

# CONCRETE & MASONRY

## THESE POLICIES ARE CONCRETE.

### PURPOSE

Concrete work is an essential and commonplace part of our industry. However, since it is so commonplace, it would be easy to take the safety and health aspects of working with concrete for granted. This policy is intended to address some of the common hazards associated with concrete work and countermeasures designed to protect persons who are involved in concrete work.

Each employee-owner will comply with §29 CFR 1926, Construction Industry Regulations, Subpart Q – Concrete and Masonry Construction in addition to the following requirements.

### ROLES & RESPONSIBILITIES

#### Project Supervision

- Project supervision will be responsible for jobsite safety program compliance and / or implementation of corrective measures recommended by a safety audit, if applicable.
- Train employee-owners and subcontractors in reinforcing steel protection requirements in the Safety Management Program.
- Provide employee-owners with sufficient personal protective equipment (PPE) to protect against concrete exposure hazards.

#### Safety Manager

- Auditing the jobsite for Program compliance and assisting supervisor in implementation of corrective measures, if applicable.

### GENERAL REQUIREMENTS

#### Construction Loads

- No construction loads shall be placed on a concrete structure or portion of a concrete structure unless information received from a person who is qualified in structural design determines the structure or portion of the structure is capable of supporting the loads.

#### Reinforcing Steel (Rebar)

- All protruding rebar, onto and into which employee-owners could fall, shall be guarded to eliminate the hazard of impalement.
  - + Use steel reinforced rebar caps or wooden troughs made from planks to prevent impalement as shown in Exhibit 3.A.001.
  - + Mushroom-style plastic rebar caps are not permitted for impalement hazards (Exhibit 3.A.002).
  - + Employee-owners working above rebar on ladders, scaffolds or platforms shall be protected through fall protection controls approved by a competent person.

EXHIBIT 3.A.001

#### Acceptable Reinforcing Steel Protection

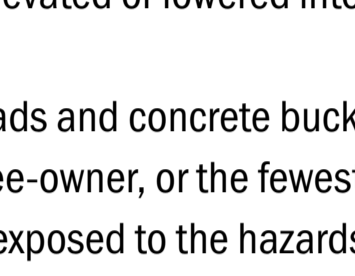
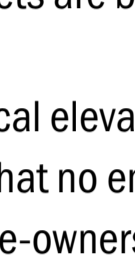
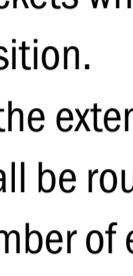
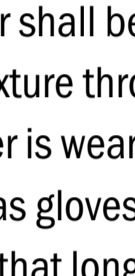
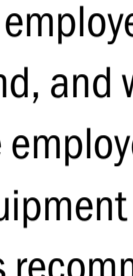


EXHIBIT 3.A.002

#### Unacceptable Reinforcing Steel Protection



#### Post-Tensioning Operations

- No employee-owners (except those essential to the post-tensioning operations) shall be permitted to be behind the jack or at the other end during tensioning operations.
- No employee-owners shall be permitted above or alongside the full length of the tendons during tensioning operations.
- Signs and barriers shall be erected to limit employee-owner access to the post-tensioning area during tensioning operations.

#### Riding Concrete Buckets

- No employee-owner shall be permitted to ride concrete buckets.

#### Concrete Deadman Designs

- Concrete deadman will be constructed as described or approved by the project plans or Project Manager.

#### Working Under Loads

- No employee-owner shall be permitted to work under concrete buckets while buckets are being elevated or lowered into position.
- To the extent practical elevated loads and concrete buckets shall be routed so that no employee-owner, or the fewest number of employee-owners, are exposed to the hazards associated with falling loads and concrete buckets.

