Apprenticeship Manitoba

Manitoba

Bricklayer
Level 3

Rev. August 2022

Apprenticeship Manitoba

Bricklayer

Unit: C1 Journeyperson Trainer

Level: Three
Duration: 7 hours
Theory: 7 hours
Practical: 0 hours

Overview:

Level 1 in-school technical training offers an entry-level orientation to the challenges of apprenticeship training as it relates to the development of core tasks, skill requirements, and 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.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Compare/contrast role-options and responsibilities of the supervising journeyperson.	**50%**

a. Implicit vs. explicit standards and content: training goals are/are not codified; assessment measures are/are not used
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.
c. Long-term vs. short-term supervision assignments – e.g., considerable latitude/little latitude for apprentice to learn from mistakes
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
e. Types of supervisory role options and what is implied by each:
   - Journeyperson 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 journeyperson by another; can include senior apprentice assisting less-experienced trade learner
- Coordinator role: often a senior-level journeyperson appointed by an organization to assume responsibilities for monitoring progression of groups of apprentices
- Other roles: may be improvised by journeyperson, such as a combination of the roles above

2. Describe and demonstrate common requirements about providing journeyperson level supervision. **50%**

a. Apprenticeship learning adapted to journeyperson supervision assignments and a journeyperson 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 journeyperson, and seek advice of experienced co-workers)
   - Coverage and documentation of prescribed tasks and subtasks where applicable
   - Discuss the limits of the journeyperson 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 journeyperson 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 journeyperson trainer
   - Identification of workplace and other factors that can contribute to good and bad trades teaching/learning experiences
   - Development of professional standards and work ethic regarding one's responsibility to share one's knowledge and skills with others in the workplace (e.g., use/misuse of humour, rigour, discretion, craft-pride, etc.)
   - Qualities of a good journeyperson trainer
   - Components of workplace journeyperson training
   - Processes and recommended practices re: journeyperson 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 journeyperson-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 journeyperson-level supervision assignments

e. Other (as may be specified by instructor)

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Unit: C2 Estimating and Job Planning

Level: Three
Duration: 28 hours
Theory: 7 hours
Practical: 21 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of estimating and job planning. Apprentices will directly apply blueprint reading and quantity surveying principles and techniques from the Level 2 unit, B1 Blueprint Reading and Quantity Surveying. The unit will review commercial working documents and refresh principles and techniques to locate, interpret and extract specific job information. The unit also focuses on estimating procedures specific to industrial, commercial and institutional projects. Finally, apprentices will develop a plan to coordinate the performance of a masonry project that includes materials, equipment, site considerations and labour.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Review terminology associated with blueprint reading and quantity surveying.	**5%**
2. Identify safety documentation and describe safe work practices associated with job planning.	**5%**
3. Interpret codes and specifications pertaining to blueprint reading and job planning.	**10%**
4. Review working documents. a. Types b. Views c. Documentation d. Drawing conventions	**20%**
5. Demonstrate and perform a job estimate using working documents. a. Industrial b. Commercial c. Institutional	**25%**
6. Interpret the working drawings and develop a plan to coordinate the performance of a masonry project. a. Materials • Substrate • Building envelope • Masonry units • Accessories	**35%**

b. Equipment
    - Scaffolding
    - Material handling
c. Site considerations
    - Site access
    - Subgrade
    - Material storage
    - Weatherproofing
    - Scheduling (coordination)
    - Waste removal
d. Labour
    - Set up
    - Production
    - Tear down

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Unit: C3 Horizontal Masonry Surfaces

Level: Three
Duration: 21 hours
Theory: 7 hours
Practical: 14 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of horizontal masonry surfaces. Beginning with terminology and safe work practices, the unit covers types, materials, patterns and considerations. The unit also covers substrate preparation and installation procedures, applying jurisdictional recommendations and installation specifications. Finally, apprentices will install various types of horizontal masonry surfaces.

