

# Sloped Roofer Level 2

## Sloped Roofer

**Unit:** B1 Preparing Steep Roof Projects

**Level:** Two

**Duration:** 28 hours

Theory: 28 hours

Practical: 0 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about preparing steep roof projects. The unit begins with coverage of debris management and preparing worksite against damage. Part of the unit covers assessing project requirements and preparing worksite. Finally, the unit covers preparing roof for replacement and preparing new roof for installation.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Describe debris management.</b>	<b>10%</b>
a. Tools and equipment	
b. Recycling materials	
c. Erect and disassemble chutes and counterweights	
<b>2. Describe procedures to prepare worksite against damage.</b>	<b>10%</b>
a. Protection materials	
b. Types of damage	
c. Identify areas of potential damage	
• Windows and skylights	
• Walls	
• Mechanical equipment	
• Vehicles	
• Landscaping	
d. Erect barriers	
e. Jobsite storage	
<b>3. Describe procedures to assess project requirements.</b>	<b>10%</b>
a. Building code	
b. Starting and finishing points	
c. Equipment requirements	
d. Deck type	
e. Access and egress	
f. Onsite utilities	
<b>4. Describe procedures to prepare worksite.</b>	<b>10%</b>
a. Position equipment	

- b. Material on the ground
- c. Position equipment/material on the roof
  - Hoists
  - Sequence of removal and installation
  - Materials/equipment and distribution
  - Safety equipment
  - Securement
  - Windows, ventilation openings
  - Access and egress

**5. Describe procedures to prepare roof for replacement.**

**40%**

- a. Protect windows, walls, skylights and mechanical equipment
  - Protection materials
  - Types of damage
  - Areas of potential damage
  - Areas of previous damage
  - Erect protection barriers
  - Place equipment and materials
- b. Removal of loose debris
  - Types of debris
  - Hazard abatement
  - Safety precautions
  - Gathering, storage and disposal
- c. Removal of roofing and metal flashings
  - System types and components
  - Effect of weather conditions
  - Sequence of material removal
  - Jobsite hazards
  - Recyclable materials, regulated and hazardous materials
  - Removal equipment and techniques
  - Disposal of materials
  - Phase construction
- d. Roof decking non-structural repairs and preparation of substrate
  - Types of roof decks (wood, steel and concrete)
  - Substrate defects and repair
  - Cleaning substrate
  - Vapour barriers
  - Insulation
  - Secure loose substrate components
- e. Height adjustment of penetrations and parapets
  - New roof composition
  - Change to roof mounted equipment
  - Adjustments
  - Height calculations
  - Building extensions
  - Material selection to suit new construction
  - Construction modifications
  - Adding material
- f. Installation of temporary water shedding
  - Temporary water shedding materials
  - Material compatibility

- Material integrity
- Removal

**6. Describe procedures to prepare new roof for installation.**

**20%**

- a. Procedures for inspecting roof decks
  - Deck types
  - Inspecting roof deck
  - Defects
- b. Notify builder of defective roof deck
- c. Verify placement of roof projections

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## Sloped Roofer

**Unit:** B2 Estimating Steep Roof Projects

**Level:** Two

**Duration:** 28 hours

Theory: 21 hours

Practical: 7 hours

### Overview:

This unit is designed to provide the apprentice with knowledge and skills about estimating steep roof projects. The unit covers concepts related to organizing work and materials estimating.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Review concepts related to organizing work.</b>	<b>20%</b>
a. Types of communication	
• Work orders	
• Inspection reports	
• Manufacturer's documentation	
• Permits	
• Drawings and specifications	
b. Reasons for communication	
• Safety, project coordination, planning, scheduling	
• Give, receive, clarify and understand instructions	
• Customer relations	
• Project notifications	
• Training	
c. Communicate with others	
d. Order/receive supplies	
e. Arrange worksite schedule	
<b>2. Describe and perform materials estimating.</b>	<b>80%</b>
a. Identify relevant information from drawings, codes and other sources	
b. Interpret product information and industry standards	
c. Apply math formulas as required	
d. Review original calculations to find deficiencies	
e. Review blueprints to find deficiencies	
f. Use imperial and metric units	

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## Sloped Roofer

**Unit:** B3 Steep Roof Cavity Ventilation

**Level:** Two

**Duration:** 14 hours

Theory: 14 hours

Practical: 0 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about steep roof cavity ventilation. The unit covers roof ventilation systems. It also covers installation techniques for ventilation, eave venting (intake venting) and roof venting (outtake venting).

