Lesson 1: Safety in Working with Concrete

Concrete is involved in nearly every type of construction project. Its benefits for construction ensure that it will continue to be popular in the future. Concrete does have a few specific hazards that are described in this lesson, but the potential for injury can be greatly minimized by following the suggestions given here.

What is Concrete?

Concrete is an artificial stone-like material consisting chiefly of sand, gravel, cement, and water. These materials are mixed together and harden and set due to a process called hydration, in which the cement combines with water and bonds to the different components. Concrete is a versatile construction material that can be adapted to almost any application and molded into many different shapes. It has a relatively low maintenance cost, is easily repaired and poured, and is easy to work. Figure 1.1 shows a list of some of the diverse uses of concrete.

Figure 1.1 - Uses of Concrete

Sidewalks	Roads	Brake linings
Foundations	Dams	Fence posts
Floors	Sewer pipes	Barges
Walls	Monuments	Canoes
Chimneys	Bridges	Caskets
Beams	Canals	Missile silos
Bricks	Bank vaults	Nuclear containment facilities

Dangers in Working with Concrete

A hazard encountered in concrete construction is tripping and falling. When preparing a site for concrete to be poured, rebar or wire is commonly staked and tied with wire at the site, creating a maze of wire and metal. Crossing this material only when necessary and taking care when doing so is the best way to avoid falling.

Working with concrete may involve different kinds of equipment that are potentially dangerous to other people. Tools such as power floats, which are gasoline-powered machines used to put a smooth surface on concrete, or mobile concrete shoots on trucks can kill a person if he or she is accidentally hit. Being alert at all times can help avoid accidents with equipment.

Burns caused by the chemicals in concrete are perhaps the most common injury when working with wet concrete. Concrete burns, which may involve large areas of the body, can be very severe; they consist of ulcerated areas where skin and flesh have been eroded away. These burns are extremely painful and require medical attention. The burns are caused by prolonged skin contact with some of the ingredients used to make cement. The amount of time before serious damage occurs will vary depending on the individual and situation. However, exposure of one hour or more will usually cause significant skin damage, and the length of time could be much less for someone with sensitive skin. By the time significant discomfort is felt, the skin has already been damaged, which often leads people to become careless since they do not realize they are injured until it is severe. Protective clothing and gear should always be used to prevent injury. Immediately flushing with water and washing an exposed area will likely prevent any effects.

If concrete is mixed on site, the cement in powder form has the same potential for injury as when it is mixed. Powdered cement may become airborne. This powder can be extremely irritating and damaging if it gets in the eyes or is inhaled, producing the same caustic results as exposure to wet cement. The use of proper protective gear minimizes this hazard.

Protective Clothing

The following items of clothing are of value in preventing injury. Workers should use protective eye gear, either goggles, which provide the best protection, or safety glasses, when working with cement in wet or powdered form. Disposable face masks are inexpensive and effective in reducing the amount inhaled when working with powdered cement. A long-sleeved shirt and heavy work pants will greatly reduce the amount of skin exposed.

Waterproof or heavy work gloves will protect the hands from exposure; waterproof gloves are preferable. Finally, rubber boots will help protect the feet from exposure.

Summary

Agricultural structures usually involve concrete. Being aware of the hazards involved and following the safety suggestions given in this lesson will greatly reduce the risk involved. Protective clothing is particularly important in preventing injury.

Credits

Huth, Mark W. *Construction Technology*. 2nd ed. Albany, N.Y.: Delmar Publishers, Inc., 1989.

Lindley, James A., and James H. Whitaker. *Agricultural Buildings and Structures.* Rev. ed. St. Joseph, Mich.: American Society of Agricultural Engineers, 1996.

Ahrens, Donald L. *Concrete and Masonry Construction*. St. Paul, Minn.: Hobar Publications, 1976.