

Laborers Cement Mason
Concrete Placement and Finishing Tech 2 Syllabus

Time: 40 hours

Maximum Class Size: 12

Prerequisites: LCM Construction Math, LCM Concrete Placement and Finishing Tech 2

Course Description: This course is designed to continue with the skills presented in LCM Concrete Placement and Finishing Tech 2. This course will review the tools and materials used in placing and finishing concrete. The participant will also review the step-by-step process of placing, finishing, and sawing concrete. Construction Math concepts and the skills needed to calculate concrete quantities will be reviewed, reinforced and applied. In addition to flatwork, the participant will learn the skills necessary for Curb & Gutter, Driveway and Sidewalk work.

Goals/Objectives/Student Learning Outcomes:

- Use basic math processes to solve problems involving fractions and decimals.
- Use standard math formulas to solve problems involving area and volume and common construction materials.
- Use common construction measuring equipment to identify units of measure in the US Standard System and the decimal system.
- Measure a variety of objects to within $\pm 1/8''$ using common construction measuring equipment.
- Convert measurements between the US Standard System and the decimal system.
- Identify, set up and use horizontal and vertical measuring equipment to perform basic layout, squaring and grade measurements.
- Calculate volume quantities for regular and irregular shapes to within \pm two hundredths of a cubic yard.
- Calculate the amount of concrete needed for concrete forms of certain dimensions with the yield amount included.
- Describe the five basic types of Portland cement and the uses of each
- List five common concrete admixtures; describe the effects of each admixture in placement, consolidation, and finishing concrete.
- Describe the primary health effect caused by skin exposure to cement and describe and identify the PPE used to prevent skin exposure.
- Describe five methods of transporting concrete to the placement area and at least one situation that warrants each method.
- List and identify at least three tools used in concrete placement.

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- Describe three problems that can result from over-vibration of placed concrete and three problems that can result from under-vibrations of placed concrete.
- Given a scenario involving concrete placement for curb and gutter, identify the tools needed, and demonstrate concrete placement and vibration techniques for walls following the guidelines in the LIUNA module.
- Given a scenario involving concrete placement for flatwork (a slab), identify the tools needed, and demonstrate concrete placement techniques for slabs.
- Identify common tools used for finishing concrete and describe the purpose of each tool.
- Describe three methods for curing concrete.
- Working in a team to complete a concrete finishing job:
 - Identify the tools needed to complete the job
 - Demonstrate basic concrete finishing techniques needed to complete the job.
 - Demonstrate at least one method of curing concrete
- List the three most common types of concrete work.
- Define the following terms: grade, sub-grade, foundation/footing, slab, finished grade, batter boards and string lines.
- Perform a site inspection and develop a rough sketch/drawing of the training area.
- Working in groups, lay out a batter board and a string line set-up for a slab using a leveling instrument to establish proper grade.
- Satisfactorily complete the following Performance Standards Hands-on Tests: Curb & Gutter, Sidewalks & Drives, Handicapped Ramps
- Complete a multiple-choice Exit Exam with a score of 80% or above.

Standards

- This course complies with all Federal and California Standards pertaining to Disabled Accessibility Guidelines.
- California Code of Regulations, Title 8, Section 1720 (4)(29) for the placement of concrete.
- OSHA 29 CFR 1926 (Construction Safety Regulations)
- OSHA 29 CFR 1926.700 Subpart Q (Concrete & Masonry Construction)

Classroom Rules and Procedures

- All classes begin at 6:30 am and end at 3:00 pm
- Upon entering classroom, all participants must sign in and be seated by 6:30 am
- Class will consist of a combination of lecture, video, demonstration, coached group exercises, individual exercises and assessment.
- Students are required to report to class ready to work and maintain the provided PPE

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Textbooks/Readings/Materials

- *Basic Construction Math*-LIUNA Training (Instructor & Participant Guides)
- *Math for Pipelayers*-LIUNA Participant Guide
- *Estimating Concrete Quantities*-LIUNA Training (Instructor & Participant Guides)
- *Concrete Placement and Consolidation*-LIUNA Training (Instructor & Participant Guides)
- *Concrete Finishing and Curing*-LIUNA Training (Instructor & Participant Guides)
- *Site Preparation for Concrete Placement*-LIUNA Training (Instructor & Participant Guides)
- Concrete Placement Power Points; Curb & Gutter (4), Drive, Sidewalk
- Reading a Rule Handout
- Types of Portland Cement Handouts (6)
- Types of Tampers Packet
- Control Joints Handouts
- Section 6 Packet (Placing, Finishing, and Joining Slabs on Concrete)
- Flatwork Drives PowerPoint
- Section 7 Packet (Curing and Protection of Concrete)
- Concrete Packet-"Chapter 7"
- Flat Work Power Trowel PowerPoint

Tools/Equipment/Other Materials

- 10 -nail bags
- 10-Tape measure
- 10-Hammer
- 10-Torpedo level
- 10- speed square
- 10-8 lb. sledge hammer
- 5- 12" curb and gutter forms
- 10-6" curb and gutter forms
- 6-2" x 4" x 16' DF (Douglas Fir)
- 5-Sheets of 3/4" ACX plywood
- 1 box 8" snap ties (short)
- 100-"A" brackets
- 50- 2" x 4" x 8' DF
- 2- 3/4" radius Walking cove
- 2-3/4" Walking noser
- 2-12" Walking Fresno
- 2-1/2" Walking edger
- 2-stainless steel hand joiners
- 2-butterfly joiner

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- 1-18" Horsehair broom
- 1-8" curb broom
- 1-5' Straight edge
- 1-4' concrete tamp
- 1-4' wooden bull float
- 1-3' wooden bull float
- 2-1/2" radius Walking lay down edgers
- 2-1/2" radius Walking finishing edgers
- 2-4' Concrete cutters
- 2-36" Fresno
- 2-30" Fresno
- 1-4' Horsehair broom
- 1-4' Aluminum broom
- 1-ADA ramps truncated domes
- 1-4' Smart level
- 1-4' level
- 10-Screed hooks
- 50-Curb hooks
- 10-finishing belts
- 10-4" x" square finishing trowel
- 10-4" x 16" wooden hand float
- 10-2" x 8" marginal trowel
- 10-1/2" radius hand edger

Personal Protective Equipment

- 12 pairs of gloves
- 12 pairs of safety glasses
- 20 pairs of earplugs
- 12 hard hats
- 12 pairs of rubber boots

Course Requirements

To receive credit for the course, participants must:

- Be present for full forty hours
- Participate in all classroom exercises
- Pass a written exam

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- Pass three hands-on exams

Course Policies

- Participants must be on-time and ready to work.
- Participants must return from breaks on-time.
- Participants must participate in each exercise and assignment
- Participants who are on “light duty” are not allowed to take this course due to the physically demanding requirements.

Assessment and Grading

Participants will be assessed on the following:

- All written exams must be passed with a score of 80% or above.
- All hands-on exercises are graded on performance and participation. They are pass/fail and must be passed with a score of 80% or above.

Safety

Failure to maintain and use PPE may result in dismissal from the course.