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PROGRAM OUTLINE

Saw Filer Endorsement: Benchperson

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SAW FILER ENDORSEMENT: BENCHPERSON PROGRAM OUTLINE

APPROVED BY INDUSTRY

MARCH 2013

Developed by
Industry Training Authority
Province of British Columbia

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Section 1

INTRODUCTION

Saw Filer

Pre-requisites

To register for this program you must hold a:

- Saw Filer – Certificate of Qualification

OR

- LMI Circular Sawfiler – Certificate of Qualification

Foreword

This Program Outline is for use in Saw Filer Endorsement: Benchperson apprenticeship training classes sponsored by the Industry Training Authority and will be used as a curriculum planning guide for instructors in the formal classroom portions of apprenticeship training.

Practical demonstration and student participation should always be integrated with classroom sessions.

Safe working practices, though not always specified in each of the competencies and learning tasks, are an implied part of the program and should be stressed throughout the apprenticeship.

This Program Outline includes a list of recommended reference textbooks that are available to support the learning objectives and the minimum shop requirements needed to support instruction.

Achievement Criteria set a common minimum standard for training providers to measure achievement of practical competencies. Achievement Criteria are included only for competencies that require a practical assessment. Where Achievement Criteria are specified, the apprentice must achieve the specifications, safety standards and timeframes described.

Competencies that are solely theory-based will be assessed through a multiple choice test(s) for which the apprentice must achieve a minimum score of 70%.

SAFETY ADVISORY

Be advised that references to the WorkSafe BC safety regulations contained within these materials do not/may not reflect the most recent Occupational Health and Safety Regulation (the current Standards and Regulation in BC can be obtained on the following website: http://www.worksafebc.com). Please note that it is always the responsibility of any person using these materials to inform him/herself about the Occupational Health and Safety Regulation pertaining to his/her work.

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How to Use this Document

This Program Outline has been developed for the use of individuals from several different audiences. The table below describes how each section can be used by each intended audience.

Section	Training Providers	Employers/ Sponsors	Apprentices	Challengers
Program Credentialing Model	Communicate program length and structure, and all pathways to completion	Understand the length and structure of the program	Understand the length and structure of the program, and pathway to completion	Understand challenger pathway to Certificate of Qualification
OAC	Communicate the competencies that industry has defined as representing the scope of the occupation	Understand the competencies that an apprentice is expected to demonstrate in order to achieve certification	View the competencies they will achieve as a result of program completion	Understand the competencies they must demonstrate in order to challenge the program
Training Topics and Suggested Time Allocation	Shows proportionate representation of general areas of competency (GACs) at each program level, the suggested proportion of time spent on each GAC, and percentage of time spent on theory versus practical application	Understand the scope of competencies covered in the technical training, the suggested proportion of time spent on each GAC, and the percentage of that time spent on theory versus practical application	Understand the scope of competencies covered in the technical training, the suggested proportion of time spent on each GAC, and the percentage of that time spent on theory versus practical application	Understand the relative weightings of various competencies of the occupation on which assessment is based
Program Content	Defines the objectives, learning tasks, high level content that must be covered for each competency, as well as defining observable, measureable achievement criteria for objectives with a practical component	Identifies detailed program content and performance expectations for competencies with a practical component; may be used as a checklist prior to signing a recommendation for certification (RFC) for an apprentice	Provides detailed information on program content and performance expectations for demonstrating competency	Allows individual to check program content areas against their own knowledge and performance expectations against their own skill levels

Section	Training Providers	Employers/ Sponsors	Apprentices	Challengers
Training Provider Standards	Defines the facility requirements, tools and equipment, reference materials (if any) and instructor requirements for the program	Identifies the tools and equipment an apprentice is expected to have access to; which are supplied by the training provider and which the student is expected to own	Provides information on the training facility, tools and equipment provided by the school and the student, reference materials they may be expected to acquire, and minimum qualification levels of program instructors	Identifies the tools and equipment a tradesperson is expected to be competent in using or operating; which may be used or provided in a practical assessment

Section 2

PROGRAM OVERVIEW

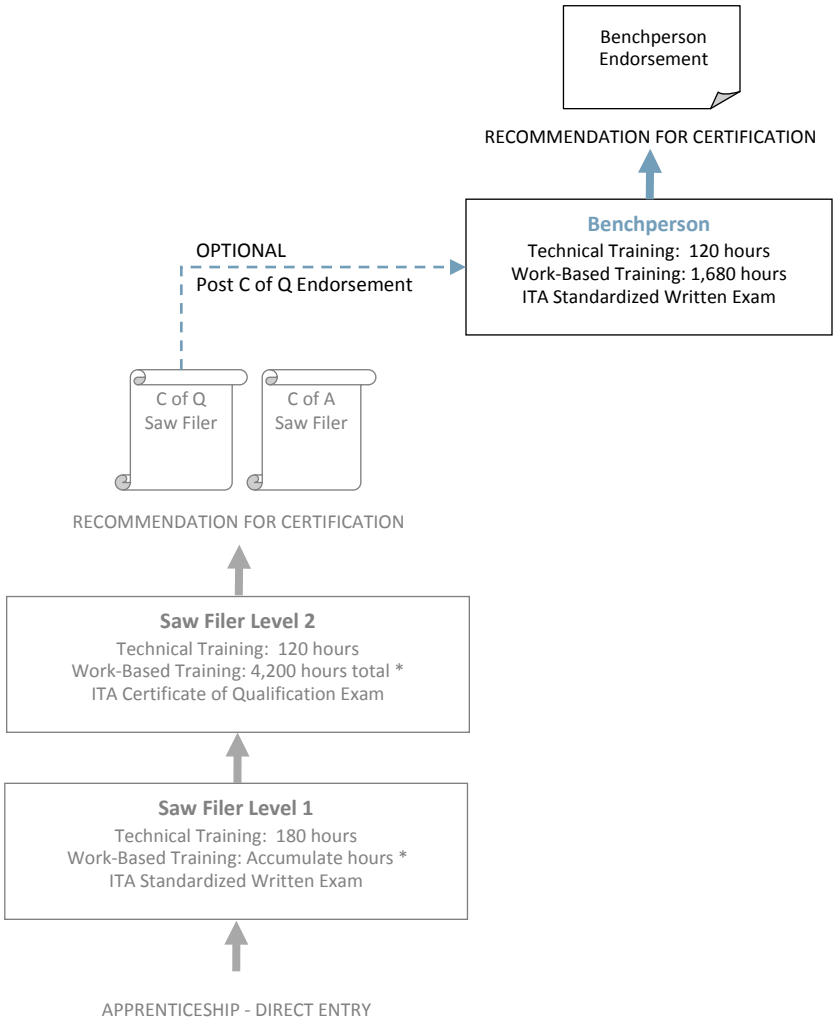
Saw Filer Endorsement: Benchperson

Program Credentialing Model

Apprenticeship Pathway

This graphic provides an overview of the Saw Filer Apprenticeship pathway.

