

ATLB-2811: SPECIAL TOPICS: MASON TENDING AND SCAFFOLDS

Cuyahoga Community College

Viewing: ATLB-2811 : Special Topics: Mason Tending and Scaffolds

Academic Term:

Fall 2020

Subject Code

ATLB - AIT-Construct/Hazard Material

Course Number:

2811

Title:

Special Topics: Mason Tending and Scaffolds

Catalog Description:

Study of work scope related to mason tending including bonding materials and properties and environmental effects related to masonry construction. There will be a focus on applied practices of selecting and mixing of mortar and material estimating and placement on worksites. In addition, scaffold erection and worker safety per the Occupational Safety and Health Administration (OSHA) Subpart L is covered.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: admission to Laborer's apprenticeship program.

Outcomes

Course Outcome(s):

I Introduce the work-scope involved in mason tending including tasks, material estimates, and material requirements.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. List and define the terms related to mason tending.
2. Discuss the purpose of mason tending and explain the need for the construction tender in masonry installations.
3. List the duties of the mason tender regarding masonry construction.
4. List the tools and equipment required for efficient tending.
5. Identify the different types of CMU's used in masonry construction.
6. Explain the process of "reading the wall" and list the material requirements.
7. Estimate the number of concrete masonry units (CMU), including corners, halves, and various specialty concrete blocks.

Course Outcome(s):

II Identify the different types of bonding materials, explain the respective properties of each, and demonstrate the ability to correctly mix batches of each with regards to job requirements and environmental conditions.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. List and define the terms related to bonding materials.
2. Describe the function of mortar.
3. Identify the types of cement mortar and describe the application of each.
4. Explain the properties of different admixtures and describe the effects each has on masonry construction.
5. Discuss the applications of different grout mixtures and explain the difference between mortar and grout.
6. Demonstrated the ability to properly set up a mixing area, explain the different mixing systems, and apply correct mixing and clean-up procedures for grout and mortar.
7. Demonstrate the ability to correctly position the masonry units on the work platforms and include the corner allowances and wall accessories.

Course Outcome(s):

III Discuss the environmental effects of extreme hot and cold weather on masonry installations, the importance of proper cleaning techniques, and procedures for safe wall bracing as prescribed by OSHA standards.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Explain the effects of heat and cold on masonry units during construction.
2. Describe proper storage of masonry, heating masonry and placing product in cold weather installation.
3. Identify the categories of cleaning failures and describe the related cleaning problems
4. Describe the methods of cleaning masonry
5. Discuss the need for bracing masonry per OSHA standards.
6. Identify the components of masonry bracing.
7. Calculate the brace spacing requirements for masonry with respect to environmental conditions.

Course Outcome(s):

IV Review the OSHA regulation, 29CFR 1926.450 subpart L, regarding workplace and worker safety during scaffold erection and dismantling.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Discuss the scope and application of scaffolding used on construction sites.
2. List and define the terms related to scaffolding.
3. Explain the general requirements for scaffold erection including capacity and platforms.
4. Discuss the erection criterion for supported scaffold.
5. Describe the importance of fall protection and discuss the various types and heights required for implementation
6. Describe scaffold tie off procedures and determine the vertical and horizontal locations.
7. Inspect erected scaffolding for compliance with safety standards.
8. Demonstrate the ability to properly erect and dismantle fabricated frame scaffolding with respect to OSHA safety regulations.

Methods of Evaluation:

HOMEWORK:

Homework may be assign to trainees for each evening of the class. Assignments are typically due the following morning.

MAKE UP WORK POLICY

1. Trainees who do not complete homework assignments on time will be given one (1) additional evening to complete the work.
1. If assignments are not turned in after the second day, trainees will be given a grade of "0" for the assignment.

WITHDRAWALS AND INCOMPLETES:

For trainees who are apprentices, withdrawals and/or incompletes of this course are reported to their Apprenticeship Coordinators for further action.

