# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** L1600 PERFORM CONCRETE FLAT WORK
**Number:** L 1600 **Hours:** 109.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to reinforce concrete work, place concrete, finish concrete flat work.

**Tasks:**

L1601 - Reinforce concrete.

L1602 - Place concrete.

L1603 - Finish concrete flat work.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

  *Supporting Anchor/Standards:*

  3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
  3.4.10.C1 Apply the components of the technological design process.
  3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
  3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
  3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

*Focus Anchor/Standard #2:*

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

  *Supporting Anchor/Standards:*

  CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
  CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
  CC.2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.
  CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.
  CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
  CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
  CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
  CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts

and topics.

*Connecting Anchor/Standard:*

- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

  *Supporting Anchor/Standards:*

  CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
  CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
  CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
  CC.2.3.8.A.1 Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.
  CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

**Instructional Activities:**

Knowledge:
Complete Focused - Free Writes regarding what a safety check list should entail
Demonstrate proper use of concrete finishing tools
Explain why good safety practices on the job are essential
Review safety precautions and care for specific equipment
Complete worksheets assigned
Complete task/project grade sheets
Participate in discussions
Take notes during the lecture
Review reinforcement techniques
Identify concrete types and characteristics
Identify concrete add mixtures
Review concrete estimation

Skill:
Mix concrete using power equipment
Cut masonry units using power saw
Set up and maintain a safe work area in a masonry training lab
Demonstrate the safe handling and storage of construction materials
Place and finish concrete flat work
Demonstrate proper use of reinforcing in concrete flat work

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Student must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Assessment List
Worksheets
Quizzes
Pre/Post Test
Log/Journal
Time cards
Rubrics
Group Projects
Oral Presentation
Individual Projects
Research Papers
Portfolio
Task project grade sheets
Diagrams
Project grade sheets

**Resources/Equipment:**

Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Electric powered concrete mixer Power saws Wheel barrows Masonry hand tools Trowel Level Reinforcing material Sand, stone, cement Ready mixed concrete Form material TransitHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** L1700 PERFORM STUCCO APPLICATION
**Number:** L 1700 **Hours:** 10.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to prepare an area for stucco application.

**Tasks:**

L1701 - Apply decorative stucco finish.

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

  *Supporting Anchor/Standards:*

  3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
  3.4.10.C1 Apply the components of the technological design process.
  3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
  3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
  3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

*Focus Anchor/Standard #2:*

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

  *Supporting Anchor/Standards:*

  CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
  CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
  CC.2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.
  CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.
  CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
  CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

*Connecting Anchor/Standard:*

- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

  *Supporting Anchor/Standards:*

CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.1 Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.
CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

**Instructional Activities:**

Knowledge:
Participate in discussions
Demonstrate skills to the instructor
Take notes during the lecture
Mix mortar using power equipment or by hand
Demonstrate proper use of hand tools
Complete project/task grade sheets
Describe the major types of stucco material used today
Define the terms associated with stucco application
Review mortar and characteristics
Demonstrate proper measuring
Identify the sources of water behind exterior masonry walls
Identify means of minimizing the migration through masonry walls
List different materials used as flashing
Describe the proper procedures for installing flashing
Discuss the types of water repellents and their recommended applications

Skill:
Mix and apply cement based scratch coats
Mix and apply decorative stucco finishes
Demonstrate proper set up and tear down of scaffold
Mix mortar using power equipment
Apply material to support stucco application
Set up and maintain a safe work area in a masonry training lab
Demonstrate the safe handling and storage of construction materials
Follow project sheets
Complete project/task grade sheets
Apply scratch coat
Apply decorative stucco finish coat

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Student must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Assessment List
Worksheets
Quizzes
Pre/Post Test
Log/Journal
Time cards
Rubrics
Group Projects
Individual Projects
Portfolio
Task project grade sheets
Diagrams
Project grade sheets

**Resources/Equipment:**

Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Group Projects Electric powered mortar mixer Power saws Scaffolding Masonry hand tools Trowel Level Stucco MortarHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** L1500 PERFORM TILE CONSTRUCTION
**Number:** L 1500 **Hours:** 70.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to demonstrate the ability to layout tile projects, identify and use tile tools, prepare thin set and grout, install floor and wall tile.

**Tasks:**

L1500 - Construct a ceramic tile wall.

L1501 - Construct a ceramic tile floor.

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

  *Supporting Anchor/Standards:*

  3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
  3.4.10.C1 Apply the components of the technological design process.
  3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
  3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
  3.3.12.A2 Analyze the availability, location, and extraction of Earth's resources. Evaluate the impact of using renewable and nonrenewable energy resources on the Earth's system.
  3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

*Focus Anchor/Standard #2:*

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

  *Supporting Anchor/Standards:*

  CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
  CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
  CC.2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.
  CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.
  CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
  CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
  CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
  CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and

phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

*Connecting Anchor/Standard:*

- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

  *Supporting Anchor/Standards:*

  CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
  CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
  CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
  CC.2.3.8.A.1 Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.
  CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

**Instructional Activities:**

Knowledge:
Complete Focused - Free Writes regarding what a safety check list should entail
Read and complete worksheets
Demonstrate proper use of hand tools
Review precautions and care for specific equipment
Participate in discussions
Identify types of tile
Identify tile adhesives
Identify tile tools

Skill:
Demonstrate proper use of tile hand tools
Mix tile grout and thin set
Complete project/task grade sheets
Demonstrate proper measuring
Complete project/task grade sheets
Demonstrate dry bonding in preparation for construction of tile walls and floors
Lay out a tile wall pattern
Demonstrate options for cutting and placing tile in a wall and floor
Demonstrate cutting tile using a snap cutter
Demonstrate cutting tile using a tile wet saw
Demonstrate center layout of a wall and floor

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Students must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Assessment List
Worksheets
Quizzes
Pre/Post Test
Time cards
Rubrics
Group Projects
Individual Projects
Research Papers
Task project grade sheets
Diagrams

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction

Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Tile Construction Power saws Tile snap cutters Ceramic tile Grout Thin set mortar Tile backer board Tile setting hand tools Level Hammer Notched trowels Grout floats Jointers Mason Rules Plumb bobs Chalk lines Specialty trowelsHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 100 MASONRY TRAINING LAB
**Number:** 100 **Hours:** 8.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to identify a mason's hand tools and equipment found in the lab and on work sites.