C of Q = Certificate of Qualification
C of A = Certificate of Apprenticeship



** 840 hours of work-based training in the Saw Filer trade recommended prior to entering Level 1 Technical Training; 2,520 hours of work-based training in the Saw Filer trade recommended prior to entering Level 2 Technical Training*

CROSS-PROGRAM CREDITS

Individuals who hold the credentials listed below are entitled to receive partial credit toward the completion requirements of this program

None

Occupational Analysis Chart

SAW FILER (WITH OPTIONAL BENCHPERSON ENDORSEMENT)

Occupation Description: "Saw Filer: Benchperson Endorsement" means a person who is a qualified Saw Filer who is able to bench band saws, including the lining up of head rigs, grinding of band wheels and any other work usually performed by a Benchperson in the Lumber Manufacturing Industry.

SAW FILER TRADES A	Describe the Scope of the Saw Filer Trades A1 (1)	Describe Apprenticeship Program A2 (1)	Describe Saw Filer Trade Terminology A3 (1, 2)
SAFE WORK PRACTICES B	Describe WorkSafe BC Regulations B1 (1)	Practice Personal Safety B2 (1)	Handle Saws and Knives Safely B3 (1)
TRADE MATH C	Use Measuring Tools and Equipment C1 (1)	Apply Trade Formulas C2 (1, 2)	Calculate Strain C3 (EN)
SAW BASICS D	Describe Cutting Systems D1 (1)	Describe and Identify Types of Cutting Tips D2 (1)	Identify Saw Tooth Problems D3 (1)
	Describe Saw Filing Tools, Equipment and Parts D7 (1)	Describe Special Purpose Tools D8 (1)	

Swaging a Saw D4 (1)	Use Shapers D5 (1)	Align Teeth D6 (1)		

EN = Endorsement

BAND SAWS E	Fit Band Saw E1	Sharpen Band Saw E2	Handle Band Saws Safely E3	Determine Band Saw Kerf Requirements E4	Swage Band Saws E5	Shape Band Saws E6
	1	1	1	1	1	1
	Grind Band Saw Backs E7	Maintain Band Saw Grinders E8	Troubleshoot Band Saws E9			
	1	1	EN			
CIRCULAR SAWS F	Identify Types of Circular Saws F1	Inspect Circular Saws F2	Select Circular Saw Tools and Equipment F3	Use Circular Saw Grinders F4	Maintain Circular Saw Grinders F5	Replace Head Saw Bit and Shank F6
	1	1	1	1	1	2
	Replace Cut-off Saw Teeth and Inserted Teeth F7	Tip Carbide Saws F8	Grind Carbide Saws F9	Troubleshoot Carbide Saws F10	Tip Stellite Circular Saws F11	Grind Stellite Circular Saws F12
	2	2	2	2	2	2
	Troubleshoot Stellite Saws F13					
	2					
GRINDING WHEELS G	Use Grinding Wheels Safely G1	Identify Types of Grinding Wheels G2	Calculate Safe Operating Speeds G3	Shape and Dress Grinding Wheels G4	Identify Wheel Dressing Tools G5	Mount Grinding Wheels G6
	1	1	1	1	1	1

EN = Endorsement

KNIVES H	Identify Types of Knives H1	Determine Knife Angles H2	Describe Knife Construction H3	Use Knife Grinders H4	Sharpen Knives H5	Perform Knife Babbitting and Balancing H6
	1	1	1	1	1	1
	Troubleshoot Knives and Chippers H7					
	1					
SAW WELDING I	Use Safe Oxy-Acetylene Welding Practices I1	Use a Portable Oxy-Acetylene Unit I2	Select Oxy-Acetylene Welding Tools and Equipment I3	Adjust Types of Flames I4	Weld Saw Teeth I5	Perform Crack Welding Using Oxy-Acetylene I6
	1	1	1	1	1	1
	Weld Saws using MIG and TIG equipment I7	Weld Band Saws Using Oxy-Acetylene Equipment I8	Use Safe Arc Welding Practices I9	Identify Various Arc Welding Machines I10	Describe Electrode Characteristics and Classifications I11	Weld Saw Plate Using Manual Arc Welding Equipment I12
	1	1	2	2	2	2
	Butt Weld Saws I13					
	EN					
SAW CHAINS J	Identify Types of Saw Chain J1	Calculate Gauge and Pitch of Saw Chain J2	Inspect and Repair Saw Chain J3	Set-up and Sharpen Saw Chain J4	Describe Chain Saw Chain Tools J5	Determine Grinding Wheel Profile J6
	1	1	1	1	1	1

EN = Endorsement

SAW GUIDES K	Identify Types of Band Saw Guides K1	1					Identify Types of Circular Saw Guides K2	1					Identify Types of Guide Materials K3	1					Maintain Saw Guides K4	1				
SAW SHEARBOARDS, SCRAPERS, COOLING SYSTEMS AND HYDRAULICS L	Identify Types of Shearboards L1	1					Identify Types of Scrapers L2	1					Maintain Band Saw and Circular Saw Cooling Systems L3	1					Describe Hydraulic Systems L4					EN
TENSION, LEVEL AND BENCH SAWS M	Describe the Tools for Tensioning and Leveling Saws M1	1					Level Band Saws M2	1				EN	Tension Band Saws M3	1				EN	Level Circular Saws M4	1	2				Tension Circular Saws M5	1	2				Use Safe Saw Handling in Circular Saw Benching M6		2			
	Prepare Circular Saw for Benching M7		2				Select Benching Hand Tools and Equipment M8		2				Maintain Benching Hand Tools M9		2				Plumb Circular Saws M10		2				Describe Band Saw Steel Required Properties M11					EN	Determine Required Tension M12					EN
	Describe Band Saw Benches M13					EN	Maintain Band Saw Back M14					EN	Maintain Band Saw Tire M15					EN	Repair Band Saw Twists M16					EN	Heat Tension Band Saws M17					EN						
PLANNING AND ORGANIZING WORK ACTIVITIES N	Plan Project Work N1		2				Participate in Mill Shutdown Planning Procedures N2		2				Interpret LMI Technical Documents N3		2				Create / Update Technical Documents N4		2															

