

Construction Sites are Workplaces, Too: Considering the Health of Those Who Occupy Buildings Before Turnover

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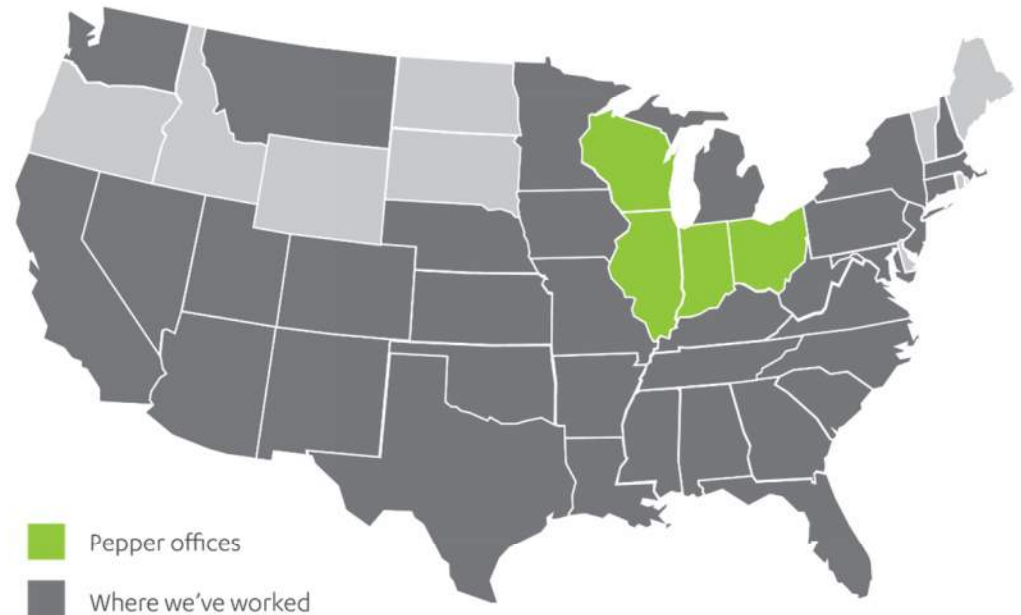
Director of Safety
Pepper Construction

PEPPER OVERVIEW

Markets

- Civic + Cultural
- Commercial Interiors
- Corporate Office
- Entertainment
- Healthcare
- Higher Education
- Hospitality
- Industrial
- K-12
- Manufacturing
- Mission Critical
- Residential
- Retail
- Senior Living

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CONSTRUCTION JOBSITES



How many of you have been to an
active construction site?

CONSTRUCTION HEALTH + SAFETY

Construction work
can be dangerous.

Much has improved
since the 1920s.



1920s
Grueling conditions,
few regulations



1933-37
Golden Gate Bridge:
first project to require

- hard hats
- respirators
- goggles
- skin protection
- circus netting for falls

1950s
Some sites have
untrained safety
supervisors

1969
Walsh-Healey Noise
Standard for federal
contract work

1971
Occupational Safety and
Health Administration
(OSHA) Founded



1996
National Occupational
Research Agenda
founded to reduce
injuries and illnesses

2016
Silica standards
updated

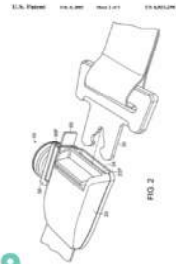
1920-30s
Rise of Unions

1927
Pepper Construction
founded



1948
Workers' compensation
programs nationwide

1959
Patent awarded
for safety belts



1980s
Locking snap
hook connectors
and full-body
harnesses gain
more acceptance

2010s
Virtual construction helping to
drive additional advancements



WORKERS + END USERS

SOCIAL RESPONSIBILITY:
creating a healthy workspace for
the tradespeople

SAFETY: long-term health
impacts of what goes into a
project site



INDOOR AIR QUALITY (IAQ)



Occupant Complaint
Investigations



USGBC - LEED Based Air
Quality Testing



WELL Building Standard

STANDARD IAQ SAMPLING



SAMPLING KIT USGBC LEED v4



Baseline IAQ testing
performed **after construction**
ends and **before occupancy**

MEASURING IAQ
OUR RESEARCH AT A
CHICAGOLAND AREA HOSPITAL



WHAT ARE WE TESTING FOR?