**Tasks:**

PA101 - Identify masonry hand and lab tools and equipment.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

**Instructional Activities:**

Knowledge:
Identify manually operated and power equipment used in the masonry construction industry
Read and complete worksheets
List safety precautions and care for specific equipment
List items of which a masonry contractor must be knowledgeable
Describe why it is important be trained by a appropriately to use every tool, piece of equipment, or piece of machinery
Describe the proper work clothing, shoes, and personal protection equipment required for compliance with governing safety regulations when performing specific tasks

Skill:
Set up and maintain a safe work area in a masonry training lab
Demonstrate the safe handling and storage of construction materials

Remediation:
Reteach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

Extended Time (assignments and/or testing)
Study Guide
Directions and/or Tests Read Aloud
Adapted Tests and/or Assignments
Use of Calculator
Taking Tests in Alternate Setting (or if requested)
Verbal/Gestural Redirection (prompts to remain on task)
Drill and Practice (Repetition of Material)
Copy of Teacher/Student Notes/Skeleton Notes
Small Group Instruction
Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
Teacher Modeling
Use of Computer (Access to)
Positive Reinforcement
Have Student Repeat Directions
Wait Time
Provide Frequent Feedback
Provide Frequent Breaks
Variety of Assessment Methods
Regular Notebook Check
Highly Structured Classroom
Limited, Short Directions
Grading Rubric
Communication Regarding Behavior & Consequences (PBS)
Clear Language for Directions
Provide Opportunities to Retest
Frequent Review Sessions
Cue for Oral Response
De-Escalation Opportunities
Daily Classwork Check
Encourage Student to Check Work Before Turning In
Opportunities for Repeated Practice of MATH Skills
Provide repetition During Initial Instruction
Allow Pre-read of Questions Before Reading Written Passage
Provide Verbal and Written Directions
All Vocabulary to be Defined Before Testing
Testing - Allow Dictation of Lengthy Answers
Time out
Monitor Speed/Accuracy in which Student Completes Assignment
Encouragement to Participate in Positive Leadership Roles

**Safety:**

Student must:
Follow all masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Project grade sheets
Quizzes
Role-play activities
Portfolio
Check list/rubric to required degree of accuracy

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Electric powered mortar mixer Power saws Hydraulic cutters Masonry hand tools Trowel Level Hammer Chisel Mortar mixer Joiners Slickers Mason rules Lines Plumb bobs Bricks Blocks Stone Chalk lines Specialty trowels Sled runnersHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 200 SAFETY PRACTICES
**Number:** 200 **Hours:** 55.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to safely use masonry tools and equipment, understand MSDS sheets, cut brick and block with power saws and on a hydraulic cutter, identify different admixtures for cement, use a power mixer for mortar and correctly use a mason's level and construct scaffolding to OSHA guidelines.

**Tasks:**

PA201 - Use personal protection equipment.

PA202 - Follow masonry hand tool safety.

PA203 - Follow mortar mixer safety.

PA204 - Erect and dismantle steel tubular scaffolding within OSHA guidelines.

PA205 - Place material and stock scaffolding.

PA206 - Use Safety Data Sheets (SDS) information.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent

understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

**Instructional Activities:**

Knowledge:
Complete Focused - Free Writes regarding what a safety check list should entail
Read and complete worksheets
Demonstrate proper use of hand tools
Explain why good safety practices on the job are essential
Describe the correct dress and safety measures to be utilized when on the job
List some of the more common hazards presented on job sites and how to avoid them
Identify manually operated and power equipment used in the masonry construction industry
Discuss factors to consider when selecting specific types of equipment
List safety precautions and care for specific equipment
Describe the work performed by brick masons
Describe the physical qualifications for doing masonry tasks
Describe the proper work clothing, shoes, and personal protection equipment required for compliance with governing safety regulations when performing specific tasks
Explain why one must be trained by a competent person to use every tool, piece of equipment, or piece of machinery
List procedures for reporting an accident or injury
Recognize and report safety hazards
Explain safety precautions for preventing electric shocks and fatal electrocution
Discuss the safe use of tools and power equipment
Discuss some of the hazards found on the job such as: using ladders safely, grounding electrical tools,

ragged mortar pans, pulling nails from lumber, danger from overhead objects
Discuss the correct way to lift
Discuss the actions to follow in the event of an accident

Skill:
Mix mortar using power equipment
Cut masonry units using power saws
Cut masonry units using hydraulic cutting tools
Identify supported scaffold components and explain safety regulation
requirements related to each component
Set up and maintain a safe work area in a masonry training lab
Demonstrate the safe handling and storage of construction materials
Explain why steel scaffolding has replaced wooden scaffolding
Discuss sectional tubular steel scaffolding and identify the different parts and how it is assembled
Explain walk thru scaffolding and the advantages
Explain platform extenders
Discuss rolling scaffold
Discuss tower-type scaffold
Discuss suspended or swinging scaffold
Discuss scaffold safety, inspections, reinspections
Discuss the importance of observing all state and federal laws
Work with a team to erect scaffolding

Remediation:
Reteach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Students must:
Follow all masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Task project grade sheets
Pre/Post Test
Time cards
Rubrics
Task grade sheet
Portfolio
Quizzes

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Electric powered mortar mixer Masonry hand tools Trowel Level Hammer Chisel Mortar mixer Joiners Slickers Mason rules Lines Plumb bobs Bricks Blocks Stone Chalk lines Specialty trowels Sled runners Scaffolding MSDS sheetsHyperlinks: careersafeonline.com

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 300 BLUEPRINTS
**Number:** 300 **Hours:** 60.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to accurately read, comprehend, and interpret blueprints.

**Tasks:**

PA301 - Identify types of blueprint plans.

PA302 - Read and interpret blueprint plans.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Connecting Anchor/Standard:*

- CC.2.4.5.A.2 Represent and interpret data using appropriate scale.

