Module 27101-13 reviews the history of the carpentry trade, describes the apprentice program, identifies career opportunities for carpenters, explores the SkillsUSA program, and lists the responsibilities and characteristics a carpenter should possess.

### Objectives

**Learning Objective 1**
- Identify the career and entrepreneurial opportunities within the carpentry trade.
  a. Identify the training opportunities within the carpentry trade.

**Learning Objective 2**
- Identify the skills, responsibilities, and characteristics needed to be a successful carpenter.
  a. Identify the skills needed to be a successful carpenter.
  b. Identify the responsibilities of a successful carpenter.
  c. State the personal characteristics of a successful carpenter.

**Learning Objective 3**
- Summarize how to be connected to the industry through an organization like SkillsUSA.
  a. Describe the program, curriculum, and SkillsUSA Championships.
  b. State the benefits from being a SkillsUSA member.
  c. List the seven goals of the SkillsUSA Program of Work.

**Learning Objective 4**
- Explain the importance of safety in the construction industry, and describe the obligations of the contractor, subcontractors, and you to ensure a safe work environment.
  a. Describe the OSHA Outreach Training Program.
  b. Explain hazard recognition and define your role in it.

### Performance Tasks
- This is a knowledge-based module; there are no Performance Tasks.

### Teaching Time: 2.5 hours
(One 2.5-Hour Classroom Session)
Session time may be adjusted to accommodate your class size, schedule, and teaching style.

### Prerequisites
Core Curriculum

### Before You Begin
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination.
**Safety Considerations**
This module does not include Performance Tasks, and as such, no PPE is required for completion of this module. However, safety should be stressed at all times when discussing apprenticeship and on-the-job learning situations.

**Classroom Equipment and Materials**
- Whiteboard/Chalkboard
- Markers/Chalk
- Pencils and paper
- *Construction Craft Laborer Level One* PowerPoint®
- Presentation Slides
- LCD projector and screen
- Computer
- Copies of the Module Examination
- Vendor-supplied videos/DVDs showing SkillsUSA Championships (optional)
- TV/DVD player

**Equipment and Materials for Laboratories and Performance Testing**
- Blank job hazard analysis (JHA) forms

**Additional Resources and References**
*SkillsUSA* website, [www.skillsusa.org](http://www.skillsusa.org)
*Build Your Future* website, [www.byf.org](http://www.byf.org)

There are a number of online resources available for trainees who would like more information on the carpentry trade. A search for additional information may be assigned as homework to interested trainees.
The lesson plan for this module consists of one 2.5-hour session which includes 10 minutes for administrative tasks and one 10-minute break.

SESSION ONE

Session One reviews the history of carpentry, describes the apprentice program, identifies career opportunities for carpenters, explores the SkillsUSA program, and lists the responsibilities and characteristics a carpenter should possess.

1. Show Session One PowerPoint® presentation slides.

2. Have trainees describe the carpentry apprentice program.

3. Describe the SkillsUSA program and how trainees can benefit from the program.

4. Have trainees list and describe various responsibilities and characteristics a carpenter should possess.

5. Have trainees complete the Module Examination.

6. Record the testing results on the Registration of Training Modules form, and submit the report to your Training Program Sponsor.
<table>
<thead>
<tr>
<th>Personal protective equipment:</th>
<th>Blank job hazard analysis (JHA) forms</th>
<th>Vendor-supplied videos/DVDs showing SkillsUSA Championships (optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Whiteboard/Chalkboard</td>
<td>Construction Craft Laborer Level One PowerPoint Presentation Slides</td>
</tr>
<tr>
<td></td>
<td>Markers/Chalk</td>
<td>Pencils and paper</td>
</tr>
<tr>
<td></td>
<td>Copies of the Module Examination</td>
<td>Computer</td>
</tr>
<tr>
<td></td>
<td>TV/DVD player</td>
<td></td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Lesson Plans for Module 27102-13

BUILDING MATERIALS, FASTENERS, AND ADHESIVES

Module 27102-13 provides an overview of the building materials used by carpenters, including lumber, engineered wood products, concrete, and steel framing materials. The module also describes the various fasteners, anchors, and adhesives used in construction.

Objectives

Learning Objective 1
- Identify various types of building materials and describe their uses.
  a. State the uses of various types of hardwoods and softwoods.
  b. Describe common lumber defects.
  c. Identify the different grades of lumber and describe uses for each.
  d. Explain how treated lumber differs from nontreated lumber.
  e. Describe how plywood is manufactured and cite common applications for plywood on a construction project.
  f. Identify uses of hardboard.
  g. Identify uses of particleboard.
  h. Identify uses of high- and medium-density overlay plywood.
  i. Describe how oriented strand board differs from particleboard and cite common applications for OSB.
  j. Cite common applications for mineral fiberboard.
  k. State the uses of various types of engineered lumber.
  l. Identify applications for wood I-beams.
  m. List advantages of glulam lumber over conventional solid lumber.
  n. Describe the composition of concrete and explain how hydration occurs.
  o. List uses of concrete masonry units for a construction project.
  p. Identify where metal framing members may be used in a structure.

Learning Objective 2
- List safety precautions associated with building materials.
  a. List general safety guidelines for working with building materials.
  b. Cite safety precautions for working with wood building materials.
  c. Cite safety precautions for working with concrete building materials.
  d. Cite safety precautions for working with metal building materials.

