

Laborers Cement Mason  
**Form Setting Techniques Syllabus**

**Time:** 40 hours

**Maximum Class Size:** 12

**Prerequisites:** LCM Construction Math

**Course Description:** This course is designed to introduce the participant to the basic skills needed to be successful on the jobsite. How to prepare, construct and strip job-built forms will be addressed. The types of forming techniques covered are: curb & gutter, valley gutter, sidewalk, driveway, approach & handicapped access ramps and pour-in-place walls. In addition, the basic math concepts required for this scope of work will be reviewed. The participant will be instructed on the importance of preparing a site correctly and thoroughly for concrete placement. They will learn about sub-grade and preparing forms and receive hands-on training on successful site preparation. Once the site is correctly prepared, the participant will be introduced to the formwork necessary to hold concrete in place.

**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.
- 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 a group, layout a batter-board and string-line setup for a slab using a leveling instrument to establish proper grade.
- Describe and identify basic forming hardware, tools and common forming systems.

**Goals/Objectives/Student Learning Outcomes continued:**

## Laborers Training School

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- Describe three safety hazards that are associated with concrete forming operations; describe at least one action to take in preventing each hazard.
- Given a drawing of an 8' x 8' x 4" slab to be built, list the tools, equipment, hardware and materials needed to layout and build the formwork for the slab.
- Given the necessary tools, hardware and materials, lay out and build the formwork for a slab (to within +/- 0.02' grade).
- Given the necessary tools, hardware and materials, lay out and build the formwork for a wall (to within +/- 0.02' grade).
- Given the necessary tools, hardware and materials, lay out and build the formwork for a column with a footing (to within +/- 0.02' grade).
- Describe at least two hazards of form removal and cleanup; describe at least one method to protect against each hazard.
- Demonstrate form cleaning, stacking and storage procedures.

### Standards

- 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)
- This course complies with all Federal and California Standards pertaining to Disabled Accessibility Guidelines.

### 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

### Textbooks/Readings/Materials

- *Basic Construction Math*-LIUNA Training (Instructor & Participant Guides)
- *Job Built Forms for Concrete Placement*- LIUNA Training (Instructor & Participant Guides)
- *Site Preparation for Concrete Placement*- LIUNA Training (Instructor & Participant Guides)
- *Pneumatic Tools* DVD
- *Job Built Forming* DVD
- *Site Prep for Concrete Placement* DVD
- PowerPoints: *Formwork, Curb & Gutter Form Setting Techniques, Curb & Gutter Finishing Techniques, Curb & Gutter Details, and Concrete Pours.*

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- Hand-outs: *LIUNA Concrete Placement & Consolidation* PG p. 14-19.
- Hand-out: *List of all PPE and Equipment*
- Hand-outs: *Nuclear Test, Soil Compaction Methods, Vibratory Rammers, Vibratory Plates*
- Hand-outs: *Converting Decimals Clock Method-2 pages*
- Hand-outs: *6" Curb Detail, Curb & Gutter Detail, 3' Wide Valley Gutter, Concrete Walk, Concrete Paving*
- Hand-outs: *Laying Out the Building-3 pages*
- Hand-outs: *HUB Tilt-Up and Forming Products-10 pages*
- Hand-out: *Wall Formwork Calculations*

**Tools/Equipment/Other Materials:**

- 10 -nail bags
- 10-Tape measure
- 10-Hammer
- 10-Torpedo level
- 10-Speed square
- 10-8' sledge hammer
- 2-Skil saws
- 2-50' extension cords
- 1 generator
- 2-¼" masonry bit
- 2-3/8" masonry bit
- 2-1/2" masonry bit
- 1 Roto-hammer
- 100-3' iron stakes
- 50-18" iron stakes
- 2-4' levels
- 1-4' Smart Level
- 5-Engineer's rulers
- 5- 12" curb and gutter forms
- 10-6" curb and gutter forms
- 6-2" x 4" x 16' DF (Douglas Fir)
- 5-Sheets of ¾" ACX plywood
- 1 box 8" snap ties (short)
- 100-"A" brackets
- 1-Laser level with tripod and grade pole (10<sup>th</sup> and 100<sup>th</sup>)

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**Personal Protective Equipment**

- 12 pairs of safety glasses
- 20 pairs of ear plugs
- 12 hard hats

**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
- Pass four 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.