Apprenticeship Manitoba

Manitoba

Roofer / Sloped Roofer
Common Core Level 1

Rev. August 2022

Apprenticeship Manitoba

Roofer / Sloped Roofer

Unit: A1 Learning About Work

Level: One

Duration: 7 hours

Theory: 7 hours

Practical: 0 hours

Overview:

A sign that an apprentice has become competent in a task or technique is to be asked to share this knowledge. Worksite skills-exchange has long been fundamental to trade-learning. Even trade veterans rely on peers to refine their knowledge and skill. The opportunity to benefit from this process, however, is shaped by complex factors that include worksite 'politics' and job deadlines. As adult trade-learners, apprentices at all levels of training must use their observational, listening and interpersonal skills to benefit from the Journeyperson's knowledge and experience. This requires understanding the trade's dynamics, as well as the roles and responsibilities which determine work-life.

This unit profiles the trade's structure and scope as determined by The Apprenticeship and Certification Act, Apprenticeship and Certification Board, Sector Committees, and Industry Working Groups using the occupational standards from which the technical training is derived. This unit also includes short- and long-term career progression and social competencies. This includes information about major areas of working knowledge, activities and interactions at work, and expansive and restrictive workplaces, stressing their application to apprenticeship on-the-job training.

A sound grasp of the roles, workplace relationships, and possibilities introduced in this unit are part of 'learning to learn' in Manitoba's apprenticeship system. Senior apprentices are later offered information about the transfer of knowledge and skills in this system. Please refer to unit ***C6 Journeyperson Trainer*** (for Roofer) or ***B9 Journeyperson Trainer*** (for Sloped Roofer), which explores the central and time-honoured foundation of trades journeywork.

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 (%)**
1. Describe the structure and scope of the Roofer and Sloped Roofer trades.	**n/a**

a. The Apprenticeship and Certification Act
- Apprenticeship and Certification Board
- Sector Committees and Industry Working Groups (IWG)
- General regulation, and specific trade regulations/by-laws
- Policies regarding attendance, evaluation procedures, conduct and progression requirements (Apprenticeship Manitoba, training provider)

b. Uses of the Red Seal Occupational Standard (for Roofer) or Provincial Occupational Analysis (for Sloped Roofer)
- Apprenticeship Manitoba technical training standards
- On-the-job report of hours

- Examinations (unit tests, final certification examinations)

c. Opportunities and future career options
   - Generalists and specialists. The move toward specialization is well known to modern tradespeople. Some prefer to specialize and others want to do it all. Supervisory positions require a broad scope.
   - Lead hands and other immediate supervisors. Apprentices need to know how to become a lead-hand as much as they need to know the benefits and pit-falls of leadership between management, journeypersons, tradespersons, and other workers.
   - Geographic mobility. What does it mean to a tradesperson to have to travel to find work? Are there more opportunities if they do? What are they? What are the drawbacks to being away from home for several weeks at a time?
   - Job hierarchies and innovations. What trade specific special training opportunities are available in the trade? Is there travel involved? How do these opportunities affect work assignments and career progression?

2. Describe two levels of workplace competency. **n/a**

a. Job competencies related to workplace culture
   - Knowledge of workplace equipment and materials
   - Skills and techniques

b. Social competencies related to workplace culture
   - Language of work
   - Workplace belief systems
   - Rules and meanings
   - Equity, diversity, and inclusion in the workplace

3. Describe accommodation for apprentices with accessibility requirements. **n/a**

a. Awareness of the *Accessibility for Manitobans Act*
   - Customer service accessibility standard
   - Employment accessibility standard
   - Information and communications accessibility standard
   - Built environment
   - Transportation

b. Technical training
   - Requirements
   - Roles and responsibilities
   - Services and information required by persons with accessibility requirements

c. On-the-job
   - Requirements
   - Roles and responsibilities
   - Services and information required by persons with accessibility requirements

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Apprenticeship Manitoba

Roofer / Sloped Roofer

Unit: A2 Trade Safety Awareness

Level: One

Duration: 14 hours

Theory: 14 hours

Practical: 0 hours

Overview:

Safe working conditions, injury prevention, and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers, supervisors, and workers. It is imperative to be familiar and apply the Manitoba Workplace Safety and Health Act and Regulations. Safety education is an integral part of apprenticeship training both in school and on-the-job. This unit is an overview of occupational safety and health best practices in Manitoba and covers Personal Protective Equipment, the Workplace Hazardous Materials Information System and Safe Work Procedures. The unit also describes injury prevention and response. Finally, the unit reinforces these best practices by navigating the SAFE Work Manitoba website through each objective to apply Manitoba's most current safety and health standards. Additional trade safety awareness related resources are located on the Apprenticeship Manitoba website link below. Trade specific hazards and safe work practices are supplemented and delivered in-context within technical training units.

- **SAFE Work Manitoba website:** https://www.safemanitoba.com/
- **Safety resources:** https://www.gov.mb.ca/aesi/apprenticeship/generalinfo/instructoreducators.html

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 (%)**

1. **Define and describe Manitoba safety and health requirements.** **n/a**
   a. Overview of the *Workplace Safety and Health Act and Regulations*
      - Rights and responsibilities of workers under the *Act*
      - Rights and responsibilities of supervisors under the *Act*
      - Rights and responsibilities of employers under the *Act*
   b. Public agencies
      - Workplace Safety and Health (Enforcement)
      - SAFE Work Manitoba (Prevention)
      - Other
   c. Codes of practice, guidelines, policies and standards (differences)
   d. Worker rights
      - Right to know, participate, refuse
      - Protection from reprisal
   e. Workplace safety and health program (worker's involvement)
      - Workplace safety and health committee
      - Participation in investigation and inspection process

2. Identify and describe personal protective equipment (PPE) requirements and standards in the workplace. **n/a**

a. Employer, supervisor and worker responsibilities
b. Hierarchy of control measures
c. Personal protective equipment (PPE)
   - Eye and face protection
   - Hearing protection
   - Foot, head, hand and skin protection
   - Respiratory protection
   - Protective clothing (including Hi-Visibility/Hi-Vis)
   - Fall protection (trade specific)

3. Identify and describe the Workplace Hazardous Material Information System (WHMIS) and procedures. **n/a**

a. Hazard identification
b Product labels, symbols and classification
   - Supplier
   - Workplace
c. Safety Data Sheets (SDS)
d. Chemical and biological hazards
   - Emergency washing
   - Transportation of dangerous goods
   - Storage and handling

4. Identify and describe Safe Work Procedures (SWP). **n/a**

a. Hazard identification
b. Uncontrolled risk
c. SWP development

5. Identify and describe injury prevention.

a. Hazard recognition, evaluation, and control (SAFE acronym)
b. Occupational disease and illness
c. Musculoskeletal
   - Ergonomics
d. Psychological health and safety
   - Harassment and violence
   - Working alone
e. Young workers
f. Physical hazards
g. Chemical and biological hazards, and exposures
   - Dust and fibres
   - Fumes, aerosols, gases and vapours
h. Confined space entry
i. Electrical safety
   - Lockout/tagout procedures
j. Fire types, fire extinguisher classifications and applications

6. Identify and describe injury response. **n/a**

a. Control the scene
b. Incident investigation
   - Near miss
   - Incident

- Serious incident

c. Corrective actions
d. Follow-up
e. Reporting an injury (Workers Compensation Board (WCB) of Manitoba)

7. Demonstrate navigation and retrieval of key content areas from SAFE Work Manitoba's website and apply resources directly to unit objectives. **n/a**

a. Legislation
b. Bulletins
c. Templates
d. Shop Talk
e. Other resources

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Apprenticeship Manitoba

Roofer / Sloped Roofer

Unit: A3 Trade Related Mathematics

Level: One

Duration: 35 hours

Theory: 21 hours

Practical: 14 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills about trade related mathematics. The unit begins with coverage of solving foundational math problems. Part of the unit covers solving problems between metric and customary measurement systems. The unit also covers problems using calculations for simple and complex geometric shapes. Finally, the unit covers solving problems using ratio and proportion, and solving algebraic problems involving simple equations and formulas.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Solve trade related foundational math problems. a. Proper, improper or mixed fractions b. Multiply, divide, reduce and expand common fractions c. Decimal and common fractions, standard operations and conversions d. Roots and exponents e. Order of operations f. Tolerances and margins of error g. Percentages	**20%**
2. Solve trade related problems between metric and customary measurement systems. a. Linear measures b. Area c. Volume d. Temperatures e. Weight/Mass	**20%**
3. Solve trade related problems using calculations for simple and complex geometric shapes. a. Perimeter, circumference and area of polygons • Triangle • Rectangle • Circle • Quadrilateral and parallelogram b. Pythagorean theorem c. Volume	**25%**

