Welcome to the Hard Hat Training Series!

Welcome to the Hard Hat Training Series! Today we will go over the essentials of concrete and masonry construction. Because concrete and masonry construction pose unique hazards, there are specific standards and regulations involved with this work.

Concrete: A History

Concrete and the technology used along with it has evolved throughout the centuries. The first recorded instance of concrete work was in 6500 BC. Here, it was used to make floors, housing structures, and underground cisterns.

Image Courtesy of the Jerusalem Antiquities Authority

The use of concrete became more widespread when the Romans began using it for the majority of their construction. They used a mix of volcanic ash, lime, and seawater in their mix. They packed the mix into wooden forms and let it harden, then used it much like masonry bricks. Structures make of Roman concrete are still standing to this day.

Today, concrete can be found in everything from sidewalks to roads, dams, and the most modern high-rises. It is such a familiar sight it is easy to forget the hazards associated with this versatile material. To illustrate the dangers of concrete and masonry construction, we want you to consider the following true story.

In the early afternoon on a Monday, five employees were working on the sixth floor of an apartment building construction site. Workers on the seventh floor of the building were pouring concrete. One of the employees on the sixth floor was in charge of checking for leaking concrete that would indicate the formwork beneath the wet concrete was failing.

As the concrete was poured, it became too heavy and the floor gave way. The formwork collapsed, injuring four of the employees on the sixth floor. They sustained crushing injuries and caustic burns, which comes from skin becoming exposed to wet portland cement. The fifth employee was crushed in the collapse and died.

Images Courtesy of Cincinnati Enquirer

This horrible accident was caused by improper shoring, which is a crucial concrete construction process that we will discuss later in this training. As you can see, mistakes in concrete and masonry construction can become truly catastrophic.

