Early Integration of Safety into Construction Projects

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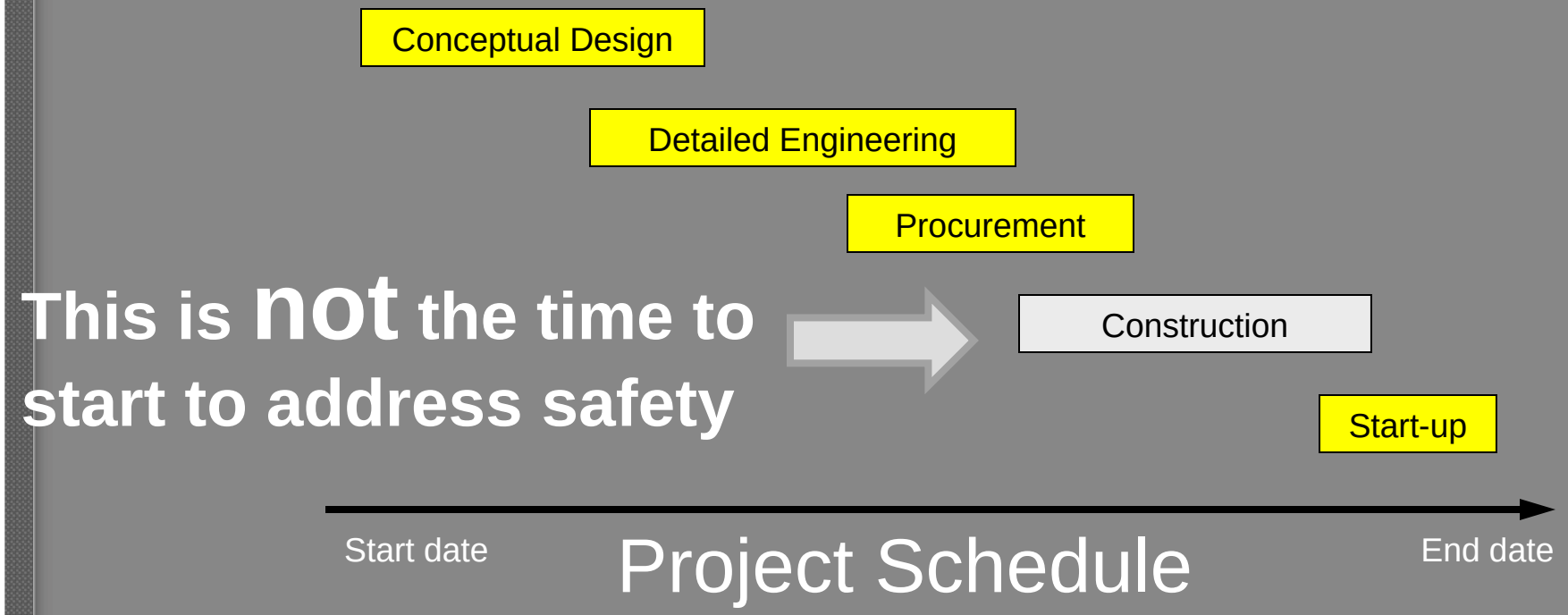
To Finish a Project Safely Begin to Address Safety Early

- Don’t Wait Until Construction Work Begins

The Phases of a Construction Project

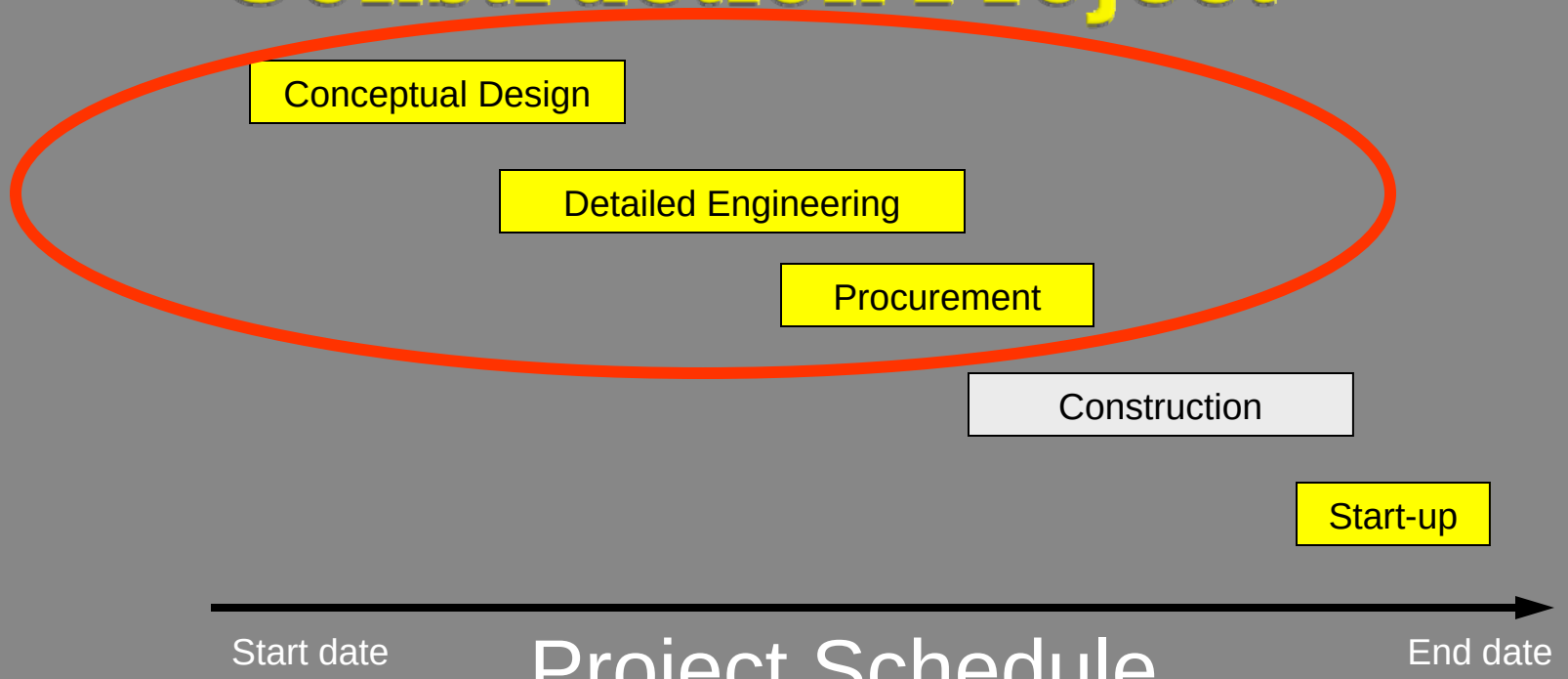


This is not the time to start to address safety

Which Parties Influence the Safety of Construction Workers?

- Workers
- Supervisors
- Employers (Contractors)
- Subcontractors

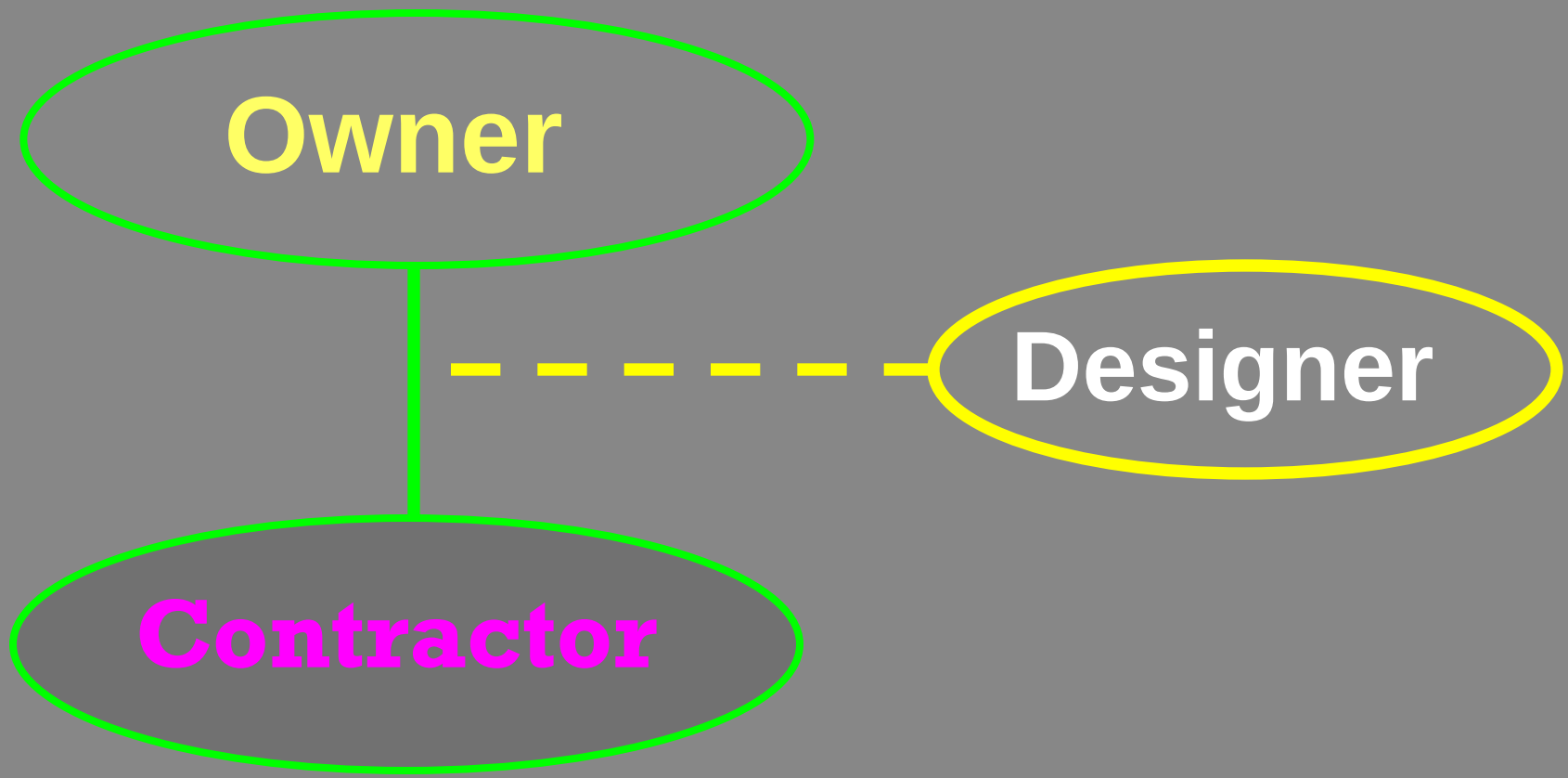
The Phases of a Construction Project



Which Parties Influence the Safety of Construction Workers?

