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**2019**  
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Four Seasons Resort Orlando at Walt Disney World® Resort Orlando, Fla.

July 9–12, 2019

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# WORKING PLATFORMS FOR FOUNDATION CONSTRUCTION AND RELATED EQUIPMENT IN THE UNITED STATES

*Matthew E. Meyer, PE, D.GE | Langan & DFI Trustee Liason to Industry Wide Working  
Platform Working Group*



# OUTLINE

1. Background
  - Working Platform Definition (Starting Point)
  - Introductory Video – EFFC – Safety on Working Platforms
  - Key Aspects to Working Platform Safety
  - Problematic Working Platforms and Consequences
2. Selected DFI Member Firm Survey Results
3. DFI/ADSC-IAFD/PDCA Collaboration, Awareness Increase and Industry Outreach
4. Comparative Status in Europe
5. Working Surface Example – Bridge Construction
6. Alternative Approaches – Rigid Mats
7. Safety Moment/Minute Example

## WORKING PLATFORM DEFINITION

- The part of the construction site on which we put our rig and start drilling;
- The part of the construction site that holds our drill rigs level; and
- The part of the construction site **which prevents our drill rigs from tipping over.**

*Reference: James Finbow – ADSC Foundation Drilling – Nov/Dec 2014 – Working Platforms of course I have one. By the way what is it?*

# 1

# BACKGROUND

## INTRODUCTORY VIDEO



EFFC – Safety on Working Platform Video – You Tube -<https://www.youtube.com/watch?v=KkUn90iqG2U>

# 1

# BACKGROUND

## KEY ASPECTS FOR WORKING PLATFORM SAFETY

- A surface of an appropriate quality is essential;
- Appropriate preparation of the working platform in accordance with design is required;
  - Proper design should be accomplished:
    - Rig loading (under various conditions standing, traveling, handling, penetrating, extracting or other – FPS calculation tool)
    - Platform calculations in accordance with BRE document or other
    - Acceptance testing
- Consideration of atypical or dangerous situations:
  - Underground explosive hazards
  - Traversing across embankments and ramps
  - Overhead powerline and buried utility considerations
  - Undocumented installations or poorly backfilled zones (recent or historic)
- Maintenance and Repair inclusive of working platform limits extending beyond work area

# 1

# BACKGROUND

## PROBLEMATIC WORKING PLATFORMS



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# 1

# BACKGROUND

## PROBLEMATIC WORKING PLATFORMS – DESTABILIZATION OF PLATFORM (KARST RELATED ISSUES)



# 1

# BACKGROUND

## CONSEQUENCES OF PROBLEMATIC WORKING PLATFORMS



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# 1

# BACKGROUND

## CONSEQUENCES



**SUNNY ISLES BEACH, Fla.** - A drilling rig barely averted disaster as it toppled over onto a condominium building.

The fallen rig caused minor damage to a balcony on a building located at 167th Street and Collins Avenue.

Images from Sky 10 showed the top of the crane busting through a wall in one of the building's lower units.

"Either wind, human error, or the surface that they're working on," said Sunny Isles Beach Police Sgt. Brian Schnell. "It's a beachfront surface. It could be any of these three things."



No injuries were reported from the accident site.

