Construction Efforts at NIOSH

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National Institute for Occupational Safety and Health
December 11, 2013
TAUC—The Association of Union Constructors

Presentation Outline

- NIOSH Construction Program
- The Construction Falls Prevention Program
- Lead Exposures in Construction
- Findings from the FACE Program
- Prevention through Design

National Institute for Occupational Safety and Health

NIOSH

The sole federal government organization charged with conducting occupational safety and health research

Organizational Chart of Federal Entities for Occupational Safety and Health

Regulation and Enforcement:

Department of Labor (DOL)

- Mine Safety and Health Administration (MSHA)
- Occupational Safety and Health Administration (OSHA)

Research and Prevention Recommendations:

Department of Health and Human Services (HHS)

- Centers for Disease Control and Prevention (CDC)
  - National Institute for Occupational Safety and Health (NIOSH)

Mission - NIOSH Construction Program

"Provide … leadership to prevent work-related illness, injury, disability, and death by … gathering information, conducting … research, and translating the knowledge gained into products, solutions, and services tailored to meet construction needs."

Program Structure and focus areas

NIOSH Office of Construction Safety and Health

Intramural Research

Basic Research
Surveillance
Methods Research
Exposure Assessment
Controls Development
Applied Research
Research to Practice

National Construction Center

Industry Characterization
Applied Research
Industry Liaison
Intervention
Research to Practice

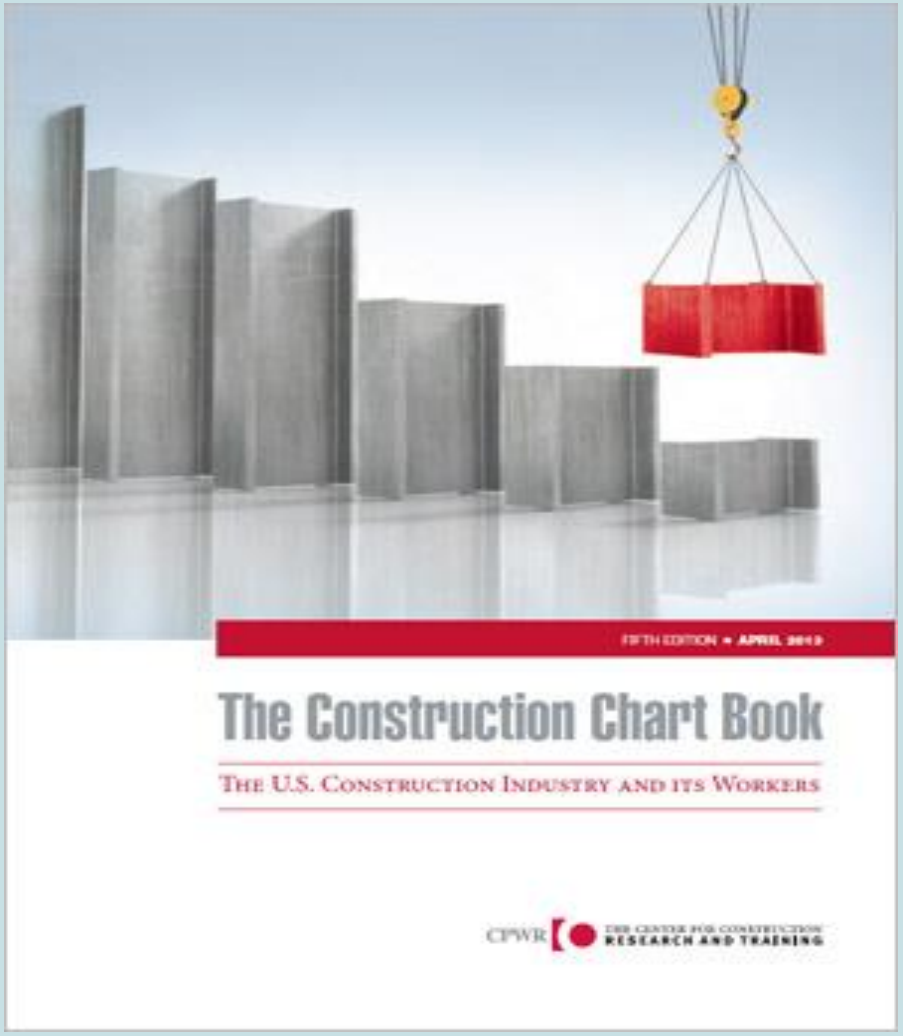
Extramural Investigator-initiated Grants

