

# Construction Sector Council Struck-by Work Group Report

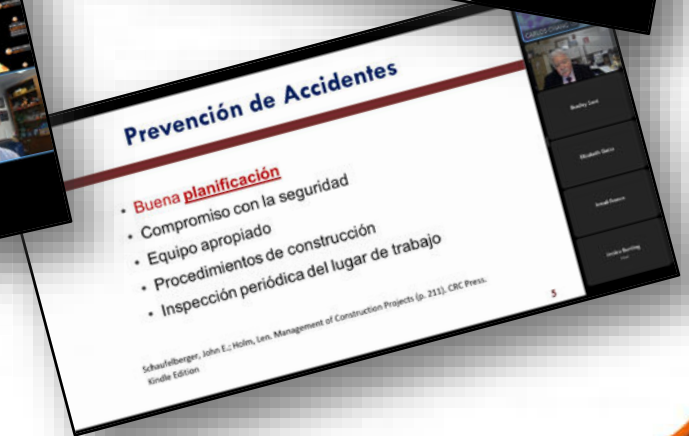
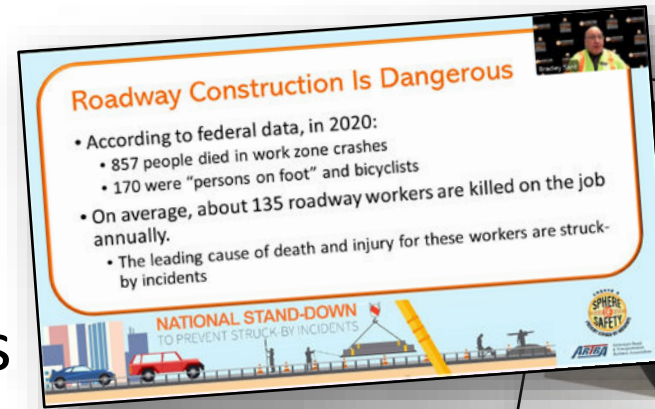
NORA



STOP. TALK. ACT.

# Activities

- National Stand Down to Prevent Struck-by Incidents
  - Four Sessions
    - Work Zone
    - Lift Zone/Heavy Equipment
    - Dropped Objects
    - English and Spanish
  - April 11-15



STRUCK-BY WORK GROUP



# Infographics

## PREVENTING STRUCK-BY INCIDENTS

**CREATE A SPHERE OF SAFETY**  
PREVENT STRUCK-BY INCIDENTS

Use flaggers, barricades and signs to control the flow of traffic

Hold a lift plan meeting before any work begins to discuss, for example, items that will be moved, crane set up, and weather conditions

Use tag lines or push sticks to keep loads under control, stay out of the crane's swing radius, never work underneath a suspended load, and **DO NOT** exceed the crane's lifting capacity

Properly set up work zones to warn motorists

For overhead work, secure tools with tethers and use protective measures such as toeboards or debris/safety nets to prevent, catch, or deflect falling objects

The signal person should use clear signals to communicate with the crane operator

Use barricades to separate workers from vehicles, heavy equipment and falling objects

**STOP. TALK. ACT.**

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## STOP THE DROP! PREVENT DROPPED OBJECTS WHEN WORKING AT HEIGHTS

**CREATE A SPHERE OF SAFETY**  
PREVENT STRUCK-BY INCIDENTS

Debris Chute

Safety Nets

Guardrails

Tool Tethers

Debris Nets

Toeboard

**REMEMBER!**

- Secure tools and materials (less than 5 lbs) can be tethered to the worker.
- Use measures such as toeboards, screens, guardrails, debris nets, catch platforms, or canopies to prevent, catch, or deflect falling objects.
- Barricade hazard areas and post warning signs.
- Always wear a hardhat and routinely inspect it for damage.
- Inspect all tools and equipment before use. Hand tools with loose or cracked handles should not be used.
- Keep materials away from floor openings or leading edges.
- Train workers on the hazards and ways to prevent an incident.

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# Toolbox Talks

## CPWR TOOLBOX TALK

### Preventing Falling Objects

Objects that fall from heights include tools, equipment, materials, and debris. Workers can be injured or killed by a falling or dropped object.