Objectives and Content:	Percent of Unit Mark (%)
1. Define terminology associated with horizontal masonry surfaces.	**5%**
2. Identify hazards and describe safe work practices associated with horizontal masonry surfaces.	**5%**
3. Interpret jurisdictional recommendations and installation specifications pertaining to horizontal masonry surfaces.	**5%**
4. Identify and describe horizontal masonry surfaces. a. Types • Rigid • Flexible b. Subgrade c. Materials d. Patterns e. Borders f. Edge restraint g. Considerations • Drainage • Grade • Geotextiles • Sealants • Loading (static vs. dynamic)	**10%**
5. Identify and describe the selection, characteristics and application of mortars, grouts and adhesives for horizontal masonry surfaces.	**5%**

6. Describe the procedures for preparing the substrate for horizontal masonry surfaces. **15%**

a. Layout
b. Slope
c. Excavation
d. Aggregate
e. Geotextiles
f. Edging restraint
g. Concrete (rigid system)

7. Describe the procedures for installation of horizontal masonry surfaces. **15%**

a. Pattern
b. Cutting
c. Placing unit
d. Filling voids
   - Natural sand
   - Polymeric
e. Tamping
f. Sweeping
g. Sealing
h. Finish joint (rigid system)
i. Construction joint (rigid system)

8. Describe and demonstrate the procedures to install horizontal masonry surfaces. **20%**

a. Planning
b. Layout
c. Preparing
d. Placing
e. Finishing

9. Perform the installation of various horizontal masonry surfaces. **20%**

a. Rigid
b. Flexible

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Apprenticeship Manitoba

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Unit: C4 Natural Stone Cladding (Mechanically Fastened)

Level: Three

Duration: 14 hours

Theory: 8 hours

Practical: 6 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of natural stone cladding (mechanically fastened). Beginning with terminology and safe work practices, the unit covers stone types and their properties, anchoring systems, flashing material and lifting methods. The unit also covers substrate preparation, stone preparation and installation procedures, applying engineered documentation and installation specifications. Finally, apprentices will prepare stone and the substrate for installation of a mechanically fastened natural stone cladding wall section.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with natural stone cladding (mechanically fastened).	**5%**
2. Identify hazards and describe safe work practices associated with natural stone cladding (mechanically fastened).	**5%**
3. Interpret engineered documentation and installation specifications pertaining to natural stone cladding (mechanically fastened).	**10%**
4. Identify and describe the selection, characteristics and application of mortars, grouts and adhesives for horizontal masonry surfaces. a. Bonding agents b. Caulking c. Epoxy d. Mortars	**5%**
5. Identify and describe natural stone cladding (mechanically fastened). a. Stone types • Igneous • Metamorphic • Sedimentary b. Properties • Mass • Porosity • Density c. Anchoring systems	**10%**

d. Flashing materials
e. Lifting methods

6. Describe the procedures for preparing the substrate for natural stone cladding (mechanically fastened). 15%

a. Identify backup wall imperfections
b. Remove debris
c. Fill voids
d. Install flashing
e. Install membranes and insulation
f. Set grid lines
g. Install anchoring systems

7. Describe the procedures for preparing the stone for installation of natural stone cladding (mechanically fastened). 15%

a. Inspect stone
b. Cut, shape and modify stone
c. Reface granite surface (flame finish)
d. Prepare for anchors
   - Hole
   - Kerfs
e. Join prefabricated sections

8. Describe the procedures for installing natural stone cladding (mechanically fastened). 15%

a. Lift and set panels
b. Align and stabilize
c. Adjust and shim
d. Finish joints

9. Demonstrate and perform the procedures to prepare the substrate, stone and installation of natural stone cladding (mechanically fastened). 20%

a. Wall Section
   - Flame finished granite

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Unit: C5 Chimneys and Fireplaces

Level: Three

Duration: 49 hours

Theory: 14 hours

Practical: 35 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills about chimneys and fireplaces. Beginning with terminology and safe work practices, the unit covers the types, materials, characteristics and components of chimneys and fireplaces. The unit also covers preparation and building procedures for fireplaces, chimneys and their components, applying jurisdictional codes and regulations. Apprentices will calculate and size chimney and fireplace components. Finally, apprentices will layout, prepare and build various fireplaces, chimneys and their components.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with chimneys and fireplaces.	**5%**
2. Identify hazards and describe safe work practices associated with chimneys and fireplaces.	**5%**
3. Interpret jurisdictional codes and regulations pertaining to chimneys and fireplaces.	**5%**
4. Identify and describe chimneys and fireplaces. a. Types b. Designs c. Materials d. Characteristics e. Applications f. Components	**10%**
5. Identify and describe the procedures for preparing and building fireplaces, and installing accessories. a. Hearth, firebox and back up b. Dampers c. Smoke chambers d. Existing fireplace for insert e. Faces and inserts	**15%**
6. Identify and describe the procedures for preparing and building chimneys, and installing accessories. a. Foundation supports	**15%**

b. Chimneys
c. Flue lining
d. Flashings
e. Caps

7. Describe and demonstrate the applications and procedures to build various chimneys and fireplaces. **15%**

a. Layout
b. Forming
c. Components

8. Perform the calculations associated with chimneys and fireplaces and their components. **5%**

a. Opening size
b. Firebox dimensions
c. Damper location
d. Smoke chamber
e. Flue size