Particulate Matter PM-10



Formaldehyde



Acetaldehyde



Volatile Organic Compounds (VOCs)

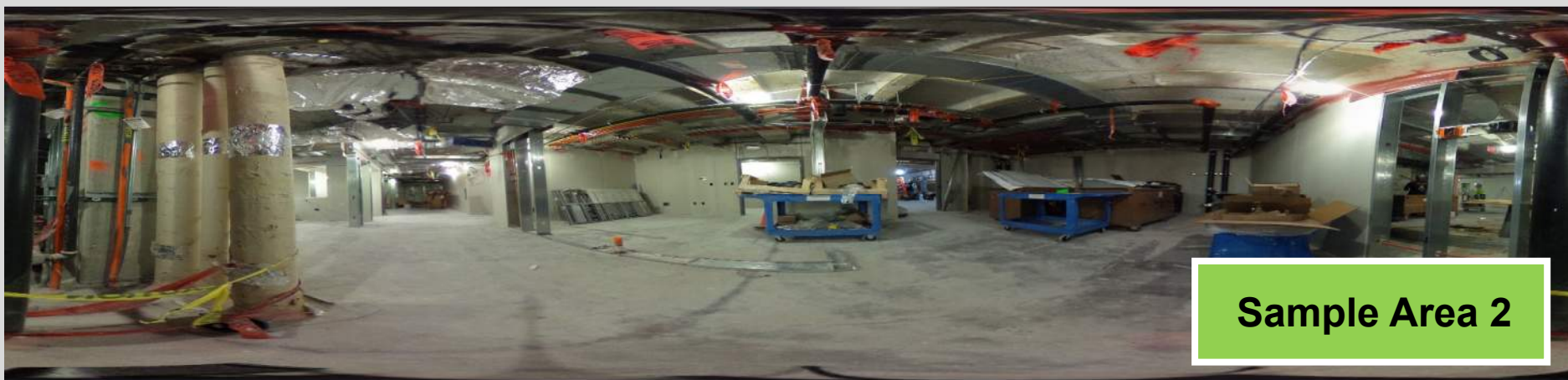
Carbon Monoxide



PROJECT TESTING I

