Masonry II

8513 36 weeks / 280 hours

Table of Contents

Acknowledgments ......................................................................................................................................... 1
Course Description........................................................................................................................................ 2
Task Essentials Table.................................................................................................................................... 3
Curriculum Framework ................................................................................................................................. 4
Applying Basic Safety Standards (Core Safety) ........................................................................................... 4
Laying Brick Positions and Bonds .............................................................................................................. 15
Laying Concrete Masonry Units ................................................................................................................. 16
Identifying and Mixing Masonry Mortars .................................................................................................. 17
Performing Residential Masonry ................................................................................................................ 19
Constructing Commercial Masonry ............................................................................................................ 22
Exploring Construction Inspection and Quality Control ............................................................................ 26
Preparing the Building Site ......................................................................................................................... 29
SOL Correlation by Task ............................................................................................................................ 31
Entrepreneurship Infusion Units ................................................................................................................. 32
Teacher Resources ...................................................................................................................................... 32
Appendix: Credentials, Course Sequences, and Career Cluster Information ............................................. 33

Acknowledgments

The components of this instructional framework were developed by the following curriculum development panelists:

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Course Description

Suggested Grade Level: 11 or 12  
Prerequisites: 8512

Students build on skills introduced in Masonry I to safely use hand tools, measuring tools, power tools, and lifting equipment that masons use on the job. Students will complete advanced projects laying masonry units (brick and block), differentiate and select mortar, apply mathematical concepts, and interpret blueprints used in masonry. Students focus on problem-solving and employability skills while performing hands-on, entry-level brick and block masonry tasks. This program is aligned with National Center for Construction Education & Research (NCCER) standards.
As noted in Superintendent's Memo #058-17 (2-28-2017), this Career and Technical Education (CTE) course must maintain a maximum pupil-to-teacher ratio of 20 students to one teacher, due to safety regulations. The 2016-2018 biennial budget waiver of the teacher-to-pupil ratio staffing requirement does not apply.

**Task Essentials Table**

- Tasks/competencies designated by plus icons (⊕) in the left-hand column(s) are essential
- Tasks/competencies designated by empty-circle icons (〇) are optional
- Tasks/competencies designated by minus icons (⊖) are omitted
- Tasks marked with an asterisk (*) are sensitive.