Innovative Ideas
Opportunities
State Initiatives

CPWR

Center for Construction Research and Training

National Construction Center

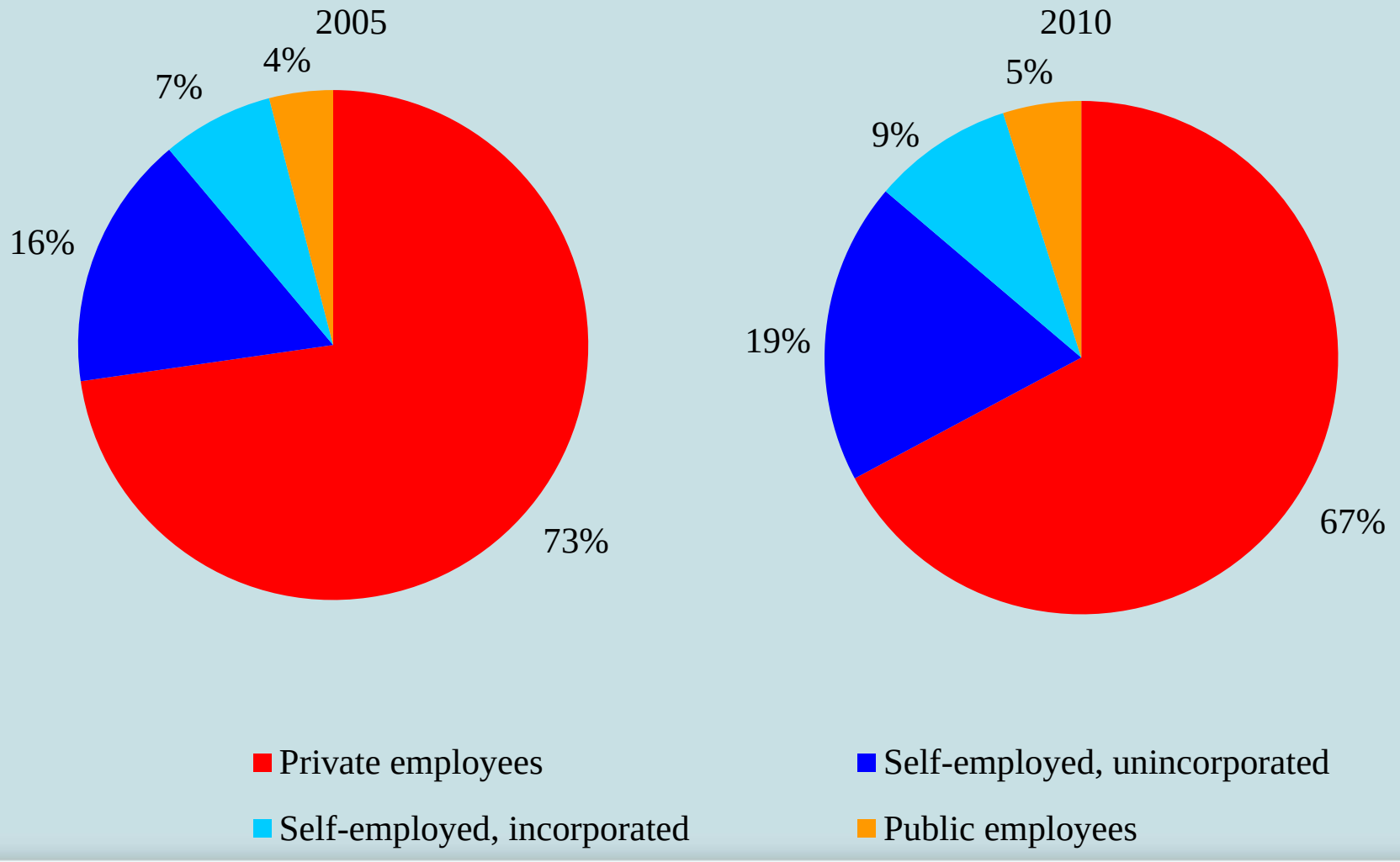


elcosh Electronic Library of Construction Occupational Safety & Health

CDC Workplace Safety and Health

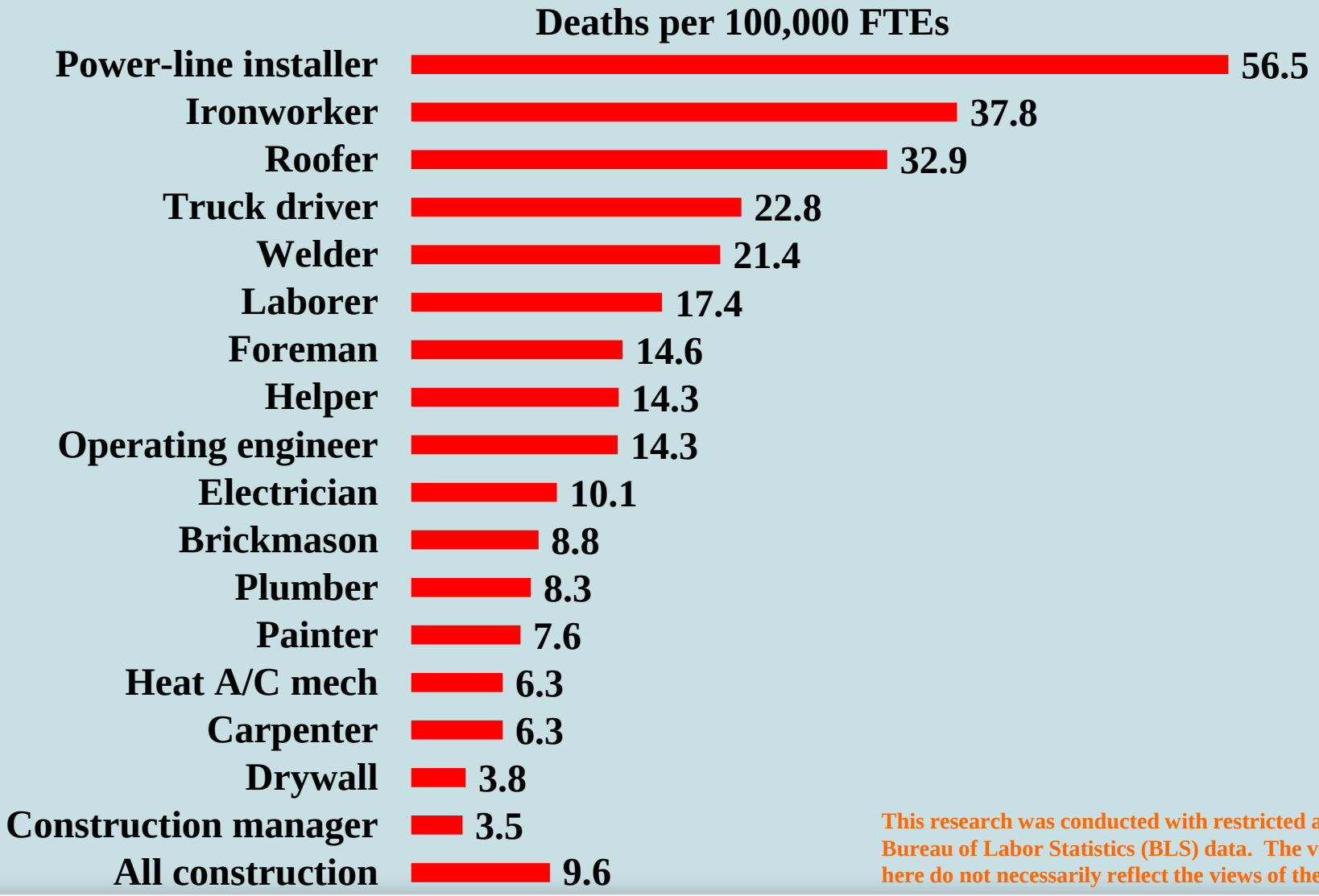
NIOSH

Percentage of construction workforce, by class of workers, 2005 and 2010



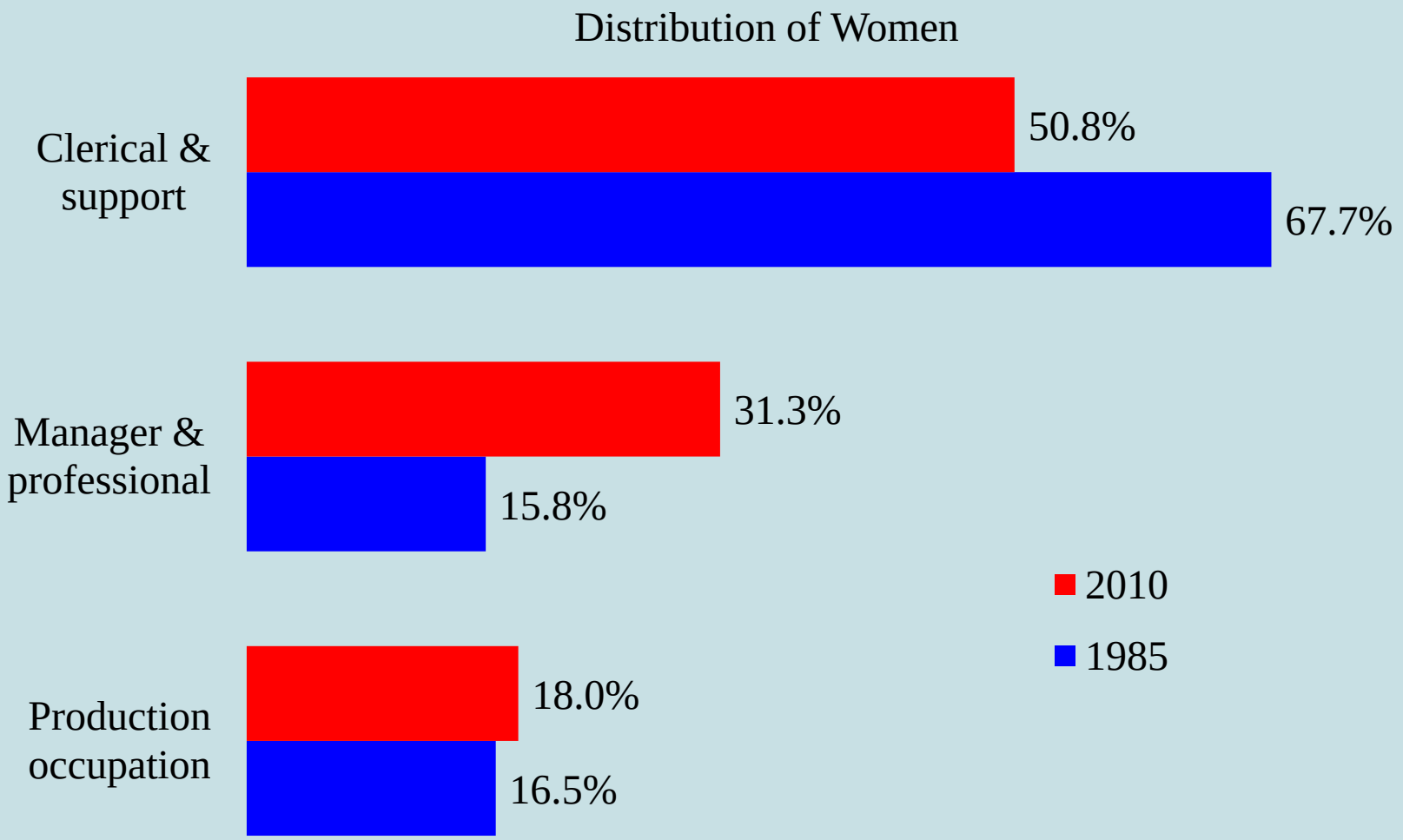
This research was conducted with restricted access to Bureau of Labor Statistics (BLS) data. The views expressed here do not necessarily reflect the views of the BLS.

Rate of fatalities, selected construction occupations, 2008-2010 average, (all employment)



This research was conducted with restricted access to Bureau of Labor Statistics (BLS) data. The views expressed here do not necessarily reflect the views of the BLS.

Distribution of women workers in construction, by occupation type, 1985 and 2010 (all employment)

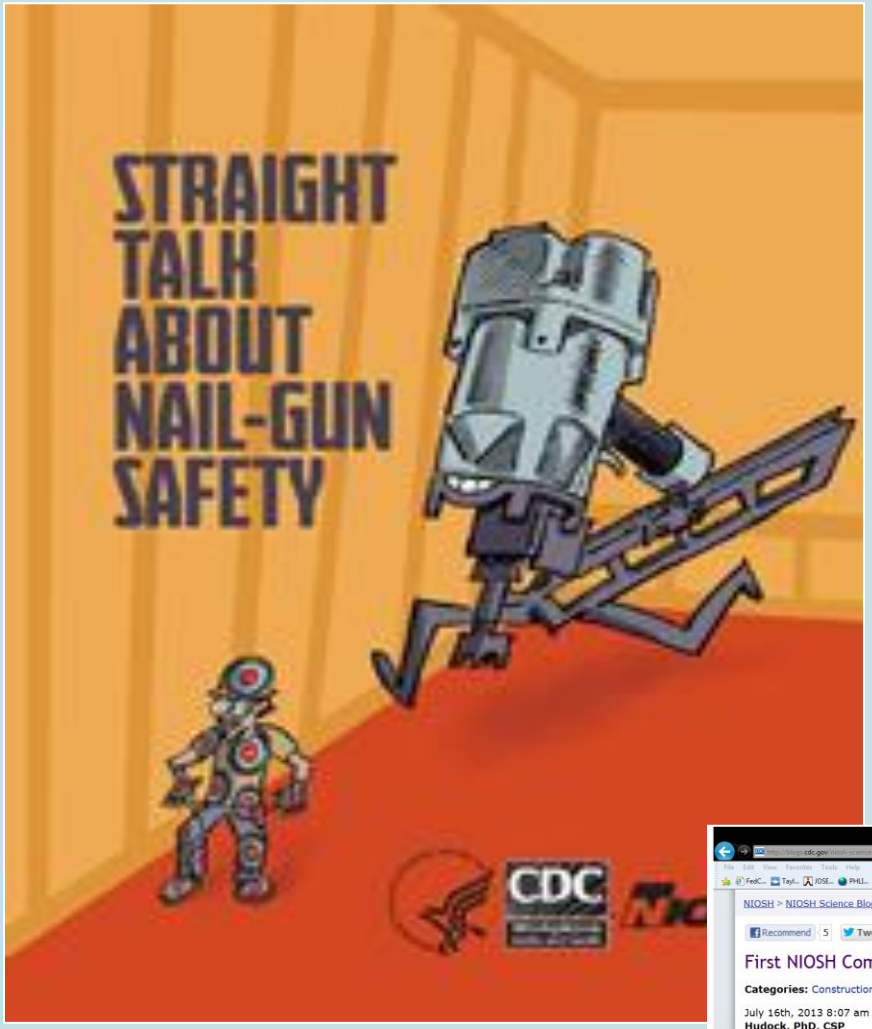


This research was conducted with restricted access to Bureau of Labor Statistics (BLS) data. The views expressed here do not necessarily reflect the views of the BLS.

Injury Assessment for Emerging Mast Scaffold Technology

Chris Pan, DSR and team

Photo: Chris Pan

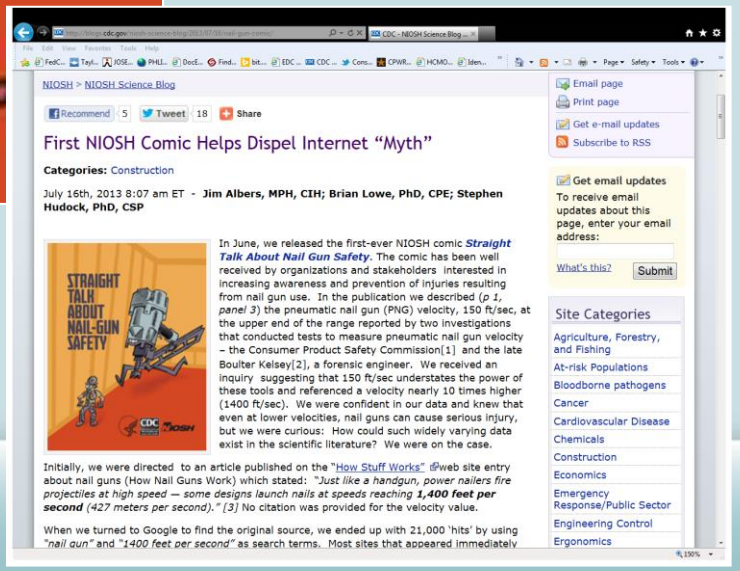


Straight Talk About Nail Gun Safety

Jim Albers and DART team

Published in June 2013

http://www.cdc.gov/niosh/docs/2013-149



NIOSH > NIOSH Science Blog

Recommend 5 Tweet 18 Share

First NIOSH Comic Helps Dispel Internet "Myth"

Categories: Construction

July 16th, 2013 8:07 am ET - **Jim Albers, MPH, CIH; Brian Lowe, PhD, CPE; Stephen Hudock, PhD, CSP**

In June, we released the first-ever NIOSH comic ***Straight Talk About Nail Gun Safety***. The comic has been well received by organizations and stakeholders interested in increasing awareness and prevention of injuries resulting from nail gun use. In the publication we described (*p 1, panel 3*) the pneumatic nail gun (PNG) velocity, 150 ft/sec, at the upper end of the range reported by two investigations that conducted tests to measure pneumatic nail gun velocity – the Consumer Product Safety Commission[1] and the late Boulter Kelsey[2], a forensic engineer. We received an inquiry suggesting that 150 ft/sec understates the power of these tools and referenced a velocity nearly 10 times higher (1400 ft/sec). We were confident in our data and knew that even at lower velocities, nail guns can cause serious injury, but we were curious: How could such widely varying data exist in the scientific literature? We were on the case.