- Workers
- Supervisors
- Employers (Contractors)
- Subcontractors
- Owners
- Designers

Traditional Contractual Organization: Design-Bid-Build



The Old View was that Safety is the Responsibility of the Contractor

- The Goal of Zero Injuries is Not Compatible with the Old View
- The Bar has been Raised
- Moving away from the Traditional Adversarial Relationships
- To be Successful with Safety, the Owner Plays a Pivotal Role

Three Specific Areas will be Explored

1. Make the Facility Safer to Construct by Design
2. Contractually Require the Constructor to Meet Specific Minimum Safety Mandates
3. Contract with Firms that Demonstrate a High Probability of Delivering a Safe Project

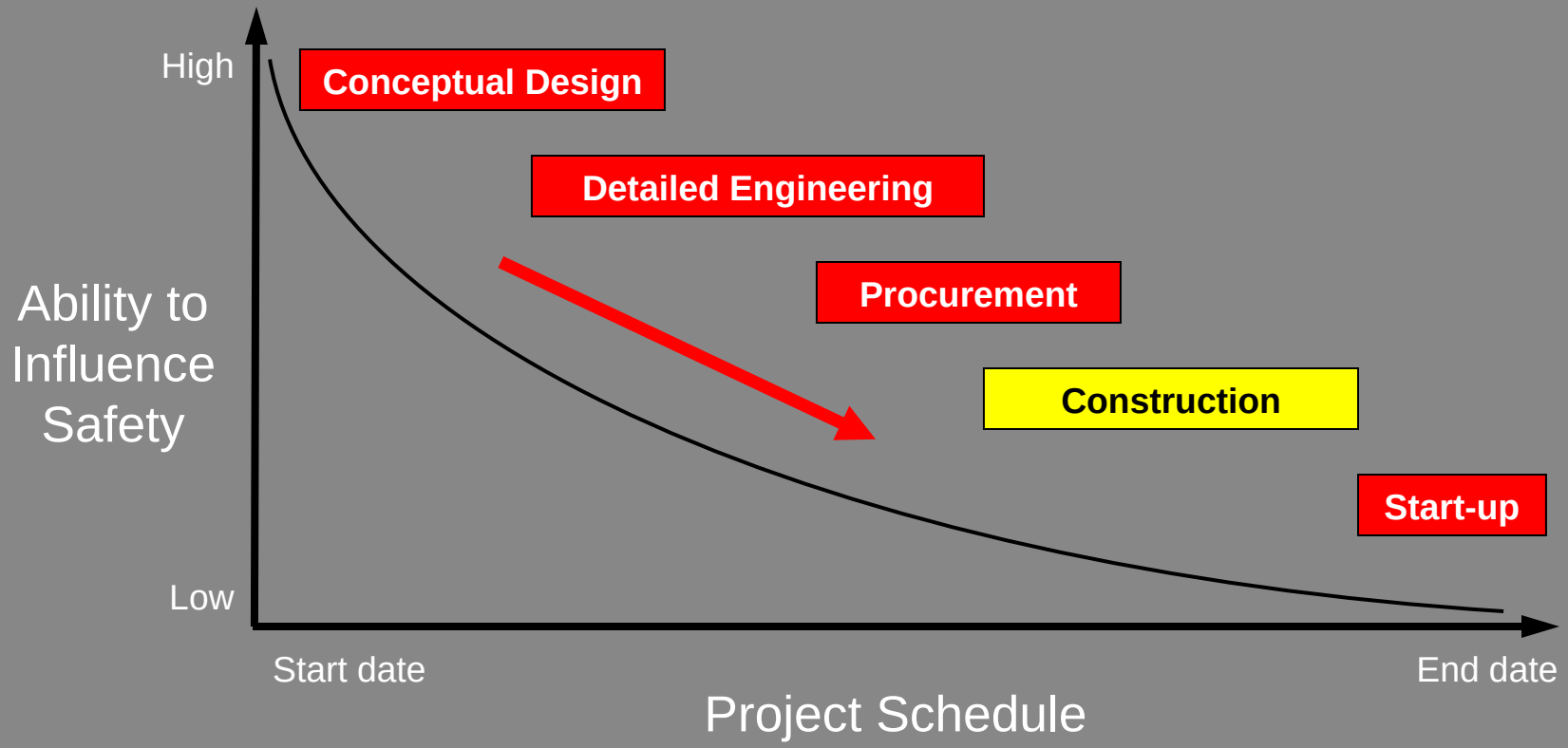
1.

Designing for Construction Worker Safety

The First Major Phase of a Project is the Design

- In the Design Phase: This is the Earliest Opportunity to Incorporate Safety into the Project

Why consider safety early?



(Source: Szymberski, R., "Construction Project Safety Planning." TAPPI Journal, Vol. 80, No. 11, pp. 69-74.)

Identify the Hazards Early in the Design Process

- Objective is to design the hazards "out"

Do Designers Think about Safety When They Make Design Decisions?

- Yes, but their focus is generally on the safety of the end users of the facility
- Generally, the safety of construction workers is not considered
- Construction safety is viewed as being the responsibility of the contractor

Construction Input Should Ideally Occur During the Programming Phase (the earlier, the better)

- Evaluate major building concepts
- Make structural decisions that effect hoisting and overall project sequencing and pacing
- Establish building layout
- Conduct Value Engineering
- Conduct Safety Constructability Reviews

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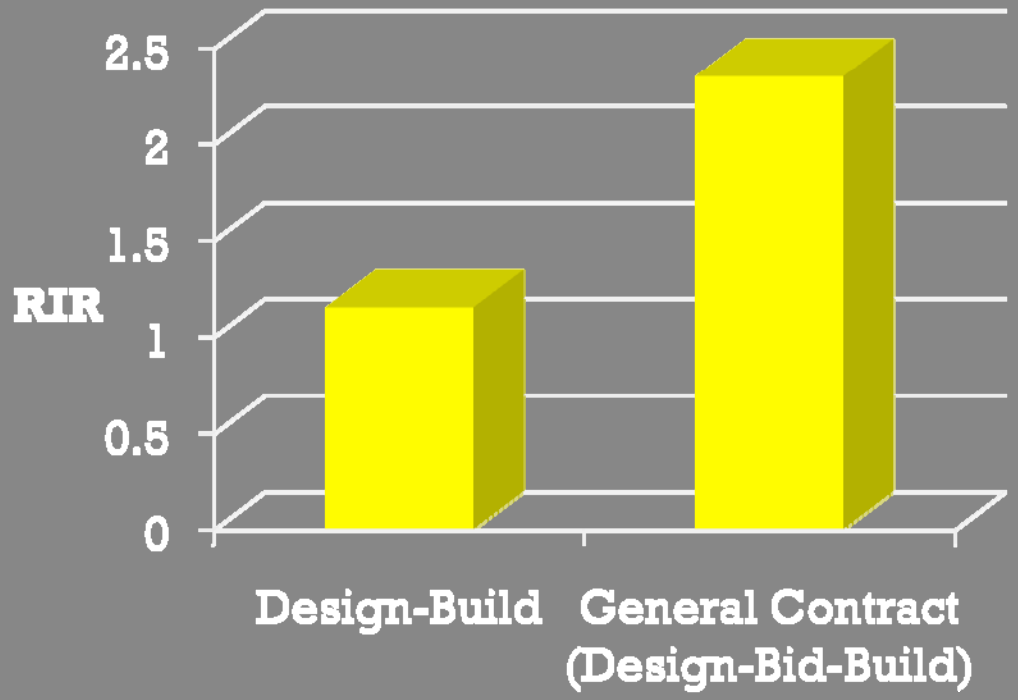
Does Designing for Safety Make a Difference?

- RIR (OSHA Recordable Injury Rate)
  - Number of OSHA recordable injuries per 200,000 worker hours



(Source: "The Owner's Role in Construction Safety", CII RS-190-1, March 2003)

Design for Safety is a Simple Concept

- **Unfortunately, many designers are reluctant to embrace this concept**

Why are many designers reluctant to design for safety?