<table>
<thead>
<tr>
<th>Task Number</th>
<th>8513</th>
<th>Tasks/Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applying Basic Safety Standards (Core Safety)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>⊕</td>
<td>Comply with federal, state, and local safety requirements.</td>
</tr>
<tr>
<td>40</td>
<td>⊕</td>
<td>Identify personal protective equipment (PPE) requirements.</td>
</tr>
<tr>
<td>41</td>
<td>⊕</td>
<td>Maintain a safe working environment.</td>
</tr>
<tr>
<td>42</td>
<td>⊕</td>
<td>Explain safe working practices around electrical hazards.</td>
</tr>
<tr>
<td>43</td>
<td>⊕</td>
<td>Identify emergency first-aid procedures.</td>
</tr>
<tr>
<td>44</td>
<td>⊕</td>
<td>Identify the types of fires and the methods used to extinguish them.</td>
</tr>
<tr>
<td>45</td>
<td>⊕</td>
<td>Inspect course-specific hand and power tools to visually identify defects.</td>
</tr>
<tr>
<td>46</td>
<td>⊕</td>
<td>Demonstrate lifting and carrying techniques.</td>
</tr>
<tr>
<td>47</td>
<td>⊕</td>
<td>Demonstrate safe laddering techniques.</td>
</tr>
<tr>
<td>48</td>
<td>⊕</td>
<td>Demonstrate safe scaffolding techniques.</td>
</tr>
<tr>
<td>49</td>
<td>⊕</td>
<td>Report personal injuries and environmental and equipment safety violations to the appropriate authority.</td>
</tr>
<tr>
<td>50</td>
<td>⊕</td>
<td>Pass a safety exam for lab/site safety and the use of tools and equipment specific to masonry.</td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>⊕</td>
<td>Lay an English bond pattern.</td>
</tr>
<tr>
<td>52</td>
<td>⊕</td>
<td>Lay a Flemish bond pattern.</td>
</tr>
<tr>
<td><strong>Laying Concrete Masonry Units</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>⊕</td>
<td>Build a block jamb.</td>
</tr>
<tr>
<td>54</td>
<td>⊕</td>
<td>Build a block corner.</td>
</tr>
<tr>
<td><strong>Identifying and Mixing Masonry Mortars</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>⊕</td>
<td>Differentiate among types of masonry mortars.</td>
</tr>
<tr>
<td>56</td>
<td>⊕</td>
<td>Select masonry mortar appropriate for a job.</td>
</tr>
<tr>
<td>57</td>
<td>⊕</td>
<td>Explain the techniques used to provide adequate protection during hot-and cold-weather masonry construction.</td>
</tr>
<tr>
<td><strong>Performing Residential Masonry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>⊕</td>
<td>Lay out a masonry foundation.</td>
</tr>
<tr>
<td>59</td>
<td>⊕</td>
<td>Construct block piers.</td>
</tr>
<tr>
<td>60</td>
<td>⊕</td>
<td>Install veneer ties.</td>
</tr>
<tr>
<td>Task Number</td>
<td>8513</td>
<td>Tasks/Competencies</td>
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<tr>
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</tr>
<tr>
<td>61</td>
<td>☒</td>
<td>Build a windowsill.</td>
</tr>
<tr>
<td>62</td>
<td>☒</td>
<td>Clean brick walls.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Constructing Commercial Masonry</strong></td>
</tr>
<tr>
<td>63</td>
<td>☒</td>
<td>Identify wall systems.</td>
</tr>
<tr>
<td>64</td>
<td>☒</td>
<td>Install wire reinforcements.</td>
</tr>
<tr>
<td>65</td>
<td>☒</td>
<td>Build a composite or cavity wall system.</td>
</tr>
<tr>
<td>66</td>
<td>☒</td>
<td>Set lintels.</td>
</tr>
<tr>
<td>67</td>
<td>☒</td>
<td>Identify the procedures for forming and building a bond beam.</td>
</tr>
<tr>
<td>68</td>
<td>O</td>
<td>Lay split-face block.</td>
</tr>
<tr>
<td>69</td>
<td>O</td>
<td>Lay fluted block.</td>
</tr>
<tr>
<td>70</td>
<td>☒</td>
<td>Identify control and expansion joints.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Exploring Construction Inspection and Quality Control</strong></td>
</tr>
<tr>
<td>71</td>
<td>☒</td>
<td>Describe how standards and specifications are used to ensure quality control throughout the masonry industry.</td>
</tr>
<tr>
<td>72</td>
<td>☒</td>
<td>Describe why masonry sample panels and prisms are built and tested to ensure quality control on a project.</td>
</tr>
<tr>
<td>73</td>
<td>☒</td>
<td>Describe how mortar is tested to ensure quality control on a project.</td>
</tr>
<tr>
<td>74</td>
<td>☒</td>
<td>Describe how field inspections and observations are used to ensure quality control on a project.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Preparing the Building Site</strong></td>
</tr>
<tr>
<td>75</td>
<td>☒</td>
<td>Estimate amounts of materials needed for a job.</td>
</tr>
<tr>
<td>76</td>
<td>☒</td>
<td>Locate and square corners.</td>
</tr>
<tr>
<td>77</td>
<td>☒</td>
<td>Read blueprints and plans.</td>
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</tbody>
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Legend: ☒ Essential  ○ Non-essential  ☐ Omitted

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Curriculum Framework

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Applying Basic Safety Standards (Core Safety)

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Task Number 39

Comply with federal, state, and local safety requirements.
Definition

Compliance should include

- understanding the roles of the Occupational Safety and Health Administration (OSHA), Virginia Occupational Safety and Health (VOSH), and the Environmental Protection Agency (EPA)
- identifying the OSHA Hazard Communication Standard (HCS)
- interpreting the information included on safety data sheets (SDS)
- describing the responsibilities of employers and employees under HCS.

