Tilt-Up Syllabus

Time: 40 hours

Maximum Class Size: 12

Prerequisites: None

Course Description: Tilt-up construction is a type of building and a construction technique using concrete. It is a cost-effective, safe and fast method used in office buildings, retail centers, warehouses, distribution centers, manufacturing facilities, parking structures and other commercial/industrial structures. In tilt-up construction, the building's walls are poured directly at the jobsite in large slabs of concrete called "tilt-up panels." These panels are then raised into position around the building's perimeter to form the exterior walls. Topics included are PPE, hand and power tools, heavy equipment, surveying, staking, and reading site plans. Students will receive hands-on training in the preparation, pouring, casting and cutting of panels, flat-work, and the tilt-up process. Those who complete the course will possess the knowledge to work safely and efficiently on a tilt-up jobsite.

Goals/Objectives/Student Learning Outcomes:

1. Explain the term *tilt-up*
2. Describe the history of *tilt-up* construction
3. Describe the methods and processes used in *tilt-up* construction
4. Describe the Personal Protective Equipment required in *tilt-up* construction.
5. Describe what hand tools are used in *tilt-up* construction
6. Describe what heavy equipment is used in *tilt-up* construction
7. Identify the materials needed for *tilt-up* construction
8. List and identify at least three tools used in concrete placement
9. Identify common tools used for finishing concrete and describe the purpose of each tool.
10. Given a scenario involving concrete placement for a wall, identify the tools needed, and demonstrate concrete placement and vibration techniques for walls
11. Describe two types of blades used in walk behind saws, the type of cutting they are used for, and the limitations of each.
12. Describe the main hazard associated with sawing/cutting concrete and the best way to control the hazard.
13. Describe the basic process of exposing aggregate in concrete using the seeding, brushing, and washing method.
14. Given the proper tools, equipment and PPE, demonstrate the seeding method for creating an exposed aggregate finish on a freshly placed slab of concrete.

Standards Addressed

- CAL/OSHA Standard 1707 (b) Power Operated Hand Tools
- OSHA 29 CFR 1926.302 (b): Pneumatic Tools

Tilt-Up Syllabus

- OSHA 29 CFR 1910.95: Occupational Noise Exposure
- OSHA 29 CFR 1926-Subpart E: Personal Protective Equipment
- OSHA 29 CFR 1926-Subpart I: Tools-Hand and Power
- OSHA 29 CFR 1926.1153: Silica
- OSHA 29 CFR 1926 Construction Safety Regulations
- OSHA 29 CFR 1926.700 Subpart Q Concrete & Masonry Construction
- California Code of Regulations, Title 8, Section 1720 (4)(29) for the placement of concrete

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

- **"**What is Tilt-Up Construction?" Power Point
- *Subpart I Tools-Hand and Power*: LIUNA Training and Education
- *Subpart E*: *Personal Protective*: LIUNA Training and Education
- *Concrete Placement and Consolidation*-LIUNA Training
- *Concrete Finishing and Curing*-LIUNA Training
- *Sawing Concrete*-LIUNA Training
- OSHA Silica Standard Handout
- Tilt-Up Hands-On Assessment
- Tilt-Up written exit exam

Tools/Equipment/Other Materials:

- 10-Nail bags
- 10-Tape measure
- 10-Hammer
- 10-Torpedo level
- 10-Speed square
- 10-8 lb. sledge hammer
- 10-Finishing belt
- 10-4" x 16" resin hand float
- 10- 5"x 12" square trowel
- 10-5" x 20" square finishing trowel
- 10-3" x 8" square finishing trowel
- 10-2" x 8" Marginal trowel
- 10- ½" radius Hand edger

Tilt-Up Syllabus

- 1- 4’ Smart level
- 1-10’ aluminum screed
- 1-12’ aluminum screed
- 10-screed hooks
- 50-18” iron stakes
- 10-2” x 4” x 16’ DF
- 1-vibratory screed
- 1-4’ roller tamp
- 1-4’ Fresno
- 1-4’ concrete hand tamp
- 1-4’ wooden bull float
- 1-6’ magnesium bull float
- 1-10’ highway straight edge
- 1-12’ highway straight edge
- 10-pairs stainless steel sliders
- 2-3’ Walk-behind power trowels
- 2-sets 36” pans with locking pins
- 2- ½” radius walking-edger
- 2-36” concrete cutters
- 5-stainless steel hand joiners
- 2-stainless steel walking joiners
- 2-funny trowels
- Tools: 25 ft. recoil tapes
- Shovels (long & short handles)
- Floats
- Edgers
- Darby
- Bull float
- Fresno float trowel
- Grovers/jointers
- Steel Trowels
- Broom/Brush
- Buckets
- Margin
- Pea gravel
- Stenciling material
- Stamping mats
- Coloring agents
- Release agent
- Power trowel.
- Trowels
- Nylon brushes
- Hand-tampers

Tilt-Up Syllabus

Personal Protective Equipment

- 12 pairs of gloves
- 12 pairs of safety glasses
- 20 pairs of ear plugs
- 12 hard hats
- 12 pairs of rubber gloves
- 12 pair 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
- Pass a hands-on exam

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.