<https://www.youtube.com/watch?v=kSYvjHpxrBY>

# 1

# BACKGROUND

## CONSEQUENCES



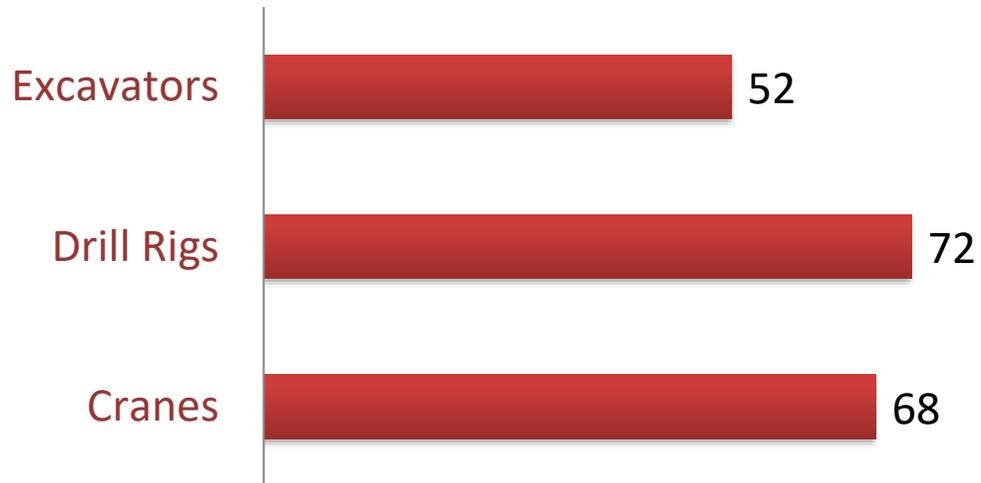
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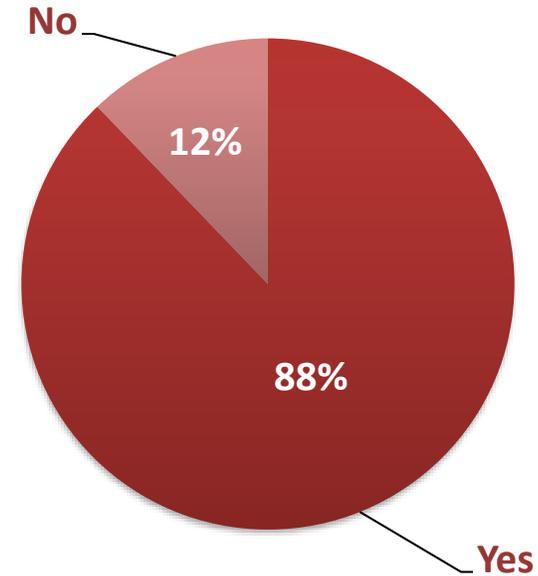
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# DFI MEMBER SURVEY RESULTS

What type of large equipment does your company operate?



Have inadequate working surfaces ever caused safety issues for your company?