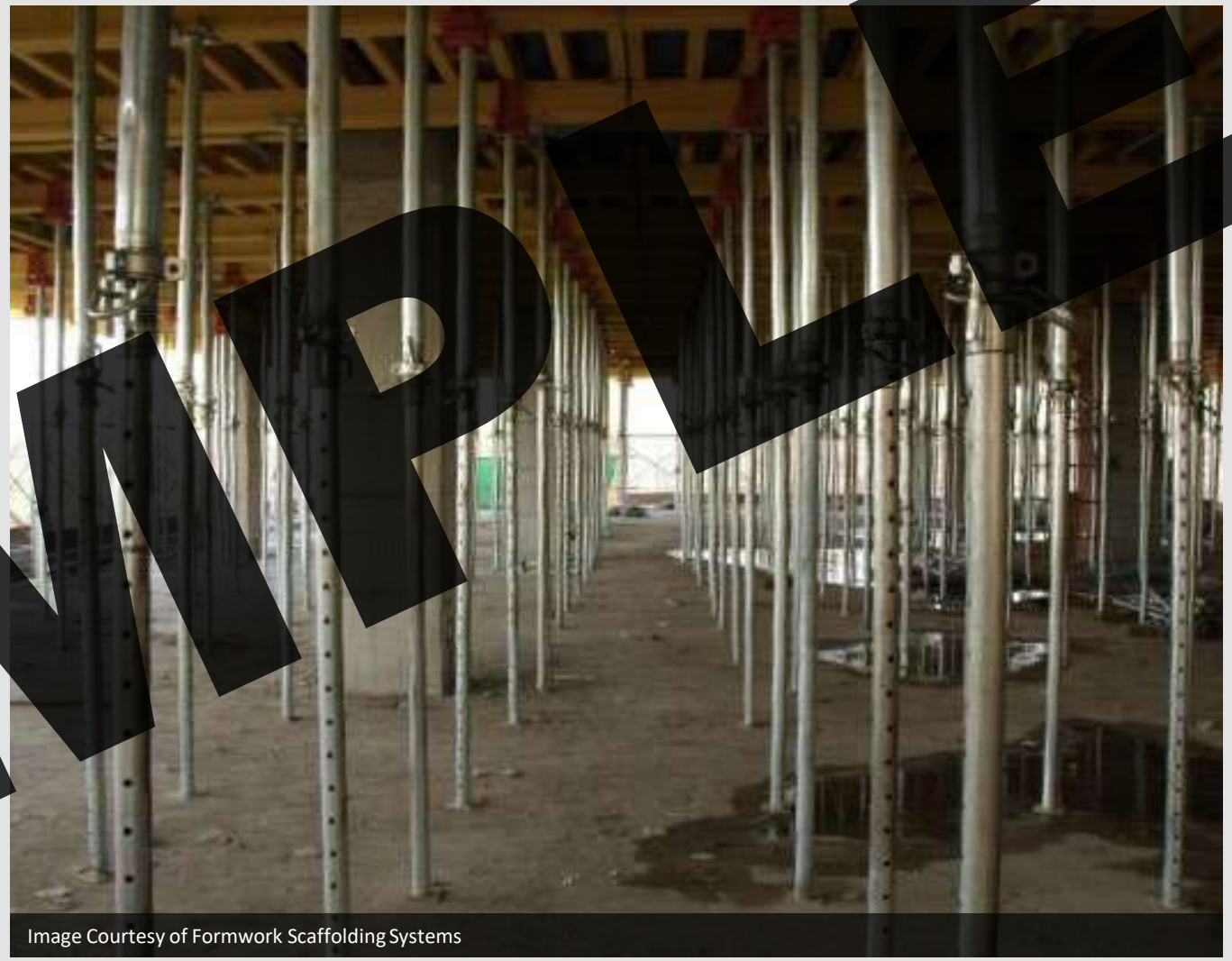
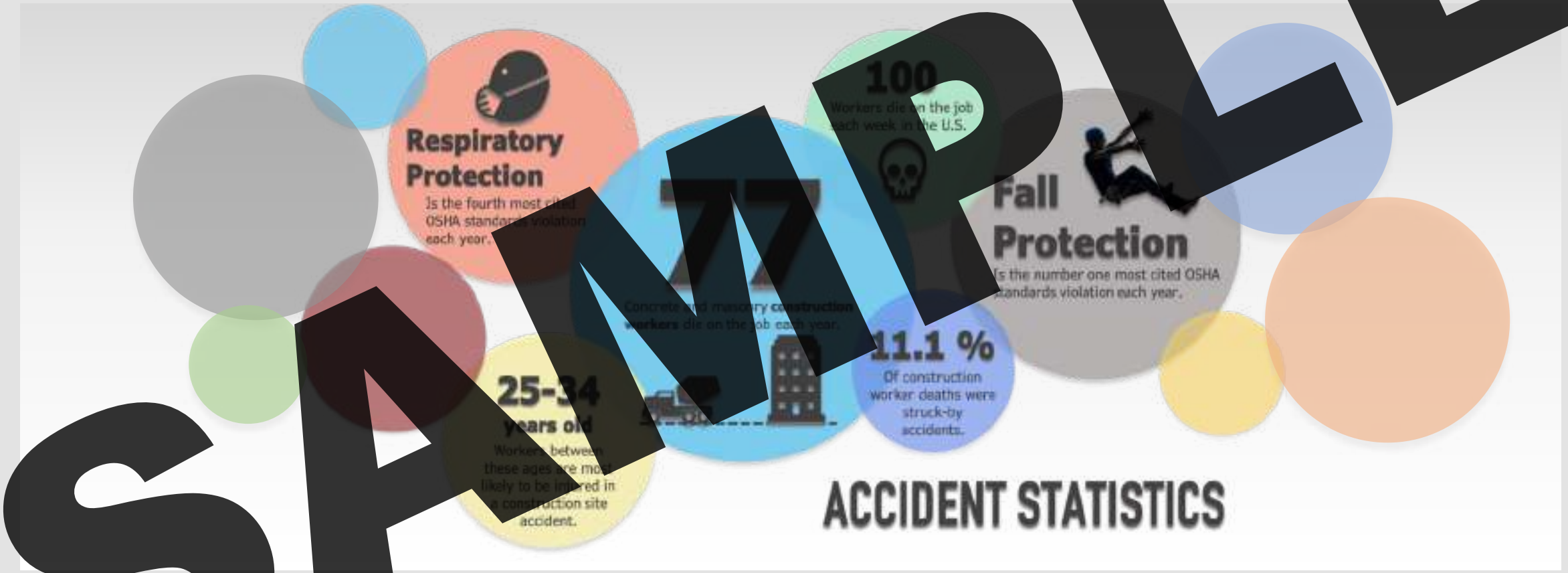


Image Courtesy of Formwork Scaffolding Systems

There are many different hazards you are exposed to in concrete and masonry construction. You may be familiar with OSHA's fatal four: falls, struck-by, electrocution, and caught-in/between. These hazards are *all* present in concrete and masonry construction. To give you some perspective, check out this graphic for more facts and figures.

