

Saved By The Belt When Falling From Grace

Daniel Hindman

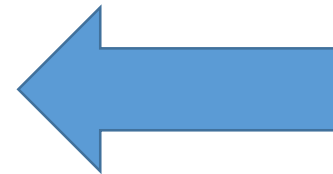


Schedule

- Fall Statistics
- Fall Demographics
- Fall Costs
- Fall Protection Measures
- Conclusions

2013 Census of Fatal Occupational Injuries

- Falls were 16% of the fatal occupational injuries
- Overall, 223 fewer fatal injuries occurred in 2013 vs. 2012
 - Number of falls dropped by 5
- In Construction, 796 fatal injuries (20.3%) occurred
 - Falls : 294 (36.9%)
 - Struck By Object: 82 (10.3%)
 - Electrocutions: 71 (8.9%)
 - Caught-In/Between: 21 (2.6%)



“The Big Four”

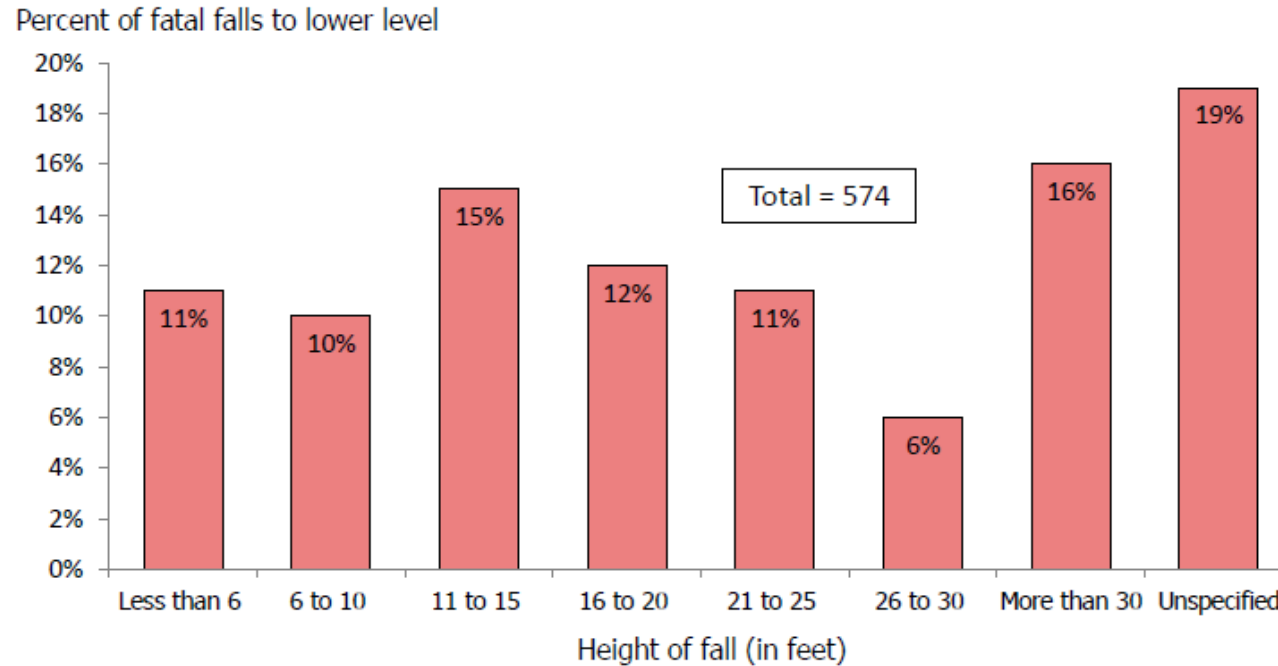
Falls In Construction – Who Is Falling?

Construction

- 41 / 296 (13.9%) Residential Construction
- 22 / 296 (7.4%) Non-Residential Construction
- Specialty Trades
- 118/296 (39.9%) Foundation, structure and building exterior contractors
- 19/296 (6.4%) Framing Contractors (11 Residential, 8 Non-residential)

Height Of Falls?

Fatal falls to lower level by height of fall, 2013*



In 2013, falls to lower level accounted for 574 fatal work injuries. Of the cases where height of fall was known (466 cases), 3 out of every 5 were falls of 20 feet or less. Only one in five cases involved falls from more than 30 feet.