GRADING SYSTEM:

- 1. - 0.9 = F 2.75 - 3.49 = B
- 1. - 1.9 = D 3.50 - 4.0 = A
- 1. - 2.74 = C

TO RECEIVE COLLEGE CREDIT THE STUDENT MUST ATTAIN A GRADE OF "C" (2.0) OR BETTER

Course Failure

- 1. When a trainee fails a course in a school year.
- 1. The student may request to retake the course at a later date.
- 1. Failure by an apprentice will be reported to their Apprenticeship Coordinator for further action.

ACADEMIC CREDIT

You must complete the course according to the Drexel J. Thrash Training Center grading and absence policy and receive no lower than a "C" (2.0) passing grade.

Course Content Outline:**Course Outline**

- 1. **Mason Tending: tasks, estimates and material**
 - a. **Terminology**
 - i. Mason
 - ii. Mason tending
 - iii. CMU
 - iv. Skid steer
 - v. Reading the wall
 - vi. Construction joints
 - vii. Control joints
 - viii. Reinforced masonry
 - ix. Steel mesh joint
 - x. Flashing
 - xi. Portland cement
 - xii. Poly bond flashing
 - xiii. Brick tongs
 - xiv. Wall tie
 - xv. Hook and tie
 - xvi. Tempering can
 - xvii. Mudding down
 - xviii. Weep holes
 - xix. Strike
 - b. **Purpose**
 - i. **Job efficiency**
 - 1. Organization
 - 2. Material placement
 - ii. Assist mason
 - iii. Scaffold erection
 - iv. Prep and clean-up
 - v. Mortar
 - 1. Mix
 - 2. Distribution
 - vi. Job coordination
 - c. **Duties**
 - i. **Job preparation**
 - 1. Tools
 - 2. Materials
 - 3. Ground
 - a. Level
 - b. Compacted
 - ii. Material estimates
 - iii. Equipment
 - 1. Maintenance
 - 2. Start-up

- iv. **Scaffolding**
 - 1. **Inspection**
 - 2. **Set-up locations**
 - 3. **Erection**
 - v. **Material**
 - 1. **Estimate**
 - 2. **Stock pile**
 - d. **Tools and equipment**
 - i. **Tools**
 - 1. **Square shovel**
 - 2. **Short handle shovel**
 - 3. **Long point**
 - 4. **Hand tools**
 - a. **Hammer**
 - b. **Snips**
 - c. **Tape measure**
1. **Equipment**
- a. **Partner saw**
 - b. **Mortar mixer**
 - c. **Table saw**
 - d. **Rough terrain forklift**
 - e. **Grout machine**
 - f. **Vibrator**
2. **CMU type**
- a. **Brick**
 - i. **Modular 4" x 2 5/8 " x 8"**
 - ii. **Standard 4" x 2 5/8 " x 8 3/8 "**
 - iii. **Jambs 4" x 3 1/8 " x 8 3/8"**
 - iv. **Oversize 4 3/8" x 3 1/8 " x 8 7/8 "**
 - v. **Norman 4" x 2 5/8" x 12"**
 - vi. **Jumbo Norman 4" x 3 1/8 " x 12"**
 - vii. **Utility 4" x 4" x 12"**
 - viii. **Quad 4" x 8" x 8"**
 - ix. **Panel 4" x 12" x 12"**
 - x. **Through wall utility I 6" x 4" x 12"**
 - xi. **Through wall utility II 8" x 4" x 12"**
 - b. **Block**
 - i. **Common.8 8" x 8" x 16"**
 - ii. **Common.6 8" x 6" x 16"**
 - iii. **Half high 8" x 4" x 16"**
 - iv. **Specialty**
 - 1. **Bond beam**
 - 2. **Lintel beam**
 - 3. **Split face**
 - 4. **Bull nose**
 - 5. **Jamb**
 - 6. **Solid**
3. **Reading the wall**
- a. **Purpose**
 - i. **Material requirements**
 - ii. **Equipment requirements**
 - b. **Construction drawing interpretation**
 - i. **Masonry type**
 - ii. **Quantity**
 - iii. **Windows**
 - iv. **Doors**
 - v. **Corners**
 - c. **Square footage**
 - d. **Materials**