EN = Endorsement

SAW FILING ROOM MACHINES **O**	Set-up and Maintain Circular Saw Bench O1	Use Circular Saw Stretcher O2	Describe Operation and Maintenance of Circular Saw Grinders O3	Maintain Circular Saw Guide Equipment O4	Set-up and Maintain Band Saw Bench O5	Maintain Filing Room Machines and Equipment O6
	2	2	2	2	EN	EN
	Describe Automatic Saw Levellers O7	Describe Saw Control Systems O8				
	EN	EN				
CIRCULAR SAW MACHINES **P**	Perform Circular Head Rig Alignment and Maintenance P1	Align Circular Gang Saws P2	Align Edgers P3	Describe the Main Elements of an Optimizing System P4	Align Cut-Off, Trim and Slasher Saws P5	Perform Laser Alignment of Circular Machines P6
	2	2	2	2	2	2
	Align Chip Canter P7	Troubleshoot Circular Saw Machines P8				
	2	2				
BAND MILLS **Q**	Align Head Saw Band Mill Q1	Align Vertical Resaw Q2	Align Horizontal Resaw Q3	Align Twin and Quad Band Mills Q4	Align Other Saw Mill Machines Q5	Align Band Mill Using Laser Alignment Q6
	EN	EN	EN	EN	EN	EN
	Maintain Band Mill Components Q7	Perform Band Mill Production Shift Inspections Q8	Maintain Strain Systems Q9	Perform Band Mill Wheel Grinding Q10		
	EN	EN	EN	EN		

EN = Endorsement

QUALITY CONTROL R	Describe Quality Control Systems R1					Identify Standards, Measuring Methods and Data R2				
					EN					EN

EN = Endorsement

Training Topics and Suggested Time Allocation

BENCHPERSON ENDORSEMENT

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
Line C	**Trade Math**	**9%**	**50%**	**50%**	**100%**
C3	Calculate Strain		✓	✓	
Line E	**Band Saws**	**14%**	**50%**	**50%**	**100%**
E9	Troubleshoot Band Saws		✓	✓	
Line I	**Saw Welding**	**3%**	**50%**	**50%**	**100%**
I13	Butt Weld Saws		✓	✓	
Line L	**Saw Shearboards, Scrapers, Cooling Systems and Hydraulics**	**6%**	**100%**	**0%**	**100%**
L4	Describe Hydraulic Systems		✓		
Line M	**Tension, Level and Bench Saws**	**13%**	**55%**	**45%**	**100%**
M2	Level Band Saws		✓	✓	
M3	Tension Band Saws		✓	✓	
M11	Describe Band Saw Steel Required Properties		✓		
M12	Determine Required Tension		✓	✓	
M13	Describe Band Saw Benches		✓		
M14	Maintain Band Saw Back		✓	✓	
M15	Maintain Band Saw Tire		✓	✓	
M16	Repair Band Saw Twists		✓	✓	
M17	Heat Tension Band Saws		✓	✓	
Line O	**Saw Filing Room Machines**	**20%**	**65%**	**35%**	**100%**
O5	Set-up and Maintain Band Saw Bench		✓	✓	
O6	Maintain Filing Room Machines and Equipment		✓	✓	
O7	Describe Automatic Saw Levellers		✓		
O8	Describe Saw Control Systems		✓		
Line Q	**Band Mills**	**29%**	**50%**	**50%**	**100%**
Q1	Align Head Saw Band Mill		✓	✓	
Q2	Align Vertical Resaw		✓	✓	
Q3	Align Horizontal Resaw		✓	✓	
Q4	Align Twin and Quad Band Mills		✓	✓	
Q5	Align Other Saw Mill Machines		✓	✓	
Q6	Align Band Mill Using Laser Alignment		✓	✓	
Q7	Maintain Band Mill Components		✓	✓	
Q8	Perform Band Mill Production Shift Inspections		✓	✓	
Q9	Maintain Strain Systems		✓	✓	
Q10	Perform Band Mill Wheel Grinding		✓	✓	

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
Line R	**Quality Control**	**6%**	**100%**	**0%**	**100%**
R1	Describe Quality Control Systems		✓		
R2	Identify Standards, Measuring Methods and Data		✓		
	Total Percentage for Benchperson (Endorsement)	**100%**			

Section 3

PROGRAM CONTENT

Saw Filer Endorsement: Benchperson

Benchperson Endorsement

LINE (GAC): C TRADE MATH

Competency: C3 Calculate Strain

Objectives

To be competent in this area, the individual must be able to:

- Calculate strain.

LEARNING TASKS	CONTENT
1. Define key number	• Band saws • Circular saws
2. Calculate key number	• Band saws • Circular saws
3. Calculate tooth bite	• Maximum • Minimum
4. Calculate strain	• Conventional strain • High strain • Strain ratio
5. Calculate weight required	• Conventional strain

Achievement Criteria

Performance — Under the direction of a licensed journeyperson on the job, the learner will calculate different types of strain.

Conditions — The learner will be given:

- Problems to be solved

Criteria — The learner will score 70% or better on a rating checklist that reflects the following criteria:

- Correct answers to problems presented on:
  - Key number
  - Tooth bite
  - Strain
  - Weight required

LINE (GAC): E BAND SAWS

Competency: E9 Troubleshoot Band Saws

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts related to troubleshooting bandsaws.
- Troubleshoot bandsaws.

LEARNING TASKS	CONTENT

1. Describe troubleshooting saw problems	• Saw overheats
	  o Wood
	  o Feedworks
	  o Saw
	• Saw snakes in cut
	  o Feedworks
	  o Saw
	  o Band mill
	• Saw runs forward when entering cut
	• Saw dodges when entering cut
	• Saw deviates constantly
	• Saw dishes
	• Saw vibrates
	• Saw oscillates on wheels
	• Saw twist
	• Related problems

2. Describe troubleshooting equipment problems	• Alignment • Carriage • Set works • Tapers • Feed • Related equipment

3.	Identify problems that cause the saw plate to crack or break	• Tire line • Tension • Burnt gullets • Bearings • Feed speeds • Strain • Vibration • Cross-line • Steel rubbing on plate • Starting equipment • Worn wheel face • Tooth profile • Gullet profile • Scratches across saw plate • Metal impregnated into guide material • Sawdust buildup on wheel
4.	Troubleshoot band saws	• Demonstrate troubleshooting band saws and related equipment

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will troubleshoot band saws and related equipment.
Conditions	The learner will be given: • Band saws with a series of problems
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Safety procedures followed • Maintenance and troubleshooting procedures are followed in accordance with manufacturer guidelines and standards • Band saw problems are correctly identifed

LINE (GAC): I SAW WELDING

Competency: I13 Butt Weld Saws

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts related to butting weld saws.
- Butt weld saws.