Learning Objective 3
- Describe the proper method of handling and storing building materials.
  a. List basic material-handling guidelines.
  b. Describe how to handle and store wood building materials.
  c. Describe how to handle and store concrete building materials.
  d. Describe how to handle and store metal building materials.

Learning Objective 4
- Explain how to calculate the quantities of lumber, panel, and concrete products using industry-standard methods.
  a. Calculate lumber quantities.
  b. Calculate panel quantities.
  c. Calculate the volume of concrete required for rectangular and cylindrical shapes.

Learning Objective 5
- Describe the fasteners, anchors, and adhesives used in construction and explain their uses.
  a. Identify various types of nails and cite uses for each.
  b. Identify applications for staples.
  c. Identify various types of screws and cite uses for each.
  d. Describe uses for hammer-driven pins and studs.
  e. Identify various types of mechanical anchors and cite uses for each.
  f. Identify various types of bolt anchors and explain how each is installed.
  g. Identify various types of screw anchors and cite uses for each.
  h. List the types of glues and adhesives used in construction.
### Safety Considerations

This module requires that trainees demonstrate the safe and proper installation of drop-in anchors. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

### Performance Tasks

<table>
<thead>
<tr>
<th>Performance Task 1 (Learning Objective 1)</th>
<th>Performance Task 3 (Learning Objective 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Given a selection of building materials, identify a particular material and state its use.</td>
<td>• Demonstrate safe and proper installation of drop-in anchors.</td>
</tr>
<tr>
<td>Performance Task 2 (Learning Objective 4)</td>
<td></td>
</tr>
<tr>
<td>• Calculate the quantities of lumber, panel, and concrete products using industry-standard methods.</td>
<td></td>
</tr>
</tbody>
</table>

### Teaching Time: 20 hours

(Eight 2.5-hour classroom sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

### Prerequisites

**Core Curriculum**

### Before You Begin

As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
Classroom Equipment and Materials

Whiteboard/Chalkboard
Markers/Chalk
Pencils and paper

Construction Craft Laborer Level One PowerPoint® Presentation Slides

LCD projector and screen
Computer
Copies of the Module Examination and Performance Profile Sheets
Vendor-supplied videos/DVDs showing various building materials and fasteners (optional)
TV/DVD player

Equipment and Materials for Laboratories and Performance Testing

Personal protective equipment (PPE):
- Hard hat
- Safety glasses
- Gloves
- Hearing protection
- Face shield
- Respiratory protection
Cut portion of a tree trunk
Tape measure
Samples of lumber with grade stamps, natural defects, and manufacturing defects
Samples of panel products containing grade stamps, including plywood, OSB, particleboard, hardboard, and mineral fiberboard
Drill and bits
Handsaw
Plywood Specification and Grade Guide
Samples of engineered lumber products, including wood I-beams, glulam, LVL, and PSL
Photos of commercial construction projects
Samples of concrete masonry units
Samples of steel framing members
Bags of portland cement
Sand
Water
Blank job hazard analysis (JHA) forms
Small loads for lifting demonstration
Wood materials
Samples of boards that equal one board foot
Calculator or smartphone calculator app
Set of plans (optional)
Scraps of wood, steel-metal framing, and concrete
Hammer
Assorted nails
Manul staple
Assorted staples
Standard screwdriver
Wood screws
Power screwdriver
Sheet-metal screws
Masonry bits
Machine and lag screws
Concrete/masonry and deck screws
Drywall and drive screws
Hammer-driven pins
Assorted bolts and nuts
Advertisements for anchors and adhesives
Assorted anchors and adhesives
Ventilation fan

Additional Resources

This module presents thorough resources for task training. The following resource materials are suggested for further study:


There are a number of online resources available for trainees who would like more information on building materials, fasteners, and adhesives. A search for additional information may be assigned as homework to interested trainees.
### Session Outline for 27102-13

**BUILDING MATERIALS, FASTENERS, AND ADHESIVES**

The lesson plan for this module is divided into eight 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

<table>
<thead>
<tr>
<th>Session One</th>
<th>Session Four</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session One reviews dimension lumber, plywood, and other panel products.</td>
<td>Session Four discusses the proper and safe handling and storage of building materials.</td>
</tr>
<tr>
<td>1. Show Session One PowerPoint® presentation slides.</td>
<td>1. Show Session Four PowerPoint® presentation slides.</td>
</tr>
<tr>
<td>2. Provide an overview of the module.</td>
<td>2. Emphasize the importance of safety on the job site, including safety when handling and storing building materials.</td>
</tr>
<tr>
<td>3. Discuss the various types of wood building materials, including plywood and other panel products.</td>
<td>3. Review job hazard analysis (JHA) and its importance.</td>
</tr>
<tr>
<td>4. Have trainees identify various wood building materials and note their applications.</td>
<td>4. Review general safety, followed by safety with wood, concrete, and steel building materials.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session Two</th>
<th>Session Five</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session Two introduces engineered lumber products, their manufacture, and their applications.</td>
<td>Session Five discusses the calculation of lumber, panel, and concrete quantities.</td>
</tr>
<tr>
<td>1. Show Session Two PowerPoint® presentation slides.</td>
<td>1. Show Session Five PowerPoint® presentation slides.</td>
</tr>
<tr>
<td>2. Discuss how engineered lumber has changed the way some buildings are constructed.</td>
<td>2. Explain board foot measurements, and describe how board feet are calculated.</td>
</tr>
<tr>
<td>3. Have trainees identify engineered lumber products and their applications.</td>
<td>3. Discuss area and how it is calculated. Explain that area is a very common construction calculation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session Three</th>
<th>Session Six</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session Three reviews concrete, concrete masonry construction, and steel framing materials.</td>
<td>Session Six reviews common fasteners used by carpenters.</td>
</tr>
<tr>
<td>2. Review the ingredients in concrete and explain that varying the amounts of these ingredients will impart different characteristics and properties to the concrete.</td>
<td>2. Discuss nail types and nail sizes.</td>
</tr>
<tr>
<td>3. Explain the benefits of concrete masonry construction.</td>
<td>3. Discuss staples and their applications.</td>
</tr>
<tr>
<td>4. Discuss the applications of steel framing members in commercial construction.</td>
<td>4. Discuss screw types and their applications.</td>
</tr>
<tr>
<td>5. Discuss the safe handling and storage of building materials.</td>
<td>5. Discuss bolts and their applications.</td>
</tr>
</tbody>
</table>
Session Outline for 27102-13

