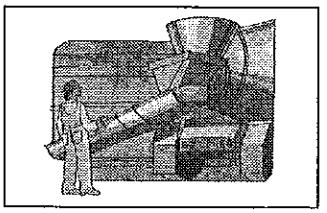


Special Trades—Concrete Construction Safety

Overview Of Topic

OSHA has requirements to protect construction employees from the hazards associated with concrete and masonry construction operations. These requirements can be found in 29 CFR Part 1926 Subpart Q. Of course, other provisions of the construction regulations apply to these operations.

Concrete construction can be divided into three distinct types:

- Cast-in-place concrete,
- Precast concrete, and
- Lift-slab operations.

What are some of the hazards involved in doing concrete construction work?

- Impalement,
- Caught in-between,
- Struck by falling objects, and
- Falls.

General safety requirements

The employer must:

- Determine if the concrete structure or portion of the concrete structure can support the construction load being placed on it (this determination must be based on information received from a person who is qualified in structural design).
- Guard all protruding reinforcing steel to eliminate the hazard of impalement (if there is a chance workers could fall onto or into the reinforcing steel).
- Not permit employees to be behind the jack during post-tensioning operations, except those essential to the process.
- Erect signs and barriers that limit employee access to the post-tensioning area.

- Not permit employees to apply a cement, sand, and water mixture through a pneumatic hose, unless the employee is wearing protective head and face equipment.
- Not allow employees to ride concrete buckets.
- Not allow employees to work under concrete buckets while the buckets are being elevated or lowered into position.
- Route concrete buckets so that the fewest number of employees are exposed to the hazards associated with falling concrete buckets.

Employee Training

While there are no specific training requirements for concrete construction, employers are required to comply with 29 CFR 1926.21(b)(2)—Safety training and education, employer responsibility.

Training Tips

Mention the general requirements covered in this Toolbox Talk. Discuss any additional site-specific safety issues that pertain to your jobsite.

Where To Go For More Information

29 CFR 1926.701—General requirements.

29 CFR 1926.21(b)(2)—Safety training and education, employer responsibility.

Accident Prevention Manual for Industrial Operations; Eighth Edition; National Safety Council.

Building Code Requirements for Reinforced Concrete (ACI 318-83).

Formwork for Concrete (ACI SP-4).

Recommended Practice for Concrete Formwork (ACI 347-78).

Safety Requirements for Concrete and Masonry Work (ANSI A10.9-1983).

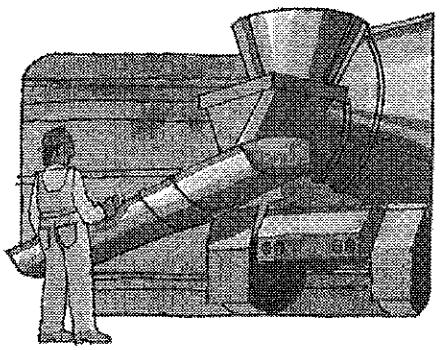
KELLER'S CONSTRUCTION TOOLBOX TALKS

Special Trades—Concrete Construction Safety

Concrete construction work is done on virtually every jobsite. OSHA has requirements to protect all construction employees from the hazards associated with concrete and masonry construction operations. These requirements can be found in 29 CFR Part 1926 Subpart Q.

Concrete construction can be divided into three distinct types:

- Cast-in-place concrete,
- Precast concrete, and
- Lift-slab operations.



What are some of the hazards involved in doing concrete construction work?

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- Not allow employees to ride concrete buckets.
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- Not permit employees to apply a cement, sand, and water mixture through a pneumatic hose, unless the employee is wearing protective head and face equipment.

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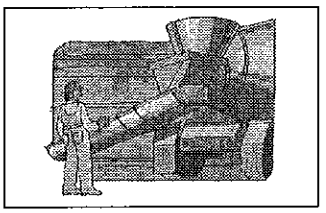

Special Trades—Concrete Construction Safety Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Special Trades—Concrete Construction Safety. The session covered:

- The types of concrete construction work.
- The types of hazards involved in doing concrete construction work.
- The general safety requirements.

The space below is for employees to "sign-off" that they were in attendance.

Date of Training: _____ **Job Location:** _____

Employee Signature	Print Name Here

Supervisor's Signature

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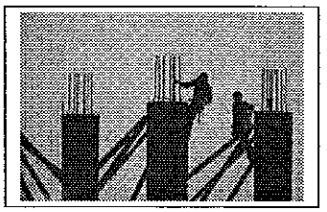


Special Trades—Concrete Construction—Impalement Protection

Overview Of Topic

OSHA requires that employees are protected against impalement hazards from exposed rebar. In the past (and possibly even today) the practice of using some type of plastic mushroom cap was an option. However, studies conducted by the California Division of Occupational Safety and Health (Cal/OSHA) showing the general ineffectiveness of rebar caps as impalement protection under requirements in 29 CFR 1926.701(b).

OSHA's position

The following information is from an OSHA Letter of Interpretation:

> The standard, 29 CFR 1926.701(b), states: "all protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement." The key words are "to eliminate the hazard of impalement." Exposure to impalement is always a consideration when employees are working above rebar or other sharp protrusions. The critical element when evaluating any job activity is the recognition or identification of impalement hazards and the exposure to employees.
>
> When employees are working at any height above exposed rebar, fall protection/prevention is the first line of defense against impalement. Fall protection/prevention is also applicable when the rebar is below grade, e.g., footings or other excavations, where a fall into a trench would present an impalement hazard.
>
> When work is at grade, impalement exposure is dependent upon numerous situations and conditions (proximity of rebar to worker, height of rebar). Working around rebar that is 3-6 feet high would not likely pose an impalement hazard. Rebar caps/covers are appropriate to prevent cuts, abrasions or other minor injuries when working at grade and there is no impalement hazard.

Cal/OSHA's testing

Tests designed by California OSHA were conducted that entailed dropping sand-filled canvas bags onto rebar protected by standard mushroom caps.

Weights of the bags ranged from 140 to 160 pounds and the bags were dropped from three, five, and seven feet. The mushroom caps provided absolutely NO protection.

Scratch protection only

Manufacturers of the mushroom caps agree that those caps were designed to provide SCRATCH PROTECTION ONLY and were never intended to prevent impalement, even at grade.

OSHA goes on to say, "Considering the serious nature of the hazard, the standard mushroom style plastic rebar caps should not be used for protection against impalement. Protective devices (covers or wooden troughs) capable of withstanding at least 250 pounds dropped from a height of ten feet should be used. OSHA doesn't approve products, but there are steel reinforced covers and plastic and wooden troughs available that provide the needed protection."

Employee Training

While there are no specific training requirements for protecting workers from rebar impalement hazards, workers need to know the hazards of working around unprotected rebar. Explain to them how to protect themselves and go over situations and locations on the jobsite where they could be exposed to these hazards. Discuss who they should contact if they discover unprotected rebar.

OSHA state-plan-states: Remember that certain states have more stringent regulations that go above and beyond the OSHA standards.

Training Tips

Bring in the various types of rebar protection devices that employees would use or encounter on your jobsite. Demonstrate how to install it.

Where To Go For More Information

29 CFR 1926.701(b)—Reinforcing steel.

OSHA Letter of Interpretation, 05/29/1997—Mushroom Style Plastic Rebar Covers Used For Impalement Protection.

KELLER'S CONSTRUCTION TOOLBOX TALKS

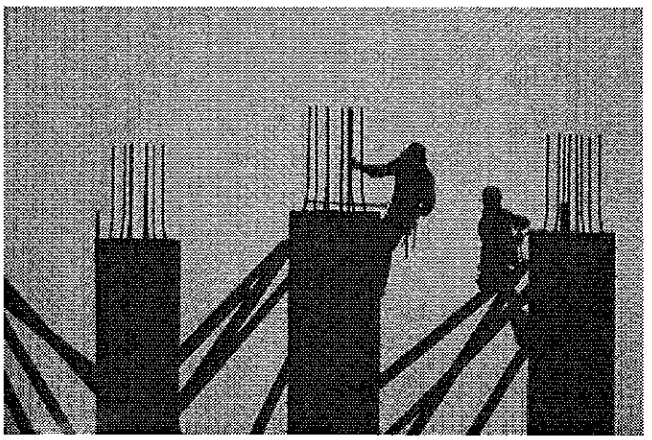
Special Trades—Concrete Construction—Impalement Protection

OSHA requires that your employer protects you against impalement hazards from exposed rebar. In the past (and possibly even today) the practice of using some type of plastic mushroom cap was an option.

However, studies conducted by the California Division of Occupational Safety and Health (Cal/OSHA) showing the general ineffectiveness of rebar caps as impalement protection under requirements in OSHA's standard at 29 CFR 1926.701(b).

What should you do?

- **Identify uncapped rebar hazards:** Keep a lookout for unprotected rebar. Let your supervisor know the location of this rebar and of any other hazards.



- **If working above rebar:** Make sure you are using fall protection if you are working above exposed rebar. Fall protection/prevention is also applicable when the rebar is below grade (e.g., footings or other excavations) and where a fall into a trench would present an impalement hazard.
- **Install rebar implatement protection:** If you are trained and authorized by your employer to install the rebar implatement protection caps or devices do so immediately.

What is considered safe?

Considering the serious nature of the hazard, the standard mushroom style plastic rebar caps should not be used for protection against impalement (unless they are specifically designed to do so).

Protective devices capable of withstanding at least 250 pounds dropped from a height of ten feet should be used.

OSHA doesn't approve products, but there are steel reinforced covers and plastic and wooden troughs available that provide the needed protection.

When in doubt

Talk to your supervisor if you have questions about working around, or above, unprotected rebar.

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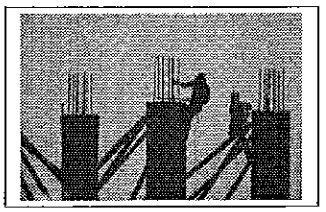

Special Trades—Concrete Construction—Impalement Protection—Sign-Off Sheet

This sign-off sheet documents the employees at this company, _____, who have taken part in a training session on Special Trades—Concrete Construction—Impalement Protection. The session covered:

- Identifying uncapped rebar hazards.
- What to do if working above rebar.
- When to install rebar implatement protection.
- What types of protective devices capable should be used.

The space below is for employees to "sign-off" that they were in attendance.

Date of Training: _____ **Job Location:** _____

Employee Signature	**Print Name Here**

_____
Supervisor's Signature

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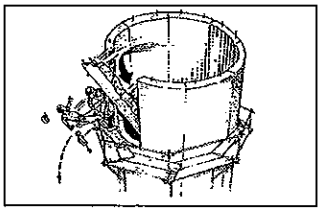


Special Trades—Demolition—Preparatory Operations

Overview of Topic

Before the start of every demolition job, you should take a number of steps to safeguard the health and safety of your employees.

OSHA requires that prior to starting the operation, an engineering survey of the structure must be completed by your competent person (§1926.850(a)).

An engineering survey provides you with the opportunity to evaluate the job in its entirety. Preparatory operations involve the overall planning of the job, including the methods for bringing down the structure, the equipment required, and the measures to be taken to perform the work safely, including the protection of the public. The safety of all workers on the job site should be a prime consideration. Potential hazards such as fires, cave-ins, and injuries, are your primary targets.

You must maintain a written copy of the survey. Photographing existing damage in neighboring structures is also advisable.

Preparatory Operations Checklist—

Use the following questions to remind yourself, and instruct your employees, on the OSHA requirements for preparatory operations.

- Has the structure been damaged by fire, flood, explosion, or other cause? If so, do you need to shore or brace walls or floors?
- Have any hazardous chemicals, gases, explosives, flammable material, or similar dangerous substances been used or stored on the site? Do you need to take and analyze samples prior to demolition?
- Have you considered your safety equipment needs? Do you have the required number of respirators, lifelines, warning signs, safety nets, special face and eye protection devices, hearing protection devices, and other PPE?
- Are you going to do a confined space entry?

Utilities

- Are all utilities—electricity, gas, water, steam, sewer, and other service lines shut off, capped, or otherwise controlled outside the building line? Have you informed workers of the

location of utilities that must be kept on during demolition? Do workers know where overhead lines are located?

Medical services and first aid

- Have you planned for prompt medical attention in case of serious injury? Are you familiar with and have planned for all provisions of OSHA's requirements for medical services and first aid (§1926.50)?

Police and fire

- Do you have the telephone numbers for the local police, ambulance, and fire departments? This information could prove very valuable in the event of any traffic problems, uncontrolled fires, or other police/fire matters such as vandalism, unlawful entry to the jobsite, or accidents.
- Do you have an emergency action plan (§1926.35) for fires, and does it outline the assignments of all key personnel? Does it provide an evacuation plan for your employees?

Other hazards

- Are all wall openings protected to a height of 42 inches? Are flying glass hazards removed? Are all debris drop points guarded by barricades and warning signs?

Employee Training

No specific training requirements are called for in the OSHA demolition regulations. However, §1926.21(b)(2) says employees must be trained to recognize and avoid unsafe conditions and the regulations applicable to his work environment to control or eliminate the hazards. The OSHA rules at §1926.20(b)(4) says that employers shall permit only those employees qualified by training or experience to operate equipment and machinery.

Training Tips

Get employees involved in the preparatory operations. They are the ones who do the work, can bring to the table valuable information on jobsite hazards, and experience the "near misses."

Where To Go For More Information

29 CFR 1926, Subpart T—Demolition.

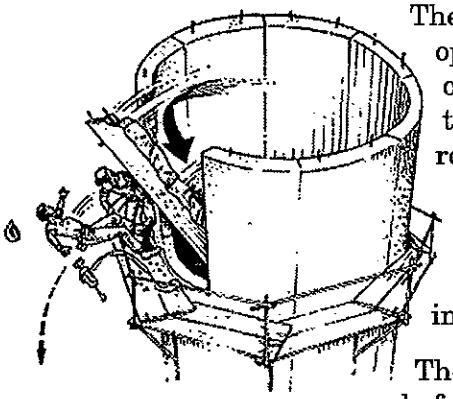
OSHA Technical Manual, Section IV, Chapter 1—OSHA Demolition Safety—Preparatory Operations.

KELLER'S CONSTRUCTION TOOLBOX TALKS

OSHA Demolition Safety—Preparatory Operations

Taking construction projects down can be far more dangerous than putting them up. You must always be on guard for hidden dangers. When something doesn't seem right, STOP what you are doing and get answers before proceeding.

Before the start of every demolition job, your company should take a number of steps to safe guard the health and safety of every worker. OSHA requires that prior to starting the operation, an engineering survey of the structure must be completed by your competent person.



The engineering survey provides your supervisors with the opportunity to evaluate the job in its entirety. Preparatory operations involve the overall planning of the job, including the methods for bringing down the structure, the equipment required, and the measures to be taken to perform the work safely, including the protection of the public.

The safety of all workers on the job site should be a prime consideration. Potential hazards such as fires, cave-ins, and injuries are the primary targets for engineering surveys.

The following questions are those OSHA expects to be answered before the actual demolition begins.

- Has the structure been damaged by fire, flood, explosion, or other cause? If so, are dangerous walls or floors shored or braced?
- Have any hazardous chemicals, gases, explosives, flammable material, or similar dangerous substances been used or stored on the site? If so, have samples been taken and analyzed prior to demolition?
- Do you have the proper safety equipment?

Utilities—Are all utilities—electricity, gas, water, steam, sewer, and other service lines shut off, capped or otherwise controlled? Do you know the location of utilities that must be kept on during demolition? Do you know where overhead lines are located?

Medical services and first aid—Are you familiar with and has your company planned for all provisions of OSHA's requirements for medical services and first aid?

Fire—Does your company have an emergency action plan for fires, and do you know your assignment? Do you know the evacuation plan and route?

Other hazards—Are all debris drop points guarded by barricades and warning signs?

Because demolition jobsites are so dangerous, give yourself and your fellow workers all the chances possible to complete the job with no accidents. Know the safety requirements. Be a responsible employee.

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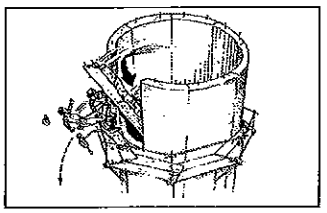

Special Trades—Demolition—Preparatory Operations Sign-Off Sheet

This sign-off sheet documents the names of employees who attended this training session on Special Trades—Demolition—Preparatory Operations at _____ .
(company name)

The session covered:

- Preparation for the demolition.
- Jobsite safety requirements.

The space below is for employees to "sign-off" that they were in attendance.

Date of Training: _____ **Job Location:** _____

Employee Signature	**Print Name Here**

_____
Supervisor's Signature

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Special Trades—Explosives

Overview Of Topic

The OSHA construction rules addressing the use of explosives and blasting are laid out in a logical sequence of events from general requirements to: (1) blaster qualifications, (2) storage and transportation of explosives, (3) loading and initiation of the explosive charge, (4) firing the blast, and (5) inspection after the blast to include handling misfires.

Sections are included for specialty blasting such as underwater and blasting in excavation work under compressed air.

General provisions are an overview of the entire field. Some of the important provisions are:

- You must only allow authorized and qualified people to handle and use explosives.
- Employees authorized to prepare explosive charges or conduct blasting operations must use every reasonable precaution to ensure employee safety. This should include but not be limited to visual and audible warning signals, flags, or barricades.
- Delivery and issue of explosives must only be made by and to authorized employees, and stored in authorized magazines or approved temporary storage or handling areas.
- All loading and firing must be directed and supervised by competent persons thoroughly experienced in the field.
- All blasts must be fired electrically with an electric blasting machine or properly designed electric power source, except as provided in the OSHA rules. Those rules specifically prohibit electric blasting where sources of extraneous electricity make the use of electric blasting caps dangerous.
- When testing circuits to charged holes, blasters must use only blasting galvanometers or other instruments that are specifically designed for this purpose.

Surface Transportation

Transportation of explosives must meet the provisions of Department of Transportation regulations at 49 CFR 171-179—*Highways and Railways*, and 49 CFR 390-397 *Motor Carriers*.

Motor vehicles or conveyances transporting explosives must: (1) be driven by, and in the charge of a licensed and physically fit driver, (2) be marked or placarded on both sides, the front, and rear with the word "Explosives" in red letters, not less than four inches high, on white background, (3) never be left unattended, and (4) be equipped with a fully charged approved fire extinguisher of not less than 10-ABC rating.

Employee Training

Blasters must: (1) be able to understand and give written and oral orders, (2) be qualified by reason of training, knowledge, or experience, in transporting, storing, handling, and use of explosives, (3) have a working knowledge of State and local laws and regulations pertaining to explosives, and (4) be knowledgeable and competent in each type of blasting method used.

Blasters will be required to furnish satisfactory evidence of competency in handling explosives and performing in a safe manner the type of blasting that will be required.

Explosives drivers must be: (1) familiar with the local, State, and Federal rules governing the transportation of explosives, and (2) trained in the use of the required fire extinguisher on his/her vehicle.

All employees must familiarize themselves with, and conform to the Code of Blasting Signals. The signals must be equivalent to Table U-1 of the regulations.

Training Tips

Stress the point that there is no room for mistakes in this field. Therefore, each person must be fully trained and totally familiar with each set up and blast. Use checklists to go over each team member's duties.

Where To Go For More Information

This Toolbox Talk is an overview of blasting and explosives. For all the regulations see 29 CFR 1926, Subpart U—Blasting and Use of Explosives.

KELLER'S CONSTRUCTION TOOLBOX TALKS

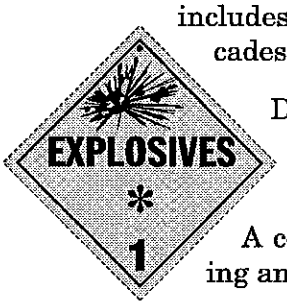
Explosives

OSHA's rules addressing the use of explosives and blasting are laid out in a logical sequence of events from general provisions to: (1) blaster qualifications, (2) storage and transportation of explosives, (3) loading and initiation of the explosive charge, (4) firing the blast, and (5) inspection after the blast to include handling misfires.

The following rules are an overview of the OSHA requirements for blasting and use of explosives. Knowing the safety rules that pertain to your operation is an requirement.

General requirements—You must be authorized and qualified to handle and use explosives. Authorized means your company has given you the authority to work with explosives. Qualified means you are an expert in the tasks you are required to do.

When preparing explosive charges or conducting blasting operations you must use every reasonable precaution to ensure your protection and the protection of fellow employees. This includes but not limited to visual and audible warning signals, flags, or barricades.



Delivery and issue of explosives must only be made by and to authorized employees, and stored in authorized magazines or approved temporary storage or handling areas.

A company appointed competent person must direct and supervise all loading and firing operations.

Surface transportation—Transportation of explosives must meet the requirements of the Department of Transportation (DOT). The DOT regulations are found in the Code of Federal Regulations (CFRs) at 49 CFR 171–179—*Highways and Railways*, and 49 CFR 390-397 *Motor Carriers*.

Motor vehicles carrying explosives must: (1) be driven by and in the charge of a licensed and physically fit driver, (2) be marked or placarded on both sides, the front, and rear with the word Explosives in red letters, not less than four inches high, on white background, (3) never be left unattended, and (4) be equipped with a fully charged approved fire extinguisher of not less than 10-ABC rating.

Required training—To be a blaster you must: (1) be able to understand and give written and oral orders, (2) be qualified by reason of training, knowledge, or experience in transporting, storing, handling, and use of explosives, (3) have a working knowledge of State and local regulations pertaining to explosives, and (4) know and be competent in the each type of blasting method used.

You will be required to furnish satisfactory evidence of competency in handling explosives and performing in a safe manner the type of blasting you will do.

You must familiarize yourself with, and conform to the Code of Blasting Signals.

There is no room for error when using explosives. Whether you are a qualified blaster, blaster helper, powderman, or explosives driver, you must know your job "stone cold." You must be deliberate and precise each step of the way toward firing the blast. This takes training, training, and more training.

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Special Trades—Explosives Sign-Off Sheet

This sign-off sheet documents the employees who have taken part in a training session on Explosives at _____ .
(company name)

The session covered the following:

- Where to find the OSHA requirements for Qualified blasters, blaster helpers, powdermen, or explosives drivers.
- An overview of the general provisions of the OSHA regulations.
- An overview of the OSHA rules for all employees.

The space below is for each individual who has been trained on this topic to sign his/her names.

Date of Training: _____ **Job Location:** _____

Employee Signature	**Print Name Here**

_____
Supervisor's Signature

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