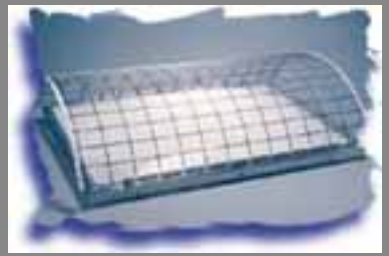
- No formal training in designing for construction worker safety
- Not a traditional function
- Safety is viewed as being the Contractor's Responsibility
- Few Standard Safety Design Guidelines
- Fear of Liability

Owners Can Insist that Designers Address Safety in Their Designs

- The Owner's Involvement Will Be Critical on Many Projects

Design for Safety Examples

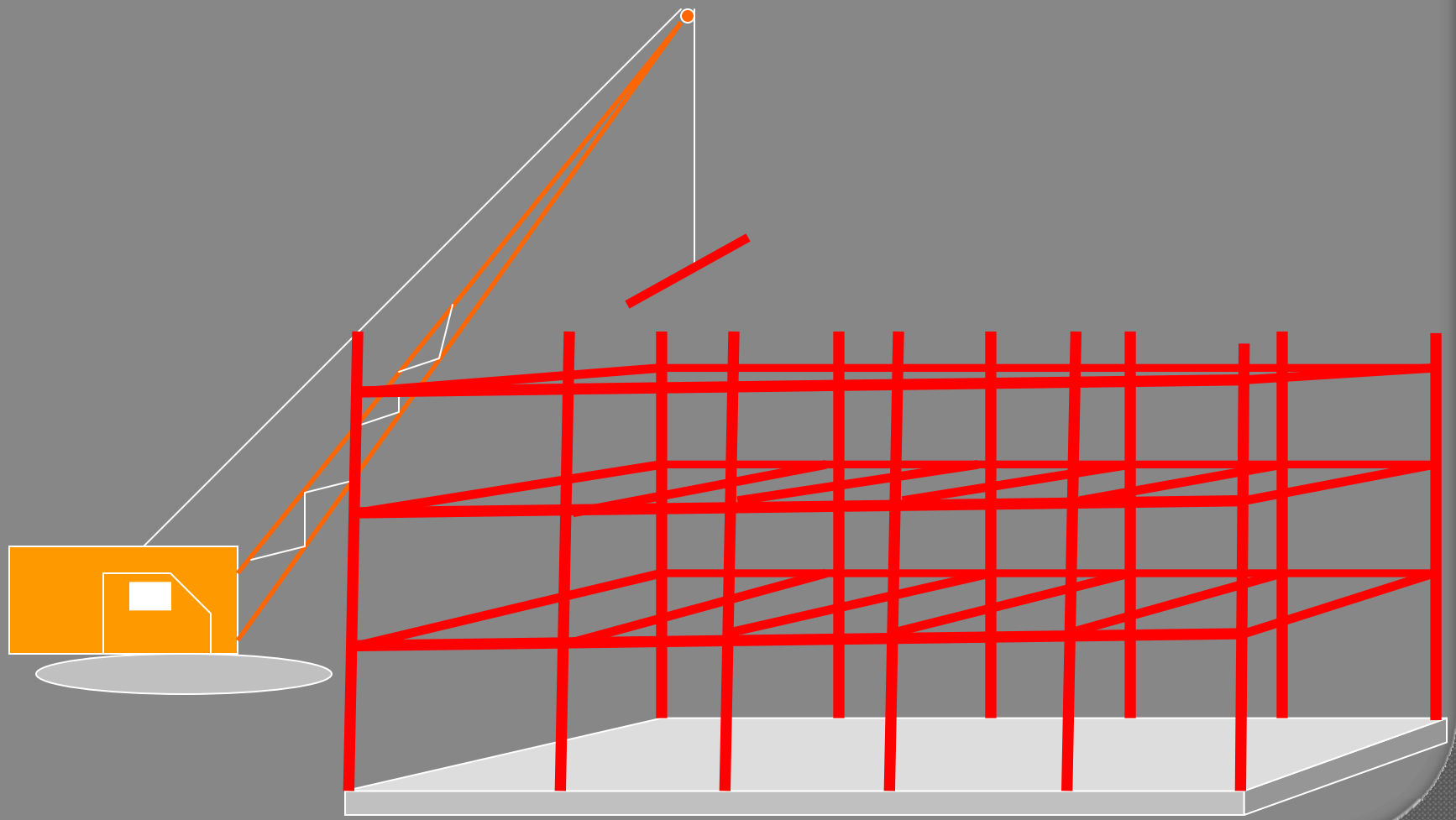
- **Permanent guardrails installed around skylights.**
- **Domed, rather than flat, skylights with shatterproof glass or strengthening wires.**
- **Skylight installed on a raised curb.**



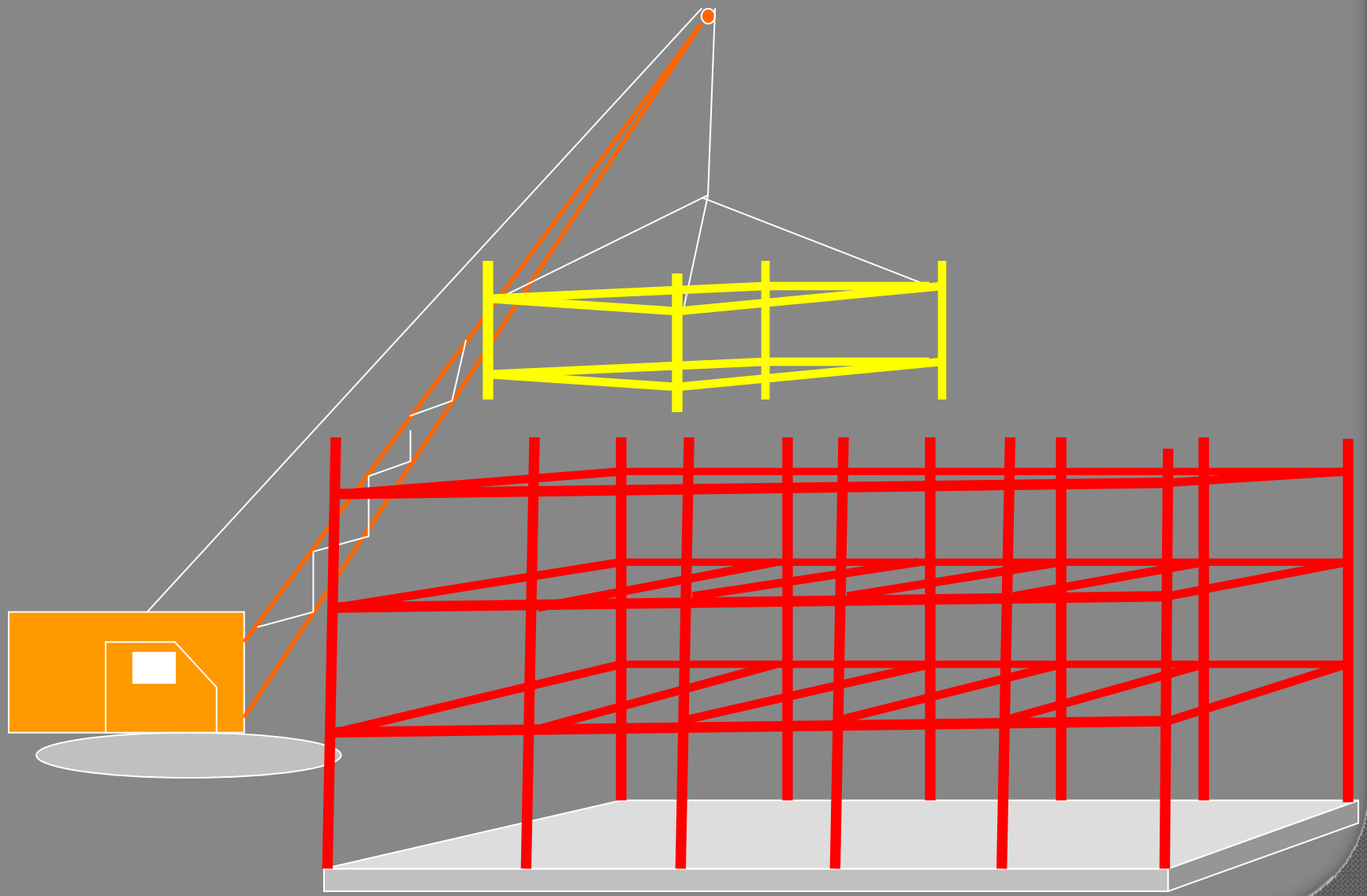
Examples of Designing for Construction Worker Safety

