OBJECTIVES

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

1. Describe the properties of different admixtures and other materials used in concrete.
2. Identify anticipated changes in set time, workability, and finishing for various types of admixtures and mix designs.

Note to the Instructor

Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overhead projector and screen</td>
<td>Trainee Task Module</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Transparencies</td>
</tr>
<tr>
<td>Appropriate Personal Protective Equipment</td>
<td>Paper and pencils</td>
</tr>
<tr>
<td></td>
<td>Markers/chalk</td>
</tr>
<tr>
<td></td>
<td>Module Examination</td>
</tr>
</tbody>
</table>
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½ hour class session in this Instructor’s Guide, the basic Presentation Sequence is as follows:

- Introduction/Overview
- Classroom, and/or Demonstration, and/or Laboratory
- Class Break
- Classroom, and/or Demonstration, and/or Laboratory
- Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

**Classroom:** Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

**Demonstration:** Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

**Laboratory:** Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

**NCCER Standardized Craft Training Programs**

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the *Guidelines for Accreditation*, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
MODULE OVERVIEW

This module introduces the Concrete Finishing trainee to the properties of cementitious materials and admixtures and their effects on concrete.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

- Core Curricula; Concrete Finishing Level One

Safety Considerations

Ensure that the trainees are equipped with Appropriate Personal Protective Equipment.

Teaching Time for This Module

Approximately 10 hours or four sessions of training time are suggested to cover Properties of Concrete, Part Two. The training class session is a suggested 2½ hour time period, which includes at least one break. You will need to adjust the time required for hands-on activities and testing based on your class size and resources. All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence—Four 2½-Hour Sessions

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Other Types of Admixtures</td>
<td>1.0.0 – 2.2.7</td>
</tr>
<tr>
<td>2</td>
<td>Mineral Admixtures – Finishing Lightweight Concrete</td>
<td>2.3.0 – 3.3.0</td>
</tr>
<tr>
<td>3</td>
<td>Flowable Fill – Heavyweight Concrete</td>
<td>4.0.0 – 5.5.0</td>
</tr>
<tr>
<td>4</td>
<td>Laboratory/Field Trip Module Examination</td>
<td></td>
</tr>
</tbody>
</table>

Note: For Session 4, you will need to arrange a field trip to a concrete batch plant and testing laboratory. Make sure sufficient transportation is available.
Optional References for Advanced Study

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.

*Chemical Admixtures for Concrete*, ACI 212.3R-91, American Concrete Institute, Farmington Hills, MI, 1991.

*Concrete Fundamentals*, Concrete Craftsman Series, American Concrete Institute, Farmington Hills, MI, 1993.


ESTIMATING CONCRETE QUANTITIES

OBJECTIVES

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

1. Describe U.S. Customary and SI metric units of measure.
2. Read residential blueprints and identify concrete construction requirements.
3. Estimate the required quantities of materials for different structural members.

Note to the Instructor

Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Personal Protective Equipment</td>
<td>Trainee Task Module</td>
</tr>
<tr>
<td>Overhead projector and screen</td>
<td>Transparencies</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Pencils and paper</td>
</tr>
<tr>
<td>Tape measures</td>
<td>Tagboard, cardboard or construction paper</td>
</tr>
<tr>
<td>Architect’s scale</td>
<td>Cellophane tape</td>
</tr>
<tr>
<td>Water or sand containers</td>
<td>Water</td>
</tr>
<tr>
<td>Four-function calculators</td>
<td>Sand</td>
</tr>
<tr>
<td>Straightedges</td>
<td>Estimating worksheets</td>
</tr>
<tr>
<td>Scissors</td>
<td>Construction drawings</td>
</tr>
<tr>
<td>Compasses</td>
<td>Colored pencils</td>
</tr>
<tr>
<td>Concrete molds or other cylinder molds</td>
<td>Module Examination</td>
</tr>
<tr>
<td></td>
<td>Performance Profile Sheets</td>
</tr>
</tbody>
</table>
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½ hour class session in this Instructor’s Guide, the basic Presentation Sequence is as follows:

  - Introduction/Overview
  - Classroom, and/or Demonstration, and/or Laboratory
  - Class Break
  - Classroom, and/or Demonstration, and/or Laboratory
  - Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

**Classroom:** Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

**Demonstration:** Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

**Laboratory:** Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

**NCCER Standardized Craft Training Programs**

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the *Guidelines for Accreditation*, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
MODULE OVERVIEW

This module provides an overview of the methods and procedures used for estimating concrete quantities. It introduces the Concrete Finishing trainee to the formulas for calculating volumes of structural elements, the layout and format of construction drawings, and the tabulation of concrete quantities.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

- Core Curricula; Concrete Finishing Level One;
- Concrete Finishing Level Two, Module 23201

Safety Considerations

Ensure that the trainees are equipped with Appropriate Personal Protective Equipment.