*Supporting Anchor/Standards:*

**Instructional Activities:**

Knowledge:
Complete Focused - Free Writes regarding what a safety check list should entail
Read and complete worksheets
Explain why good safety practices on the job are essential
Identify the types of lines, symbols, and abbreviations used for drawings and explain where they may be found on a drawing
Define and explain the types of working drawings that may be part of a construction document
Define, identify, and explain the purposes of elevation drawings, details, and sections
Explain the purpose of presentation drawings and how they differ from working drawings
Define that part of the construction documents called “specifications,” and explain its purposes and contents
Become familiar with interpreting working drawings

Skill:
Define the difference between specification and plans
Read plans and specifications
Define scope of work as related to the mason
Know what to do when there is a difference between the specifications and plans
Know how good workmanship fits into specifications
Understand the contractual relationship between owner, general contractor, subcontractor, and worker
Discuss use of lines on plans
Discuss dimension an extension lines
Discuss door, window, and schedule marks
Understand elevation and section views
Identify important symbols
Identify abbreviations'
Explain schedules as related to brickwork
Understand that specifications and plans must be studied together to gain a complete understanding of the job
Discuss working drawings
Discuss plot plan
Discuss foundation and floor plans
Discuss elevation drawings
Discuss sectional drawings
Discuss details of construction
Discuss revisions on drawings
Explain the relationship of each page of the working drawing to every other part

Remediation:
Reteach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring

Enrichment:

After completing assigned task/project, student will proceed to the next level of project
Retest or alternative assessment
Checklist
One on one instruction
Assist fellow classmates

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

**Safety:**

Student must:
Follow all masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Assessment List
Worksheets
Quizzes
Pre/Post Test
Time cards
Rubrics
Portfolio
Debates
Portfolio

**Resources/Equipment:**

Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction Teachers Resource Binder. Delmar Cengage Learning Publications. Clifton Park, NY. Blueprint work sheets Scale rulesHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 400 MASONRY HAND TOOLS
**Number:** 400 **Hours:** 60.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to demonstrate safe and proper use of all masonry hand tools.

**Tasks:**

PA401 - Read and use a modular and spacing ruler.

PA402 - Mark and use a masonry guide or corner pole.

PA403 - Secure mason's line to line blocks, pins, and line stretchers.

PA404 - Set a trig properly.

PA405 - Use a hammer and chisel to cut block and brick.

PA407 - Identify and use masonry jointers to finish mortar joints.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

**Instructional Activities:**

Knowledge:
Complete Focused - Free Writes regarding what a safety check list should entail
Explain why good safety practices on the job are essential
Describe the correct dress and safety measures to be utilized when on the job
Identify masonry hand tools
Describe available options for specific tools
List manufacturers of specific masonry hand tools
List some of the more common hazards presented on job sites and how to avoid them
Explain safety precautions for preventing electric shocks and fatal electrocution
Recognize and report safety hazards
List procedures for reporting an accident or injury
Discuss factors to consider when selecting specific types of equipment
List safety precautions and care for specific equipment
Know the features of each tool
Know the two types of mason's rules
Explain why one must be trained by a competent person to use every tool, piece of equipment, or piece of machinery
Identify the following masonry terms:
heel
level
lift
plumb
toe
trowel blade
trowel shank
vials

Skill:
Demonstrate proper use of hand tools
Demonstrate how to hold the trowel correctly
Demonstrate the two methods of cutting and spreading mortar
Demonstrate the use of both hand simultaneously
Perform cutting, spreading of mortar, and laying bricks on a plank
Demonstrate cutting of a brick with the hammer, brick set and trowel
Cut masonry units using hydraulic cutting tools
Identify supported scaffold components and explain safety regulation requirements related to each component
Set up and maintain a safe work area in a masonry training lab
Demonstrate the safe handling and storage of masonry hand tools

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Student must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Worksheets
Quizzes
Prue/Post test
Time cards
Rubrics
Group projects
Portfolio
Oral presentation
Individual projects
Research papers
Task project grade sheets

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Engage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Group Projects Hydraulic cutters Masonry hand tools Trowel Level Hammer Chisel Joiners Slickers Mason rules Lines Plumb bobs Bricks Blocks Stone Chalk lines Specialty trowels Sled runnersHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 500 BUILDING SITE
**Number:** 500 **Hours:** 90.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to accurately read, comprehend, and interpret blueprints and prepare a building site using blueprints specifications.

**Tasks:**

PA501 - Lay out and level a building using a transit.

PA502 - Square a building using the 3-4-5 Pythagorean Theorem.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

*Supporting Anchor/Standards:*

NUMBERS AND OPERATIONS

Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.

Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

ALGEBRA

Standard 2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.

GEOMETRY

Standard 2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.

Standard 2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.

Standard 2.3.HS.A.13 Analyze relationships between two dimensional and three dimensional objects.

**Instructional Activities:**

Knowledge:

Participate in discussions
Demonstrate proper use of hand tools
Complete all required reading assignments
Follow project sheets
Complete all assigned work sheets
Interpret blueprint drawing and symbols
Explain how the size of a footing is determined
Identify the various types of footings
Discuss how the footing form is built to receive the concrete
Know how concrete is placed in the footings

Skill:

Demonstrate proper measuring
Complete project/task grade sheets
Identify the types of lines, symbols, and abbreviations used for drawings and explain where they may be found on a drawing
Define and explain the types of working drawings that may be part of a construction document
Define, identify, and explain the purposes of elevation drawings, details, and sections
Explain the purpose of presentation drawings and how they differ from working drawings
Define that part of the construction documents called “specifications,” and explain its purposes and contents
Become familiar with interpreting working drawings
Identify factors considered for the design of concrete footings
Describe methods for forming concrete footings
List design elements for foundation walls built with concrete masonry units
Lay out and build a foundation wall
Recognize properly placed footings
Build block or CMU foundation walls in accordance with acceptable engineered design and governing building code regulations
Consider the following factors for a properly designed CMU foundation wall including:
CMU size
mortar type
vertical bar reinforcements and grouting
provisions for anchoring the wood sill plates
damp-proofing or waterproofing the exterior walls
exterior water drainage
ventilation
egress routes

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Student must;
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Assessment list
Worksheets
Quizzes
Pre/Post test
Log/Journal
Time cards
Rubrics
Group projects
Oral presentation
Individual projects
Portfolio
Task project grade sheets
Diagrams
Project grade sheets

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Blueprints Measuring instruments TransitHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 600 POWER TOOLS
**Number:** 600 **Hours:** 74.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to, create and construct a mason's safety check list, cut brick and block with power saws, brick splitter, and on a hydraulic cutter, use a power mortar mixer.

**Tasks:**

PA601 - Operate a portable masonry gas cut-off saw.

PA602 - Operate a mortar mixer.

PA603 - Operate a stationary or portable masonry saw.