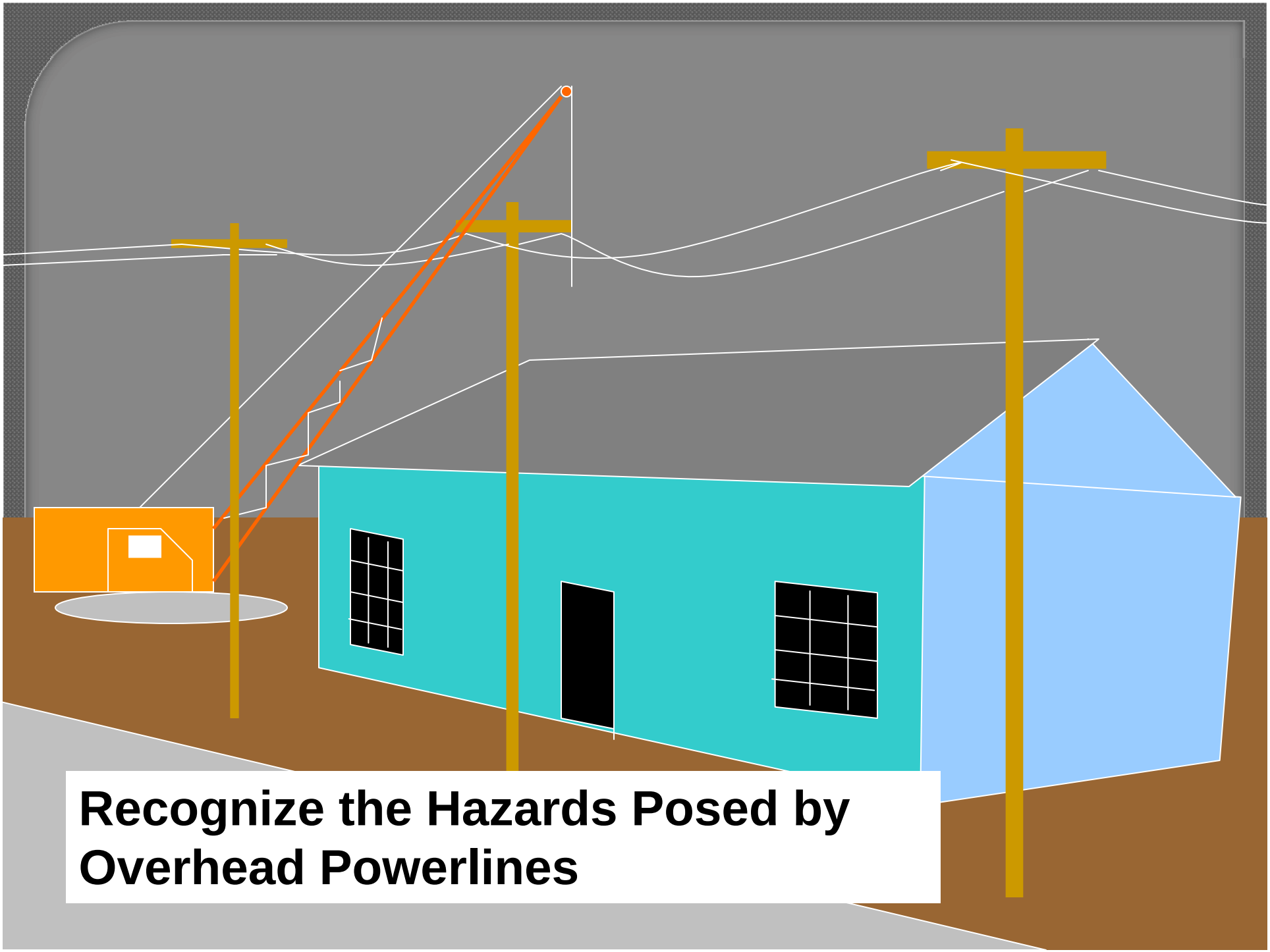
Modification of Parapets

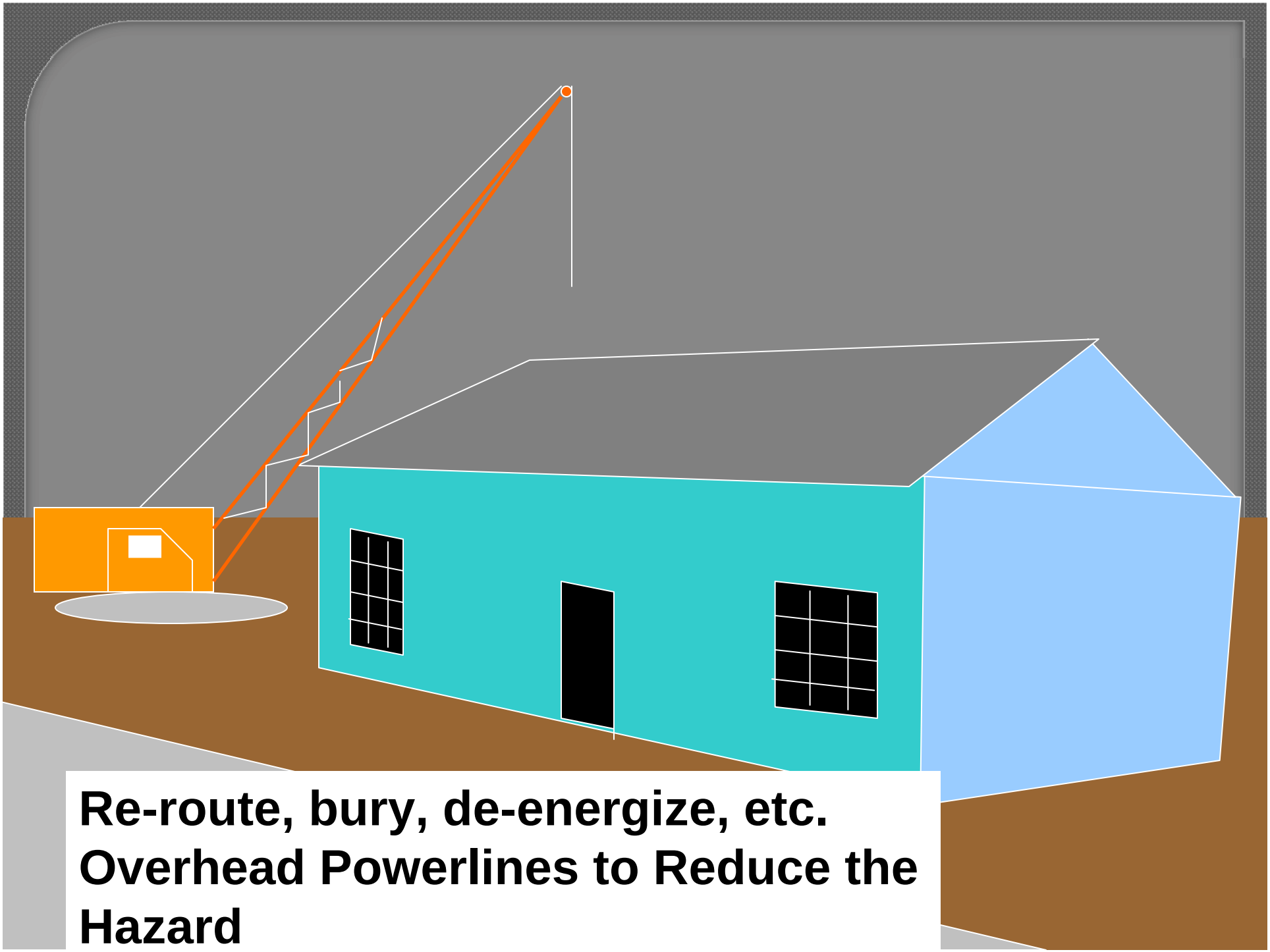
Avoid the Old Approach of Constructing Steel Structures by Installing One Member at a Time



Install Assemblies to Reduce the Exposure of Making Connections on Steel Structures