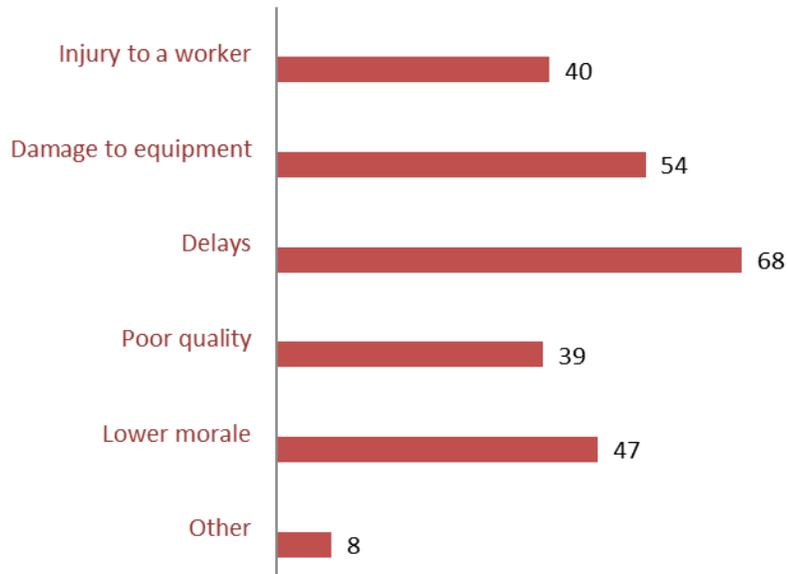


*\*Based on 74 individual survey respondents with 192 responses*

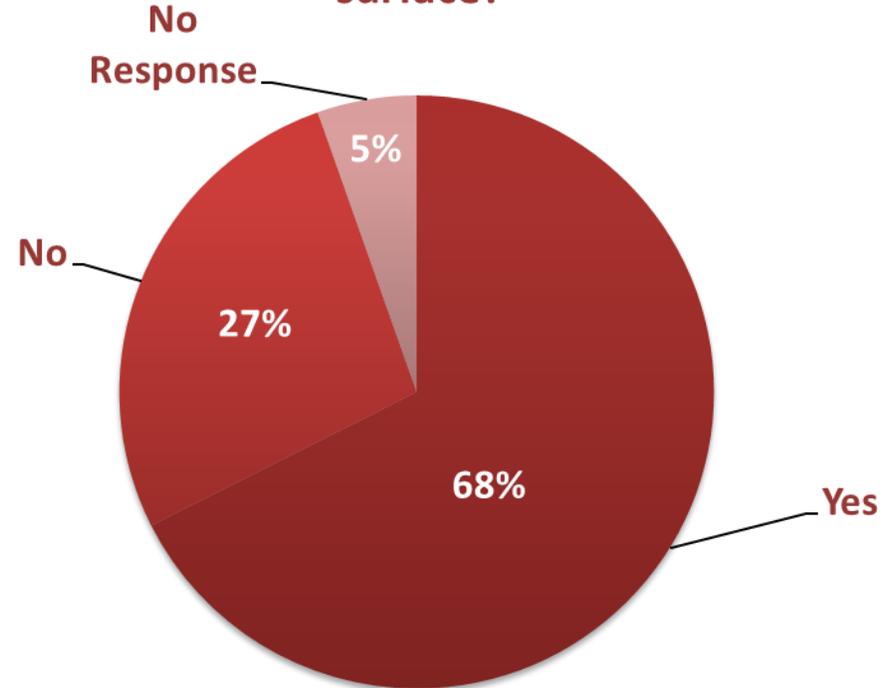
# 2

# DFI MEMBER SURVEY RESULTS

What have been the consequences of the inadequate working surface?



Has your company ever tipped a rig, crane, excavator, or other large piece of equipment due to an inadequate working surface?