Initially, we were directed to an article published on the "How Stuff Works" web site entry about nail guns (How Nail Guns Work) which stated: *"Just like a handgun, power nailers fire projectiles at high speed — some designs launch nails at speeds reaching* ***1,400 feet per second*** *(427 meters per second)." [3]* No citation was provided for the velocity value.

When we turned to Google to find the original source, we ended up with 21,000 'hits' by using *"nail gun"* and *"1400 feet per second"* as search terms. Most sites that appeared immediately

Email page
Print page
Get e-mail updates
Subscribe to RSS

Get email updates
To receive email updates about this page, enter your email address:
What's this? Submit

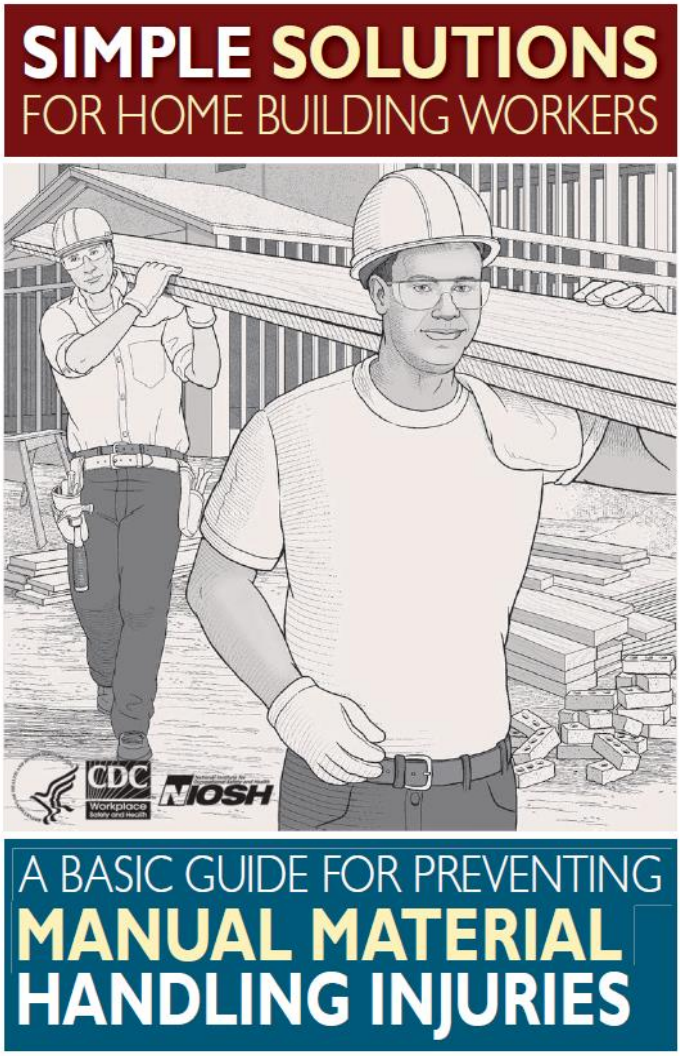
Site Categories
Agriculture, Forestry, and Fishing
At-risk Populations
Bloodborne pathogens
Cancer
Cardiovascular Disease
Chemicals
Construction
Economics
Emergency Response/Public Sector
Engineering Control
Ergonomics

Simple Solutions for Home Building Workers

Jim Albers and DART team

Published in June 2013

http://www.cdc.gov/niosh/docs/2013-111/

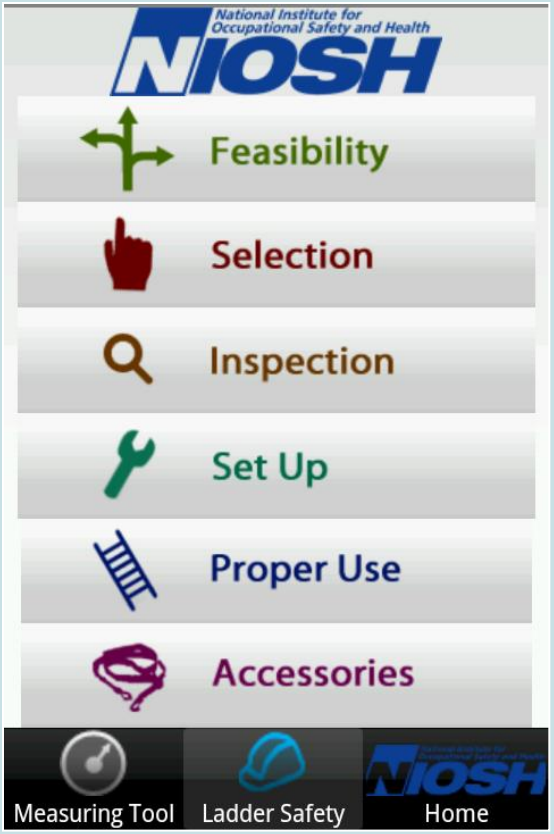


Ladder Safety Application for Smart Phones

Peter Simeonov, DSR and team

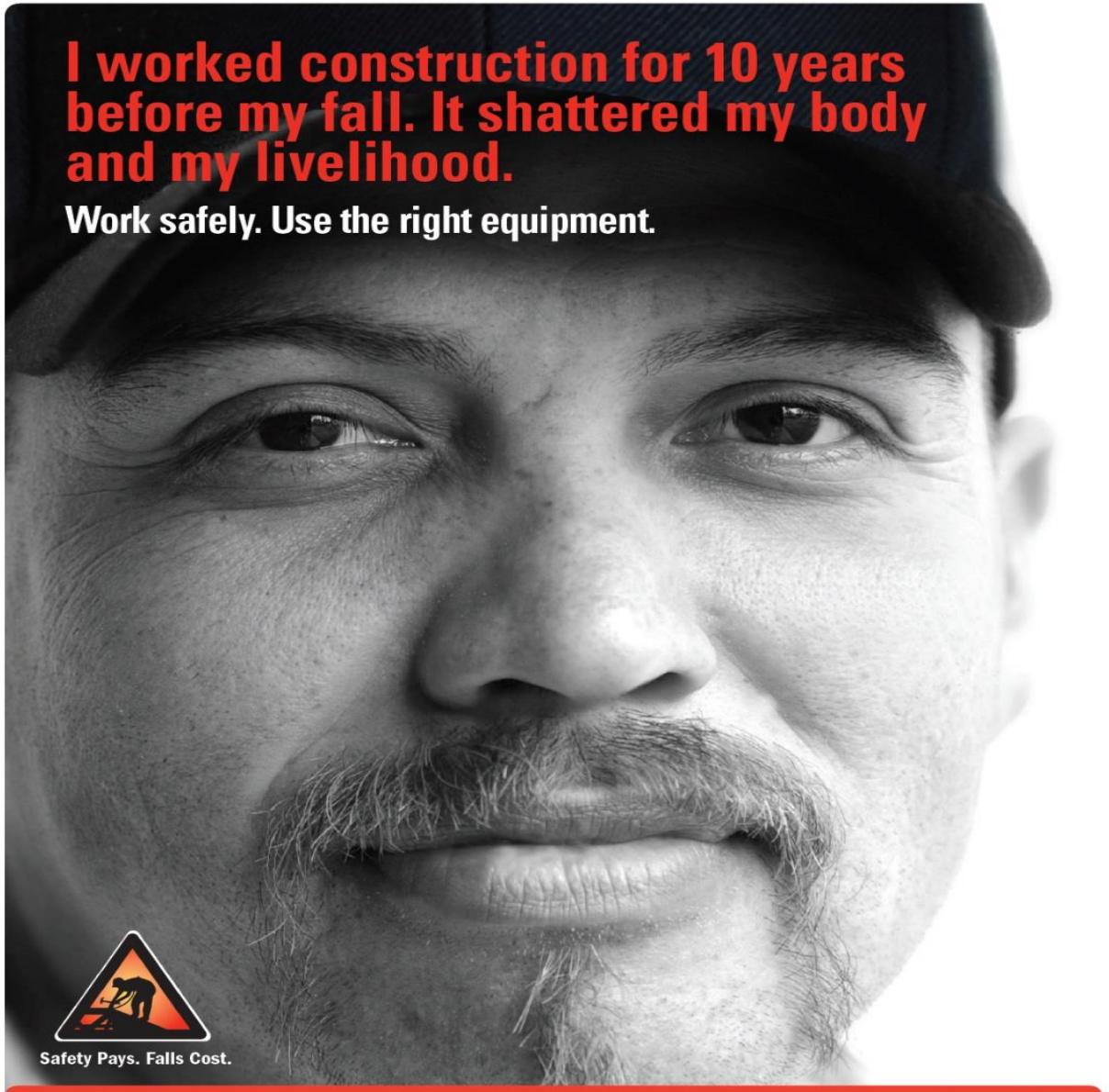
Developed APP to quickly and easily position extension ladder at correct angle

Inclination indicator



Graphic-oriented aid

stopconstructionfalls.com



FALLS FROM LADDERS, SCAFFOLDS AND ROOFS CAN BE PREVENTED!

U.S. Department of Labor

PLAN ahead to get the job done safely.
PROVIDE the right equipment.
TRAIN everyone to use the equipment safely.

www.osha.gov/stopfalls.gov

1 (800) 321-OSHA (6742) • TTY 1-877-889-5627

OSHA® Occupational Safety and Health Administration

CDC Workplace Safety and Health NIOSH NORA

NIOSH 2012-141 / OSHA 3531-04 2012

Why a Focus on Falls?

Greatest fall fatality hazards:

- Roofs ~ 33%
- Scaffolds ~ 16%
- Ladders ~ 16%

These 3 hazards combined account for roughly two-thirds of all fatal falls in construction

They represent, however, very different problems

FALLS FROM LADDERS CAN BE PREVENTED!

- ☑ Choose the right ladder for the job
- ☑ Maintain three points of contact
- ☑ Secure the ladder
- ☑ Always face the ladder

DON'T
overreach

DON'T
stand on top or on the top step of a stepladder

DON T
place the ladder on unlevel footing

PLAN ahead to get the job done safely.
PROVIDE the right ladder and equipment.
TRAIN everyone to use the equipment safely.

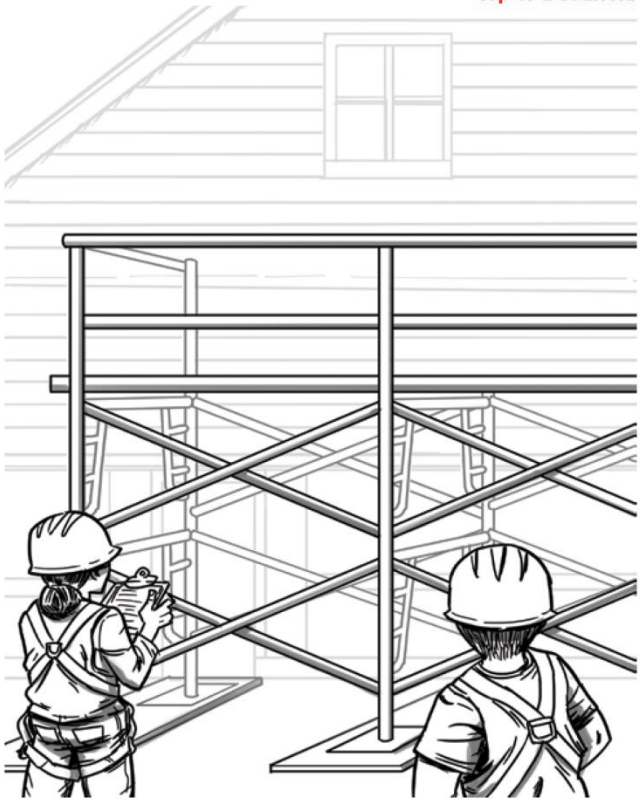
CDC Workplace Safety and Health
NIOSH

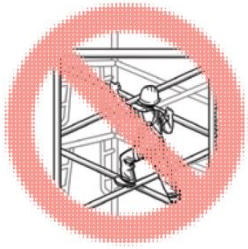
FALLS FROM SCAFFOLDS CAN BE PREVENTED!

