

UNIT IV - CONCRETE

Lesson 1: Safety in Working with Concrete

Competency/Objective: Discuss safety in working with concrete.

Study Questions

1. What is concrete?
2. How can concrete be dangerous to people?
3. What is the proper personal protective clothing to use when working with concrete?

References

1. Agricultural Structures (*Student Reference*). University of Missouri-Columbia: Instructional Materials Laboratory, 1999, Unit IV.
2. Activity Sheet
 - a) AS 1.1: Concrete Safety

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Lesson 1: Safety in Working with Concrete

TEACHING PROCEDURES

B. *Introduction*

Concrete is a durable, versatile material of choice for many applications in agricultural structures. However, working with concrete does require some safety measures. Understanding and taking advantage of the suggestions provided in the lesson will help to ensure safety while working with concrete.

C. *Motivation*

Discuss how common concrete is used in construction. Ask if anyone knows of any injuries associated with concrete. If so, have them explain the injury. If not, tell the students that a few specific hazards will be outlined in this lesson.

D. *Assignment*

E. *Supervised Study*

F. *Discussion*

1. Ask students to explain what concrete is. Discuss the characteristics of concrete.

What is concrete?

- a) Concrete is an artificial stone-like material consisting chiefly of sand, gravel, cement, and water.
 - b) 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.
 - c) It is a versatile construction material that can be adapted to almost any application and molded into many different shapes.
 - d) Concrete has a relatively low maintenance cost, is easily repaired and poured, and is easy to work.
2. Discuss the following information on the possible hazards of construction with concrete.

How can concrete be dangerous to people?

- a) Tripping and falling over rebar and wire
 - b) Working with different kinds of potentially dangerous equipment
 - c) Chemical burns from concrete
 - 1) Perhaps the most common injury
 - 2) Consist of ulcerated areas where skin and flesh have been eroded away
 - 3) Caused by prolonged skin contact with some of the ingredients used to make cement; exposure of one hour or more will usually cause significant skin damage
 - 4) Prevent injury by using protective clothing and gear and immediately flushing with water and washing an exposed area
 - d) Airborne powdered cement getting in the eyes or being inhaled, producing the same caustic results as exposure to wet cement
3. Discuss protective clothing and gear with students. Show the class samples of as many of these items as possible. Hand out AS 1.1.

What is the proper personal protective clothing to use when working with concrete?

- a) Protective eye gear, either goggles, which provide the best protection, or safety glasses, when working with cement in wet or powdered form
- b) Disposable face masks to reduce the amount inhaled when working with powdered cement
- c) Long-sleeved shirt
- d) Heavy work pants
- e) Waterproof or heavy work gloves; waterproof gloves are preferable
- f) Rubber boots

G. ***Other Activities***

Ask your local EMS service, hospital, or nursing school if they would be willing to have someone come and talk to the class about concrete burns.

H. ***Conclusion***

The hazards of working with concrete are greatly minimized by staying alert and using protective clothing or gear. In most cases, avoiding a problem is the best way to deal with it.

I. ***Answers to Activity Sheet***

J. ***Answers to Evaluation***

- 1. a
- 2. c
- 3. To reduce the amount inhaled when working with powdered cement
- 4. Immediately flushing with water and washing an exposed area
- 5. One hour or more
- 6. An ulcerated area where skin and flesh have been eroded away
- 7. An artificial stone-like material consisting chiefly of sand, gravel, cement, and water

EVALUATION

Circle the letter that corresponds to the best answer.

1. Eye protection is recommended:
 - a. When working with wet or powdered cement.
 - b. When working with wet cement.
 - c. For exposure to cement in powdered form.
 - d. For non-professionals working with wet cement.

2. What is the most common type of injury when working with concrete?
 - a. Injuries from tripping and falling over rebar and wire
 - b. Injuries from working with equipment
 - c. Burns caused by the chemicals in wet concrete
 - d. Reactions from getting powdered concrete in the eyes

Complete the following short answer questions.

3. Why should disposable face masks be worn?

4. In addition to wearing personal protective clothing, what can be done to protect against injuries from concrete burns?

5. While the length of time before damage occurs may vary, how much exposure to wet concrete usually causes significant skin damage?

6. What does a concrete burn look like?

7. What is concrete?

Lesson 1: Safety in Working with Concrete

Name _

Concrete Safety

Objective: Observe concrete safety practices in use at a construction site.

Travel to a local construction site where concrete is being poured. Observe their activities, recording in the areas listed below the proper safety practices being used, as well as any others you think are appropriate. Also, record any improvements that could be made. Be prepared to discuss what you observed after returning to the classroom.

Clothing

Eye protection

Skin protection

How concrete is moved/handled

Ventilation requirements

Teamwork/working together