4. Solve trade related problems using ratio and proportion. 25%

a. Direct
   - Slope
   - Pitch
   - Measurement scaling

b. Indirect

5. Solve trade related algebraic problems involving simple equations and formulas. 10%

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Unit: A4 Blueprints and Trade Documents I

Level: One

Duration: 35 hours

Theory: 21 hours

Practical: 14 hours

Overview:

This unit is designed to provide the apprentice with introductory knowledge and skills about blueprints and trade documents. The unit begins with coverage of the use of technical drawing in the roofing trades. Part of the unit covers roof designs used in technical drawings. The unit also covers technical drawing equipment and materials. Finally, the unit covers techniques to produce roofing sketches and technical drawings, and designing or sketching a roof component.

Objectives and Content: **Percent of Unit Mark (%)**

1. Describe use of technical drawing in the roofing trades. **10%**

a. Use of technical drawing
- Design and production of roofing structures/components (e.g., form/function, job details, application methods, material requirements, project planning, cost considerations, etc.)
- Problem solving and troubleshooting

b. Types, techniques and terminology
- Freehand sketches and brainstorming
- Developing sketches/drawings from photographs
- Pictorial drawings
- Working drawings
- Drawings to specifications
- Blueprints and blueprint components (including schedules)
- Layouts

2. Describe roof designs used in technical drawings. **10%**

a. Basic principles of design

b. Roof shapes and related terminology

c. Major design characteristics of common roof shapes
- Barrel, flat, gable, gambrel, intersecting, dutch/hip, mansard, sawtooth, serpentine, shed
- Other roof shapes and structures

3. Describe use of technical drawing equipment and materials. **10%**

a. Rulers and straight edges (including T-square, parallel rule)

b. Architect scales (metric, imperial)

c. Pencils and leads (e.g., line-weight)

d. Erasers
e. Set squares
f. Protractors
g. Tools for curved work

4. Describe and perform techniques to produce roofing sketches and technical drawings. **20%**

a. Basic orthographic projection
   - Visualize and sketch views (i.e., plan view, elevation view, side view, sectional view)
b. Basic oblique projection
c. Basic isometric projection
d. Applied geometry
   - Construct angles
   - Construct circles, arcs, tangents, etc.
   - Dividing lines
   - Construct regular polygons
e. Line work and weight
   - Object line
   - Hidden line
   - Extension line
   - Dimension line
   - Centre line
   - Break line
   - Cutting-plane line
f. Common architectural symbols
g. Measurement and drawing scale (metric, imperial)
h. Lettering
   - Basic knowledge of legibility and other requirements
i. Digital photography (e.g., camera, tablets, androids)

5. Design or sketch a roof component. **50%**

a. Interpret technical drawings and other materials to identify/solve a roofing problem
b. Use of scale, accepted conventions re: line-weight, lettering, etc.
c. Use/convert metric and imperial units of measure
d. Sequence
   - Freehand sketches (including isometric and orthographic projections)
   - Specified detail sketch
   - Finished drawing (including application of line-weights)
   - Verification of sketch re: roofing component, original drawing and/or specifications provided

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Unit: A5 Tools and Equipment

Level: One

Duration: 14 hours

Theory: 14 hours

Practical: 0 hours

Overview:

This unit is designed to provide the apprentice with knowledge about tools and equipment in the roofing trades. The unit begins with coverage of the selection, use and maintenance of roofing tools and equipment. Part of the unit covers hand tools, power tools, and hot process and motorized roofing equipment. Finally, the unit covers aids for roof project rigging, lifting/hoisting and waste disposal.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Describe selection, use and maintenance of roofing tools and equipment. a. Use of tools and equipment • Safe work procedures • Manufacturer and employer specifications b. Selection of tools and equipment • Variation in the cost, quality and capacity of roofer tools • Match tools/equipment to job requirements • Select, set-up tools for project (including tool limits, settings/adjustments) • Trade culture re: borrowing, using and returning tools • Workplace policies on employee's personal tools/equipment and employer-supplied tools/equipment • Select tools/equipment for own use (e.g., budget, arrangements with employer, etc.)	**50%**
2. Describe selection, use and maintenance of hand tools.	**20%**
3. Describe selection, use and maintenance of power tools/equipment. a. Pneumatic b. Powder actuated	**10%**
4. Describe selection, use and maintenance of hot process and motorized roofing equipment.	**10%**
5. Describe aids for roof project rigging, lifting/hoisting and waste disposal. a. Trucks b. Trailers	**10%**

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Unit: A6 Roofing Materials and Products

Level: One

Duration: 21 hours

Theory:	21	hours
Practical:	0	hours

Overview:

This unit is designed to provide the apprentice with knowledge about roofing materials and products. The unit begins with coverage of the types of roofing materials and products, and the use of rolled materials. Part of the unit covers aggregates and coatings for flat/low slope, and materials for flat/low slope and steep roof constructions. Finally, the unit covers roofing fasteners, adhesives and other miscellaneous materials.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Describe types of roofing materials and products.	**5%**
a. Major types of materials, physical properties and characteristics b. Building codes c. Manufacturer/industry specifications, classification systems and standards d. Recent innovations in engineering and manufacturing of roofing materials	
2. Describe use of rolled roofing materials and explain preferred use.	**5%**
a. Roofing materials (e.g., asphalt saturated, fibreglass, reinforced, synthetic underlayment, tar) b. Mineral surface c. Salvage edge d. Determine rolled material requirements for a specific roof area	
3. Describe aggregates and roof coatings for flat/low slope roofs, and explain preferred use.	**10%**
a. Aggregates (crushed gravel, pea gravel, river stone, slag) b. Roof coatings • Aluminum paint • Asphalt flood coat • Cutback • Decorative • Emulsion • Fibrated, non-fibrated • Synthetic rubber • Vinyl	

4. Describe materials for flat/low slope roof construction and explain preferred use. 25%

a. Built-up roofing (BUR) membrane
b. Hot rubberized roofing
c. Cold process roofing
d. Modified bituminous membrane roofing
e. Single-ply roofing
   - Polyvinyl chloride (PVC)
   - Chlorinated polyethylene (CPE)
   - Chlorosulphinated polyethylene (CSPE) “Hypalon”
   - Thermoplastic Olefin (TPO)
   - Ethylene Propylene Diene Monomer (EPDM)
   - Chloroprene Rubber (CR) Neoprene
f. Thermoplastics
g. Thermoset membranes
h. Heat welded varieties
   - Polyvinyl chloride (PVC)
   - Thermoplastic Olefin (TPO)
   - Chlorosulphinated polyethylene (CSPE) “Hypalon”
i. Metal flashings (e.g., aluminum, copper, stainless steel)

5. Describe materials for steep roof construction and explain preferred use. 25%

a. Shingle roof materials
   - Shingles: asphalt, fiberglass, laminate, styrene-butadiene-styrene (SBS)
   - Asphalt shingles (standard, laminate, modified bitumen)
   - Wood shingles/shakes
   - Underlayment
   - Mastics
   - Flashings
   - Fasteners
b. Tiled-roof materials
   - Tiles (clay, composite, concrete, slate, metal)
   - Underlayment
   - Closure strips
   - Flashings
   - Mortars and dyes
c. Metal roof materials
   - Pre-engineered roofing systems
   - Pre-formed metal
   - Strapping
   - Underlayment
   - Closure strips
   - Flashings
   - Fasteners
   - Ridge vents
   - Snow guards