- ☑ Use fully planked scaffolds
- ☑ Ensure proper access to scaffold
- ☑ Plumb and level
- ☑ Complete ALL guardrails
- ☑ Ensure stable footing
- ☑ Inspect before use (by competent person)

DON'T
use a ladder on top of a scaffold

DON'T
stand on guardrails





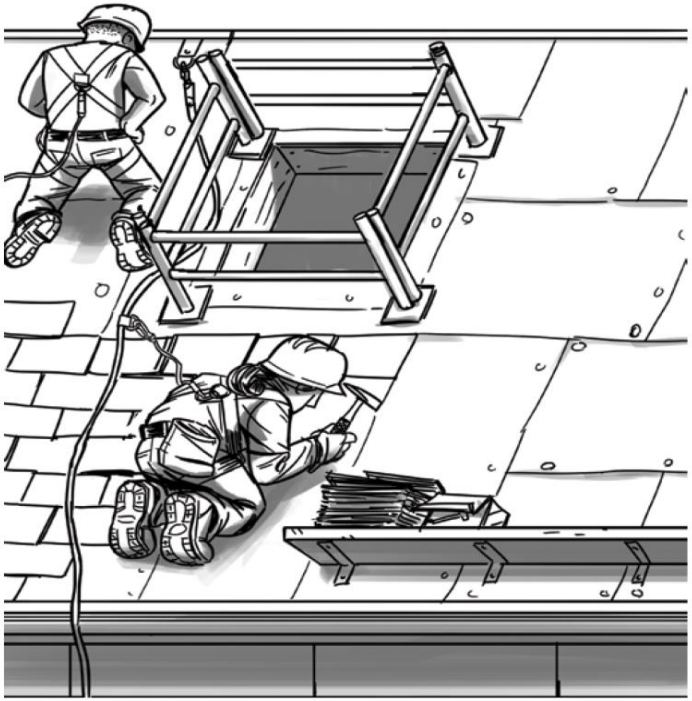
DON'T
climb cross-braces

PLAN ahead to get the job done safely.
PROVIDE the right scaffold and equipment.
TRAIN everyone to use the equipment safely.

CDC Workplace Safety and Health
NIOSH

FALLS FROM ROOFS CAN BE PREVENTED!

- ☑ Wear a harness and always stay connected
- ☑ Make sure your harness fits
- ☑ Use guardrails or lifelines
- ☑ Inspect all fall protection equipment before use
- ☑ Guard or cover all holes, openings, and skylights



DON'T
disconnect from
the lifeline

DON'T
work around unprotected
openings or skylights

DON'T
use defective equipment

PLAN ahead to get the job done safely.
PROVIDE the right roof equipment.
TRAIN everyone to use the equipment safely.

U.S. Department of Labor

OSHA® Occupational Safety and Health Administration
1-800-321-OSHA (6742) • TTY 1-877-889-5627
www.osha.gov

NIOSH 2012-142 / OSHA 3533-04 2012

Spot the Hazard: Can You Spot the Hazard?

stopconstructionfalls.com

Web Addresses

Main campaign website (CPWR—The Center for Construction Research and Training) http://www.stopconstructionfalls.com

Campaign posters and fact sheets
http://www.cdc.gov/niosh/construction/stopfalls.html

http://www.osha.gov/stopfalls/

NIOSH Science blog http://blogs.cdc.gov/niosh-science-blog/

Fatality Assessment and Control Evaluation Program (FACE) reports http://www.cdc.gov/niosh/face/

To become a campaign partner: email falls@cpwr.com

NIOSH Construction Page
http://www.cdc.gov/niosh/construction/

NIOSH Construction Program on Twitter

@NIOSHConstruct

Lead Developments

RIVETBUSTING

Photo: Mt Sinai/CHEP

From eLCOSH Images

ABLES Highlights for Construction

Manufacturing had greatest overall number of elevated blood leads (BLL > 25 µg/dl) reported in 2009:

72% Manufacturing

14% for Construction

However, **construction has the greatest proportion of individuals with BLLs ≥40 µg/dL (among those with BLL ≥25 µg/dL) of all industries**

Painting and Paperhanging	27.1%
Bridge, tunnel, elevated highway construction	25.2%
Special trade contractors	26.3%
Heavy construction	20.4%

AMERICAN JOURNAL OF INDUSTRIAL MEDICINE 54:356–365 (2011)

Studies of OSHA IMIS data also suggest that lead exposures are on the decline for almost every industry
…..except construction

Characterization of Lead in US Workplaces Using Data From OSHA's Integrated Management Information System

Scott A. Henn, MS,* Aaron L. Sussell, PhD, Jia Li, MS, Jeffrey D. Shire, MS, Walter A. Alarcon, MD, and Sangwoo Tak, ScD

Background *Lead hazards continue to be encountered in th*
Integrated Management Information System (IMIS) is the larg
containing sampling results in US workplaces.
Methods *Personal airborne lead sampling results in IMIS were ex*
2008. Descriptive analyses, geographical mapping, and regress
were performed.
Results *Seventy-nine percent of lead samples were in the manu*
sample results were highest in the construction sector (median
sector, year, OSHA region, number of employees at the worksite, fe
unionization, advance notification, and presence of an employ
statistically associated with having a lead sample result exceed the PEL.
Conclusions *Lead concentrations within construction have been higher than any other industry. Lead hazards have been most prevalent in the north and northeastern US. IMIS*

"The construction sector is the only sector that did not show a decrease in the percent of samples greater than the PEL (0.05 mg/m^3) over the years ..." 1979 - 2008

Impact of New Information?

Research suggests that the 1993 OSHA construction lead standard, which was based on the available science for the 1978 general industry lead standard, is no longer sufficiently protective

Example:

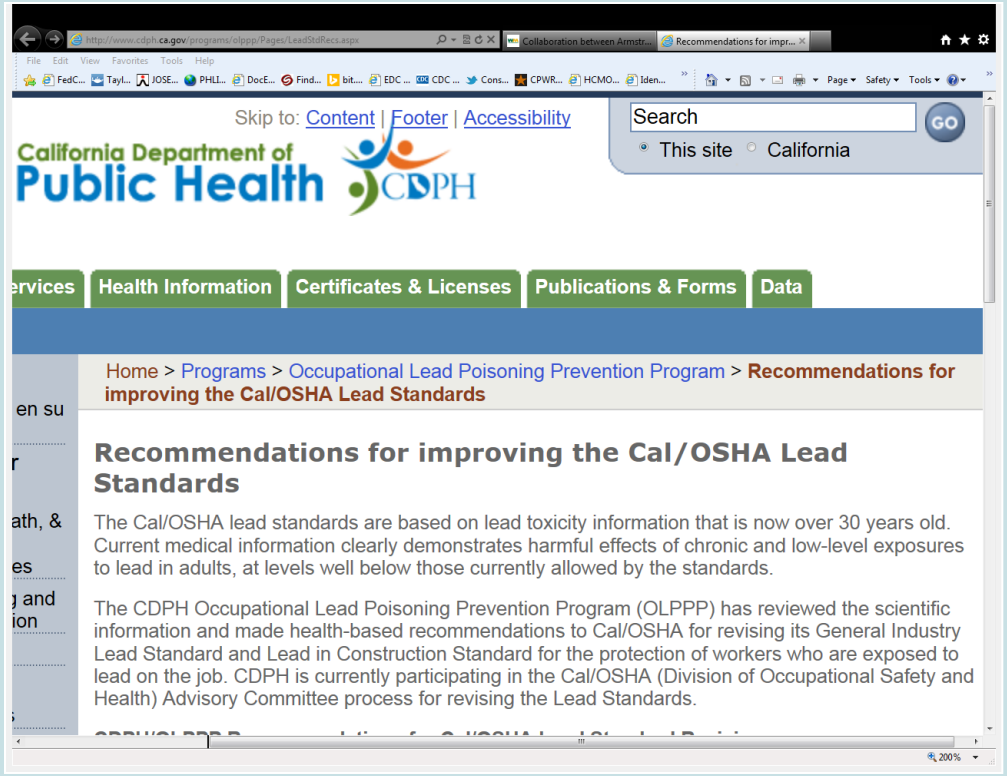
PEL of 50 µg/m3 → designed to keep blood lead below 40 µg/dl of blood trigger

….**NIOSH recommends that adult blood lead levels ≥10 µg/dl be considered elevated**

Health Effects at Different BLLs

Blood Lead Level (µg/dL)				
5-9	**10-19**	**20-39**	**40-79**	**≥ 80**
• Possible adverse population effects suggested by epidemiological studies NTP: BLL<10 µg/dL • Essential tremor • Increased risk of hypertension • Increased blood pressure NTP: BLL<5 µg/dL: • Decreased glomerular filtration rate • Maternal BLL associated with reduced fetal growth	• Possible spontaneous abortion • Reduced newborn birth weight • Possible blood pressure changes • Possible renal dysfunction (• Possible neurocognitive deficits) (• Possible postnatal development delay)	• Spontaneous abortion • Reduced newborn birth weight • Possible blood pressure changes • Possible renal dysfunction • Possible non-specific symptoms • Possible CNS effects -Memory and attention deficits (• Possible postnatal development delay)	• Spontaneous abortion • Reduced newborn birth weight • Non-specific symptoms • CNS effects • Sperm effects -lowered counts -abnormal sperm • Subclinical peripheral neuropathy • Possible hypertension • Possible anemia • Possible renal damage • Possible gout (• Possible postnatal development delay) (• Neurocognitive deficits)	• Spontaneous abortion • Reduced newborn birth weight • Non-specific symptoms • CNS effects • Sperm effects • Peripheral Neuropathy • Hypertension • Anemia • Abdominal Colic • Nephropathy • Gout (• Neurocognitive deficits) (• Encephalopathy)

Source: AOEC's Medical Management Guidelines. For effects in ( ) Kosnett *et al* and Shih *et al*.



California Department of Public Health Occupational Lead Poisoning Prevention Program recommended a dramatic reduction in the amount of lead in workplace air allowed under the Permissible Exposure Limit.