- i. **Brick**
 - ii. **Block**
 - iii. **Reinforcement**
 - iv. **Grout**
 - e. **Equipment**
 - i. **Scaffolding**
 - ii. **Mixer**
 - iii. **Forklift**
 - f. **Material/equipment list**
- 4. **Material estimating**
 - a. **Importance**
 - i. **Cost saving**
 - ii. **Job efficiency**
 - iii. **Prevents cluttering/waste**
 - iv. **Work place safety**
 - b. **Brick/block identification**
 - i. **Nominal dimension**
 - ii. **Actual dimension**
 - c. **Square feet calculation**
 - i. **Length of brick/block**
 - ii. **Width of brick/block**
 - d. **Conversion**
 - e. **Chart/number of units**
- 5. **Material placement**
 - a. **Positioning**
 - i. **Group placement**
 - 1. **Corner positioning**
 - 2. **Standard block/field**
 - 3. **Specialty block**
 - ii. **Scaffold placement**
 - 1. **Between frame locations: mud board and anchors**
 - 2. **Frame: standard block**
 - b. **Working height access**
- 1. **Bonding materials, properties and mixing**
 - a. **Terminology**
 - i. **Bonding material**
 - ii. **Bond**
 - iii. **Strength**
 - iv. **Plasticity**
 - v. **Body**
 - vi. **Water retention**
 - vii. **Repellent**
 - viii. **Admixture**
 - ix. **Air entraining**
 - x. **Accelerator**
 - xi. **Retarder**
 - xii. **Modifier**
 - xiii. **Proportion**
 - xiv. **Tempering**
 - b. **Mortar function**
 - i. **Bind masonry units**
 - ii. **Water resistant barrier**
 - iii. **Weather resistant walls**
 - iv. **Uniform appearance**
 - c. **Mortar types and application**
 - i. **Type I**
 - 1. **Portland cement mortar**
 - a. **Type I**
 - b. **Type III**

- 2. **Masonry cement**
 - a. **Type M**
 - b. **Type S**
 - c. **Type N**
 - d. **Type O**
 - e. **Type K**
- ii. **Mortar**
 - 1. **Type I**
 - a. **General purpose**
 - b. **Highway**
 - 2. **Type III**
 - a. **Quick setting**
 - b. **Cold weather**
- 1. **Type M**
 - a. **Reinforced**
 - b. **Un-reinforced**
 - c. **High rise buildings**
 - d. **Below grade**
 - e. **Retaining walls**
 - f. **Sewer construction**
- 2. **Type S**
 - a. **Normal weight load**
 - b. **High flexural bond**
 - c. **Adhesion type veneer**
- 3. **Type N**
 - a. **Medium strength**
 - b. **Above grade**
 - c. **Glass block**
 - d. **Water proof**
- 4. **Type O**
 - a. **Lower strength**
 - b. **Interior walls**
- 5. **Type k**
 - a. **Restoration**
 - b. **Tuck-pointing**
- 6. **Admixtures**
 - a. **Air entraining**
 - i. **Resistant to freeze-thaw cycles**
 - ii. **Workable**
 - b. **Accelerators**
 - i. **Speed up set time**
 - ii. **High-early strength**
 - iii. **Cold weather construction**
 - c. **Retarder**
 - i. **Slows set time**
 - ii. **Hot weather applications**
 - iii. **Eliminates tempering**
 - d. **Bond modifier**
 - i. **Improved adhesion**
 - ii. **Glass block**
 - e. **Corrosion inhibitor**
 - f. **Water repellent**
- 1. **Plasticizers**
 - a. **Mortar workability**
 - b. **Bentonite clay**
- 2. **Grouts**

