September 12, 2019

Yankee Conference
OSHA Update- Silca and Open Trench Requirements

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OSHA Occupational Safety and Health Administration

CAS Material Developed & Distributed

This information has been developed by an OSHA Compliance Assistance Specialist and is intended to assist employers, workers, and others as they strive to improve workplace health and safety. While we attempt to thoroughly address specific topics ***[or hazards]***, it is not possible to include discussion of everything necessary to ensure a healthy and safe working environment in a presentation of this nature. Thus, this information must be understood as a tool for addressing workplace hazards, rather than an exhaustive statement of an employer's legal obligations, which are defined by statute, regulations, and standards. Likewise, to the extent that this information references practices or procedures that may enhance health or safety, but which are not required by a statute, regulation, or standard, it cannot, and does not, create additional legal obligations. Finally, over time, OSHA may modify rules and interpretations in light of new technology, information, or circumstances; to keep apprised of such developments, or to review information on a wide range of occupational safety and health topics, you can visit OSHA's website at www.osha.gov.

Occupational Safety and Health Administration

OSHA's Respirable Crystalline Silica Rule

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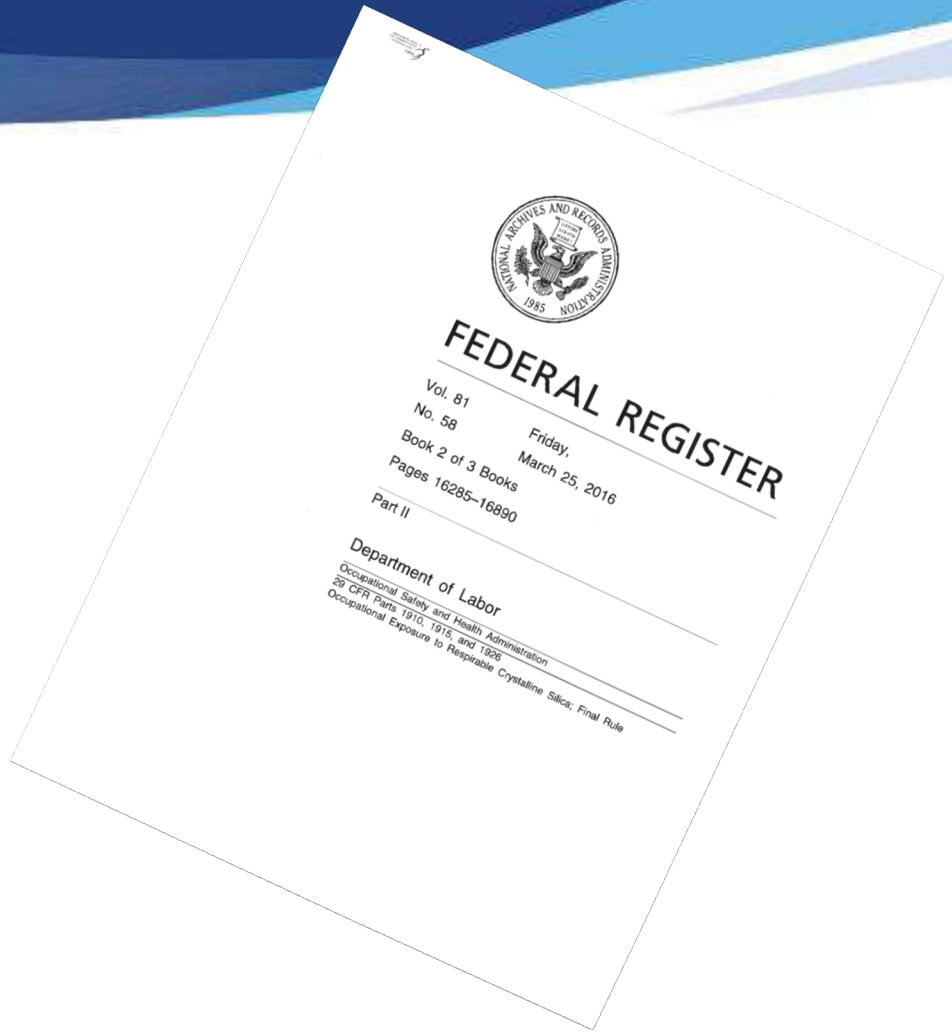
Final Rule Published on March 25, 2016



§ 1926.1153 Respirable crystalline silica.

OSHA's Final Rule to Protect Workers from Exposure to Respirable Crystalline Silica

OSHA delayed enforcement of the respirable crystalline silica standard for construction until September 23, 2017, to conduct additional outreach and provide educational materials and guidance for employers. See the memorandum

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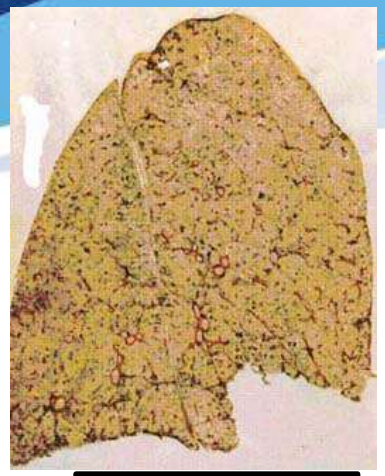
Most Important Reason for the Rule

- Former PELs do not adequately protect workers
- Extensive epidemiologic evidence that lung cancer and silicosis occur at exposure levels below 100 µg/m^3

Exposure and Health Risks

Exposure to respirable crystalline silica has been linked to:

- Silicosis;
- Lung cancer;
- Chronic obstructive pulmonary disease; and
- Kidney disease