LEARNING TASKS	CONTENT
1. Describe shearing	• Proper length • Required hand • Single cut • Double cut

2. Describe preparation of a band saw to be butt welded	• Cutting to length
	• Placement in saw clamp
	  o Gap
	  o Alignment
	• Anvil clearance

3. Describe oxy-acetylene welding of butt weld	• Penetration • Puddles • Forging • Annealing • Finishing
4. Describe MIG welding a butt weld	• Preparation • Annealing • Finishing
5. Butt weld saws	• Demonstrate shearing • Demonstrate butt welding saws including preparation using oxy-acetylene or MIG equipment

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will demonstrate shearing. The learner will also prepare for and demonstrate butt welding a saw using oxy-acetylene or MIG equipment.
Conditions	The learner will be given: • Band saw • Oxy-acetylene or MIG welding equipment
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Shearing is performed in accordance with accepted shearing procedures • Correct use of tools and procedures • Saw is butt welded to standard

LINE (GAC): L SAW SHEARBOARDS, SCRAPERS, COOLING SYSTEMS AND HYDRAULICS

Competency: L4 Describe Hydraulic Systems

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of hydraulic systems.

LEARNING TASKS	CONTENT
1. Describe principles of hydraulics	• Force • Resistance • Energy • Work • Power • Horsepower • Pressure • Related principles
2. Describe hydraulic fluids	• Types • Intensity • Pressure • Forces • Gauges • Transmission
3. Describe hydraulic system components	• Check valves • Cylinders • Motors • Flow control valves • Directional control valves • Simple conductors and connectors • Related components

LINE (GAC): M TENSION, LEVEL AND BENCH SAWS

Competency: M2 Level Band Saws

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of band saw leveling and bench maintenance.
- Level band saws.

LEARNING TASKS	CONTENT

1. Describe band saw leveling	• Removal of all
	  o Lumps
	  o Ridges
	  o Cross bumps

2. Describe maintenance of benches	• Interwoven with:
	  o Level
	  o Tension
	  o Back of saw
	• Gullet area
	• Body
	• Back
	• Welded area
	• Crack area

3. Describe correct method of holding and reading straight edges	• 90 degrees to saw plate • Determine ridge and bump location • Cross leveling
4. Describe leveling using stretcher rolls	• Dishing rolls • Leveling jigs
5. Level band saws	• Demonstrate leveling band saws • Demonstrate bench maintenance • Demonstrate correct method of holding and reading straight edges • Demonstrate leveling using stretcher rolls

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will level band saws, using the correct methods of holding and reading straight edges, and using the correct method of using stretcher rolls. The learner will also maintain the bench.
Conditions	The learner will be given: • Band saw • Straight edges and stretcher rolls • Supporting tools, equipment and materials • Bench
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Approved procedures followed • Correct leveling of bandsaw in accordance with leveling standards and requirements • Bench maintained in accordance with maintenance requirements

LINE (GAC): M TENSION, LEVEL AND BENCH SAWS

Competency: M3 Tension Band Saws

Objectives

To be competent in this area, the individual must be able to:

- Explain the concepts of tensioning band saws.
- Tension band saws.

LEARNING TASKS	CONTENT
1. Describe tensioning terms	• Fast • Tight • Open • Stiff • Dished • Tire • Back of saw • 1/64” in 5 feet back • Related terms

2. Describe areas of tensioning	• Interwoven with:
	  o Level
	  o Tire
	  o Back of saw
	• Tire lines
	  o Front
	  o Back
	• Body
	• Butt weld
	• Welds
	• Cracked area

3. Describe correct method of holding and reading tension gauges	• 90 degrees to saw plate • Determine tight areas • Determine open areas • Convex/straight edge • Light gap • Amount required
4. Tension band saws	• Demonstrate tensioning of band saws using tension gauges

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will tension band saws using tension gauges.
Conditions	The learner will be given: • Band saw in need of tensioning • Tension gauges
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Correct use of the proper gauges and equipment • Tension adjusted to manufacturer standard

LINE (GAC): M TENSION, LEVEL AND BENCH SAWS

Competency: M11 Describe Band Saw Steel Required Properties

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of saw steel required properties.

LEARNING TASKS	CONTENT
1. Describe the required properties of circular and band saw steel	• Impact strength • Good metal flow • Hardness and wear resistance • Elasticity and structural uniformity • Fatigue resistance • Ability to take high temperature

2. Describe saw steel composition	• Iron
	  o Softness
	• Carbon
	  o Hardness
	• Nickel
	  o Toughness
	• Phosphorous
	  o Impurities
	• Temper (manganese, sulphur, silicon, chrome, molybdenum)
	  o Stresses

LINE (GAC): M TENSION, LEVEL AND BENCH SAWS

Competency: M12 Determine Required Tension

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of band saw tension requirements.
- Determine correct amount of tension.

LEARNING TASKS	CONTENT
1. Describe reasons for band saw tension	• Counteract expansion during cutting • Stiffen cutting edge to cut straight • Ensure saw runs in a constant position on band mill wheels.
2. Determine correct amount of tension	• Width and thickness of saw plate • Diameter and crown of band mill wheels • Flat wheels • Grooved wheels • Amount of strain • Feed speed • Type of wood sawed

Achievement Criteria

Performance Under the direction of a licensed journeyperson on the job, the learner will determine the correct amount of tension on a band saw.

Conditions The learner will be given:

- Band saw
- Different tensioning requirements

Criteria The learner will score 70% or better on a rating checklist that reflects the following criteria:

- Correct use of the proper gauges and equipment
- Tension adjusted to manufacturer standard

LINE (GAC): M TENSION, LEVEL AND BENCH SAWS

Competency: M13 Describe Band Saw Benches

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of band saw benches.

LEARNING TASKS	CONTENT

1. Describe components of band saw benches	• Moveable end wheels
	• Air cylinder strain mechanism
	• Stretcher rolls
	• Leveling slabs
	  o Upper
	  o Lower
	• Welding clamp
	• UMHW conveyor rolls
	• Inspection lift assembly
	• Hard anvil
	• Lights

2. Describe maintenance of benches	• Lubrications • Set-up • Alignment

LINE (GAC): M TENSION, LEVEL AND BENCH SAWS

Competency: M14 Maintain Band Saw Back

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of band saw back maintenance.
- Maintain band saw backs.