Process/Skill Questions

- Where should hazardous materials be stored?
- What information can be found on an SDS?

NCCER Core Curriculum: Introductory Craft Skills, 2015

00101-15 Basic Safety
Module One (00101-15) explains the importance of safety in the construction and industrial crafts. Trainees will learn how to identify and follow safe work practices and procedures and how to properly inspect and use safety equipment. Trainees will be able to describe the safety practices associated with elevated work; energy release; and various hazards encountered on job sites.

NCCER Masonry Standards

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This module describes how to identify the common causes of accidents and the hazards associated with masonry tools, equipment, mortar, and concrete. This module also provides information about how to prevent accidents and hazards on the job site by using personal protective equipment, working safely from elevated surfaces, properly using masonry tools and equipment, and handling masonry materials safely.

Task Number 40

Identify personal protective equipment (PPE) requirements.

Definition

Identification could include procedures for inspecting, wearing, and removing

- eye protection
- a respirator
• a hard hat
• gloves
• a safety harness
• hearing protection
• safety shoes.

Identification should also include explaining when particular PPE is required.

**Process/Skill Questions**

- What are some dangerous effects of sun exposure, and how can one prevent these effects?
- Why is wearing jewelry prohibited while in the lab or on the jobsite?

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**Level One, Module One (28101-13): Introduction to Masonry**
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**Task Number 41**

**Maintain a safe working environment.**

**Definition**

Maintaining safety should result in identifying potential hazards on a jobsite or in the lab, such as
- unstable or improperly erected scaffolding
- electrical hazards
- jobsite debris
- improperly stored materials
- air quality hazards.

When present, hazards must be remedied, in compliance with school and instructor guidelines.

**Process/Skill Questions**

- What are some examples of jobsite hazards?
- Why is it important to use good housekeeping standards on a jobsite?
- Why is it important to store materials and tools in their proper place?

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**Task Number 42**

**Explain safe working practices around electrical hazards.**

**Definition**

Explanation should include
• identifying equipment used to test electrical circuits
• describing safe working conditions (e.g., grounding, using ground-fault circuit interrupters [GFCIs] and cords)
• demonstrating safe work habits.

Process/Skill Questions

• What is the definition of proximity work?
• What are safe working clearances according to the National Electrical Code (NEC)?
• What are considered safe working conditions and safe working habits?
• What is the unseen hazard with electrical work?

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Task Number 43

Identify emergency first-aid procedures.

Definition

Identification should include standard first-aid procedures and school policies regarding incidents involving

• bodily fluids
• electrical injuries
• eye injuries
• falls
• burns.
Process/Skill Questions

- What steps should be followed in the event of an accident?
- Why is knowing cardiopulmonary resuscitation (CPR) important?
- Why is it important to be certified to administer first aid?
- What are the different classifications (degrees) of electrical burns?

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Task Number 44

Identify the types of fires and the methods used to extinguish them.

Definition

Identification should include classifications of fires (e.g., Classes A, B, C, and D), causes and prevention of fires, types of extinguishers, and, when possible, the demonstrated use of a fire extinguisher, in accordance with government regulations and instructor guidelines.

Process/Skill Questions

- Why do fires have different classifications, and what are they?
- What is the fire triangle?
- What are the three things necessary to start a fire?
- Why is it important to know the classification of a fire when trying to extinguish it?
- Why and how often should extinguishers be inspected?
What are the classifications of extinguishers?

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Task Number 45

Inspect course-specific hand and power tools to visually identify defects.

Definition

Inspection of tools should include

- identifying components of machinery (e.g., guards, blades, moving parts, start/stop switches)
- identifying standard safety procedures (i.e., lab practices and manufacturer recommendations)
- observing a demonstration of the safe operation and use of each piece of machinery in the lab
- identifying tool defects.

Process/Skill Questions

- What power tools are used in masonry?
- What are the proper actions to take before using a power circular saw?
- Why should a power tool always be grounded?
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Task Number 46

Demonstrate lifting and carrying techniques.