Healthy Lung

Silicotic Lung

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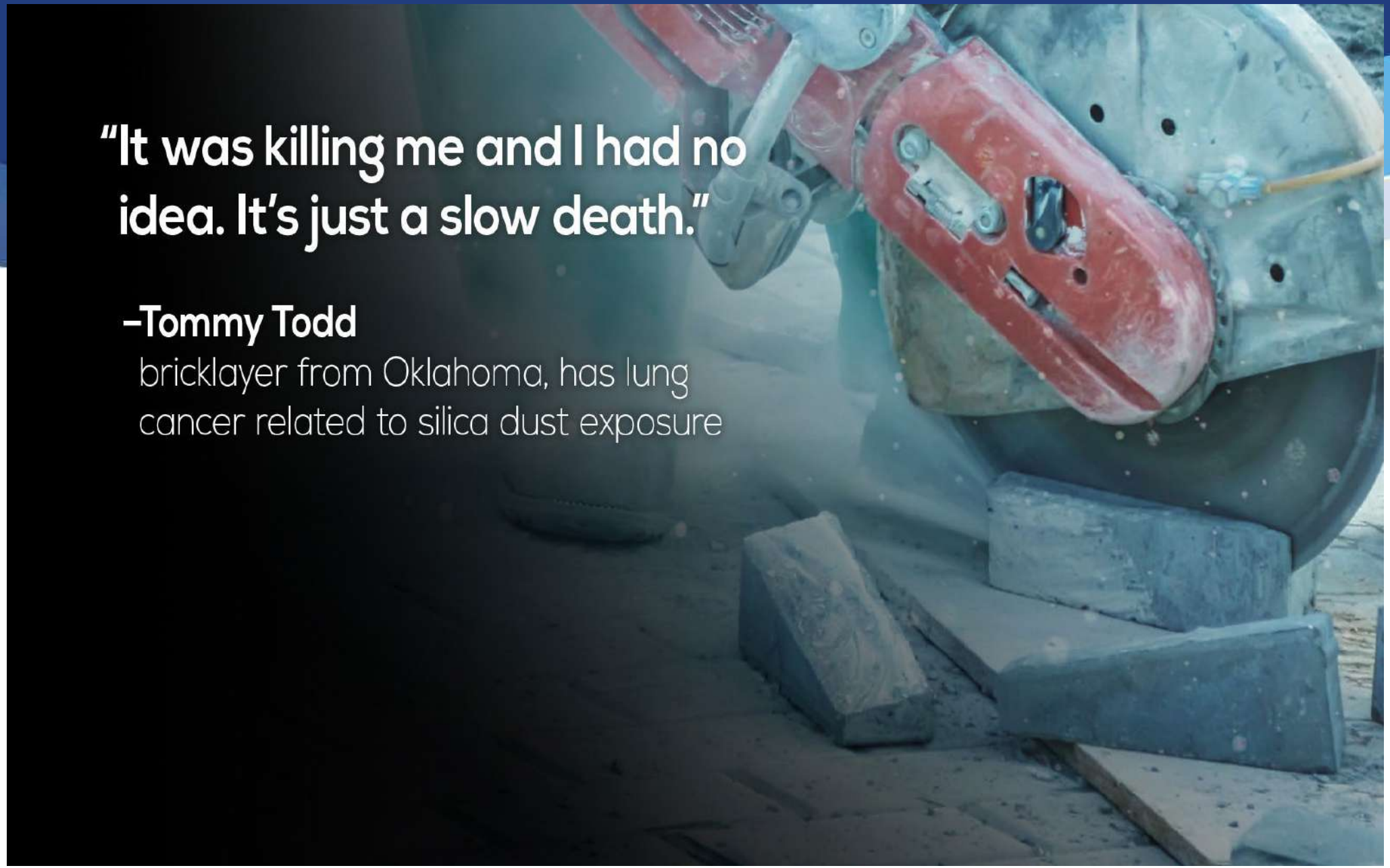
Health Benefits

OSHA estimates that once the effects of the rule are fully realized, it will prevent:

- More than 600 deaths per year
  - Lung cancer: 124
  - Silicosis and other non-cancer lung diseases: 325
  - End-stage kidney disease: 193
- More than 900 new silicosis cases per year



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Scope of OSHA Silica Coverage

- Three forms of silica: quartz, cristobalite and tridymite
- Exposures from chipping, cutting, sawing, drilling, grinding, sanding, and crushing of concrete, brick, block, rock, and stone products (such as in construction operations)
- Exposures from using sand products (such as glass manufacturing, foundries, and sand blasting)

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Industries and Operations with Exposures

- Construction
- Glass manufacturing
- Pottery products
- Structural clay products
- Concrete products
- Foundries
- Dental laboratories
- Paintings and coatings
- Jewelry production
- Refractory products
- Asphalt products
- Landscaping
- Ready-mix concrete
- Cut stone and stone products
- Abrasive blasting in:
  - Maritime work
  - Construction
  - General industry
- Refractory furnace installation and repair
- Railroads
- Hydraulic fracturing for gas and oil

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KEY POINTS FROM THE NEW SILICA DUST STANDARD :

The new standard requires a more stringent “permissible exposure limit, **reducing** 250 micrograms per cubic meter of air (250µg/m3) over an 8 hour day (time weighted average)

- **50 µg/m3** over an 8 hour day.

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New Permissible Exposure Limit (PEL)

- PEL = 50 µg/m^3 as an 8-Hour TWA
- Action Level = 25 µg/m^3 as an 8-Hour TWA

Methods of Compliance – Hierarchy of Controls

- Employers can use any engineering or work practice controls to limit exposures to the PEL
- Respirators permitted where PEL cannot be achieved with engineering and work practice controls

Engineering Controls

Grinding stone
without engineering controls

Polishing stone using water to
control the dust

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Construction – Competent Person

- Construction employers must designate a competent person to implement the written exposure control plan
- *Competent person* is an individual capable of identifying existing and foreseeable respirable crystalline silica hazards, who has authorization to take prompt corrective measures
- Makes frequent and regular inspection of job sites, materials, and equipment

Communication of Health Hazards

- Employers required to comply with hazard communication standard (HCS) (29 CFR 1910.1200)
- Address: Cancer, lung effects, immune system effects, and kidney effects as part of HCS
- Train workers on health hazards, tasks resulting in exposure, workplace protections, and medical surveillance.