**Leo's Story**  
Having finished repair of a three-story roof, Leo's crew were cleaning up the worksite. Using a portable hand saw, Leo was lowering a large bag of gravel to the ground below. Leo was monitoring progress from the ground. On break, Leo had just returned from a local donut shop with donuts and coffee for the crew. Leo stepped into the fall zone and called out to his crew to join him. The crew misheard Leo's call and began lowering a 50-pound bag of gravel. The bag fell free and struck Leo's head. Leo died before he reached the hospital.

**Remember This**

- Select a pulley system with a brake system and inspect the pulley's components before each use.
- Make sure to follow manufacturer's specifications for proper installation of all equipment used on the worksite.
- Always check with the manufacturer to make sure the weight of the load does not exceed the capacity of the system and attach and inspect each load.
- Baricade fall zones with a physical barrier to prevent others from being struck by loads. Use signage, if possible, such as "Overhead Work" signs.
- Keep an eye out for your co-workers and have a communication system that includes both voiced and visual.
- Make sure the worker assigned to the fall zone never stands below a raised load and that the worker has plenty of space to stand clear of loads that are being raised or lowered.

**How can we stay safe today?**  
What will we do at the worksite to prevent falling or dropped objects?

- \_\_\_\_\_
- \_\_\_\_\_

OSHA REGULATION: 1926.501 and 502

CPWR RESEARCH AND TRAINING

## CPWR TOOLBOX TALK

### Challenges Preventing Falling Objects

Objects that fall from heights include tools, equipment, materials, and debris. Workers can be injured or killed by a falling or dropped object.

**Remember This**

- Employers should protect workers from falling objects during all activities.
- Workers should be trained in proper use of overhead work is to be done. Barriers and danger zones should be established and clearly marked.
- Workers should recognize language used by workers to indicate danger.
- In the presence of high winds, workers should take more precautions from falling or flying objects.
- Installing toe-boards, screens and setting up debris nets, canopy structures can stop objects from hitting workers.
- Workers should always wear safety gloves and fall protection equipment.

## CPWR TOOLBOX TALK

### Solutions for Falling Objects & Dropped Tools

Objects that fall from heights include tools, equipment, materials, and debris. Workers can be injured or killed by a falling object or dropped tool.

**Hector and Nicki's Story**  
Hector and Nicki are building a scaffold to reach a roof. Hector is working on the ground building the scaffold while Nicki is on the roof. As the work progresses, it becomes difficult for Hector to find good areas to stand while he works. Nicki suggests Hector place two boards across a set of rungers to have a better platform to work from. Hector doesn't see the need for it and worries it will slow him down. Hector signals for Nicki to hand him a 5' runner. Hector is leaning over the scaffold and can't quite reach the runner. He bends over further to reach down. His hand makes contact with greasy oil on the rail. Hector loses his balance. The scaffold shakes. Hector's wrench makes contact with Nicki's hand and falls out of his tool belt. It strikes Nicki's hard hat. The jolt to the hard hat pushes Nicki's safety glasses into the bridge of her nose, resulting in a glass eye.

**Remember This**

- When an object falls, its weight is not the force that will reach the target. As an object falls, its speed increases. The faster the speed, the more force an object will have when it strikes its target. Even a small object like a wrench can break bones, cause head trauma, and even cause death.
- Properly tether all equipment and hand tools to prevent them from being dropped.
- Wear proper personal protective equipment (PPE) that would have been seriously injured without your hat. Hector would have a better grip without his hat.
- Only work on a stable platform.
- Good housekeeping can prevent many accidents from falling.
  - Clean work areas, equipment and areas are slippery.
  - Make sure everyone is aware of work areas and proper housekeeping daily.

**How can we stay safe today?**  
What will we do at the worksite to prevent falling or dropped objects?

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- \_\_\_\_\_

OSHA REGULATION: 1926.501 and 502

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## CPWR TOOLBOX TALK

### Prevent Being Caught in/between Equipment and Machinery

Almost all projects use machinery that has moving parts. "Caught in" or "caught between" injuries are the most common and are among the most serious. These injuries result from being squeezed, caught, or crushed between parts of an object.