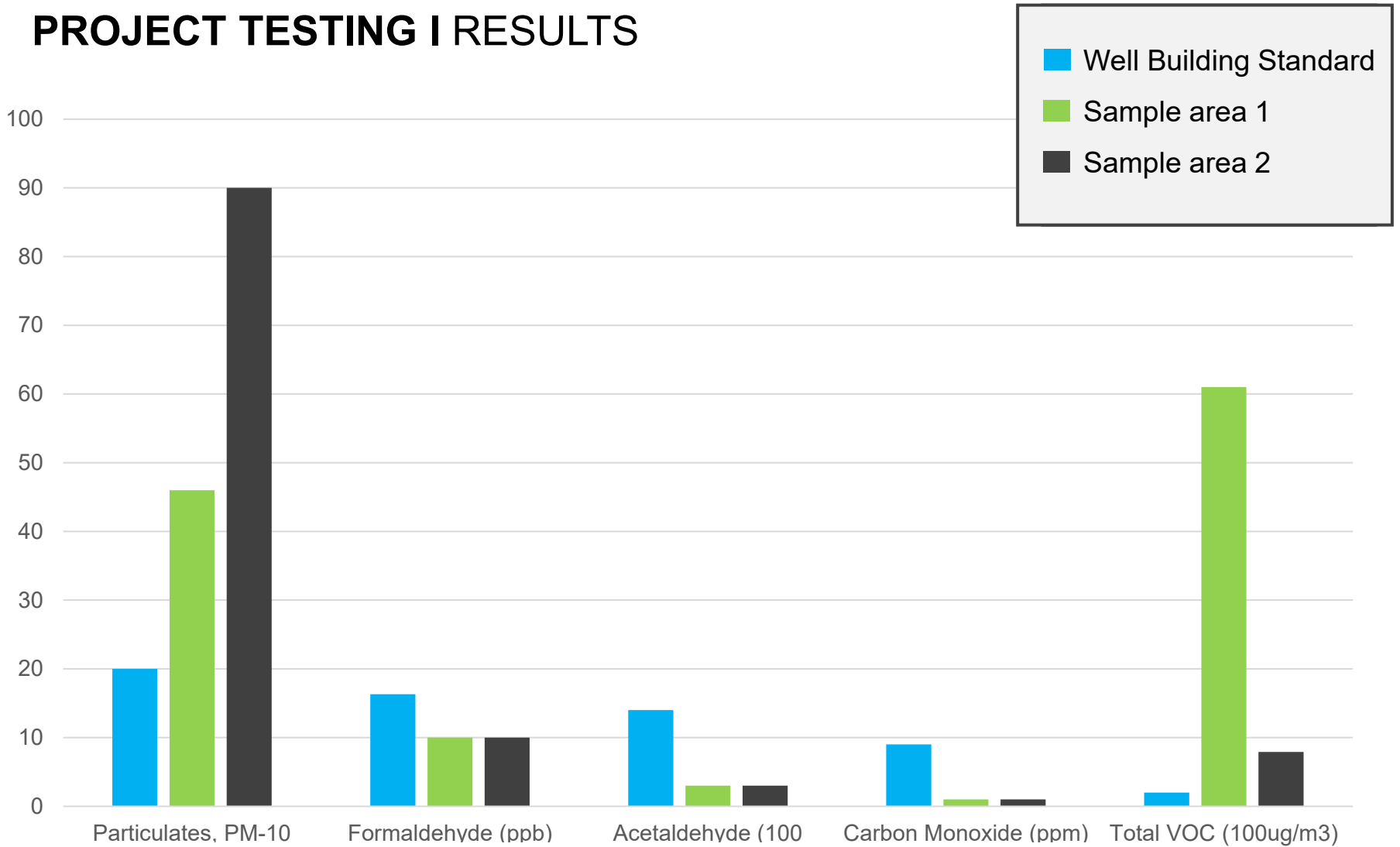


Sample Area 1



Sample Area 2

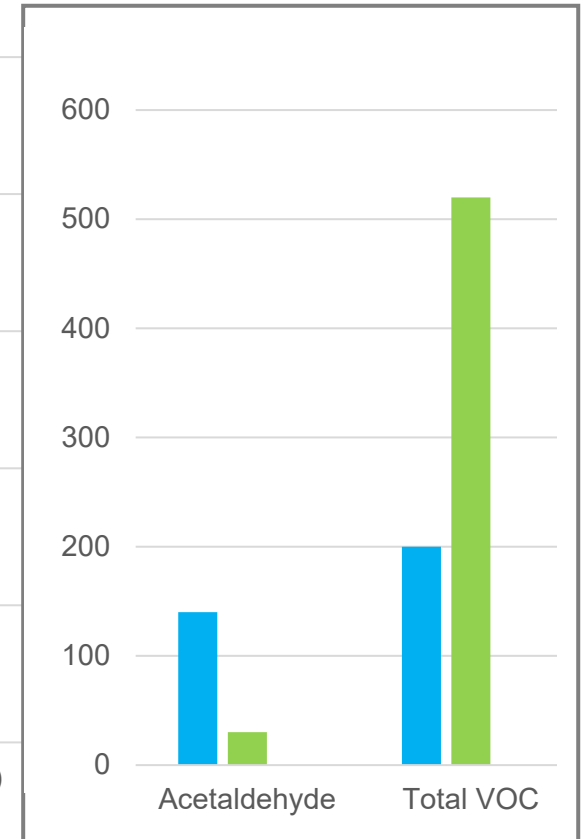
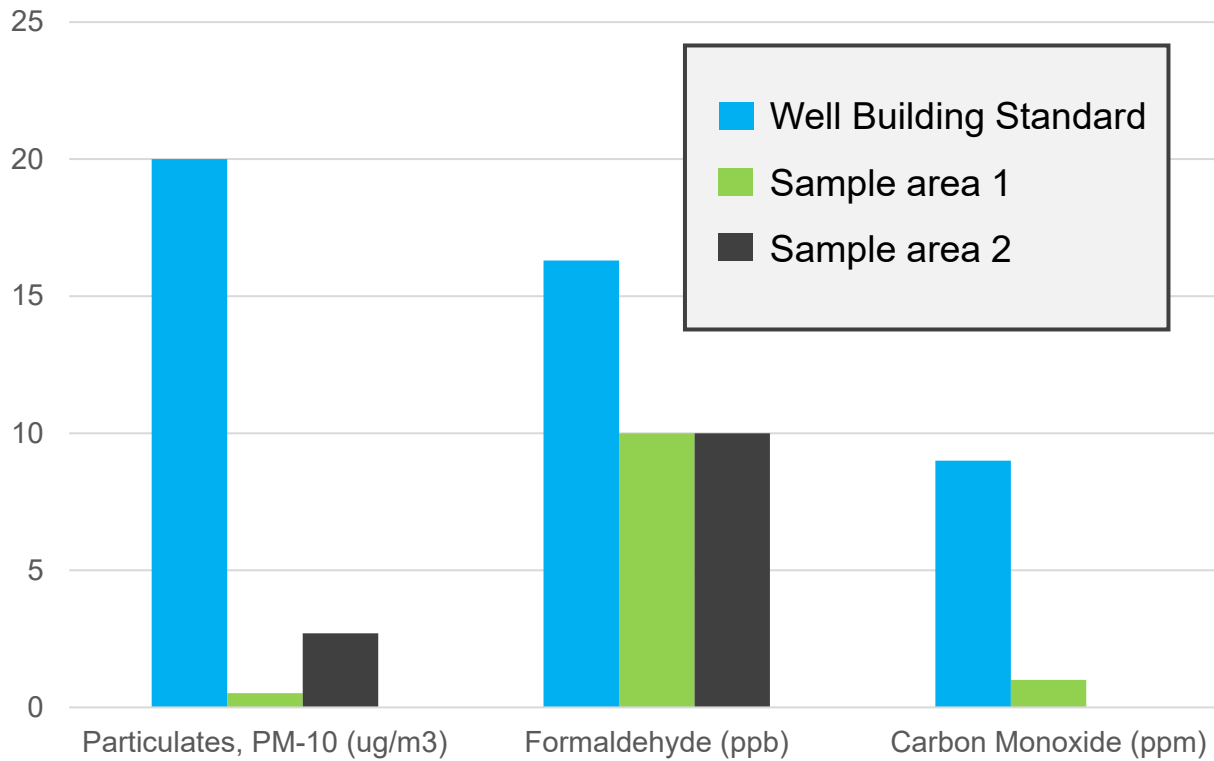
PROJECT TESTING I RESULTS



