

MODULE OVERVIEW

This module covers information the mason will need to work with residential plans and construction drawings and be able to convert that information into action on the job. This includes understanding the organization and format of plans; dimensioning and scaling; and estimating material quantities from information on the plans.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum* and *Masonry Level One*.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Explain the organization of residential plans and drawings.
2. Interpret dimensions and scales on drawings.
3. Interpret information on residential plans.
4. Estimate material quantities from plans and drawings.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. From a plan, calculate the square footage of one elevation, including openings.
2. Estimate the amount of brick and mortar from that same elevation.
3. Estimate the size and number of lintel block for that same elevation.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen	Architect's ruler
Transparencies	Engineer's ruler
Blank acetate sheets	Mason's ruler
Transparency pens	Standard rulers (English and metric)
Whiteboard/chalkboard	Electronic scaling ruler
Markers/chalk	Construction calculator
Pencils and scratch paper	Copies of the Quick Quiz*
Appropriate personal protective equipment	Module Examinations**
Model residential drawing set	Performance Profile Sheets**

* Located in the back of this module.

** Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

Concrete Masonry Handbook, Fifth Edition. W.C. Panerese, S.K. Kosmatka, and F.A. Randall, Jr. Skokie, IL: Portland Cement Association.

Bricklaying: Brick and Block Masonry, 1988. Brick Industry Association. Orlando, FL: Harcourt Brace & Company.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 12½ hours are suggested to cover *Residential Plans and Drawing Interpretation*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction, Residential Plans, and Dimensions	
A. Introduction	_____
B. Requirements for Residential Plans	_____
C. Dimensions and Scales	_____
1. Dimensioning	_____
2. Scales	_____
3. Use of Rules	_____
Session II. Interpreting Plan Information	
A. Site Plans	_____
B. Foundation Plans	_____
C. Floor Plans	_____
D. Elevation Drawings	_____
E. Sectional Drawings	_____
F. Specialty Plans	_____
Sessions III and IV. Estimating Quantities	
A. The Rule of Thumb Method	_____
1. Estimating Block by Wall Area	_____
2. Estimating Block Allowing for Openings	_____
3. Estimating Materials for Brick Construction	_____
4. Estimating Mortar	_____
B. Estimating Aids	_____
C. Laboratory – Trainees practice calculating square footage from a plan, estimating brick and mortar, and estimating the size and number of lintel block needed. This laboratory corresponds to Performance Tasks 1 through 3.	_____

Session V. Review, Module Examination, and Performance Testing

A. Review

B. Module Examination

1. Trainees must score 70 percent or higher to receive recognition from NCCER.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

C. Performance Testing

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module covers the construction techniques for residential and small structure foundations, steps, patios, decks, chimneys, and fireplaces. Work activities that the mason must perform as well as those that tie into the masonry work are described.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Masonry Level One; and Masonry Level Two, Module 28201-05.*

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Explain the requirements for construction of various types of residential foundations.
2. Identify and explain the characteristics, uses, and installation techniques for brick pavers.
3. Lay out and build steps, patios, and decks made from masonry units.
4. Lay out and build chimneys and fireplaces.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Lay out and construct a set of steps with three risers.
2. Lay out and construct a 5-foot by 7-foot brick patio section.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen	Manufacturer's literature on specialty pavers
Transparencies	Masonry tools including level, string line, mallets, and so forth to build steps and patio
Blank acetate sheets	Bricks, mortar, and other supplies needed to build steps and patio section
Transparency pens	MSDS and application instructions for muriatic or other cleaning acid
Whiteboard/chalkboard	Copies of the Quick Quiz*
Markers/chalk	Module Examinations**
Pencils and scratch paper	Performance Profile Sheets**
Appropriate personal protective equipment	
Rulers and tape measures	
Assorted brick pavers and/or manufacturer's literature	

* Located in the back of this module.

** Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires that trainees work with bricks and mortar. Ensure that they are briefed on shop safety procedures and how to handle bricks and mortar safely. Cutting bricks may be required; make sure trainees are briefed on proper protective equipment and procedures for cutting or chipping masonry. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

Concrete Masonry Handbook, Fifth Edition. W.C. Panerese, S.K. Kosmatka, and F.A. Randall, Jr. Skokie, IL: Portland Cement Association.