PA604 - Operate a hammer drill.

PA605 - Identify cutting blades for a masonry saw

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

**Instructional Activities:**

Knowledge:
Participate in discussions
Demonstrate proper use of power tools
Follow project sheets
Complete project/task grade sheets
Demonstrate proper measuring
Complete project/task grade sheets
Identify and list manually operated and power equipment used in the masonry construction industry
Discuss the need for mechanical-powered equipment to reduce labor and allow the mason to be more productive
Discuss factors to consider when selecting specific types of equipment
List safety precautions and care for specific equipment
Identify the following terms:
Dense Industrial 65
Point up
Sawn Planking
Scaffold buck
Supported scaffolds
Suspension scaffolds

Skill:
Demonstrate the proper use of power tools
Demonstrate mixing mortar with a power mixer
Demonstrate cutting masonry units with power saws
Demonstrate good safety practice with power equipment
Describe the masonry saw and its parts
Demonstrate wet and dry sawing
Discuss the cost of diamond blands and why they are selected for cutting masonry units
Discuss advantages of dry and wet cutting methods
Demonstrate various types of cuts using concrete block and brick
Demonstrate how to cut out around an electrical box in a masonry unit
Demonstrate how to care for saw

Remediation:
Re-teach major concepts
Review with teacher assistance
Individual tutoring
Group tutoring
Alternative assessment
Study guides
One-on-one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Students assists others in class

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Students must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Essays
Summaries
Log/Journal
Time Cards
Writing Activities
Rubrics
Portfolio

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Group Projects Electric powered mortar mixer Power saws Hydraulic cutters Masonry hand tools Trowel Hammer Chisel Mortar mixer Mason rules Bricks BlocksHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 700 MASONRY FASTENERS
**Number:** 700 **Hours:** 20.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to list and describe different types of masonry fasteners.

**Tasks:**

PA701 - Use masonry fasteners and reinforcements.

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

**Instructional Activities:**

Knowledge:
Participate in discussions
Demonstrate proper use of hand tools
Follow project sheets
identify different types of masonry fasteners
Demonstrate proper measuring
Complete project/task grade sheets

Skill:
Demonstrate proper use of masonry fasteners and reinforcements

Remediation:
Re-teach major concepts
Review with teacher assistance
Individual tutoring
Group tutoring
Retest or alternative assessment
Study guides
One-on-one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Students assists others in class

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Students must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional work like manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Worksheets
Quizzes
Pre/Post Test
Log/Journal
Time Cards
Writing Activities
Rubrics
Portfolio
Task grade sheets

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Group Projects Masonry hand tools Mason rules Masonry fastenersHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 800 BRICKLAYING TECHNIQUES
**Number:** 800 **Hours:** 256.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to demonstrate the ability to dry bond, build leads, lay brick to the line, use brick and modular spacing rule, mix mortar by hand, install flashing and weep holes, build brick columns, corners, cavity and composite walls, install headers, rowlocks, and soldiers.

**Tasks:**

PA801 - Identify brick types and bonds.

PA802 - Lay out proper dry bond of a brick wall.

PA803 - Lay brick to the line.

PA804 - Install window and door openings (jambs) in brick walls.

PA805 - Install flashing for windows and doors.

PA806 - Install weep holes/vents.

PA808 - Install a soldier course.

PA809 - Lay a brick and block composite wall.

PA810 - Build brick columns.

PA811 - Construct a brick veneer wall.

PA812 - Discuss a brick cavity wall.

PA813 - Corbel a brick wall.

PA814 - Clean a brick wall.

PA815 - Lay a course of rowlocks.

PA816 - Lay a course of headers.

PA817 - Construct a brick jamb lead.

PA818 - Construct a 4" brick inside corner.

PA819 - Construct a 4" brick outside corner.

PA820 - Perform trowel techniques for brick.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Career Education and Work Academic Standards
  13.3. Career Retention and Advancement

  *Supporting Anchor/Standards:*

13.3.11 C. Evaluate conflict resolution skills as they relate to the workplace: Constructive criticism Group dynamics Managing/leadership Mediation Negotiation Problem solving
13.3.11 E. Evaluate time management strategies and their application to both personal and work situations.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

*Supporting Anchor/Standards:*

NUMBERS AND OPERATIONS
Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers
ALGEBRA
Standard 2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.
GEOMETRY
Standard 2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
Standard 2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.
Standard 2.3.HS.A.13 Analyze relationships between two dimensional and three dimensional objects.

**Instructional Activities:**

Knowledge:
Complete Focused - Free Writes regarding what a safety check list should entail
Demonstrate proper use of hand tools

Identify brick types and bonds
Define the term pattern bond
Identify the five brick pattern bonds
Dry bond each of the five pattern bonds
Discuss project layout
Review basic masonry techniques
Explain why one must be trained by a competent person to use every
tool, piece of equipment, or piece of machinery
Read and complete worksheets
Layout a brick wall in the running bond pattern
Demonstrate options for placing cut brick in a wall
List the four procedures performed for laying every brick
Demonstrate procedure for hanging a line and twigging a line
Lay brick to the inein the running bond pattern
List precautions when brick toothing
Understand that care during construct in reduces amount of cleaning required
Know that all brickwork is washed down with a cleaning agent to bring out the full color and beauty of the brick
Know that poor cleaning techniques may damage a wall
Discuss the process of cleaning new brickwork with muriatic acid
Discuss clean g different-colored and different-textured bricks
Discuss proprietary cleaning compound
List the advantages and disadvantages of proprietary cleaning compounds
Identify sources for construction dirt and mortar soiling masonry
List measures for preventing dirt-stained and mortar-staining masonry
Describe the different brick cleaning methods
Know the following terms:
American Bond
bat
Dutch Corner
English Bond
English Corner
Flemish Bond
Flemish Garden Wall Bond
Garden Walls
Pattern Bond
Queen Closure
Running Bond
Screen Wall
Single-wythe brick wall
Snap header
Stack Bond
Wythe
Closure brick
crowding the line
dry bonding
facing the brick
hanging the line
holding bond
layout
lipping
racking
raising the line
set-back
twigging the line
brick jamb
checking the range
corner
corner of the lead
double-wythe wall
lead
mortar bridgings
mortar protrusions

quoined corners
rack of the lead
single-wythe
tail of the lead
toothing
bleeding
efflorescence
muriatic acid
propriety compounds
trisodium phosphate
white scum