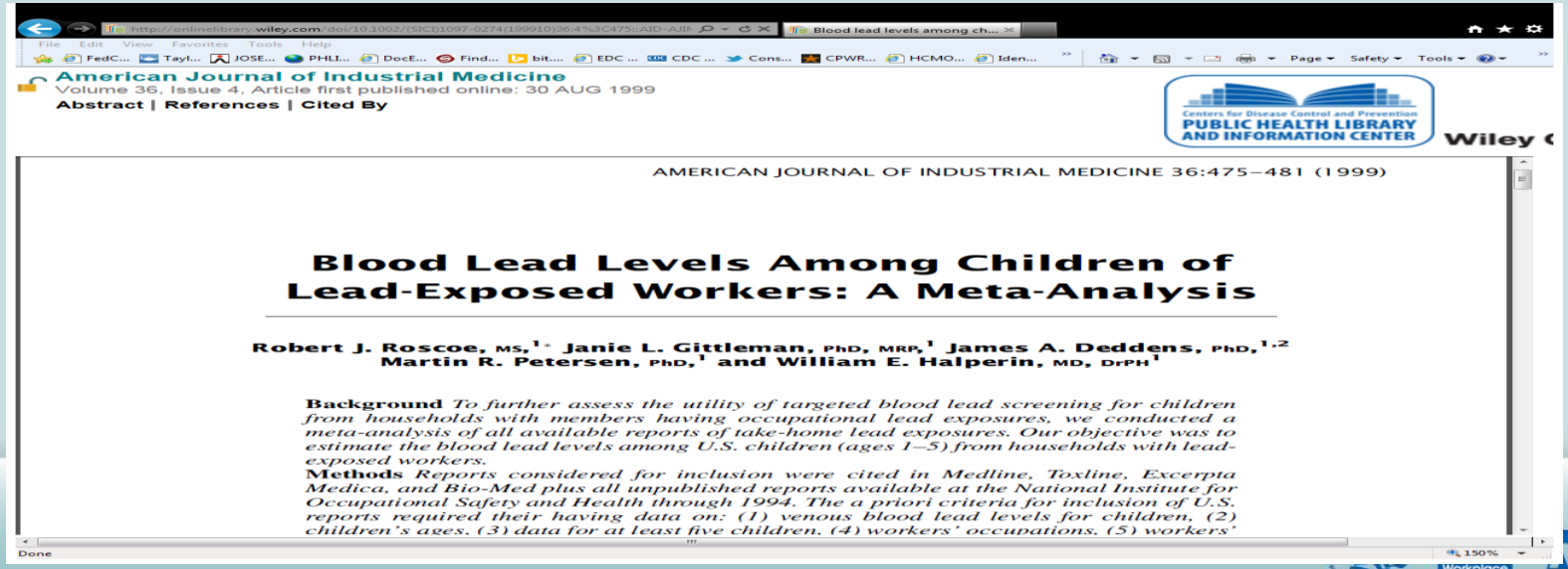
Health-based PEL → at or below 0.5 – 2.1 µg/m³ to keep workers' blood lead levels at or below 5 to 10 micrograms per deciliter (µg/dL) over a working lifetime.

Dr. John Howard moderated

"Lead in the Workplace: The New Science" in California, Nov 2013

What about the Children of Exposed Workers?

"Based on a meta-analysis of 10 reports from 1987-1994, the children (n=139) of lead-exposed workers (n=222) had a geometric mean blood lead level of 9.3 µg/dL compared to a U.S. population geometric mean of 3.6 µg/dL (*P*=0.0006). Also in this group, **52% of the children had blood lead levels (BLLs) ≥ 10 µg/dL compared to 8.9% in the U.S.** (*P*=.0010), and **21% of the children had BLLs ≥ 20µg/dL compared to 1.1% in the U.S**. (*P*=.0258)." *[emphasis added]*



http://onlinelibrary.wiley.com/doi/10.1002/(SICI)1097-0274(199910)36:4%3C475::AID-AJIM

Blood lead levels among ch...

American Journal of Industrial Medicine
Volume 36, Issue 4, Article first published online: 30 AUG 1999
Abstract | References | Cited By

Centers for Disease Control and Prevention
PUBLIC HEALTH LIBRARY AND INFORMATION CENTER

Wiley

AMERICAN JOURNAL OF INDUSTRIAL MEDICINE 36:475–481 (1999)

Blood Lead Levels Among Children of Lead-Exposed Workers: A Meta-Analysis

Robert J. Roscoe, MS,[1]* Janie L. Gittleman, PhD, MRP,[1] James A. Deddens, PhD,[1,2] Martin R. Petersen, PhD,[1] and William E. Halperin, MD, DrPH[1]

Background *To further assess the utility of targeted blood lead screening for children from households with members having occupational lead exposures, we conducted a meta-analysis of all available reports of take-home lead exposures. Our objective was to estimate the blood lead levels among U.S. children (ages 1–5) from households with lead-exposed workers.*

Methods *Reports considered for inclusion were cited in Medline, Toxline, Excerpta Medica, and Bio-Med plus all unpublished reports available at the National Institute for Occupational Safety and Health through 1994. The a priori criteria for inclusion of U.S. reports required their having data on: (1) venous blood lead levels for children, (2) children's ages, (3) data for at least five children, (4) workers' occupations, (5) workers'*

Done

150%

NIOSH

"Failure to screen this population will probably mean that their lead poisoning will be missed because they might not live in neighborhoods or houses which would otherwise make them candidates for targeted screening." Roscoe, et al. Conclusions, pg. 480

Trigger levels for childhood blood leads have also been reduced based on new information: From 10 ug/dl to no safe level … with use of 5 ug/dl as a "reference level" to recommend testing

"Children who come in contact with lead-exposed workers should be targeted for blood lead screening"

(ABLES Description webpage)

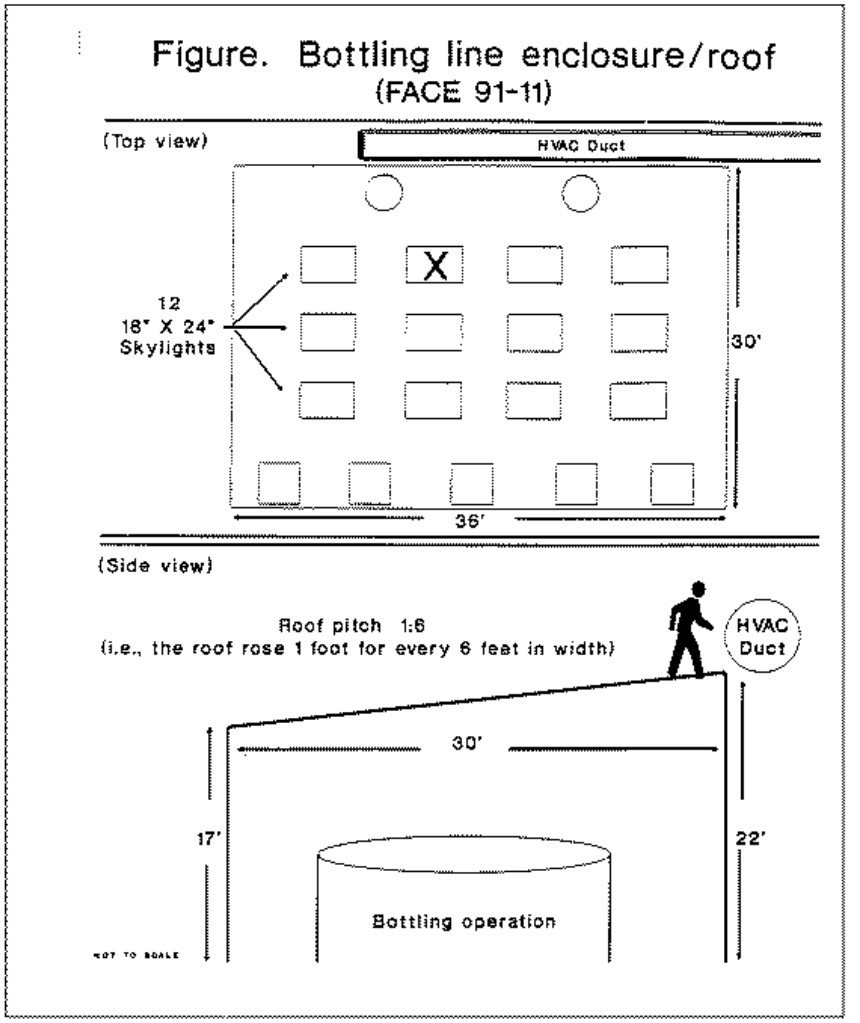
The Bottom Line: Lead continues to pose challenges for Construction

The Fatality Assessment and Control Evaluation (FACE) Program

FACE Website: www.cdc.gov/niosh/face

Reports Do Not Use Any Identifiers or Place Blame

Ironworker Dies in Ohio Following a 20’ Fall Through a Skylight Opening, Ohio

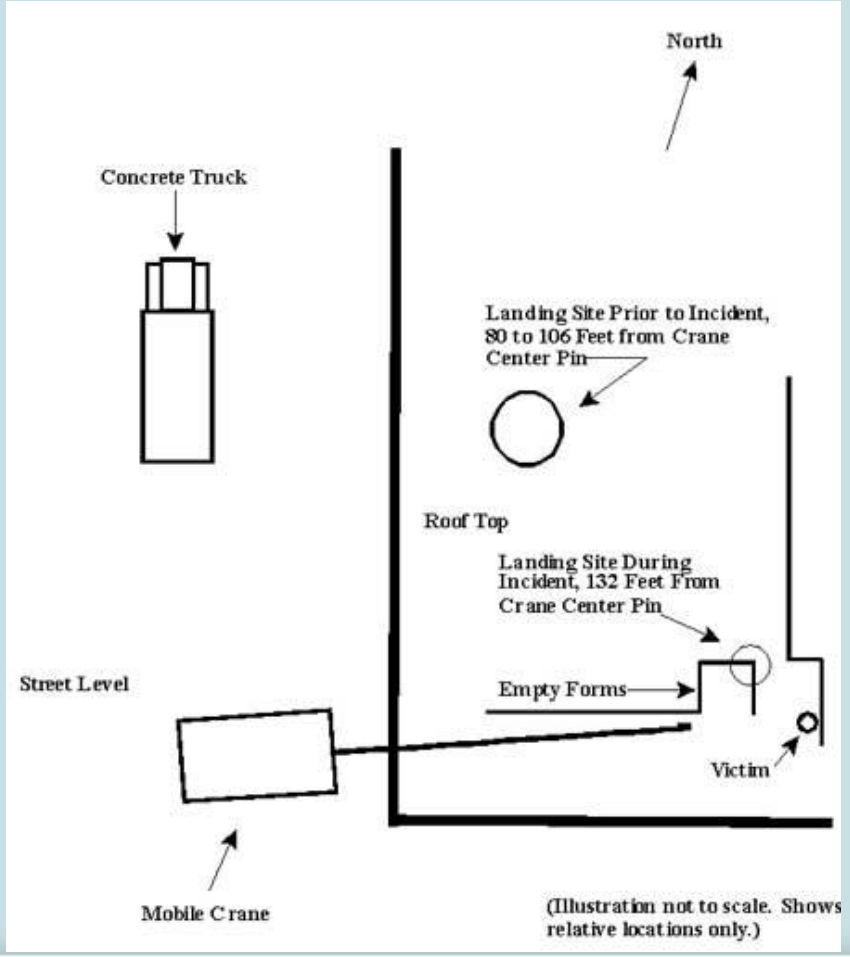


FACE Report 9111

Scaffold Erector Dies After Falling 60’ from Scaffold Inside Boiler, South Carolina

FACE Report 9808

Carpenter Dies After Being Struck by Uncontrolled Concrete Bucket When Crane Tips Over, Ohio



FACE Report 2000-12

4 Construction Workers Die after Cantilever Launching Gantry Collapses at Bridge Construction Site, Ohio

FACE Report 2004-05

Welder/Ironworker Dies After Becoming Entangled in a Beltline Driveshaft, South Carolina

FACE Report 9607

Prevention through Design (PtD)

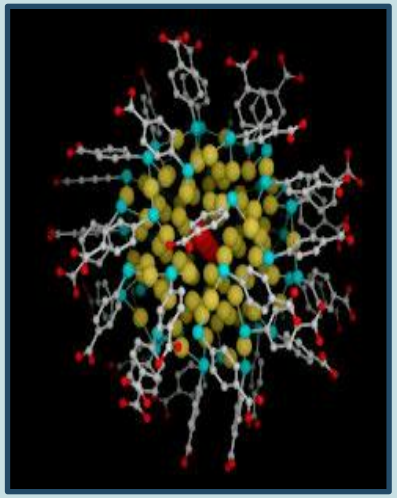
Mission: Design out hazards and minimize risks associated with:

Facilities

Work methods

Processes

Equipment



Products & new technologies

What is Prevention through Design?