PROJECT TESTING II



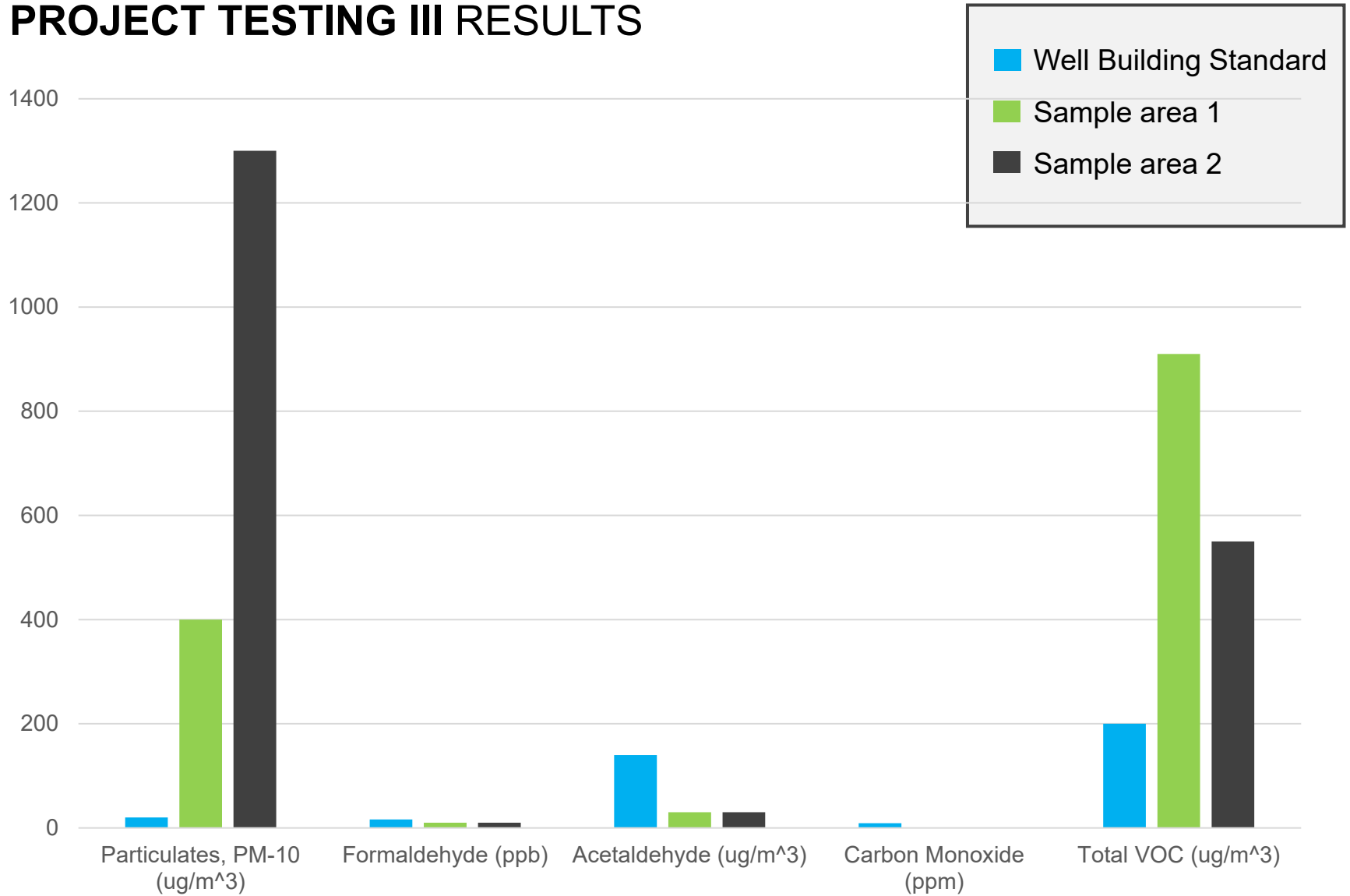
PROJECT TESTING II RESULTS



PROJECT TESTING III



PROJECT TESTING III RESULTS

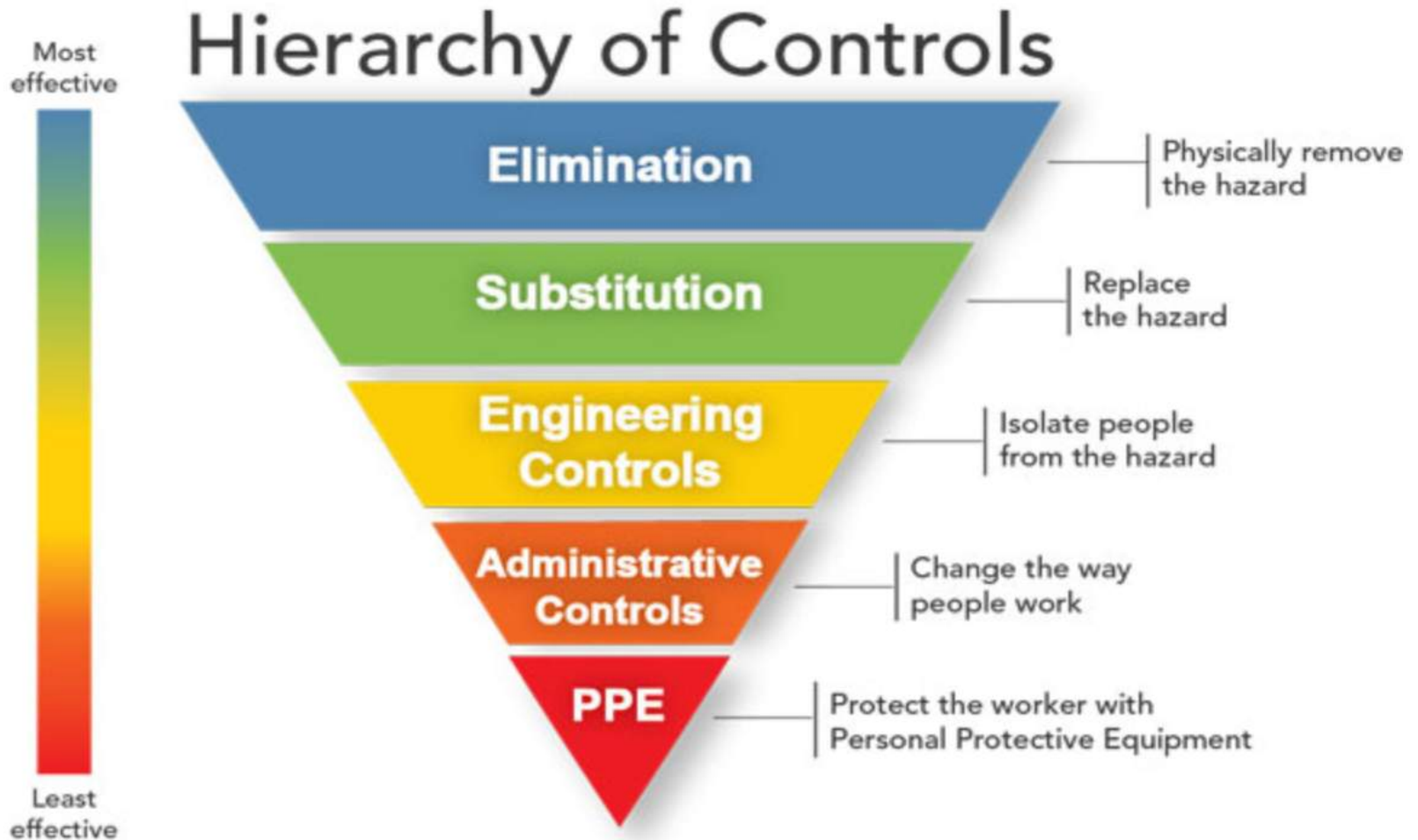


IDENTIFYING CONCERNS



Master project safety plans
Talk to trade partners

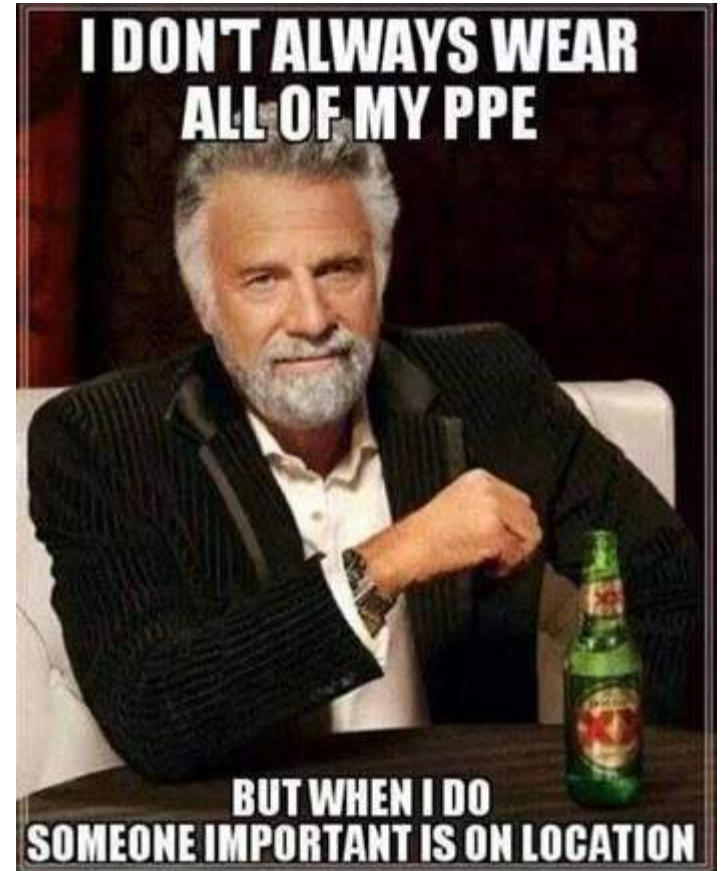
PROTECTING OUR WORKERS



PROTECTING OUR WORKERS

PPE and Administrative Controls

- » Used with existing processes when hazards are not well controlled
- » Hazards are not eliminated or reduced
- » Inexpensive but can be ineffective
- » Put burden on worker – **human error**
