

# Focus Four for Health

## Major Construction Health Hazards

# Introductions

Mike Kenyon, M.S, SMP

Director, Contractor EHS

Chris Ulriksen, M.S, CSP

Director, Life Sciences EHS



- 45 combined years of Construction & EHS Experience
- Oversees HazTek Contractor & Life Sciences EHS Support
- Subject matter experts
- OSHA liaison with fatalities, injuries and speaking events
- Safety Committee Programs (Owners, general contractors, subs)
- Direct EHS deliverables
- Manage budgets, proposals and contract execution

300+ EHS Professionals

EHS Consulting

- Training
- Audits
- Programs

500,000+ Manhours

190+ Countries

Logistics

- 1<sup>st</sup> shift
- 2<sup>nd</sup> shift
- 3<sup>rd</sup> shift

MWBE Partnerships

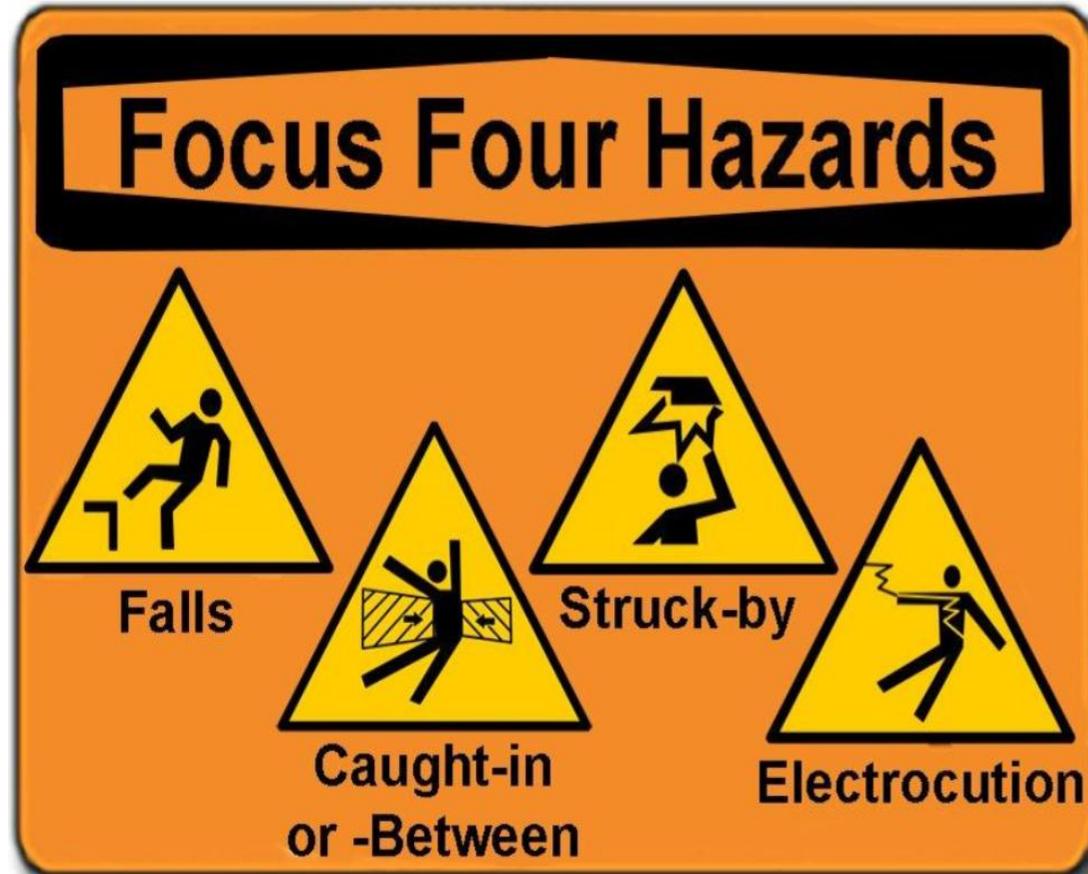
# Major Construction Health Hazards

## KEY LEARNING OBJECTIVES

- Identify health hazards with significant impacts to workers / businesses
- Discuss efforts to reduce health hazards that typically lag behind those for safety hazards on many sites
- Health hazards can be effectively controlled, just as safety risks are