Skill:
Mix mortar using power equipment
Temper mortar
Cut masonry units using power saws
Cut masonry units using hydraulic cutting tools
Cut masonry units using hand tools
Hang a mason line using line blocks
Set up and maintain a safe work area in a masonry training lab
Demonstrate the safe handling and storage of construction materials
Spread mortar
Apply head joints
Strike joints
Lay out and build a brick wall for each of the pattern bonds
Layout project
Layout and construct an outside corner
Layout and construct an inside corner
Layout and construct 4". 8", and 12" brick jambs
Demonstrate procedures for setting a cornor pole
Know that the line acts as a guide for the wall and is the best place to start
Discuss the use of the corner pole
Know that any wall longer than 4" should be built to a line
Know how to prepare work area
Demonstrate the erection of a corner pole
Demonstrate attaching corner block and line to pole
Discuss pulling and attaching a line with the nail and line pin safely
Demonstrate setting a trig brick and attaching a trig to the line
Discuss and demonstrate the correct method of laying bricks to the line
Discuss the responsibility of the mason erecting the corner, not only to build a true corner, but to keep it built ahead of the line
Discuss and build the simplest type of corner, the rack-back lead
Discuss inside and outside corners
Explain how the number of courses laid is determined on the first course
Explain and demonstrate ranging the corner
Discuss the importance of tailing the lead
Discuss the essentials of building any type of corner, such as leveling, plumbing, straight edging, tooling of the joints, and brushing the work
Demonstrate sighting down the corner for plumbness
Discuss and demonstrate measuring the height of the corner with the rule
Explain and demonstrate parging

Remediation:
Re-teach major concepts
Review with teacher assistance
Individual tutoring
Group tutoring
Retest or alternative assessment
Study guides
One-on-one instruction

Enrichment:

After completing assigned task/project, student will proceed to next level of project.
Students assists others in class

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Student must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area.
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional work like manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Worksheets
Quizzes
Pre/Post Test
Essays
Summaries
Log/Journal
Time Cards
Rubrics
Role-play
Group Projects
Portfolio
Project/task grade sheets

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Group Projects Electric powered mortar mixer Power saws Hydraulic cutters Masonry hand tools Trowel Level Hammer Chisel Mortar mixer Joiners Slickers Mason rules Lines Plumb bobs Bricks Blocks Stone Chalk lines Specialty trowels Sled runnersHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 900 BLOCK LAYING TECHNIQUES
**Number:** 900 **Hours:** 192.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to lay block to the line, set lintels, construct jamb leads, block piers, brick ledges, block walls, block jambs, block inside and outside corners, clean and parge block walls, and identify and construct various block types and bonds.

**Tasks:**

PA901 - Identify block types and bonds.

PA902 - Lay block to the line.

PA903 - Construct a brick ledge.

PA904 - Discuss a control joint.

PA905 - Install window and door openings in block walls.

PA906 - Set lintels.

PA907 - Construct block piers.

PA908 - Clean a block wall.

PA909 - Parge a block wall.

PA910 - Construct a jamb block lead.

PA911 - Construct a corner block lead.

PA912 - Perform trowel techniques for block.

PA913 - Layout bond for block.

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts

in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

*Supporting Anchor/Standards:*

NUMBERS AND OPERATIONS
Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers
ALGEBRA
Standard 2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.
GEOMETRY
Standard 2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.

Standard 2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.
Standard 2.3.HS.A.13 Analyze relationships between two dimensional and three dimensional objects.

**Instructional Activities:**

Knowledge:
Complete Focused - Free Writes regarding what a safety check list should entail
Demonstrate proper use of hand tools
Discuss factors to consider when selecting specific types of equipment
List safety precautions and care for specific equipment
Describe methods for cleaning concrete masonry units
Read and complete worksheets
Identify various block types bonds
Discuss a control joint
Identify types of concrete masonry units
Identify the sizes of concrete masonry units
List the ingredients of concrete masonry units
Lay out a block wall in the running bond pattern
Explain procedures for placing a cut block in a wall
List the four procedures performed for laying each block to the line
Demonstrate procedures for hanging a line and twigging a line
Lay block to the line in the running bond pattern
Lay out and construct block corners and jambs
Identify the special offset corner blocks and demonstrate their installations
Demonstrate the proper alignment for block cut length at the end of a lead
Describe methods for cleaning concrete masonry units
Identify the following terms:
Anchored veneer
Architectural CMUs
Autoclaved CMUs
Exposed aggregate CMUs
Fluted CMUs
Glazed CMUs
Ground face CMUs
Heavyweight CMUs
Hollow Unit
Lightweight CMUs
Solid Unit
Sound-absorbing CMU's
Split-face CMUs
Stone-face CMUs
Structural Load
CMU
face-shell spreading
facing the block
hanging the line
twigging the line
block jamb
block size
checking the range
corner
corner of the lead
lean
nominal size
rack of the lead
tail of the lead
toothing

Skill:
Mix mortar using power equipment
Cut masonry units using power saws
Cut masonry units using hydraulic cutting tools
Set up and maintain a safe work area in a masonry training lab
Set lintels
Lay block to the line
Spread mortar
Cut block with the hammer and brick set
Install a control joint
Install masonry jambs
Clean and parge a block
Construct an inside and outside corner block lead
Discuss laying the first course on the base
Set up corner poles if used
Demonstrate spreading mortar on the outside webs of a block (face shell bedding)
Demonstrate how to apply a head joint on a block
Demonstrate lifting and laying a block to the line
Demonstrate adjusting a block to the line using the trowel and hammer
Check the height of the block with the rule
Demonstrate laying a closure block
Demonstrate striking mortar joints
Discuss the use of wire joint reinforcement
Demonstrate cutting the block with the hammer and brick set
Discuss the preparation of the base or footing for the first course
Discuss and demonstrate how to lay the first course
Explain why and install joint reinforcement every 2 ounces
Lay a corner to a specified height
Understand that single-unit block should be plumbed on only one side
Discuss the different types of joint finished for concrete block

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Safety:**

Student must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Assessment list
Worksheets
Quizzes
Pre/Post test
Log/Journal
Time cards
Rubrics
Group projects
Portfolio
Role-play activities
Debates
Oral presentation
Individual projects
Research papers
Current events
Task project grade sheets
Diagrams
Project grade sheets

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Group Projects Electric powered mortar mixer Power saws Hydraulic cutters Masonry hand tools Trowel Level Hammer Chisel Mortar mixer Joiners Slickers Mason rules Lines Plumb bobs Bricks Blocks Chalk lines Specialty trowels Sled runnersHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 1000 MORTAR
**Number:** 1000 **Hours:** 45.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to apply knowledge of spreading mortar on brick and block, mix mortar by hand and with a power mixer, and demonstrate procedures for tempering mortar.