#### Personal Protective Equipment

- No employee-owner shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee-owner is wearing protective head and face equipment as well as gloves.
- It is recommended that long sleeved shirts be worn to minimize exposure to concrete. If the sleeves become saturated with wet concrete, the shirt must be changed immediately.
- Rubber boots prevent contact with concrete. When pants are taped inside, concrete will not enter the boots.
- Employee-owners should use knee pads and kneeboards if they kneel on wet concrete.

### REQUIREMENTS FOR EQUIPMENT AND TOOLS

#### Bulk Cement Storage

- Bulk storage bins, containers, and silos shall be equipped with the following:
  - + Conical or tapered bottoms; and
  - + Mechanical or pneumatic means of starting the flow of material.
- No employee-owner shall be permitted to enter storage facilities unless the ejection system has been shut down, locked out, and tagged to indicate that the ejection system is not to be operated.

#### Concrete Mixers

- Concrete mixers with one cubic yard or larger loading skips shall be equipped with the following:
  - + A mechanical device to clear the skip of materials; and
  - + Guardrails installed on each side of the skip.

#### Power Concrete Trowels

- Powered and rotating type concrete troweling machines that are manually guided shall be equipped with a control switch that will automatically shut off the power whenever the hands of the operator are removed from the equipment handles.

#### Concrete Buggies

- Concrete buggy handles shall not extend beyond the wheels on either side of the buggy.

#### Concrete Pumping Systems

- Concrete pumping systems using discharge pipes shall be provided with pipe supports designed for 100 percent overload.
- Compressed air hoses used on concrete pumping system shall be provided with positive fail-safe joint connectors to prevent separation of sections when pressurized.

#### Concrete Buckets

- Concrete buckets equipped with hydraulic or pneumatic gates shall have positive safety latches or similar safety devices installed to prevent premature or inadvertent dumping.
- Concrete buckets shall be designed to prevent concrete from hanging up on top and the sides.
- Equip buckets with a discharge device that an employee-owner can operate without being exposed to the load.
- Refer to Rigging a Load policy for information on rigging a concrete bucket.

#### Tremies

- Use tremies that are manufactured for the specific purpose of conveying concrete. Do not use makeshift apparatus or assemblies.
- Sections of tremies and similar concrete conveyances shall be secured with wire rope (or equivalent materials) in addition to the regular couplings or connections.

#### Bull Floats

- Bull float handles used where they might contact energized electrical conductors, shall be constructed of nonconductive material, or insulated with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection of a handle constructed of nonconductive material.
- Position operations so that bull float handles do not conflict with traffic.

#### Masonry Saws

- Masonry saw shall be guarded with a semicircular enclosure over the blade.
- A method for retaining blade fragments shall be incorporated in the design of the semicircular enclosure.
- Water shall be used during cutting operations to reduce the risk of respiratory dust exposure and cool the saw blade.

#### Lockout/Tag Out Procedures

- No employee-owner shall be permitted to perform maintenance or repair activity on equipment where the inadvertent operation of the equipment could occur and cause injury, unless all potentially hazardous energy sources have been locked out and tagged.
- Tags shall read “Do Not Start” or similar language to indicate that the equipment is not to be operated and the keys shall be removed and placed into the possession of the supervisor.
- Refer to Lockout / Tag out Policy for more information.

### CAST-IN-PLACE CONCRETE

#### Formwork

- Formwork shall be designed, fabricated, erected, supported, braced and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork.
- Drawings or plans, including all revisions, for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, shall be available at the jobsite. Electronic drawings or plans are acceptable.
- Plan ingress / egress for anyone working within the formwork.

#### Shoring and Re-shoring

- All shoring equipment (including equipment used in reshoring operations) shall be inspected prior to erection to determine that the equipment meets the requirements specified in the formwork drawings.
- Shoring equipment found to be damaged such that its strength is reduced to less than that required by §29 CFR 1926.703(a)(1) shall not be used for shoring.
- Erected shoring equipment shall be inspected immediately prior to, during, and immediately after concrete placement.
- Shoring equipment that is found to be damaged or weakened after erection, such that its strength is reduced to less than that required by §29 CFR 1926.703(a)(1), shall be immediately reinforced.