6. Describe roofing fasteners and adhesives, and explain preferred use. 10%

a. Fasteners
   - Nails
   - Mechanical fasteners
   - Screws
   - Bolts

- Hollow-wall
- Clips
- Plates
- Bars
- Compatibility of fasteners with types of flashings (e.g., metal combinations)
- Significance of fastener standards, selection, and schedules/pattern

b. Adhesives (contact cements, primer, seam tape, peel and stick)

7. Describe miscellaneous roofing materials and explain preferred use. 20%

a. Caulking
b. Insulation
c. Gypsum board
d. Vapour retarders
   - Polyethylene
   - Peel and stick
   - Modified bitumen
   - Laminate
   - Two-ply felt
   - Retarder adhesives
e. Primers
f. Paints
g. Protection boards
   - Insulation
   - Corrugated
   - Drain mat
   - Wood fibre
   - Fibreglass
   - SBS boards
   - Asphalt impregnated

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Apprenticeship Manitoba

Roofer / Sloped Roofer

Unit: A7 Steep Roof Construction and Products I

Level: One

Duration: 35 hours

Theory: 35 hours

Practical: 0 hours

Overview:

This unit is designed to provide the apprentice with introductory knowledge about steep roof construction and products. The unit begins with coverage of the types of roof structures, designs, construction features and slopes. Part of the unit covers steep roof systems and their construction. Finally, the unit covers the installation procedures for shingled, tiled and pre-formed metal (PFM) roofing systems.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Describe types of roof structures, designs, construction features and slopes.	**10%**
a. Types of roof structures and designs	
b. Roof construction features	
c. Roof slopes	
2. Compare steep roof systems and their construction.	**10%**
a. Types of steep roof systems and components	
• Asphalt shingles	
• Tile roofs	
• Pre-formed metal roofing	
b. Loading, drainage and substrate requirements	
3. Describe installation procedures for shingled roofing systems.	**30%**
a. Flashings	
• Assess project requirements for flashings	
• Locate/select flashing and specifications	
• Selection/compatibility of fasteners	
• Techniques for cutting, forming/jointing and caulking of flashings	
b. Saddles/crickets	
c. Underlayment	
• Select underlayment product	
• Roll preparation	
d. Shingles	
• Layout	
• Cutting techniques	
• Fastening techniques	
• Tabbing methods	

e. Vents
- Net-Free Vent Areas (NFVA)
- Types of vents and vent flashings
- Calculate number of vents and location
- Procedures and precautions when cutting roof decks
- Building codes

4. Describe installation procedures for tiled roofing systems. 25%

a. Installation phases
- Selection/use of specialized tools/fixtures and fasteners
- Lay-outs and manufacturer specifications

b. Underlayment
- Choice of underlayment material
- Fitting, placement and securement

c. Vents
- Determine number and location of vents
- Seal vents to underlayment

d. Flashings
- Locate/select flashing and specifications
- Selection/compatibility of fasteners
- Techniques for cutting, forming/jointing, caulking flashings

e. Tiled roof strapping
- Locate rafters and establish nailing/fastener pattern
- Layouts for strapping

f. Tiled roof starter strips and closure strips
- Establish height, location and start-line
- Stagger starter-strip butt joints
- Select closure-strip material
- Place and secure closure-strips

g. Roof tiles
- Special tips and techniques to cut/fit tiles around flashings, valleys, capping, projects and vents
- Establish and maintain pattern for tile/fastener placement
- Fasten ridge/hip caps

h. Mortar
- Select, mix and colour match mortar
- Mortar placement

5. Describe installation procedures for pre-formed metal (PFM) roofing systems. 25%

a. Basic sheet-metal work
- Selection/use of basic sheet metal hand tools
- Review flashing/strapping, fasteners and other materials

b. Underlayment materials
- End/side-lap allowances
- Adapt techniques for underlayment material

c. PFM techniques
- Chalk line layout pattern for strapping
- Compatibility/choice of wood/metal
- Fastening/anchoring strapping
- Cut, place, fasten and caulk foam, metal and other closure strips

d. Fasten PFM roofing panels
   - PFM standards
   - Types of PFM panels
   - Selection/use of seamers (hand/power), adjustable-torque drivers and other tools/equipment

e. Roof flashings
   - Layout for flashings, crickets, saddles, etc.
   - Cutting, fitting and mitre-jointing
   - Use of screws, rivets and butyl tape to fasten and seal flashings

f. Ridge-vents and snow guards
   - Assess general requirements and precautions
   - Considerations in selection, capacity/requirements, placement and purpose of vents and snow guards
   - Techniques to apply ridge vents
   - Techniques/standards to install snow guards