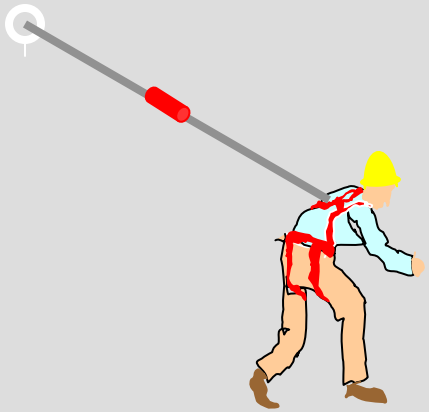


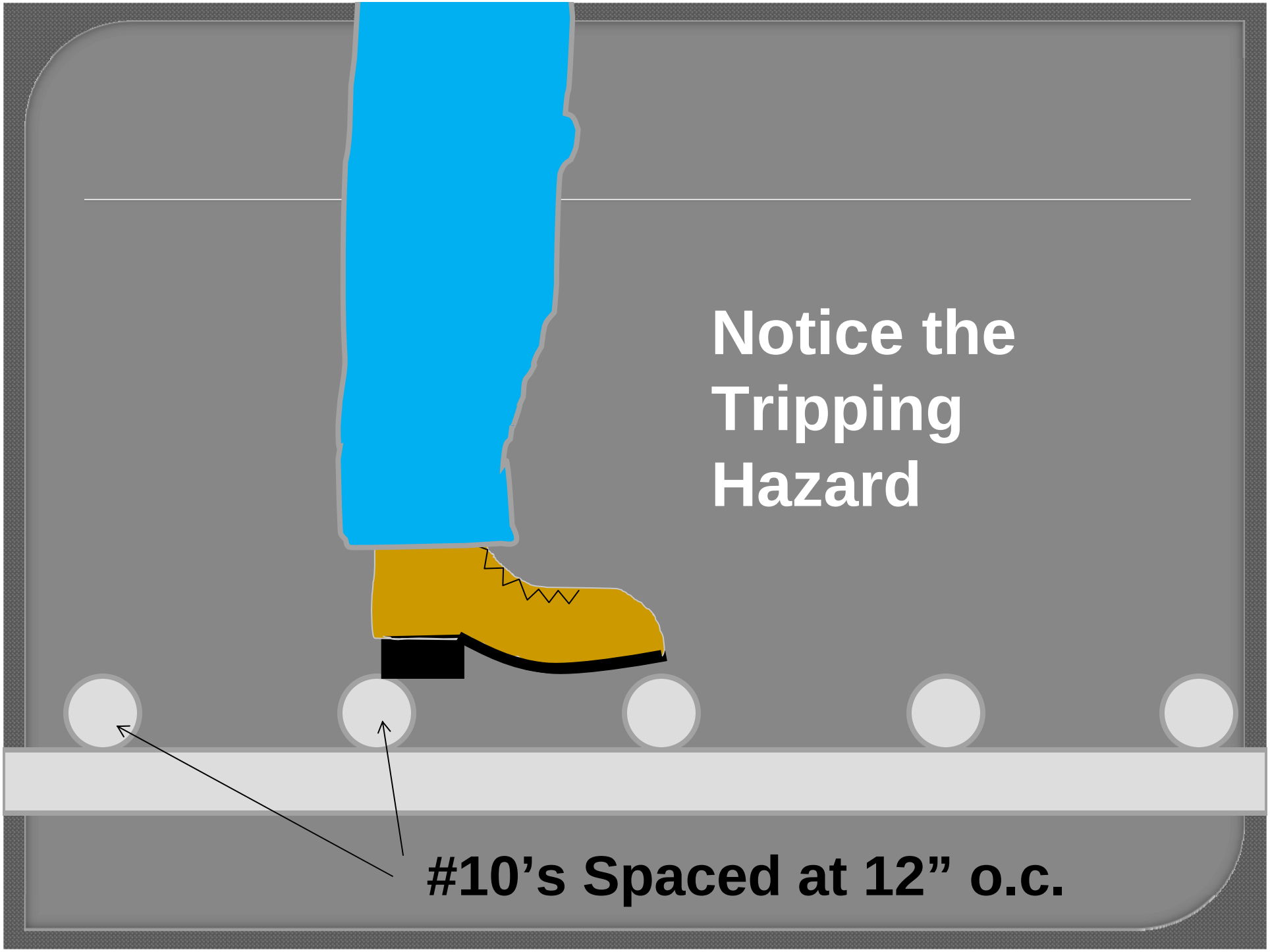

Recognize the Hazards Posed by
Overhead Powerlines

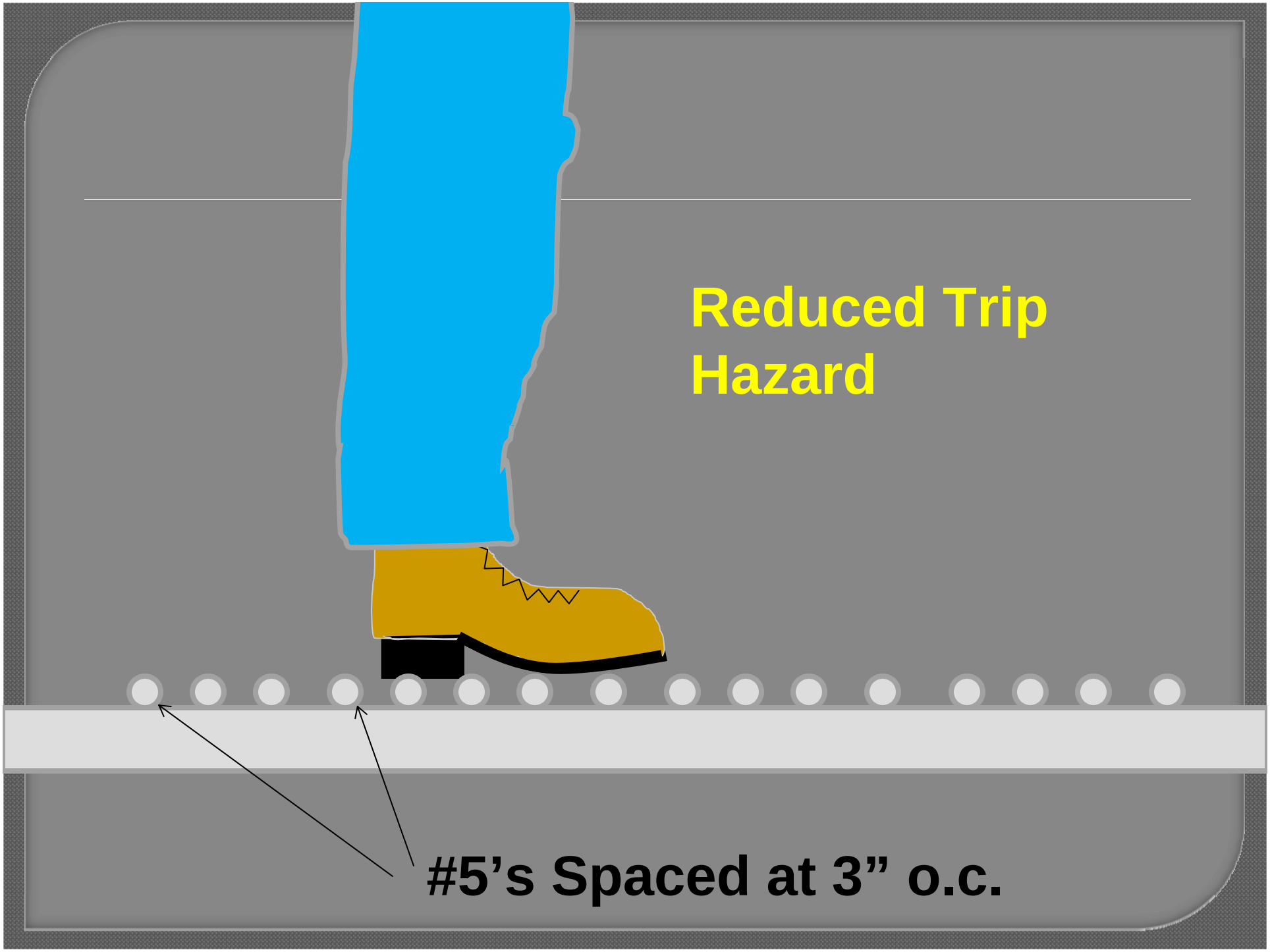


Re-route, bury, de-energize, etc. Overhead Powerlines to Reduce the Hazard

Incorporate Roof Anchors in the Design




Notice the Tripping Hazard
#10’s Spaced at 12” o.c.


Reduced Trip Hazard
#5's Spaced at 3" o.c.

Always Keep Thinking about Construction Worker Safety as Design Decisions are being Made

2.

Contract Provisions that Promote Construction Worker Safety

The Contract Should Mandate that the Constructor Comply with Specific Requirements during the Construction Phase

Contract Requirements

- Contractor must comply with the local, state and federal safety regulations (100%)
- Contractor must comply with safety requirements beyond the OSHA regulations (88.1%)
- Contractor must place at least one full-time safety representative on the project (83.1%)
- Contractor must provide specified minimum training for the workers (62.7%)

Contract Requirements

- Contractor must report all lost time injuries to the owner (98.3%)
- Contractor must report all OSHA recordable injuries to the owner (96.6%)
- Contractor must include personnel from the owner in coordination meetings (67.8%)
- Contractor must submit subcontractor list to owner for approval (79.7%)

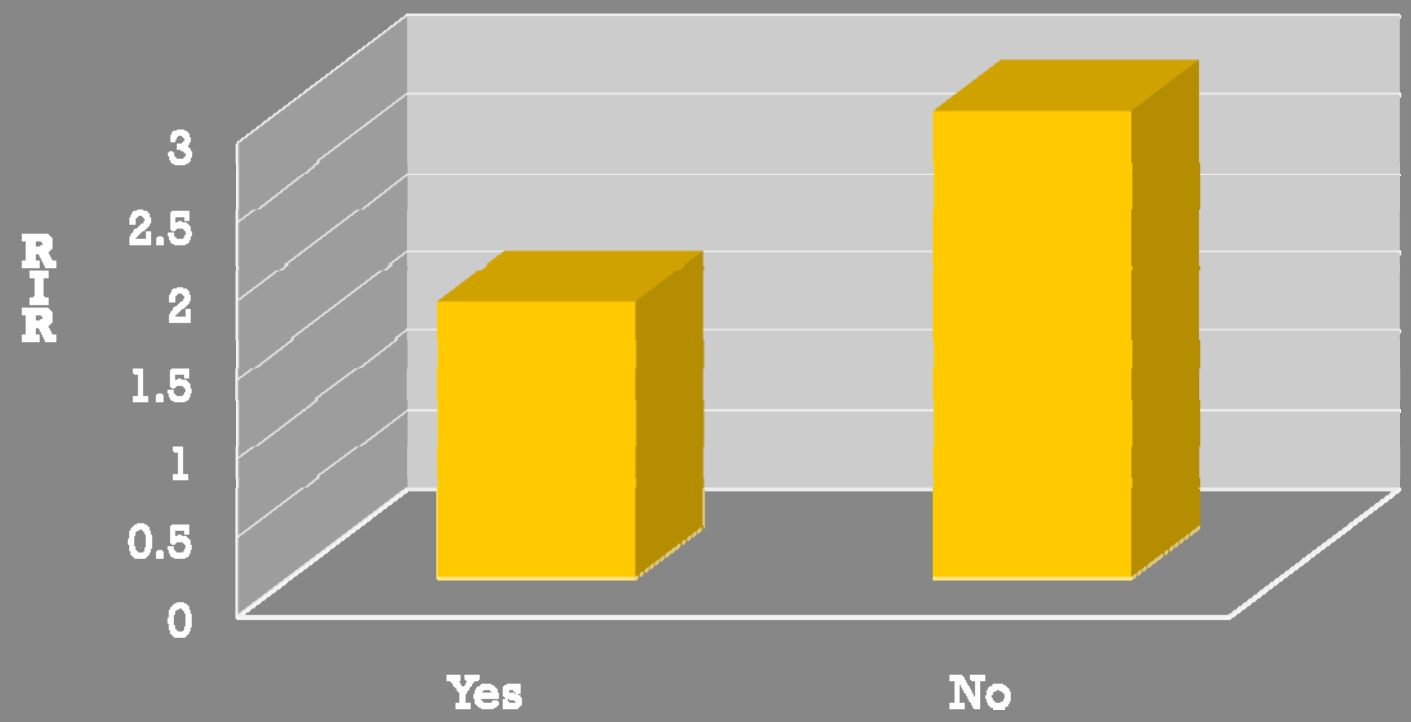
Contract Requirements

- Contractor must implement a substance abuse program (93.2%)
- Contractor must participate in site safety audits (88.1%)
- Contractor must conduct weekly safety meetings for the workers (93.2%)
- Contractor must submit a site-specific safety plan (84.7%)
- Contractor must submit a safety policy signed by its CEO (52.5%)