Bricklaying: Brick and Block Masonry, 1988. Brick Industry Association. Orlando, FL: Harcourt Brace & Company.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 25 hours are suggested to cover *Residential Masonry*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I and II. Introduction and Foundations	
A. Introduction	_____
B. Foundations	_____
1. Spread Foundation	_____
2. Raft and Mat Foundations	_____
3. Foundation Walls	_____
Sessions III and IV. Steps	
A. Types of Steps	_____
B. Patterns and Tread Design	_____
C. Building a Concrete Base	_____
D. Setting Bricks in Steps	_____
E. Laboratory – Trainees practice laying out and constructing a set of steps with three risers. This laboratory corresponds to Performance Task 1.	_____
Sessions V through VII. Paving Materials, Brick Patios, and Decks	
A. Paving Materials	_____
B. Brick Patios and Decks	_____
1. Patio Construction	_____
2. Deck Construction	_____
C. Laboratory – Trainees practice laying out and constructing a 5-foot by 7-foot brick patio section. This laboratory corresponds to Performance Task 2.	_____
Sessions VIII and IX. Fireplaces	
A. Basic Theory of the Fireplace	_____
B. Parts of a Fireplace	_____
C. Workmanship	_____
D. Chimney and Fireplace Layout	_____
E. Beginning the Fireplace	_____
F. Finishing the Fireplace	_____
G. Multiple-Opening Fireplaces	_____

Session X. Review, Module Examination, and Performance Testing

A. Review

B. Module Examination

1. Trainees must score 70 percent or higher to receive recognition from NCCER.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

C. Performance Testing

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module focuses on the use of grout and other types of reinforcement such as reinforcing steel to strengthen and support masonry structures. It describes the locations where grout can be used and the techniques for placement. The use and application of various types of reinforcing steel bars is also discussed.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum*; *Masonry Level One*; and *Masonry Level Two*, Modules 28201-05 and 28202-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Name and describe the primary ingredients in grout and their properties.
2. Identify the different types of grout used in masonry work.
3. Describe the common admixtures and their uses.
4. Describe the use of steel bar reinforcement in masonry construction.
5. Apply grout in low and high lifts using the proper techniques.
6. Place grout in a hollow block wall and rod it into place.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Place grout in a hollow block wall and rod in place.
2. Pour grout for a two-lift pour.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen	Standards for grout: <i>ASTM C476</i> , <i>ACI 530</i> , and <i>ACI 530.1</i>
Transparencies	Various types of steel reinforcing bar
Blank acetate sheets	Hollow concrete block and mortar to form a wall
Transparency pens	Grout and the materials to mix grout
Whiteboard/chalkboard	Grout pump for placing grout
Markers/chalk	Rod or mechanical vibrator
Pencils and scratch paper	Module Examinations*
Appropriate personal protective equipment	Performance Profile Sheets*

*Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires that trainees work with grout; ensure that they are briefed on safety procedures and how to handle grout and rebar safely. Cutting rebar may be required; make sure trainees are briefed on proper protective equipment and procedures for cutting rebar. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

Concrete Masonry Handbook, Fifth Edition. W.C. Panerese, S.K. Kosmatka, and F.A. Randall, Jr. Skokie, IL: Portland Cement Association.

Bricklaying: Brick and Block Masonry, 1988. Brick Industry Association. Orlando, FL: Harcourt Brace & Company.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 15 hours are suggested to cover *Grout and Other Reinforcement*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I and II. Introduction, Components of Grout, and Preparing Grout	
A. Introduction	_____
B. Components of Grout	_____
C. Preparing Grout	_____
Sessions III and IV. Grouting Techniques	
A. Low-Lift Grouting	_____
B. High-Lift Grouting	_____
C. Mortar Joints for Grouted Masonry	_____
D. Using Mechanical Vibrators	_____
E. Laboratory – Trainees practice placing grout in a hollow wall, rodding it in place, and pouring grout for a two-lift pour. This laboratory corresponds to Performance Tasks 1 and 2.	_____
Session V. Steel Bar Reinforcement	
A. Placing Rebar	_____
B. Bond Beams and Internal Pilasters	_____
Session VI. Review, Module Examination, and Performance Testing	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70 percent or higher to receive recognition from NCCER.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