Teaching Time for This Module

Approximately 10 hours or four sessions of training time are suggested to cover Estimating Concrete Quantities. The training class session is a suggested 2½ hour time period, which includes at least one break. You will need to adjust the time required for hands-on activities and testing based on your class size and resources. All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Four 2½-Hour Sessions

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Solid Figures And Volumes Demonstration/Laboratory</td>
<td>1.0.0 – 2.4.0</td>
</tr>
<tr>
<td>2</td>
<td>Drawings – Looking At The Drawings</td>
<td>3.0.0 – 3.2.7</td>
</tr>
<tr>
<td>3</td>
<td>Estimating Quantities – Columns Demonstration/Laboratory</td>
<td>4.0.0 - 4.3.7</td>
</tr>
<tr>
<td>4</td>
<td>Module Examination Performance Profile Testing</td>
<td></td>
</tr>
</tbody>
</table>

Note: A guest speaker should be invited for the demonstration portion of Session 3. This should be a person in a local construction company who prepares bids and estimates for concrete construction. The speaker should be prepared to describe and demonstrate take off procedures and estimating methods for concrete items of different types and shapes.
Optional References for Advanced Study

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.


*Finishing Concrete Flatwork*, Videotape 32:00 minutes, Portland Cement Association, Skokie, IL, 1991.

*Guide for Concrete Floor and Slab Construction*, ACI 302.1R-96, American Concrete Institute, Farmington Hills, MI, 1997.

PERFORMANCE PROFILE TASKS

1. Calculate the volume of a concrete test cylinder mold in cubic feet and cubic meters.

2. Calculate the volume and weight of concrete required to fill the mold.

3. Estimate the quantity of concrete required for the slab under the floor of the house in the drawings in Appendix B.
OBJECTIVES
Upon completion of this module, the trainee will be able to:

1. Identify different types of forming materials and explain how they are used.
2. Erect on-grade forms for different types of construction.
3. Erect low wall and foundation wall forms.

Note to the Instructor
Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials
The following are required for instruction using this module:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overhead projector and screen</td>
<td>Trainee Task Module</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Transparencies</td>
</tr>
<tr>
<td>Appropriate Personal Protective Equipment</td>
<td>Paper and pencils</td>
</tr>
<tr>
<td>Hammers</td>
<td>String</td>
</tr>
<tr>
<td>Builder’s levels</td>
<td>Marking pencils or keel</td>
</tr>
<tr>
<td>Spirit levels</td>
<td>Nails</td>
</tr>
<tr>
<td>Saws</td>
<td>Construction stakes</td>
</tr>
<tr>
<td>Planes</td>
<td>Dimensional lumber</td>
</tr>
<tr>
<td>Hand drills</td>
<td>Plywood sheets</td>
</tr>
<tr>
<td>Wall clamps</td>
<td>Chamfer strips</td>
</tr>
<tr>
<td>Level rods</td>
<td>Form ties</td>
</tr>
<tr>
<td></td>
<td>Prefabricated form sections</td>
</tr>
<tr>
<td></td>
<td>Premanufactured column forms</td>
</tr>
<tr>
<td></td>
<td>Manufacturer’s forms brochures</td>
</tr>
<tr>
<td></td>
<td>Construction drawings</td>
</tr>
<tr>
<td></td>
<td>(foundations or floor plan)</td>
</tr>
<tr>
<td></td>
<td>Prefabricated edge forms with hardware</td>
</tr>
<tr>
<td></td>
<td>Module Examination</td>
</tr>
<tr>
<td></td>
<td>Performance Profile Sheets</td>
</tr>
</tbody>
</table>
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½ hour class session in this Instructor’s Guide, the basic Presentation Sequence is as follows:

- Introduction/Overview
- Classroom, and/or Demonstration, and/or Laboratory
- Class Break
- Classroom, and/or Demonstration, and/or Laboratory
- Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

**Classroom:** Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

**Demonstration:** Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

**Laboratory:** Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

**NCCER Standardized Craft Training Programs**

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the *Guidelines for Accreditation*, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
MODULE OVERVIEW

This module provides instruction and information to the Concrete Finishing trainee on techniques and procedures used in building forms. It includes types of forms, forming materials, use of release agents, form accessories, placement of anchors, and embedment and form removal.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

- Core Curricula; Concrete Finishing Level One;
- Concrete Finishing Level Two, Modules 23201 and 23202

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment.

Teaching Time for This Module

Approximately 20 hours or eight sessions of training time are suggested to cover Forming. The training class session is a suggested 2½-hour time period, which includes at least one break. You will need to adjust the time required for hands-on activities and testing based on your class size and resources. All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Eight 2½-Hour Sessions

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Safety Concerns And Reshoring</td>
<td>1.0.0 – 2.8.0</td>
</tr>
<tr>
<td>2</td>
<td>Form Siting And Checking – Placing Embedded Objects</td>
<td>3.0.0 – 4.2.3</td>
</tr>
<tr>
<td>3</td>
<td>Establishing Line And Grade</td>
<td>3.2.3</td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Low Wall And Foundation Wall Forms – Construction Techniques</td>
<td>5.0.0 – 5.2.1</td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Wall Openings – Joints</td>
<td>5.2.2 – 5.4.0</td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Form Construction</td>
<td>5.2.0 – 5.2.2</td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Performance Profile Testing</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Module Examination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance Profile Testing</td>
<td></td>
</tr>
</tbody>
</table>
Optional References for Advanced Study

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.

*Cast-In-Place Walls*, ACI Craftsman Series, American Concrete Institute, Farmington Hills, MI, 1984.