- » Training – **usually not lack of knowledge**
- » Require work to be done off hours – **costs more**



PROTECTING OUR WORKERS

Thumbs up!?

PPE = Last Resort

PERSONAL PROTECTIVE EQUIPMENT(PPE)

EAR PROTECTION
USE IN NOISY AREAS TO AVOID HEARING LOSS

RESPIRATORY EQUIPMENT
USE TO PROTECT FROM INHALING DUST AND OTHER CONTAMINANTS

SAFETY GLOVES
USE TO PROTECT YOUR HANDS FROM INJURY

SAFETY SHOES
USE TO PROTECT YOUR FEET FROM FALLING OR ROLLING OBJECTS

SAFETY HELMET
USE TO PROTECT YOUR HEAD FROM FALLING OBJECTS

SAFETY GLASSES
USE TO PROTECT EYES FROM FLYING PARTICLES

REFLECTIVE CLOTHING
USE TO MAKE SURE YOU ARE HIGHLY VISIBLE TO OTHER PERSONNEL

YOU ONLY HAVE ONE BODY!

The infographic features a central illustration of a worker in full PPE: a yellow safety helmet, safety glasses, ear protection, a respirator mask, safety gloves, safety shoes, and reflective blue and yellow overalls. Surrounding the worker are eight circular icons, each with a small illustration and text describing a PPE item and its use. Arrows point from each text block to the corresponding part of the worker's gear.