Silica Construction Compliance

OSHA offers three methods an employer can choose from to demonstrate compliance and assess employee exposure:

1. Table 1: a table of pre-defined tasks and specified control methods available in the market today

2. Performance or ‘Objective Data’: assess exposure by providing objective data proving the control method used

3. Scheduled Air Monitoring program: assess exposure by implementing a scheduled air monitoring program to ensure employees are not exposed above 50 µg/m3

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List of Table 1 Entries

- Stationary masonry saws
- Handheld power saws
- Handheld power saws for fiber cement board
- Walk-behind saws
- Drivable saws
- Rig-mounted core saws or drills
- Handheld and stand-mounted drills
- Dowel drilling rigs for concrete
- Vehicle-mounted drilling rigs for rock and concrete
- Jackhammers and handheld powered chipping tools
- Handheld grinders for mortar removal (tuckpointing)
- Handheld grinders for other than mortar removal
- Walk-behind milling machines and floor grinders
- Small drivable milling machines
- Large drivable milling machines
- Crushing machines
- Heavy equipment and utility vehicles to abrade or fracture silica materials
- Heavy equipment and utility vehicles for grading and excavating

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Example of a Table 1 Entry

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None

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Example of a Table 1 Entry

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturers' instruction to minimize dust - When used outdoors - When used indoors or in an enclosed area	None APF 10	APF 10 APF 10

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	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours /shift	> 4 hours /shift
(xii) Handheld grinders for uses other than mortar removal	For tasks performed outdoors only: Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR	None	None

Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
	≤ 4 hours /shift	> 4 hours /shift
Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.		
– When used outdoors.	None	None
– When used indoors or in an enclosed area.	None	APF 10

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Engineering Controls

Cutting block
without engineering controls

Cutting block using water to
control the dust

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Engineering Controls

Grinding without engineering controls

Grinding using a vacuum dust collector

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Engineering Controls (cont.)

Jackhammer use without engineering controls

Jackhammer use with water spray to control dust

Vacuum Dust Collection Systems

- **Keep** the vacuum hose clear and free of debris, kinks and tight bends.
- **Follow** the equipment manufacturer's directions on how to reduce dust buildup on the filter.
- **Change** vacuum-collection bags as needed.
- **Set up** a regular schedule for filter cleaning and maintenance.
- **Avoid** exposure to dust when changing vacuum bags and cleaning or replacing air filters.
- **Train** employees to understand the proper use of those controls and use them accordingly.

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- Employers are required to have a written exposure control plan.
  i. housekeeping measures
  ii. procedures used to restrict access

- Designate a competent person.

- Medical surveillance (exams) must be offered for employees required by the standard to wear a respirator for 30 or more days per year

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Center for Construction Research and Training

http://www.cpwr.com/publications/cpwr-updates/cpwr-can-help-you-work-safely-silica

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http://www.silica-safe.org/training-and-other-resources/manuals-and-guides/asset/Silica_Table-1_Equipment-Names_Best-Practices_FINAL_Mar2017.pdf

Equipment/ Control	Photo	Names	Best Practice Tips
xii) Handheld grinders for uses other than mortar removal **CONTROL:** water (Go to page 13 for details) OR **ventilation (local exhaust ventilation or LEV) + respirators[3] (used indoors longer than 4 hours – APF10)**	 (vacuum) *Photos courtesy of the International Masonry Institute & OSHA*	**Surface Grinder** **Sander** **Polisher**	OSHA[1] requires, for dust collection controls, the employer to ensure that: • The system provides at least 25 CFM of air flow per inch of wheel diameter, a filter with 99% efficiency or greater, and either a cyclonic pre-separator or a filter-cleaning mechanism • The shroud or cowling is intact and is installed in accordance with the manufacturer's instructions • The hose connecting the tool to the vacuum is intact and without kinks or tight bends • The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions • The dust collection bags are emptied to avoid overfilling • Additional exhaust is provided as needed to minimize the accumulation of visible airborne dust when operating indoors or in an enclosed space (area where airborne dust can build up) Other tips: • Use the smallest wheel and least aggressive tool necessary to complete task • Visually inspect the grinder, shroud (cowl or hood), and dust collection system to ensure they are properly connected, and for missing or damaged parts • Check the grinder and dust collection system regularly to ensure the system is operating so that no visible dust[2] is emitted from the process once the grinder is flush with the work surface/substrate.

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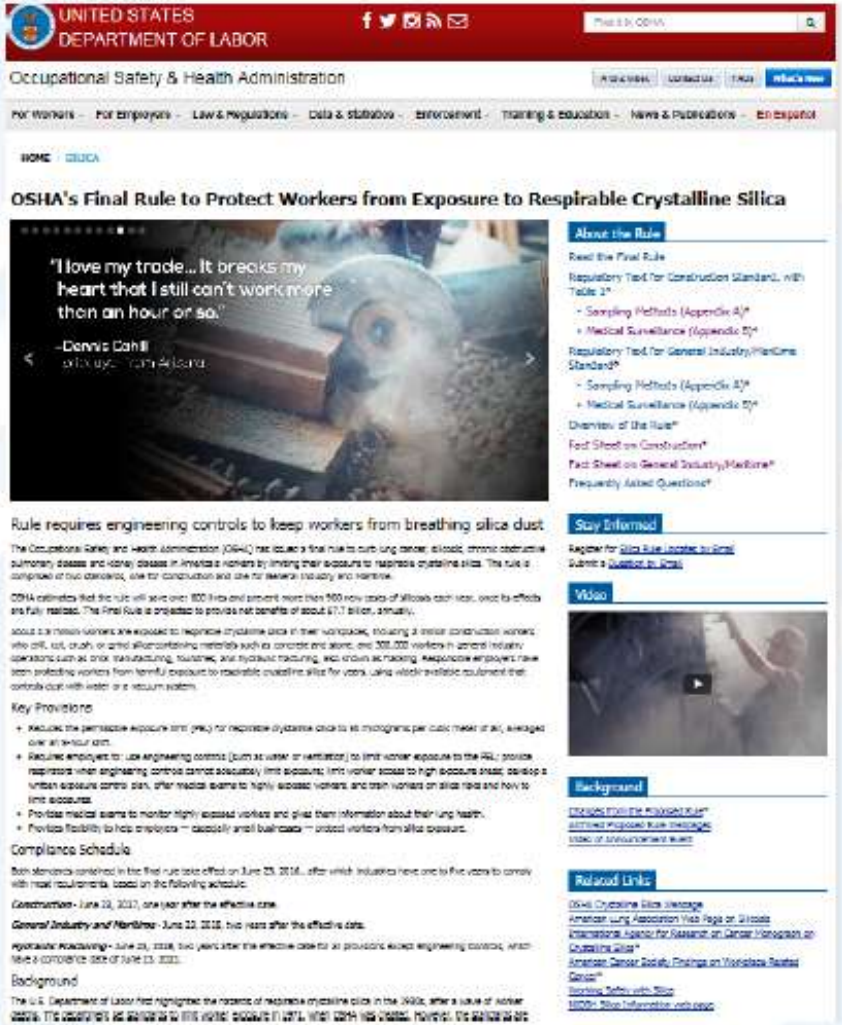
Guidance and Outreach

- Silica Rulemaking Webpage: www.osha.gov/silica
  - Fact sheets
  - FAQs
  - Video
- Appendix B – Medical Surveillance Guidelines
- Coming soon – Small Entity Compliance Guides



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Leading Causes of Construction Accidents- Focus Four

- Falls from elevations
- Electrical Shock
- Struck by machinery or materials
- Crushing injuries, **trench collapse,** overturned vehicles, etc.