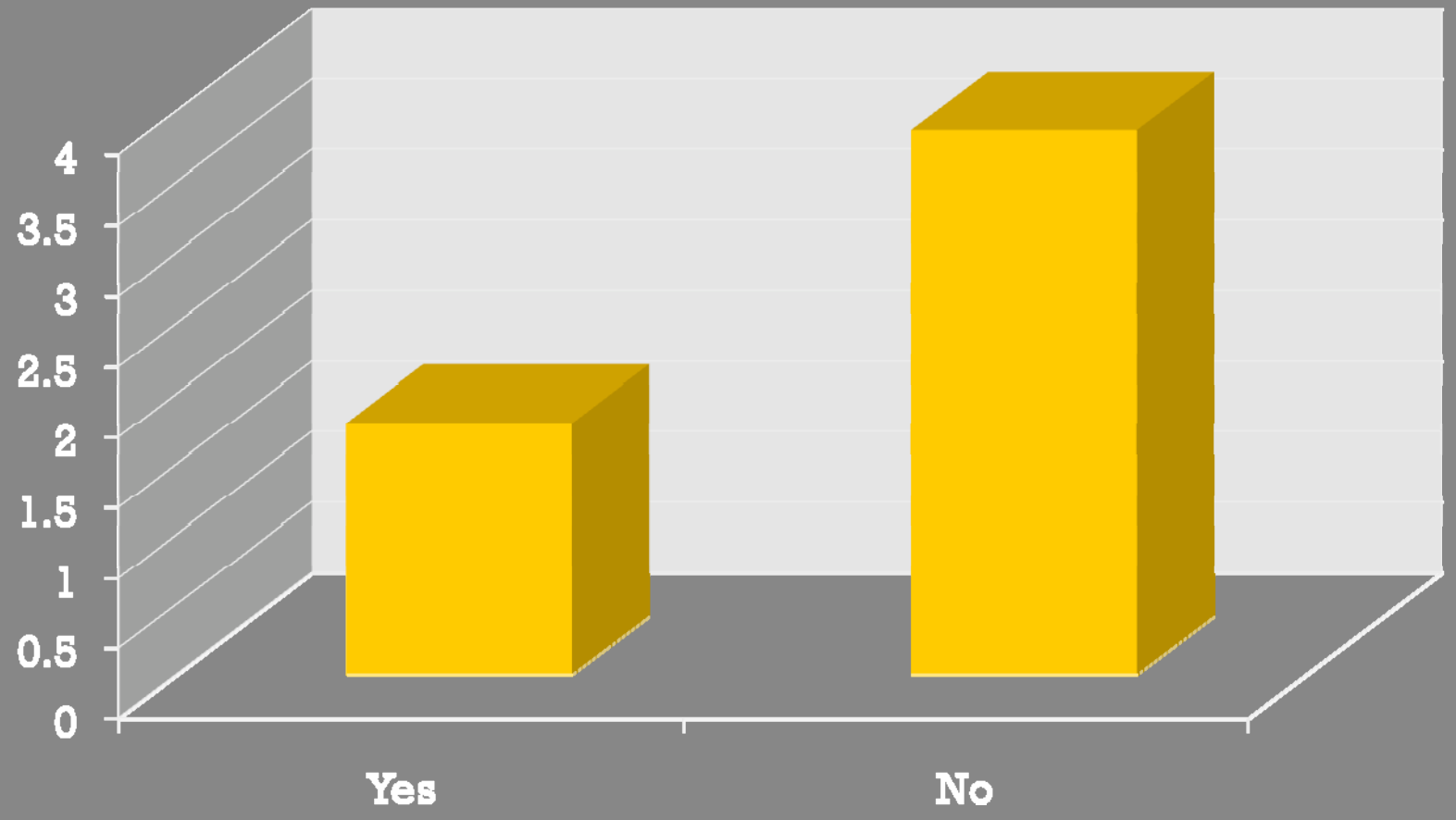
Contract Requirements

- Contractor is required to provide specified PPE (hard hats, safety glasses, gloves) (96.6%)
- Contractor must implement a permit system when performing hazardous activities (line breaks, lockout/tagout, excavations, proximity to power lines, confined space entry, hot work, etc.) (88.1%)

Contractor is required to place at least one full-time safety representative on site?



Contractor Must Implement a Drug Testing Program



Establishing Clear Minimum Rules on how to Address Safety Helps to Set the Tone for a Project

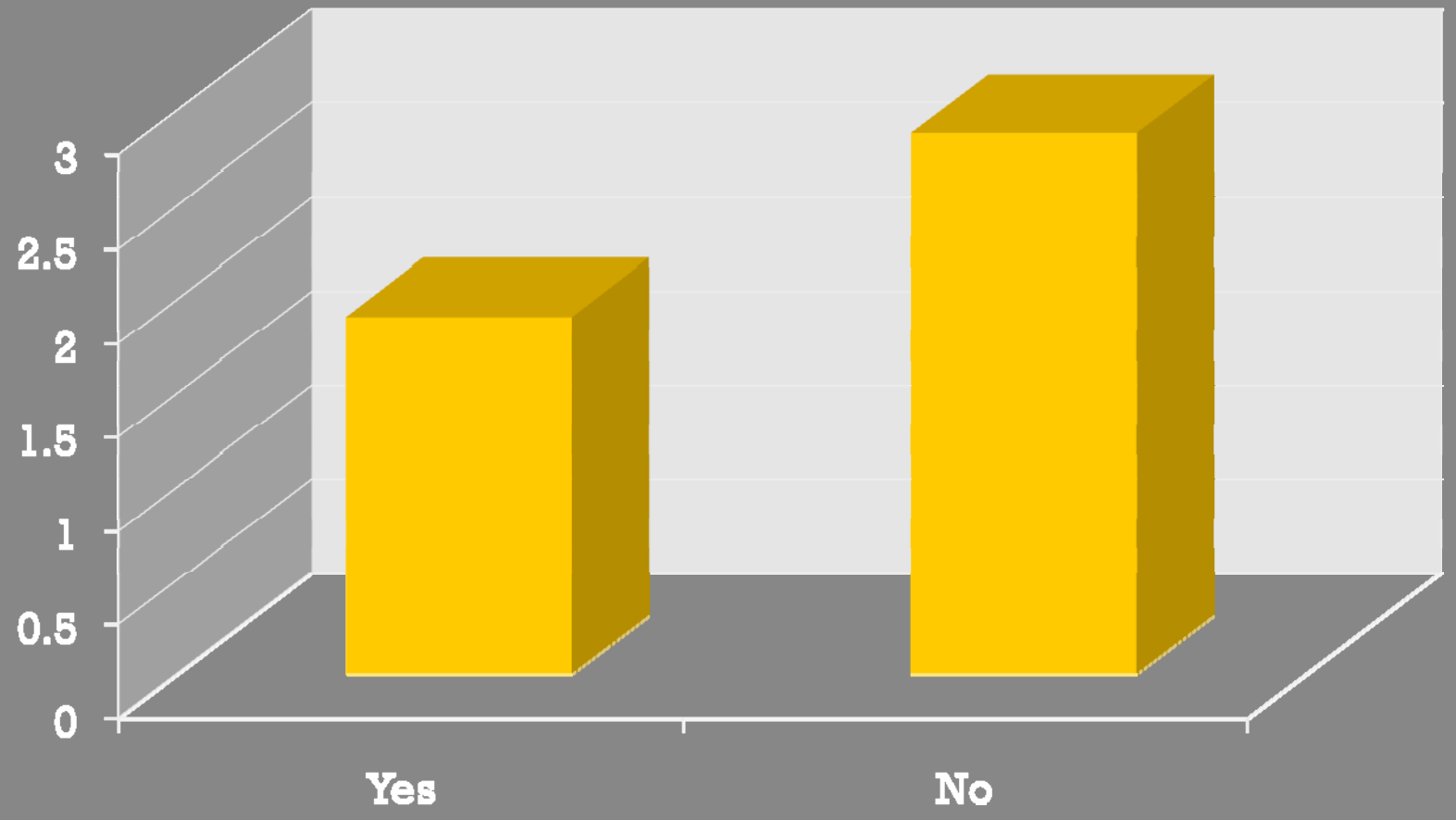
3.