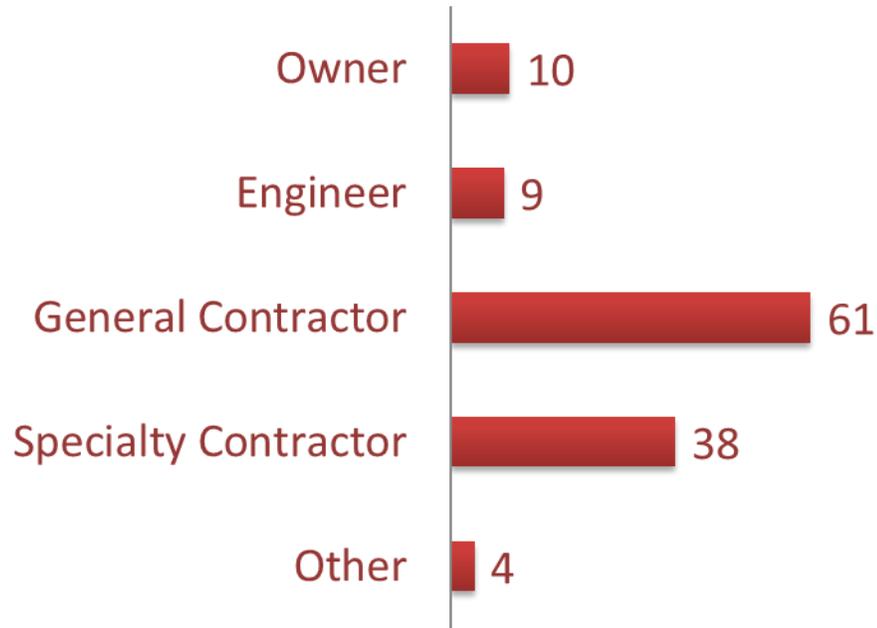


*\*Based on 74 individual survey respondents and 256 responses*

# 2

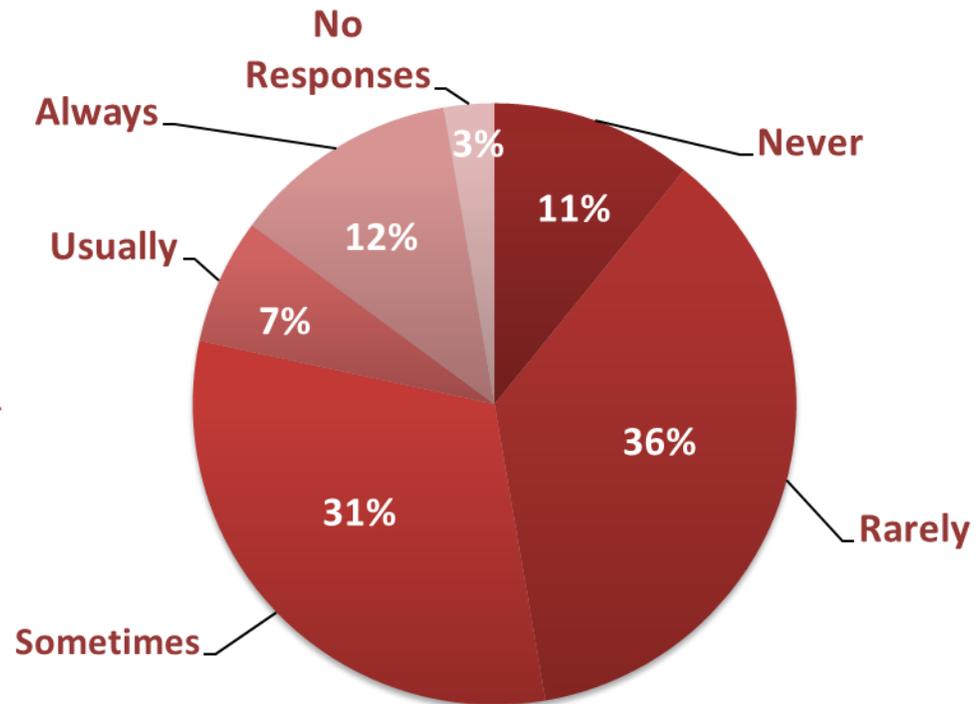
# DFI MEMBER SURVEY RESULTS

Typically, who is responsible for making sure that the recommended minimum requirements are provided and that the working platform stays safe/stable?



*\*Based on 73 individual survey respondents and 122 responses*

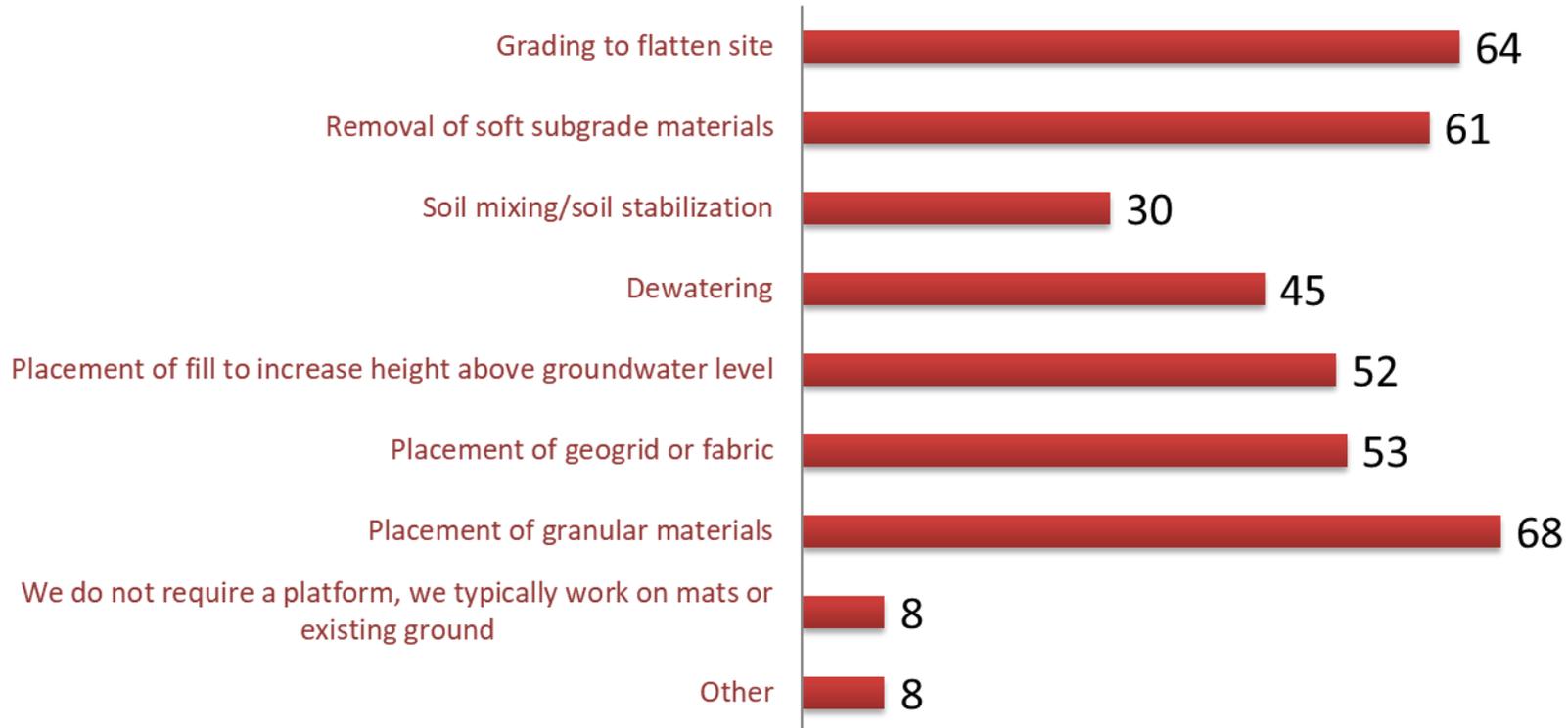
As a Contractor, how often are you required to install and maintain the working platform as part of your contract?