MODULE OVERVIEW

This module acquaints the mason with the various types of metal components and how they are installed. These items include metal rods, joint reinforcements, plates, anchors, fasteners, and hollow metal frames for doors and windows.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Masonry Level One; and Masonry Level Two, Modules 28201-05 through 28203-05.*

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Describe the uses and installation of vertical reinforcement.
2. Describe the uses and installation of different types of horizontal joint reinforcements and ties.
3. Describe the uses and installation of different anchors, fasteners, and embedded items.
4. Install hollow metal frames.
5. Describe the functions of sills and lintels.
6. Install sills and lintels.
7. Install metal hardware.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Install a knockdown door frame in a 2- or 3-course brick wall.
2. Install a slip sill.
3. Lay one wythe of brick against one side of the frame.
4. Install hardware cloth unit ties in every other course.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen	Wire ties for rebar
Transparencies	Various types of horizontal joint reinforcement
Blank acetate sheets	Various types of rigid and adjustable unit ties and assemblies
Transparency pens	Various types of anchors
Whiteboard/chalkboard	Bricks and mortar
Markers/chalk	Hardware cloth
Pencils and scratch paper	Masonry tools for laying a wall section
Appropriate personal protective equipment	Knockdown door frame and tools to build same
Bolt cutter or portable rebar cutter	Slip sill, mortar, and masonry tools for installation
Hickey bar or rebar bender	Module Examinations*
Scrap pieces of rebar	Performance Profile Sheets*

*Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits. This module requires trainees to work with mortar. Review the hazards posed by mortar and cement dust. Review shop safety procedures, including fire, emergency power shut off, and first aid stations, with all trainees.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

Concrete Masonry Handbook, Fifth Edition. W.C. Panerese, S.K. Kosmatka, and F.A. Randall, Jr. Skokie, IL: Portland Cement Association.

Bricklaying: Brick and Block Masonry, 1988. Brick Industry Association. Orlando, FL: Harcourt Brace & Company.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 15 hours are suggested to cover *Metal Work in Masonry*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I and II. Introduction, Vertical and Horizontal Reinforcement, and Anchors	
A. Introduction	_____
B. Vertical Reinforcement	_____
C. Horizontal Reinforcement	_____
D. Anchors and Embedments	_____
E. Laboratory – Trainees practice installing hardware cloth unit ties in every other course. This laboratory corresponds to Performance Task 4.	_____
Session III. Hollow Metal Frames	
A. Frame Materials and Types	_____
B. Door Frame Installation	_____
C. Laboratory – Trainees practice installing a knockdown door frame in a 2- or 3-course brick wall. This laboratory corresponds to Performance Task 1.	_____
Session IV. Sills and Lintels	
A. Sills	_____
B. Lintels	_____
C. Laboratory – Trainees practice installing a slip sill. This laboratory corresponds to Performance Task 2.	_____
Session V. Laying Around Frames	
A. Laying Brick	_____
B. Laying Block	_____
C. Laboratory – Trainees practice laying one wythe of brick against one side of a frame. This laboratory corresponds to Performance Task 3.	_____

Session VI. Review, Module Examination, and Performance Testing

A. Review

B. Module Examination

1. Trainees must score 70 percent or higher to receive recognition from NCCER.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

C. Performance Testing

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module contains detailed information that directs the mason in accomplishing the actual construction of walls, arches, and other useful structures. Construction techniques, safety requirements, and interaction with structure components are explained. Skill is gained through construction of small projects.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum*; *Masonry Level One*; and *Masonry Level Two*, Modules 28201-05 through 28204-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Recognize the structural principles and fundamental uses of basic types of walls.
2. Recognize the requirement for, and function of, control joints and expansion joints.
3. Build various types of walls using proper reinforcement, jointing, and bonding techniques.
4. Lay out specialty structures such as maintenance holes, segmented block walls, and screens.
5. Identify and explain the different types of masonry arches used today.
6. Lay out a semicircular arch and a jack arch.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Lay a wythe of brick against a block wythe or wood frame to make a composite wall. Use ties and a collar joint.
2. Lay out specialty structures and arches.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen	Various types of metal ties
Transparencies	Bricks, mortar, metal ties, and accessories to build multi-wythe wall sections, both a composite wall and an anchored veneered wall
Blank acetate sheets	Masonry tools to build wall sections
Transparency pens	Manufacturer's literature on segmental retaining walls
Whiteboard/chalkboard	<i>ASTM C139</i>
Markers/chalk	Copies of the Quick Quiz*
Pencils and scratch paper	Module Examinations**
Appropriate personal protective equipment	Performance Profile Sheets**
Local or national building codes	
Bricks and blocks	

* Located in the back of this module.

** Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires that trainees work with bricks and mortar. Ensure that they are briefed on shop safety procedures and how to handle bricks and mortar safely. Cutting bricks may be required; make sure trainees are briefed on proper protective equipment and procedures for cutting or chipping masonry. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

Concrete Masonry Handbook, Fifth Edition. W.C. Panerese, S.K. Kosmatka, and F.A. Randall, Jr. Skokie, IL: Portland Cement Association.

Bricklaying: Brick and Block Masonry, 1988. Brick Industry Association. Orlando, FL: Harcourt Brace & Company.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 50 hours are suggested to cover *Advanced Laying Techniques*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I through X. Introduction and Masonry Wall Systems	
A. Introduction	_____
B. Solid Masonry Wall Construction	_____
C. Cavity Walls	_____
D. Composite Walls	_____
E. Anchored Veneered Walls	_____
F. Laboratory – Trainees practice laying a wythe of brick against a block wythe or wood frame to make a composite wall, using ties and a collar joint. This laboratory corresponds to Performance Task 1.	_____
G. Curtain and Panel Walls	_____
Session XI. Retaining Walls and Freestanding Walls	
A. Retaining Walls	_____
B. Freestanding Walls	_____
Session XII. Joints	
A. Temperature	_____
B. Moisture Movements	_____
C. Use of Control Joints	_____
D. Expansion Joints	_____

Sessions XIII through XIX. Maintenance Holes and Arches

A. Maintenance Holes

B. Arches

1. Arch Design

2. Constructing a Semicircular Arch

3. Constructing a Jack Arch

C. Laboratory – Trainees practice laying out specialty structures and arches.
This laboratory corresponds to Performance Task 2.

Session XX. Review, Module Examination, and Performance Testing

A. Review

B. Module Examination

1. Trainees must score 70 percent or higher to receive recognition from NCCER.

2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

C. Performance Testing

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.

2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module describes techniques used to construct openings in masonry walls, the application of insulation, and methods of moisture control as they relate to the mason's trade. Properties and uses of materials used in moisture control are explained. Various methods of insulating structures are described.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum*; *Masonry Level One*; and *Masonry Level Two*, Modules 28201-05 through 28205-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Explain and demonstrate techniques for constructing masonry around windows, doors, and other openings.
2. Explain the requirements for wall bracing, and demonstrate the techniques used to construct pilasters and other types of bracing.
3. Identify the various types of insulation used in conjunction with masonry construction, and explain installation techniques.
4. Identify the need for moisture control in various types of masonry construction, and demonstrate the techniques used to eliminate moisture problems.
5. Construct corbeling in a double-wythe wall.
6. Join intersecting walls.
7. Install flashing.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Construct a four-course corbel starting at the fifth course of a double-wythe wall.
2. Construct an intersecting block wall joined with wire mesh or metal lath.
3. Install a row of flashing in an anchored veneered wall.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen

Transparencies

Blank acetate sheets

Transparency pens

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

Appropriate personal protective equipment

Manufacturer's literature for specialty block used to make openings

Manufacturer's literature for windows and doors

Local building codes and OSHA requirements regarding bracing masonry walls

Manufacturer's literature on specialty block used to make pilasters

Bricks, mortar, metal ties, and accessories to build corbeling and intersecting walls

Masonry tools

Samples of loose fill and rigid board insulation

Samples of blanket or batt insulation

Manufacturer's literature on various types of waterproof paints

Flashing materials

Mortar and tools to install flashing

Copies of the Quick Quiz*

Module Examinations**

Performance Profile Sheets**

* Located in the back of this module.

**Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires that trainees work with bricks and mortar. Ensure that they are briefed on shop safety procedures and how to handle bricks and mortar safely. Cutting bricks may be required; make sure trainees are briefed on proper protective equipment and procedures for cutting or chipping masonry. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

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Bricklaying: Brick and Block Masonry, 1988. Brick Industry Association. Orlando, FL: Harcourt Brace & Company.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 20 hours are suggested to cover *Construction Techniques and Moisture Control*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I through III. Introduction and Construction Techniques I	
A. Introduction	_____
B. Construction Techniques I	_____
1. Openings	_____
2. Tothing	_____
3. Corbeling	_____
C. Laboratory – Trainees practice constructing a four-course corbel starting at the fifth course of a double-wythe wall. This laboratory corresponds to Performance Task 1.	_____
Sessions IV and V. Construction Techniques II	
A. Wall Bracing	_____
B. Anchors	_____
C. Intersecting Walls	_____
D. Pilasters	_____
E. Laboratory – Trainees practice constructing an intersecting block wall joined with wire mesh or metal lath. This laboratory corresponds to Performance Task 2.	_____
Session VI. Insulation	
A. The Concept of Heat Transfer	_____
B. Internal Insulation	_____
C. External Insulation	_____

Session VII. Moisture Control

- A. Parging _____
- B. Flashing _____
- C. Weep Holes _____
- D. Waterproofing _____
- E. Laboratory – Trainees practice installing a row of flashing in an anchored veneered wall. This laboratory corresponds to Performance Task 3. _____

Session VIII. Review, Module Examination, and Performance Testing

- A. Review _____
- B. Module Examination _____
 - 1. Trainees must score 70 percent or higher to receive recognition from NCCER.
 - 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.
- C. Performance Testing _____
 - 1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
 - 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module introduces the quality control requirements for masonry construction. Procedures for inspection and testing of masonry materials and finished masonry construction are presented.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Masonry Level One; and Masonry Level Two*, Modules 28201-05 through 28206-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Describe industry standards for quality control.
2. Describe how to build masonry sample panels and prisms.
3. Perform a slump test.
4. Describe and perform field inspections.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Perform a slump test.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen	Computer with internet access
Transparencies	Bricks, block, mortar, and grout for testing
Blank acetate sheets	Masonry tools
Transparency pens	Sand, scales, and sieves to perform sand tests
Whiteboard/chalkboard	Siltation test jar
Markers/chalk	Sodium hydroxide
Pencils and scratch paper	Cone mold and accessories for slump test
Appropriate personal protective equipment	Eye dropper for water
Copy of a contract that lists submittals and quality control requirements	Watch with second hand
Copies of the local or national building codes and standards	Electronic moisture meter
Several example ASTM standards for masonry	Module Examinations*
	Performance Profile Sheets*

* Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires that trainees work with bricks and mortar. Ensure that they are briefed on shop safety procedures and how to handle bricks and mortar safely. Cutting bricks may be required; make sure trainees are briefed on proper protective equipment and procedures for cutting or chipping masonry. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

Concrete Masonry Handbook, Fifth Edition. W.C. Panerese, S.K. Kosmatka, and F.A. Randall, Jr. Skokie, IL: Portland Cement Association.

Bricklaying: Brick and Block Masonry, 1988. Brick Industry Association. Orlando, FL: Harcourt Brace & Company.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 15 hours are suggested to cover *Construction Inspection and Quality Control*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I and II. Introduction, Masonry Specifications, and Building Panels and Prisms	
A. Introduction	_____
B. Masonry Specifications	_____
C. Building Panels and Prisms	_____
1. Sample Panels	_____
2. Masonry Prisms	_____
3. Mortar or Grout Prisms	_____
Sessions III and IV. Mortar	
A. Sand Tests	_____
B. Mortar Consistency Tests	_____
C. Brick Absorption Test	_____
D. Laboratory Tests	_____
E. Laboratory – Trainees practice performing a slump test. This laboratory corresponds to Performance Task 1.	_____
Session V. Field Observations and Inspections	
A. Standards and Codes Inspections	_____
B. Materials Inspections	_____
C. Construction Observations	_____
D. Construction Tolerances	_____
E. Weather Precautions	_____
Session VI. Review, Module Examination, and Performance Testing	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70 percent or higher to receive recognition from NCCER.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	