Selection of Contractors that Show Potential for Delivering a Safe Project

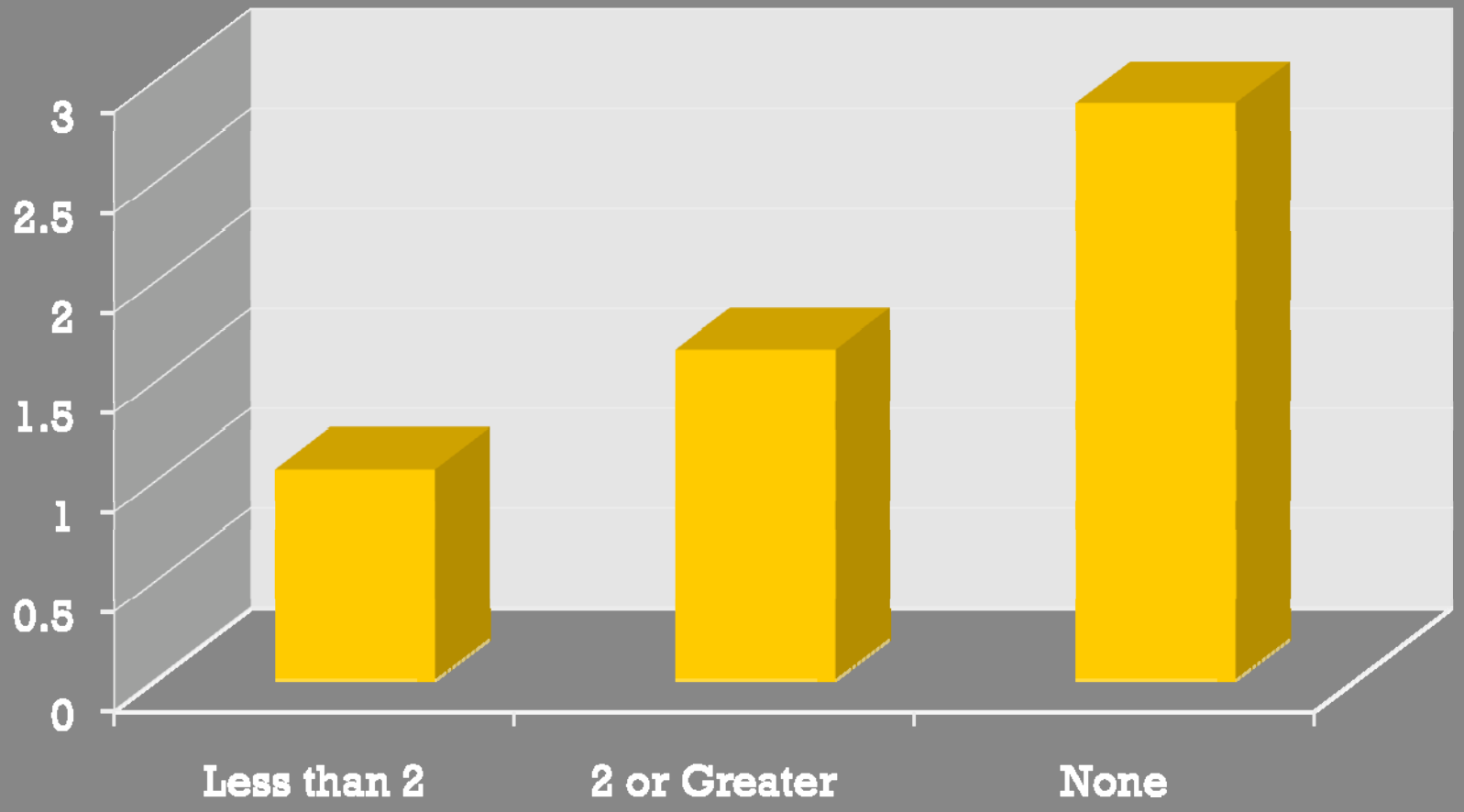
In the Selection of a Contractor Avoid the Traditional Low Bid Criteria as the Sole Measure to be Considered for the Contract Award

Safety Credentials Must be Considered

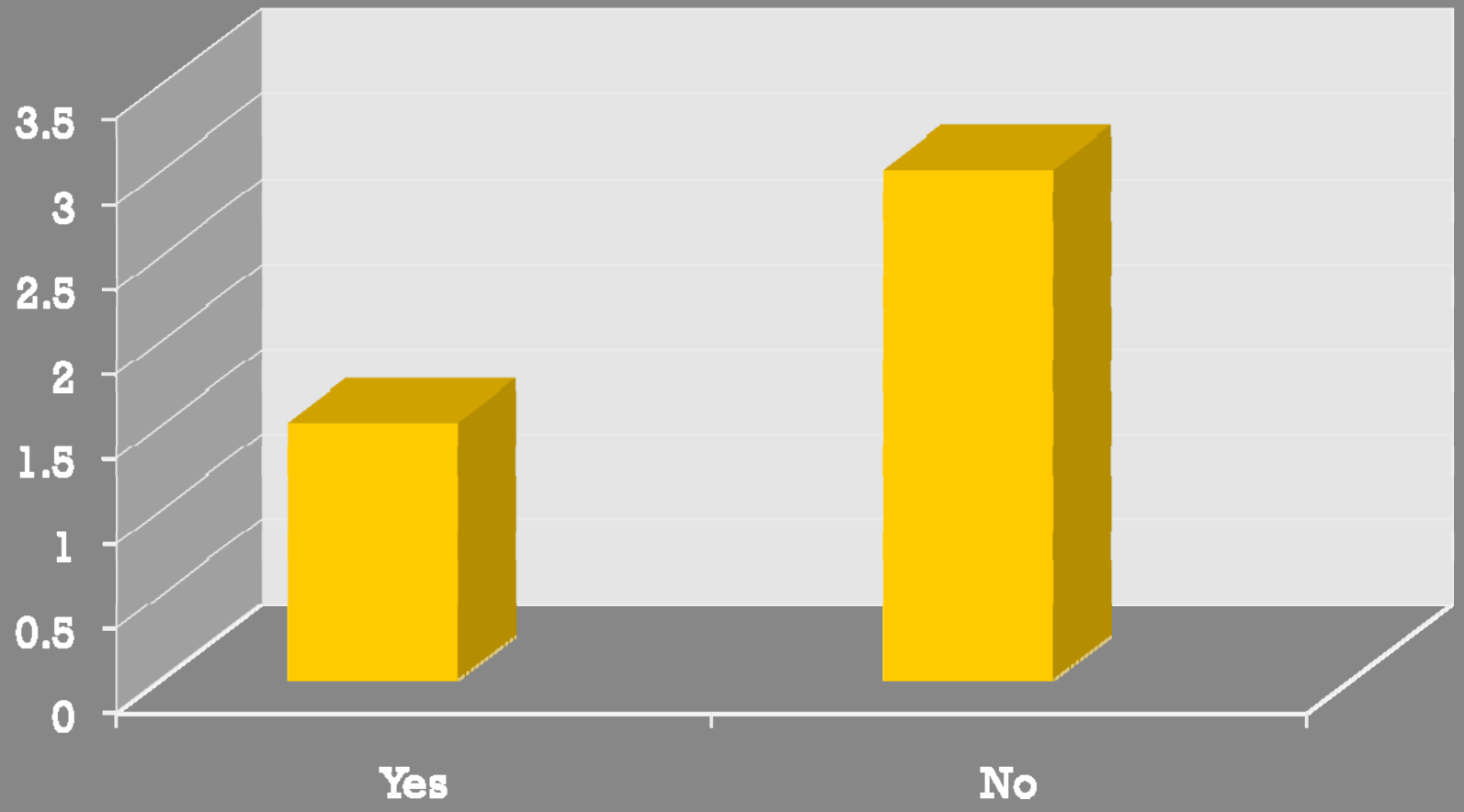
Contractors are Evaluated by the Reported RIR