# Have you heard of OSHA's Focus Four?



# What About Health in Construction!

*Why do you think health hazards in construction remain overlooked compared to safety hazards like falls or struck-by incidents?*

# What About Health in Construction?

- Lower awareness
- Fewer programs and activities
- Lack of guidance and training materials.
- Regulatory gaps
- Low enforcement profile → reinforces **lack** of importance

**Inadvertent message sent → Health is not a priority**

# The Case for Health



Photo: Jason McInnis Boilermakers (IBB).

- >1/2 of construction workers reported regular exposures **2Xs/week**
  - **Double** for all industries combined<sup>1</sup>
- Construction & outdoor worker occupations ~2X as likely to speak up<sup>2</sup>

# The Case for Health

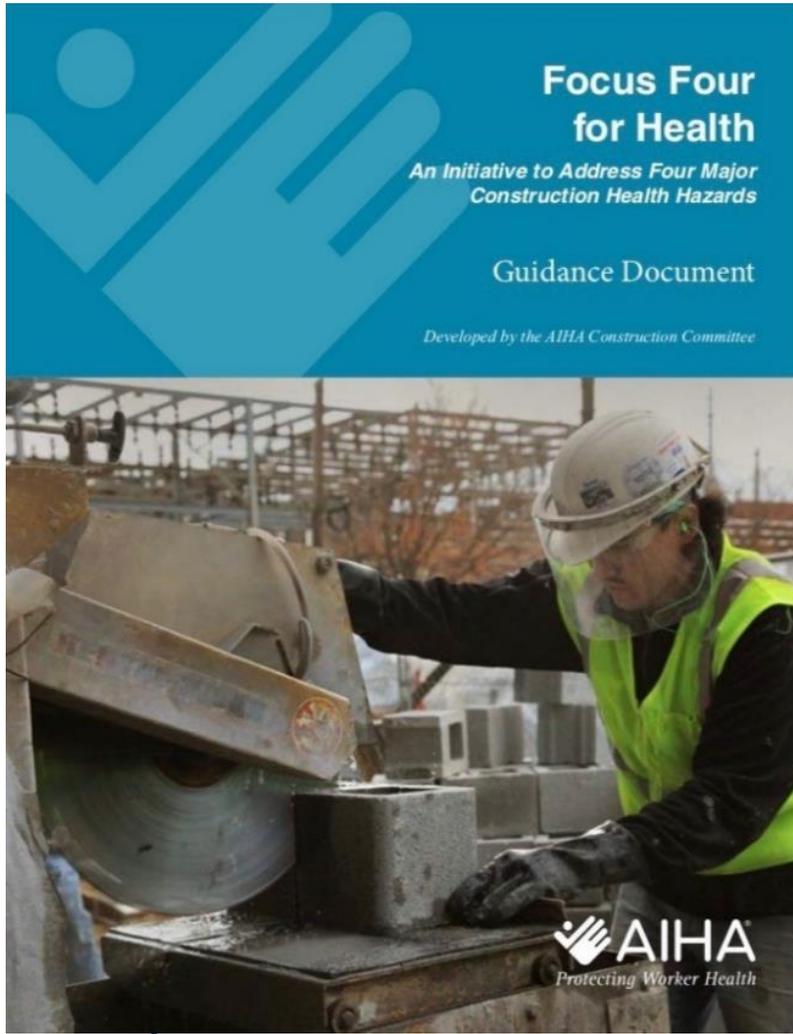
- ~ **3/4** of construction workers found overexposed to noise (2011 study)
- Construction trade health risk is believed to be **2X to 6X greater** than non-construction



Flux core welding Photo: J. Vinton Schafer & Sons Inc. and CCBC via eLCOSH.