PROTECTING OUR WORKERS

Engineering Controls: Isolate people from the hazard

- » Favored over PPE and Administrative controls
- » Remove hazard at the source
- » Can be highly effective
- » Cost is higher
- » Requires additional equipment and work
- » Hazard still exists, still potential exposure

PROTECTING OUR WORKERS



PROTECTING OUR WORKERS



PROTECTING OUR WORKERS



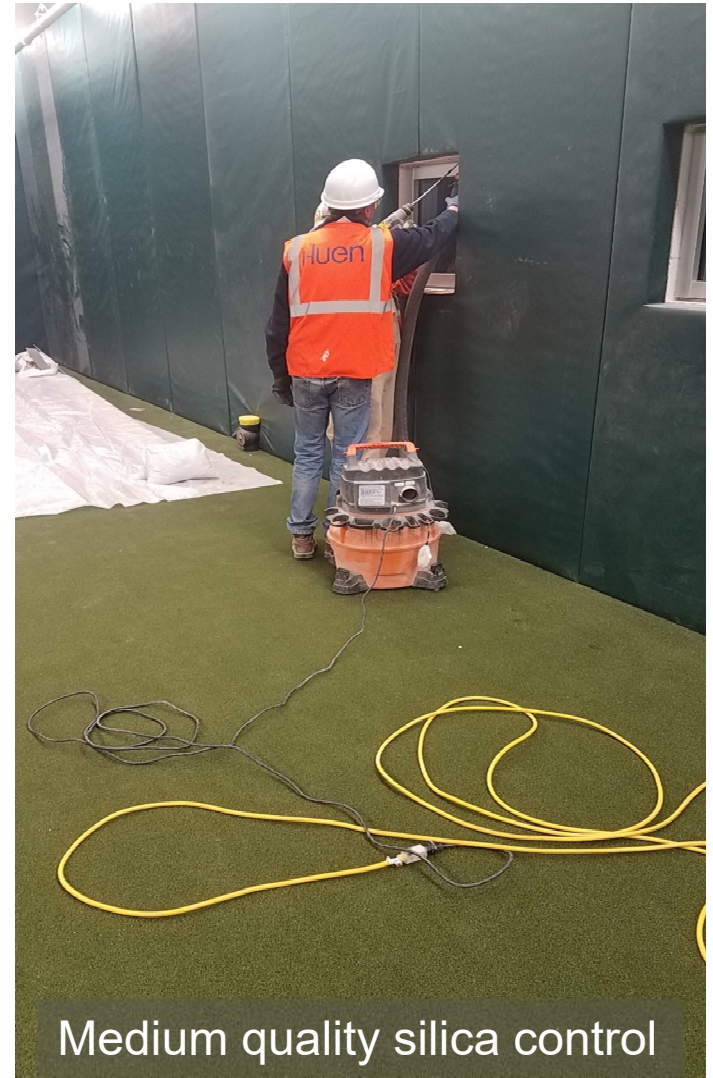
PROTECTING OUR WORKERS



Low quality silica control



High quality silica control



Medium quality silica control

We never want to see this again.



Low quality ventilation during silica work

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PROTECTING OUR WORKERS

Elimination and Substitution:

Replace or remove the hazard

- » Most effective
- » Most difficult
- » Requires cooperation from multiple parties
- » Can be costly and take time
- » Not typical and may challenge assumptions
- » Easier during design and developmental stages