**Tasks:**

PA1001 - Identify types of mortars and their characteristics.

PA1002 - Mix mortar (other than mortar mixer)

PA1004 - Temper mortar.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

**Instructional Activities:**

Knowledge:
Demonstrate proper use of hand tools
Review good safety practices on the job are essential
Identify manually operated and power equipment used in the
masonry construction industry
Discuss factors to consider when selecting specific types of equipment
Review safety precautions and care for specific equipment required for compliance with governing safety regulations
when performing specific tasks
Read and complete worksheets
Describe different types of mortars and their characteristics
Explain what masonry cement is
List the ingredients of masonry mortars (port and cement, lime, sand, water)
Identify samples of the ingredients of mortar
Explain the necessity for using clean washed sand in the mix
Explain that dirt prevents mortar from attaining full strength
Explain that water should be clean and free of alkali, salts, acids, and organic matter
Explain that mixing instructions should be followed
Identify the types of cementitious materials used to make mortar
List additives contained in some cenentitious materials
Describe the procedures for mixing mortar manually and with a power mixer
List procedures for maximizing the intended performance of mortars
Describe the differences between mortars used for new construction and mortars used for repairing the joints of older and historical brick walls
Describe potential problems associated with mortars
Discuss masonry cement mortars and explain the advantages and disadvantages of each
Discuss admixtures
Explain efflorescence and why it is a problem
Discuss the methods of preventing and removing efflorescence
Discuss the water content of mortar and why it is an important fact in mixing mortar
Explain tempering as related to masonry mortar
Discuss the proper way to temper mortar on the job
Discuss storing the mixing materials dry and near the mixing area saves time

Discuss why it is important to accurately measure materials
Discuss the standard proportions for mortar
Discuss the various problems encountered in the mixing of mortar: drowing the mortar, over sanding, fat and lean mortar, using cement which has hard lumps, cold weather precautions
Identify these terms:
accelerators
admixtures
air-entraining agents
autogeneous healing
bond strength
cold weather construction
elasticity
flexural strength
grout
hot weather construction
masonry cements
mortar
mortar cements
pigments
plasticizers
retarders
retempering
tensile strength
water retention
workability

Skill:
Mix mortar using power equipment
Clean the mixer after use
Mix mortar by hand in a mortar box
Demonstrate mortar tempering techniques
Demonstrate the proper use of the mason's trowel
Set up and maintain a safe work area in a masonry training lab
Demonstrate the safe handling and storage of construction materials

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Student must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Assessment list
Worksheets
Quizzes
Pre/Post test
Time cards
Rubrics
Group projects
Oral presentation
Individual projects
Portfolio
Task project grade sheets
Project grade sheets

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Group Projects Electric powered mortar mixer Masonry hand tools Trowel Level Hammer Chisel Mortar mixer Joiners Slickers Mason rules Lines Plumb bobs Bricks Blocks Stone Chalk lines Specialty trowels Sled runners Mortar boxHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 1100 CHIMNEYS AND FIREPLACES
**Number:** 1100 **Hours:** 180.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to construct a fireplace, brick and block chimneys.

**Tasks:**

PA1101 - Identify parts of a chimney and fireplace.

PA1102 - Discuss fireplace construction.

PA1103 - Construct a brick chimney.

PA1104 - Construct a block chimney.

PA1105 - Determine flashing methods where the chimney meets the roof.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

  *Supporting Anchor/Standards:*

  KEY IDEAS/DETAILS GRADES 9-10-11-12
  Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
  Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
  Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
  CRAFT & STRUCTURE GRADES 9-10-11-12
  Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
  Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
  Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
  INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
  Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
  Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
  Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
  INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
  Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
  Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
  Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
  RANGE OF READING GRADES 9-10-11-12
  Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

  *Supporting Anchor/Standards:*

  TEXT TYPES AND PURPOSE GRADES 9-10-11-12
  Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
  Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
  PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
  Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
  Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
  Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
  RESEARCH GRADES 9-10-11-12
  Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
  Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
  Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
  RANGE OF WRITING GRADES 9-10-11-12
  Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

  *Supporting Anchor/Standards:*

  NUMBERS AND OPERATIONS
  Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
  Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers
  ALGEBRA
  Standard 2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.
  GEOMETRY
  Standard 2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
  Standard 2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.
  Standard 2.3.HS.A.13 Analyze relationships between two dimensional and three dimensional objects.

**Instructional Activities:**

Knowledge:
Complete Focused - Free Writes regarding what a safety check list should
entail
Demonstrate proper use of hand tools
Review good safety practices on the job are essential
Identify manually operated and power equipment used in the
masonry construction industry
Discuss factors to consider when selecting specific types of equipment
Read and complete worksheets
Identify the parts of brick masonry chimneys
Explain important regulations and codes governing the construction of masonry chimneys
Identify the components of a wood-burning fireplace

Explain basic features of the four types of masonry fireplaces
Describe factors governing the performance of a fireplace
List building code requirements for a single-face masonry fireplace
Explain procedures for constructing a single-face masonry fireplace
Discuss chimney flashing techniques
Identify these terms:
chimney base flashing
chimney cap
clean out
corbelling
counter-flashing
cricket
cross-sectional area
fire blocking
fire clay
flue lining
thimble
air-circulating fireplace
air intake
ash pit
base
chimney
combustion chamber
draft
fire stopping
firebox
fireplace brick
fireplace surround
hearth
hearth base
inner hearth
multi-face fireplace
outer hearth
Rosin fireplace
Rumford fireplace
single-face fireplace
smoke chamber
smoke shelf
throat
throat damper