**Need to raise awareness & stimulate activity on health**

# AIHA Focus 4 Health Topics



## Addressing:

- Manual Material Handling
- Noise
- Air Contaminants
- High Temperatures

# Guidance Document Approach?

- **Identify the hazard & severity**
- **Where will this be a problem?**
  - Evaluate
- **Strategies to control**
  - Resources for help
- **Main focus: Contractors**
  - *But also allies: trade groups, unions, insurers...*

# Manual Material Handling

## KEY MESSAGES

- Musculoskeletal Disorders (MSDs) are a large problem in construction
- TOP CAUSE → **Manual Material Handling**
- Major health impact
  - Painful, costly, likely to recur
  - **Pain medications (OPIOIDS) used to continue working when injured → can lead to dependency problems**
- Pre-job planning, site setup, tool use can all reduce this hazard

### *You should know*

*....Many industries have reduced the weight of manually lifted materials to fewer than 50 pounds. Yet loads weighing 80 pounds or more are still common in construction.*

Construction worker deaths from opioid overdoses are 6-7X rate of general industry

# Who is Affected?

- Back injuries are most common
- Masonry, concrete with highest days lost
  - *Bricklayer handling concrete blocks:*
    - *200x / day x 38 pounds = 7600 pounds a day*
- *Any trade can be impacted*



# Manual Material Handling

*What practical steps does your company do now OR can tomorrow to MMH exposure without slowing production?*

# Noise

## KEY MESSAGES

- Overexposures common...yet too often taken for granted
- Major health impact
  - Hearing loss + tinnitus
  - Growing evidence – sleep disturbance, cardiovascular disease, hypertension, depression
- Decibel scale easily misunderstood
- Good practice goal → NIOSH REL
- Pre-job planning, site setup, “Buy & Rent Quiet” can all reduce this hazard

### ***You should know ...***

*Hearing loss caused by exposure to noise is common among construction workers. One study found a lifetime probability of developing hearing loss averaging 60 percent among all trades, and up to 80 percent in some trades, such as welding.*

### **Sidebar topics:**

- Availability of Noise apps
- Hearing protectors and NRR ratings
- Importance of training & hearing tests

# Common Construction Noise

## NOISE EXPOSURE LEVELS OF CONSTRUCTION TRADES

Let's take a look at the average exposure levels (dBA) and loudest tasks of 6 common construction trades.



**Iron Worker**  
91.1 decibels

---

**Laying metal deck**  
99.6 decibels



**Carpenter**  
89.3 decibels

---

**Using roto hammer**  
95.1 decibels



**Laborer**  
89.1 decibels

---

**Chipping concrete**  
102.9 decibels



**Masonry Worker**  
88.5 decibels

---

**Grinding**  
97.0 decibels



**Operating Engineer**  
88.4 decibels

---

**Welding**  
91.2 decibels



**Electrician**  
86.7 decibels

---

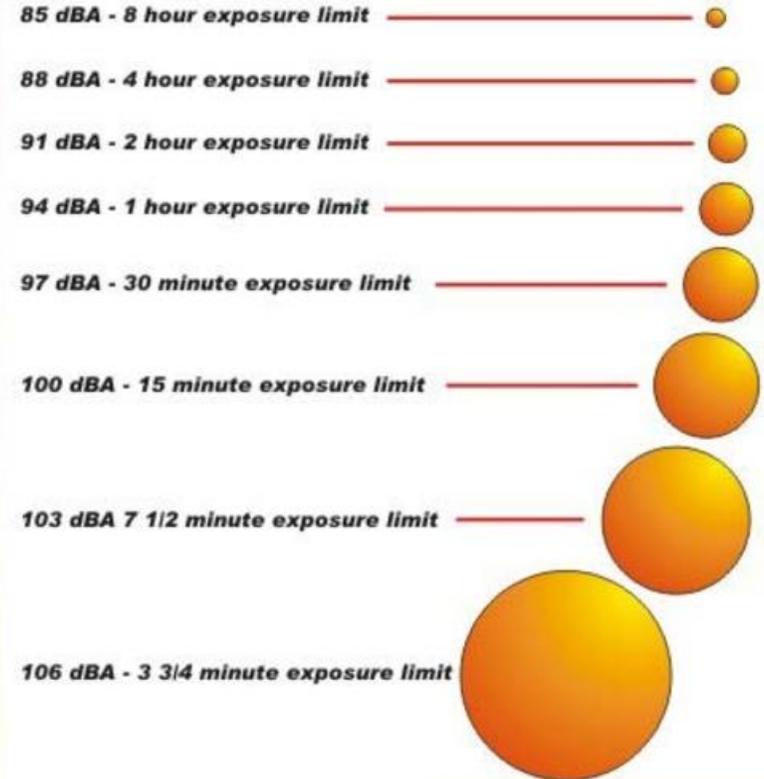
**Installing trench conduit**  
95.8 decibels