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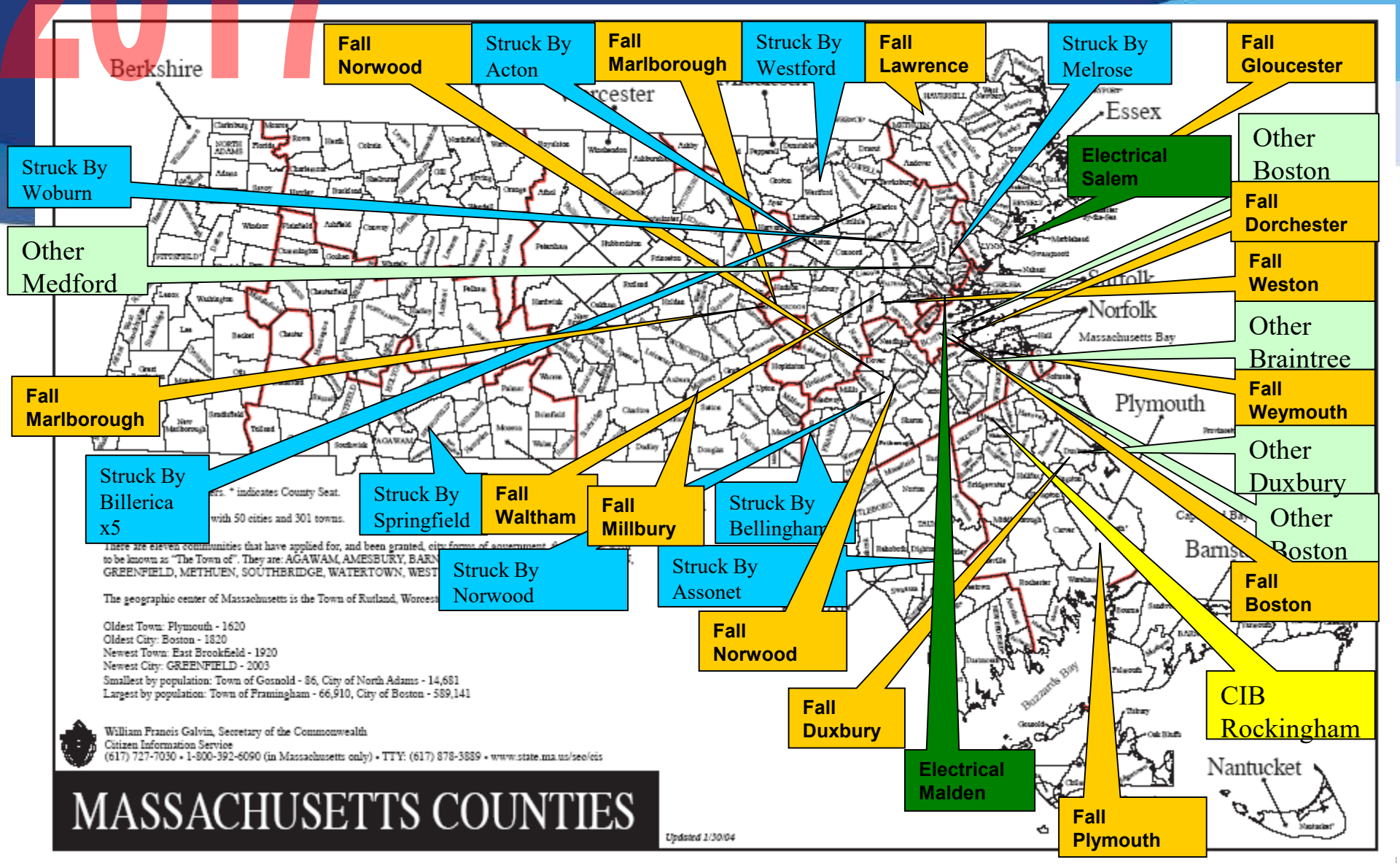
2017



10/1/16-9/7/2017

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Top 10 Violations in Construction

Most frequently cited OSHA standards during FY 2018 inspections

1. Fall Protection – General Requirements (1926.501)
2. Scaffolding (1926.451)
3. Ladders (1926.1053)
4. Fall Protection – Training (1926.503)
5. Eye and Face Protection (1926.102)
6. General Safety and Health Provisions (1926.20)
7. Head Protection (1926.100)
8. Aerial Lifts (1926.453)
9. Hazard Communication (1910.1200)
10. Fall Protection – Systems Criteria and Practices (1926.502)

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Trenching & Excavation

Revised-October 01, 2018

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Protective Systems [29 CFR 1926.652(a)]

Employees in excavations must be protected from cave-ins by an adequate protective system *except* when:

- excavations are made entirely in stable rock; or
- excavations are less than 5 feet deep **and** a Competent Person determines there is no indication of a potential cave-in.

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1926.651(k)(1) Inspections

- **Daily Inspection of excavations shall be conducted by a ‘competent person’ prior to the start of work and as needed throughout the shift.**
- **Inspections shall also be conducted after every rainstorm or other *hazard increasing occurrence*.**

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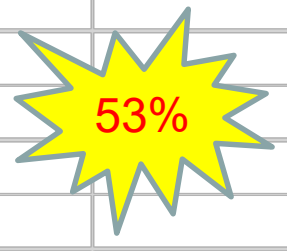
Trenching/Excavation Incidents by End Use Type of Construction

Type of Construction	Number	Percent
single family or duplex dwelling	29	24%
pipeline	19	16%
highway street road	16	13%
commercial building	10	8%
other heavy construction	10	8%
sewer/water treatment plant	9	8%
other building	8	7%
multi-family dwelling	7	6%
bridge	4	3%
powerline transmission	4	3%
excavation landfill	2	2%
manufacturing plant	1	1%
power plant	1	1%
	120	100%



Note: Out of 156 total incidents, for which 36 end use unspecified.