#### Placement

- For mass pours conduct a pre-pour meeting or complete a pre-pour checklist
- Plan access / egress for trucks to minimize conflict points.
- Maintain line of sight between pump truck operator, hose operator, and employee-owners working within pour or use a spotter.
- Locate concrete washout pits to avoid conflicts with full trucks entering the construction site. Follow all environmental requirements.
- Rate of pour and vibration loads must not exceed the formwork design limits or manufacturer’s recommendations.

#### Removal of Formwork

- Forms and shoring (except those used for slabs on grade and slip forms) shall not be removed until the concrete has gained sufficient strength to support its weight and superimposed loads. Such determination shall be based on compliance with one of the following:
  - + The plans and specifications stipulate conditions for removal of forms and shores, and such conditions have been followed; or
  - + The standard has been properly tested with an appropriate ASTM standard test method designed to indicate the concrete compressive strength, and the test results indicate that the concrete has gained sufficient strength to support its weight and superimposed loads.
- Re-shoring shall not be removed until the concrete being supported has attained adequate strength to support its weight and all loads in place upon it.
- Initial Hardware Removal: For formwork removal operations that require the use of hoisting and rigging equipment to remove sections and components the number of hardware component locations (minimum 2 points) will be determined with the following considerations:
  - + Size/weight of the formwork to be
  - + Formwork manufacturer instructions for removal
  - + The removal sequence of the section – top/down or bottom/up
  - + Wire materials will not be utilized as the remaining hardware components.
  - + Consideration of other formwork components that will be impacted by formwork and hardware removal such as back sides of formwork, connecting hardware, adjacent forms, etc.
- Final Hardware Removal: If possible, final hardware shall be removed from the ground or in a position not requiring a personal fall arrest connection to the formwork being removed. Considerations will include:
  - + The formwork logistics, manufacturer, and configuration.
  - + Other fall arrest anchor point connections such as adjacent formwork, anchors placed in adjacent concrete, mobile elevated work platforms (MEWPs), nearby rebar, etc.
  - + Stripped formwork shall not be left leaning and unsecured to prevent tip over.
  - + Employee-owners involved in applicable tasks will be trained on these requirements.
  - + Deviations from the requirements in this section must be approved by a designated member of project supervision involved in this task.

### PRECAST CONCRETE

#### Rigging

- A qualified person is required to be responsible for the inspection of all rigging and hardware and the supervision of the rigging of precast concrete members.
- Lifting inserts which are embedded or otherwise attached to tilt-up precast concrete members shall be capable of supporting at least two times the maximum intended load applied or transmitted to them.
- Lifting inserts that are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the maximum intended load applied or transmitted to them.
- Do not exceed the working load limit of the lifting hardware.
- Refer to Rigging a Load in the Company Safety Management Program for more information.

#### Unloading of Precast Concrete Members

- Precast concrete members usually have recommended pick points. Use manufacturer provided pick points and lifting instructions to ensure proper lifting and handling of precast members. Improper picking of precast members can result in damage and failure of the precast element.
- Prior to precast concrete members being unloaded, all rigging and hardware will be inspected, ensure that the member is properly rigged.
- Prior to releasing the rigging, ensure that the load is properly placed and supported. Like picking, precast members are typically designed to be placed and supported in specific ways. Follow, plans, specifications, shop drawings and manufacturer recommendations regarding precast picking and placement.

#### Placement of Precast Concrete Members

- Precast members are not to be moved over employee-owners. Employee-owners involved in the setting or connecting of precast members will strictly adhere to the 100% fall protection policy with no exception. No employee-owner will use hands to reach under a precast member to adjust a shim or bearing pad.
- Precast concrete wall units, structural framing, and tilt-up wall panels shall be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed.
- No employee-owner shall be permitted under precast concrete members being lifted or tilted into position except those employee-owners required for the erection of those members.