**Remember This**

- Eliminate need to remove guards for simple maintenance tasks by extending life parts when available, install interlocking guards, which requires a special tool for removal.
- Requirements for Safeguards:
  - Power Contact
  - Be Secure
  - Protect from falling objects
  - Create no new hazards
  - Allow for safe lubrication
- Train supervisors, equipment operators, and workers on safe work practices.
- Only qualified personnel should perform maintenance and repairs.
- Safe work practices should include procedures for lockout/tagout of equipment when completing maintenance work. Ensure any stored energy is bled (air, hydraulics, capacitors, etc.) before maintenance and repair work.
- Workers should understand how to stop equipment if a worker becomes entangled.
- Post warning signs to alert workers and bystanders of potential dangers.
- Inspect guards for damage and repair or replace guards before re-energizing and resuming equipment.
- Select appropriate clothing for the task.
  - Avoid loose or baggy clothing. Pants and shirt should have sleeves tucked in.
  - Do not wear jewelry.
  - Tie back long hair and tuck it into clothing to reduce entanglement risks.
  - If gloves are needed, ensure that they fit appropriately.

**Bob's Story**  
Bob was performing repairs to a bulldozer on a job site. He was working on the cylinder rod on the hydraulic system. As he was working, the cylinder rod suddenly moved and struck Bob's hand, resulting in a right hand becoming caught in the machine and ultimately amputated.

**Remember This**

- When working with machinery and equipment, the following controls should be in place to reduce the likelihood of injuries from rolling, sliding, or shifting objects:
  - Install emergency stop systems to shut down the machine.
  - Create markings for emergency shut-off are present and conduct periodic testing to ensure that they are functional.
  - Place guards and barricades on machinery and equipment to prevent contact with moving parts.
  - Evaluate equipment points of operation, transmission parts, rotating parts, etc. and determine if protection is required or is missing.

**How can we stay safe today?**  
What will you do at the worksite to prevent getting caught in moving equipment and machinery?

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- \_\_\_\_\_

OSHA REGULATION: 1926.501 and 502

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# Fact Sheet

## Trench Safety: Before You Dig It, Plan It!

January 2022

1 cubic yard of dirt weighs the same as a compact car!

137 deaths were caused by excavation and trench cave-ins from 2011 to 2018.



**BEFORE YOU DIG IT, PLAN IT!**

- Assign and train a competent person.
- Call 811 to identify and mark underground utility lines.
- Dig a minimum 5 ft away from utility lines.
- Evaluate the soil to determine its stability.
- Plan the job layout to identify safe locations for spoil piles and heavy equipment routes.
- Before the job starts, if the trench will be 5 ft or deeper, set up a protective system. If the trench will be 20 ft or deeper, provide engineering protections.
- Have a traffic control plan and lane closure permits.
- Develop a trench emergency action plan.

**WHEN YOU DIG IT, USE CAUTION!**

- Have the competent person inspect the trench, nearby areas, and protective systems each day before the start of work, when conditions change throughout the shift, and after every rainstorm.
- Maintain signs, barriers, and protection around the trench.
- Keep all vehicles and machinery a safe distance from the excavation.
- Ensure ladders and exits are never more than 25 ft away from any worker in the trench.
- Remove workers from the excavation upon any evidence that could cause a cave-in.
- Monitor other types of trench-related hazards that can occur, such as falls from the edge, rigging hazards, or toxic and combustible gases, or oxygen deficient conditions.
- Enforce procedures to ensure that work in an unprotected trench does not occur.

**IF YOU WORK IN A TRENCH:**

Check the trench for problems before entering and never enter an unprotected trench. Make sure there is safe entry and exit before entering. When there is evidence of problems, exit the trench and inform the competent person. Never assume there will be a warning before a cave-in, or that you will have time to get out.

 Centers for Disease Control and Prevention  
National Institute for Occupational Safety and Health

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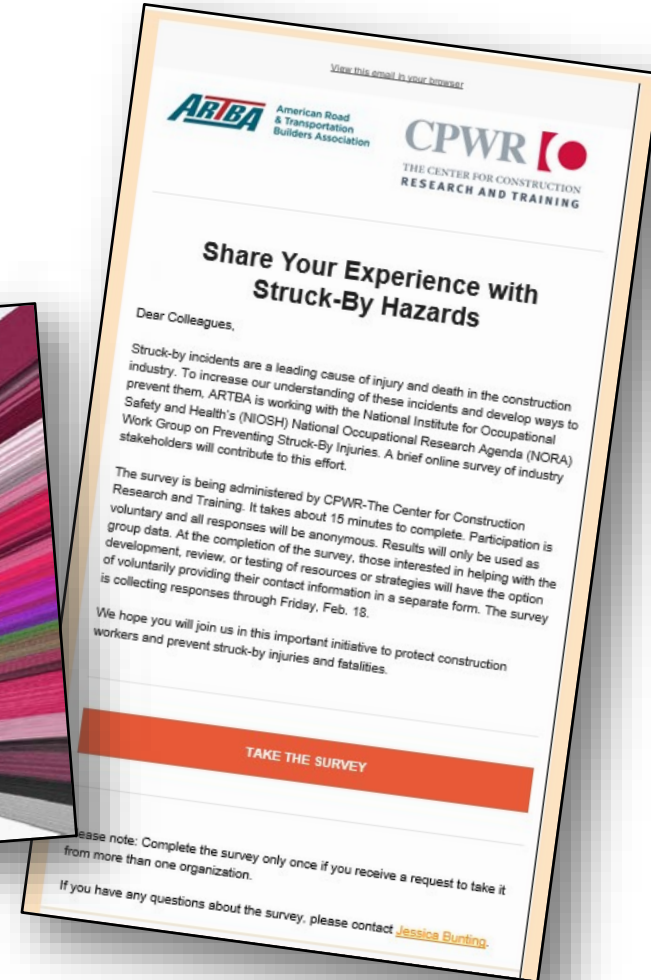
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## STRUCK-BY WORK GROUP



# Choice Architecture/ Behavior



## STRUCK-BY WORK GROUP



# California FACE

- Preventing Struck-by Fatalities Related to Excavator Quick Couplers, Buckets, and Attachments



## Preventing Struck-by Fatalities Related to Excavator Quick Couplers, Buckets, and Attachments

March 10, 2022 by Laura Styles, Hank Clerpin, Robert Harrison, David Schutt, Scott Earnest, Nancy T. Romano, CDRE Elizabeth Garza, Jette Novakovich, Douglas Trout, and LT Bryan Wimer

The 3rd annual National Stand-Down to Prevent Struck-by Incidents will take place April 11–15, 2022. As part of these efforts, NIOSH and others are highlighting the lethal struck-by risk related to excavator quick couplers. A quick coupler failure can cause the attachment to fall suddenly, causing death, injury, and/or damage to the excavator and attachment.



Figure 1. Hydraulic Excavator Photo © Getty Images

### Background

Hydraulic excavators (Figure 1 and 2) are used in construction to move large quantities of earth. Many excavators have tracks for movement and are commonly called “trackhoes” or “backhoes.” An excavator quick coupling device (quick coupler) can save a lot of time on the job site, but when an excavator bucket unintentionally detaches from a quick coupler, worker fatalities can – and have – occurred. Quick couplers allow for the rapid change of buckets and other attachments on the end of excavator dipper arms. Depending on the design, they may be used to connect attachments remotely from the cab or may require the operator to complete the connection of the device manually on the ground by inserting a locking pin. Safety mechanisms are built into most modern quick couplers, but they are not fail-proof.



Figure 2. Quick coupler, bucket, and excavator Photo © Getty Images

Struck-by incidents are a leading cause of death among construction workers [1], and since 1992 the leading cause of nonfatal injuries in the construction industry [2]. Excavators are dangerous to work around. The boom and dipper arm move quickly in small spaces such as a trench and carry extremely heavy loads. An excavator bucket can weigh 900 pounds while empty, and significantly more when holding soil or rock, making a failure very dangerous.

Three deaths have been reported since 2019 as a result of a worker being crushed by a bucket that fell from a quick coupler. While quick couplers have their own individual safety specifications, it is important to note that employers must ensure their workers are never working beneath a bucket, attachment, or load, and that workers should never be within the swing radius of an operating excavator. If workers are located outside of this hazard zone, there is much less risk of injury or death if a failure occurs. Furthermore, OSHA prohibits working beneath a load or within the swing radius of an excavator [3-6], and manufacturer and industry guidelines provide strong language recommending against this all-too-common practice [7-11]. If

these guidelines are not followed, injuries and death can occur.

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# Thank you!

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