Definition

Demonstration involves lifting and carrying materials and equipment and

- lifting with the legs
- keeping the back straight
- holding the load close to the body
- getting help, if necessary.

Process/Skill Questions

- What lifting equipment is common in masonry?
- What are common injuries associated with improper lifting techniques?
- What can one do to prevent injury?
- How does proper positioning affect proper technique?

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Task Number 47

Demonstrate safe laddering techniques.

Definition

Demonstration should involve using appropriate conduct and safety procedures while

- using aluminum ladders (e.g., three-point contact)
- carrying ladders (e.g., two people at all times)
- erecting and setting ladders (e.g., using the 4:1 rule)
- identifying types of ladders and the components and safety features of each (e.g., wall or straight, extension, roof, attic, special-purpose, solid-beam, aluminum, wood/aluminum truss ladder, fiberglass).

Teacher resource: Parents and Educators Can Keep Young Workers Safe, U.S. Department of Labor

Process/Skill Questions

- Why are ladders rated for certain weights?
- Why is the apex (highest point) of a stepladder not considered a step?

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Task Number 48

Demonstrate safe scaffolding techniques.

Definition

Demonstration should include inspecting

- settings
- duty ratings
- safety tags.

Process/Skill Questions

- How can one determine the safe weight limit of any particular scaffolding?
- When is scaffolding preferred or required?

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Task Number 49

Report personal injuries and environmental and equipment safety violations to the appropriate authority.

Definition

Report should include

- identifying the violation
- documenting the date when the incident or behavior was observed
- submitting the report to the instructor, supervisor, or the local OSHA inspector.

Process/Skill Questions

- Why is it important to report injuries?
- What are common reporting procedures?
- What are the key components of a report?
- What ethical considerations might be involved when reporting coworkers?
- Why is it important to follow reporting procedures?
- What is liability?

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Task Number 50
Pass a safety exam for lab/site safety and the use of tools and equipment specific to masonry.

Definition

Passing should include an assessment that must measure participation in safety training programs, including safety meetings, and demonstrating knowledge and skills gained from program topics (e.g., interpretation of SDS).

Process/Skill Questions

- How often should one participate in safety training programs? Why?
- How does insurance influence the requirement of continuous retraining for safety?
- What is workers' compensation?

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Laying Brick Positions and Bonds
Task Number 51

Lay an English bond pattern.

Definition

Laying should include creating a pattern that must consist of a panel of alternating courses of stretchers and headers.

Process/Skill Questions

- What is the difference between a Dutch and an English corner?
- What is the minimum lap of one brick over another?

Task Number 52

Lay a Flemish bond pattern.

Definition

Laying should include creating a pattern that must consist of alternating headers and stretchers on each course.

Process/Skill Questions

- What size brick begins the Flemish bond corner?
- Why are bond patterns important to homeowners?

Laying Concrete Masonry Units

Task Number 53

Build a block jamb.

Definition
Building should include a course of block that must be laid in running bond, forming a plumb jamb on one end while maintaining 3/8 inch uniform thickness.

**Process/Skill Questions**

- Why plumb the jamb?
- What is a bullnose block?

**NCCER Masonry Standards**

**Level Two, Module Five (28205-14): Advanced Laying Techniques**
This module contains detailed information that directs the mason in accomplishing the actual construction of walls, arches, and other useful structures. The text explains construction techniques, safety requirements, and interaction with structure components.

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**Task Number 54**

**Build a block corner.**

**Definition**

Building should include corners laid out in 90-degree orientation, plumb and level, while stepping block back 8 inches on each tail and maintaining a 3/8-inch thickness in the joint.

**Process/Skill Questions**

- When examining from the exterior, is there a noticeable difference among 8-inch, 10-inch, and 12-inch corners?
- Why should a corner be ranged?

**NCCER Masonry Standards**

**Level Two, Module Five (28205-14): Advanced Laying Techniques**
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**Identifying and Mixing Masonry Mortars**
Task Number 55

Differentiate among types of masonry mortars.