Source: OSHA OIS Accident Investigation Report, FY 2013 - FY 2017

Two people removed from trench after collapse in Oakwood video)
WKEF-TV (Miamisburg, Ohio)
March 8, 2018

Man dies after trench collapses at Grand County construction site
Denver Post
June 15, 2018

Investigation into fatal trench collapse at Baltimore park could take weeks
Baltimore (Md.) Sun
June 7, 2018

Worker killed in trench is contractor's 4th death in 2018
Rock Hill Herald (South Carolina)
December 19, 2018

Worker rescued from trench filled with water, mud in Wesley Chapel
WFLA-AM (Tampa, Fla., radio station)
July 23, 2018

Utilities contractor cited by OSHA after trench collapse injury
Business Insurance- Jacksonville Fl
March 8, 2018

'Alarming' rise in trench worker deaths prompts hazard alert
WorkersCompensation.com
February 21, 2018

Trench collapses on construction worker in North Stafford
Inside Northern Virginia
February 1, 2018

Anthony Hills was doing sewer repairs as the earth caved in and killed him
Hawk Eye (Burlington, Vt.)
February 17, 2018

Gov. Charlie Baker signs bill extending OSHA safety standards to municipal workers
MassLive.com
March 10, 2018

OSHA Trenching Initiative

- Increase awareness of excavation hazards in construction;
- Educate employers and workers on safe cave-in prevention solutions;
- Decrease the number of trench collapses

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SLOPE IT. SHORE IT. SHIELD IT.

- Construction
- Hazards and Solutions
- Additional Resources

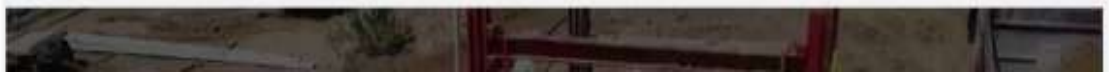
Overview

According to the Bureau of Labor Statistics, excavation and trench-related fatalities in 2016 were nearly double the average of the previous five years. OSHA has made reducing trenching and excavation hazards the Agency's Priority Goal. Trench collapses, or cave-ins, pose the greatest risk to workers' lives. To prevent cave-ins:

- SLOPE or bench trench walls
- SHORE trench walls with supports, or
- SHIELD trench walls with trench boxes

Employers should also ensure there is a safe way to enter and exit the trench. Keep materials away from the edge of the trench. Look for standing water or atmospheric hazards. Never enter a trench unless it has been properly inspected.

29 CFR 1926.650, 29 CFR 1926.651, and 29 CFR 1926.652 are applicable OSHA standards.



Highlights

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Access and Egress 1926.651 (c)(2)

- “A stairway, ladder, ramp or other safe means of egress shall be located in a trench excavations that are 4’ or more in depth so at to require no more than 25’ of lateral travel for employees.”

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What's wrong?

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Driving by a Newton side street on a nice day in the Summe r of 2017

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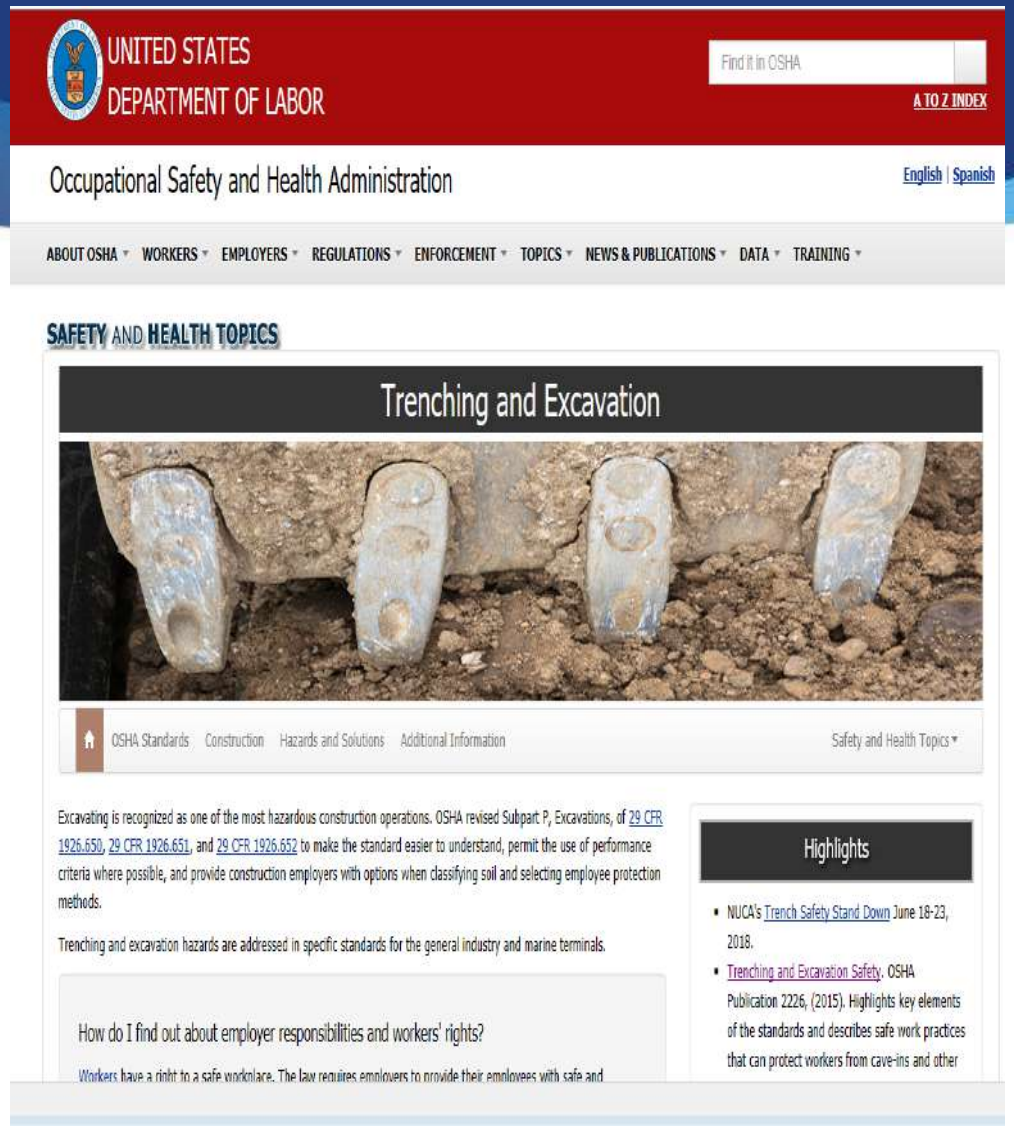
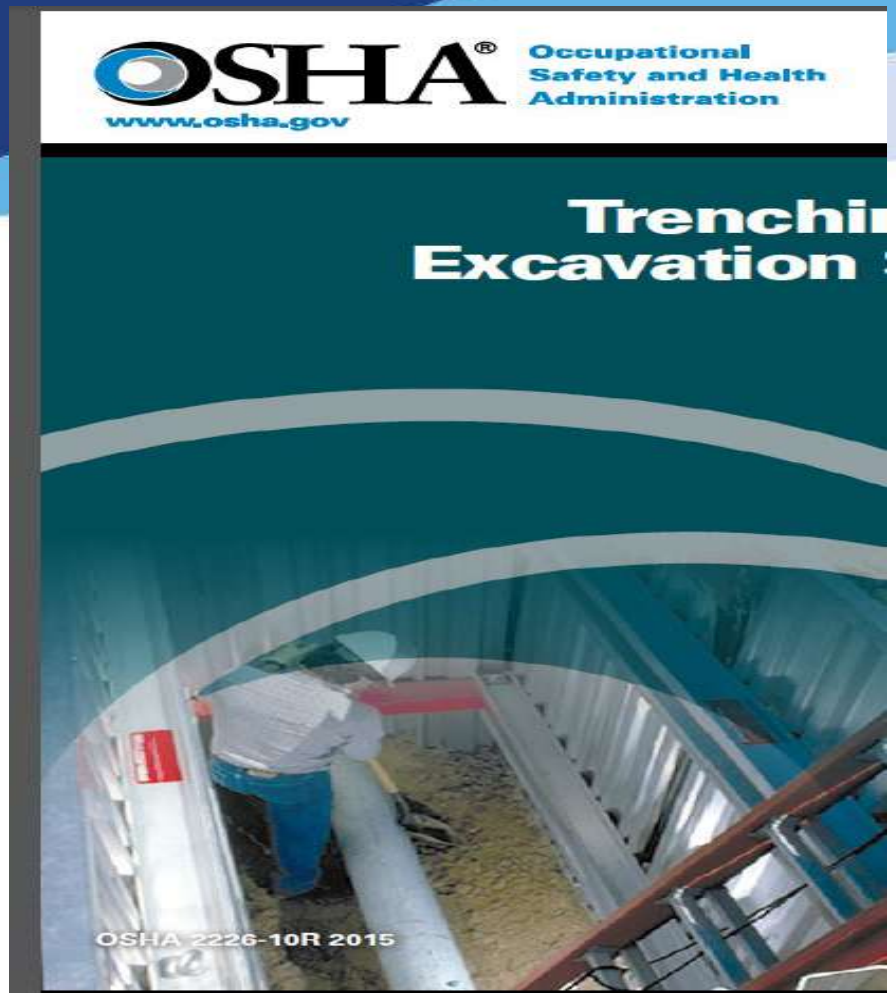
Trenching and Excavation Resources