## HOW TO "LOOK" AT NOISE

INTENSITY COMPARISONS WITH NIOSH RECOMMENDED PERMISSIBLE EXPOSURE TIME

Note: For every 3dB the energy doubles.



### NOTE:

Noise Levels for the Following:

- 91dB - Orbital Sander
- 96 dB - Router
- 101 dB - Circular Saw



**HAZTEK SAFETY MANAGEMENT**

A PARADIGM COMPANY

# Track, Train, Test

- Train on hearing loss, noisy tasks, noise reduction
- Use labels/stickers
- Use right HPD
  - Train on use
  - Provide variety
  - Enforce
- Test hearing

However, a combination of testing issues and real-world experience means the NRR needs to be adjusted to estimate the degree of protection actually provided.

NIOSH recommends you adjust NRRs as follows:

- Earmuffs: Subtract 25% from the NRR
- Formable earplugs: Subtract 50% from the NRR
- All other earplugs: Subtract 70% from the NRR

EXAMPLE: For a 100-dBA noise exposure and choice of the following:

A) Earmuffs with an NRR of 29

B) Formable earplugs with an NRR of 28

Estimated noise exposures are as follows:

**A. Wearing earmuffs**

**B. Wearing earplugs**

Noise level

Noise level

$$= 100 - [29 - (25\% \text{ of } 29)]$$

$$= 100 - [28 - (50\% \text{ of } 28)]$$

$$= 100 - [29 - 7.25]$$

$$= 100 - [28 - 14]$$

$$= 100 - 21.75$$

$$= 100 - 14$$

$$= 78.25 \text{ dBA}$$

$$= 86 \text{ dBA}$$

# Noise

*Why do you think hearing loss is often accepted as “part of the job” in construction?*



# Air Contaminants



- Not obvious. Effects delayed
- Lost among more immediate concerns



*15.2% of construction workers 50 years & older show signs of lung disease*

*2x rate of white collar*



# Air Contaminants

The fall could kill.

What about the welding fumes?



# Air Contaminants

Worried about getting backed over?

What about exposure to asphalt fumes?