Eliminating or reducing work-related hazards and illnesses and minimizing risks associated with

- Construction
- Manufacturing
- Maintenance
- Use, reuse, and disposal of facilities, materials, and equipment

DESIGN MATTERS!

Design as a Risk Factor: Australian Study, 2000–2002

Main finding: design contributes significantly to work-related serious injury.

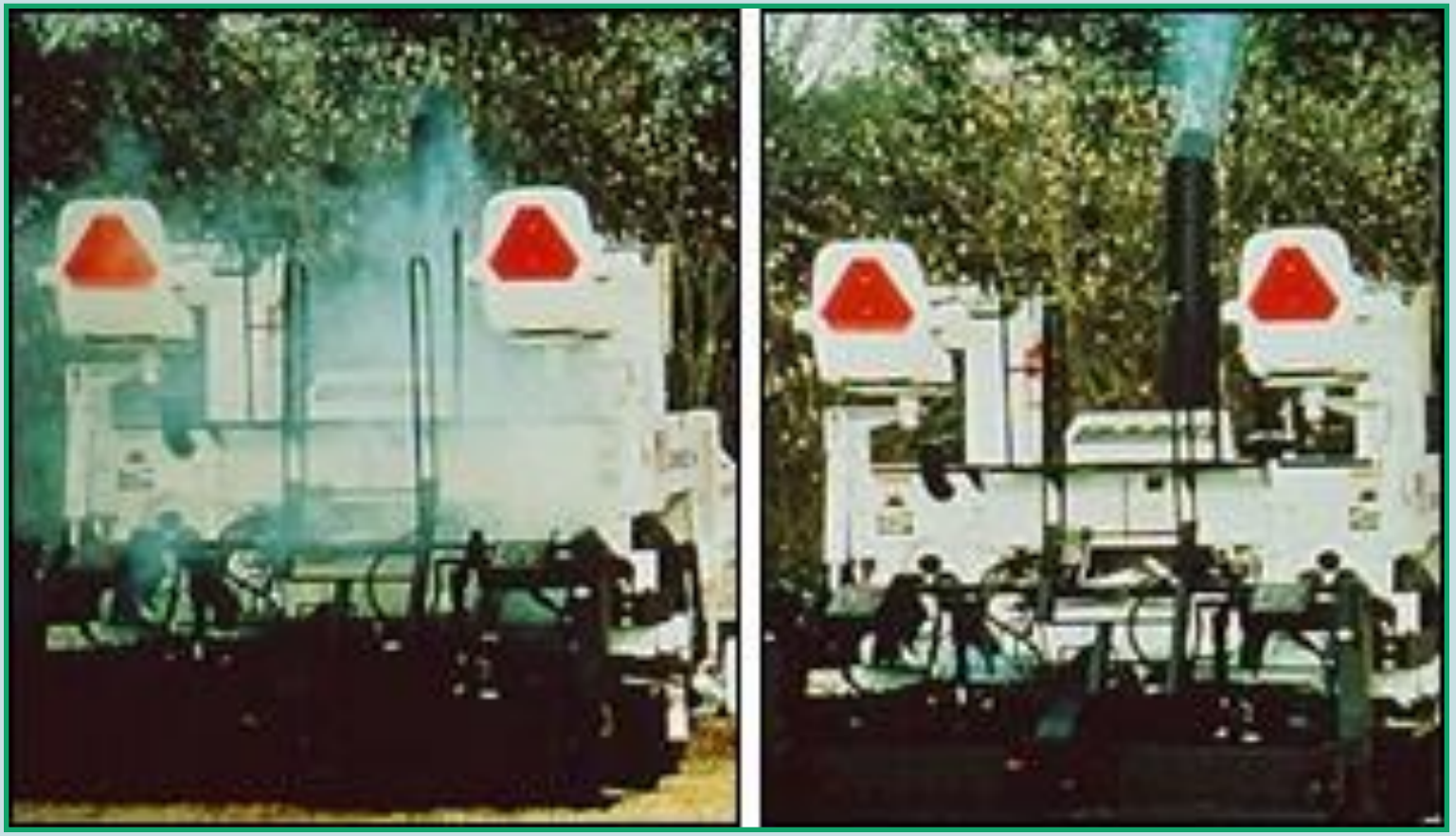
37% of workplace fatalities are due to design-related issues.

In another 14% of fatalities, design-related issues may have played a role.

From Driscoll et al., 2008

Photo courtesy of Thinkstock

Asphalt repaving

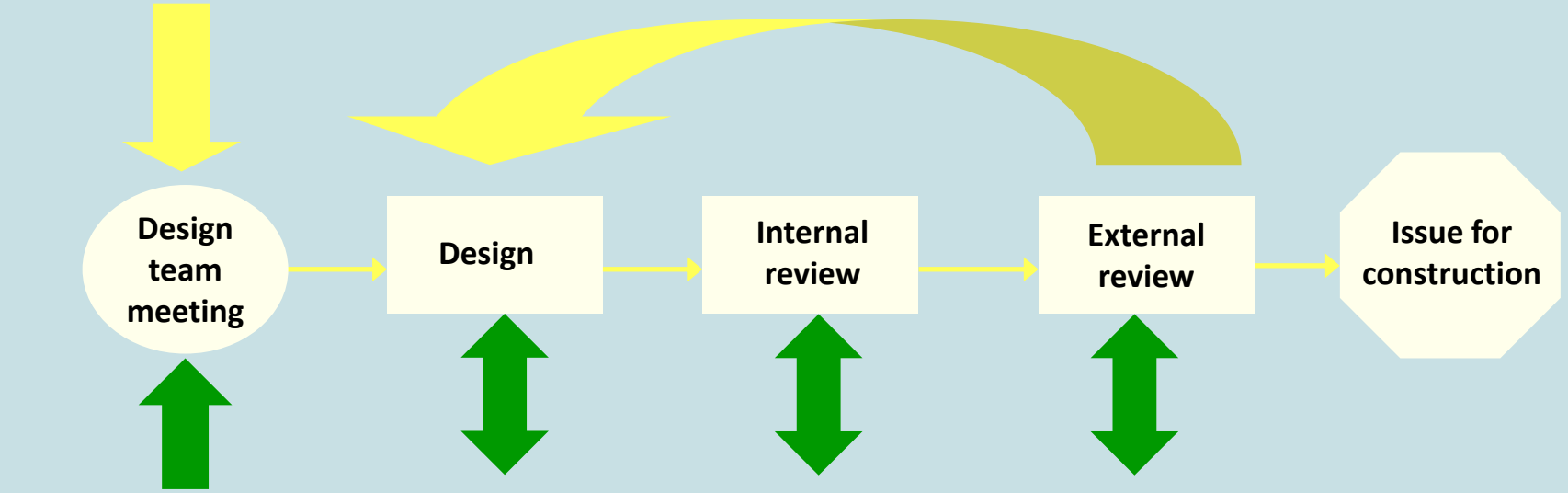


Before and after photos of asphalt fume emissions from highway-class pavers

Cervarich MB. Prevention through Partnerships. PtD in Motion; 2008 (Issue 2).

PtD Process

- Establish PtD expectations
- Include construction and operation perspective
- Identify PtD process and tools



Hecker et al. 2005

Prevention through Design: Basic Steps

- Identify potential hazards
- Evaluate risks
- Eliminate or reduce risks
- Communicate residual risks to downstream users

Why Prevention through Design?

- Ethical reasons
- Construction dangers
- Design-related safety issues
- Financial and non-financial benefits
- Practical benefits

Photo courtesy of PakIndfun.com

Hierarchy of Controls

Per ANSI/AIHA Z10-2005

Personal Protective Equipment (PPE)

Last line of defense against injury

Examples:

- Hard hats
- Steel-toed boots
- Safety glasses
- Gloves
- Harnesses

Photo courtesy of Thinkstock

OSHA [www.osha.gov/Publications/osha3151.html]

Clients Likely to be Interested in PtD

Industrial clients where shut downs are expensive

Hospitals

Lab facilities

Security and emergency response operations

Emerging areas:

- Smart Grid
- Microgeneration

PtD: Digging Deeper

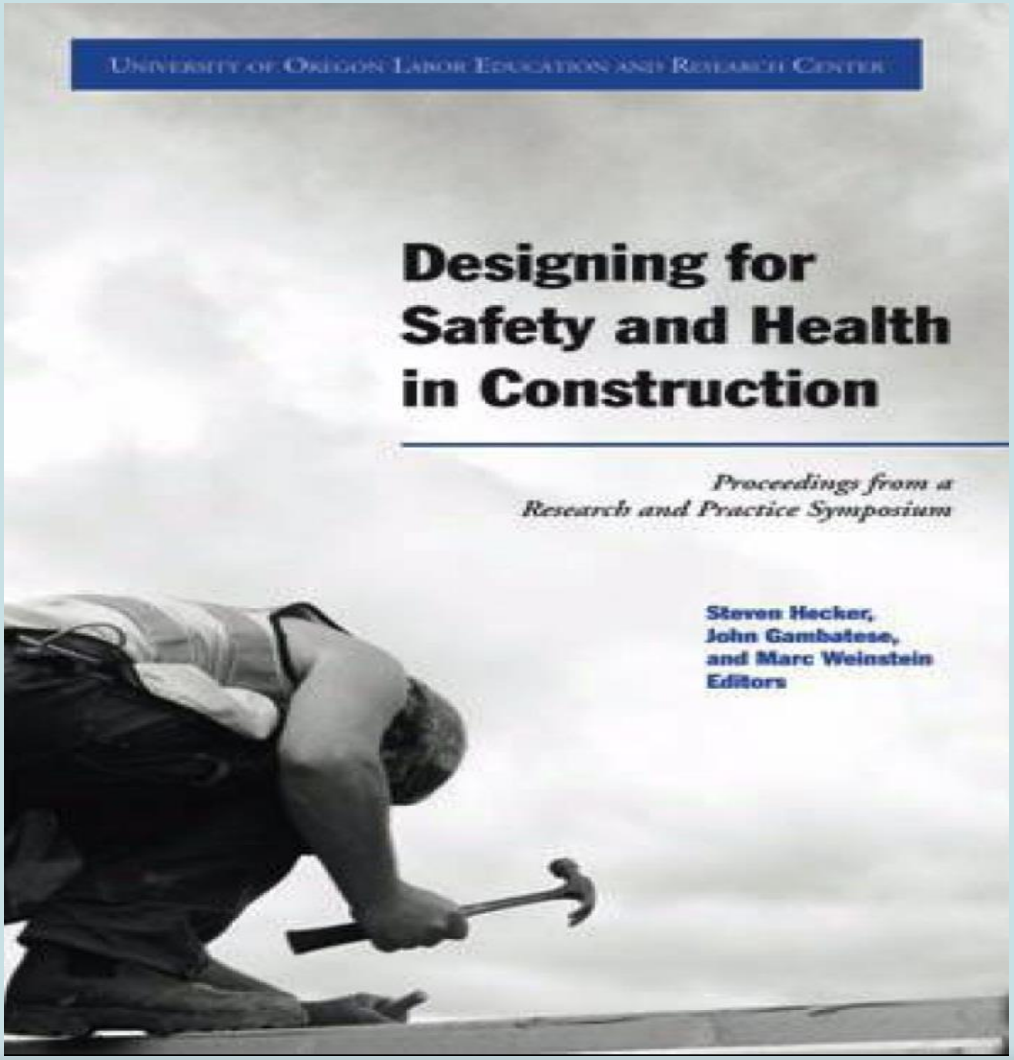
Design is at the top of the Hierarchy of Controls….but safety and health professionals cannot do design alone.

