
NL Curriculum Standard Plan of Training

Heavy Equipment Operator



Government of Newfoundland and Labrador
Department of Immigration, Population Growth and Skills
Apprenticeship and Trades Certification Division

June 2018

PLAN OF TRAINING

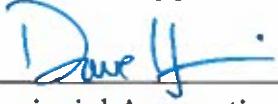
Heavy Equipment Operator

June 2018



Government of Newfoundland and Labrador
Department of Advanced Education, Skills and Labour
Apprenticeship and Trades Certification Division

Approved by:



Chairperson, Provincial Apprenticeship and Certification Board

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Preface

This curriculum standard is based on the 2015 edition of the National Occupational Analysis (NOA) and 2016 edition of the Red Seal Program Guide (IPG) for the Red Seal Heavy Equipment Operator trade. It describes the curriculum content for the Heavy Equipment Operator apprenticeship training program.

Acknowledgements

The Provincial Trade Advisory Committee (PTAC), industry representatives, instructors and apprenticeship staff provided valuable input to the development of this provincial plan of training. Without their dedication to quality apprenticeship training, this document could not have been produced.

We offer a sincere thank you to the following:

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Document Status	Date Approved	Mandatory Implementation Date	Comments
New	June 2018	January 2019	Release of the Direct Entry Plan of Training for HEO
Update	September 2018	January 2019	The trade is now designated for certification and training for both Provincial and Red Seal pieces of equipment using the curriculum outlined in this POT
Update	March 2019	September 2019	Updated Related Suite courses
Update	March 2020	September 2020	<ul style="list-style-type: none"> • One Objective and Practical requirement changed in HE1601 • Pre-requisites modified to include Co-requisite of AM1171 for five courses (HE1161, HE1170, HE1121, HE1210, HE1220)
Update	March 2021	Immediate implementation	<ul style="list-style-type: none"> • Addition of a note on simulator use (page 7) • Addition of a note on Student – Instructor ratio (page 7)

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A. Program Structure

For each and every course, a formal assessment is required for which 70% is the pass mark. A mark of 70% must be attained in both the theory examination and the practical project assignment, where applicable as documented on an official transcript.

The order of course delivery within each level can be determined by the training institution, as long as pre-requisite and co-requisite conditions are satisfied.

Upon completion of a training program, individuals may be required to complete other certifications (employer or job site specific) in order to gain employment.

LEVEL 1				
Course No.	IPG No.	Course Name	Hours	Pre- or Co-Requisite(s)
HE1111	HEO-100	Safety	6	None
HE1103	HEO-180	Equipment Operation Safety	12	HE1111 HE1621
HE1130	HEO-145	Heavy Equipment Certification Requirements	6	HE1621
HE1601	-	Air Brakes	15	None
HE1161	HEO-110	Hoisting and Rigging	12	AM1171 HE1111 HE1621
HE1170	HEO-120	Survey Indicators	9	AM1171 HE1111
HE1121	HEO-125	Slopes and Grades	9	AM1171 HE1111
HE1181	HEO-130	Methods of Approach for Worksite Job Planning	3	HE1111 HE1121
HE1191	HEO-135	Trade Related Documents	9	HE1111
HE1210	HEO-205	Drawings and Plans	4	AM1171
HE1220	HEO-140	Soil Fundamentals	4	AM1171
HE1203	HEO-155	Scheduled and Preventative Maintenance	10	HE1111
HE1231	HEO-160	Pre- and Post-Operational Inspections	9	HE1191
HE1241	HEO-165	Troubleshooting and Basic Repairs	6	HE1203

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LEVEL 1				
Course No.	IPG No.	Course Name	Hours	Pre- or Co-Requisite(s)
HE1250	HEO-175	Transportation of Equipment	10	HE1563 HE1503 HE1523 HE1513 HE1533 HE1543 HE1553
HE1261	HEO-185	Environmental Protection	6	HE1220
HE1621	-	Powerline Hazards	6	None
HE1631	-	Transportation of Dangerous Goods (TDG)	6	None
OL1605	-	Traffic Control Person (TCP)	6	None
AM1171	-	HEO Math Fundamentals	42	None*
Choose three courses from the heavy equipment list in Table 1.0			150	HE1130 HE1601 HE1103 HE1231
Total Course Credit Hours			340	

*A **Direct Entry** HEO apprentice is not required to complete AM1101 – Math Essentials course.

Heavy Equipment List

Table 1.0

Course Number	IPG No.	Course Name	Hours	Pre- or Co-Requisite(s)
Choose three (3) of the following courses which will consist of a minimum of 30 hours practical / operating time per student per piece of equipment.				
HE1563	EXC-190	Excavator	50*	HE1130 HE1601 HE1103 HE1231
HE1503	DOZ-190	Dozer	50*	
HE1523	TLB-190	Tractor-Loader-Backhoe (TLB)	50*	
HE1513	-	Grader	50*	
HE1533	-	Front-End Loader	50*	
HE1543	-	Tandem Dump Truck	50*	
HE1553	-	Off-Highway Dump Truck	50*	

*** FLEXIBLE HOURS:**

There will be a total of 150 hours allocated for three pieces of equipment (theory and practical combined) – typically 50 hours per each piece of equipment.

However, if an apprentice shows proficiency, through a Demonstration of Skills (DOS), in one or more pieces of equipment in less than 50 hours, then there is a flexibility to apply the remaining hours to any of their other scheduled piece(s) of equipment.

Notes:

1. Use of a simulator by an educational institution in place of actual seat time on a piece of equipment requires prior approval by the Department. Requests for simulator use will be reviewed by the Provincial Trade Advisory Committee (PTAC) to ensure it meets audio / visual / sensory feedback quality. The PTAC will review the simulator specifications and its application in delivering POT content to determine how many hours could be credited towards practical seat time for an individual piece of equipment. This may involve on-site evaluation by one or more members representing the PTAC.

Use of simulators as a supplemental instruction tool, without hour credit, is unlimited and does not require approval by the Department or PTAC.

2. For instruction that takes place in the field/pit/yard, the maximum allowable number of students per instructor is 8:1.

[CORE CONTENT]

HE1111 Safety

Learning Outcomes:

- Demonstrate knowledge of personal protective equipment (PPE) and safety equipment, their applications, maintenance and procedures for use.
- Demonstrate knowledge of safe operating procedures.
- Demonstrate knowledge of regulatory requirements pertaining to safety.

Duration: 6 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Define terminology associated with PPE and safety equipment.
2. Identify workplace hazards and describe safe work practices and equipment.
 - i. personal
 - pressurized and hot fluids
 - pinch points
 - slips, trips and falls
 - ii. workplace
 - environment (surroundings)
 - traffic control (flagsperson)
 - confined space
 - H₂S gas
 - powerline hazards/utilities
 - underground
 - overhead
 - iii. environmental
 - weather/climate effects
 - soil conditions
3. Review workplace safety and health regulations.
 - i. federal
 - Workplace Hazardous Material Information System (WHMIS)
 - Safety Data Sheets (SDS)
 - Transportation of Dangerous Goods (TDG)

- ii. provincial/territorial
 - Occupational Health and Safety (OH&S)
 - First Aid
 - H₂S Alive
- iii. municipal
- iv. company policies
 - job safety analysis (JSA)
 - policies exceeding jurisdictional requirements

4. Identify types of PPE and describe their applications and procedures for use.
5. Describe the procedures used to maintain and store PPE and safety equipment.
6. Identify types of safety devices and describe their applications and procedures for use.
 - i. seat belts
 - ii. travel alarm
 - iii. hydraulic lock outs and brakes
 - iv. fire extinguishers
 - v. rollover protective structures (ROPS)
 - vi. falling objects protective structures (FOPS)
 - vii. communication devices
 - cell/satellite phones
 - mobile radios
 - viii. horns
7. Describe the procedures used to safely mount and dismount equipment (three-point contact).
8. Describe the procedures used to secure unattended equipment.
9. Describe the procedures used to lock out and tag out equipment.
10. Describe the procedures used to store, use, transport and dispose of materials.
 - i. site
 - building/construction
 - spoils
 - ii. hazardous
 - lubricants
 - coolants
 - fuel
11. Interpret soil types and explain how they affect strength and stability of trench walls.

12. Describe the conditions that affect trench wall stability.
 - i. vibration
 - ii. spoil surcharge
 - iii. weather/moisture
 - iv. equipment traffic
13. Describe the procedures used to protect workers against cave-ins.
 - i. trench boxes
 - ii. shoring
 - iii. sloping
14. Describe emergency procedures used while working in and around trenches.
 - i. emergency procedures
 - ii. safe access and egress
15. Describe emergency and operational procedures used while working with or around utilities.
 - i. powerlines
 - ii. pipelines
 - iii. above ground utilities
 - iv. underground/buried utilities
 - v. after exposed underground utilities
16. Describe the procedures used while working around moving equipment and vehicles.
 - i. blind spots
 - ii. site planning
 - iii. eye contact
 - iv. signaler

Practical Requirements:

None.

HE1103 Equipment Operation Safety

Learning Outcomes:

- Demonstrate knowledge of hazards and conditions pertaining to the operation of heavy equipment.
- Demonstrate knowledge of the procedures to safely operate heavy equipment.