Definition

Differentiation includes

- identifying applications, strengths, and proper use of the most commonly used mortars—M, S, O, and N
- describing additives used in masonry mortars (e.g., aggregates, accelerators, retardants, water-repellent agents, colors, air-entraining agents).

Process/Skill Questions

- What are the types of masonry mortars?
- What accounts for the differences in masonry mortars?

NCCER Masonry Standards

Level One, Module Five (28104-13): Mortar
This module explains the types and properties of mortar and the materials used in the mixture, including admixtures; provides instructions for mixing mortar by machine; and describes how to properly apply and store mortar.

Task Number 56

Select masonry mortar appropriate for a job.

Definition

Selection must result from consideration of tensile and compressive strength needed for a particular application, according to specifications of the architect, engineer, or local codes.

Process/Skill Questions

- When repointing masonry, what factors affect the selection of mortar type?
- What masonry mortar is appropriate for foundations below grade?

NCCER Masonry Standards

Level One, Module Five (28104-13): Mortar
This module explains the types and properties of mortar and the materials used in the mixture, including admixtures; provides instructions for mixing mortar by machine; and describes how to properly apply and store mortar.

**Task Number 57**

**Explain the techniques used to provide adequate protection during hot- and cold-weather masonry construction.**

**Definition**

Explanation should include:

- adequate storage of masonry units
- tempering of masonry units
- use of additives.

**Process/Skill Questions**

- Why would you wet masonry units during hot weather?
- How can mortar be kept from freezing?

**NCCER Masonry Standards**

**Level One, Module Five (28104-13): Mortar**

This module explains the types and properties of mortar and the materials used in the mixture, including admixtures; provides instructions for mixing mortar by machine; and describes how to properly apply and store mortar.

**Level Two, Module Six (28206-14): Effects of Climate on Masonry**

This module describes techniques used to construct openings in masonry walls, the application of insulation, and the effects of climate as they relate to the mason’s trade. The module also explains properties and uses of materials used in moisture and temperature control and describes various methods of insulating structures.

**Performing Residential Masonry**

**Task Number 58**
Lay out a masonry foundation.

Definition

Laying should include

- constructing perimeter walls
- installing anchor bolts or straps
- constructing vents, piers, and parging.

Foundation must be square, plumb and level, of specified height, and must meet all local codes.

Process/Skill Questions

- What are factors to consider before building a foundation?
- Why should masons use blueprints?
- What OSHA standards apply to workers in excavations and trenches?

NCCER Masonry Standards

Level Two, Module Two (28202-14): Residential Masonry

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

Task Number 59

Construct block piers.

Definition

Construction should include masonry units placed one on top of another to a specified height to support structural framing. Constructed piers must meet local codes.

Process/Skill Questions

- Where might one find block piers used?
- What has replaced block piers and foundations?

NCCER Masonry Standards

Level Two, Module Two (28202-14): Residential Masonry
Task Number 60

Install veneer ties.

Definition

Installation should meet local codes.

Process/Skill Questions

- What size nail is used for installation?
- How often should ties be added?
- What is the correct horizontal and vertical spacing for wall ties?

NCCER Masonry Standards

Level Two, Module Two (28202-14): Residential Masonry
This module describes the construction techniques for residential and small structure foundations, steps, patios, decks, chimneys, and fireplaces and work activities that the mason must perform, as well as those tasks that tie into the masonry work.

Task Number 61

Build a windowsill.

Definition

Building should include a brick windowsill and

- maintain proper slope and spacing
- include flashing and weeps according to local codes.

Process/Skill Questions

- What are the positions in which the brick can be laid?
- How is the sill brick spaced?
Task Number 62

Clean brick walls.

Definition

Cleaning should include the use of chemical cleaning solution, as specified by the brick manufacturer, and all excess mortar must be removed from the face of the wall.

Process/Skill Questions

- What factors should be considered before selecting chemical solutions for cleaning brick walls?
- Should muriatic acid be used to clean brick? Why, or why not?
- What hazards exist when cleaning brick?
- What factors should be considered when using pressure washers to clean masonry work?