Revised OSHA 2226 Excavation

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Jackie's Law,' named after a Bridgewater 4-year-old who died when a trench collapsed on her

Almost 10 years after a trench collapsed on Bridgewater 4-year-old Jackie Moore, a new trench law to protect the public — the so-called "Jackie's Law" — went into effect Sunday.

Jackie died in August 1999 after a contractor dug a nine-foot trench in the Moore's backyard and left it unprotected. Within minutes of the contractor leaving, Jackie, her brother and another neighborhood child were playing in the hole when it collapsed.

The other two children escaped, but Jackie did not.

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Title 520 CMR 14.00 - Excavation And Trench Safety (jackie's Law)

According to the Massachusetts Department of Public Safety, “Jackie’s Law” is designed to prevent the general public from falling into an unattended trench and suffering an injury or fatality

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Fall Hazards Include

- Scaffolds
- Holes-floor & walls
- Skylights
- Edges
- Roofs
- Ladders
- Decking and plywood
- Installation of trusses
- Excavations

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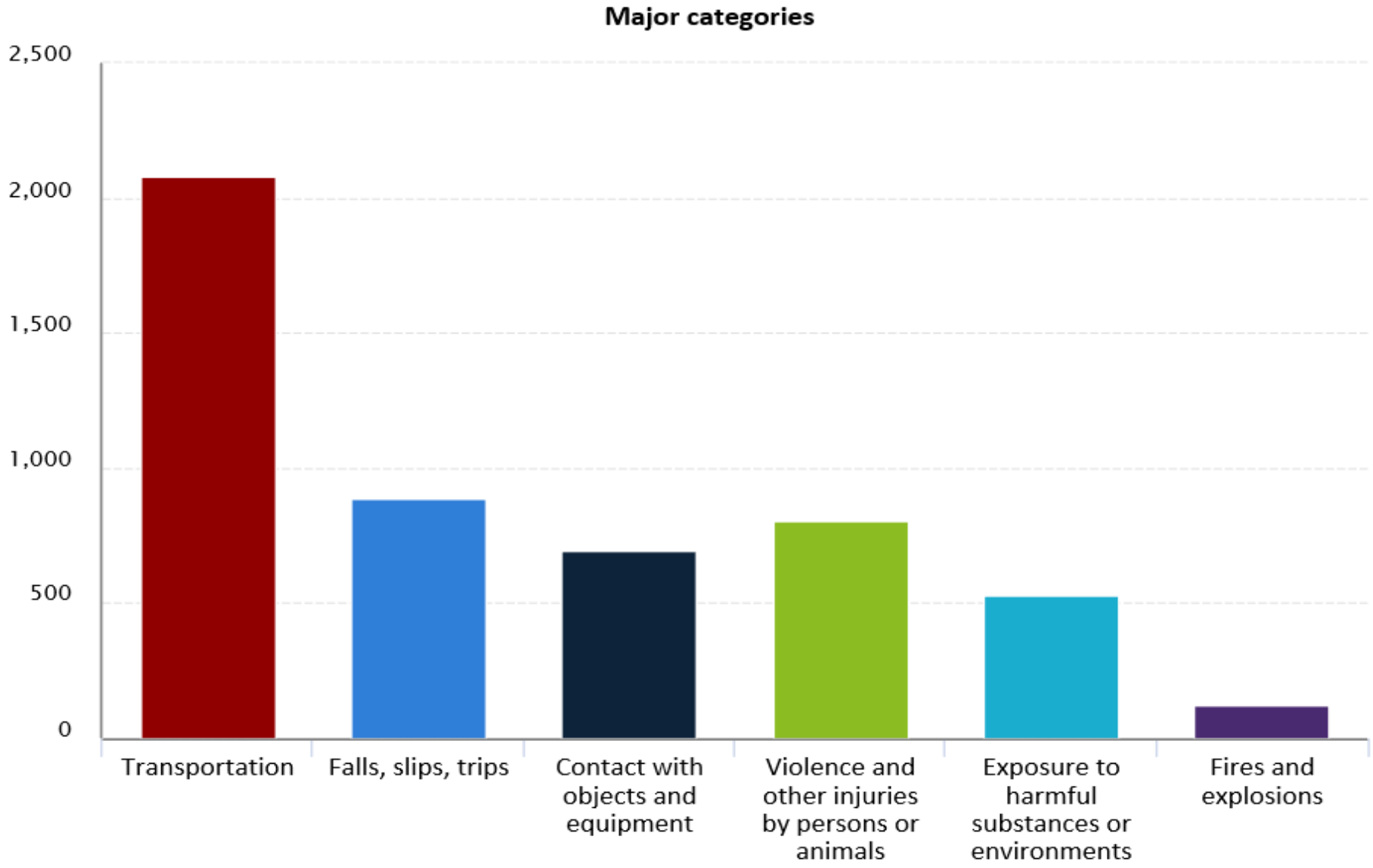
Fatal occupational injuries by event, 2017