BUILDING MATERIALS, FASTENERS, AND ADHESIVES

SESSION SEVEN

Session Seven introduces common anchors and adhesives used by carpenters.

1. Show Session Seven PowerPoint® presentation slides.
2. Discuss common anchors and adhesives used on construction projects.
3. Emphasize the importance of proper ventilation and PPE when applying some types of adhesives.

SESSION EIGHT

Session Eight is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Seven.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on the Registration of Training Modules form, and submit the report to your Training Program Sponsor.
Materials Checklist for Module 27102-13, Building Materials, Fasteners, and Adhesives

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th>Personal protective equipment:</th>
<th>Cut portion of a tree trunk</th>
<th>Tape measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard hat</td>
<td>Drill and bits</td>
<td>Sand</td>
<td>Bags of portland cement</td>
</tr>
<tr>
<td>Safety glasses</td>
<td>Water</td>
<td>Sand</td>
<td>Bags of portland cement</td>
</tr>
<tr>
<td>Gloves</td>
<td>Safety glasses</td>
<td>Gloves</td>
<td>Assorted staple</td>
</tr>
<tr>
<td>Hearing protection</td>
<td>Hearing protection</td>
<td>Hearing protection</td>
<td>Manual stapler</td>
</tr>
<tr>
<td>Face shield</td>
<td>Respiratory protection</td>
<td>Respiratory protection</td>
<td>Wood screws</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>Whiteboard/Chalkboard</td>
<td>Whiteboard/Chalkboard</td>
<td>Power screwdriver</td>
</tr>
<tr>
<td>Markers/Chalk</td>
<td>Pencils and paper</td>
<td>Pencils and paper</td>
<td>Samples of lumber with grade stamps, natural defects, and manufacturing defects</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Construction Craft Laborer Level One PowerPoint® Presentation Slides</td>
<td>Samples of lumber with grade stamps, natural defects, and manufacturing defects</td>
<td>Samples of engineered lumber products, including wood I-beams, glulam, LVL, and PSL</td>
</tr>
<tr>
<td>Computer</td>
<td>LCD projector and screen</td>
<td>LCD projector and screen</td>
<td>Assorted bolts and nuts</td>
</tr>
<tr>
<td>Computer</td>
<td>Copy of the Module Examination and Performance Profile Sheets</td>
<td>Copy of the Module Examination and Performance Profile Sheets</td>
<td>Samples of concrete masonry units</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing various building materials and fasteners (optional)</td>
<td>Samples of panel products containing grade stamps, including plywood, OSB, particleboard, hardboard, and mineral fiberboard</td>
<td>Samples of panel products containing grade stamps, including plywood, OSB, particleboard, hardboard, and mineral fiberboard</td>
<td>Blank job hazard analysis (JHA) forms</td>
</tr>
<tr>
<td>TV/DVD player</td>
<td>Concrete/masonry and deck screws</td>
<td>Concrete/masonry and deck screws</td>
<td>Advertisements for anchors and adhesives</td>
</tr>
<tr>
<td>Calculator or smartphone calculator app</td>
<td>Assorted anchors and adhesives</td>
<td>Assorted anchors and adhesives</td>
<td>Samples of boards that equal one board foot</td>
</tr>
<tr>
<td>Samples of steel framing members</td>
<td>Small loads for lifting demonstration</td>
<td>Small loads for lifting demonstration</td>
<td></td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module 27303-14 describes the properties, characteristics, and uses of cement, aggregates, and other materials that, when mixed together, form different types of concrete. The text covers procedures for estimating concrete volume and for testing freshly mixed concrete as well as methods and materials for curing concrete.

**Objectives**

**Learning Objective 1**
- Identify various concrete ingredients and describe their purpose in a concrete mixture.
  - a. Explain how portland cement affects a concrete mixture and list the types of portland cement.
  - b. Describe the characteristics of aggregate used in a concrete mixture.
  - c. List the characteristics of water used in a concrete mixture.
  - d. List types of concrete admixtures and describe how they affect a concrete mixture.

**Learning Objective 2**
- Identify proper concrete mixture measurements and curing methods.
  - a. Describe normal concrete-mix proportions and measurements.
  - b. List special types of concrete.
  - c. Describe the properties of air-entrained concrete.
  - d. Describe how concrete is cured.

**Learning Objective 3**
- Describe the methods for testing concrete.
  - a. Describe the proper procedure for sampling concrete.
  - b. Explain the purpose of a slump test.
  - c. Describe how a concrete compression test is performed.