Design is done by architects and engineers – yet they do not currently recognize or appreciate the need, and do not have safety and health expertise, or may be concerned about liability.

→ Need collaborative effort to do PtD

NIOSH Construction Program and PtD

Supported the 2003 *"Designing for Safety and Health in Construction"* Symposium in Portland, Oregon



Accidents in Construction Linked to Design

22% of 226 injuries linked partly to design, 2000-2002 study in Oregon, Washington, California

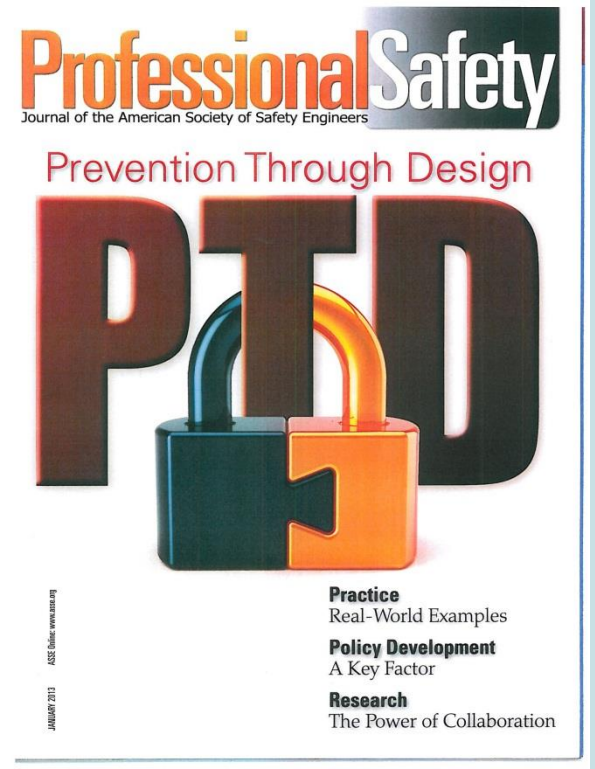
42% of 224 fatalities in U.S. during 1990-2003 linked to design

60% of fatal accidents resulted in part from decisions made before site work began, 1991 study in Europe

63% of all fatalities and injuries could be attributed to design decisions or lack of planning

Education

- PtD in engineering textbooks
- PtD in engineering and H&S curricula
  - 2 dozen university partners
  - ABET
  - NCEES
- Develop and disseminate engineering education modules
- Develop and disseminate educational programs to health and safety professionals
  - ASSE, AIHA



Websites

Prevention through Design web page
http://www.cdc.gov/niosh/programs/PtDesign/

Research to Practice (r2p) case studies
http://www.cdc.gov/niosh/programs/PtDesign/r2p.html

PtD and Sustainability
http://www.cdc.gov/niosh/topics/ptd/greenjobs.html

PtD 2011 Conference Proceedings
http://www.asse.org/professionalaffairs_new/ptd.php

PtD wiki
http://www.orcehs.org/wiki/display/orcehs/PtD+Case+Studies

Business Value of PtD

Anticipate worker exposures—be proactive

Align health and safety goals with business goals

Modify designs to reduce/eliminate workplace hazards in

Facilities	Equipment
Tools	Processes
Products	Work flows

Improve business profitability!

AIHA [www.ihvalue.org/]

Benefits of PtD

Reduced site hazards and thus fewer injuries

Reduced workers' compensation insurance costs

Increased productivity

Fewer delays due to accidents

Increased designer-constructor collaboration

Reduced absenteeism

Improved morale

Reduced employee turnover

Industries Use PtD Successfully

Construction companies

Computer and communications corporations

Design-build contractors

Electrical power providers

Engineering consulting firms

Oil and gas industries

Water utilities

And many others

Green Building on the Rise

- 76% of Architects
- 66% of Contractors
- 51% of Subcontractors

… believe that green construction will be the norm for their trade or profession by 2016

McGraw Hill (2012). Expectation of Green as a Norm for Firm/Industry by 2016. p 15

Is Green Construction Better?

Not Always

IDEA: Integrate Safety & Health into Green Construction

- **GREEN** building is on the increase
- Rating systems (e.g. LEED) are driving best practices
- How do SAFETY and SUSTAINABILITY relate?

Target: **Safety and Health community**
US Green Building Council (USGBC)
Architects and Designers
Owners

LEED = Leadership in Energy and Environmental Design

ISSUES

- How safe is green construction?
- How do rating systems address safety & health?

OPPORTUNITIES

Can we promote worker safety and health as a fundamental dimension of true sustainability?

Can we encourage Prevention through Design (PtD)?

PtD™ Prevention through Design

It is common to assume that green building projects are inherently safer for workers…

EXAMPLE: "Attention to environmental issues during construction leads to a safer and healthier work site"

Los Alamos National Lab Sustainable Design Guide, p64

…and common to overlook safety and health

EXAMPLE: "There currently is a blind spot in sustainable design practice when it comes to worker safety and health… Tremendous focus is placed on materials, energy and the environment, but designers typically give little, if any, consideration to the safety and health of the people who install the green features or build the projects"

John Gambatese, "Don't Leave Safety Out of Sustainability" ENR Editorial, 11/18/2009

Las Vegas CityCenter—The Wake Up Call

Development wins 6 coveted design certifications (Las Vegas, NV) - More than three months before it opens, the $8.5 billion CityCenter development has received six Leadership in Energy and Environment Design (LEED) gold certifications from the U.S. Green Building Council….(*Las Vegas Review Journal, September 14, 2009*)

Six deaths during 2007-2008 construction phase (Las Vegas, NV) **-** MGM Mirage's CityCenter

Construction and Maintenance Workers

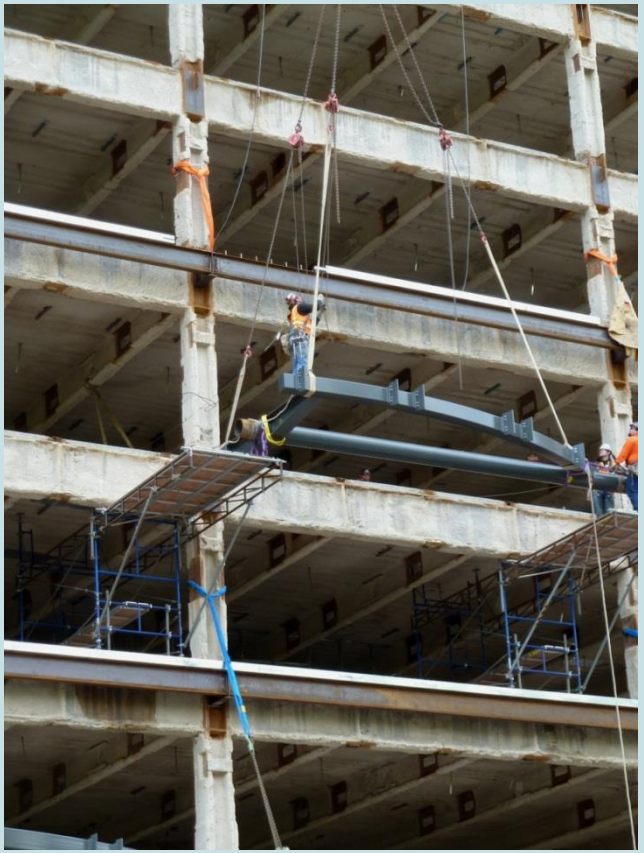
Key role in building lifecycle

- Build
- Maintain
- Renovate/Refurbish/Replace
- Decommission/Demolish

Face many types of hazards

- Injuries: Falls, struck by, electrocution
- Illness: Silica, welding, noise, solvents
- Musculoskeletal Disorders:

  Awkward postures, high exertion, heavy lifting

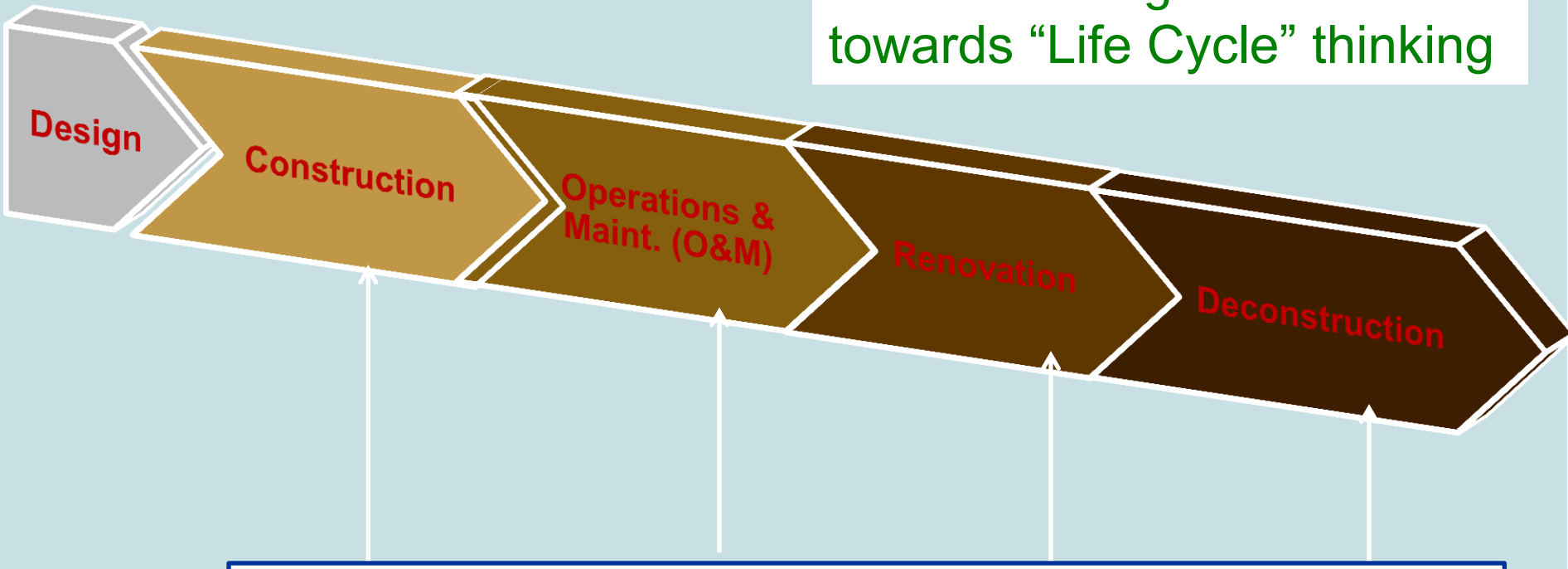


Renovation of Portland Federal Building
Photo: Matt Gillen

Strategies for Integrating Safety and Health into Green Building

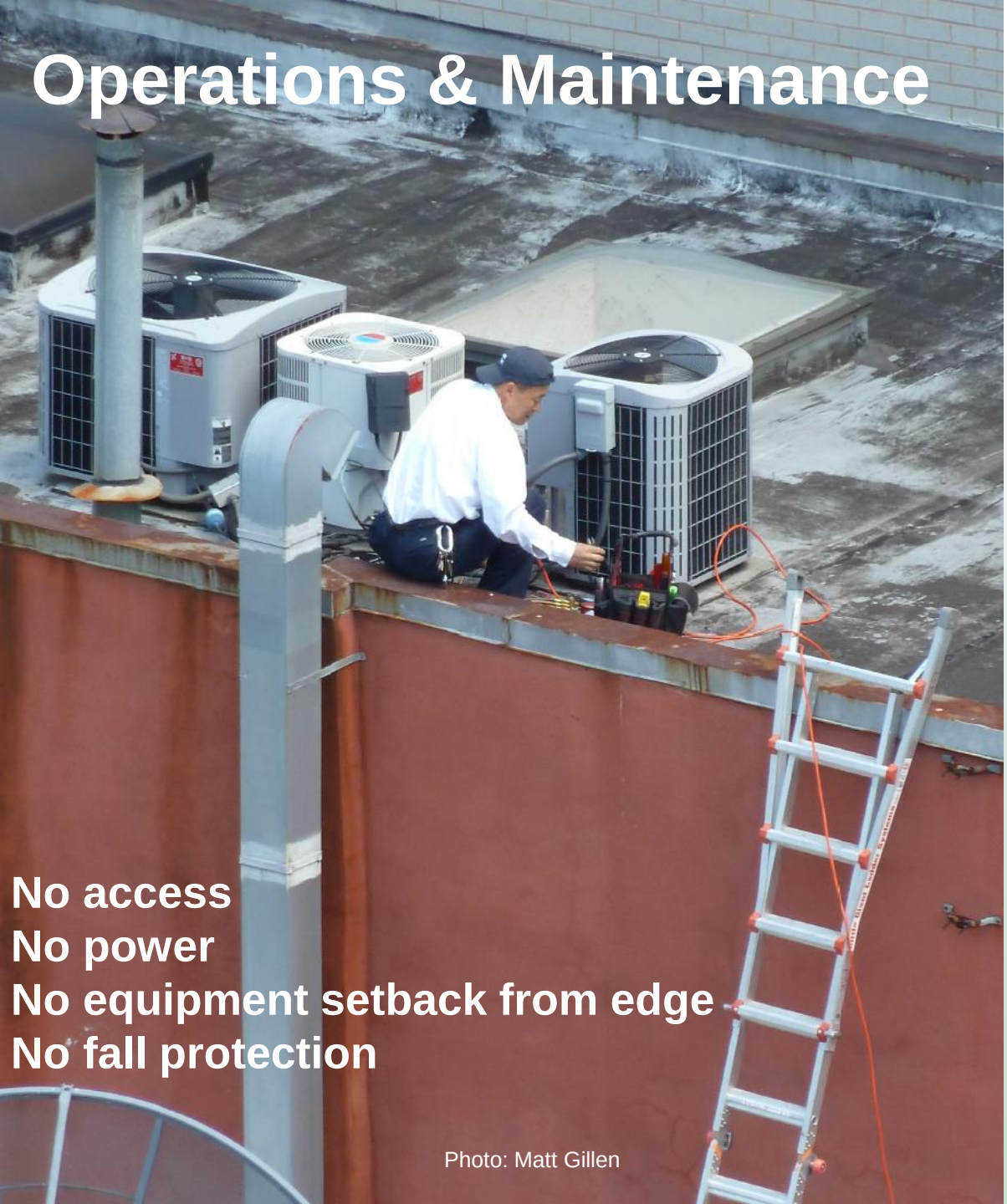
"Life Cycle Safety"

Green building is oriented towards "Life Cycle" thinking



Construction and Maintenance workers play key roles in the built environment "Life Cycle"

Operations & Maintenance



No access
No power
No equipment setback from edge
No fall protection

Photo: Matt Gillen

Servicing rooftop HVAC equipment

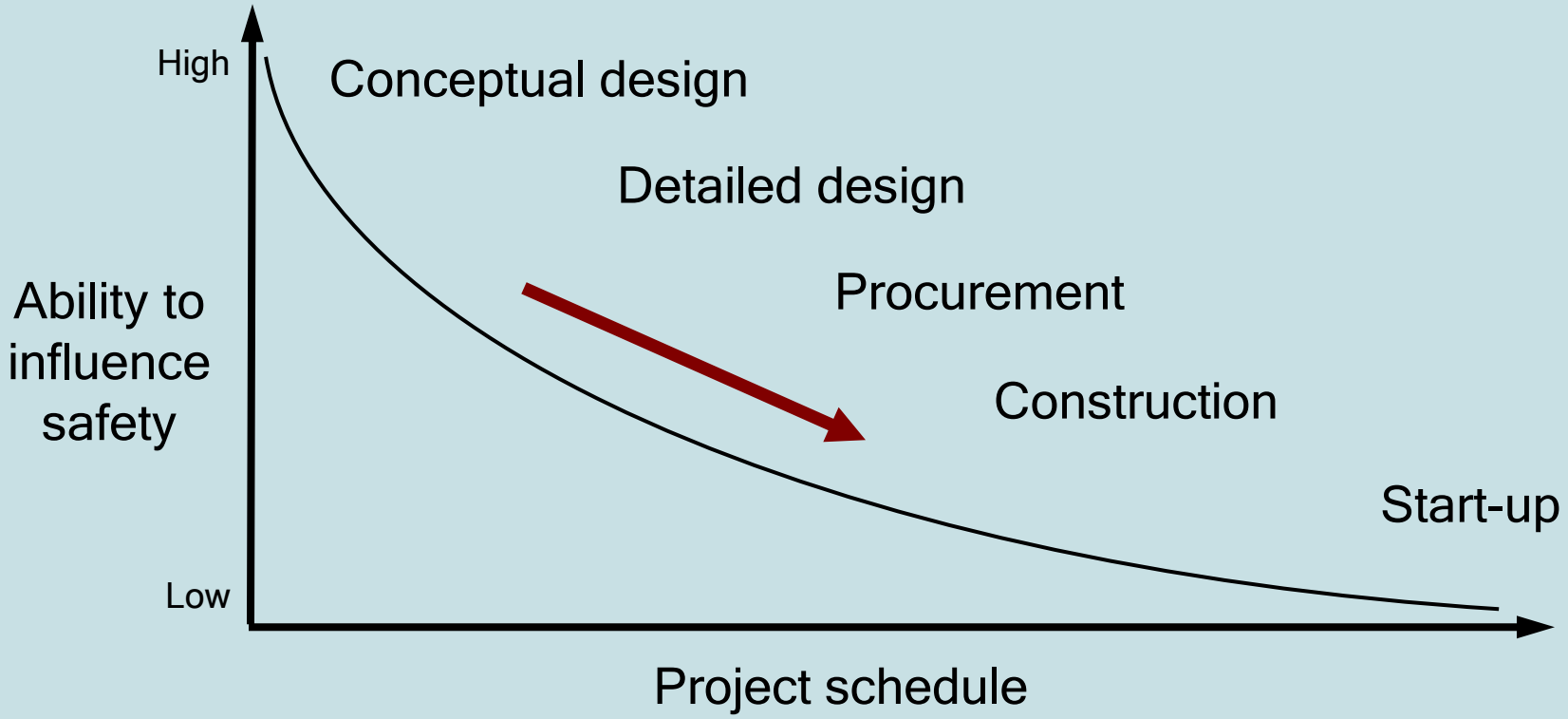
Fall exposures

"Error trap" for workers

Design issues?

HVAC= Heating, Ventilation, and Air Conditioning

Safety Payoff During Design



Adapted from Szymberski 1997

LEED includes some elements related to worker health and well-being

Building Occupants

Major LEED focus

Largest worker group – lowest risk

Custodial Workers

Minor LEED focus

Smaller worker group – medium risk

Construction, Maintenance Workers

Minor LEED focus

Smaller worker group → highest risk potential

But What is Missing?

Type of OUTCOME → / ↓ Type of WORKER	HEALTH & WELL-BEING Illness	SAFETY Injury	ERGONOMICS MSD Musculoskeletal Disorder
Building Occupant	Major focus via IEQ credits	Not addressed	Pilot Credits
Custodial Worker	Minor focus	Not addressed	Minor focus
Operations, Maintenance (O&M), and Construction Worker	Minor focus	Not addressed	Not addressed

NIOSH Perspectives on Sustainability

"As green and sustainable practices become more common in the U.S, there is an opportunity to promote worker safety and health as a fundamental dimension of true sustainability. …

A sustainable product, process or technology should not only protect the environment and the consumer but also the worker. Green jobs must be safe jobs."

NIOSH Science Blog: *Going Green: Safe and Healthy Jobs, January 4,* 2010
http://blogs.cdc.gov/niosh-science-blog/2010/01/green-2/

Help make the workplace safer…

Include *Prevention through Design* concepts in your projects.

For more information, please contact the National Institute for Occupational Safety and Health (NIOSH) at

Telephone: (513) 533–8304
E-mail: preventionthroughdesign@cdc.gov

Visit these NIOSH Prevention through Design websites:

www.cdc.gov/niosh/topics/PtD/

www.cdc.gov/niosh/programs/PtDesign/

Summary

PtD is the preferred approach

- **Working at the top of the hierarchy of controls is most reliable**

PtD provides potential solutions for tackling a major cause of fatalities

PtD provides opportunities for working with owners and clients to improve safety and productivity

"In many respects, PtD is a transformative concept for the 21st century. It views investments in worker safety and health as an integral part of business efficiency and quality, rather than as a cost. It is also a practical concept that has already been used successfully in several model applications."

John Howard, MD
Director, NIOSH, CDC
November 22, 2010

NIOSH Directory of Construction Resources

www.cdc.gov/niosh/construction/

Twitter

http://twitter.com/NIOSHConstruct

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