

Lead Exposure During Cable De-tensioning Work

Attention: Structural steel and concrete contractors who perform tensioning work

The Hazard Source

Workers using thermal cutting tools (e.g., an exothermic slice torch) to de-tension (or destress) cables embedded in concrete structures are exposed to lead and other hazardous metals.

Lead is present in the metal wedges used to hold steel strands under tension inside cables. The wedges are embedded in an anchor plate (see photo). As workers “burn out” the wedge material it’s converted into fine lead particles that form a smoke cloud or haze in the work area.

Cable de-tensioning typically occurs on construction projects in congested urban areas during building foundation modifications and decommissioning of infrastructure like bridges and freeway overpasses.

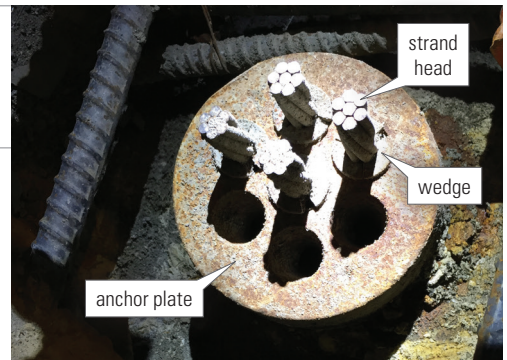
Exposures and Health

Workers, including helpers, can inhale harmful amounts of lead during de-tensioning. Exposure depends on ventilation, burn-out-speed, shift duration, proximity to emissions, workspace dimensions and other conditions.

Lead particles also settle on and contaminate clothes, skin and hair. Workers can spread this contamination to vehicles and residences when proper hygiene precautions aren’t followed at the job site.

Lead on hands, face or surfaces can get ingested by workers when transferred to food and other consumable materials, even sweat.

Inhaling or ingesting lead can lead to a variety of serious health problems such as nausea, fatigue, muscle weakness, kidney disease, irritability and reproductive damage. Risk for health problems increases with increased exposure.



This photo shows 4 strand “heads” held in tension by embedded wedges. Wedges were burned out of the 3 empty holes at the bottom of the plate, allowing the strand heads to pull back into the structure behind the anchor plate so they are no longer visible.

DOSH photo.



Caution! Ventilation setups like this aren’t enough. Better local exhaust ventilation (LEV) options are available like portable equipment used in welding environments.

DOSH photo.



Lead accumulates in the body and stays for years. Lead is especially dangerous to children who are exposed to contamination.

Possible Solutions and Requirements

When eliminating lead isn't feasible, look for solutions to reduce exposures and follow regulatory requirements for exposure assessment, housekeeping, blood lead testing, safety training and other precautions found in the Lead rule for construction work, WAC 296-155-176.

Some possible solutions to reduce airborne lead include:

- **Ventilation improvements.** Use a portable local exhaust ventilation (LEV) system designed to allow variable positioning while providing the right amount of suction power. The suction end of the LEV needs to have the right diameter of ducting and appropriate phalange to optimize smoke capture.
- **Safer work practices.** For example, determine how workers can position themselves and the LEV at each job location in order to get the best smoke reduction.
- **Less exposure time.** Limiting the amount of time spent at this process can bring down overall shift exposures. Use actual employee lead exposure data to estimate how much reduction to expect.

- **Improved hygiene practices and facilities.**

Ensure facilities are available for hand washing, showering, etc. and used as required. Tell workers what they need to do to prevent lead from spreading to food, cars and surfaces outside the immediate work area and why it's important.

If respirators and other personal protective equipment (PPE) use becomes necessary, then you'll need to evaluate worker exposures and follow applicable requirements for written programs, selection, fitting, training, cleaning/maintenance, etc., in WAC 296-155-200 and associated rules. Do not use Tyvek suits during hot work activities.

For safety training videos, publications, sample programs and other resources, visit the Safety & Health page at [Search By Topic](#) and type:

- Lead
- Chemical Safety
- Hazard Communication – GHS
- Personal Protective Equipment
- Respiratory Protection

Other resources you can access

To find an **electronic** copy of this [Hazard Alert](#).

[L&I Safety Web page](#).

For other related rules, contact your local L&I office or visit the safety rules webpage.

How can I get help from Labor & Industries?

The Department of Labor & Industries provides consultations, training, and technical assistance at no cost to employers. Call today to schedule a free confidential consultation or go to [Request Consultation](#) for more information.

You may also call 1-800-423-7233 or visit a local L&I office and ask for the Consultation Manager.

*This alert was developed by L&I's Division of Occupational Safety and Health (DOSHS) to alert employers, labor groups, and employees to potential hazards associated with work activities. **This is not a rule and creates no new legal obligations.** The information provided includes suggested guidance on how to avoid workplace hazards and describes relevant mandatory safety and health rules. DOSHS recommends you also check the related rules for additional requirements.*