9. Perform the procedures to layout, prepare, and build chimneys and fireplaces and install various components. **25%**

a. Conventional masonry fireplace
b. Multi-flue chimney

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Unit: C6 Refractories and Corrosion Resistant Materials

Level: Three

Duration: 21 hours

Theory: 15 hours

Practical: 6 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of refractories and corrosion resistant materials. Beginning with terminology and safe work practices, the unit covers a detailed understanding of refractories and corrosion resistant materials including linings and insulation, anchors and failures. The unit also covers the procedures for removal, preparation, installation and repair. Finally, apprentices will prepare and install sections of refractories and corrosion resistant materials using various materials.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with refractories and corrosion resistant materials.	**5%**
2. Identify hazards and describe safe work practices associated with refractories and corrosion resistant materials.	**5%**
3. Identify and describe refractories and corrosion resistant materials. a. Refractory lining • Brick • Plastic • Castable b. Classification c. Applications d. Supports e. Anchors f. Insulation g. Membrane h. Failures	**15%**
4. Identify and describe the selection, characteristics and application of mortars, grouts and adhesives for refractories and corrosion resistant materials. a. Type • Air setting • Heat setting • Ceramic setting b. Mixing procedures c. Admixtures	**15%**

5. Describe the procedures for refractories and corrosion resistant materials. 35%

a. Prepare
- Anchoring locations
- Accessories
- Shape insulation
- Refractory unit
- Forms and arch centers
- Surface preparation and protection
- Membrane selection

b. Remove existing
- Methods
- Cleanup
- Disposal

c. Installation
- Tools and equipment selection
- Methods
- Insulation
- Refractory material sequence
- Vents and plastics
- Control joints
- Separation material

d. Repair
- Isolate damage
- Methods
- Replacement materials

6. Demonstrate and perform the preparation and installation of refractories and corrosion resistant materials. 25%

a. Brick
b. Plastic
c. Castable

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Unit: C7 Masonry Restoration II

Level: Three
Duration: 21 hours
Theory: 10 hours
Practical: 11 hours

Overview:

This unit is designed to provide a continuation of knowledge and skills of masonry restoration. Apprentices will apply principles and techniques building on the Level 2 unit, B6 Masonry Restoration I. Beginning with reviewing terminology and masonry repair procedures, this unit will focus on the methods and procedures to clean masonry and the associated hazards and safe work practices. Finally, apprentices will repair and clean various types of damaged masonry.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Review terminology associated with repairing masonry restoration.	**5%**
2. Identify hazards and describe safe work practices associated with cleaning masonry restoration.	**5%**
3. Review the procedures to repair masonry. a. Removal b. Repoint joints c. Repair masonry units d. Reinstall	**15%**
4. Identify and describe the methods for cleaning masonry. a. Low impact • Cleaning agents • Steam • Poultice b. High impact • Pressure wash • Micro abrasion • Sandblasting	**20%**
5. Identify and describe the procedures for cleaning masonry. a. Surface condition b. Testing c. Mixing d. Application	**25%**

6. Demonstrate and perform the repair and cleaning of damaged masonry. 30%

a. Dutchman
b. Brick replacement
c. Mortar colour match
d. Cleaning methods

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Unit: C8 Ornamental and Sculpted Masonry Units

Level: Three

Duration: 21 hours

Theory: 7 hours

Practical: 14 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of ornamental and sculpted masonry units. Beginning with terminology and safe work practices, the unit covers material types, bond patterns, considerations and applications. The unit also covers the procedures for preparation and installation. Finally, apprentices will construct various types of sculpted and ornamental panels.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with ornamental and sculpted masonry units.	**5%**
2. Identify hazards and describe safe work practices associated with ornamental and sculpted masonry units.	**5%**
3. Identify and describe ornamental and sculpted masonry units. a. Types b. Materials c. Bond patterns d. Characteristics e. Considerations • Weather • Aesthetics f. Applications • Screen types • Sound reduction • Other	**15%**
4. Identify and describe the selection, characteristics and application of mortars, grouts and adhesives for ornamental and sculpted masonry units. a. Type b. Colour	**10%**
5. Describe the procedures for preparing for installation of ornamental and sculpted masonry units. a. Tool selection b. Considerations	**20%**

- Patterns
- Opening size
- Placement
- Durability

c. Masonry units
d. Surface preparation
e. Anchoring

6. Describe and demonstrate the procedures for installation of ornamental and sculpted masonry units. **20%**

a. Planning
b. Layout
c. Preparing
d. Installation
e. Finishing

7. Perform the procedures to construct various ornamental and sculpted masonry panels. **25%**

a. Post-sculpted
b. Bond patterns
   - Basket weave
   - Herringbone
   - Brick lattice

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Unit: C9 Arches II

Level: Three
Duration: 28 hours
Theory: 6 hours
Practical: 22 hours

Overview:

This unit is designed to provide the apprentice with advanced knowledge and skills of arches. Apprentices will apply principles and techniques building on the Level 2 unit, B8 Arches I. Beginning with terminology and safe work practices, the unit covers multi-centered arch types, characteristics and material types. The unit also covers multi-centered arch template preparation, installation and removal procedures. Finally, apprentices will template and construct various multi-centered arches by interpreting drawings and specifications.

Objectives and Content:	Percent of Unit Mark (%)
1. Define terminology associated with arches. a. Multi-centered	**5%**
2. Identify hazards and describe safe work practices associated with arches.	**5%**
3. Interpret drawings and specifications associated with arches.	**10%**
4. Identify and describe multi-centered arches. a. Type • Gothic • Tutor • Elliptical b. Characteristics • Shape • Strength • Gauged • Rough	**15%**
5. Describe and demonstrate the procedures to construct multi-centered arches. a. Prepare location b. Calculate arch properties c. Layout template d. Build template e. Place template f. Install masonry unit g. Remove template	**25%**

6. Perform the procedures to construct various multi-centered arches. 40%

a. Gothic
b. Tutor
c. Elliptical

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Unit: C10 Pre-Interprovincial Review

Level: Three

Duration: 35 hours

Theory: 35 hours

Practical: 0 hours

Overview:

This unit offers senior apprentices a systematic review of skills and knowledge required to pass the InterProvincial 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 Interprovincial (Red Seal) certification and the features of the Interprovincial 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.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Describe the significance, format and general content of Inter-Provincial (IP) Examinations for the trade of Bricklayer. a. Scope and aims of Interprovincial (Red Seal) certification; value of certifications b. Obligations of candidates for Interprovincial certification • Relevance of Interprovincial Examinations to current, accepted trade practices; industry-based provincial and national validation of test items • Supplemental policy (retesting) • Confidentiality of examination content c. Multiple-choice (four-option) item format, Red Seal standards for acceptable test items d. Government materials relevant to the Interprovincial Examinations for apprentice Bricklayers • Red Seal Occupational Standard (RSOS) – for Bricklayer; prescribed scope of the skills and knowledge which comprise the trade • RSOS "Pie-chart" and its relationship to content distribution of Interprovincial Examination items • Red Seal Examination Breakdown • Red Seal Self-Assessment Guide • Apprenticeship Manitoba Technical Training package	**n/a**
2. Identify resources, strategies and other considerations for maximizing successful completion of written examinations. a. Personal preparedness • Rest • Nutrition • Personal study regimen	**n/a**

- Prior experience in test situations (e.g., unit tests)

b. Self-assessment, consultation and personal study plan
   - Self-assessment of individual strengths/weaknesses in trade related skills and knowledge
   - Approved textbooks
   - Study groups

3. Review program content regarding the major work activity of performs common occupational skills. **n/a**

4. Review program content regarding the major work activity of performs general masonry practices. **n/a**

5. Review program content regarding the major work activity of builds masonry systems. **n/a**

6. Review program content regarding the major work activity of builds natural stone systems. **n/a**

7. Review program content regarding the major work activity of builds chimneys and fireplaces. **n/a**

8. Review program content regarding the major work activity of installs refractories and corrosion resistant materials. **n/a**

9. Review program content regarding the major work activity of performs restorations. **n/a**

10. Review program content regarding the major work activity of performs additional masonry. **n/a**

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