*Finishing Concrete Flatwork*, Videotape 32:00 minutes, Portland Cement Association, Skokie, IL, 1991.


*Guide for Concrete Floor and Slab Construction*, ACI 302.1R-96, American Concrete Institute, Farmington Hills, MI, 1997.

PERFORMANCE PROFILE TASKS

1. Set batter boards at a given location on building corners.

2. Set building layout from plans using string lines and stakes. Tie onto batter boards.

3. Build a $2 \times 2$-foot footer form on grade with overlapping corners.

4. Construct wood job-built formwork for a wall 4 feet high, 1 foot thick, and 8 feet long. Use through-wall ties and bracing.

5. Set, level, and brace a premanufactured column form.
Concrete Finishing Instructor’s Guide Task Module 23204

SITE CONCRETE

OBJECTIVES

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

1. Lay out, place, and finish curb and gutter.
2. Lay out, place, and finish site-built stairs.
3. Lay out, place, and finish small slabs for sidewalks, patios, and driveways.

Note to the Instructor

Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

**Equipment**
- Overhead projector and screen
- Whiteboard/chalkboard
- Appropriate Personal Protective Equipment
- Hammers
- Builder’s levels
- Level rods
- Spirit levels
- Saws
- Hammers
- Shovels
- Four-function calculators
- Wheelbarrows
- Small mechanical vibrators
- Straightedges
- Floats
- Edgers
- Margin trowels
- Brushes
- Steel measuring tapes
- Water containers
- Brooms

**Materials**
- Trainee Task Module
- Markers/chalk
- Transparencies
- Paper and pencils
- Construction stakes
- String
- Nails
- Dimensional lumber
- Keel or marking pencils
- Ready-mix concrete
- Water
- Form release agent
- Metal curb and gutter forms and accessories
- Wire mesh reinforcing (optional)
- Manufacturers’ literature on slipform pavers
- Photos or brochures on special finishes
- Module Examination
- Performance Profile Sheets

Copyright © 1999 National Center for Construction Education and Research, Gainesville, FL 32614-1104. All rights reserved. No part of this work may be reproduced in any form or by any means, including photocopying, without written permission of the publisher.
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½ hour class session in this Instructor’s Guide, the basic Presentation Sequence is as follows:

- Introduction/Overview
- Classroom, and/or Demonstration, and/or Laboratory
- Class Break
- Classroom, and/or Demonstration, and/or Laboratory
- Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

**Classroom:** Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

**Demonstration:** Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

**Laboratory:** Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

**NCCER Standardized Craft Training Programs**

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the *Guidelines for Accreditation*, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
MODULE OVERVIEW

This module introduces the Concrete Finishing trainee to the techniques and procedures used in constructing formwork and placing and finishing site concrete.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

- Core Curricula; Concrete Finishing Level One;
- Concrete Finishing Level Two, Modules 23201 through 23203

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment.

Teaching Time for This Module

Approximately 30 hours or twelve sessions of training time are suggested to cover Site Concrete. The training class session is a suggested 2½ hour time period, which includes at least one break. You will need to adjust the time required for hands-on activities and testing based on your class size and resources. All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Twelve 2½-Hour Sessions

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Removing Forms</td>
<td>1.0.0 – 2.7.0</td>
</tr>
<tr>
<td>2</td>
<td>Form Curb and Gutter</td>
<td>2.3.0 – 2.4.0</td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Finish Curb and Gutter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Stairs – Placing and Finishing</td>
<td>3.0.0 – 3.3.2</td>
</tr>
<tr>
<td>5</td>
<td>Form Stairs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Finish Stairs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Laboratory</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Sidewalks, Driveways, and Patios – Form Removal</td>
<td>4.0.0 – 4.8.0</td>
</tr>
<tr>
<td>8</td>
<td>Layout Radius for Rounded Corner</td>
<td>4.1.2</td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Other Site Work Structures – Curing</td>
<td>5.0.0 – 6.4.0</td>
</tr>
<tr>
<td></td>
<td>Module Examination</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Performance Profile Testing</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Performance Profile Testing</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Performance Profile Testing</td>
<td></td>
</tr>
</tbody>
</table>
Optional References for Advanced Study

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 Parking Lots: Eight Steps to Quality Construction*, Videotape 18:28 minutes, Portland Cement Association, Skokie, IL.


*Finishing Concrete Flatwork*, Videotape 32:00 minutes, Portland Cement Association, Skokie, IL, 1991.

*Guide for Concrete Floor and Slab Construction*, ACI 302.1R-96, American Concrete Institute, Farmington Hills, MI, 1997.

*Guide to Residential Cast-In-Place Concrete Construction*, ACI 332R-98, American Concrete Institute, Farmington Hills, MI, 1998.

PERFORMANCE PROFILE TASKS

1. Lay out prefabricated forms for a section of barrier curb and gutter. Align forms and set to grade.

2. Estimate the amount of concrete needed to fill the formwork. Place and finish the concrete.

3. Lay out a 4-foot radius outside curve. Set construction stakes for formwork.

4. Given the total rise and run of a set of stairs, calculate the tread and riser dimensions.

5. Build wood formwork for a 3-step set of stairs on grade with a top landing.

6. Place and finish concrete for a 3-step set of stairs with a top landing.
OBJECTIVES

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

1. Identify the four types of architectural concrete.
2. Identify various types of architectural finishes and surface treatments.
3. Apply various types of architectural finishes and surface treatments to concrete.

Note to the Instructor

Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

**Equipment**
- Overhead projector and screen
- Whiteboard/chalkboard
- Appropriate Personal Protective Equipment
- Concrete mixer
- Water containers
- Measures
- Shovels
- Floats
- Hand pump sprayers
- Commercial or other pattern stamps
- Screed boards
- Water brooms or brooms
- Bushhammer face tools
- Hoses
- Trowels

**Materials**
- Trainee Task Module
- Transparencies
- Markers/chalk
- Pencils and paper
- Module Examinations
- Performance Profile Sheets
- Dimensional lumber for 4’ × 4’ forms
- Freshly prepared fly ash mixture (Fly ash, sand, water)
- Samples of large and small aggregate
- Cardboard for templates
- Surface retarder
- Polyethylene sheeting
- Two color shake hardeners
- Photographs of architectural finishes
- Samples of various colored cements
- Samples of portland cement paint
- Form liner
- Two shake hardener containers per trainee
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½ hour class section in this Instructor’s Guide, the basic Presentation Sequence is as follows:

- Introduction/Overview
- Classroom, and/or Demonstration, and/or Laboratory
- Class Break
- Classroom, and/or Demonstration, and/or Laboratory
- Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

**Classroom:** Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

**Demonstration:** Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

**Laboratory:** Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

**NCCER Standardized Craft Training Programs**

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the *Guidelines for Accreditation*, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
MODULE OVERVIEW

This module introduces the Concrete Finishing trainee to the surface classes of architectural concrete, and the treatments commonly specified to make them attractive, including special surface treatments, special forms, and form liners.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

- Core Curricula; Concrete Finishing Level One;
- Concrete Finishing Level Two, Modules 23201 through 23204

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment.

Teaching Time for This Module

Approximately 20 hours or eight sessions of training time are suggested to cover Architectural Finishes. The training class session is a suggested 2½ hour time period, which includes at least one break. **You will need to adjust the time required for hands-on activities and testing based on your class size and resources.** All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Eight 2½-Hour Sessions

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Portland Cement Paint</td>
<td>1.0.0 – 3.4.3</td>
</tr>
<tr>
<td>2</td>
<td>Applying Color Shake Demonstration/Laboratory</td>
<td>3.4.2</td>
</tr>
<tr>
<td>3</td>
<td>Exposed Aggregate Treatments – Repairing Exposed Aggregate Surfaces</td>
<td>4.0.0 – 4.5.0</td>
</tr>
<tr>
<td>4</td>
<td>Preparing Exposed Aggregate Surface Demonstration/Laboratory</td>
<td>4.3.0</td>
</tr>
<tr>
<td>5</td>
<td>Broom And Wash Exposed Aggregate Demonstration/Laboratory</td>
<td>4.4.1</td>
</tr>
<tr>
<td>6</td>
<td>Blasting – Job-Made Patterns Demonstration</td>
<td>5.0.0 – 7.2.2</td>
</tr>
<tr>
<td>7</td>
<td>Laboratory/Site Visit</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Module Examination Performance Profile Testing</td>
<td></td>
</tr>
</tbody>
</table>
**Note:**
(1) For Sessions 2, 6, and 8, you will need to prepare several 4' × 4' slabs to use with the demonstrations and laboratories. These slabs can be made by constructing a 4' × 4' box using 2" × 4" lumber as the forming material. Fill the box with a mixture of sand, fly ash, and water to simulate fresh concrete. Make sure there are enough slabs for the number of trainees.

(2) For Session 7, you will need to arrange a site visit well in advance. Make sure sufficient transportation is available.

**Optional References for Advanced Study**

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.


*Finishing Concrete Flatwork*, Videotape 32:00 minutes, Portland Cement Association, Skokie, IL, 1991.

*Guide for Concrete Floor and Slab Construction*, ACI 302.1R-96, American Concrete Institute, Farmington Hills, MI, 1997.

*Guide to Cast-In-Place Architectural Concrete Practice*, American Concrete Institute, Farmington Hills, MI, 1997.
TRANSPARENCY 2
TASK MODULE 23205, ARCHITECTURAL FINISHES

PERFORMANCE PROFILE TASKS

1. Identify a minimum of four architectural finishes by looking at a set of photographs of concrete surfaces.

2. Apply two separate color shakes to adjacent surfaces without mixing the colors.

3. Use the seeding method to place exposed aggregate.

5. Use the water washing technique to remove surface paste and expose aggregate.
OBJECTIVES

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

1. Prepare an industrial floor area for placing concrete.
2. Place and finish concrete for an industrial floor.

Note to the Instructor

Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

**Equipment**
- Overhead projector and screen
- Whiteboard/chalkboard
- Appropriate Personal Protective Equipment
- Water containers
- Shovels
- Optical levels
- Level rods
- Laser level
- Highway straightedges
- Mechanical vibrators
- Screeds
- Bullfloats
- Wheelbarrows or chutes
- Tape measures
- Hammers
- Drills and drill bits
- Concrete mixer

**Materials**
- Trainee Task Module
- Transparencies
- Module Examinations
- Performance Profile Sheets
- Paper and pencils
- Markers/chalk
- Freshly prepared fly ash mixture (fly ash, water, sand)
- Dimensional lumber for form (16' × 32' × 8" deep)
- Pea gravel or equivalent aggregate
- Construction stakes
- Dowels
- Dowel baskets
- Working drawings of dowel installation
- Dowel release agent or substitute
- Manufacturer’s literature on profileograph and dipstick
- Sample of shake hardeners

Copyright © 1999 National Center for Construction Education and Research, Gainesville, FL 32614-1104. All rights reserved. No part of this work may be reproduced in any form or by any means, including photocopying, without written permission of the publisher.
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½ hour class session in this Instructor’s Guide, the basic Presentation Sequence is as follows:

  Introduction/Overview
  Classroom, and/or Demonstration, and/or Laboratory
  Class Break
  Classroom, and/or Demonstration, and/or Laboratory
  Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

Classroom: Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

Demonstration: Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

Laboratory: Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

NCCER Standardized Craft Training Programs

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the Guidelines for Accreditation, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
**MODULE OVERVIEW**

This module introduces the Concrete Finishing trainee to requirements and techniques for placing and finishing concrete industrial floors.

**Prerequisites**

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curricula; Concrete Finishing Level One;
Concrete Finishing Level Two, Modules 23201 through 23205

**Safety Considerations**

Ensure that the trainees are equipped with appropriate personal protective equipment.

**Teaching Time for This Module**

Approximately 22½ hours or nine sessions of training time are suggested to cover *Industrial Floors*. The training class session is a suggested 2½ hour time period, which includes at least one break. You will need to adjust the time required for hands-on activities and testing based on your class size and resources. All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

**Suggested Teaching Sequence — Nine 2½-Hour Sessions**

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Forms And Screeds Demonstration</td>
<td>1.0.0 – 3.3.0</td>
</tr>
<tr>
<td>2</td>
<td>Laboratory/Performance Profile Testing</td>
<td>3.3.0</td>
</tr>
<tr>
<td>3</td>
<td>Embedments – Joints Demonstration</td>
<td>3.4.0 – 3.6.0</td>
</tr>
<tr>
<td>4</td>
<td>Laboratory/Performance Profile Testing</td>
<td>3.4.0 – 3.6.0</td>
</tr>
<tr>
<td>5</td>
<td>Placing – Saw Cutting Joints Demonstration</td>
<td>4.0.0 – 8.0.0</td>
</tr>
<tr>
<td>6</td>
<td>Laboratory/Performance Profile Testing</td>
<td>4.0.0 – 8.0.0</td>
</tr>
<tr>
<td>7</td>
<td>Demonstration/Laboratory</td>
<td>4.0.0</td>
</tr>
<tr>
<td>8</td>
<td>Placing and Finishing Laboratory</td>
<td>4.0.0 – 5.0.0</td>
</tr>
<tr>
<td>9</td>
<td>Module Examination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance Profile Testing</td>
<td></td>
</tr>
</tbody>
</table>
Note:  (1) Because of the number of Performance Profile Tasks in this module, they have been scheduled throughout the module sessions instead of at the end.

(2) Fresh concrete can be simulated for the demonstrations, laboratories, and Performance Profile Tasks by using a mixture of fly ash, sand, and water.

Optional References for Advanced Study
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.


Guide for Concrete Floor and Slab Construction, ACI 302.1R-96, American Concrete Institute, Farmington Hills, MI, 1997.

Standard Specifications for Tolerance for Concrete Construction and Materials and Commentary, ACI 117R-90, American Concrete Institute, Farmington Hills, MI, 1990.
PERFORMANCE PROFILE TASKS

1. Using dimensional lumber, lay out, install, and set an 8-inch deep concrete form to grade and elevation with the use of an optical level and level rod.

2. Use drawings to locate the correct place for dowel assemblies in concrete slab.

3. Drill holes and insert two dowels.

4. Apply release agent to dowels.

5. Place a wet screed to grade using an optical level and level rod.

6. Place a wet screed to grade using a laser level and level rod.
PERFORMANCE PROFILE TASKS

7. Place, consolidate, and screed a concrete slab to a given elevation.

8. Use a highway straightedge to remove high areas and fill low areas of a slab.
OBJECTIVES
Upon completion of this module, the trainee will be able to:

1. Discuss the requirements for installing a superflat floor.
2. Prepare an area and materials for finishing a superflat floor.
3. Place and finish concrete for a superflat floor.

Note to the Instructor
Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials
The following are required for instruction using this module:

**Equipment**
- Overhead projector and screen
- Whiteboard/chalkboard
- Appropriate Personal Protective Equipment
- Dipsticks
- Highway straightedges
- Optical levels
- Level rods
- Chalk lines
- Hammers
- Measuring tapes
- Block planes

**Materials**
- Trainee Task Module
- Transparencies
- Module Examinations
- Performance Profile Sheets
- Paper and pencils
- Markers/chalk
- Construction stakes
- Dimensional lumber for edge forms
- Nails
- Carpenter’s pencils
- Keel
- Existing concrete floor
- Plans for floor construction and rack layout
- Photographs or brochures of superflat floors
- Sample preplacement checklist
- Brochure on laser screed
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½ hour class session in this Instructor’s Guide, the basic Presentation Sequence is as follows:

- Introduction/Overview
- Classroom, and/or Demonstration, and/or Laboratory
- Class Break
- Classroom, and/or Demonstration, and/or Laboratory
- Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

**Classroom:** Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

**Demonstration:** Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

**Laboratory:** Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

**NCCER Standardized Craft Training Programs**

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the *Guidelines for Accreditation*, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
MODULE OVERVIEW

This module introduces the Concrete Finishing trainee to the procedures and methods used to construct superflat floors. Information is provided about flatness and levelness requirements and the finishing methods used to meet the required tolerances.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

- Core Curricula; Concrete Finishing Level One;
- Concrete Finishing Level Two, Modules 23201 through 23206

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment.

Teaching Time for This Module

Approximately 22½ hours or nine sessions of training time are suggested to cover Superflat Floors. The training class session is a suggested 2½ hour time period, which includes at least one break. You will need to adjust the time required for hands-on activities and testing based on your class size and resources. All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Nine 2½-Hour Sessions

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Factors Influencing F-number Values</td>
<td>1.0.0 – 2.3.0</td>
</tr>
<tr>
<td>2</td>
<td>Preparation – Mix Design</td>
<td>3.0.0 – 3.4.0</td>
</tr>
<tr>
<td></td>
<td>Demonstration</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Forms/Laboratory</td>
<td>3.2.0</td>
</tr>
<tr>
<td>4</td>
<td>Placing – Form Monitoring</td>
<td>4.0.0 – 4.3.0</td>
</tr>
<tr>
<td></td>
<td>Demonstration</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Placing/Laboratory</td>
<td>4.0.0</td>
</tr>
<tr>
<td></td>
<td>Site Visit</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Finishing – Measuring</td>
<td>5.0.0 – 5.3.2</td>
</tr>
<tr>
<td></td>
<td>Demonstration</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Measuring/Laboratory</td>
<td>5.3.2</td>
</tr>
<tr>
<td>Session</td>
<td>Topic</td>
<td>Trainee Module Section(s)</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>8</td>
<td>Curing – Grinding</td>
<td>6.0.0 – 7.0.0</td>
</tr>
<tr>
<td></td>
<td>Performance Profile Testing</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Module Examination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance Profile Testing</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Arrange for the site visit well in advance. Make sure you know the schedule for the concrete placing activities. Make sure sufficient transportation is available for all trainees.

**Optional References for Advanced Study**

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.


*Finishing Concrete Flatwork*, Videotape 32:00 minutes, Portland Cement Association, Skokie, IL, 1991.

*Floors and Slabs*, American Concrete Institute, Farmington Hills, MI, 1996.

*Guide for Concrete Floor and Slab Construction*, ACI 302.1R-96, American Concrete Institute, Farmington Hills, MI, 1996.


TRANSPARENCY 2
TASK MODULE 23207, SUPERFLAT FLOORS

PERFORMANCE PROFILE TASKS

1. Set a 20-foot wooden edge form on grade to a specified elevation and check top of the form for flatness with a highway straightedge. Mark areas that are not true.

2. Using a floor plan and rack layout, prepare a placing sequence for a defined-traffic floor.

3. Mark gridlines on a floor slab for measuring guides.

4. Use a dipstick to take measurements for flatness and levelness.

5. Identify areas in the floor section that are out of tolerance and mark the areas for grinding.
OBJECTIVES

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

1. Describe different surface treatments.
2. Apply common surface treatments.
3. Finish a concrete floor to receive toppings.

Note to the Instructor

Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

**Equipment**
- Overhead projector and screen
- Whiteboard/chalkboard
- Appropriate Personal Protective Equipment
- Concrete mixer
- Shovels or scoops
- Floats
- Shotblasting or equivalent equipment
- Magnets
- Brooms
- Water hose

**Materials**
- Trainee Task Module
- Transparencies
- Module Examination
- Performance Profile Sheets
- Markers/chalk
- Paper and pencils
- Dimensional lumber for 4’ × 4’ sandboxes
- Fly ash
- Sand
- Water
- Epoxy compound
- Mineral shake hardener
- Metallic shake hardener
- Color shake hardener
- Paper bags for containers
- Hardened concrete slab
- ICRI guideline No. 03732
- Concrete surface profile (CSP) chips
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½ hour class session in this Instructor’s Guide, the basic Presentation Sequence is as follows:

- Introduction/Overview
- Classroom, and/or Demonstration, and/or Laboratory
- Class Break
- Classroom, and/or Demonstration, and/or Laboratory
- Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

**Classroom:** Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

**Demonstration:** Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

**Laboratory:** Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

**NCCER Standardized Craft Training Programs**

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the *Guidelines for Accreditation*, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
MODULE OVERVIEW

This module introduces the Concrete Finishing trainee to the various types of surface treatments used to repair and protect concrete structures. Preparation of the slab’s surface and applications of various treatments are described.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

- Core Curricula; Concrete Finishing Level One;
- Concrete Finishing Level Two, Modules 23201 through 23207

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment.