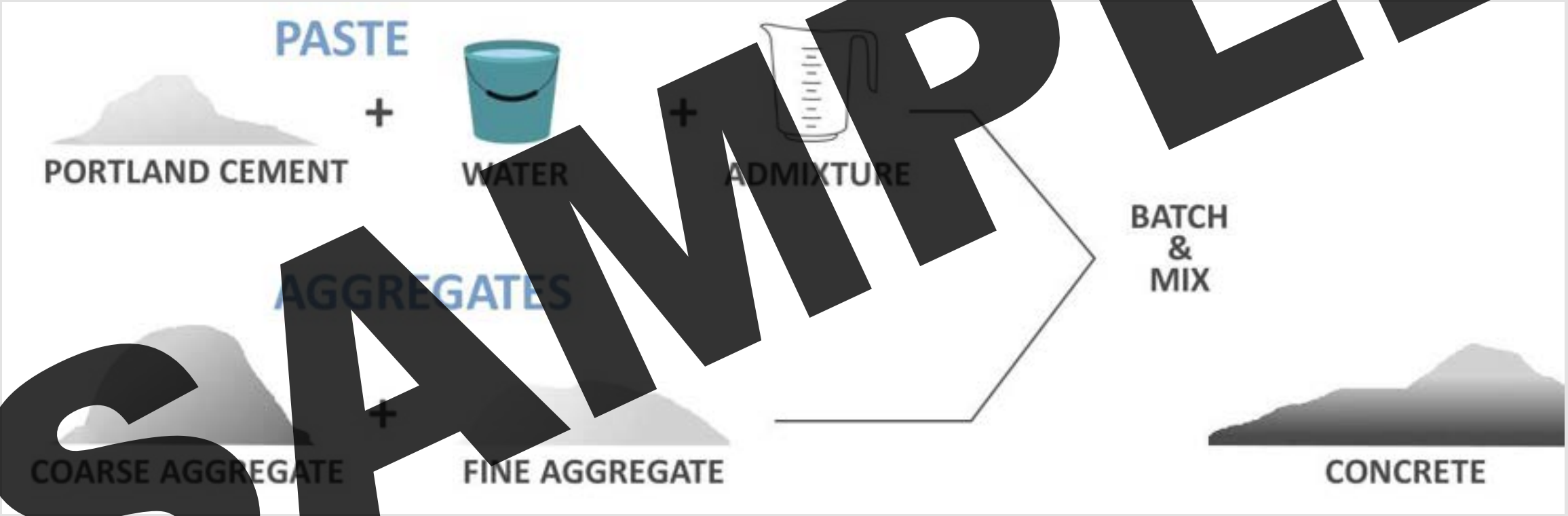


Definitions

Before we jump into the bulkier part of this training, we want to make sure that you understand a few of the vocabulary words that we'll be using. These next slides will define some of the terms we will be using throughout this training.

Concrete

You've probably heard the words "cement" and "concrete" used synonymously before. They are not the same thing; however, they are closely related in that cement is used to make concrete. Portland cement is the most common kind of cement used in construction. It is one of the main ingredients in concrete, but it is also used in mortar, plaster, grout, stucco, and terrazzo.



Masonry

When we talk about masonry construction, we are referring to creating structures out of individual masonry units that are sealed together with portland cement mortar. Masonry construction doesn't just involve bricks; it can also be concrete blocks or stone.

Formwork

Formwork is the complete system of supports used with freshly placed or partially cured concrete. Formwork includes the mold or sheeting that is in contact with the concrete. Formwork also consists of the shores, reshores, hardware, braces, and related hardware.

Image Courtesy of Designing Buildings Ltd.

In this training, we will talk about the machinery and equipment you will use on the job site. We will also cover safe operations in cement handling, concrete placement, vertical shoring and reshoring, and formwork.

We will look at how to safely handle prestressed and precast concrete and how to safely perform in lift slab operations and masonry construction. You will learn about the proper personal protective equipment (PPE) to use for concrete and masonry construction tasks.

Finally, we will go over the most common hazards associated with concrete and masonry construction. You will examine case studies and determine how to avoid similar accidents. By the end of this training, you will be a safer employee on a concrete or masonry construction site.

STANDARDS

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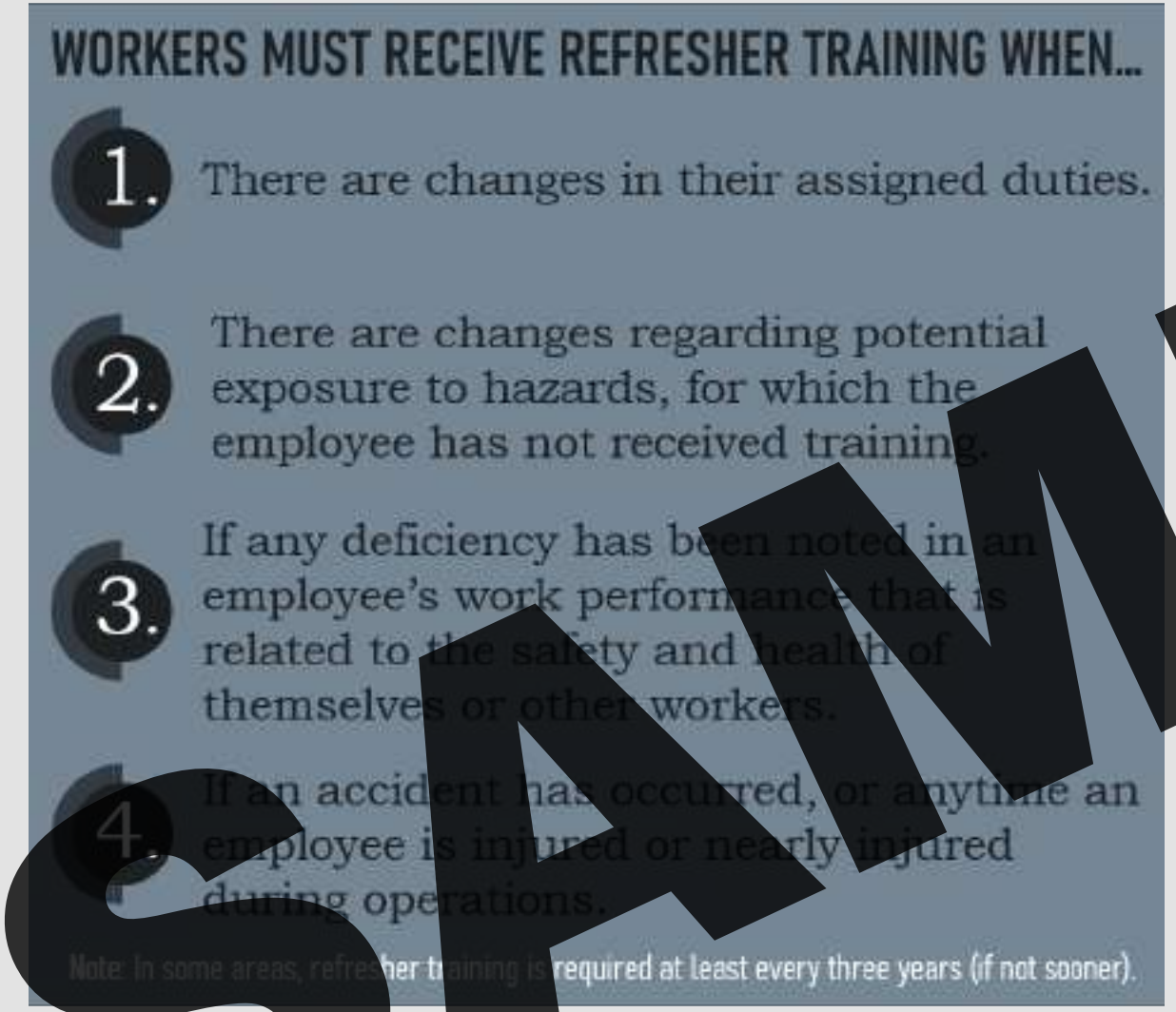
29 CFR 1926.700 – Concrete and Masonry Construction
29 CFR 1926.701 – General requirements
29 CFR 1926.702 – Equipment and tools
29 CFR 1926.703 – Cast-in-place concrete
29 CFR 1926.704 – Precast concrete
29 CFR 1926.705 – Lift-slab construction
29 CFR 1926.706 – Masonry construction
29 CFR 1910.135 – Head protection
29 CFR 1926.501 – Duty to have fall protection
ANSI A10.9-1983 – Concrete and Masonry Construction

These are some of the main standards concerning concrete and masonry construction safety. Many states have additional standards, as do some industries. We have provided these as a guide, but it's your responsibility to know all federal, local and company rules that apply to your job site.

Why Training?

No matter the situation, it is common to hear workers and even employers ask, “Where does it state we need to be trained?” Can’t a worker also be deemed “qualified” based on experience? The answer is “no.” Experience helps, yes, but OSHA makes it very clear that employees must be trained (no matter how long they’ve been on the job) and that it is the employer who is responsible for overseeing that safety training and evaluating the permit space program in order to confirm that the employees have the understanding, knowledge, and skills needed for safe concrete and masonry operations.

Initial training and refresher training, as well as any written and practical evaluations, must be documented and filed. At the very least, in the case of an investigation, OSHA will want to see proof of proper and consistent training (in the way of training outlines, class lists, training goals, tests, certificates, and so on.) These documents should include the name of the person who taught the class or conducted the evaluation.



Training is not just a one-and-done occurrence; it is on-going. In fact, similar to the guidelines set down for when initial training is required, regulations are specific when it comes to "refresher training." More specifically, OSHA acknowledges the need for "refresher" or "follow up" training whenever there is a demonstrated need for it. Can you think of any others?

The extent of training will be determined by the employer, but at the very least it should include classroom instruction followed by a written and practical examination that prove continued competency.

Equipment