Duration: 12 Hours

Pre-Requisite(s): HE1111, HE1621

Objectives and Content:

1. Define terminology associated with the safe operation of heavy equipment.
2. Identify hazards and describe safe work practices pertaining to the operation of heavy equipment.
 - i. personal
 - training / competency
 - physiological states
 - psychological states
 - operational malpractice
 - operating unsafe equipment
 - operating equipment unsafely
 - ii. workplace
 - weight restrictions on infrastructure
 - bridges
 - temporary false work
 - dock/wharf
 - parking garage
 - enclosed areas
 - underground work
 - stability of excavations and trenches
 - utilities
 - site traffic and personnel
 - iii. equipment
 - mechanical failures
 - machine capacity
 - machine stability
 - hot surfaces
 - pressurized components
 - rotating components
 - crushing/pinching

- iv. weather conditions
- v. soil conditions

3. Review acts, regulations, requirements and policies pertaining to the safe operation of heavy equipment.

- i. federal
- ii. provincial/territorial
- iii. municipal
- iv. manufacturers' specifications
- v. company policies
- vi. personal liability / due diligence/ professionalism

4. Identify safe operating clearances.

- i. overhead/underground
- ii. sides
- iii. forward
- iv. rearward

5. Identify the conditions to be considered when determining equipment operating clearances.

- i. configuration
 - extended
 - retracted
- ii. attachments
- iii. extensions
- iv. swing and reach
- v. height and reach restriction devices
- vi. centre of gravity
 - tipping axis

6. Identify information required before digging.

- i. work permits
- ii. locates
- iii. hazard assessment / job safety analysis (JSA)
- iv. soil analysis

7. Describe the procedures used to safely shut down and secure heavy equipment.

- i. ground elevated equipment
- ii. block elevated equipment
- iii. use parking brakes/wheel chocks
- iv. chain or secure non-operational components
- v. emergency procedures

Practical Requirement:

None.

HE1130 Heavy Equipment Certification Requirements

Learning Outcomes:

- Demonstrate knowledge of heavy equipment certification requirements.

Duration: 6 Hours

Pre-Requisite(s): HE1621

Objectives and Content:

1. Review acts and regulations pertaining to the use of heavy equipment certification requirements.
 - i. licensing and permitting
 - Road Users Guide for Class 03 &/or 08
 - Air Brake 09A
 - ii. road regulations (highway traffic act)
 - iii. insurance requirements
 - iv. Occupational Health and Safety (OH&S)
2. Identify types of heavy equipment and describe their applications.
 - i. tractor-loader-backhoes (TLBs)
 - ii. dozers
 - iii. excavators
 - iv. grader
 - v. off-highway dump truck
 - vi. front-end loader
 - vii. tandem dump truck
 - viii. other equipment
 - skid steer
 - compactors

Practical Requirement:

1. Complete the Road Users Guide for Class 03 &/or 08 Endorsement provided by the provincial department responsible for Motor Registration.
2. Complete and pass the examination to receive a Class 03 Drivers licence & /or 08 Endorsement from the provincial department responsible for Motor Registration.

HE1601 Air Brakes

Learning Outcomes:

- Demonstrate knowledge of the procedures to prepare professional drivers to operate air brake equipped vehicles in a safe and collision free manner.
- Demonstrate knowledge of air brake systems.

Note: Any vehicle equipped with air brakes (ie: dump truck, loader) requires the operator to have the NL Air Brake 09 endorsement.

Duration: 15 Hours

Pre-requisite(s): None

Objectives and Content:

1. Define terminology associated with air brake systems.
 - i. brakes
 - ii. braking
 - iii. heat
 - iv. energy
 - v. traction
 - vi. friction
2. Describe how force is created, using mechanical advantage, through the application of air pressure and leverage.
3. State the three factors used to determine ‘Stopping Distance’.
4. Identify the components of an air brake system.
5. Identify the operator-activated control valves associated with an air brake system.
 - i. front wheel limiting valve
 - ii. parking brake valve
 - iii. trailer charging valve
 - iv. hand valve
6. Explain the basic operation of air brakes.
7. Identify the components of a trailer air brake system.

8. Explain the operation of a combined truck and trailer air brake system.
9. Explain the purpose of a dual air system.
10. Identify the procedure to complete the air brake system pre-trip on single and combination units.
11. Describe the methods used for checking push-rod travel to meet the acceptable manufacturer's criteria.
12. Explain the procedures to inspect air brakes.

Practical Requirements:

1. Demonstrate the procedure for inspecting air brakes.
 - i. visual inspection
 - ii. manual inspection
 - iii. application inspection
2. Complete and pass the examination for the NL Air Brake 09 Endorsement from the provincial department responsible for Motor Registration.

HE1161 Hoisting and Rigging

Learning Outcomes:

- Demonstrate knowledge of hoisting and rigging equipment, their applications, limitations and procedures for use.
- Demonstrate knowledge of basic hoisting and rigging techniques.
- Demonstrate knowledge of the procedures used to perform hoisting operations.
- Demonstrate knowledge of calculations required when performing hoisting operations.

Duration: 12 Hours

Pre-Requisite(s): HE1111, HE1621

Pre-Requisite(s) or Co-Requisite(s): AM1171

Objectives and Content:

1. Define terminology associated with hoisting and rigging.
2. Identify hazards and describe safe work practices pertaining to hoisting and rigging.
3. Review acts and regulations pertaining to hoisting and rigging.
 - i. Occupational Health and Safety (OH&S)
 - training requirements
4. Identify types of rigging equipment and accessories, and describe their applications, limitations and procedures for use.
 - i. ropes
 - ii. slings
 - iii. chains
 - iv. hooks
 - v. spreader bars
 - vi. shackles
 - vii. tag lines
5. Assess the factors when selecting rigging equipment.
 - i. load characteristics
 - ii. environment
 - iii. safety factor

6. Identify the considerations when rigging material and equipment for hoisting.
 - i. load characteristics
 - ii. equipment and accessories
 - iii. environmental factors
 - iv. anchor points/attachment locations
 - v. sling angles
 - vi. machine capacity/load chart
7. Identify types of knots, hitches, and splices, and describe the procedures used to tie them.
 - i. bowline
 - ii. running bowline
 - iii. square/reef
 - iv. half-hitch
8. Identify types of hoisting equipment and accessories, and describe their applications and procedures for use.
 - i. come-alongs
 - ii. chainfalls
 - iii. winches
9. Describe the procedures used to inspect, maintain and store hoisting and rigging equipment.
10. Describe the effect of sling angle on the working load limit (WLL) when preparing for hoisting operations.
 - i. strain
 - ii. capacity
11. Describe the procedures used for attaching rigging equipment to the load.
12. Identify and interpret basic hand signals used for hoisting.
13. Identify and describe procedures used to communicate during hoisting and rigging operations.
 - i. hand signals
 - ii. electronic communications
 - iii. audible/visual
14. Describe the procedures used to ensure the work area is safe for hoisting.

15. Interpret the lift plan and describe the procedures used to perform a lift.
 - i. determine load weight and dimensions
 - ii. identify machine capacity
 - iii. determine rigging requirements (WLL/SWL)
 - iv. determine communication methods
 - v. perform pre-lift checks
 - vi. determine placement of load
 - vii. perform lift
 - viii. perform post-lift inspection

Practical Requirement:

None.

HE1170 Survey Indicators

Learning Outcomes:

- Demonstrate knowledge of the use of basic survey equipment.

Duration: 9 Hours

Pre-Requisite(s): HE1111

Pre-Requisite(s) or Co-Requisite(s): AM1171

Objectives and Content:

1. Define terminology associated with surveying.
2. Interpret basic abbreviations, symbols and markings pertaining to surveying found on stakes.
 - i. centerline
 - ii. offsets
 - iii. stations
 - iv. benchmarks
 - v. geodetic station
3. Identify types of grade checking and tracking instruments and describe their applications.
 - i. string line
 - ii. auto level
 - laser levels
 - iii. measuring tapes
 - iv. surveyor's level
 - v. hand/sight level
 - vi. Global Positioning System (GPS)
 - vii. emerging technologies
4. Describe the procedures used to set-up and use grade checking and tracking instruments.
 - i. string lines
 - ii. auto level
 - laser level
 - iii. measuring tapes
 - iv. boning rods

5. Identify types of stakes and describe their applications.
 - i. utility warning stakes/ colour markings
 - ii. survey work stakes
6. Describe the procedures used to verify survey grade elevation and location.
 - i. set-up instrument
 - ii. establish instrument height
 - iii. transfer information to survey grade stake at job site
7. Describe the procedures used to read and record survey grade stake information.

Practical Requirement:

1. Use a hand level to check grade.
2. Set up and use a laser level to check grade.
3. Set up and use a surveyor's level to check grade.

HE1121 Slopes and Grades

Learning Outcomes:

- Demonstrate knowledge of slopes and grades.
- Demonstrate knowledge of calculating slope ratios and percentages.

Duration: 9 Hours

Pre-Requisite(s): HE1111

Pre-Requisite(s) or Co-Requisite(s): AM1171

Objectives and Content:

1. Define terminology associated with slopes and grades.
2. Interpret information pertaining to slopes and grades found on drawings and specifications.
3. Identify types of measuring tools used to establish grade levels and describe their applications and procedures for use.
4. Describe the procedures used to calculate the slope ratio or percentage.
5. Describe the procedures used to check grade.

Practical Requirement:

1. Perform a cut slope check.
2. Complete a ditch stake layout.

HE1181 Methods of Approach for Worksite Job Planning

Learning Outcomes:

- Demonstrate knowledge of methods of approach for worksite job planning.

Duration: 3 Hours

Pre-Requisite(s): HE1111, HE1121

Objectives and Content:

1. Define terminology associated with methods of approach for worksite job planning.
2. Identify hazards and safe work practices pertaining to determining methods of approach for worksite job planning.
 - i. underground obstacles
 - gas lines
 - water mains
 - storm lines
 - sewer lines
 - communication lines
 - ii. overhead obstacles
 - building protrusions
 - roof overhangs
 - overhead powerlines
 - bridges and overpasses
3. Interpret drawings and specifications to determine methods of approach for worksite job planning.
4. Identify considerations for machine selection and describe their limitations.
 - i. size
 - ii. dimensions
 - iii. capacity
 - iv. attachments
5. Identify the various methods of approach for worksite job planning.
 - i. parallel
 - ii. perpendicular
 - iii. bench
 - iv. ramps

6. Identify the considerations used to determine methods of approach for worksite job planning.
 - i. site conditions
 - soil
 - waterways
 - terrain
 - ii. environmental conditions
 - iii. weather conditions
 - iv. traffic

Practical Requirement:

None.

HE1191 Trade Related Documents

Learning Outcomes:

- Demonstrate knowledge of trade related documents and their use.
- Demonstrate knowledge of procedures used to prepare documentation.

Duration: 9 Hours

Pre-Requisite(s): HE1111

Objectives and Content:

1. Define terminology associated with trade related documents.
2. Review regulations and standards pertaining to the operation of heavy equipment.
 - i. manufacturers' recommendations in the OMM
 - ii. employer requirements/Safe Operating Procedures (SOP)
 - iii. regulatory and legislative requirements
 - Highway Traffic Act
 - Licensing and Equipment regulations
 - Cargo Securement
 - Occupational Health and Safety requirements (OH&S)
 - National Safety Code
 - Standard # 9 – hours of service
 - Standard # 13 – out-of-service criteria
3. Identify types of trade related documents and describe their applications.
 - i. manufacturers' specifications
 - ii. work orders
 - change
 - job
 - material
 - iii. logbooks
 - service / maintenance log
 - daily work log
 - driver's log
 - time card
 - iv. pre / post-operation documentation

- v. reports/forms
 - hazard assessments/JSA
 - accident/incident
 - toolbox/tailgate meeting documents
 - Worker's Compensation
 - equipment defect
- vi. maintenance/service records
- vii. stock/inventory records
 - stockroom
 - job site
 - equipment

4. Describe the procedures used to complete trade related documents.
 - i. complete the information at the required intervals
 - ii. follow company policies, manufacturers' specifications and legislative/regulatory requirements
5. Explain the importance of the coaching and mentoring relationship between journeyperson and apprentice.

Practical Requirement:

None.

HE1210 Drawings and Plans

Learning Outcomes:

- Demonstrate knowledge of drawings and plans and their applications.
- Demonstrate knowledge of the procedures to interpret and extract information from drawings and plans.

Duration: 4 Hours

Pre-Requisite(s) or Co-Requisite(s): AM1171

Objectives and Content:

1. Define terminology associated with drawings and plans.
2. Identify types of drawings.
 - i. civil
 - ii. sketches
3. Describe applications of civil drawings and site plans.
 - i. utility
 - ii. road building
 - iii. marine
 - iv. land clearing
 - v. pipeline
4. Identify the views found on drawings.
 - i. plan
 - ii. profile
 - iii. section
5. Identify the parts of a drawing and describe their purpose and applications.
 - i. lines
 - ii. legend
 - iii. symbols and abbreviations
 - iv. title block
 - v. notes and specifications
 - vi. orientation

Practical Requirements:

1. Interpret information from drawings and specifications.
 - i. assess site and obstacles
 - ii. determine measurements
 - iii. determine methods of approach
 - iv. develop a field sketch

HE1220 Soil Fundamentals

Learning Outcomes:

- Demonstrate knowledge of the types of soils suitable for construction and their characteristics.
- Demonstrate knowledge of swelling and compaction principles and their associated calculations.

Duration: 4 Hours

Pre-Requisite(s) or Co-Requisite(s): AM1171

Objectives and Content:

1. Describe soil characteristics.
 - i. load bearing
 - ii. density
 - iii. adhesion/cohesion
 - iv. shearing resistance
 - v. water resistance
 - vi. plasticity
 - vii. elasticity
 - viii. gradation
 - ix. texture
 - x. structure
 - xi. consistency
 - xii. colour
2. Identify soil types and describe their applications and characteristics.
 - i. cohesive
 - clay
 - silt
 - ii. granular
 - sand
 - gravel
 - iii. organic
 - topsoil
3. Describe methods used to determine soil suitability.
 - i. feel
 - ii. visual
 - iii. smell
 - iv. soil report
 - v. construction requirements/specifications

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4. Identify types of aggregates and describe their characteristics and applications.
5. Explain swell and compaction factors and describe their associated calculations.
6. Describe the procedures used to control water.
 - i. dams and berms
 - ii. ditches and swales
 - iii. pumps

Practical Requirement:

None.

HE1203 Scheduled and Preventative Maintenance

Learning Outcomes:

- Demonstrate knowledge of heavy equipment systems and components, and their function.
- Demonstrate knowledge of scheduled maintenance procedures.
- Demonstrate knowledge of preventative maintenance procedures.

Duration: 12 Hours

Pre-Requisite(s): HE1111

Objectives and Content:

1. Define terminology associated with scheduled and preventative maintenance of heavy equipment and attachments.
2. Identify hazards and describe safe work practices pertaining to the performance of scheduled and preventative maintenance.
3. Review acts, regulations and manufacturers' specifications pertaining to the performance of scheduled and preventative maintenance.
4. Identify tools and equipment used to perform scheduled and preventative maintenance, and describe their applications and procedures for use.
5. Identify types of heavy equipment systems and components, and describe their applications, and required scheduled and preventative maintenance.
 - i. engine systems
 - oil
 - cooling
 - fuel
 - air induction
 - exhaust (tier 4 emission requirements)
 - ii. lubrication system (greasing)
 - iii. hydraulic systems
 - iv. drive systems
 - transmission and final drive
 - hydrostatic drive

- v. braking systems
- vi. electrical systems
- vii. attachments and ground engaging components
- viii. operator station
- ix. undercarriage/drive train system
- x. tracks, tires and rims
- xi. steering systems

6. Describe the procedures used to maintain the heavy equipment operator station.

Practical Requirement:

None.

HE1231 Pre- and Post-Operational Inspections

Learning Outcomes:

- Demonstrate knowledge of pre-operational inspection procedures.
- Demonstrate knowledge of post-operational inspection procedures.

Duration: 9 Hours

Pre-Requisite(s): HE1191

Co-Requisite(s): HE1203

Objectives and Content:

1. Define terminology associated with pre- and post-operational inspections.
2. Identify hazards and describe safe work practices pertaining to pre- and post-operational inspections.
3. Review acts, regulations, manufacturers' specifications and company policies pertaining to pre- and post-operational inspections.
4. Identify the tools and equipment used to perform pre- and post-operational inspections, and describe their applications and procedures for use.
5. Identify systems and components that require pre- and post-operational inspections.
 - i. engine compartment
 - ii. air intake/exhaust systems
 - iii. transmission systems
 - iv. swing gear system
 - v. electrical system
 - vi. hydraulic system
 - vii. braking system
 - viii. steering system
 - ix. ground engaging components and attachments
 - x. undercarriage/drive train system
 - xi. tracks, tires and rims
 - xii. operator station
 - location and function of gauges and controls

- xiii. safety equipment
 - seat belt
 - wiper and washer (if required)
 - horn
 - backup alarm
 - lights
 - first aid kit
 - emergency shutdown and fire suppression system
 - fire extinguisher
- xiv. swing drive fluid level
- xv. dump body
- xvi. grader blade circle
- xvii. body condition

6. Describe the procedures used to perform pre-operational inspections.
7. Describe the procedures used to perform post-operational inspections.

Practical Requirement:

None.

HE1241 Troubleshooting and Basic Repairs

Learning Outcomes:

- Demonstrate knowledge of basic troubleshooting techniques.
- Demonstrate knowledge of basic repair procedures.

Duration: 6 Hours

Pre-Requisite(s): HE1203

Objectives and Content:

1. Define terminology associated with troubleshooting and repairing heavy equipment.
2. Identify hazards and describe safe work practices pertaining to troubleshooting and repairing heavy equipment.
3. Interpret policies and standards pertaining to troubleshooting and repairing heavy equipment.
 - i. company policies
 - ii. manufacturers' specifications
 - iii. operator's repair limits as set out by regulation and legislation
4. Interpret information found on drawings and schematics pertaining to troubleshooting and repairing heavy equipment.
5. Identify tools and equipment used to troubleshoot problems with heavy equipment.
6. Identify tools and equipment used to perform basic repairs on heavy equipment.
7. Identify potential failures, symptoms and indicators of failure.
 - i. noise
 - ii. vibration
 - iii. odours
 - iv. cracks
 - v. leaks
 - vi. loss of performance
 - vii. unintended motions
 - viii. starting issues

8. Describe the procedures used to troubleshoot problems with heavy equipment.
9. Interpret codes and warning signs/symbols observed in the operator station.
10. Describe the procedures used to tow vehicles.
 - i. operational
 - ii. non-operational
11. Describe the procedures used to perform basic repairs on heavy equipment.
 - i. adjust tracks
 - ii. change tires
 - iii. change teeth and cutting edges
 - iv. replace track pads
 - v. change lines and hoses
 - vi. change fuel and air filters
 - vii. replace fuses
 - viii. change grease fittings
 - ix. replace lights
 - x. replace wipers

Practical Requirement:

None.

HE1250 Transportation of Equipment

Learning Outcomes:

- Demonstrate knowledge of the procedures to load and unload equipment, attachments and implements for transportation.

Duration: 10 Hours

Co-Requisite(s): HE1563, HE1503, HE1523, HE1513, HE1533, HE1543, HE1553

Objectives and Content:

1. Define terminology associated with loading/unloading and transportation of equipment.
2. Identify hazards and describe safe work practices pertaining to loading/unloading and transportation of equipment.
3. Review acts and regulations pertaining to the loading/unloading and transportation of equipment.
 - i. licensing and permitting
 - ii. road regulations
4. Identify requirements pertaining to loading/unloading and transportation of equipment.
 - i. signage
 - slow vehicle
 - over dimensions
 - pilot vehicle
 - dangerous goods placards
 - ii. lighting
 - beacons
 - 4-way flashers
 - escort vehicle
 - iii. cleaning of debris
5. Identify considerations when preparing equipment for transportation.
 - i. types of trailer and their limitations
 - ii. height, weight and width of equipment
 - iii. weight and size of attachments and implements
 - iv. position of equipment on trailer
 - v. changes to centre of gravity
 - vi. securement (tie-downs and WLL)
 - NL Cargo Securement Regulations 152/04

6. Describe the procedures used to prepare equipment for transportation.
 - i. clean equipment
 - ii. remove attachments, implements and components as required
 - iii. install planking
 - iv. identify and attach rigging and hoisting materials
7. Describe the procedures used to load equipment, attachments, implements and components for transportation.
8. Describe the procedures used to secure equipment, attachments, implements and components for transportation.
9. Describe the procedures used to unload equipment, attachments, implements and components.

Practical Requirement:

1. Prepare a piece of equipment for transport.
2. Load a piece of equipment for transport
3. Secure a piece of equipment for transport. (Large group activity)
4. Unload a piece of equipment after transport.

HE1261 Environmental Protection

Learning Outcomes:

- Demonstrate knowledge of methods to minimize environmental impacts.
- Demonstrate knowledge of spill control techniques.
- Demonstrate knowledge of sediment control techniques.

Duration: 6 Hours

Pre-Requisite(s): HE1220

Objectives and Content:

1. Define terminology associated with environmental protection.
2. Identify environmental hazards and describe safe work practices and equipment.
 - i. personal
 - ii. workplace
 - iii. surroundings
 - iv. equipment
3. Review acts and regulations pertaining to the protection of the environment.
 - i. Fisheries Act
 - ii. Environmental Protection Act
 - iii. jurisdictional legislation
 - water
 - natural resources
4. Explain environmental impacts as they relate to the use of heavy equipment.
 - i. emissions
 - ii. pollution
 - soil
 - air
 - water
 - noise
 - iii. sedimentation
 - effects on plants and wildlife/fish
 - effects on waterways
 - iv. spills
 - fuel/oil
 - contaminated sites

5. Identify types and sources of spills or leaks.
 - i. broken or leaking lines
 - ii. mechanical failures
 - iii. sewage
 - iv. chlorination and flushing
 - v. improper storage and handling of fuels and oils
6. Describe the procedures used to prevent and control spills.
7. Describe the procedures used to clean-up spills.
8. Identify methods used to control sediment.
 - i. divert water
 - ii. provide filtration
 - silt fences / filter cloths
 - hay bales
 - iii. apply surface protection (stabilize soil)
 - mulch/straw
 - sod
 - maintain existing vegetation
 - use erosion control blankets
 - place rock on unstable slopes
 - install riprap/gabions
 - leave buffer zones
9. Describe the procedures used to minimize impacts on the environment.
 - i. soil
 - ii. air
 - iii. water
 - iv. noise

Practical Requirement:

None.

HE1621 Powerline Hazards

Learning Outcomes:

- Demonstrate knowledge of the procedures for working safely near power lines by recognizing hazards and putting controls in place to prevent injury to people and property damage.

Duration: 6 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Review the course content and materials on Powerline Hazards, which is provided by Workplace NL.

Practical Requirements:

1. Complete the Participant's Workbook from Workplace NL.

HE1631 Transportation of Dangerous Goods (TDG)

Learning Outcomes:

- Demonstrate knowledge of the Training Certificate requirements for the transportation of dangerous goods (TDG).
- Demonstrate knowledge of the criteria for handling, offering for transport or transporting dangerous goods.
- Demonstrate knowledge of employer guidelines for directing or allowing employees to handle, offer for transport or transport dangerous goods.

Duration: 6 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Identify the nine classifications of dangerous goods in 'Classifications'.
2. Identify and interpret the shipping names used for various products.
3. Understand the use of Schedules 1, 2 and 3.
4. Identify the required documents for shipping and handling dangerous goods in 'Documentation'.
5. Identify the safety mark requirements of dangerous goods in 'Dangerous Goods Safety Marks'.
6. Identify the packaging requirements for handling and shipping dangerous goods in "Means of Containment".
7. Identify the emergency response requirements in 'Emergency Response Assistance Plan (ERAP)'.
8. Identify the accidental release and imminent accidental release report requirements in 'Reporting Requirements'.
9. Describe the safe handling and transportation practices for dangerous goods, including the characteristics of the dangerous goods.
10. Identify equipment used to handle or transport dangerous goods and state the competencies required in 'Basic Competency Checklist'.

11. Identify and describe the reasonable emergency measures that must be taken to reduce or eliminate any danger to public safety that results (or may reasonably be expected to result) from an accidental release of the dangerous goods in 'Emergency Actions'.
12. Identify where to find information on transporting dangerous goods via other modes of transportation.
 - i. air
 - ii. marine
 - iii. rail

Practical Requirements:

1. Complete the exercises and write an exam using the TDG Guide as a reference.

OL1605 Traffic Control Person (TCP)

Learning Outcomes:

- Demonstrate knowledge of the importance of traffic control.
- Demonstrate knowledge of the methods and techniques of stopping, slowing and directing traffic.

Duration: 6 Hours

Pre-requisite(s): None

Objectives and Content:

1. Explain the importance of traffic control persons (TCPs).
 - i. ensure protection of co-workers
 - ii. ensure protection of public
 - iii. ensure safe and efficient flow of traffic
 - iv. legislative requirements
 - qualifications
2. Identify where, when and how many TCPs are required.
 - i. travel speed
 - ii. location
 - iii. volume of traffic
 - iv. visibility
 - v. type of roadway
 - vi. duration of the work
3. Identify the types of construction equipment and the hazards associated with working around them.
4. Identify the approved safety equipment required for a TCP.
 - i. specifications
 - ii. environmental conditions
 - iii. daylight
 - iv. dark
5. Identify proper standing location in the work area for TCPs.
 - i. in relation to traffic flow
 - ii. with additional TCPs
 - iii. escape route plan

6. Identify types of communication between TCPs.
 - i. visual
 - ii. traffic light system
 - iii. two-way radios
7. Define standard requirements for a stop/slow paddle.
8. Identify the procedure to stop traffic.
 - i. stop traffic in daytime
 - ii. stop traffic at night
9. Identify the procedure to direct traffic.
 - i. slow traffic
 - ii. start traffic
 - iii. continuous movement of traffic
10. Outline the general instructions for TCPs.
 - i. advance warning signs
 - ii. do's
 - iii. don'ts

Practical Requirements:

1. Complete a traffic control plan using the appropriate signage and distances for a given scenario utilizing the TCP manual.

AM1171 Heavy Equipment Operator Math Fundamentals

Learning Outcomes:

- Demonstrate knowledge of mathematical concepts in the performance of trade practices.
- Demonstrate knowledge of mathematics as a critical element of the trade environment.
- Solve mathematical word problems.
- Demonstrate knowledge of mathematical principles for the purposes of problem solving, job and materials estimation, measurement, calculation, system conversion, diagram interpretation and scale conversions, formulae calculations, and geometric applications.

Duration: 42 Hours

Pre-Requisite(s): None

Objectives and Content:

The instructor is required to use trade specific examples to reinforce the course objectives.

1. Describe percent/decimal/fraction conversions and comparisons in trade specific situations.
2. Describe ratios and proportions as they relate to trade specific problems.
3. Describe the use of the Imperial and Metric measurement systems in trade specific applications.
4. Describe Imperial and Metric conversions in trade specific situations.
 - i. convert between imperial and metric measurements
 - ii. convert to another unit within the same measurement system
5. Describe how to manipulate formulas using cross multiplication, dividing throughout, elimination, and substitution to solve trade specific problems.
 - i. right angle triangles
 - ii. area
 - iii. volume
 - iv. perimeter
 - v. density

6. Identify calculations involving geometry that are relevant to the trade.
 - i. angle calculations
 - ii. circle calculations
7. Identify math processes used to complete administrative trade tasks.
 - i. material estimation
 - ii. material costing
 - iii. time & labour estimates
 - iv. taxes & surcharges
 - v. markup & projecting revenue

Practical Requirements:

1. To emphasize or further develop specific knowledge objectives, students will be asked to complete practical demonstrations, which confirm proper application of mathematical theory to job skills.

Note: This course is **Non-Transferable** to other trades programs, and **Not Eligible for Prior Learning Assessment**. Students completing training in this trade program are required to complete this math course. Apprentice transfers under Provincial / Territorial Mobility agreements may be exempt from this requirement.

[PIECES OF EQUIPMENT]

HE1563 Excavator

Learning Outcomes:

- Demonstrate knowledge of excavators, their attachments and components.
- Demonstrate knowledge of procedures to operate excavators.
- Demonstrate knowledge of the procedures to remove and install excavator attachments and implements.

NOTE: If the college has a TLB on-site (at the campus) with the same control pattern as the excavator, then the student will be permitted to make use of that resource and use the TLB for a maximum of 15 hours of experience while completing excavator tasks during their practical in-seat training. This allows the school the diversity to utilize both the excavator and TLB pieces of equipment on-site / campus with the same control pattern for the practical experience portion of training for their students.

Duration: 50 Hours

Pre-Requisite(s): HE1130, HE1601, HE1103, HE1231

Objectives and Content:

1. Define terminology associated with excavators and attachments.
2. Identify hazards and describe safe work practices pertaining to the operation of excavators.
 - i. personal
 - three-point contact
 - ii. worksite
 - emergency procedures
 - lock-out and tag-out
 - site traffic and personnel
 - iii. work environment (surroundings)
 - iv. other equipment
 - v. installation, operation and removal of excavator attachments and implements
3. Review acts and regulations pertaining to the operation of excavators.
 - i. licensing and permitting
 - ii. road regulations
 - iii. restrictions
 - iv. Occupational Health and Safety (OH&S)

4. Identify types of excavators and describe their applications, characteristics and limitations.
5. Identify types of excavator attachments and implements, and describe their applications and limitations.
 - i. rock breaker
 - ii. buckets
 - iii. blades
 - iv. mulcher-heads
 - v. rippers
 - vi. thumbs
 - vii. packers (tamper)
 - viii. brushcutter
6. Identify and describe the procedures used to install and remove excavator attachments and implements.
 - i. tools and equipment
 - ii. communications
 - iii. installation methods
7. Identify the structural components of excavators.
8. Identify considerations when operating excavators.
 - i. road/site conditions
 - slopes
 - rough terrain
 - soil stability
 - ii. centre of gravity
 - tipping axis
 - iii. pinch points
 - iv. obstacles
 - powerlines
 - utilities
 - bridges
 - over/underpasses
 - culverts
 - v. visibility
 - vi. machine limitations
 - configuration
 - stability
 - vii. right-of-way

9. Describe the procedures used to operate excavators.
 - i. pre-start
 - ii. start up
 - iii. cycle controls/warm up
 - iv. equipment control
 - operating mode
 - adjustments
 - centre of gravity
 - clearances
 - travel mode
 - maneuvering
 - v. performance monitoring
 - GPS
 - vi. positioning for work
 - set-up location
 - stabilization
 - vii. basic functions
 - curl and dump bucket
 - raise and lower boom
 - extend and retract dipper stick
 - swing
 - move forward, reverse, stop, pivot turn, gradual turn and counter rotate
 - engage auxiliary function
 - viii. parking
 - position
 - lower ground-engaging attachments
 - lock-out hydraulics
 - cool down
 - shut down
 - securing
 - post-operational check
10. Describe the procedures used to operate an excavator equipped with attachments and implements.
11. Describe the procedures used when creating and maintaining a bench cut.
12. Describe the procedures used to strip, segregate and stockpile materials.
13. Describe the procedures used to create mass excavations, while maintaining grade.
14. Describe the procedures used to create slopes and ditches, while maintaining grade.

15. Describe the procedures used to clear a location.
 - i. stumps / roots
 - ii. trees / brush
 - iii. rocks
 - iv. demolition
16. Describe the procedures used to excavate trenches, while maintaining grade.
17. Describe the procedures used to backfill trenches, excavations, and areas where utilities and other obstructions exist.
18. Describe the procedures used to load haulage units.
19. Describe the procedures used to operate excavators on roads.
20. Describe the procedures used to place and spread materials in lifts, while maintaining grade according to indicators.
21. Describe the procedures used to perform cut and fill operations, while maintaining grade according to indicators.
22. Describe procedures used when travelling with an excavator.
23. Describe the procedures used to maintain excavator attachments and implements.
24. Explain the importance of quality workmanship and professionalism when operating excavators.

Practical Requirement:

1. Operate an excavator and perform the following tasks while maintaining professionalism and quality workmanship:
 - i. perform a walk around and pre-start checks on an excavator
 - ii. perform start-up and shut-down procedures on excavator
 - iii. travel with an excavator
 - iv. excavate using a bench cut
 - v. strip and stockpile materials

- vi. create and backfill an excavation
- vii. create slopes and ditches
- viii. excavate and backfill a trench
- ix. rig and lift materials
- x. load materials into a haulage unit
- xi. operate an excavator on a simulated roadway

2. Remove and install an attachment to an excavator.

HE1503 Dozer

Learning Outcomes:

- Demonstrate knowledge of dozers and their attachment and components.
- Demonstrate knowledge of procedures to operate dozers.
- Demonstrate knowledge of the procedures to remove and install dozer attachments and implements.

Duration: 50 Hours

Pre-Requisite(s): HE1130, HE1601, HE1103, HE1231

Objectives and Content:

1. Define terminology associated with dozers and attachments.
2. Identify hazards and describe safe work practices pertaining to the operation of dozers.
 - i. personal
 - three-point contact
 - ii. worksite
 - emergency procedures
 - lock-out and tag-out
 - site traffic and personnel
 - iii. work environment (surroundings)
 - iv. other equipment
3. Review acts and regulations pertaining to the operation of dozers.
 - i. licensing and permitting
 - ii. road regulations
 - iii. restrictions
 - iv. Occupational Health and Safety (OH&S)
4. Identify types of dozers and describe their applications, characteristics and limitations.
5. Identify types of dozer attachments and implements, and describe their applications and limitations.
 - i. winches
 - ii. blades
 - iii. rippers

6. Identify and describe the procedures used to install and remove dozer attachments and implements.
 - i. tools and equipment
 - ii. communications
 - iii. installation methods
7. Identify the structural components of dozers.
8. Identify considerations when operating dozers.
 - i. road/site conditions
 - slopes
 - rough terrain
 - soil stability
 - ii. centre of gravity
 - tipping axis
 - iii. pinch points
 - iv. obstacles
 - powerlines
 - utilities
 - bridges
 - culverts
 - v. visibility
 - vi. machine limitations
 - configuration
 - stability
 - vii. right-of-way
9. Describe the procedures used to operate dozers.
 - i. pre-start
 - ii. start up
 - iii. cycle controls/warm up
 - iv. equipment control
 - adjustments
 - centre of gravity
 - clearances
 - gear selection/shifting
 - maneuvering
 - v. positioning for work
 - set-up location
 - maintain stability
 - reposition

- vi. performance monitoring
 - GPS
- vii. basic functions
 - raise, lower, tilt and angle attachments
 - move forward, steer, stop, back up
- viii. parking
 - position
 - lower ground-engaging attachment
 - apply park brake
 - lockout transmission / hydraulics
 - cool down
 - shut down
 - securing
 - post-operational check

10. Describe the procedures used to strip and stockpile materials in lifts, while maintaining grade according to indicators.
11. Describe the procedures used to place and spread materials in lifts, while maintaining grade according to indicators.
12. Describe the procedures used to move mass materials.
13. Describe the procedures used to perform cut and fill operations in lifts, while maintaining grade according to indicators.
14. Describe the procedures used to clear land.
 - i. stumps / roots
 - ii. trees / brush
 - iii. rocks
15. Describe the procedures used to remove and stockpile snow.
16. Describe the procedures used to backfill trenches, excavations and locations where utilities or other obstacles exist.
17. Describe the procedures used to maintain dump sites.
18. Describe the procedures used to push scrapers.
19. Describe the procedures used to level demolition sites.
20. Describe the procedures used to create slopes and ditches, while maintaining grade according to indicators.

21. Describe procedures used when travelling with a dozer.
22. Describe the procedures used to maintain dozer attachments and implements.
23. Explain the importance of quality workmanship and professionalism when operating dozers.

Practical Requirement:

1. Operate a dozer and perform the following tasks while maintaining professionalism and quality workmanship:
 - i. perform a walk around and pre-start checks on a dozer
 - ii. perform start-up and shut-down procedures on a dozer
 - iii. travel with a dozer
 - iv. maintain a dump site
 - v. perform cut and fill operations
 - vi. strip and stockpile materials
 - vii. place and spread materials
 - viii. create and backfill an excavation
 - ix. create a slope
 - x. backfill a trench
 - xi. operate a dozer on a simulated roadway

HE1523 Tractor-Loader-Backhoe (TLB)

Learning Outcomes:

- Demonstrate knowledge of tractor-loader-backhoes (TLBs) and their attachments and components.
- Demonstrate knowledge of procedures to operate tractor-loader-backhoes (TLBs).
- Demonstrate knowledge of the procedures to remove and install tractor-loader-backhoes (TLB) attachments and implements.

NOTE: If the college has an excavator and / or a front-end loader on-site (at the campus) with the same control pattern as the TLB, then the student will be permitted to make use of those resources and use the excavator and / or front-end loader for a maximum of 15 hours of experience while completing TLB tasks during their practical in-seat training. This allows the school the diversity to utilize the excavator and / or front-end loader and TLB pieces of equipment on-site / campus with the same control pattern for the practical experience portion of training for their students.

Duration: 50 Hours

Pre-Requisite(s): HE1130, HE1601, HE1103, HE1231

Objectives and Content:

1. Define terminology associated with TLBs and attachments.
2. Identify hazards and describe safe work practices pertaining to the operation of TLBs.
 - i. personal
 - three-point contact
 - ii. worksite
 - emergency procedures
 - lock-out and tag-out
 - site traffic and personnel
 - iii. work environment (surroundings)
 - iv. other equipment

3. Review acts and regulations pertaining to the operation of TLBs.
 - i. licensing and permitting
 - ii. road regulations
 - iii. restrictions
 - iv. Occupational Health and Safety (OH&S)
4. Identify types of TLBs and describe their applications, characteristics and limitations.
5. Identify types of TLB attachments and implements, and describe their applications and limitations.
 - i. stingers
 - ii. 4-in-1 buckets
 - iii. blades
 - iv. sweepers
 - v. rock breakers
 - vi. forks
 - vii. hoe packs
 - viii. grinders
 - ix. grapples
 - x. snowblowers
6. Identify and describe the procedures used to install and remove TLB attachments and implements.
 - i. tool and equipment
 - ii. communications
 - iii. installation methods
7. Identify the structural components of TLBs.
8. Identify considerations when operating TLBs.
 - i. road/site conditions
 - slopes
 - rough terrain
 - soil stability
 - ii. centre of gravity
 - tipping axis
 - iii. pinch points
 - iv. obstacles
 - powerlines
 - utilities
 - bridges
 - over/underpasses
 - culverts

- v. visibility
- vi. machine limitations
 - configuration
 - stability
- vii. right-of-way

9. Describe the procedures used to operate TLBs.

- i. pre-start
- ii. start up
- iii. cycle controls/warm up
- iv. equipment control
 - adjustments
 - centre of gravity
 - clearances
 - gear selection/shifting
 - ride control
 - maneuvering
- v. performance monitoring
- vi. positioning for work
 - set-up location
 - stabilization
- vii. basic functions
 - raise and lower loader bucket
 - curl and dump loader bucket
 - lower stabilizers
 - raise and lower backhoe boom
 - extend and retract dipper stick
 - extend and retract telescopic dipper stick
 - engage float function
 - engage automatic leveller (return to dig function)
 - pre-set height kick-out
 - curl and dump backhoe bucket
 - engage/disengage the boom lock
 - swing backhoe boom
 - engage auxiliary functions
 - travel (forward, reverse and steer)

viii. parking

- position
- lower bucket
- apply park brake
- centre and secure hoe
- lock-out hydraulics
- release hydraulic pressure
- cool down
- shut down
- securing
- post-operational check

10. Describe the procedures used to dig, carry, segregate and stockpile materials.
11. Describe the procedures used to excavate trenches and excavations, while maintaining grade according to indicators.
12. Describe the procedures used to backfill trenches, excavations and areas where utilities and other obstructions exist.
13. Describe the procedures used to perform cut and fill operations, while maintaining grade according to indicators.
14. Describe the procedures used to perform clean-up operations.
15. Describe the procedures used to clear locations.
 - i. stumps / roots
 - ii. trees / brush
 - iii. rocks
 - iv. demolition
16. Describe the procedures used to load haulage units.
 - i. front-end attachment
 - ii. rear attachment
17. Describe the procedures used to push and remove snow and ice.
18. Describe the procedures used to create slopes and ditches.
19. Describe the procedures used to place materials and spread materials in lifts, while maintaining grade according to indicators.

20. Describe the procedures used to operate TLBs on roads.
21. Describe the procedures used when travelling with TLBs.
22. Describe the procedures used to maintain TLB attachments and implements.
23. Explain the importance of quality workmanship and professionalism when using TLBs.

Practical Requirements:

1. Operate a TLB and perform the following tasks while maintaining professionalism and quality workmanship:
 - i. perform a walk around and pre-start checks on a TLB
 - ii. perform start-up and shut-down procedures on a TLB
 - iii. travel with a TLB
 - iv. place materials
 - v. dig, carry and stockpile materials
 - vi. excavate and backfill an area
 - vii. perform cut and fill operations
 - viii. perform clean-up operations
 - ix. create slopes and ditches
 - x. excavate and backfill a trench
 - xi. rig and lift materials
 - xii. load materials into a haulage unit
 - use a front attachment
 - use a rear attachment
 - xiii. operate a TLB on a simulated roadway
2. Remove and install an attachment to a TLB.

HE1513 Grader

Learning Outcomes:

- Demonstrate knowledge of graders and their attachments and components.
- Demonstrate knowledge of procedures to operate graders.
- Demonstrate knowledge of the procedures to remove and install grader attachments and implements.

Duration: 50 Hours

Pre-Requisite(s): HE1130, HE1601, HE1103, HE1231

Objectives and Content:

1. Define terminology associated with graders.
2. Identify hazards and describe safe work practices pertaining to the operation of graders.
 - i. personal
 - three-point contact
 - ii. worksite
 - emergency procedures
 - lock-out and tag-out
 - site traffic and personnel
 - iii. work environment (surroundings)
 - iv. other equipment
3. Review acts and regulations pertaining to the operation of graders.
 - i. licensing and permitting
 - ii. road regulations
 - iii. restrictions
 - iv. Occupational Health and Safety (OH&S)
4. Identify types of graders and describe their applications, characteristics and limitations.
5. Identify types of grader attachments and implements, and describe their applications and limitations.
 - i. scarifiers / rippers
 - ii. blades
 - iii. wings

6. Identify and describe the procedures used to install and remove grader attachments and implements.
 - i. tools and equipment
 - ii. communications
 - iii. installation methods
7. Identify the structural components of graders.
8. Identify considerations when operating graders.
 - i. road/site conditions
 - slopes
 - rough terrain
 - soil stability
 - ii. centre of gravity
 - tipping axis
 - iii. pinch points
 - iv. obstacles
 - powerlines
 - utilities
 - bridges
 - culverts
 - v. visibility
 - vi. machine limitations
 - configuration
 - stability
 - vii. right-of-way
9. Describe the procedures used to operate graders.
 - i. pre-start
 - ii. start up
 - iii. cycle controls/warm up
 - iv. equipment control
 - adjustments
 - centre of gravity
 - clearances
 - gear selection/shifting
 - maneuvering
 - v. positioning for work
 - set-up location
 - maintain stability
 - reposition
 - vi. performance monitoring
 - GPS

- vii. basic functions
 - raise, lower, tilt and angle attachments
 - move forward, steer, stop, back up
 - front wheel lean
 - side and circle shift blade
 - articulate frame
- viii. parking
 - position
 - lower ground-engaging attachment
 - apply park brake
 - lockout transmission / hydraulics
 - cool down
 - shut down
 - securing
 - post-operational check

10. Describe the procedures used to strip materials.
11. Describe the procedures used to spread materials.
12. Describe the procedures used to perform cut operations.
13. Describe the procedures used to remove snow and ice.
14. Describe the procedures used to create slopes and ditches.
15. Describe the procedures used to maintain a finished grade according to indicators.
16. Describe procedures used when travelling with a grader.
17. Describe the procedures used to maintain grader attachments.
18. Explain the importance of quality workmanship and professionalism when operating graders.

Practical Requirement:

1. Operate a grader and perform the following tasks while maintaining professionalism and quality workmanship:
 - i. perform a walk around and pre-start checks on a grader
 - ii. perform start-up and shut-down procedures on a grader
 - iii. maintain a finished grade
 - iv. strip materials
 - v. spread materials
 - vi. scarify materials
 - vii. create a slope and ditch
 - viii. travel with a grader
 - ix. operate a grader on a simulated roadway

HE1533 Front-End Loader

Learning Outcomes:

- Demonstrate knowledge of front-end loaders and their attachments and components.
- Demonstrate knowledge of procedures to operate front-end loaders.
- Demonstrate knowledge of the procedures to remove and install front-end loader attachments and implements.

NOTE: If the college has a TLB on-site (at the campus) with the same control pattern as the front-end loader, then the student will be permitted to make use of that resource and use the TLB for a maximum of 15 hours of experience while completing front-end loader tasks during their practical in-seat training.

This allows the school the diversity to utilize both the front-end loader and TLB pieces of equipment on-site / campus with the same control pattern for the practical experience portion of training for their students.

Duration: 50 Hours

Pre-Requisite(s): HE1130, HE1601, HE1103, HE1231

Objectives and Content:

1. Define terminology associated with front-end loader and attachments.
2. Identify hazards and describe safe work practices pertaining to the operation of front-end loaders.
 - i. personal
 - three-point contact
 - ii. worksite
 - emergency procedures
 - lock-out and tag-out
 - site traffic and personnel
 - iii. work environment (surroundings)
 - iv. other equipment
3. Review acts and regulations pertaining to the operation of front-end loaders.
 - i. licensing and permitting
 - ii. road regulations
 - iii. restrictions
 - iv. Occupational Health and Safety (OH&S)

4. Identify types of front-end loaders and describe their applications, characteristics and limitations.
5. Identify types of front-end loader attachments and implements, and describe their applications and limitations.
 - i. stingers
 - ii. buckets (various)
 - iii. blades / wings
 - iv. sweepers
 - v. snow baskets
 - vi. forks
 - vii. grinders
 - viii. grapples
 - ix. snowblowers
 - x. shoulderering machine
6. Identify and describe the procedures used to install and remove attachments and implements to front-end loaders.
 - i. tool and equipment
 - ii. communications
 - iii. installation methods
7. Identify the structural components of front-end loaders.
8. Identify considerations when operating front-end loaders.
 - i. road/site conditions
 - slopes
 - rough terrain
 - soil stability
 - ii. centre of gravity
 - tipping axis
 - iii. pinch points
 - iv. obstacles
 - powerlines
 - utilities
 - bridges
 - over/underpasses
 - culverts
 - v. visibility
 - vi. machine limitations
 - configuration
 - stability
 - vii. right-of-way

9. Describe the procedures used to operate front-end loaders.
 - i. pre-start
 - ii. start up
 - iii. cycle controls/warm up
 - iv. equipment control
 - adjustments
 - centre of gravity
 - clearances
 - gear selection/shifting
 - ride control
 - maneuvering
 - v. performance monitoring
 - vi. positioning for work
 - set-up location
 - vii. basic functions
 - raise and lower loader bucket
 - curl and dump loader bucket
 - engage float function
 - engage automatic leveller
 - return to dig function
 - pre-set height kick-out
 - engage auxiliary functions
 - travel (forward, reverse and steer)
 - types of steering controls
 - viii. parking
 - position
 - lower and / or secure attachments
 - apply park brake
 - lock-out hydraulics
 - release hydraulic pressure
 - cool down
 - shut down
 - drain air tanks (if applicable)
 - securing
 - post-operational check
10. Describe the procedures used to dig, carry, segregate and stockpile materials.
11. Describe the procedures used to excavate materials while maintaining grade according to indicators.
12. Describe the procedures used to backfill trenches, excavations and areas where utilities and other obstructions exist.
13. Describe the procedures used to perform clean-up operations.

14. Describe the procedures used to maintain a smooth and level work area.
15. Describe the procedures used to load and carry materials.
 - i. stumps / roots
 - ii. rocks
 - iii. demolition
16. Describe the procedures used to load haulage units.
17. Describe the procedures used to push and remove snow and ice.
18. Describe the procedures used to place and spread materials in lifts.
19. Describe the procedures used to operate front-end loaders on roads.
20. Describe the procedures used when travelling.
21. Describe the procedures used to maintain front-end loader attachments and implements.
22. Explain the importance of quality workmanship and professionalism when using front-end loaders.

Practical Requirements:

1. Operate a front-end loader and perform the following tasks while maintaining professionalism and quality workmanship:
 - i. perform a walk around and pre-start checks on a front-end loader
 - ii. perform start-up and shut-down procedures on a front-end loader
 - iii. travel with a front-end loader
 - iv. place materials
 - v. dig, carry and stockpile materials
 - vi. excavate and backfill an area
 - vii. perform clean-up operations
 - viii. backfill a trench
 - ix. lift materials with forks
 - x. load materials into a haulage unit
 - xi. maintain a level and smooth work area
 - xii. operate a front-end loader on a simulated roadway
2. Remove and install an attachment to a front-end loader.

HE1543 Tandem Dump Truck

Learning Outcomes:

- Demonstrate knowledge of procedures to operate tandem dump trucks.

NOTE: Where a student has completed the Off-highway Truck course, a credit of 15 hours can be awarded towards the tandem dump truck operational time requirement.

Duration: 50 Hours

Pre-Requisite(s): HE1130, HE1601, HE1103, HE1231

Objectives and Content:

1. Define terminology associated with tandem dump trucks.
2. Identify hazards and describe safe work practices pertaining to the operation of tandem dump trucks.
 - i. personal
 - three-point contact
 - ii. worksite
 - emergency procedures
 - lock-out and tag-out
 - site traffic and personnel
 - iii. work environment (surroundings)
 - iv. other equipment
3. Review acts and regulations pertaining to the operation of tandem dump trucks.
 - i. licensing and permitting
 - ii. road regulations
 - iii. restrictions
 - iv. Occupational Health and Safety (OH&S)
4. Identify types of tandem dump trucks and describe their applications, characteristics and limitations.

5. Identify types of tandem dump truck attachments and implements, and describe their applications and limitations.
 - i. spreaders
 - ii. blades
 - iii. wings
6. Identify and describe the procedures used to install and remove tandem dump truck attachments and implements.
 - i. tools and equipment
 - ii. communications
 - iii. installation methods
7. Identify the structural components of tandem dump trucks.
8. Identify types of tandem dump truck dump boxes, and describe their applications and limitations.
 - i. u-body / v-body
 - ii. side dump
 - iii. standard
 - iv. others
9. Identify considerations when operating tandem dump truck.
 - i. road/site conditions
 - slopes
 - rough terrain
 - soil stability
 - ii. centre of gravity
 - tipping axis
 - iii. pinch points
 - iv. obstacles
 - powerlines
 - utilities
 - bridges
 - culverts
 - v. visibility
 - vi. machine limitations
 - configuration
 - stability
 - vii. right-of-way

10. Describe the procedures used to operate tandem dump trucks.
 - i. pre-start
 - out-of-service criteria
 - ii. start up
 - iii. cycle controls/warm up
 - iv. equipment control
 - adjustments
 - centre of gravity
 - clearances
 - gear selection/shifting
 - drive line retarder
 - maneuvering
 - v. positioning for work
 - set-up location
 - maintain stability
 - reposition
 - vi. performance monitoring
 - GPS / AVL (electronic fleet management)
 - vii. basic functions
 - raise and lower dump
 - move forward, steer, stop, back up
 - move materials
 - viii. parking
 - position
 - lower hydraulic assist (if applicable)
 - apply park brake
 - transmission in neutral
 - chock wheel (if applicable)
 - cool down
 - shut down
 - securing
 - drain air tanks (daily)
 - post-operational check
11. Describe the procedures used to dump materials.
12. Describe the procedures used to spread materials.
13. Describe the procedures used to transport materials.
14. Describe the procedures used to tow using a trailer.
15. Describe the procedures used to operate a tandem dump truck equipped with attachments.

16. Describe the procedures used to maintain tandem dump truck attachments.
17. Explain the importance of quality workmanship and professionalism when operating tandem dump truck.

Practical Requirement:

1. Operate a tandem dump truck and perform the following tasks while maintaining professionalism and quality workmanship:
 - i. perform a walk around and pre-start checks on a tandem dump truck
 - ii. perform start-up and shut-down procedures on a tandem dump truck
 - iii. haul and dump materials
 - iv. spread materials
 - v. perform maneuvers (forward and reverse) while assessing clearances, obstacles, environment, etc.
 - vi. operate standard shift transmission* (**see exception/exemption rule below**)
 - using proper shift sequence
 - coordinate the use of clutch and accelerator
 - xii. operate a tandem dump truck on a public roadway and in traffic

*** EXCEPTION /EXEMPTION RULE:**

Students MUST be given a minimum of 40 practical hours of training on the operation of standard shift transmissions in the HE1543 - Tandem Dump Truck course. After that time, if the student is unsuccessful in mastering the operation of the standard shift transmission, but is competent in all other aspects of the operation of the tandem dump truck, then they may be considered for an exemption. The instructor may recommend that the student receive the option to road test on an automatic tandem dump truck. If successful, their driver's license would indicate a restriction of Class 03 – Automatic Only.

HE1553 Off-Highway Dump Truck

Learning Outcomes:

- Demonstrate knowledge of procedures to operate off-highway dump trucks.

NOTE: Where a student has completed the Tandem Dump Truck course, a credit of 15 hours can be awarded towards the off-highway truck operational time requirement.

Duration: 50 Hours

Pre-Requisite(s): HE1130, HE1601, HE1103, HE1231

Objectives and Content:

1. Define terminology associated with off-highway dump trucks.
2. Identify hazards and describe safe work practices pertaining to the operation of off-highway dump trucks.
 - i. personal
 - three-point contact
 - ii. worksite
 - emergency procedures
 - lock-out and tag-out
 - site traffic and personnel
 - iii. work environment (surroundings)
 - iv. other equipment
3. Review acts and regulations pertaining to the operation of off-highways.
 - i. licensing and permitting
 - ii. road regulations
 - iii. restrictions
 - iv. Occupational Health and Safety (OH&S)
4. Identify types of off-highway dump trucks and describe their applications, characteristics and limitations.
5. Identify the structural components of off-highway dump trucks.

6. Identify considerations when operating off-highway dump trucks.

i. road/site conditions

- slopes
- rough terrain
- soil stability

ii. centre of gravity

- tipping axis

iii. pinch points

iv. obstacles

- powerlines
- utilities
- bridges
- culverts

v. visibility

vi. machine limitations

- configuration
- stability

vii. right-of-way

7. Describe the procedures used to operate off-highway dump trucks.

i. pre-start

ii. start up

iii. cycle controls/warm up

iv. equipment control

- adjustments
- centre of gravity
- clearances
- gear selection/shifting
- drive line retarder
- maneuvering

v. positioning for work

- set-up location
- maintain stability
- reposition

vi. performance monitoring

- GPS / AVL (electronic fleet management)

vii. basic functions

- raise and lower dump
- move forward, steer, stop, back up
- move materials

viii. parking

- position
- lower dump
- apply park brake
- transmission in neutral/park
- cool down
- shut down
- chock wheel (if applicable)
- securing
- post-operational check

8. Describe the procedures used to dump materials.
9. Describe the procedures used to spread materials.
10. Describe the procedures used to transport materials.
11. Explain the importance of quality workmanship and professionalism when operating off-highway dump trucks.

Practical Requirement:

1. Operate an off-highway dump truck and perform the following tasks while maintaining professionalism and quality workmanship:
 - i. perform a walk around and pre-start checks on an off-highway dump truck
 - ii. perform start-up and shut-down procedures on an off-highway dump truck
 - iii. haul and dump materials
 - iv. perform maneuvers (forward and reverse) while assessing clearances, obstacles, environment, etc.
 - v. operate a semi-automatic / power shift transmission on an off-highway dump truck
 - vi. operate a an off-highway dump truck on a simulated roadway

B. Conditions Governing Apprenticeship Training

1.0 General

The following general conditions apply to all apprenticeship training programs approved by the Provincial Apprenticeship and Certification Board (PACB) in accordance with the **Apprenticeship Training and Certification Act (1999)**. If an occupation requires additional conditions, these will be noted in the specific Plan of Training for the occupation. In no case should there be a conflict between these conditions and the additional requirements specified in a certain Plan of Training. All references to Memorandum of Understanding will also apply to Letter of Understanding (LOU) agreements.

2.0 Entrance Requirements

2.1 Entry into the occupation as an apprentice requires:

Indenturing into the occupation by an employer who agrees to provide the appropriate training and work experiences as outlined in the Plan of Training.

2.2 Notwithstanding the above, each candidate must have successfully completed a high school program or equivalent, and in addition may be required to have completed certain academic subjects as specified in a particular Plan of Training. Mature students, at the discretion of the Director of Apprenticeship and Trades Certification, may be registered. A mature student is defined as one who has reached the age of 19 and who can demonstrate the ability and the interest to complete the requirements for certification.

2.3 At the discretion of the Director of Apprenticeship and Trades Certification, credit toward the apprenticeship program may be awarded to an apprentice for previous work experience and/or training as validated through prior learning assessment.

2.4 An Application for Apprenticeship form must be duly completed along with a Memorandum of Understanding as applicable to be indentured into an Apprenticeship. The Memorandum of Understanding must contain signatures of an authorized employer representative, the apprentice and an official representing the Provincial Apprenticeship and Certification Board to be valid.

2.5 A new Memorandum of Understanding must be completed for each change in an employer during the apprenticeship term.

3.0 Probationary Period

The probationary period for each Memorandum of Understanding will be six months or 900 employment credit hours. Within that period the memorandum may be terminated by either party upon giving the other party and the PACB one week notice in writing.

4.0 Termination of a Memorandum of Understanding

After the probationary period referred to in Section 3.0, the Memorandum of Understanding may be terminated by the PACB by mutual consent of the parties involved, or cancelled by the PACB for proper and sufficient cause in the opinion of the PACB, such as that stated in Section 14.

5.0 Apprenticeship Progression Schedule, Wage Rates and Advanced Training Criteria

Progression Schedule

Heavy Equipment Operator - 4800 Hours			
Apprenticeship Level and Wages			
Level	Wage Rate	Requirements for Progression to Next Level	Next Level
1	60%	<ul style="list-style-type: none"> ▪ Completion of Pre-Employment / Level 1 training ▪ Registration as an apprentice ▪ Pass Level 1 exam* ▪ Minimum 1800 hours of combined relevant work experience and training 	2 nd Year
2	75%	<ul style="list-style-type: none"> ▪ Completion of Level 1 training ▪ Minimum 3200 hours of combined relevant work experience and training 	3 rd Year
3	90%	<ul style="list-style-type: none"> ▪ Completion of Level 1 training ▪ Minimum 4800 hours of combined relevant work experience and training on one piece of equipment ▪ Sign-off of all workplace skills for one piece of equipment in apprentice logbook ▪ Pass certification exam (100-question core exam, then a 30-question endorsement exam for an individual piece of equipment) or Red Seal examination. 	Journeyperson Certification (endorsement for one piece of equipment)
Journeyperson (one piece of equipment)		<ul style="list-style-type: none"> ▪ Sign-off of additional workplace skills totaling 2400 hours or more in an additional piece of equipment ▪ Pass certification endorsement exam for second piece of equipment or Red Seal examination. 	Journeyperson Certification - (two pieces of equipment)
Journeyperson (two or more pieces of equipment)		<ul style="list-style-type: none"> ▪ Sign-off of additional workplace skills totaling 2400 hours or more in <u>each</u> additional piece of equipment ▪ Pass certification endorsement exam for <u>each</u> additional piece of equipment or Red Seal examination. 	Journeyperson Certification - (for <u>each</u> additional piece of equipment)

Wage Rates

- Rates are percentages of the prevailing journeyperson's wage rate in the place of employment of the apprentice.
- Rates must not be less than the wage rate established by the Labour Standards Act (1990), as now in force or as hereafter amended, or by other order, as amended from time to time replacing the first mentioned order.
- Rates must not be less than the wage rate established by any collective agreement which may be in force at the apprentice's workplace.
- Employers are free to pay wage rates above the minimums specified.

Level Exams*

- This program may **not** currently contain level exams, in which case this requirement will be waived until such time as level exams are available.

Direct Entry Apprentice

- Must complete Level 1 courses through PLA and / or in-school training.
- Level 1 training will be completed via class calls; up to 16 weeks of training per calendar year.
- Minimum of 1800 hours of work experience required for class calls.

Class calls at Minimum Hours:

- Class calls may not always occur at the minimum hours indicated. Some variation is permitted to allow for the availability of training resources and apprentices.

Journeyperson – two to seven pieces of equipment

- An individual can progress to be a certified journeyperson in up to seven pieces of equipment pending:
 - Completion and sign-off of additional skills totaling a minimum of 2400 hours in each additional piece of equipment, and
 - Pass provincial certification (endorsement) or Red Seal exam for each additional piece of equipment

6.0 Tools

Apprentices shall be required to obtain their own hand tools applicable for the designated occupation of registration or tools as specified by the PACB.

7.0 Periodic Examinations and Evaluation

- 7.1 Every apprentice shall submit to such occupational tests and examinations as the PACB shall direct. If after such occupational tests and examinations the apprentice is found to be making unsatisfactory progress, his/her apprenticeship level and rate of wage shall not be advanced as provided in Section 5 until his/her progress is satisfactory to the Director of Apprenticeship and Trades Certification and his/her date of completion shall be deferred accordingly. Persistent failure to pass required tests shall be a cause for revocation of his/her Memorandum of Understanding.
- 7.2 Upon receipt of reports of accelerated progress of the apprentice, the PACB may shorten the term of apprenticeship and advance the date of completion accordingly.
- 7.3 For each and every course, a formal assessment is required for which 70% is the pass mark. A mark of 70% must be attained in both the theory examination and the practical project assignment, where applicable as documented on an official transcript.
- 7.4 Course credits may be granted through the use of a PACB approved matrix which identifies course equivalencies between designated trades and between current and historical Plans of Training for the same trade.

8.0 Granting of Certificates of Apprenticeship

Upon the successful completion of apprenticeship, the PACB shall issue a Certificate of Apprenticeship.

9.0 Hours of Work

Any hours employed in the performance of duties related to the designated occupation will be credited towards the completion of the term of apprenticeship. Appropriate documentation of these hours must be provided.

10.0 Copies of the Registration for Apprenticeship

The Director of Apprenticeship and Trades Certification shall provide copies of the Registration for Apprenticeship form to all signatories to the document.

11.0 Ratio of Apprentices to Journeypersons

Under normal practice, the ratio of apprentices to journeypersons shall not exceed two apprentices to every one journeyperson employed. Other ratio arrangements would be determined and approved by the PACB.

12.0 Relationship to a Collective Bargaining Agreement

Where applicable in Section 5 of these conditions, Collective Agreements take precedence.

13.0 Amendments to a Plan of Apprenticeship Training

A Plan of Training may be amended at any time by the PACB.

14.0 Employment, Re-Employment and Training Requirements

- 14.1 The Plan of Training requires apprentices to regularly attend their place of employment.
- 14.2 The Plan of Training requires apprentices to attend training for that occupation as prescribed by the PACB.
- 14.3 Failure to comply with Sections 14.1 and/or 14.2 will result in cancellation of the Memorandum of Understanding. Apprentices may have their MOUs reinstated by the PACB but would be subject to a commitment to complete the entire program as outlined in the General Conditions of Apprenticeship. Permanent cancellation in the said occupation is the result of non-compliance.
- 14.4 Cancellation of the Memorandum of Understanding to challenge journeyperson examinations, if unsuccessful, would require an apprentice to serve a time penalty of two (2) years before reinstatement as an apprentice or qualifying to receive a class call to training as a registered Trade Qualifier. Cancellation must be mutually agreed upon by the employer and the apprentice.
- 14.5 An employer shall ensure that each apprentice is under the direct supervision of an approved journeyperson supervisor who is located at the same worksite as the apprentice, and that the apprentice is able to communicate with the journeyperson with respect to the task, activity or function that is being supervised.
- 14.6 Under the Plan of Training the employer is required to keep each apprentice employed as long as work is available, and if the apprentice is laid off due to lack of work, to give first opportunity to be hired before another is hired.

- 14.7 The employer will permit each apprentice to attend training programs as prescribed by the PACB.
- 14.8 Apprentices who cannot acquire all the workplace skills at their place of employment will have to be evaluated in a simulated work environment at a PACB authorized training institution and have sign-off done by instructors to meet the requirements for certification.

15.0 Appeals to Decisions Based on Conditions Governing Apprenticeship Training

Persons wishing to appeal any decisions based on the above conditions must do so in writing to the Minister of Immigration, Population Growth and Skills within 30 days of the decision.

C. Requirements for Provincial Certification or Red Seal Endorsement

1. Evidence that the required work experiences outlined in this Plan of Training have been obtained. This evidence must be in a format clearly outlining the experiences and must be signed by an appropriate person or persons attesting that these experiences have been obtained to the level required.
2. Successful completion of all required courses in the program.
3. A combination of training from an approved training program and suitable work experience totaling 4800 hours for the initial piece of equipment.

Or

A total of 7200 hours of suitable work experience.

4. Completion of a certification examination, to be set at a place and time determined by the Apprenticeship and Trades Certification Division.

Provincial certification examination for - Front-end Loader, Grader, Tandem Dump Truck, or Off-highway Dump Truck.

National Red Seal examination for - Dozer, Excavator, or Tractor-Loader-Backhoe (TLB).

5. For additional endorsements, refer to pages 78-79.

D. Roles and Responsibilities of Stakeholders in the Apprenticeship Process

The apprenticeship process involves a number of stakeholders playing significant roles in the training of apprentices. This section outlines these roles and the responsibilities resulting from them.

The Apprentice:

- completes all required technical training courses as approved by the PACB.
- finds appropriate employment.
- completes all required work experiences in combination with the required hours.
- ensures work experiences are well documented.
- approaches apprenticeship training with an attitude and commitment that fosters the qualities necessary for a successful career as a qualified journeyperson.
- obtains the required hand tools as specified by the PACB for each period of training of the apprenticeship program.

The Employer:

- provides high quality work experiences in an environment conducive to learning.
- remunerates apprentices as set out in the Plan of Training or Collective Agreements.
- provides feedback to training institutions, Apprenticeship and Trades Certification Division and apprentices in an effort to establish a process of continuous quality improvement.
- where appropriate, releases apprentices for the purpose of returning to a training institution to complete the necessary technical courses.
- ensures work experiences of the apprentice are documented.
- ensures a certified journeyperson is currently on staff in the same trade area as the apprentice and whose certification is recognized by the NL Department of Immigration, Population Growth and Skills.

The Training Institution:

- provides a high quality learning environment.
- provides the necessary student support services that will enhance an apprentice's ability to be successful.
- participates with other stakeholders in the continual updating of programs.

The Apprenticeship and Trades Certification Division:

- establishes and maintains program advisory committees under the direction of the PACB.
- promotes apprenticeship training as a viable career option to prospective apprentices and other appropriate persons involved, such as career guidance counsellors, teachers, parents, etc.
- establishes and maintains a protocol with training institutions, employers and other appropriate stakeholders to ensure the quality of apprenticeship training programs.
- ensures all apprentices are appropriately registered and records are maintained as required.
- schedules all necessary technical training periods for apprentices to complete requirements for certification.
- administers level, provincial and Red Seal examinations.

The Provincial Apprenticeship and Certification Board:

- sets policies to ensure the provisions of the **Apprenticeship and Certification Act (1999)** are implemented.
- ensures advisory and examination committees are established and maintained.
- accredits institutions to deliver apprenticeship training programs.
- designates occupations for apprenticeship training and/or certification.