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Apprenticeship Manitoba

Roofer / Sloped Roofer

Unit: A8 Shingled Roof Work

Level: One
Duration: 35 hours
Theory: 0 hours
Practical: 35 hours

Overview:

This unit, which is a practical unit of ***A7 Steep Roof Construction and Products I***, is designed to provide the apprentice with skills about shingled roof work. The unit begins with coverage of the installation of flashings, saddles/crickets and underlayment. Part of the unit covers techniques for shingle layouts, fitting and securement. Finally, the unit covers installation of vents.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Perform installation of flashings for shingle roof work.	**20%**
a. Interpret building code standards, manufacturer and job specifications	
b. Select flashing to suit project type and job specifications	
c. Perform layout(s) for installation of flashings	
d. Form, joint and fit flashings	
e. Secure and caulk flashings	
2. Perform installation of saddles/crickets for shingled roof work.	**20%**
a. Building code requirements for saddles/crickets	
b. Install and secure	
3. Perform installation of underlayment for shingled roof work.	**20%**
a. Select underlayment materials for project specifications	
b. Relax and place underlayment	
c. Special techniques	
4. Perform techniques for shingle layouts, fitting and securement.	**20%**
a. Design and layout techniques	
• Practical layout	
• Layout procedures	
b. Cutting and fitting shingles	
• Fitting for transitions with ridge-caps, capping, edges, projects, and flashings, etc.	
c. Fastening	
• Select/adjust nailing guns and air compressors	
• Practical design and layout	
• Select fasteners and fastener patterns	
• Maintain and verify patterns and overlap allowances	

- Special considerations and fastening practices

d. Tabbing
   - Wind proofing methods
   - Apply adhesives
   - Sealing projections

5. Perform installation of vents for shingled roof work. 20%

a. Vent layouts and clearances
   - Interpret specifications/standards
   - Cut and install types of vents
   - Calculate number of vents and location

b. Install and secure vents
   - Attic type
   - Turbine type
   - Ridge type

c. Seal roof projections
   - Application of mastic
   - Caulking
   - Ridge type

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Roofer / Sloped Roofer

Unit: A9 Pre-formed Metal Roof Work

Level: One

Duration: 35 hours

Theory: 0 hours

Practical: 35 hours

Overview:

This unit, which is a practical unit of ***A7 Steep Roof Construction and Products I***, is designed to provide the apprentice with skills about pre-formed metal (PFM) roof work. The unit begins with coverage of the use of sheet metal and woodworking tools. Part of the unit covers installation techniques for PFM underlayment, and panels and related products. Finally, the unit covers installation techniques for PFM flashings, vents and snow guards.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Demonstrate use of sheet metal and woodworking tools.	**20%**
a. Select/special application of tools, equipment and accessories for PFM roof work b. Interpret PFM roof work project specifications c. Woodwork tools d. Sheet metal tools	
2. Perform installation techniques for PFM underlayment.	**20%**
a. Install underlayment materials • Interpret manufacturer specifications • Establish allowances for side and end laps • Fit and place underlayment materials • Installation techniques b. Install starter and closure strips and strapping • Manufacturer specifications for lay-out/location, fitting, and securement of these components • Compatibility/choice of wood/metal • Fastening/strapping • Cut, place, fasten and caulk foam/metal and other closure strips	
3. Perform installation techniques for PFM panels and related products.	**20%**
a. Identify/select PFM roof work products, accessories, etc. b. Apply standards and specifications to select and use specific products and hardware compliance c. Verify lay-outs d. Form seams • Select/use seamers • Use adjustable torque-drivers	