Skill:
Mix mortar using power equipment
Cut masonry units using power saws
Cut masonry units using hydraulic cutting tools
Identify supported scaffold components and explain safety regulation requirements related to each component
Set up and maintain a safe work area in a masonry training lab
Demonstrate the safe handling and storage of construction materials
Construct a brick and block chimney
Construct a fire brick fire place
Describe a natural and a forced draft
Discuss the function of a chimney
Discuss the selection of brick for a chimney
Discuss that single flue chimney can only have one heat source
Discuss flue liners and identify types of liner (round and square)
Discuss a flue ring (thimble) and its purpose
Discuss the proper distance between the wood framing and the chimney
Discuss flashing of a chimney
Discuss the theory of draft in a fireplace and chimney
Discuss how location and a roof affect draft
Discuss the selection of materials used in a chimney
Describe the installation of flue linings in a chimney

Discuss the factors to consider when building a fireplace
Discuss the two methods of building a fireplace
Discuss the lay out of a fireplace and chimney on the footing
Discuss the installation of the hearth
Explain the rules for establishing the size of fireplace openings
Discuss building of the firebox
Describe the construction of the smoke shelf
Demonstrate how a damper is installed and discuss damper operation
Explain how the smoke chamber is built
Discuss how to determine the size of a flue
Discuss the building of the finished face of the fireplace
Describe the building of a chimney when their is more than one fireplace

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Student must:
Follow all masonry lab safety procedures, including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional work like manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Worksheets
Quizzes
Pre/Post Test
Summaries
Project Rubric
Time Cards
Writing Activities
Rubrics
Oral Presentation
Diagrams
Individual Projects
Group Projects
Research Paper
Portfolio
Project grade sheets

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Group Projects Electric powered mortar mixer Power saws Hydraulic cutters Masonry hand tools Trowel Level Hammer Chisel Mortar mixer Joiners Slickers Mason rules Lines Plumb bobs Bricks Blocks Stone Flue liners Chalk lines Specialty trowels Sled runnersHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 1200 ARCH CONSTRUCTION
**Number:** 1200 **Hours:** 56.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will discuss arch terminology, identify and be able to build arches with brick and block masonry units.

**Tasks:**

PA1201 - Identify arch terminology.

PA1202 - Identify types of arches.

PA1203 - Construct an arch.

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Science, Technology & Engineering, and Environmental Literacy & Sustainability Standards
  3.5.6-8.4 Strand: Design in Technology & Engineering Education

  *Supporting Anchor/Standards:*

  3.5.6-8.S Illustrate the benefits and opportunities associated with different approaches to design.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

  *Supporting Anchor/Standards:*

  NUMBERS AND OPERATIONS
  Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
  Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers
  ALGEBRA
  Standard 2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.
  GEOMETRY
  Standard 2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
  Standard 2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.
  Standard 2.3.HS.A.13 Analyze relationships between two dimensional and three dimensional objects.

**Instructional Activities:**

Knowledge:
Participate in discussions
Demonstrate skills to the instructor
Take notes during the lecture
Follow project layout sheets
Complete project/task grade sheets
Explain how the arch bricks are spaced on different types of arches
Describe the major types of masonry arches used today
Define the terms associated with arch construction
Identify the six brick positions
List the four procedures performed for laying every brick
Define the terms pier, pilaster, chase and column
Identify and give uses for masonry piers, pilasters, chases and columns
Identify brick arches by their shape
Identify and define the part of an arch
Construct a semicircular brick arch
Identify these terms:
actual size
cap/capping
capital
chase
column
compass brick
compressive strength
concentrated load
control joint
hollow masonry pier
lateral strength
masonry column
nominal size
pier
pilaster
pilaster block

radial pier
reinforced masonry pier
structural pier
abutments
bonded arch
camber
circular arch
compression
creepers
depth
extrados
gaged brick
Gothic Arch
horseshoe arch
intrados
jack arch
keystone
major arch
minor arch
multicentered arch
rise
segmental arch
semicircular arch
skew back
soffit
span
spring line
triangular arch
Tudor Arch
unbonded arch
Venetian arch
voussoir
wood centering

Skill:
Mix mortar using power equipment
Cut masonry units using power saws
Cut masonry units using hydraulic cutting tools
Identify supported scaffold components and explain safety regulation requirements related to each component
Set up and maintain a safe work area in a masonry training lab
Demonstrate the safe handling and storage of construction materials
Mix mortar using power equipment
Construct a semicircular brick arch
Lay out and build a pier, pilaster
Demonstrate procedures for hanging a line and twigging a line
Lay brick to the line in the running bond pattern
Construct various types of arch projects
Demonstrate proper project layout
Explain why a semicircular arch is strong
Calculate the correct curvature for a semicirular arch
Describe a semicircular (Roman) arch and why it is the strongest of all arches
Explain how semicircular arches are laid out from the springing point to the center or keystone
Explain how the correct curvature is found for the semicircular arch
Describe how the arch form is set in place
Demonstrate how the arch form is marked off using a mason's rule.
Demonstrate how the arch bricks are laid out in mortar on top of the form
Discuss the different types of brick positions that can be used in an arch
Explain how the arch form is removed and the arch pointed
Explain that a jack arch is a flat arch and must be laid on a support over an opening
Explain that a jack arch is the weakest of all arches and is usually built for architectural effect
Describe the two types of jack arches, common and bonded
Demonstrate how a jack arch is laid out from the skew backs

Demonstrate how a jack arch is laid on the framed opening

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

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- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

- Drill and Practice (Repetition of Material)

- Copy of Teacher/Student Notes/Skeleton Notes

- Small Group Instruction

- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)

- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

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- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage

- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Students must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Assessment List
Worksheets
Quizzes
Pre/Post Test
Log/Journal
Time cards
Rubrics
Group Projects
Task grade sheet
Oral Presentation
Individual Projects
Portfolio
Task project grade sheets
Diagrams
Project grade sheets

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Group Projects Electric powered mortar mixer Power saws Hydraulic cutters Arch templatesHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 1300 MASONRY ESTIMATION
**Number:** 1300 **Hours:** 60.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to examine estimation and evaluation in all aspects of masonry materials.

**Tasks:**

PA1301 - Estimate mortar, number of units, and material costs for brick work.

PA1302 - Estimate mortar, number of units, and material costs for block work.

PA1303 - Estimate the area, volume and cost for various masonry applications.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

*Supporting Anchor/Standards:*

NUMBERS AND OPERATIONS
Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers
ALGEBRA
Standard 2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.
GEOMETRY
Standard 2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
Standard 2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.
Standard 2.3.HS.A.13 Analyze relationships between two dimensional and three dimensional objects.