Teaching Time for This Module

Approximately 12½ hours or five sessions of training time are suggested to cover Surface Treatments. The training class session is a suggested 2½ hour time period, which includes at least one break. You will need to adjust the time required for hands-on activities and testing based on your class size and resources. All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Five 2½-Hour Sessions

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Applying Natural-Aggregate Dry Shakes Demonstration</td>
<td>1.0.0 – 3.3.0</td>
</tr>
<tr>
<td>2</td>
<td>Applying Dry Shakes/Laboratory</td>
<td>3.2.0</td>
</tr>
<tr>
<td>3</td>
<td>Self-Leveling Toppings And Underlayments – Application Surface Preparation Demonstration</td>
<td>4.0.0 – 6.3.0</td>
</tr>
<tr>
<td>4</td>
<td>Surface Preparation Laboratory</td>
<td>2.3.0</td>
</tr>
<tr>
<td>5</td>
<td>Module Examination Performance Profile Testing</td>
<td></td>
</tr>
</tbody>
</table>

Note: For this module you will need to prepare several 4’ × 4’ slabs to use with the demonstrations and laboratories. These slabs can be made by constructing a 4’ × 4’ box using 2” × 4” lumber as the forming material. Fill the box with a mixture of sand, fly ash, and water to simulate fresh concrete.
Optional References for Advanced Study

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.


Guide for Concrete Floor and Slab Construction, ACI 302.1R-96, American Concrete Institute, Farmington Hills, MI, 1997.

The Contractor’s Guide to Quality Construction, American Concrete Institute, Farmington Hills, MI, 1997.

Selecting and Specifying Concrete Surface Preparation For Sealers, Coatings, and Polymer Overlays, Guideline No. 03732, International Concrete Repair Institute, Sterling, VA, 1997.
TRANSPARENCY 2
TASK MODULE 23208, SURFACE TREATMENTS

PERFORMANCE PROFILE TASKS

1. Apply an even-colored finish to a wet surface.

2. Uniformly broadcast and work with a mineral hardener.

3. Uniformly broadcast and work with a metallic hardener.

4. Properly use shotblasting or equivalent equipment to prepare a surface to a specified concrete surface profile.

5. Properly clean a surface after using shotblasting or equivalent equipment.
QUALITY CONTROL

OBJECTIVES

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

1. Describe the purpose, frequency, sampling requirements, and procedures for performing common concrete tests.
2. Perform each concrete test.
3. Describe and perform preplacement inspections.

Note to the Instructor

Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

**Equipment**
- Overhead projector and screen
- Whiteboard/chalkboard
- Appropriate Personal Protective Equipment
- Four-function calculators
- Shovels or scoops
- Slump test kits
- Yield test kits
- Cylinder molds
- Tamping rods
- Thermometer for temperature test
- Cover sheets or caps
- Scales
- Strikeoff plates or straightedges

**Materials**
- Trainee Task Module
- Transparencies
- Module Examinations
- Performance Profile Sheets
- Paper and pencils
- Markers/chalk
- Labels
- Six different sizes of rebar
- Freshly mixed concrete or fly ash based mixture
- Copies of ASTM standards C31, C138, C143, and C172
- Copies of ACI testing references
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½ hour class session in this Instructor’s Guide, the basic Presentation Sequence is as follows:

- Introduction/Overview
- Classroom, and/or Demonstration, and/or Laboratory
- Class Break
- Classroom, and/or Demonstration, and/or Laboratory
- Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

**Classroom:** Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

**Demonstration:** Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

**Laboratory:** Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

**NCCER Standardized Craft Training Programs**

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the *Guidelines for Accreditation*, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
MODULE OVERVIEW

This module introduces the Concrete Finishing trainee to the requirements for controlling the quality of materials and craftsmanship used in concrete construction. Standard test methods and procedures accepted by the industry are also presented.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

- Core Curricula; Concrete Finishing Level One;
- Concrete Finishing Level Two, Modules 23101 through 23208

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment.

Teaching Time for This Module

Approximately 10 hours or four sessions of training time are suggested to cover Quality Control. The training class session is a suggested 2½ hour time period, which includes at least one break. You will need to adjust the time required for hands-on activities and testing based on your class size and resources. All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Four 2¼-Hour Sessions

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Test and Acceptance Criteria Demonstration/Laboratory</td>
<td>1.0.0 – 3.5.0</td>
</tr>
<tr>
<td>2</td>
<td>Field Testing – Temperature Test Procedure Demonstration/Laboratory</td>
<td>4.0.0 - 4.4.2</td>
</tr>
<tr>
<td>3</td>
<td>Inspections – Bulkheads Demonstration/Laboratory</td>
<td>5.0.0 - 7.2.0</td>
</tr>
<tr>
<td>4</td>
<td>Module Examination Performance Profile Testing</td>
<td>1.0.0 - 7.2.0</td>
</tr>
</tbody>
</table>
Optional References for Advanced Study

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 Parking Lots: Eight Steps to Quality Construction*, Videotape 18:32 minutes, Portland Cement Association, Skokie, IL.


*Finishing Concrete Flatwork*, Videotape 32:00 minutes, Portland Cement Association, Skokie, IL, 1991.

