

## Concrete R & R Syllabus

**Time:** 40 hours

**Maximum Class Size:** 12

**Prerequisites:** None

**Course Description:** Concrete is the primary building material for the construction of roads, pavements, buildings, tunnels, foundations, subterranean facilities, culverts, and other structures throughout California. This course will cover the tools and materials used in this scope of work, calculating and estimating concrete quantities, preparing subgrade, and placing, floating and finishing a concrete slab. Ample time is provided for the participants to develop proficiency in basic concrete-related skills.

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

- Convert U.S. standard measurements to decimal.
- Read elevations with a laser level.
- Estimate concrete quantities.
- List the uses of different aggregates, cement, water, and additives.
- Perform a slump test.
- Describe the methods of conveying, placing, pumping, and consolidating concrete.
- Understand the causes of honeycombing and segregation.
- Set and reinforce slab forms.
- Strip and clean forms.
- Identify ties and anchors.
- Identify and use tools specific to concrete scopes of work.
- Determine how soil types and moisture content will affect compaction.
- Prepare sub grades and compact with tampers, rammers, and vibrating plates.
- Place, float, edge, and finish a concrete slab.
- Strip and clean forms.
- Cut concrete with a powered walk-behind saw.
- List PPE, scopes of work, tools, and heavy equipment used in concrete operations.

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### Standards

- OSHA 29 CFR 1926: Subpart E: Personal Protective Equipment
- OSHA 29 CFR 1926.702(c): Working with power concrete trowels
- OSHA 29 CFR 1926.702(h): Working with Bull Floats
- OSHA 29 CFR 1926.703(a): General requirements for formwork
- OSHA 29 CFR 1926.1153: Silica

### 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

- *Estimating Concrete Quantities*-LIUNA Training
- *Concrete Placement and Consolidation*-LIUNA Training
- *Job-Built Forming for Concrete Placement*-LIUNA Training
- *Site Preparation for Concrete Placement*-LIUNA Training
- *Soil Compaction*-LIUNA Training
- *Concrete Finishing and Curing*-LIUNA Training
- *Sawing Concrete*-LIUNA Training
- *Basic Construction Math*-LIUNA Training
- "Decimal Conversion" Handout
- "Concrete Orientation"- DVD
- "Concrete Program"-DVD
- "Reference Stake for Roadway, Curb & Gutter"
- "Basic Principles Used in the Transfer of Grade"-DVD
- "Concrete Vibration"- DVD
- "Concrete Orientation Exercise"
- "Reading a Rule Worksheet"-CITEC, W. Gray

### Tools/Equipment/Other Materials

- Hand Tools; tape measures, hammers, shovels, floats, steel stakes, etc.
- Power Tools; compactors, saws, etc.
- Form lumber
- PPE; gloves, boots, knee pads, etc.

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### Personal Protective Equipment

- 12 pairs of gloves
- 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 two 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.