Constructing Commercial Masonry

Task Number 63

Identify wall systems.

Definition
Identification includes labeling and listing procedures for building composite, cavity, and reinforced brick masonry (RBM) systems, including grouting and/or insulation when used.

**Process/Skill Questions**

- What are the types of wall systems?
- What is the minimum air space between tiers in a cavity wall?

**Task Number 64**

**Install wire reinforcements.**

**Definition**

Installation should include composite cavity wall, including wire reinforcements, built according to engineering specifications.

**Process/Skill Questions**

- What type of wire should be used for exterior joint reinforcement?
- What are the vertical spacing requirements for wire reinforcement?
- What distance must be maintained between high-voltage electrical lines and any materials or equipment?

**NCCER Masonry Standards**

**Level Two, Module Three (28203-14): Reinforced Masonry**

This module describes the use of grout and other types of reinforcement, such as reinforcing steel, to strengthen and support masonry structures. The module also describes the locations where grout can be used and the techniques for placement.

**Task Number 65**

**Build a composite or cavity wall system.**

**Definition**

Building should include laying out and constructing, according to specifications, a 12-foot composite wall, using 8-inch block and a single wythe of brick. Wall must include reinforcements and meet all local building codes.

**Process/Skill Questions**
• What scaling system is used for composite wall construction?
• What are the components of a cavity wall?

NCCER Masonry Standards

Level Two, Module Five (28205-14): Advanced Laying Techniques
This module contains detailed information that directs the mason in accomplishing the actual construction of walls, arches, and other useful structures. The text explains construction techniques, safety requirements, and interaction with structure components.

Task Number 66
Set lintels.

Definition
Setting must include a lintel of correct length being placed above a window, door, or masonry opening to support the wall above. Setting must meet engineered specifications and local building codes.

Process/Skill Questions
• What is used as a steel lintel?
• What are the OSHA standards regarding the manual lifting of heavy materials or equipment?

Task Number 67
Identify the procedures for forming and building a bond beam.

Definition
Identification should include a beam formed and built using concrete masonry units (CMU) and reinforced with steel and concrete, according to engineered specifications and local codes.

Process/Skill Questions
• Why would a bond beam be used above an opening instead of a lintel?
• What determines the size and placement of reinforcing bar (rebar) in a bond beam?
Task Number 68

Lay split-face block.

Definition

Laying should include block that is level, plumb, and of proper height, according to specifications.

Process/Skill Questions

- Why is the type of block called split-face?
- What are the advantages of using split-face block?
- Why is split-face block replacing conventional, composite walls?

NCCER Masonry Standards

Level One, Module One (28101-13): Introduction to Masonry
This module provides information about basic masonry materials, tools, techniques, and safety precautions; explains how to mix mortar by hand and lay masonry units; and describes the skills, attitudes, and abilities of successful masons.

Task Number 69

Lay fluted block.

Definition

Laying should include fluted block that is level, plumb, and of proper height, according to specifications.

Process/Skill Questions

- What is the difference between a fluted and split-face block?
- Why is it more time-consuming to lay fluted block than split-face?

NCCER Masonry Standards

Level One, Module One (28101-13): Introduction to Masonry
This module provides information about basic masonry materials, tools, techniques, and safety precautions; explains how to mix mortar by hand and lay masonry units; and describes the skills, attitudes, and abilities of successful masons.
Task Number 70

Identify control and expansion joints.

Definition

Identification should include a control or expansion joint formed according to specifications, with joint size uniform and plumb.

Process/Skill Questions

- What is the difference between an expansion and a control joint?
- What material could be used for creating an expansion joint?
- What is the function of a control joint?

NCCER Masonry Standards

Level Two, Module Five (28205-14): Advanced Laying Techniques
This module contains detailed information that directs the mason in accomplishing the actual construction of walls, arches, and other useful structures. The text explains construction techniques, safety requirements, and interaction with structure components.