- Use other specialty equipment for seam-forming

e. Fasten and secure PFM roof work products

4. Perform installation techniques for PFM flashings. 20%

a. Locate/lay-out the installation
   - Saddles and crickets
   - Flashings

b. Locate/cut clearances

c. Cut, fit/joint of flashing materials

d. Application of screws, rivets and butyl tape to secure/seal flashings

5. Perform installation techniques for PFM vents and snow guards. 20%

a. Identify/select vent, snow guard products and accessories

b. Assess specific project requirements and precautions
   - Type
   - Layout and placement
   - Calculations

c. Install vents
   - Building codes
   - Selection/placement of fasteners

d. Install snow guards according to building codes

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Roofer / Sloped Roofer

Unit: A10 Fall Protection, Scaffolding and Roof Access Structures

Level: One

Duration: 14 hours

Theory: 7 hours

Practical: 7 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills about fall protection, scaffolding and roof access structures. The unit begins with coverage of fall protection equipment and scaffolding. Part of the unit covers ladders, ramps/runways and temporary stairs. Finally, the unit covers inspection of scaffolding and hoisting equipment.

Objectives and Content:	**Percent of Unit Mark (%)**

1. Describe scaffolding and roof access structures. — **15%**

a. Types
- Ladders
- Ramps, runways and stairs
- Scaffolding and scaffold systems
- Suspended access equipment
- Scissor lifts
- Tele handler

b. Applications and preferred uses
c. General safety precautions and regulatory considerations
d. Fall protection requirements, apparatus and techniques
e. Dismantling and storage
f. Rigging/hoisting procedures and equipment

2. Describe and demonstrate selection, use and maintenance of fall protection equipment. — **30%**

a. Types of fall protection
- Arrest
- Restraint
- Prevention

b. Fall arrest and travel restraint systems
- Harnesses
- Lanyards
- Lifelines (horizontal/vertical)
- Rope-grabs
- Shock absorbers
- Tie-ins/anchor points

c. Travel arrest equipment and accessories
   - Belly-hooks
   - Belts
   - Harnesses
   - Half-harnesses
   - Lanyards
   - Rope-grabs
   - Tie-ins
   - Anchor points

d. Fall prevention
   - Floor opening protection
   - Guardrail systems
   - Wall openings
   - Safety nets

3. Describe and demonstrate selection, use and maintenance of ladders, ramps/runways and temporary stairs. **15%**

a. Ladders
   - Varieties of ladders
   - Base-to-height ratio, three-point contact
   - Electrical and other hazards
   - Fall protection, tie-off
   - Ladder cages/jacks
   - Minimum extension
   - Overlaps
   - Rest platform
   - Safety feet
   - Securement

b. Ramps, runways and stairs
   - Construction regulations
   - Varieties and their uses
   - Guardrails and handrails
   - Slope
   - Stepping laths (cleats)
   - Widths

c. Design, construction and installation techniques
   - Construction regulations
   - Braces
   - Handrails and guardrails
   - Footings
   - Loading
   - Platform material

4. Describe and perform selection, use and maintenance of scaffolding. **10%**

a. Types of scaffolding/scaffolding systems
   - Birdcage
   - Bridging and cantilever scaffolds
   - Independent/dependent
   - Rolling
   - Tube and clamp
   - Frame

- Machine scaffolds (including articulated booms, mast-climbing scaffolds, scissor-lifts, and zooms)
- WSH regulations
- Manufacturer's rating of machine

b. Major components of scaffolding

c. Loading and capacities
- Dead/live loads
- Ground loads
- Leg loads
- Rolling loads
- Safe workloads
- Static loads
- Wind loads
- Permissible spans

d. Erect, maintain and disassemble independent scaffolding
- Access, egress
- Base lift
- Base-to-height ratio
- Bracing
- Duty ratings (light/heavy)
- Foundations
- Guardrails
- Single- and double-pole
- Tie-ins (vertical/horizontal)
- Wood and metal

5. Describe and demonstrate inspection of hoisting equipment. 20%

a. Safety considerations
b. Inspection procedure
c. Targets for scheduled and periodic maintenance
d. Special considerations

6. Describe and perform inspection of scaffolding. 10%

a. Safety considerations
b. Inspection procedure
c. Targets for scheduled and periodic maintenance
d. Special considerations

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