


<i>HEALTH AND SAFETY MANUAL</i>	
Title: Concrete and Masonry Construction	
Approved by: Greg Savoy	Rev. 1/1/08

1 Purpose/Scope:

This program sets forth safety requirements and hazard controls for concrete or grout mix and pour operations.

This program applies to all Company concrete or masonry operations. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Company employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

2 Definitions/Responsibilities:

2.1 Definitions

- 2.1.1 Shoring - a supporting member that resists a compressive force imposed by a load.
- 2.1.2 Forms - the total system of support for freshly placed or partially cured concrete, including the mold or sheeting that is in contact with the concrete as well as all supporting members including shores, hardware, braces, and all related hardware.

2.2 Responsibilities:

2.2.1 Management:

- Ensure all equipment is routinely serviced and maintained in a safe condition.
- Conduct periodic on-site inspection of operations.
- Provide operation and safety training for affected employees.

2.2.2 Supervisors

- Ensure access to operation areas are controlled.
- Provide continuous safety observation and control.
- Provide immediate corrective training for all unsafe acts.
- Conduct pre-pour inspections.

2.2.3 Employees

- Follow all safety and operational procedures.
- Immediately notify supervisor of all unsafe conditions.

3 Requirements:

3.1 Shoring

- 3.1.1 All Shoring equipment shall be inspected prior to erection to determine that the equipment meets the requirements specified in the formwork drawings.
- 3.1.2 Shoring equipment found to be damaged shall not be used for shoring.
- 3.1.3 Erected shoring equipment shall be inspected immediately prior to, during, and immediately after concrete/grout placement.
- 3.1.4 Shoring equipment that is found to be damaged or weakened after erection shall be immediately reinforced or replaced.
- 3.1.5 The material used for shoring shall be sound, rigid, and capable of carrying the maximum intended load.

3.2 Formwork:

- 3.2.1 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.

3.3 Reinforcing Steel:

- 3.3.1 Reinforcing steel for structures shall be adequately supported to prevent overturning and to prevent collapse.
- 3.3.2 Measures shall be taken to prevent unrolled wire mesh from recoiling.
 - Such measures may include, but are not limited to, securing each end of the roll or turning over the roll.
- 3.3.3 All protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement.

3.4 Removal of Formwork:

- 3.4.1 Forms and shores shall not be removed until it has been determined that the concrete/grout 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.
 - The concrete/grout 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.

- Shoring shall not be removed until the concrete/grout being supported has attained adequate strength to support its weight and all loads in placed upon it.

3.5 Cement Pumping Operations:

3.5.1 When the initial plans are made to pump cement to the forms the supervisor should contact the company contracted to perform the cement pour and set up a meeting at the site.

- Explain and show the representative what is planned and what our expectations of their part of the job entail (i.e. set-up of equipment, location of the pour, and piping/hose requirements).

3.5.2 The pump discharge line shall be steel pipe with the exception of a hose whip at the end of the piping.

- The hose whip must remain as short as possible.

3.5.3 Protective material shall be placed on the client's floor/decking in order to protect from spillage.

3.5.4 A pump discharge line composed of pipe with a hose whip shall be used to lesson the effects of pressure changes in the piping due to clogs forming and releasing.

3.5.5 Visually inspect the inside of the hose whip for damages or frayed hoses.

- The condition of the hose is important to ensure good flow.

3.5.6 Use 45-degree fittings instead of 90-degree fittings.

- Locate the pump so the least amount of turns is created in the piping and hose run.
- This will help the flow of cement through the hose and help prevent clogs.

3.5.7 Workers shall be briefed on the hazards of pumping cement and necessary precautions.

- The supervisor shall monitor the hose and piping closely to stop as much hose movement as possible.

3.6 General:

3.6.1 Conduct a Job Safety Analysis (JSA) meeting with the workers at the beginning of each shift to review the hazards that each person may encounter and give instructions for hazard elimination and/or protection.

3.6.2 Inspect all tools and equipment at least daily before use.

3.6.3 Workers, mixing dry contents, saw cuts or other dust raising actions with concrete/grout, may be exposed to dust inhalation.

- Workers shall use approved respiratory protection when exposed to silica dust above the threshold limits.

- Implement dust control measures during sawing, grinding, chipping and mixing operations.
- 3.6.4 Ensure backup alarms work on all equipment and/or require all equipment to be escorted into position.
 - Keep workers out of the path of mixing trucks.
- 3.6.5 Be aware of the swing radius of the concrete chutes, pinch points and the handling of chutes.
 - Fingers caught in chute pinch points may be amputated.
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- 3.6.6 Permit one (1) person trained with standard crane hand signals to signal the crane operator swinging the cement bucket.
 - Ensure the swing path of the cement bucket is not over any personnel.
- 3.6.7 Check for overhead power lines and avoid contact with float handles, pump booms and other tools and equipment.
- 3.6.8 If electrical lines are too close for safe float and finish work, the concrete pour shall be reconfigured to avoid potential contact hazards.
- 3.6.9 Protect all moving parts of batch plants, mixers, portable mixers and other equipment with the appropriate safety guards or barriers.
 - Keep fingers, hands, loose clothing and hair away from pinch and catch points.
- 3.6.10 Determine the confined space applicability.
 - If the space is considered to be a confined space follow approved, client or Company, confined space procedures.
- 3.6.11 Use proper Lockout-Tagout (LOTO) procedures when cleaning, performing maintenance and repairing batch plants, mixers and other equipment.
- 3.6.12 Inspect all hand-held electrically powered tools and cords before use and keep them in good repair, as per the Assured Grounding Program.
 - Plug the tools into Ground-Fault Circuit Interrupters (GFCIs).
- 3.6.13 Provide and require the use of approved fall protection when workers are exposed to a fall greater than six (6) feet or more.
- 3.6.14 Use approved tied-off ladders and stairs to access all excavations and elevated heights.
- 3.6.15 Review Material Safety Data Sheets (MSDS) with the employees concerning the ingredients of the concrete/grout, both the basic and additive ingredients, and other items such as curing compounds and sealants.
- 3.6.16 Secure the work area to keep untrained personnel out.
 - The risk of injury increases dramatically when workers are distracted by outside hazards.

4 References:

29 CFR 1926.700 through 706 (Concrete and Masonry Construction)

5 Exhibits: None.