**Learning Objective 4**
- Calculate concrete volume for rectangular or circular structures.
  - a. Calculate rectangular volume.
  - b. Calculate circular volume.

**Performance Tasks**

**Performance Task 1 (Learning Objective 3)**
- Perform a concrete slump test or create a concrete test cylinder.

**Performance Task 2 (Learning Objective 4)**
- Calculate concrete volume requirements using formulas, concrete tables, and/or concrete calculators, as applicable.

**Teaching Time: 10 hours**

(Four 2.5-hour Classroom Sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

**Prerequisites**

*Core Curriculum*

**Before You Begin**

As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
Safety Considerations
This module requires that trainees work around cement. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

Classroom Equipment and Materials
- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- PowerPoint® Presentation Slides
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing concrete mixing operations (optional)
- TV/DVD player

Equipment and Materials for Laboratories and Performance Testing
- Personal protective equipment (PPE):
  - Eye protection
  - Gloves
  - Hard hat
  - Construction calculator
  - Containers of water
  - Copies of a completed concrete test recording form
  - Copies of or excerpts from ASTM C150, Standard Specification for Portland Cement
  - Copy of performance specifications
  - Cylindrical molds
  - Digital thermometers
  - Hand grips
  - Materials used for concrete hydration, including waterproof curing paper, plastic sheeting, burlap mats, blankets, and curing compounds
  - Metal tags and tag wires
  - Nonabsorbent surface
  - Samples of acceptable and unacceptable aggregates
  - Samples of admixtures
  - Samples of coloring agents
  - Samples of fine and/or coarse aggregate
  - Samples of portland cement
  - Set of commercial construction drawings
  - Set of residential construction drawings
  - Shovel
  - Sieve or filter
  - Slide-rule concrete calculator
  - Slump cone mold
  - Straightedge
  - Tamping rod
  - Tape measure
  - Water
  - Wheelbarrow

Additional Resources and References
This module presents thorough resources for task training. The following resource material is suggested for further study:

American Concrete Institute. [www.concrete.org](http://www.concrete.org)


There are a number of online resources available for trainees who would like more information on the properties of concrete. A search for additional information may be assigned as homework to interested trainees.
The lesson plan for this module is divided into four 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**

Session One introduces concrete ingredients and their impact on a concrete mixture.

1. Show Session One PowerPoint® presentation slides.
2. Introduce trainees to hydration and its various stages.
3. Introduce trainees to the various types of aggregates and admixtures that may be used in a concrete mixture.

**SESSION TWO**

Session Two introduces concrete mixture proportions, measurements, and concrete testing.

1. Show Session Two PowerPoint® presentation slides.
2. Introduce trainees to the procedure for determining the proper proportions for a concrete mixture.
3. Introduce trainees to the proper technique for properly obtaining concrete samples.
4. Introduce trainees to the proper technique for performing a slump test.

**SESSION THREE**

Session Three introduces concrete volume calculations.

1. Show Session Three PowerPoint® presentation slides.
2. Introduce trainees to the proper technique for determining the volume of rectangular and circular solids.
3. Introduce trainees to the proper technique for determining concrete volume.

**SESSION FOUR**

Session Four is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Three.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on the Registration of Training Modules form, and submit the report to your Training Program Sponsor.
## Materials Checklist for Module 27303-14, Properties of Concrete

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th>Personal protective equipment:</th>
<th>Construction calculator</th>
<th>Samples of admixtures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye protection</td>
<td>Containers of water</td>
<td>Samples of coloring agents</td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td>Copies of a completed concrete test recording form</td>
<td>Samples of fine and/or coarse aggregate</td>
<td></td>
</tr>
<tr>
<td>Hard hat</td>
<td>Hand grips</td>
<td>Samples of portland cement</td>
<td></td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Copy of performance specifications</td>
<td>Set of commercial construction drawings</td>
<td></td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Cylindrical molds</td>
<td>Set of residential construction drawings</td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td>Digital thermometers</td>
<td>Shovel</td>
<td></td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td>Materials used for concrete hydration, including waterproof curing paper, plastic sheeting, burlap mats, blankets, and curing compounds</td>
<td>Sieve or filter</td>
<td></td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing concrete mixing operations (optional)</td>
<td>Metal tags and tag wires</td>
<td>Slump cone mold</td>
<td></td>
</tr>
<tr>
<td>TV/DVD player</td>
<td>Nonabsorbent surface</td>
<td>Straightedge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Samples of acceptable and unacceptable aggregates</td>
<td>Tamping rod</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>Tape measure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wheelbarrow</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Lesson Plans for 27401-14

SITE LAYOUT ONE: DIFFERENTIAL LEVELING

Module 27401-14 describes differential leveling—differences in elevation between two or more points on a surface. This module is the first of two modules that focus on site layout.

Objectives

Learning Objective 1
1. Describe the responsibilities of the carpenter relative to construction drawings, control points, and hand signals.
   a. Read and interpret a set of civil plans and how they relate to elevations on a job site.
   b. Identify the types of control points and explain their use on a job site.
   c. Describe how to use hand signals to communicate.

Learning Objective 2
2. Recognize, use, and properly care for tools and equipment associated with differential leveling.
   a. Identify the instruments commonly used for differential leveling.
   b. Explain how to set up and calibrate a leveling instrument.
   c. Explain how to use a builder’s level and differential-leveling procedures to determine site and building elevations.

