Apprenticeship Manitoba

Manitoba

Bricklayer
Level 2

Rev. August 2022

Apprenticeship Manitoba

Bricklayer

Unit: B1 Blueprint Reading and Quantity Surveying

Level: Two
Duration: 35 hours
Theory: 25 hours
Practical: 10 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of blueprint reading and quantity surveying. Apprentices will apply fundamental document use principles and techniques from the Level 1 unit A6, Worksite Activities and Organization. Building on Level 1 working document terminology, the unit covers in depth, the application of types, views, drawing conventions and accompanying working document sets. Apprentices will apply this knowledge by reproducing various drawing types and conventions. Finally, apprentices will perform quantity surveying focused on residential and commercial projects. Apprentices will later apply these principals and techniques in the Level 3 unit, C2 Estimating and Job Planning, which focuses on developing a plan to coordinate the performance of a masonry project.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with blueprint reading and quantity surveying.	**5%**
2. Interpret codes and specifications pertaining to blueprint reading and quantity surveying.	**10%**
3. Describe and demonstrate the use of working documents.	**25%**

a. Types
- Architectural
- Structural
- Mechanical
- Electrical
- Shop drawings

b. Views
- Plan view
- Elevation
- Sections
- Details

c. Documentation
- Specifications
- Addendums
- Change orders
- Request for information (RFI)

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d. Drawing conventions
   - Line types
   - Reference numbers and symbols
   - Scaling

4. Demonstrate and perform basic drawing techniques. 10%

a. Sketching
b. Perspective
c. Orthographic projection
d. Isometric
e. Other

5. Perform quantity surveying using various types of working documents. 50%

a. Residential
b. Commercial

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Unit: B2 Masonry Walls II

Level: Two
Duration: 56 hours
Theory: 21 hours
Practical: 35 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of load bearing masonry walls. Apprentices will apply principles and techniques building on the Level 1 unit, A11 Masonry Walls I. Beginning with terminology and safe work practices, the unit covers the types, characteristics, and applications of load bearing walls and their components. The unit also covers layout, building methods, and installation procedures, applying their codes and regulations. Finally, apprentices will construct various types of load bearing walls.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with masonry walls. a. Load bearing	**5%**
2. Identify hazards and describe safe work practices when working with masonry walls.	**5%**
3. Interpret jurisdictional codes and regulations pertaining to load bearing masonry walls. a. Masonry units b. Anchorage c. Reinforcement d. Bond beams and lintels e. Construction joints f. Building envelope g. Foundations	**10%**
4. Identify and describe load bearing masonry walls. a. Types • Hollow core • Composite • Multi-wythe • Cavity walls • Column • Pilaster • Retaining walls • Buttresses • Foundation	**10%**

b. Characteristics
   - Bonds
   - Bond patterns
   - Joints

c. Related components
   - Reinforcing
   - Construction joints
   - Lintels
   - Accessories
   - Bearing plates

5. Identify and describe the applications of load bearing masonry walls. 10%

a. Considerations
   - Reinforcing
   - Grouting
   - Drainage
   - Mortar joints
   - Moisture control
   - Other

b. Properties (layout)
   - Height
   - Length

c. Location

d. Procedure and techniques for ordering

e. Procedure for handling, shipment, storage

f. Testing (sampling)

g. Troubleshooting (deterioration, including failing mortars)

6. Demonstrate layout and building methods for load bearing masonry walls. 20%

a. Procedures
   - Material selection
   - Related calculations
   - Layout
   - Coursing
   - Mortar spreading
   - Build leads
   - Wall completion
   - Jointing
   - Quality assurance

7. Perform layout and construction of various types of load bearing masonry walls. 40%

a. Cavity walls

b. Single- and multi-wythe

c. Columns

d. Pilaster

e. Buttress

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Unit: B3 Prefabricated Masonry

Level: Two
Duration: 14 hours
Theory: 7 hours
Practical: 7 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of prefabricated masonry. Beginning with terminology and safe work practices, the unit covers the types, considerations and applications of prefabricated masonry. The unit also covers building and erection procedures interpreted from engineered drawings and specifications. Finally, apprentices will build and prepare sample sections of various panel systems in preparation for erection.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with prefabricated masonry.	**5%**
2. Identify hazards and describe safe work practices associated with prefabricated masonry.	**5%**
3. Interpret drawings and engineered specifications associated with prefabricated masonry.	**10%**
4. Identify and describe prefabricated masonry. a. Types b. Construction methods c. Transporting d. Erection e. Considerations • Material costs • Labour costs • Weather	**15%**
5. Identify and describe the procedures to build prefabricated masonry. a. Forming b. Release agents c. Reinforcing d. Lifting points e. Anchoring systems f. Grouting g. Curing	**20%**

6. Identify and describe the procedures to erect prefabricated masonry. 20%

a. Substrate preparation
b. Delivery logistics
c. Rigging and hoisting
d. Placement
e. Panel alignment
f. Securing
   - Weld plates
   - Bolt systems
g. Joint sealing
h. Repair

7. Describe and demonstrate the procedures to build, prepare to transport, and erect prefabricated masonry. 25%

a. Brick panel systems
b. Lintel systems

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Unit: B4 Surface-Bonded Masonry Units

Level: Two
Duration: 14 hours
Theory: 7 hours
Practical: 7 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of surface-bonded masonry units. Beginning with terminology and safe work practices, the unit covers the types, associated joints, bond patterns and mortars. The unit also covers substrate preparation and installation procedures, applying their codes and regulations. Finally, apprentices will install various surface-bonded masonry units.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with surface-bonded masonry units.	**5%**
2. Identify hazards and describe safe work practices associated with surface-bonded masonry units.	**5%**
3. Interpret jurisdictional codes and regulations pertaining to surface-bonded masonry units. a. Flashing b. Anchoring c. Accessories d. Base coat (scratch)	**15%**
4. Identify and describe surface-bonded masonry units. a. Types • Brick • Concrete products • Natural stone • Manufactured stone b. Joints • Dry stack • Mortared c. Bonds and patterns • Random • Coursed • Ashlar • Dimensioned (smooth face, split face) • Other	**15%**

d. Mortar and bonding agent considerations
   - Types
   - Strength
   - Location
   - Environmental conditions

5. Describe the procedures for preparing the substrate for applying surface-bonded masonry units. 15%

a. Weatherproofing
b. Cement board or backing material
c. Scratch coat
   - Mortar strength
   - Thickness
   - Surface finish
   - Curing

6. Describe and demonstrate the procedures to install surface-bonded masonry units. 20%

a. Substrate preparation
b. Layout
   - Arrangement
   - Pattern
c. Damp
   - Substrate
   - Masonry unit
d. Buttering techniques
e. Joint finish
f. Clean and seal

7. Perform the substrate preparation, layout and installation of various surface-bonded masonry units. 25%

a. Brick
b. Block
c. Stone
   - Dry stack
   - Mortared system

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Unit: B5 Natural Stone Walls

Level: Two
Duration: 35 hours
Theory: 14 hours
Practical: 21 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of natural stone walls. Beginning with terminology and safe work practices, the unit covers stone and wall types, bond patterns, mortars and adhesives. The unit also covers stone preparation and installation procedures, applying their codes and regulations. Finally, apprentices will construct various natural stone walls.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with natural stone walls.	**5%**
2. Identify hazards and describe safe work practices associated with natural stone walls. a. Hand cutting b. Cleaning	**5%**
3. Interpret jurisdictional codes and regulations pertaining to natural stone walls. a. Flashing b. Anchoring c. Accessories	**10%**
4. Identify and describe natural stone walls. a. Stone types • Igneous • Metamorphic • Sedimentary • Manufactured b. Wall types • Veneers • Multi-wythe • Garden • Retaining c. Bonds and patterns • Random • Coursed • Ashlar • Dry stack	**15%**

- Dimensioned (smooth face, split face)
- Other

d. Mortars and adhesives
- Non-staining mortar
- Colour
- Strength
- Setting time
- Admixtures

5. Describe and demonstrate the procedures for preparing the stone for natural stone walls. 20%

a. Tool selection
b. Cutting and trimming
c. Facing

6. Describe and demonstrate the procedures to build natural stone walls. 20%

a. Wall layout
b. Stone arrangement
- Size
- Orientation

c. Lay stone
- Pattern

d. Finishing
- Pointing
- Tooling
- Cleaning

e. Curing
- Damp
- Natural

7. Perform the layout, preparation and construction of various natural stone wall types. 25%

a. Ashlar wall (3 course)
b. Random ranch rock
c. Fieldstone

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Unit: B6 Masonry Restoration I

Level: Two
Duration: 28 hours
Theory: 14 hours
Practical: 14 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of masonry restoration. Beginning with terminology, safe work practices, and documentation methods involved in restoration work, this unit will focus on masonry restoration, rebuilding and repair. This unit also covers rebuilding and repair procedures. Finally, apprentices will repair various types of damaged masonry. Apprentices will later apply these principles and techniques in the Level 3 unit, C7 Masonry Restoration II, which focuses on repairing and cleaning of masonry.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with masonry restoration. a. Rebuilds b. Repairing	**5%**
2. Identify hazards and describe safe work practices associated with masonry restoration.	**5%**
3. Interpret drawings and identify documentation methods associated with masonry restoration.	**10%**
4. Identify and describe rebuilding and repairing masonry restoration. a. Building survey b. Support systems c. Protection systems d. Documentation e. Disassembly f. Reassembly	**10%**
5. Identify and describe the procedures to rebuild masonry. a. Disassembly • Action plan • Documentation • Shoring • Cleaning • Storage	**25%**

b. Preparation
   - Mortar
   - Accessories
   - Repair substrate

c. Reassembly
   - Recorded placement
   - Match existing

6. Identify and describe the procedures to repair masonry. 25%

a. Removal
   - Template non-salvageable units
   - Remove damaged portions
   - Document material failures
   - Clean and store units

b. Repoint joints

c. Repair masonry units
   - Pinning and stitching
   - Moulding

d. Reinstall
   - Recorded placement
   - Match mortar
   - Place masonry unit
   - Tool
   - Cure

7. Demonstrate and perform the repair of damaged masonry. 20%

a. Tool selection

b. Removal procedure

c. Brick match

d. Mortar match

e. Repointing

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Unit: B7 Glass Block

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

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of glass block. Beginning with terminology and safe work practices, the unit covers glass block types, properties and applications. The unit also covers glass block preparation and installation procedures, applying their codes and regulations. Finally, apprentices will prepare and install a glass block panel.

Objectives and Content:	**Percent of Unit Mark (%)**
1. Define terminology associated with glass block.	**5%**
2. Identify hazards and describe safe work practices associated with glass block.	**5%**
3. Interpret jurisdictional codes and manufacturers' specifications pertaining to glass block. a. Sill preparation b. Anchorage	**5%**
4. Identify and describe glass block. a. Shapes • Square • Rectangular • Corner b. Size c. Colour d. Fire rating e. Clarity • Clear • Obscured • Light diffusing • Light reflective f. Security • Impact resistance g. Thermal properties	**15%**

5. Describe the procedures for preparing the installation of glass block. 20%

a. Layout
   - Opening size
   - Wall dimension
   - Location

b. Sill preparation
   - Level
   - Waterproof
   - Anchorage

c. Mortar
   - Types
   - Characteristics
   - Applications

d. Reinforcement
   - Types

6. Describe and demonstrate the procedures for the installation of glass block. 25%

a. Tool selection

b. Mortar
   - Spreading techniques
   - Consistency

c. Accessories
   - Track
   - Spacers
   - Expansion strips
   - Reinforcement
   - Anchorage

d. Laying glass block
   - Pattern
   - Orientation
   - Position

e. Finishing

f. Cleaning

7. Perform the preparation and installation of a glass block panel. 25%

a. Exterior system
   - Masonry opening

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Unit: B8 Arches I

Level: Two
Duration: 77 hours
Theory: 28 hours
Practical: 49 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of arches. Beginning with terminology and safe work practices, the unit covers single-centered arch types, characteristics and material types. The unit also covers single-centered arch template preparation, installation and removal procedures. Finally, apprentices will template and construct various single-centered arches by interpreting drawings and specifications. Apprentices will directly apply the concepts and skills of single-centered arches to the Level 3 unit, C9 Arches II, which focuses on multi-centered arches.

Objectives and Content:	Percent of Unit Mark (%)
1. Define terminology associated with arches. a. Single-centered b. 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 single-centered arches. a. Types • Roman • Segmental • Flat • Inverted • Bullseye (rough) b. Characteristics • Shape • Strength • Gauged • Rough c. Materials of arches	**20%**
5. Describe and demonstrate the procedures to template and construct single-centered arches. a. Prepare location b. Calculate arch properties	**25%**

c. Layout template
d. Build template
e. Place template
f. Install masonry unit
g. Remove template

6. Perform the procedures to construct various single-centered arches. 35%

a. Flat
b. Segmental
c. Roman
d. Bullseye
e. Inverted

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