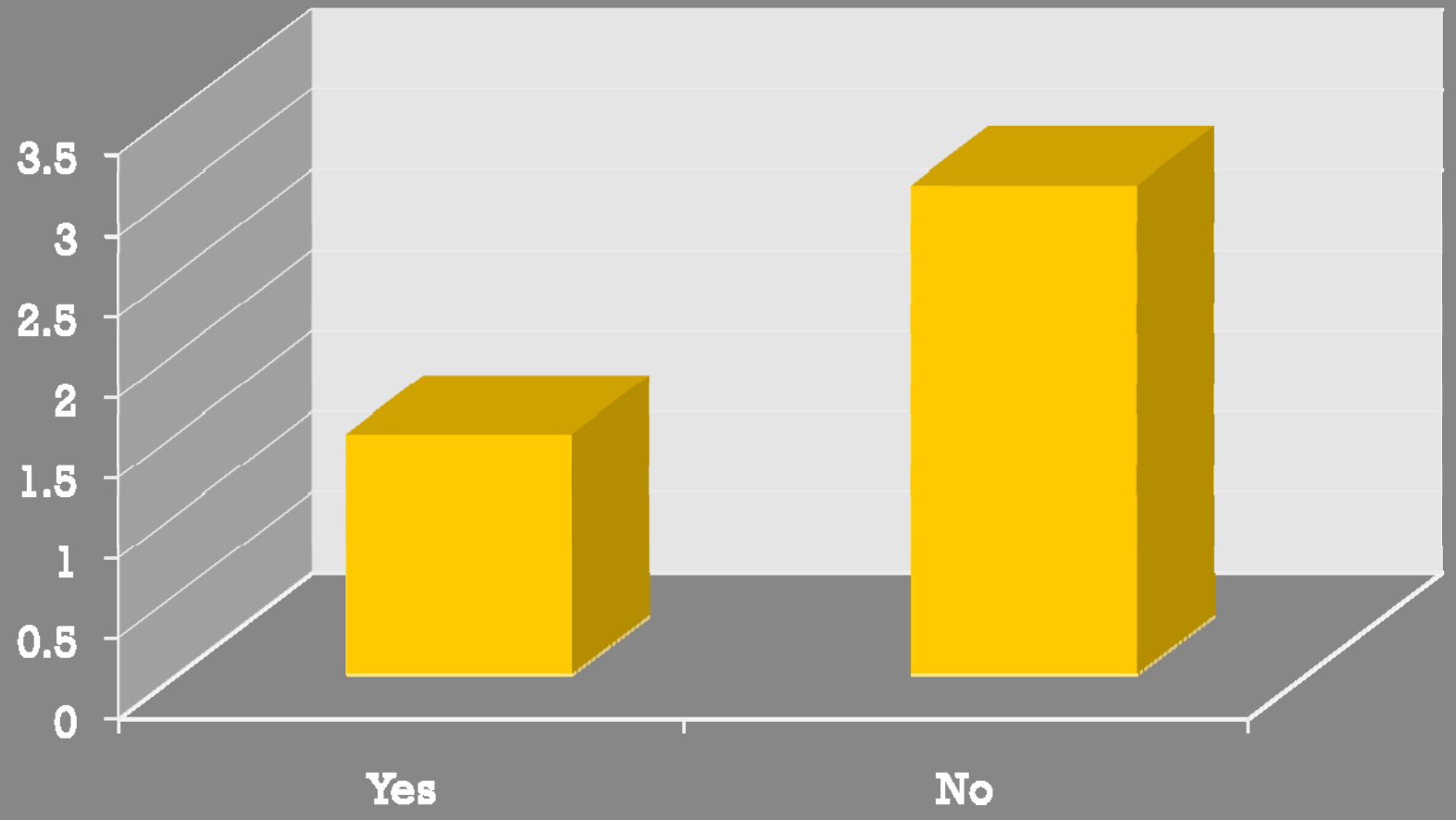
Threshold Value Set for RIR



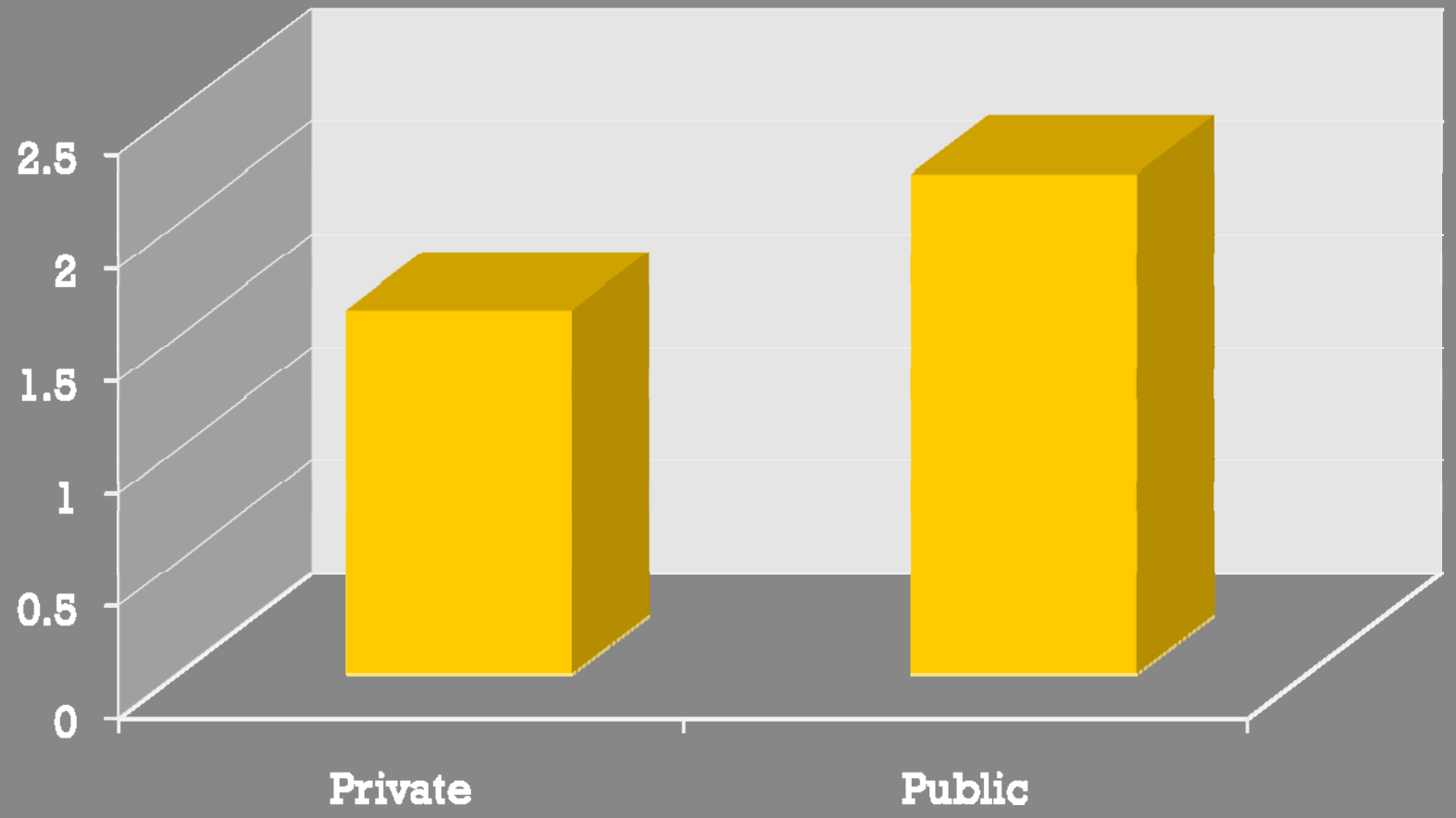
Contractor must submit Safety résumés for Owner Approval



Qualifications of Project Team are Reviewed



Type of Facility Owner

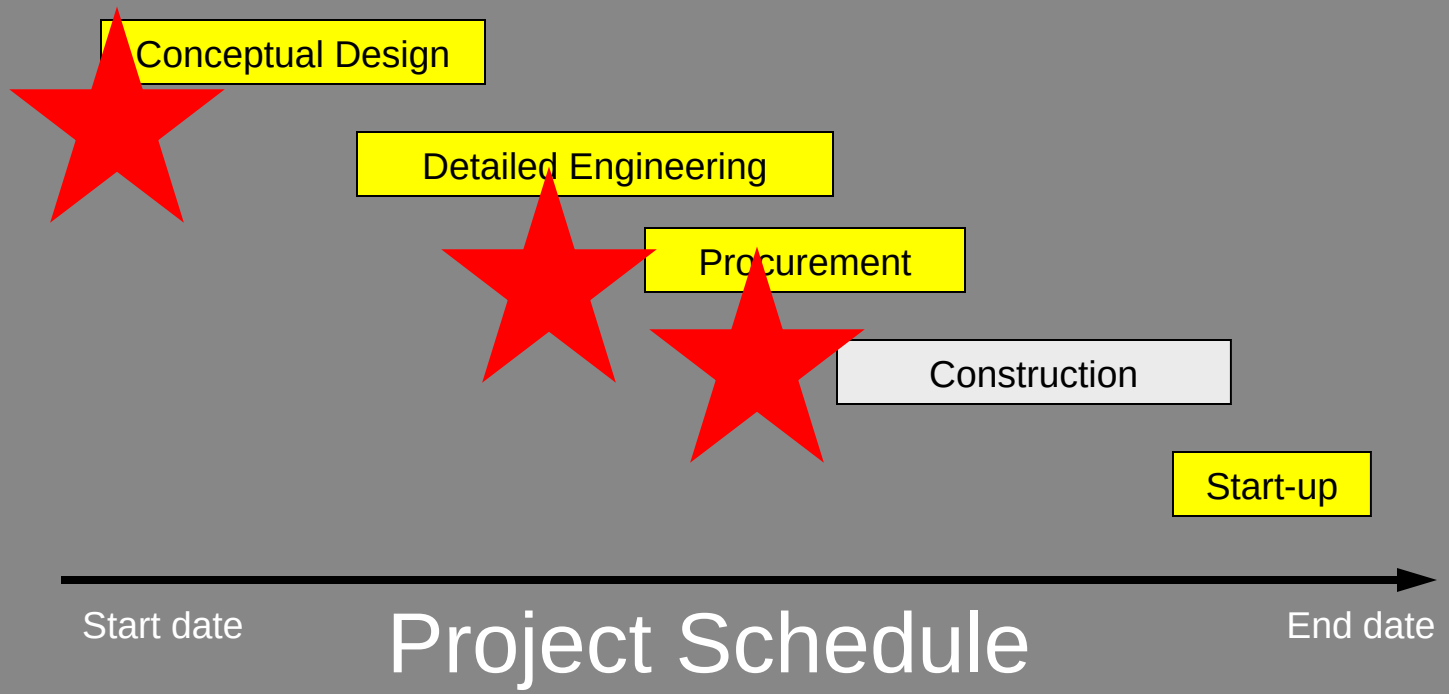


Awarding the Contract to a Firm that is "on board" with Safety Gives Greater Assurance of Success

Early Integration of Safety into a Project is Vital to Worker Safety

1) Work should be made safe by design
2) Contract should promote safety
3) Contractor should have a proven history of safety

When is Safety Addressed During a Construction Project?



Thank You