Learning Objective 3
3. Record site-layout data and information in field notes using accepted practices.

Learning Objective 4
4. Describe the applications involving differential leveling.
   a. Explain how to transfer an elevation up a structure.
   b. Discuss applications for profile, cross-section, and grid leveling.

Performance Tasks

Performance Task 1
• Set up, adjust, and field-test leveling instruments.

Performance Task 2
(Learning Objective 2)
• Convert measurements given in feet and inches to equivalent decimal measurements stated in feet, tenths, and hundredths, and vice versa.

Performance Task 3
(Learning Objective 2)
• Use a builder’s level, leveling rods, and/or laser level with appropriate differential-leveling procedures to determine site and building elevations.

Performance Task 4
(Learning Objective 3)
• Record differential-leveling data in field notes in accordance with accepted procedures.

Performance Task 5
(Learning Objective 4)
• Use differential-leveling procedures to transfer elevations up a structure.

Teaching Time: 20 hours
(Eight 2.5-hour Classroom sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites
Core Curriculum

Before You Begin
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
Additional Resources and References
This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on differential leveling. A search for additional information may be assigned as homework to interested trainees.
Session Outline for 27401-14

SITE LAYOUT ONE: DIFFERENTIAL LEVELING

The lesson plan for this module is divided into eight 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**

Session One introduces construction drawings, control points, and hand signals.

1. Show Session One PowerPoint® presentation slides.
2. Discuss the use of site plans and have trainees identify elements shown on site plans.
3. Discuss the types of control points used on a construction site.
4. Describe hand signals commonly used in the field for site-layout work.

**SESSION TWO**

Session Two introduces distance measurement tools.

1. Show Session Two PowerPoint® presentation slides.
2. Identify the instruments commonly used for differential leveling.
3. Explain how to set up and calibrate a leveling instrument.
4. Discuss the proper care and handling of leveling instruments.
5. Describe how to use leveling rods and direct elevation rods.
6. Explain how to set up, calibrate, and use laser levels.

**SESSIONS THREE AND FOUR**

Sessions Three and Four introduce site layout instruments and equipment.

1. Show Sessions Three and Four PowerPoint® presentation slides.
2. Discuss the importance of accurately converting between measurement systems.
3. Explain how to use a builder’s level and differential leveling procedures to determine site and building elevations.

**SESSIONS FIVE THROUGH SEVEN**

Sessions Five, Six, and Seven introduce laying out building lines.

1. Show Sessions Five, Six, and Seven PowerPoint® presentation slides.
2. Explain how to record field notes according to accepted practices.
3. Describe the applications involving differential leveling.
4. Explain how to transfer an elevation up a structure.
5. Discuss applications for profile, cross-section, and grid leveling.

**SESSION EIGHT**

Session Eight is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Seven.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on the Registration of Training Modules form, and submit the report to your Training Program Sponsor.
# Materials Checklist for Module 27401-14, Site Layout One: Differential Leveling

<table>
<thead>
<tr>
<th>Personal protective equipment:</th>
<th>Equipment and Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye protection</td>
<td>Auto level</td>
</tr>
<tr>
<td>Gloves</td>
<td>Blank set of field notes</td>
</tr>
<tr>
<td>Hard hat</td>
<td>Builder’s level</td>
</tr>
<tr>
<td>Steel-toe boots</td>
<td>Calculator</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Direct elevation rod</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Examples of good and bad field notes</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Field notes with backsight and foresight measurements</td>
</tr>
<tr>
<td>Construction Craft Laborer Level One PowerPoint® Presentation Slides</td>
<td>Laser beam detector</td>
</tr>
<tr>
<td>DVD player</td>
<td>Laser level</td>
</tr>
<tr>
<td>Computer</td>
<td></td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td></td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing differential leveling (optional)</td>
<td></td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module 27305-14 describes tools, equipment, and procedures for handling, placing, and finishing concrete. The text describes joints made in concrete structures, the use of joint sealants, and form removal procedures. Safety procedures for handling, placing, and finishing concrete are emphasized.

### Objectives

#### Learning Objective 1
- List the safety precautions for handling, placing, and finishing concrete.
  - List the rules for the care and safe use of hand tools when handling and placing concrete.
  - List the rules for the care and safe use of power tools when handling and placing concrete.
  - Explain how to prevent cement dermatitis.

#### Learning Objective 2
- Identify the methods of moving and handling concrete.
  - Identify off-site equipment for mixing and conveying concrete.
  - Identify on-site equipment for mixing and conveying concrete.
  - Explain how to use hand and power tools for mixing and conveying concrete.

#### Learning Objective 3
- Explain the proper methods for placing and consolidating concrete into forms.
  - Explain the proper method for placing concrete into forms.
  - Explain the proper method for consolidating concrete.

#### Learning Objective 4
- Describe the proper methods for finishing and curing concrete.
  - Explain the proper method for screeding concrete.
  - Explain the proper method for leveling concrete.
  - Explain the proper method for finishing concrete.
  - Explain how to properly cure concrete.
  - Describe the use of joint sealants.
  - Identify the tools used to rub and patch concrete.

#### Learning Objective 5
- Identify the different kinds of joints in concrete structures.
  - Identify construction joints.
  - Identify isolation joints.
  - Identify control joints.
  - Identify decorative joints.