# Air Contaminants



# Air Contaminants

A fall hazard — but asphalt or coal tar fumes/burns are a hazard as well



# What Trades are Most Affected?

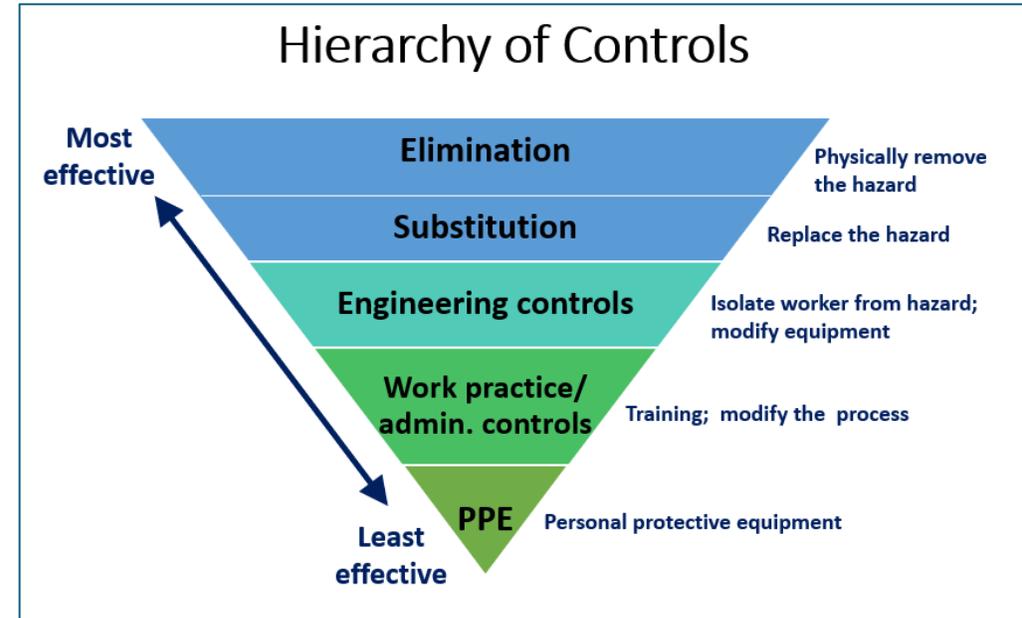
All Trades are affected:

- Welders – Heavy Metal Fumes, UV exposures
- Masons – Silica & Dust
- Iron Workers – Lead
- Painters – Lead, VOCs
- Roofers – Asphalt Fumes & Dust
- Carpenters – Silica, Wood Dust
- Plumbers - Lead & Epoxies

Let's not forget about working next to each other!

# Exposure Factors

- Highly Toxic materials
- Large amounts (using or disturbing)
- Longer duration tasks
- Dispersive equipment
- Enclosed or confined areas
- Not using controls



## Guidelines for JSAs:

- What tasks will involve use of chemical products?
- Will other tasks generate contaminants?

# Air Contaminants

*How do we overcome the challenge of hazards that are invisible and have delayed health effects?*

# High Temperatures

## KEY MESSAGES

- High temperatures are increasingly common – need for program approach

## These factors aggravate heat conditions

- Working in direct sunlight
- Protective clothing, especially semipermeable or impermeable types
- Respirator use
- No breeze
- Hot work such as welding or working around steam
- Carrying additional weight from tools and protective equipment
- No recent exposure to hot workplaces
- Low liquid intake

### Sidebars topics:

- Factors that aggravate heat conditions
- High temperatures can lead to injuries
- Acclimatization is an important consideration
- OSHA NIOSH Heat Safety Tool App
- Full sun matters
- Heat safety tool app plan elements
- Urine color and hydration
- Hydration – how much is needed?
- Acclimatization scheduling guidance
- WBGT - Taking heat illness prevention to the next level

# High Temperatures

Common illnesses related to heat stress include:

- Heat rash
- Heat cramps
- Heat exhaustion
- Heat stroke

# High Temperatures

Plan ahead to identify and reduce potential heat illness problems

## Guidance for JSAs

Step 1: Obtain the heat index forecast.

Step 2: Adjust risk levels to account for construction risk factors.

Step 3: Determine the risk level and tailor appropriate protective measure program elements.



# High Temperatures

## KEY MESSAGES

- Acclimatization is key
- Use OSHA NIOSH Heat Index app – but tailor to construction
- Site leadership must take heat dangers seriously

***You should know ...***

**Acclimatization is an important consideration**

*OSHA investigated 20 heat illness cases in 2012 to 2013 that involved 13 deaths. Of those 13 deaths, 9 occurred on the first three days of the job. **Of those 9 deaths, 4 occurred on the first day of the job.***

# High Temperatures

*Given that most heat-related deaths occur within the first three days on the job, what onboarding changes could prevent this?*