### Objectives and Content:

### Percent of Unit Mark (%)

**1. Describe roof ventilation systems.**

**20%**

- a. Purpose of ventilation system
- b. Intake vents
  - Soffit vents
- c. Outtake vents
  - Roof, ridge, baffle vents
  - Gable, dormer vents
  - Cap roof, turbine, power vents, solar power vents
  - Chimney, skylight vents
- d. Sizing vents (net free ventilation area or NFVA)
- e. Considerations
  - Ice dams and prevention
  - Cold roofs
  - Cathedral ceilings

**2. Describe installation techniques for ventilation.**

**40%**

- a. Ventilation layouts
  - Building code
  - Installation techniques
  - Calculation
- b. Installation of vents
  - Attic type
  - Turbine type
  - Ridge type
- c. Seal roof projections
  - Apply mastic
  - Caulking

- Ridge type
  - d. Building codes
- 3. Describe installation techniques for eave venting (intake venting). 20%**
- a. Calculate venting requirements
  - b. Install ventilation chutes
  - c. Install soffit venting
  - d. Install eave venting
- 4. Describe installation techniques for roof venting (outtake venting). 20%**
- a. Calculate venting requirements
  - b. Install roof vents
  - c. Install power vents
  - d. Install ridge vents

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## Sloped Roofer

**Unit:** B4 Steep Roof Flashing and Shingles

**Level:** Two

**Duration:** 28 hours

Theory: 28 hours

Practical: 0 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about steep roof flashing and shingles. The unit begins with a review of roofing accessories, materials and flashing. Part of the unit covers installation techniques for built-in gutter membranes, flashings, saddles/crickets and underlayment. Finally, the unit covers techniques for shingle layouts.

### Objectives and Content:

### Percent of Unit Mark (%)

- |   |            |
|---|------------|
| <b>1. Review roofing accessories, materials and flashing.</b>             | <b>20%</b> |
| a. Roofing materials  |            |
| • Eave protection   |            |
| • Underlayment  |            |
| • Asphalt shingles  |            |
| • Others  |            |
| b. Flashing   |            |
| • Perimeter flashings   |            |
| • Wall-to-roof intersection flashing                                      |            |
| • Valley flashing   |            |
| • Roof projection flashings   |            |
| c. Building codes   |            |
| <b>2. Describe installation techniques for built-in gutter membranes.</b> | <b>10%</b> |
| a. Built-in gutter membranes for existing or new installation             |            |
| • Membrane types  |            |
| • Remove cap, drains and waterproofing membrane                           |            |
| • Inspect substrate   |            |
| b. Inspecting existing or new built-in gutters                            |            |
| • Slope to drain  |            |
| • Drain locations   |            |
| • Substrate   |            |
| • Vertical terminations   |            |
| c. Installing water cut-offs and temporary seals                          |            |
| • Water cut-offs for built-in gutters                                     |            |
| • Jobsite requirements  |            |
| • Terminations  |            |



- 3. Describe installation techniques for flashings. 15%**
- a. Assess project requirements
    - Building code
    - Selection of flashing
  - b. Installation of flashings
  - c. Secure and caulk flashings
- 4. Describe installation techniques for saddles/crickets. 15%**
- a. Building code
  - b. Locate and lay-out
  - c. Fabrication
  - d. Install and secure
- 5. Describe installation techniques for underlayment. 10%**
- a. Select underlayment
  - b. Relax underlayment
  - c. Installation techniques
- 6. Describe techniques for shingle layouts. 30%**
- a. Layout techniques
    - Layout patterns
    - Establish special layout patterns
  - b. Cut and fit shingles
    - Adapt techniques to products
    - Shingle transitions
  - c. Fastening
    - Select nailing guns
    - Adjust nailing guns
    - Nailing patterns
    - Selection of fasteners
    - Overlap allowances
  - d. Tabbing
    - Wind proofing methods
    - Applying adhesives
    - Caulking the shingles

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## Sloped Roofer

**Unit:** B5 Steep Roof Installation and Repair

**Level:** Two

**Duration:** 42 hours

Theory: 0 hours

Practical: 42 Hours

### Overview:

This unit, which builds on **B3 Steep Roof Cavity Ventilation** and **B4 Steep Roof Flashing and Shingles**, is designed to provide the apprentice with skills about steep roof installation and repair. The unit begins with coverage of inspection and repair of deck. Part of the unit covers installation of vents, eave protection and underlayment, and flashings. Finally, the unit covers installation of shingles, wood shingles and metal materials for metal roof systems.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Perform inspection and repair of deck.</b> a. Building code requirements b. Fastening c. Cleaning d. Defects e. Details	<b>10%</b>
<b>2. Perform installation of vents.</b> a. Cathedral, vaulted b. Cold systems	<b>10%</b>
<b>3. Perform installation of eave protection and underlayment.</b> a. Types of underlayment b. Fastening methods c. Overlaps	<b>10%</b>
<b>4. Perform installation of flashings.</b> a. Types of flashings b. Compatibility between materials c. Materials d. Gauge of metal e. Selection of metal f. Forming of metal g. Fasteners h. Installation methods i. Caulking and sealants	<b>25%</b>

- 5. Perform installation of shingles. 10%**
- a. Application techniques
  - b. Underlayment
  - c. Hips and valleys
  - d. Starting point
  - e. Overhangs
  - f. Layout
  - g. Fasteners
  - h. Hip and ridge shingles
  - i. Wind uplift
- 6. Perform installation of wood shingles. 10%**
- a. Application techniques
  - b. Underlayment
  - c. Starting point
  - d. Layout
  - e. Fasteners
  - f. Hip and ridge caps
- 7. Perform installation of metal materials for metal roof systems. 25%**
- a. Application techniques
  - b. Metal panel systems
  - c. Underlayment
  - d. Strapping
  - e. Battens
  - f. Details
  - g. Metal flashing
  - h. Layout
  - i. Fasteners and clips
  - j. Hip and ridge caps

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## Sloped Roofer

**Unit:** B6 Analyzing and Troubleshooting Steep Roofs

**Level:** Two

**Duration:** 28 hours

Theory: 28 Hours

Practical: 0 Hours

### Overview:

This unit is designed to provide the apprentice with knowledge about analyzing and troubleshooting steep roofs. The unit covers inspection techniques, and maintenance/repair techniques.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Describe inspection techniques.</b>	<b>40%</b>
a. Steep roof inspection	
• Deficiencies	
• Steep roofs	
b. Factors influencing quality of inspection	
• Building codes	
• Causes of roof failure	
• Problem solving	
• Solutions	
• Maintenance and repair	
<b>2. Describe maintenance/repair techniques.</b>	<b>60%</b>
a. Considerations to specify problem area	
• Troubleshooting	
• Cause of roof failure	
• Compatibility of materials	
• Repair solutions	
• Roof maintenance	
• Exterior and interior inspection	
b. Repair techniques	
• Valleys	
• Nails backing out of deck	
• Broken shingles	
• Details	
• Defective flashing	
• Vents	

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## Sloped Roofer

**Unit:** B7 Lifting, Rigging and Hoisting

**Level:** Two

**Duration:** 14 hours

Theory: 14 hours

Practical: 0 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about lifting, rigging and hoisting. The unit covers lifting, rigging and hoisting procedures.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Describe lifting procedures.</b>	<b>20%</b>
a. Safe work practices and procedures	
b. Manual lifting techniques	
c. Mechanically assisted lifting techniques	
<b>2. Describe rigging procedures.</b>	<b>40%</b>
a. Safe work practices and procedures	
b. Types of knots and splices	
• Bowline	
• Clove-hitch	
• Rescue knot	
• Scaffold-hitch	
c. Rigging equipment	
d. Rigging hardware	
e. Load limits	
f. Safe Working Load (SWL)	
g. Chokers and taglines	
h. Slings	
<b>3. Describe hoisting procedures.</b>	<b>40%</b>
a. Safe work practices and procedures	
b. Types of roof hoist	
• Ladder hoist	
• Boom trucks	
• Cranes	
c. Roof hoist hardware	

- d. Communication equipment
- Mobile phones
  - Two-way radios
  - Hand signals

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## Sloped Roofer

**Unit:** B8 Jobsite Coordination and Maintenance

**Level:** Two

**Duration:** 14 hours

Theory: 14 hours

Practical: 0 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about jobsite coordination and maintenance. The unit covers jobsite coordination techniques.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<p><b>1. Describe coordination of jobsites.</b></p> <ul style="list-style-type: none"> <li>a. Jobsite coordination</li> <li>b. Jobsite maintenance</li> </ul>	<b>20%</b>
<p><b>2. Describe jobsite coordination techniques.</b></p> <ul style="list-style-type: none"> <li>a. Planning and organizing               <ul style="list-style-type: none"> <li>• Schedules</li> <li>• Delivery of materials</li> <li>• Jobsite setup</li> </ul> </li> <li>b. Consultation and communication</li> <li>c. Jobsite storage               <ul style="list-style-type: none"> <li>• Lifting and shifting</li> <li>• Rigging and hoisting</li> <li>• Safety and security</li> </ul> </li> <li>d. Roof access               <ul style="list-style-type: none"> <li>• Guardrails</li> <li>• Ramps</li> <li>• Ladders</li> <li>• Shoring</li> <li>• Hoardings</li> <li>• Swing stages</li> <li>• Scaffolding and scaffold systems</li> </ul> </li> <li>e. Winter conditions               <ul style="list-style-type: none"> <li>• Hypothermia</li> <li>• Frostbite</li> <li>• Heaters</li> <li>• Insulated tarpaulin</li> </ul> </li> <li>f. Summer conditions               <ul style="list-style-type: none"> <li>• Heat stroke</li> </ul> </li> </ul>	<b>80%</b>

- Heat exhaustion
  - Sunburns
  - Burns
- g. Troubleshooting

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## Sloped Roofer

**Unit:** B9 Journeyperson Trainer

**Level:** Two

**Duration:** 14 hours

Theory: 14 hours

Practical: 0 hours

### Overview:

Level One in-school technical training offers an entry-level orientation to the challenges of apprenticeship training as it relates to the development of core tasks and skill requirements, as well as social competencies. This unit introduces senior apprentices to the responsibilities of workplace training that they will assume as supervising journeypersons. Most trades have a rich tradition of refreshing and sharing their trade skills from one generation of trade practitioner to the next. This unit orients senior apprentices to some of the practical and conceptual tools that can enable them to contribute to this trade heritage when they become certified journeypersons and, ultimately, journeyperson trainers.

The journeyperson's obligation to assist entry-level apprentices to develop skills and knowledge is complex and challenging. It involves safety considerations, employer expectations, provincial regulations, as well as the tradition of skills stewardship that links modern practice with the long history of workplace teaching and learning that defines the apprenticeable trades. The ability to offer timely and appropriate support to apprentices is itself an important area of trade learning. This unit presents material intended to help refine this ability through reflection and discussion by senior apprentices, and discussion with their in-school instructor and journeyperson trainer.

This content reflects Manitoba and Canadian standards prescribed for journeyperson-level supervisory capabilities, as well as key topics in current research on the importance of workplace training in apprenticeship systems. These detailed descriptors represent suggested focal points or guidelines for potentially worthwhile exploration, and are neither mandatory nor exhaustive.

**Note: No percentage-weightings for test purposes are prescribed for this unit's objectives. Instead, a "Pass/Fail" grade will be recorded for the unit in its entirety.**

Objectives and Content:	Percent of Unit Mark (%)
<ol style="list-style-type: none"> <li>1. <b>Compare/contrast role options and responsibilities of the supervising journeyperson.</b> <ol style="list-style-type: none"> <li>a. Implicit vs. explicit standards and content: training goals are/are not codified; assessment measures are/are not used</li> <li>b. Accountability for results: e.g., journeyperson is/is not required to prepare performance evaluation that could affect apprentice's employability or wage-rate, etc.</li> <li>c. Long-term vs. short-term supervision assignments – e.g., considerable latitude/little latitude for apprentice to learn from mistakes</li> <li>d. Formally vs. informally structured – e.g., supervision assignment is part of a prescribed cycle of assignments involving coordination among multiple journeypersons; apprentice is trained according to an individual training plan negotiated with employer</li> </ol> </li> </ol>	n/a

- e. Types of supervisory role options and what is implied by each:
  - Journeyman Trainer (JT) role: often initiated by someone other than apprentice, and limited to a particular skill set, task, or production requirement
  - Mentor role: often initiated by apprentice, and relatively open-ended regarding content, duration, etc.
  - Peer role: typically involves individual upgrading or cross-training of one journeyman by another; can include senior apprentice assisting less-experienced trade learner
  - Coordinator role: often a senior-level journeyman appointed by an organization to assume responsibilities for monitoring progression of groups of apprentices
  - Other roles: may be improvised by journeyman, such as a combination of multiple roles of the above

**2. Describe and demonstrate common requirements about providing journeyman level supervision. n/a**

- a. Apprenticeship learning adapted to journeyman supervision assignments and a journeyman perspective
  - Application of adult education concepts to trades teaching and learning (e.g., responsibilities and expectations of senior-level apprentices)
  - Practical significance of 'styles' of adult learning and teaching
  - Helping senior-level apprentices integrate in-school technical training and on-the-job practical training experiences
  - Providing help and guidance about new tasks and skills
  - Providing help and guidance about fixing mistakes
  - Learning and teaching "the ropes" – socialization of apprentice within a community of trade practice (e.g., how to borrow a tool, interrupt a journeyman, seek advice of experienced co-workers)
  - Coverage and documentation of prescribed tasks and subtasks where applicable
  - Discuss the limits of the journeyman trainers' own responsibilities and competence (e.g., scope, willingness to train, etc.)
  - Benefits of maintaining a personal record of achievements, ideas, and needs as a journeyman trainer (e.g., resume, portfolio, training credentials, logbook, etc.)
- b. Individual reflection and guided group discussion about personal experiences of workplace learning as an apprentice
  - Identification of best and worst practices of a journeyman trainer
  - Identification of workplace and other factors that can contribute to good and bad trades teaching/learning experiences
  - Development of professional standards and work ethics about responsibility to share one's knowledge and skill with others in the workplace (e.g., use/misuse of humour, rigour, discretion, craft-pride, etc.)
  - Qualities of a good journeyman trainer
  - Components of workplace journeyman training
  - Processes and recommended practices re: journeyman training
  - Troubleshooting problems re: supervision assignments
- c. Role of assessment in supervising, coaching, or guiding other people to learn or improve their skills (e.g., formative and summative evaluation), and how this might contribute to how the journeyman-level supervision task is approached in future
- d. Compare and contrast discussion results with current knowledge and resources about workplace training methods as they apply to journeyman-level supervision assignments
- e. Other (as may be specified by instructor)

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## Sloped Roofer

**Unit:** B10 Pre-Provincial Exam Review

**Level:** Two

**Duration:** 70 hours

Theory: 70 hours

Practical: 0 hours

### Overview:

This unit offers senior apprentices a systematic review of skills and knowledge required to pass the Provincial Examination. It promotes a purposeful personal synthesis between on-the-job learning and the content of in-school technical training. The unit includes information about the significance of Provincial certification and the features of the Provincial Examination.

**Note: No percentage-weightings for test purposes are prescribed for this unit's objectives. Instead, a "Pass/Fail" grade will be recorded for the unit in its entirety.**

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<p><b>1. Describe the significance, format and general content of Provincial Examinations for the trade of Sloped Roofer.</b></p> <ul style="list-style-type: none"> <li>a. Scope and aims of Provincial certification; value of certifications</li> <li>b. Obligations of candidates for Provincial certification               <ul style="list-style-type: none"> <li>• Relevance of Provincial Examinations to current, accepted trade practices; industry-based provincial and national validation of test items</li> <li>• Supplemental Policy (retesting)</li> <li>• Confidentiality of examination content</li> </ul> </li> <li>c. Multiple-choice (four-option) item format, standards for acceptable test items</li> <li>d. Government materials relevant to the Provincial Examinations for Sloped Roofer apprentices               <ul style="list-style-type: none"> <li>• Provincial Occupational Analysis (POA); prescribed scope of the skills and knowledge which comprise the trade</li> <li>• POA "Pie-chart" and its relationship to content distribution of Provincial Examination items</li> <li>• Apprenticeship Manitoba Technical Training package</li> </ul> </li> </ul>	n/a
<p><b>2. Identify resources, strategies and other considerations for maximizing successful completion of written examinations.</b></p> <ul style="list-style-type: none"> <li>a. Personal preparedness               <ul style="list-style-type: none"> <li>• Rest</li> <li>• Nutrition</li> <li>• Personal study regimen</li> <li>• Prior experience in test situations (e.g., unit tests)</li> </ul> </li> <li>b. Self-assessment, consultation and personal study plan</li> </ul>	n/a

- Self-assessment of individual strengths/weaknesses in trade related skills and knowledge
- Approved textbooks
- Study groups

- |   |            |
|---|------------|
| <b>3. Review program content regarding occupational skills.</b>           | <b>n/a</b> |
| <b>4. Review program content regarding roof preparation.</b>              | <b>n/a</b> |
| <b>5. Review program content regarding roof cavity ventilation.</b>       | <b>n/a</b> |
| <b>6. Review program content regarding installation of sloped roof.</b>   | <b>n/a</b> |
| <b>7. Review program content regarding installation of flashing.</b>      | <b>n/a</b> |
| <b>8. Review program content regarding inspection of roofing systems.</b> | <b>n/a</b> |

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