Click columns to drill down. Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.

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Accident – worker wrapping up at end of day fell into the basement of this home under construction

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Requires each worker be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes.

Open sided work surface

Some builders use 24” OC studs for non-load bearing walls. Prior to installation of drywall, guardrail systems must be installed to prevent workers from falling through.

Guardrail Systems
1926.502(b)

Requirements for guardrail systems include:

Top rails 42” +/- 3”

- Must withstand 200 pounds

Mid rails halfway

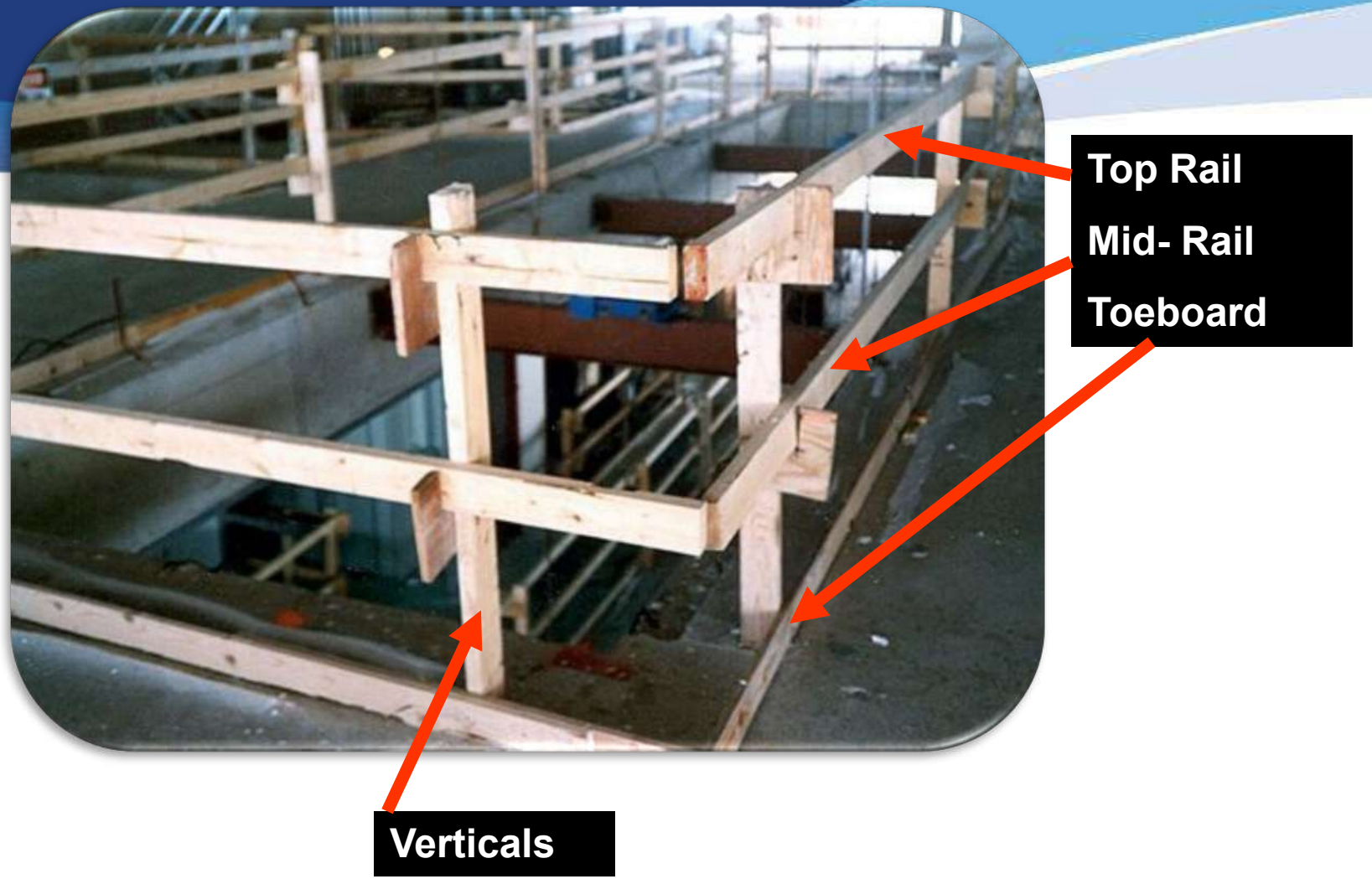
- Must withstand 150 pounds

– Toe Boards 50 pounds (Overhead hazards present)

– Surface the guardrail to prevent punctures, lacerations and the snagging of clothing.