Costs of Fall

- Estimated Direct Cost of Average Fall is \$27,000
- Wide Variance
- Indirect Costs Are Not Estimated, but Include:
 - Worker's Compensation Increase
 - Lost Time of Work Crew
 - Reduced Future Productivity of Work Crew
 - Loss of Client Confidence
 - Negative Press / News Coverage (Effect on Future Business?)

What Does Fall Protection Mean?

- 29 CFR 1926.501 Duty to Have Fall Protection

“Each employee who is construction a leading edge 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems, safety net systems or personal fall arrest systems.”

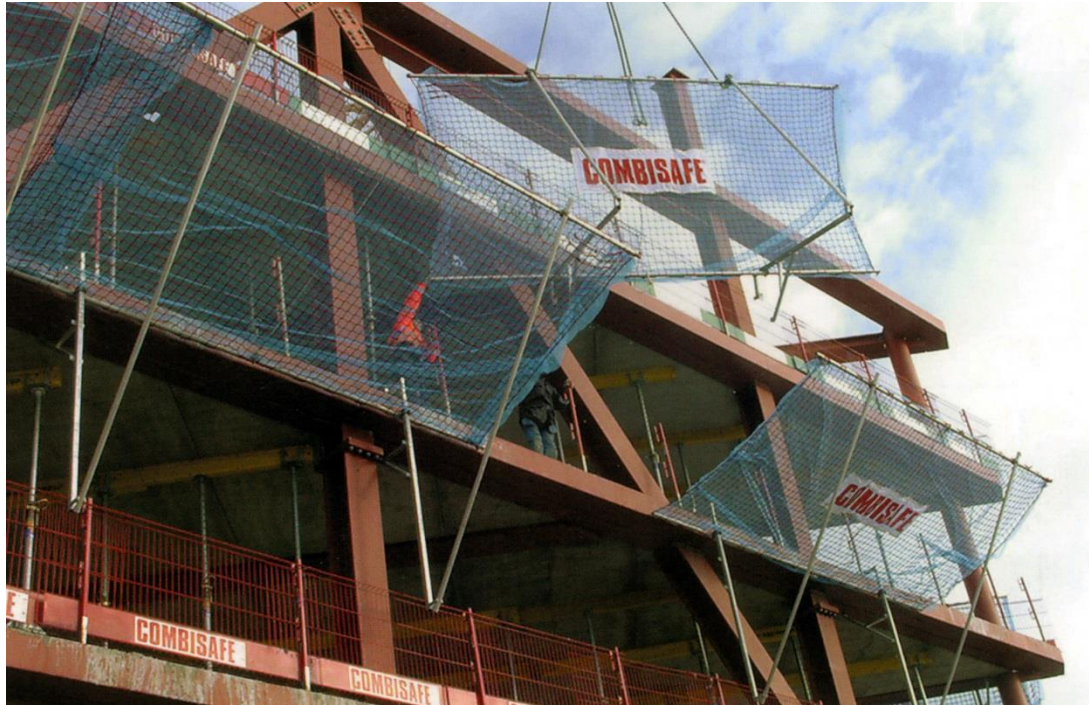
“Exception: When the employer can demonstrate that it is infeasible or creates a greater hazard to use these systems, the employer shall develop and implement a fall protection plan which meets the requirements of paragraph (k) of 1926.502.”

- *Similar language applies for holes, formwork, ramps, excavations, roofing, precast concrete erection and residential construction*

Guardrail Systems



Safety Net Systems



IC-SAFE

Center for Innovation in Construction Safety, Health and Well-Being

Workshop on Initiative for Construction Safety Awareness

ICONSA-15

Personal Fall Arrest Systems



Alternative Fall Protection Plans

- When Use of Fall Protection May Represent Greater Hazard Than Fall
- Plans Must Be Site-Specific
- CANNOT Be Based Upon Productivity Metrics (Time, Cost)
- Must Present Alternative Solutions Not Exemptions
 - Use of Spotter
 - Restrict Workers Accessing Area