- a. **Types**
 - i. **Fine**
 - 1. **Masonry wall stability**
 - 2. **Small openings**
 - ii. **Coarse**
 - 1. **Sound proofing**
 - 2. **Fire proof**
 - 3. **Large openings**
 - 4. **Security**
 - 5. **Strength and stability**
 - b. **Fly ash**
 - c. **Compression strength**
3. **Mixing: Set up and application**
- a. **Set up**
 - i. **Mixers**
 - 1. **Barrel**
 - 2. **Paddle**
 - ii. **Mortar**
 - iii. **Sand**
 - iv. **Additives**
 - b. **Placement**
 - i. **Efficient area**
 - ii. **Varies with job requirements**
 - iii. **Crew service**
 - c. **Methods of cleaning**
 - i. **Hand**
 - ii. **Pressurized**
 - iii. **Abrasive blasting**
4. **Material stacking**
- a. **At grade level**
 - i. **Placement order**
 - 1. **Corners**
 - 2. **Specialty locations**
 - 3. **Field**
 - ii. **Location**
 - iii. **Stock pile dimensions**
1. **Scaffold placement**
- a. **Location**
 - b. **Dimensions**
 - c. **Material rotation**
1. **Weather, cleaning, and bracing**
- a. **Weather effects**
 - i. **Cold weather**
 - 1. **Loss of material strength**
 - 2. **Freezing**
 - 3. **Slower setting time**
 - ii. **Heat**
 - 1. **Rapid set time**
 - 2. **Shrinkage**
 - 3. **Fracture**
 - b. **Cold weather: masonry storage, heating, and placement**
 - i. **Storage**
 - 1. **Material elevation**
 - 2. **Blankets and tarps**
 - ii. **Heating**
 - 1. **Sand**
 - 2. **Water**
 - 3. **Masonry units**
 - 4. **Heating equipment**

- a. Blankets and tarps
- b. Torpedo heater
- c. Portable torch
- d. Water line
- iii. Placement
 - 1. Temperature
 - a. Optimum temperature is above forty degrees
 - b. Thirty-two to forty degrees: heated water in mix
 - c. Twenty-five to thirty-two degrees: heated water and sand
 - d. Twenty to twenty-five degrees: enclosures required
 - 2. Protection
 - a. Visquene
 - b. Tarps
 - c. Wind breakers
 - d. Heat, insulated blankets
- 1. Masonry cleaning
 - a. Failure evidence
 - i. Effervescence
 - ii. White scum
 - iii. Staining
 - b. Failure causes
 - i. Improper mortar saturation
 - ii. Improper mixing ratio of cleaning solutions
 - iii. Improper protection
- 2. Cleaning methods
 - a. By hand
 - i. Bucket
 - ii. Brush
 - b. Pressurized water
 - c. Abrasive blasting
- 3. Bracing
 - a. Prevention
 - i. Wall overturning
 - ii. Collapse
 - b. Wind velocity
 - i. Bracing components
 - ii. Bracing requirements
 - iii. Bracing spacing
 - c. OSHA
 - i. Bracing requirements
 - 1. Size and block type
 - 2. Wind speed
 - 3. Wall height
- 4. Bracing components
 - a. Vertical member
 - i. 2" x 10"
 - ii. Scaffold plank
 - b. Inclined strut
 - i. 2" x 10"
 - ii. Angle
 - 1. 30 degrees
 - 2. 45 degrees
 - c. Stake
 - i. 2" x 4" member pointed
 - ii. Soil penetration
- 1. Strut bracing
 - a. Load carrying capacity
 - b. Buckling prevention
- 2. Brace spacing

- a. **General**
 - i. **12 foot maximum**
 - ii. **Equation: $8 \times 1.5 = S$**
- b. **Block size/wind speed calculation**
- c. **Brace chart**
- d. **Brace removal**
 - i. **Mortar strength**
 - ii. **Mortar hardening**
 - iii. **Approximate time**

Resources

LIUNA Training and Education Fund . " *Scaffold User Safety* . current. " LIUNA Training and Education Fund ,Pomfret CT 06259, 2011.

LIUNA Training and Education Fund . *Building Frame Scaffold* . current. LIUNA Training and Education Fund Pomfret CT 06259 , 2011.

LIUNA Training and Education Fund . *Mason Tending* . current. LIUNA Training and Education Fund Pomfret CT 06259 , 2011.

Resources Other

<https://www.indeed.com/q-Mason-Tender-jobs>.

<https://eric.ed.gov/?id=ED379419>

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