LEARNING TASKS	CONTENT

1. Describe purpose of back curvature on band saws	• Single cut
	  o Head rig
	  o Standard
	  o Silver tooth
	  o Resaws
	  o Twins
	  o Quads
	• Types of band mill wheels
	  o Crowned
	  o Straight
	  o Grooved

2. Describe the use of back gauges	• Dial • 3 point • Solid steel
3. Describe types of band saw backs	• Straight • Sliver tooth
4. Describe grinding of band saw backs	• On the grinder • On the bench
5. Maintain band saw back	• Demonstrate use of back gauges • Demonstrate grinding of band saw backs • Demonstrate maintaining band saw backs

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will use different types of back gauges and grinders to maintain band saw backs.
Conditions	The learner will be given: • Band saw backs • Required tools, equipment and materials
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Correct use of the proper gauges and equipment • Maintenance completed to manufacturer standard

LINE (GAC): M TENSION, LEVEL AND BENCH SAWS

Competency: M15 Maintain Band Saw Tire

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of band saw tire maintenance.
- Maintain band saw tires.

LEARNING TASKS	CONTENT

1. Describe the tire of band saws	• Purpose
	• Area of tire
	  o Front
	  o Back
	• Interwoven
	  o Tension
	  o Level
	  o Back of saw
	• Peening
	• Proctor roll
	• Even and uniform

2. Describe lack of tire	• Loose cutting edge • Cracks • Oscillation
3. Maintain band saw tire	• Demonstrate maintaining band saw tire

Achievement Criteria

Performance — Under the direction of a licensed journeyperson on the job, the learner will maintain a band saw tire.

Conditions — The learner will be given:

- Band saw tire
- Required tools, equipment and materials

Criteria — The learner will score 70% or better on a rating checklist that reflects the following criteria:

- Correct use of the tools and equipment
- Maintenance completed to manufacturer standard

LINE (GAC): M TENSION, LEVEL AND BENCH SAWS

Competency: M16 Repair Band Saw Twists

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of band saw twists repair.
- Repair band saw twists.

LEARNING TASKS	CONTENT
1. Describe band saw twist removal	• Manual • Stretcher roll • Hammer
2. Describe causes of twists	• Helical twists • Overloading during sawing • Oscillation • Band saw wheels out of line • Guides set wrong • Careless leveling • Hammer face not parallel
3. Repair band saw twists	• Demonstrate removal of band saw twists • Demonstrate repair of band saw twists

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will remove and repair band saw twists, demonstrating all three methods of removal.
Conditions	The learner will be given: • Band saws with twists • Required tools, materials and equipment
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Determine best removal and repair method for each twist. • Correct use of the proper tools and equipment • Twists removed to manufacturer standard

LINE (GAC): M TENSION, LEVEL AND BENCH SAWS

Competency: M17 Heat Tension Band Saws

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of tension band saw heating.
- Heat tension band saws.

LEARNING TASKS	CONTENT
1. Describe heat tensioning of band saws	• Purpose • Area • Applications • Crawler
2. Heat tension band saws	• Demonstrate heat tensioning of band saws

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will heat tension band saws.
Conditions	The learner will be given: • Band saws • Required tools, equipment and materials
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Correct use of tools and equipment • Tensioning attained to manufacturer standard

LINE (GAC): O SAW FILING ROOM MACHINES

Competency: O5 Set-up and Maintain Band Saw Bench

Objectives

To be competent in this area, the individual must be able to:

- Explain the concepts of setting up and maintaining a band saw bench.
- Set up and maintain a band saw bench.

LEARNING TASKS	CONTENT
1. Describe band saw bench set-ups	• Hand (right or left) • Planer mill resaws • Resaws • Twins • Quads • 38’ to 60’ • Wide thin plates

2. Describe bench component set-up and maintenance	• Stretcher rolls
	  o Roll radius
	  o Alignment to leveling slabs
	  o Level
	  o Lubrication of gears and bearings
	  o Plate dishing
	  o Twist removal
	  o Handle pressure
	  o Handle position (equal both edges)
	• Leveling slabs (single and double cut)
	  o Solid
	  o With core holes
	  o Hard faced
	  o Double cuts
	  o Trunnions
	  o Length
	  o Thickness
	  o Width
	• Elevating assembly
	• Saw leveling stretchers
	• Leveling weights
	• Peening anvils
	• Weld clamp set-up
	• Lighting systems

3. Set-up band saw bench	• Demonstrate set-up of band saw bench

4. Maintain band saw bench	• Demonstrate maintenance of band saw bench

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will set-up and maintain a band saw bench.
Conditions	The learner will be given: • Band saw bench • Required tools, materials and equipment
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Correct use of the proper tools and equipment • Bench set up and maintained to manufacturer standard

LINE (GAC): O SAW FILING ROOM MACHINES

Competency: O6 Maintain Filing Room Machines and Equipment

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of filling room machines and equipment maintenance.
- Maintain filling room machines and equipment.

LEARNING TASKS	CONTENT
1. Describe set-up and maintenance of gauge grinder	• Safety procedures • Straight edge • Convex • Concave • Measuring devices • Grinding wheel
2. Describe set-up and maintenance of uniplane	• Safety procedures • Cutterd • Guide jigs
3. Describe maintenance of saw transportation systems	• Saw dollies • Saw carts • Related equipment
4. Describe maintenance of back gauges	• Dial • Solid steel • 3 point
5. Maintain filing room machines and equipment	• Demonstrate maintenance of filing room machines and equipment o Gauge grinder o Uniplane o Saw transportation systems o Back gauges

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will maintain gauge grinders, uniplanes, saw transportation systems and back gauges.
Conditions	The learner will be given: • Gauge grinders • Uniplanes • Saw transportation systems • Back gauges • Required tools, equipment and materials
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Correct use of the proper tools and equipment • Machines and equipment maintained to manufacturer standard

LINE (GAC): O SAW FILING ROOM MACHINES

Competency: O7 Describe Automatic Saw Levellers

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of automatic saw levellers.

LEARNING TASKS	CONTENT

1. Describe automatic levelers	• Safety procedures
	• Purpose
	  o Improved level of saw plate
	  o Filers time
	  o Improve sawing accuracy
	  o Reduce guide friction
	  o Help attain target sizes
	  o Eliminate down time
	• Set-up
	  o Saw size
	  o Width
	  o Diameter
	• Operation
	• Electronics
	• Maintenance
	• Related components

LINE (GAC): O SAW FILING ROOM MACHINES

Competency: O8 Describe Saw Control Systems

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of saw control systems.

LEARNING TASKS	CONTENT

1. Describe saw control systems	• Sensor
	  o Monitors saw blade
	  o Lateral movement
	  o Vibration
	  o Displacement/offset
	• Oscilloscope
	  o Saw movement
	  o Counters

2. Describe basic systems operation	• Sensor • Oscilloscope • Alarms • Print outs • Screens
3. Describe purpose of system	• Increased production • Recovery • Crack detection • End snipes • Feed speeds • Dull saws • Bearing failure • Guide wear • Guide rail misalignment • Track or line bar misalignment

LINE (GAC): Q BAND MILLS

Competency: Q1 Align Head Saw Band Mill

Objectives

To be competent in this area, the individual must be able to:

- Explain the concepts of head saw band mill alignment.
- Align a head saw band mill.

LEARNING TASKS	CONTENT
1. Describe safety procedures	• Personal safety equipment • Lock-out

2. Describe tools used in alignment	• Steel tapes
	• Straight edges
	• Key steel
	• Machinist squares
	• Machinist levels
	• Plum bobs
	• Dial indicators
	• Callipers
	  o Inside
	  o Outside
	• Track jig

3. Describe track alignment	• “V” rail • Flat rail • Square • Plumb • Straight • Level • Track jig

4.	Describe band mill alignment	• Plumb
		• Square
		• Straight
		• Level
		• Bottom wheel to “V” rail
		• Plumb bottom wheel
		• Crossline top wheel to bottom wheel
		• Top wheel and bottom wheel end alignment
		• Plumb saw from top wheel to bottom wheel
		• Square bed skids of carriage to saw
		• Set guides
		  o Conventional
		  o Pressure
		• Related system components

5.	Align head saw band mill	• Demonstrate track alignment • Demonstrate alignment of head saw band mill

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will track alignment and align a head saw band mill.
Conditions	The learner will be given: • Head saw band mill • Required tools, equipment and materials
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Safety requirements followed • Correct use of the proper tools and equipment • Head saw band mill tracked and aligned to manufacturer standard

LINE (GAC): Q BAND MILLS

Competency: Q2 Align Vertical Resaw

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of vertical resaw alignment.
- Align a vertical resaw.

LEARNING TASKS	CONTENT
1. Describe safety procedures	• Personal • Machine • Lock-out
2. Describe alignment	• Plumb • Square • Straight • Level • Plumb bottom wheel • Cross-line top wheel to bottom wheel • Top wheel and bottom wheel end alignment • Plumb saw from top wheel to bottom wheel • Extend saw lines • Set rolls • Set line bar • Set guides
3. Align vertical resaw	• Demonstrate alignment of vertical resaw

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will align a vertical resaw.
Conditions	The learner will be given: • Vertical resaw • Required tools, equipment and materials
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Correct use of the proper tools and equipment • Alignment is within manufacturer standards

LINE (GAC): Q BAND MILLS

Competency: Q3 Align Horizontal Resaw

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of horizontal resaw alignment.
- Align horizontal resaw.

LEARNING TASKS	CONTENT
1. Describe safety procedures	• Personal • Machine • Lock-out
2. Describe alignment	• Plumb • Square • Straight • Level • Plumb bottom wheel • Cross-line top wheel to bottom wheel • Top wheel and bottom wheel end alignment • Plumb saw from top wheel to bottom wheel • Extend saw lines • Feed table (slat bed • Infeed table • Tail table • Related systems
3. Align horizontal resaw	• Demonstrate alignment of horizontal resaw

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will align a horizontal resaw.
Conditions	The learner will be given: • Horizontal resaw • Required tools, equipment and materials
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Safety requirements followed • Correct use of the proper tools and equipment • Saw is aligned within manufacturer standards

LINE (GAC): Q BAND MILLS

Competency: Q4 Align Twin and Quad Band Mills

Objectives

To be competent in this area, the individual must be able to:

- Explain twin and quad band mill alignment.
- Align twin and quad band mills.

LEARNING TASKS	CONTENT
1. Describe safety procedures	• Personal • Machine • Lock-out
2. Describe alignment	• Plumb • Square • Straight • Level • Level Band Mill • Bottom wheels in line with each other • Plumb the top wheels to the bottom wheels • Cross-line • Set guide pressure • Slack in dovetail slides
3. Describe system alignment	• Infeed system • Outfeed system
4. Align twin and quad band mills	• Demonstrate alignment of twin and quad band mills

Achievement Criteria

Performance Under the direction of a licensed journeyperson on the job, the learner will align twin and quad band mills.

Conditions The learner will be given:

- Twin and quad band mills
- Required tools, equipment and materials

Criteria The learner will score 70% or better on a rating checklist that reflects the following criteria:

- Safety requirements followed
- Correct use of the proper tools and equipment
- Band mills aligned to manufacturer standards

LINE (GAC): Q BAND MILLS

Competency: Q5 Align Other Saw Mill Machines

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of alignment on other saw mill machines.
- Align other saw mill machines.

LEARNING TASKS	CONTENT

1. Describe other benchperson alignment responsibilities	• Gang saws
	  o Circular
	• Trimmers
	  o Arbours
	  o Feed chains
	  o Depth of cut
	• Edgers
	  o Arbour
	  o Press rols
	  o Feed roll systems
	  o Straight edge
	• Cut offs
	  o Circular
	  o Chains
	• Chip canter
	  o Feed systems
	  o Sawing systems
	• Related equipment

2. Align other saw mill machines	• Demonstrate aligning othe saw mill machines including:
	  o Gang saw
	  o Trimmer
	  o Edger
	  o Cut-off
	  o Chip canter

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will align gang saws, trimmers, edgers, cut-offs and chip canters.
Conditions	The learner will be given: • Gang saw • Trimmer • Edger • Cut-off • Chip canter • Required tools, equipment and materials
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Safety requirements followed • Correct use of the proper tools and equipment • Machines aligned to their respective manufacturer standards

LINE (GAC): Q BAND MILLS

Competency: Q6 Align Band Mill Using Laser Alignment

Objectives

To be competent in this area, the individual must be able to:

- Explain the concepts of aligning a band mill using laser alignment.
- Align a band mill using laser alignment.

LEARNING TASKS	CONTENT
1. Describe the procedure for alignment of all band saw machines using laser alignment equipment	• Safety procedures • Laser components • Set-up procedures • Alignment procedures
2. Align band mill using laser alignment	• Demonstrate aligning band mill using laser alignment equipment

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will align a band mill using laser alignment equipment.
Conditions	The learner will be given: • Band mill • Required tools, equipment and materials
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Safety requirements followed • Correct use of the proper tools and equipment • Band mill aligned to manufacturer standards

LINE (GAC): Q BAND MILLS

Competency: Q7 Maintain Band Mill Components

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of band mill component maintenance.
- Maintain band mill components.

LEARNING TASKS	CONTENT
1. Describe safety procedures	• Personal safety equipment • Machinery safety equipment • Lock-out procedures • Shift inspection • Regular maintenance • Follow WorkSafe BC regs

2. Describe parts of a band mill	• Foundation
	• Top wheel
	  o Solid
	  o Spokes
	  o Balanced
	• Bottom wheel
	  o Driver
	  o Belts
	  o Motors (AC/DC)
	• Wheel arbours
	  o Bearings
	  o Rotating
	  o Non-rotating
	• Strain system
	• Wheel tilt
	• Strain gauge
	• Guides
	  o Conventional
	  o Pressure
	• Controls
	• Husk
	• Shearboards
	• Scrapers
	• Cooling system
	• Related components

3.	Describe track and carriage parts	• Foundation
		• Tracks
		  o Flat rail
		  o “V” rail
		• Carriage
		  o Bed skids
		  o Knees
		  o Dogs
		  o Tapers
		• Set works
		• Carriage wheels
		  o Scrapers
		• Related parts

4.	Describe bearing inspection	• Adjustment o Clearance • Lubrication • Assembly and installation • Types
5.	Check wheel balance	• Static • Dynamic

6.	Inspect guides and ways	• Alignment
		  o Crossline guides
		• Ways
		• Types
		  o Conventional
		  o Pressure
		  o Cartridge type

7.	Perform maintenance of band mill components	• Demonstrate maintenance of band mill components • Demonstrate inspection of bearings • Demonstrate checking wheel balance • Demonstrate inspection of guides and ways

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will maintain band mill components, inspect bearings, check wheel balance and inspect guides and ways.
Conditions	The learner will be given: • Band mill components • Required tools, equipment and materials
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Safety requirements followed • Correct use of the proper tools and equipment • Maintenance, inspection and checks of band mill components are to manufacturers' standards

LINE (GAC): Q BAND MILLS

Competency: Q8 Perform Band Mill Production Shift Inspections

Objectives

To be competent in this area, the individual must be able to:

- Explain the concepts of band mill production shift inspections.
- Carry out band mill production shift inspections.

LEARNING TASKS	CONTENT
1. Describe guide care and maintenance	• Purpose • Materials • Replacement • Set-up • Resurfacing • Tools and equipment
2. Describe coolant systems care and maintenance	• Purpose • Types • Nozzles
3. Describe shearboard care and maintenance	• Purpose • Material • Wear and maintenance • Adjustment
4. Describe wheel scrapers care and maintenance	• Purpose • Material • Angles • Counterweights • Wheel cleanliness
5. Describe rim cleaners	• Materials • Shape • Size
6. Perform band mill production shift inspections	• Demonstrate band mill production shift inspections

Achievement Criteria

Performance	Under the direction of a licensed journeyperson on the job, the learner will conduct band mill production shift inspections.
Conditions	The learner will be given: • Required tools, equipment and materials
Criteria	The learner will score 70% or better on a rating checklist that reflects the following criteria: • Safety requirements followed • Correct use of the proper tools and equipment • Inspection and maintenance of procedures are to mill standards

LINE (GAC): Q BAND MILLS

Competency: Q9 Maintain Strain Systems

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of strain system maintenance.
- Maintain strain systems.

LEARNING TASKS	CONTENT
1. Describe types of strain systems	• Weight and lever • Hydraulic and accumulator • Air diaphragm • Air spring • Air spring and levers • Steel spring • Rubber spring/block
2. Describe strain points and sockets	• Angles • Hardness • Maintenance
3. Describe maintenance points	• Check list • Manufacturers' recommendations
4. Calculate required strain on conventional systems	• Hydraulic • Mechanical • Air diaphragm • Rubber spring/block
5. Maintain strain systems	• Demonstrate maintenance of strain systems

Achievement Criteria

Performance — Under the direction of a licensed journeyperson on the job, the learner will maintain strain systems.

Conditions — The learner will be given:

- Variety of strain systems
- Required tools, equipment and materials

Criteria — The learner will score 70% or better on a rating checklist that reflects the following criteria:

- Safety requirements followed
- Correct use of the proper tools and equipment
- Maintenance procedures are to manufacturers' standards

LINE (GAC): Q BAND MILLS

Competency: Q10 Perform Band Mill Wheel Grinding

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of band mill wheel grinding.
- Grind band mill wheels.

LEARNING TASKS	CONTENT
1. Describe safety procedures for grinding band mill wheels	• Follow live lock-out procedures • Personal safety equipment • Machine safety equipment • Working on live machinery • Determine wheel thickness for grinding (WorkSafe BC)
2. Describe band mill preparation	• Lock-out • Blowdown • Removal of guides • Removal of shearboards • Removal of scrapers • Locked strain • Locked tilt • Power head or ribbons • Solid installation

3. Describe grinder preparation	• Clean
	• Square end brackets
	• Screws
	• Barrel screw
	• Head
	• Power head
	• Remote control unit
	• Bearnings
	• Grinding wheel
	  o Resinoid
	  o Size
	  o Ceramic

4.	Describe grinding band mill wheels	• Tape wheels (Pi Tape)
		• Determine wear
		• Scribe line
		• Mount grinder
		  o Secure
		  o Free of vibration
		• Align barrel with wheel
		• Precision square
		• Mount grinding head or power head
		• Adjust as necessary
		• Recheck all measurements
		• Recheck all installations
		• Grind
		• Retape (Pi tape)
		• Brick edges

5.	Describe wheel face	• Flat
		• Crowned
		  o Position
		• Edge measurements
		  o 1 in. from all edges
		• Log all measurements

6.	Perform band mill wheel grinding	• Demonstrate band mill preparation • Demonstrate grinder preparation • Demonstrate grinding band mill wheels

Achievement Criteria

Performance — Under the direction of a licensed journeyperson on the job, the learner will prepare band mills and grinders, and then grind band mill wheels.

Conditions — The learner will be given:

- Various band mills
- Various grinders
- Other required tools, equipment, materials

Criteria — The learner will score 70% or better on a rating checklist that reflects the following criteria:

- Safety requirements followed
- Correct use of the proper tools and equipment
- Preparation and grinding are to manufacturer standards

LINE (GAC): R QUALITY CONTROL

Competency: R1 Describe Quality Control Systems

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of quality control systems.

LEARNING TASKS	CONTENT
1. Describe systematic objectives and the importance of quality control	• Establish sizing targets • Ensure that size targets are being met • Aid in correcting size and sawing problems • Provide a decision making tool • Recognize machine induce lumber defects
2. Identify size control program	• Measure sawing variance for each machine • Prevent operating “out of control” • Aid in effective maintenance • Provide feedback to the filing room • Reduce lumber processing costs • Improve lumber recovery

LINE (GAC): R QUALITY CONTROL

Competency: R2 Identify Standards, Measuring Methods and Data

Objectives

To be competent in this area, the individual must be able to:

- Explain concepts of standards, measuring methods and data identification.

LEARNING TASKS	CONTENT
1. Describe main elements of an optimizing system	• Method to accurately locate and measure board geometry • Computer • Servo or other positioner • Transport system • Cutting system • Piece-count
2. Describe operating, calibrating and maintaining saw control systems	• Sensor • Oscilloscope • Alarms • Print outs • Screens • Amp draw systems

Section 4

TRAINING PROVIDER STANDARDS

Facility Requirements

Classroom Area

- 900 sq. ft. for a class size of 12 – 16 students, with moveable tables and chairs
- Instructional media to include multimedia projector, projection screen, DVD player and whiteboard

Shop Area

- 50 sq. ft. per student
- Well heated and ventilated
- 12 ft. high ceilings
- Lighting appropriate to detailed work

Lab Requirements

- N/A

Student Facilities

- N/A

Instructor’s Office Space

- 150 sq. ft. per instructor, with desk and chairs and materials storage/filing cabinet

Tools and Equipment

Shop Equipment

Required

- Knives:
    - Chipper canter
    - Hog
    - Profile
    - Face mounted
    - Enclosed
    - Clamp type
    - Drum
    - Lily pad
    - Slabbing head rig
    - Veneer chipper
    - Planer
    - Molders
    - Waferizer
    - Straight thick knives
    - Straight thin knives
    - Bent knives
    - Dome tops
    - Counter knives
    - Key knives
- Power Tools:
    - Hand grinders
    - Uniplanes
    - Jockey grinders
- Hand Tools:
    - Wrenches:
        - Set
        - Bit and shank wrenches
        - Saw wrenches
        - Collar wrenches
    - Dolly
    - Hammers
        - Ball peen
        - Welding
        - Dog head
        - Cross face
        - Twist face
        - Forging
    - Forging tools
    - Upsets
    - Grinding jigs (dies and anvils)

  - Files
    - Flat
    - Mill bastard
    - Halfround
    - Round
    - Quadrangular
    - Circular
    - Triangular
  - Drift
  - Punches
  - Positioning tool
  - Brass brushes
  - Wire brush
  - Tweezers
- Portable Oxy-Acetylene Equipment:
  - Oxy-Acetylene Unit
  - Welding clamp
  - Tips
  - Torch
  - Gauges
  - Upset and forging tool
  - Welding rod
  - Tip cleaner and striker
  - Flux
  - Welding curtain
- Saw Blades (examples with different tips and requiring maintenance):
  - Circular
  - Band
  - Chain
- Swages:
  - Band saw
  - Hand and air
  - Circular saw
  - Hand and air
  - Shingle
- Anvils:
  - Steel
  - Soft
  - Hard faces
  - Crowned

- Measuring Tools and Gauges:
    - Protractor
    - Micrometer
    - Vernier calipers
    - Outside and inside calipers
    - Dial indicator
    - Alignment gauges
    - Straight edges
    - Circular convex / concave
    - Bandsaw tension gauge
    - Circular saw tension gauges
    - Back gauges
        - Solid steel
        - 3 point
        - Depth gauges
        - Wire gauges
        - Anvil setting gauges
        - V gauge
        - Steel tapes
        - Key steel
        - Machinist squares
        - Machinist levels
        - Plum bobs
        - Track jig
- Swage Maintenance Tools:
    - Anvils
    - Carbide
    - Carbon steel
    - Dies
    - Long bite
    - Short bite
    - Extra short bite
    - Clamp screws
    - Carbon steel
    - Carbide
- Shapers:
    - Band saw
    - Hand and air
    - Circular saw
    - Hand and air
    - #5700-C
    - #6900-C
    - #5500-S
- Saw Filing Tools and Equipment:
    - Gauge grinder
    - Filing clamps
    - Hand sharpeners
    - Stretcher rolls (36 in.)
    - Work benches
    - Bandmill wheel grinder

- Wheel Dressers:
    - Dressing brick
    - Vitrified and resinoid
    - Diamond stick
    - Metcalfe dresser
    - Desmond dresser
    - Universal dresser
    - Star dresser
    - Diamond profile dresser
    - Diamond wheel dressing jigs
    - CBN wheel dressing jigs
- Saw sets:
    - Hand
    - Hammer
    - Power
    - Swage and shaper
- Grinding Wheels:
    - Vitrified
    - Resinoid
    - Diamond
    - CBN
    - Ceramic
    - Knife grinding wheels
    - Cup
    - Cylinder
    - Straight
    - Profile
    - Segments
- Chain Saw Tools:
    - Files
    - Raker gauge
    - Chain breakers
    - Rivet punch
    - Special wrenches
- Leveling Slabs:
    - Circular slabs

Student Equipment (supplied by school)

Required

- Face shield
- Leather aprons
- Dust masks

Student Tools (supplied by student)

Required

- Safety toe workboots
- Hard hat
- Gloves
- Safety goggles and glasses
- Ear protection

Recommended

- Close-fitting pants, shirts and jackets

Reference Materials

Required Reference Materials

- Instructional materials for the Saw Fitter, Saw Filer and Benchperson trades (4 manuals) published by ITAC, 2002

Recommended Resources

- Saws - Design, Selection, Operation and Maintenance; ED M. Williston, Miller Freeman, ISBN 0-87930-221-6
- Sawmill Machinery Alignments; Julien Pleau, Forintek Canada Corp.; January 1997, ISBN 0-86488-522-1
- Wood Bandsaw Balde Manual; Uddenholm Strip Steel AB, 2001

NOTE:

This list of Reference Materials is for training providers. Apprentices should contact their preferred training provider for a list of recommended or required texts for this program.

Instructor Requirements

Occupation Qualification

The instructor must possess:

- Lumber Manufacturing Industry (LMI) – Benchperson Certificate of Qualification

  Or
- Saw Filer Certificate of Qualification with Benchperson Endorsement

Work Experience

A minimum of ten years experience working in the industry as a Lumber Manufacturing – Benchperson, and/or Saw Filer.

Instructional Experience and Education

It is preferred that the instructor also possesses one of the following:

- Provincial (BC) Instructor Diploma or completion of a similar trainer training or instructional methods program
- Two years of supervisory or administrative experience
- Demonstrated effectiveness of communication skills – instructional and interpersonal
- Experienced user of relevant software programs for:
    - Word processing
    - Spreadsheets
    - Presentations
    - CAD