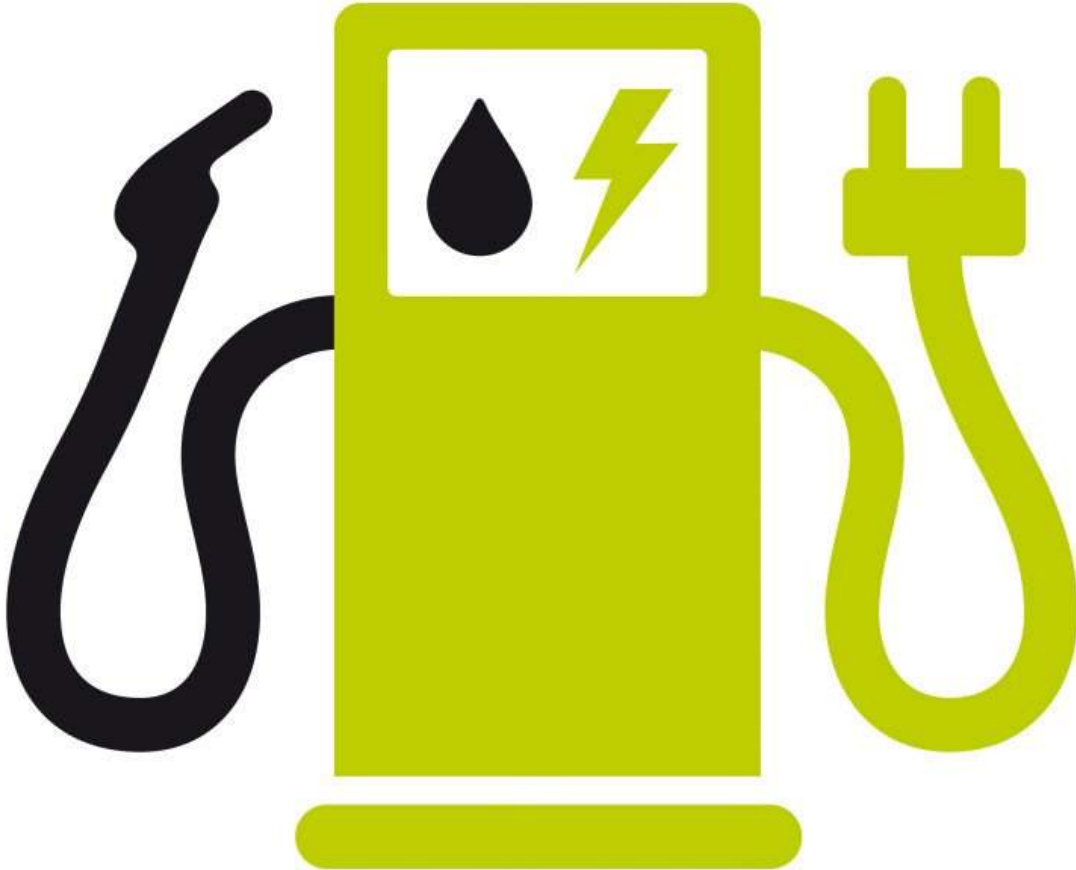
PROTECTING OUR WORKERS



PROTECTING OUR WORKERS



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vs



PROTECTING OUR WORKERS



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PROTECTING OUR WORKERS

Keep hazardous materials off the jobsite

Partner with architects to specify safe products



**LIVING
BUILDING
CHALLENGESM**

the **REDLIST**

The Living Building Challenge publishes a “Red List” of materials to be avoided in buildings seeking certification under the Living Building Challenge. What’s on it?

- Asbestos ● Cadmium ● Chlorinated Polyethylene and Chlorosulfonated Polyethylene ● Chlorofluorocarbons (CFCs) ● Chloroprene (Neoprene) ●
- Formaldehyde ● Halogenated Flame Retardants ●
- Hydrochlorofluorocarbons (HCFCs) ● Lead ● Mercury ●
- Petrochemical Fertilizers and Pesticides ● Phthalates ● Polyvinyl Chloride (PVC) ●
- Wood treatments containing creosote, arsenic or pentachlorophenol ●

PROTECTING OUR WORKERS



NIOSH – National Institute for Occupational Safety and Health

PROTECTING OUR WORKERS

Examples:

- » Parapet walls and skylights
- » Rooftop anchor points
- » Weight and size of building materials
- » Surface coatings and finishes
- » Eliminate RED LIST items
- » Eliminate confined spaces
- » Require prefabrication



cdc.gov/niosh/topics



Making progress

TYPICAL JOBSITE TRAILER



BUILDING THE FUTURE



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WHERE WE'RE GOING



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Success Nutrition Facts

Serving Size: 26 Hours a Week
Servings Per Container: 100 (4000 Hours)

Amount Per Serving	
Health	100%
Focus	100%
Persistence	100%
Discipline	100%
Failure	100%
Risk	100%
Patience	100%

*Percent Daily Values are based on a diet of hard work.



A net zero trailer with solar panels on the roof. The trailer is white on the left and blue on the right. The solar panels are mounted on a blue metal roof. The trailer is parked on a grassy area next to a paved road.

One Net Zero Trailer eliminates **53,712 pounds of CO₂ emissions** each year (4 homes)

If 700,000 construction companies had one trailer each, we'd eliminate **19 trillion tons of CO₂** each year (2,800,000 homes)...

...or **760 trillion tons** over their lifetime of use (28,000,000 homes)

That's more than the populations of the **10 largest US cities** combined!

QUESTIONS + ANSWERS