# Case Study # 1

## Heat

- **Who:** Sitework Excavation / Trenching Crew
- **What:** Crews work 8-10 hr's with small breaks
- **Why:** Company has lack of heat stress program  
Company works longer shifts to beat weather (rain)  
Company lacks education in training
- **When:** May - August
- **Where:** Northeast U.S



**HAZTEK** SAFETY  
MANAGEMENT  
A PARADIGM COMPANY

# Acclimatization Schedule

TABLE 4 – Effective WBGT Work/Rest Schedules and Water Intake

Heat Risk Category		Effective WBGT	LIGHT WORK		MODERATE WORK		HEAVY WORK	
			Minutes of Work/Rest per Hour	Water Intake (Quart/Hr.)	Minutes of Work/Rest per Hour	Water Intake (Quart/Hr.)	Minutes of Work/Rest per Hour	Water Intake (Quart/Hr.)
Low/ Minimal Risk	Unacclimatized	78 to 79.9 °F	50 / 10 Min	½	40 / 20 Min	¾	30 / 30 Min	¾
	Acclimatized		Continuous	½	Continuous	¾	50 / 10 Min	¾
Caution	Unacclimatized	80 to 84.9 °F	40 / 20 Min	½	30 / 30 Min	¾	20 / 40 Min	1
	Acclimatized		Continuous	½	50 / 10 Min	¾	40 / 20 Min	1
Moderate	Unacclimatized	85 to 87.9 °F	30 / 30 Min	¾	20 / 40 Min	¾	10 / 50 Min	1
	Acclimatized		Continuous	¾	40 / 20 Min	¾	30 / 30 Min	1
High Risk	Unacclimatized	88 to 90 °F	20 / 40 Min	¾	10 / 50 Min	¾	Avoid	1
	Acclimatized		Continuous	¾	30 / 30 Min	¾	20 / 40 Min	1
Very High to Extreme	Unacclimatized	>90 °F	10 / 50 Min	1	Avoid	1	Avoid	1
	Acclimatized		50 / 10 Min	1	20 / 40 Min	1	10 / 50 Min	1



# Case Study # 2

## Asbestos

- **Who:** Demolition Contractor
- **What:** Demo crew opened historic building wall to discover pipe wrapped in asbestos and started removal
- **Why:** Company lacked training on asbestos awareness  
Environmental testing company onsite did not read demolition plan
- **When:** September, 2025
- **Where:** Philadelphia



# Case Study # 3

## Silica

- **Who:** Concrete Contractor
- **What:** Two crew members dry cut sidewalk at basketball stadium exposing pedestrians and other construction trades
- **Why:** Company lacked training on Respirable Crystalline Silica Dust  
Company did not provide proper PPE and tools to mitigate dust  
Workers did not have respirator fit testing and medical evaluations  
Pre-planning did not occur
- **When:** March, 2025
- **Where:** New Jersey



# Case Study # 4

## Volatile Organic Compounds

- **Who:** Owner, Subcontractor + Environmental Company
- **What:** Owner quickly contracted / demanded work to begin after a long permitting process to excavate petroleum contaminated soil
- **Why:** Company was small, low bidder with no safety program / culture  
Company believed Environmental company was protecting them.  
Workers did not have training, fit testing, personal air monitors, PIDs  
Pre-planning EHS did not occur
- **When:** Yesterday!!!
- **Where:** Coney Island



## Focus Four for Health

*An Initiative to Address Four Major  
Construction Health Hazards*

Guidance Document

*Developed by the AIHA Construction Committee*



# Questions

## Focus Four for Health in Construction

Presenters: Chris Ulriksen, M.S, CSP  
Mike Kenyon, M.S, SMS

Phone / Email: [culriksen@haztekinc.com](mailto:culriksen@haztekinc.com) / (609-949-6867)  
[mkenyon@haztekinc.com](mailto:mkenyon@haztekinc.com) / (609-864-2557)

[www.focusfourconstructionhealth.org](http://www.focusfourconstructionhealth.org)