Exploring Construction Inspection and Quality Control

Task Number 71

Describe how standards and specifications are used to ensure quality control throughout the masonry industry.

Definition

Description should include

- masonry units, mortar, grout, and accessories
• laboratory and field testing of masonry construction.

Process/Skill Questions

• Why is testing necessary?
• What is the purpose of using grout?
• What is the American Society for Testing and Materials (ASTM)? Why is it important for masonry?

NCCER Masonry Standards

Level Two, Module Seven (28207-14): Construction Inspection and Quality Control
This module introduces the quality control requirements for masonry construction. In addition, the module presents procedures for inspection and testing of masonry materials and finished masonry construction.

Task Number 72

Describe why masonry sample panels and prisms are built and tested to ensure quality control on a project.

Definition

Description should include aesthetics and strength. Description should also include techniques for building sample panels including both hollow and grouted masonry prisms. Description may include preparing and testing mortar and grout prisms and conducting masonry tests.

Process/Skill Questions

• What is a prism in masonry?
• What are aesthetics?

NCCER Masonry Standards

Level Two, Module Seven (28207-14): Construction Inspection and Quality Control
This module introduces the quality control requirements for masonry construction. In addition, the module presents procedures for inspection and testing of masonry materials and finished masonry construction.

Task Number 73
Describe how mortar is tested to ensure quality control on a project.

Definition

Description should include

- sand tests
- mortar consistency tests
- brick absorption tests
- laboratory tests.

Process/Skill Questions

- Why is it important to test mortar?
- What can be done if the bricks are too dry?
- What is a sand test? How is it performed?

NCCER Masonry Standards

Level Two, Module Seven (28207-14): Construction Inspection and Quality Control

This module introduces the quality control requirements for masonry construction. In addition, the module presents procedures for inspection and testing of masonry materials and finished masonry construction.

Task Number 74

Describe how field inspections and observations are used to ensure quality control on a project.

Definition

Description should include

- why and how standards and codes inspections are performed
- why and how materials inspections are performed
- observations that are undertaken during construction
- why and how construction tolerances are monitored.

Process/Skill Questions

- What is the purpose of inspections?
• How are inspections conducted?
• Who is responsible for inspections?
• How are inspections arranged?

NCCER Masonry Standards

Level One, Module Four (28103-13): Measurements, Drawings, and Specifications
This module provides a review of the calculation of distances and areas common in masonry work, describes the information found on residential construction drawings, and reviews the role of specifications, standards, and codes.

Level Two, Module Seven (28207-14): Construction Inspection and Quality Control
This module introduces the quality control requirements for masonry construction. In addition, the module presents procedures for inspection and testing of masonry materials and finished masonry construction.

Preparing the Building Site

Task Number 75

Estimate amounts of materials needed for a job.

Definition

Estimation should include amounts of block/brick, mortar, and sand, number of wall anchors, and amounts of all other materials, as determined from wall dimensions and specifications. Calculations must be accurate and complete.

Process/Skill Questions

• How does estimation affect cost and making a competitive bid for a job?
• How is accurate estimating beneficial to customer satisfaction?
• What are some problems with estimation?
• What may be estimated when estimating a total job for a customer?

NCCER Masonry Standards

Level One, Module Four (28103-13): Measurements, Drawings, and Specifications
This module provides a review of the calculation of distances and areas common in masonry work, describes the information found on residential construction drawings, and reviews the role of specifications, standards, and codes.

Level Two, Module One (28201-14): Residential Plans and Drawing Interpretation
This module describes the information trainees will need in order to work with residential plans and construction drawings and convert that information into action on the job.

Task Number 76

Locate and square corners.

Definition

Location should include a foundation laid out and squared, using transit level or 3-4-5 method, according to plans.

Process/Skill Questions

- What are two methods used to square a foundation?
- What is meant by pinning the corners?

Task Number 77

Read blueprints and plans.

Definition

Reading includes

- identifying symbols
- identifying lines for wall layout
- interpreting notes
- reading scale.

Process/Skill Questions

- Why are blueprints important?
- What are some of the symbols associated with blueprints?
- How does one properly interpret a quarter-inch scale?

NCCER Masonry Standards

Level One, Module Four (28103-13): Measurements, Drawings, and Specifications

This module provides a review of the calculation of distances and areas common in masonry work, describes the information found on residential construction drawings, and reviews the role of specifications, standards, and codes.
## SOL Correlation by Task

<table>
<thead>
<tr>
<th>Task</th>
<th>English:</th>
<th>History and Social Science:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comply with federal, state, and local safety requirements.</td>
<td>11.5, 12.5</td>
<td>GOVT.7, GOVT.8, GOVT.9, GOVT.14, GOVT.15</td>
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<tr>
<td>Identify personal protective equipment (PPE) requirements.</td>
<td>11.5, 12.5</td>
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<tr>
<td>Maintain a safe working environment.</td>
<td>11.5, 12.5</td>
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<tr>
<td>Explain safe working practices around electrical hazards.</td>
<td>11.5, 12.5</td>
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<tr>
<td>Identify emergency first-aid procedures.</td>
<td>11.5, 12.5</td>
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<tr>
<td>Identify the types of fires and the methods used to extinguish them.</td>
<td>11.5, 12.5</td>
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<tr>
<td>Inspect course-specific hand and power tools to visually identify defects.</td>
<td>11.5, 12.5</td>
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<tr>
<td>Demonstrate lifting and carrying techniques.</td>
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<td>Demonstrate safe laddering techniques.</td>
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<td>Demonstrate safe scaffolding techniques.</td>
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<tr>
<td>Report personal injuries and environmental and equipment safety violations to the appropriate authority.</td>
<td>11.5, 11.6, 11.7, 12.5, 12.6, 12.7</td>
<td>GOVT.7, GOVT.8</td>
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<tr>
<td>Pass a safety exam for lab/site safety and the use of tools and equipment specific to masonry.</td>
<td>11.5, 12.5</td>
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<tr>
<td>Lay an English bond pattern.</td>
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<td>Lay a Flemish bond pattern.</td>
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<td>Build a block jamb.</td>
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<td>Build a block corner.</td>
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<tr>
<td>Differentiate among types of masonry mortars.</td>
<td>11.5, 12.5</td>
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<td>Select masonry mortar appropriate for a job.</td>
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<td>Explain the techniques used to provide adequate protection during hot- and cold-weather masonry construction.</td>
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<td>Locate and square corners.</td>
<td>Mathematics: G.8</td>
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<td>Read blueprints and plans.</td>
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<td></td>
<td>Mathematics: G.14</td>
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</table>

**Entrepreneurship Infusion Units**

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked “optional.”

**Teacher Resources**

The National Center for Construction Education and Research (NCCER) provides competencies and objectives as well as modules and lesson plans. Refer to the masonry craft page on the [NCCER website](http://www.nccer.org) and access those resources on the right hand side under "Course Planning Tools."
Appendix: Credentials, Course Sequences, and Career Cluster Information

Industry Credentials: Only apply to 36-week courses

- College and Work Readiness Assessment (CWRA+)
- Construction Masonry—Block Assessment
- Construction Masonry—Brick Assessment
- Core: Introductory Craft Skills Entry-Level Assessment
- Customer Service Examination
- Customer Service Specialist (CSS) Examination
- Masonry Examination
- Masonry Level One Entry-Level Assessment
- National Career Readiness Certificate Assessment
- Professional Communications Certification Examination
- Workplace Readiness Skills for the Commonwealth Examination

Concentration sequences: A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.

- Masonry I (8512/36 weeks, 140 hours)

Career Cluster: Architecture and Construction

<table>
<thead>
<tr>
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<td>General Contractor</td>
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<td></td>
<td>Mason</td>
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<td></td>
<td>Tile Installer</td>
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<td>Design/Pre-Construction</td>
<td>Building Code Inspector</td>
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<td>Cost Estimator</td>
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<td>Restoration Technician</td>
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<td>Tile Installer</td>
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