### Performance Tasks

#### Performance Task 1 (Learning Objective 3)
- Properly place and consolidate concrete in selected concrete forms.

#### Performance Task 2 (Learning Objective 4)
- Use a screed to strike off and level a concrete surface.

#### Performance Task 3 (Learning Objective 4)
- Use a bull float and/or darby to level and smooth a concrete surface.

#### Performance Task 4 (Learning Objective 4)
- Use an edger to form a radius at the edges of a concrete pad, slab, etc.

#### Performance Task 5 (Learning Objective 4)
- Use a hand float and finishing trowel to level high spots, remove imperfections, and smooth a concrete surface.

#### Performance Task 6 (Learning Objective 5)
- Use a jointer to make control joints in a concrete surface.

### Teaching Time: 20 hours
(Eight 2.5-hour Classroom Sessions)
Session time may be adjusted to accommodate your class size, schedule, and teaching style.
Classroom Equipment and Materials
Whiteboard/chalkboard
Markers/chalk
Pencils and paper
Construction Craft Laborer Level One PowerPoint® Presentation Slides
Computer
Copies of the Module Examination and Performance Profile Sheets
Vendor-supplied videos/DVDs showing the handling and placing of concrete (optional)
TV/DVD player

Equipment and Materials for Laboratories and Performance Testing
Personal protective equipment:
- Coveralls and long-sleeved shirts
- Gloves
- Goggles or face mask
- Respirators or other breathing devices
- Work boots
- Boxes to contain wet sand
- Brooms
- Bulkheads
- Bush hammers
- Carborundum rubbing stones
- Chipping hammers
- Combination tools, such as edger/jointers, step-and-sidewalk tools, and cove-and-base tools
- Concrete
- Concrete forms
- Concrete-handling equipment
- Copies of instruction manuals for a variety of power tools
- Copies of safety data sheets (SDSs) for concrete and mortar
- Copies of the section of the local applicable building code that covers concrete finishing and curing requirements
- Copies of, or extracts from, American Society for Testing and Materials (ASTM) E1155, Standard Test Method for Determining $F_F$ Floor Flatness and $F_L$ Floor Levelness Numbers
- Darby floats/bull floats
- Drop chutes (if required)
- Edgers
- Embedded items such as anchor bolts, traps, pipe, and conduit
- Expansion-joint materials
- Hand floats
- Hand trowels
- Joint sealant
- Jointers (groovers)
- Knee boards
- Manual and power screeds
- Manual consolidation tools such as tamping rods, spades, and shovels
- Mechanical consolidation tools such as vibrators
- Pneumatic guns
- Pointing and margin trowels
- Power grinders
- Power saws
- Properly constructed concrete formworks
- Reinforcing mesh or rods
- Sand
- Sprayer

Prerequisites
Core Curriculum

Before You Begin
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.

Safety Considerations
This module requires that trainees place and consolidate concrete, use a screed and various tools to smooth a concrete surface, and make a control joint. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.
Additional Resources and References

This module presents thorough resources for task training. The following resource material is suggested for further study:

- American Concrete Institute (ACI). www.concrete.org
- American Concrete Pumping Association. www.concretepumpers.com
- Cement Association of Canada. www.cement.ca

There are a number of online resources available for trainees who would like more information on handling and placing concrete. A search for additional information may be assigned as homework to interested trainees.
The lesson plan for this module is divided into eight 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**
Session One introduces moving and handling concrete.
1. Show Session One PowerPoint® presentation slides.
2. Introduce trainees to the safety precautions for handling, placing, and finishing concrete.
3. Introduce trainees to the methods of moving and handling concrete.
4. Introduce trainees to the proper methods for finishing and curing concrete.
5. Introduce trainees to the proper methods for using a bull float and/or darby to level and smooth a concrete surface.
6. Introduce trainees to the proper methods for finishing and curing concrete.
7. Introduce trainees to the proper methods for using an edger to form a radius at the edges of a concrete pad, slab, etc.
8. Introduce trainees to the proper methods for using a hand float and finishing trowel.
9. Introduce trainees to the proper methods for finishing and curing concrete.

**SESSION TWO**
Session Two introduces placing and consolidating concrete.
1. Show Session Two PowerPoint® presentation slides.
2. Introduce trainees to the proper methods for placing and consolidating concrete into forms.

**SESSIONS THREE THROUGH SIX**
Sessions Three through Six introduce the process of finishing and curing concrete.
1. Show Sessions Three through Six PowerPoint® presentation slides.
2. Introduce trainees to the proper methods for finishing and curing concrete.
3. Introduce trainees to the proper methods for using a screed to strike off and level a concrete surface.
4. Introduce trainees to the proper methods for finishing and curing concrete.
5. Introduce trainees to the proper method for using a bull float and/or darby to level and smooth a concrete surface.

**SESSION SEVEN**
Session Seven introduces concrete joints.
1. Show Session Seven PowerPoint® presentation slides.
2. Introduce trainees to the different kinds of joints in concrete structures.
3. Introduce trainees to the proper methods for using a jointer to make control joints in a concrete surface.