– No banding (steel or plastic)

Guardrails



Floor holes

- **Covers** can be used to prevent from falling through holes.
  - Vehicular traffic /foot traffic cover must support 2 times the maximum intended load
  - Secured to prevent displacement
  - Marked with the word “HOLE” or “COVER” or color coded

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Safety is not expensive

Intro to DLS Workplace Safety Stand

Case Study – Lack of Railings

Floor Holes

All floor holes larger than 2 inches must be protected against slips/trips – even if less than 6 feet

This is wrong!

Must be **secured** and **marked** with the word hole.

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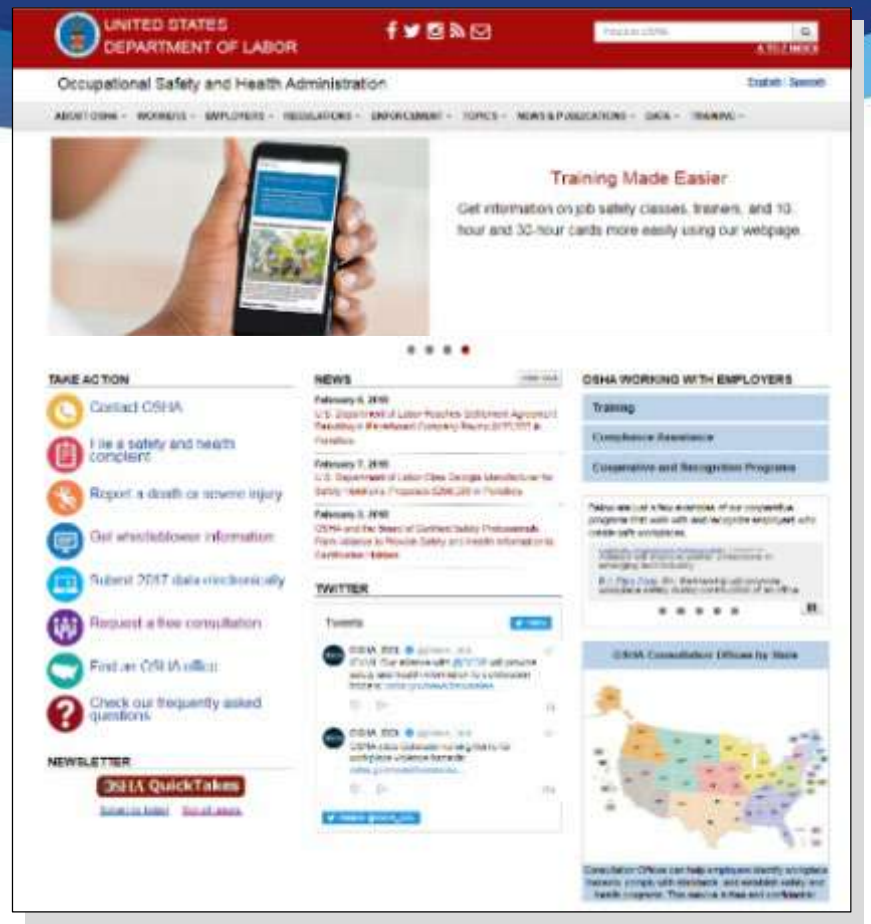
OSHA Web Resources



- Compliance Assistance
- Training
- Cooperative Programs
- Forms
- Contact OSHA

osha.gov

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Contact OSHA

- Toll-free hotline: 1-800-321-OSHA (6742)
- Submit email questions through OSHA's website at www.osha.gov
- Contact your local OSHA Area Office

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MASSACHUSETTS

Contact the office nearest you.

OSHA Area Offices

These federal OSHA offices cover private sector employers and workers in Massachusetts:

North Boston Area Office
Shattuck Office Center
138 River Road, Suite 102
Andover, MA 01810
(978)837-4460
(978)837-4455 FAX

South Boston Area Office
639 Granite Street, 4th Floor
Braintree, MA 02184
(617)565-6924
(617)565-6923 FAX

Springfield Area Office
1441 Main Street, Room 550
Springfield, MA 01103-1493
(413)785-0123
(413)785-0136 FAX

On-Site Consultation Program

Massachusetts On-site Consultation Program

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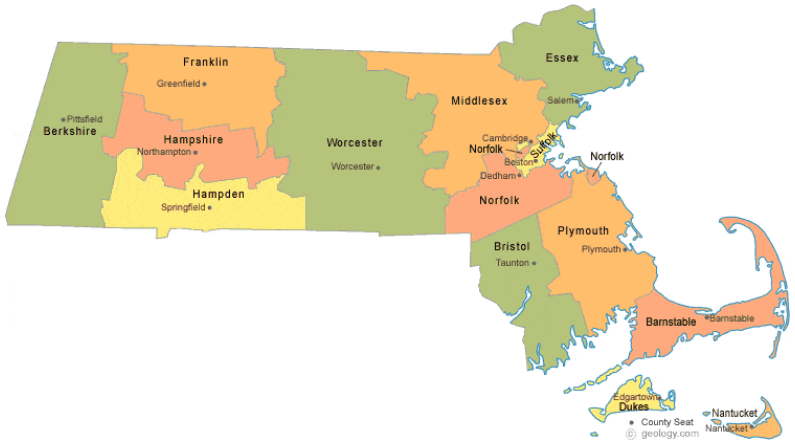
On-site Consultation

Free

MA Department of Labor Standards
OSHA Consultation Program
Wall Experiment Station
37 Shattuck Street
Lawrence, MA 01843

phone: 617-626-6504
fax: 978-687-0013
email: Masscon@state.ma.us



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New Law Extending Safety Standards to Public Sector

Intro to DLS Workplace Safety Standards

- Who: All public workplaces and employees
- What: "Public employers shall provide public employees at least the level of protection provided under the federal Occupational Safety and Health Act of 1970."
- How: DLS Enforcement
- When: February 1, 2019

Intro to DLS Workplace Safety Standards

Review

- New law includes ALL public sector.
- Requires employers to comply with OSHA standards to prevent injury.
- DLS responsible for enforcement.
- DLS focus on injury prevention.

Municipal Inspections
2013-2018

Intro to DLS Workplace Safety Standards

Contact Us

- Department of Labor Standards
- Main phone: 508-616-0461 x9488
- E-mail: safepublicworkplacemailbox@mass.gov
- Website: www.mass.gov/dols/wshp

William McKinney, DLS Director
Michael Flanagan, Manager
Mary Dozois, Program Supervisor

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