Introduction

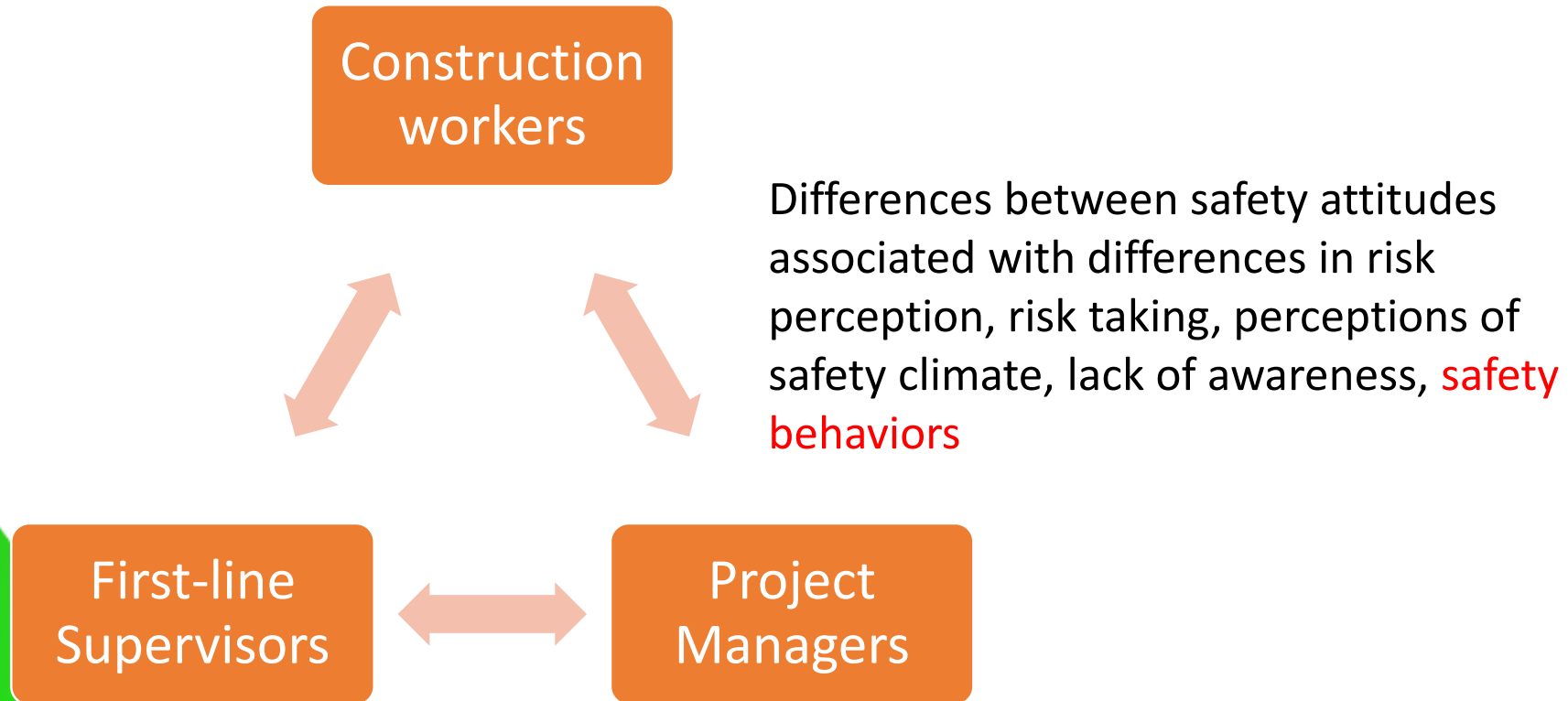


Photo: Figure 13: OSHA Guidance doc on fall protection in residential construction

- Safety climate and use of Personal Protective Technology (PPT)
- Usability and use of PPT (donning/doffing, discomfort, re-adjustment, lack of enforcement)

Goggins et al., 2008; Kirwan, 2003; Lahiri et al., 2005; Lehtola et al., 2008; Sa, 2008

Safety Attitude Incongruence





Combining Physical Testing and Safety Climate

- Recent work at Virginia Tech and North Carolina A&T
- How Does Safety Equipment Affect Productivity
- Roofing Exercise
 - Workers Install Roofing Wearing Fall Arrest Harness
 - Questionnaires After Each Activity
 - Examine Effects of Harnesses, Anchors, Environment (Indoor, Outdoor)

Usability Tasks at Virginia Tech



Preliminary Conclusions

- No Falls Were Caused By Safety Equipment
- Slips / Trips / Entanglement Were Observed
- Workers Do NOT Like Fall Arrest System!
- Little Difference Noted Between Indoor and Outdoor Activities