**SESSION EIGHT**
Session Eight is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Seven.) Answer any questions that trainees may have.
1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on the Registration of Training Modules form, and submit the report to your Training Program Sponsor.
## Materials Checklist for Module 27305-14, Handling and Placing Concrete

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
<td></td>
</tr>
<tr>
<td>Coveralls and long-sleeved shirts</td>
<td>Brooms</td>
</tr>
<tr>
<td>Gloves</td>
<td>Bulkheads</td>
</tr>
<tr>
<td>Goggles or face mask</td>
<td>Bush hammers</td>
</tr>
<tr>
<td>Respirators or other breathing devices</td>
<td>Carborundum rubbing stones</td>
</tr>
<tr>
<td>Work boots</td>
<td>Chipping hammers</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Combination tools, such as edger/jointers, step-and-sidewalk tools, and cove-and-base tools</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Copies of, or extracts from, American Society for Testing and Materials (ASTM) E1155, Standard Test Method for Determining Ff, Floor Flatness and Fl, Floor Levelness Numbers</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Embedded items such as anchor bolts, traps, pipe, and conduit</td>
</tr>
<tr>
<td><strong>Construction Craft Laborer Level One PowerPoint® Presentation Slides</strong></td>
<td>Expansion-joint materials</td>
</tr>
<tr>
<td>Computer</td>
<td>Hand floats</td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td>Hand trowels</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing the handling and placing of concrete (optional)</td>
<td>Mechanical consolidation tools such as vibrators</td>
</tr>
<tr>
<td>TV/DVD player</td>
<td>Joint sealant</td>
</tr>
<tr>
<td></td>
<td>Jointers (groovers)</td>
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<tr>
<td></td>
<td>Knee boards</td>
</tr>
<tr>
<td></td>
<td>Manual and power screeds</td>
</tr>
<tr>
<td></td>
<td>Pneumatic guns</td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module 27307-14 describes basic site layout tools and methods; layout and construction of deep and shallow foundations; layout and forming of slabs-on-grade; and forms used for curbing and paving.

### Objectives

#### Learning Objective 1
- Identify the safety requirements when forming foundations and slabs.
  a. List safety rules pertaining to the use of hand tools when forming foundations and slabs.
  b. List safety rules pertaining to the use of power tools when forming foundations and slabs.
  c. Describe cement dermatitis and how it can be remedied.

#### Learning Objective 2
- Describe how to establish formwork locations and elevations.
  a. Describe how to use control points when establishing formwork locations and elevations.
  b. Explain how to use leveling instruments.
  c. Explain how to measure horizontal distances.
  d. Explain how to measure vertical distances.

#### Learning Objective 3
- Explain how to properly perform job-site layout.
  a. Describe how to establish building layout.
  b. Explain how to establish building lines with batter boards.
  c. Describe excavating and trenching processes.
  d. Explain how to lay out forms.
  e. Describe how to use templates.

#### Learning Objective 4
- Identify the various types of foundations and list appropriate uses for each.
  a. Identify the various types of deep-foundation elements.
  b. Identify the various types of shallow-foundation elements.

#### Learning Objective 5
- Identify various types of foundation forms and their proper removal.
  a. Describe how to erect and strip job-built wood forms.
  b. Explain how to erect manufactured forms.
  c. Describe how to strip forms.

#### Learning Objective 6
- Describe how slabs-on-grade are formed and finished.
  a. List slab-on-grade construction considerations.
  b. Describe how to form and finish a commercial slab-on-grade.
  c. Discuss the use of screeds when finishing slabs-on-grade.

#### Learning Objective 7
- Identify methods to create curbs and pavement.
  a. Discuss the use of curbing forms.
  b. Identify paving equipment used for commercial slabs-on-grade.

### Teaching Time: 20 hours
(Eight 2.5-hour Classroom Sessions)
Session time may be adjusted to accommodate your class size, schedule, and teaching style.

### Prerequisites
*Core Curriculum*
**Before You Begin**
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.

**Safety Considerations**
This module requires that trainees establish elevations, lay out and construct an instructor-selected foundation, and install templates, keyways, and embedments. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

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### Classroom Equipment and Materials
- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- **Construction Craft Laborer Level One PowerPoint® Presentation Slides**
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing foundations and slabs-on-grade (optional)
- TV/DVD player

### Equipment and Materials for Laboratories and Performance Testing
- Personal protective equipment:
  - Eye protection
  - Hand protection
  - Hard hat
  - Work boots
  - 2’ or 4’ level
  - Anchor bolts
  - Automatic leveling instruments
  - Batter boards
  - Brush for applying form-release compound or agent
  - Builder’s level
  - Circular saws
  - Color-coded stakes or markers
  - Container of form-release compound or agent
  - Copies of a safety data sheet (SDS) for portland cement
  - Copies of Figure 47 with the terms covered
  - Copies of foundation plans from sets of construction drawings
  - Copies of instruction manuals for a variety of power tools
  - Copies of manufacturers’ brochures or installation instructions for slip-form pavers
  - Copies of manufacturers’ instructions for manufactured forms
  - Copies of the manufacturer’s instructions for a leveling instrument
  - Copies of the section of the local applicable building code that addresses building foundations
  - Copies of, or excerpts from, the latest edition of the Concrete Reinforcing Steel Institute (CRSI) publication *Manual of Standard Practice*

- Direct elevation rod
- Field notebook
- Gammon reel
- Hammers
- Hub stakes
- Images of curbing forms
- Laser level and detector
- Ledger boards
- Lengths of dowel
- Leveling rods and accessories
- Marker stakes
- Measuring tapes
- Nails
- Pier foundation forms
- Pliers
- Plumb bobs and line
- Power drills
- Power nailers
- Project plans
- Reciprocating saws
- Samples of rebar and WWR
- Sanders
- Saws
- Shovels
- Stakes
- Steel tape (100’)
- String line
- Transit level
- Tripod
- Walers
- Wire cutters
- Wood or metal form
- Wood templates
**Additional Resources and References**

This module presents thorough resources for task training. The following resource material is suggested for further study:

- **ACI 315, Details and Detailing of Concrete Reinforcement**, Latest Edition. Farmington Hills, MI: American Concrete Institute.
- American Concrete Institute. [www.concrete.org](http://www.concrete.org)
- **Placing Reinforcing Bars. 2005.** Concrete Reinforcing Steel Institute (CRSI).
- The Concrete Network. [www.concretenetwork.com](http://www.concretenetwork.com)

There are a number of online resources available for trainees who would like more information on foundations and slabs-on-grade. A search for additional information may be assigned as homework to interested trainees.
The lesson plan for this module is divided into eight 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**
Session One introduces the safety requirements when forming foundations and slabs.
1. Show Session One PowerPoint® presentation slides.
2. Introduce trainees to hand and power tool safety rules.
3. Introduce trainees to the techniques used to prevent and treat cement dermatitis.

**SESSION TWO**
Session Two introduces techniques for using control points when establishing formwork locations and elevations.
1. Show Session Two PowerPoint® presentation slides.
2. Introduce trainees to the techniques for using leveling instruments.
3. Introduce trainees to the measurement of horizontal and vertical distances.

**SESSION THREE**
Session Three introduces job site layout.
1. Show Session Three PowerPoint® presentation slides.
2. Introduce trainees to the various elements of job site layout, such as building lines, excavations, forms, and templates.

**SESSION FOUR**
Session Four introduces the various types of foundations.
1. Show Session Four PowerPoint® presentation slides.
2. Introduce trainees to the various types of deep and shallow foundation elements.

**SESSION FIVE**
Session Five introduces the types of foundation forms and their proper removal.
1. Show Session Five PowerPoint® presentation slides.
2. Introduce trainees to job-built wood forms and manufactured forms, and explain how to strip forms.

**SESSION SIX**
Session Six introduces how slabs-on-grade are formed and finished.
1. Show Session Six PowerPoint® presentation slides.
2. Introduce trainees to slab-on-grade construction.
3. Introduce trainees to the techniques used to form and finish slabs-on-grade, including the use of screeds.
SESSION SEVEN

Session Seven introduces methods to create curbs and pavement.
1. Show Session Seven PowerPoint® presentation slides.
2. Introduce trainees to the use of curbing forms.
3. Introduce trainees to paving equipment used for commercial slabs-on-grade.

SESSION EIGHT

Session Eight is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Seven.) Answer any questions that trainees may have.
1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on the Registration of Training Modules form, and submit the report to your Training Program Sponsor.
### Materials Checklist for Module 27307-14, Foundations and Slabs-on-Grade

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th>Copies of a safety data sheet (SDS) for portland cement</th>
<th>Copies of Figure 47 with the terms covered</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
<td>Copies of foundation plans from sets of construction drawings</td>
<td>Copies of instruction manuals for a variety of power tools</td>
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<td>Copies of, or excerpts from, the latest edition of the Concrete Reinforcing Steel Institute (CRSI) publication <em>Manual of Standard Practice</em></td>
</tr>
<tr>
<td>Hand protection</td>
<td>Copies of the manufacturer’s instructions for a leveling instrument</td>
<td>Copies of manufacturers’ instructions for manufactured forms</td>
</tr>
<tr>
<td>Hard hat</td>
<td>Copies of the section of the local applicable building code that addresses building foundations</td>
<td>Power drills</td>
</tr>
<tr>
<td>Work boots</td>
<td>Copies of manufacturers’ instructions for manufactured forms</td>
<td>Power drills</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Direct elevation rod</td>
<td>Power nails</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Field notebook</td>
<td>Project plans</td>
</tr>
<tr>
<td><strong>Construction Craft Laborer Level One PowerPoint</strong></td>
<td>Gammon reel</td>
<td>Reciprocating saws</td>
</tr>
<tr>
<td>Computer</td>
<td>Hammers</td>
<td>Samples of rebar and WWR</td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td>Hub stakes</td>
<td>Sanders</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing foundations and slabs-on-grade (optional)</td>
<td>Images of curbing forms</td>
<td>Saws</td>
</tr>
<tr>
<td>TV/DVD player</td>
<td>Laser level and detector</td>
<td>Shovels</td>
</tr>
<tr>
<td>LEDGER boards</td>
<td>Measuring tapes</td>
<td>Stakes</td>
</tr>
<tr>
<td>2’ or 4’ level</td>
<td>Lengths of dowel</td>
<td>Steel tape (100’</td>
</tr>
<tr>
<td>Anchor bolts</td>
<td>Leveling rods and accessories</td>
<td>String line</td>
</tr>
<tr>
<td>Automatic leveling instruments</td>
<td>Marker stakes</td>
<td>Transit level</td>
</tr>
<tr>
<td>Batter boards</td>
<td>Measuring tapes</td>
<td>Tripod</td>
</tr>
<tr>
<td>Brush for applying form-release compound or agent</td>
<td>Nails</td>
<td>Walers</td>
</tr>
<tr>
<td>Builder’s level</td>
<td>Pier foundation forms</td>
<td>Wire cutters</td>
</tr>
<tr>
<td>Circular saws</td>
<td>Pliers</td>
<td>Wood or metal form</td>
</tr>
<tr>
<td>Color-coded stakes or markers</td>
<td>Plumb bob and line</td>
<td>Wood templates</td>
</tr>
<tr>
<td>Container of form-release compound or agent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.