*Guide for Concrete Floor and Slab Construction*, American Concrete Institute, Farmington Hills, MI, 1997.
PERFORMANCE PROFILE TASKS

1. Sample concrete according to ASTM standard C172. Prepare a test cylinder according to ASTM standard C31.

2. Perform a slump test according to ASTM standard C143.

3. Perform a yield test and calculate yield, unit weight, and air content according to ASTM standard C138.

4. Correctly identify at least four out of six sizes of rebar according to bar markings.
MAKING REPAIRS

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

1. Describe common surface defects.
2. Repair cracks.
3. Describe and locate delaminations.
4. Stone or sack rub surfaces.

Note to the Instructor
Before teaching this module, you should review the details in this Instructor’s Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials
The following are required for instruction using this module:

**Equipment**
- Overhead projector and screen
- Whiteboard/chalkboard
- Appropriate Personal Protective Equipment
- Concrete slabs with cracks, spalls, and discolorations
- Mixing containers
- Water containers
- Concrete saws
- Chipping hammers or hammers and chisels
- Vacuum cleaners or airblasters
- Brushes for bonding material
- Pointing or mason’s trowels
- Floats
- Straightedges
- Grinder
- Caulking guns

**Materials**
- Trainee Task Module
- Transparencies
- Paper and pencils
- Markers/chalk
- Manufacturer’s literature on milling machines (if available)
- Joint filler or substitute
- Preformed joint strips
- Patching compound or substitute
- Cement
- Sand
- Water
- Bonding compound or substitute
- Burlap for rubbing
- Curing materials
- Module Examinations
- Performance Profile Sheets
HOW TO USE THIS INSTRUCTOR’S GUIDE

For each 2½ hour class session in this Instructor’s Guide, the basic Presentation Sequence is as follows:

- Introduction/Overview
- Classroom, and/or Demonstration, and/or Laboratory
- Class Break
- Classroom, and/or Demonstration, and/or Laboratory
- Summary

Suggested time periods for classroom sessions are included throughout this Instructor’s Guide. These time periods should be adapted to meet local conditions and training requirements.

Each class session is presented with two columns of information. On the left side of the page, a narrow column provides suggested trainee and instructor actions, icons to call your attention to material, safety, audiovisual, or testing requirements, and space for your notes. The right-hand column provides the outline of the suggested presentation for each class session.

In this Instructor’s Guide, the terms classroom, demonstration, and laboratory are defined and used as follows:

**Classroom:** Sessions are designed for lectures, group discussions, coaching, and additional activities. Trainees should be encouraged to actively participate.

**Demonstration:** Instructors will demonstrate all procedures before trainees attempt them. Instructors should make sure that trainees can point out all safety procedures during demonstrations to be assured of the proper use of equipment by trainees.

**Laboratory:** Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

**NCCER Standardized Craft Training Programs**

The National Center for Construction Education and Research (NCCER) provides a standardized national program of accredited craft training. Key features of the program include instructor certification, competency-based training, and performance testing. The program provides trainees, instructors, and companies with a standard form of recognition through a National Craft Training Registry. The program is described in full in the *Guidelines for Accreditation*, published by the NCCER. For more information on standardized craft training, contact the NCCER at P.O. Box 141104, Gainesville, FL 32614-1104; or call 352-334-0911.
MODULE OVERVIEW

This module introduces the Concrete Finishing trainee to the methods and procedures used in making repairs to concrete structures. The trainee will learn how to recognize problems and determine the best way to make the repair.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

- Core Curricula; Concrete Finishing Level One;
- Concrete Finishing Level Two, Modules 32201 through 23209

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment.

Teaching Time for This Module

Approximately 10 hours or 4 sessions of training time are suggested to cover Making Repairs. The training class session is a suggested 2½ hour time period, which includes at least one break. **You will need to adjust the time required for hands-on activities and testing based on your class size and resources.** All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Four 2½-Hour Sessions

Adjust your class times based on class size and resources.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Trainee Module Section(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – Large Areas</td>
<td>1.0.0 – 3.2.0</td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Grinding and Milling – Stone Rubbing</td>
<td>4.0.0 – 7.2.0</td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Joint Maintenance And Repair – Shotcrete Repairs</td>
<td>8.0.0 – 9.0.0</td>
</tr>
<tr>
<td></td>
<td>Demonstration/Laboratory</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Module Examination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance Profile Testing</td>
<td></td>
</tr>
</tbody>
</table>

Note: This module covers repairs to hardened concrete. The instructor should prepare beforehand a small slab of concrete for each trainee. As the slabs cure, the instructor should induce spalls, chips, and cracks into each slab so that the slabs will be ready for use during the laboratory sessions.
Optional References for Advanced Study

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.


Floors and Slabs, Compilation 35, American Concrete Institute, Farmington Hills, MI.

Guide For Selecting and Specifying Materials For Repair of Concrete Surfaces, Guideline No. 03733, International Concrete Repair Institute, Sterling, VA, 1996.
TRANSPARENCY 2
TASK MODULE 23210, MAKING REPAIRS

PERFORMANCE PROFILE TASKS

1. Patch a crack and cure it.

2. Sack rub a discolored patch and cure it.

3. Cut and fill a joint and cure it.