**Instructional Activities:**

Knowledge:
Read and complete worksheets
Participate in discussions
Demonstrate proper measuring
Discuss steps and formulas for estimation
Define the following terms:
bidder
bid price
cost estimate
gable
labor constant

Skill:
Complete project/task grade sheets
Estimate quantities of brick, block, masonry cement, sand, and reinforcement
Estimate the amount of concrete needed for a footing
Estimate the amount of materials needed for a concrete slab
Estimate the labor costs for given masonry projects
Explain and estimate using rule of thumb
Explain and estimate using square foot wall area
Explain the concept of waste
Explain that 3 blocks equal 4' in length
Explain that lineal feet is multiplied by 0.75 to give the number of block in 1 course
Estimate mortar by allow 30 concrete block to the bag
Estimate the amount of sand by allowing 240 block to the ton
Explain that the estimate will allow for a reasonable amount of waste
Explain how openings are provide in the block wall and with a corresponding deduction of materials
Study the tables of factors

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Study groups
Reading comprehension packets
Retest or alternative assessment
Study guides

Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

- Use of Calculator

- Taking Tests in Alternate Setting (or if requested)

- Verbal/Gestural Redirection (prompts to remain on task)

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- Copy of Teacher/Student Notes/Skeleton Notes

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- Teacher Modeling

- Use of Computer (Access to)

- Positive Reinforcement

- Have Student Repeat Directions

- Wait Time

- Access to School Counselor

- Provide Frequent Feedback

- Provide Frequent Breaks

- Variety of Assessment Methods

- Regular Notebook Check

- Highly Structured Classroom

- Syllabus for Major Projects

- Limited, Short Directions

- Grading Rubric

- Communication Regarding Behavior & Consequences (PBS)

- Clear Language for Directions

- Provide Opportunities to Retest

- Frequent Review Sessions

- Use a variety of Modalities when Introducing Skills/Concepts

- Copies of Text for Home

- Cue for Oral Response

- De-Escalation Opportunities

- Daily Classwork Check

- Encourage Student to Check Work Before Turning In

- Opportunities for Repeated Practice of MATH Skills

- Provide repetition During Initial Instruction

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- Provide Verbal and Written Directions

- All Vocabulary to be Defined Before Testing

- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

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**Safety:**

Student must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Assessment List
Worksheets
Quizzes
Pre/Post Test
Rubrics
Oral Presentation
Individual Projects
Research Papers

Task project grade sheets
Diagrams
Project grade sheets

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Ham, Robert. 2008. Workbook Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Chapter 12. Kreh, Richard. 1996. "Masonry Skills" 4th Edition. Delmar Cengage Learning. Clifton Park, NY. Units 18, 21 Program supplied tools Magazines; Masonry Construction, Masonry Group Projects CalculatorHyperlinks:

# Monroe Career & Technical Institute

## Course: Masonry

**Unit Name:** 1400 THIN VENEER
**Number:** 1400 **Hours:** 90.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to prepare for and place adhered manufactured stone masonry veneer construction.

**Tasks:**

PA1401 - Identify thin veneer applications.

PA1402 - Describe finishing thin veneer.

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

  *Supporting Anchor/Standards:*

  3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
  3.4.10.C1 Apply the components of the technological design process.
  3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
  3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
  3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

*Focus Anchor/Standard #2:*

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

  *Supporting Anchor/Standards:*

  CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
  CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
  CC.2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.
  CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.
  CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
  CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
  CC.3.6.11-12.F. Conduct short as well as more sustained research projects to answer a question (including a self generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation

*Connecting Anchor/Standard:*

- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

  *Supporting Anchor/Standards:*

  CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
  CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
  CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
  CC.2.3.8.A.1 Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.
  CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

**Instructional Activities:**

Knowledge:
Identify the five stone pattern bonds
Identify the sources of water behind exterior masonry walls
Identify means of minimizing the migration through masonry walls
Define the terms flashing
Describe procedures for ensuring performance of flashing
List different materials used as flashing
Describe the proper procedures for installing flashing
Describe types of masonry mortars used in stone application
Describe differ tent types of anchoring systems used in stone application

Skill:
Demonstrate proper use of hand tools
Demonstrate applying anchoring systems for a stone venner wall
Demonstrate applying a scratch coat for a stone venner wall
Mix mortar using power equipment
Follow project sheets
Complete project/task grade sheets
Demonstrate proper measuring
Demonstrate dry bonding in preparation for construction of stone walls
Lay out and build a stone venner wall for each of the pattern bonds
Demonstrate flashing for a stone venner wall
Demonstrate grouting and striking joints in a stone venner wall
Demonstrate applying a raised or beaded joint in a stone veneer wall

Remediation:
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets with answers if needed
Group tutoring
Reading comprehension packets
Retest or alternative assessment
Study guides
Checklist
One on one instruction

Enrichment:
After completing assigned task/project, student will proceed to next level of project
Assist fellow classmate

**Special Adaptations:**

- Extended Time (assignments and/or testing)

- Chunking of Assignments/Material

- Preferential Seating

- Study Guide

- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments

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- Limited, Short Directions

- Grading Rubric

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- Provide repetition During Initial Instruction

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- Testing - Allow Dictation of Lengthy Answers

- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment

- Encouragement to Participate in Positive Leadership Roles

**Safety:**

Student must:
Follow all Masonry lab safety procedures including wearing of safety glasses, shop uniform, and work boots when working in the shop area
Handle material in a safe and professional manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use tools and equipment in a professional manner according to OSHA standards

**Assessment:**

Check list/rubric to required degree of accuracy
Assessment List
Worksheets
Quizzes
Pre/Post Test
Log/Journal
Time cards
Rubrics
Group Projects
Portfolio
Individual Projects
Research Paper
Task project grade sheets
Diagrams

**Resources/Equipment:**

Ham, Robert. 2008. Residential Construction Academy Masonry Brick and Block Construction. Delmar Cengage Learning Publications. Clifton Park, NY. Kreh, Richard. 1996. "Masonry Skills" 4th Edition.

Delmar Cengage Learning. Clifton Park, NY. Program supplied tools DVD’s or Videos Magazines; Masonry Construction, Masonry Group Projects Electric powered mortar mixer Power saws Hydraulic cutters Masonry hand tools Trowel Level hammer chisels jointers grout bag mortar galvanized mesh fasteners manufactured stoneHyperlinks: