 Maintains heavy equipment operator (dozer) station.	4.02 Maintains undercarriage, drive train system and tracks.	4.03 Performs preventative maintenance.	4.04 Performs basic maintenance on attachments.	
	5. Performs inspections.	5.01 Performs pre-operational inspections.	5.02 Performs post-operational inspections.	5.03 Completes daily equipment logbook.		
C - HEAVY EQUIPMENT OPERATOR (DOZER) TASKS	6. Performs basic heavy equipment operator (dozer) functions.	6.01 Maintains control of equipment.	6.02 Positions equipment for task.	6.03 Monitors performance of equipment.	6.04 Trouble-shoots equipment problems.	6.05 Installs attachments.

BLOCKS	TASKS	SUB-TASKS				
		6.06 Performs emergency procedures.	6.07 Compacts material.	6.08 Performs cut and fill operations.	6.09 Clears snow and ice. **(NOT COMMOM CORE)**	
	7. Transports equipment.	7.01 Prepares equipment for transportation.	7.02 Loads equipment and attachments for transportation.	7.03 Assists in securing equipment for transportation.	7.04 Unloads equipment and attachments.	
	8. Operates dozers.	8.01 Moves mass material.	8.02 Strips surface material.	8.03 Creates slopes and ditches.	8.04 Spreads material.	8.05 Clears land.
		8.06 Pushes scrapers.	8.07 Backfills trenches and excavations.	8.08 Levels demolition materials.	8.09 Maintains dumpsite area.	