# 2

# DFI MEMBER SURVEY RESULTS

Which of the following have you seen incorporated in working platforms?



*\*Based on 74 individual survey respondents and 389 responses*

# 3

## DFI/ADSC-IAFD/PDCA COLLABORATION

- In June of 2017 – DFI SuperPile Event included “Safety Theme Portion” where presentations on working platforms were included;
- In October of 2017, Industry Wide Working Platform Working Group established with first official meeting held at DFI Annual Event. The Group goals established were as follows:
  - Foster a general industry discussion with major industry groups;
  - Discuss, agree and develop recommended practices to improve safety for large tracked plants and related equipment;
  - Discuss the international state of the practice and consider ways to improve practices
  - Discuss big picture concepts on platform safety, as opposed to detailed design information; and
  - Identify experiences and thoughts on how to take the initiative forward.

# 3

## DFI/ADSC-IAFD/PDCA COLLABORATION

- In June of 2018, a workshop on “Safe Working Platforms” was held as part of a joint conference between DFI and EFFC in Rome Italy;
- In June of 2018, a webinar was included as part of DFI’s SuperPile Event in June of 2018 relative to “Federation of Piling Specialists – UK Working Platform Initiative and Calculation of Rig Bearing Pressures”;
- In November of 2018, the Position Statement entitled “**Consensus Deep Foundation Industry Position on Working Platforms for Foundation Construction and Related Equipment in the United States of America and Canada**” was signed by DFI, ADSC-IAFD and PDCA”;
- In the Spring 2019 edition of ASCE Illinois Section News an article on “Working Platforms for Crawler Rigs” was published;
- In March of 2019, a presentation was given on “Working Platforms” at the Canadian Chapter of ADSC;
- In May of 2019 at the SW Geotechnical Engineering Conference a presentation was given on “Safe Working Platform Initiative”

## EXCERPT FROM POSITION STATEMENT



“...these associations support the development and adoption of an established policy for the evaluation of working platforms for construction equipment. Furthermore, the responsibility for providing a safe working platform should be acknowledged by controlling entities (general contractors, construction managers, and owners) as being an integral cost for every project. Specialty subcontractors should not be left with the unknown risk and cost of creating safe working platforms without due consideration. The goal is to reduce the risk that proper evaluation and preparation may not occur and consequently corresponding safety risks could increase.”

Existing Reference Documents and Standards: OSHA Standards for Canes (1926.1400) and ANSI A10.19-2017 Safety Requirements for Pile Installation and Extraction Operations and updated ANSI A10.23-2019 Safety Requirements for Installations of Drilled Shafts

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# 4

## COMPARATIVE STATUS IN EUROPE

- A guide was developed by BRE under a steering group appointed by Federation of Piling Specialists (Working Platforms for tracked plant: Good Practice guide to the design, maintenance and repair of ground supported working platforms) in about 2004. Available via [www.brebookshop.com](http://www.brebookshop.com)
  - Piling contractor responsible for working platform;
  - Full platform design required based upon rigs and cranes utilized;
  - Working platform certificate issued; and
  - Platform Maintenance responsibility of GC (Principal Contractor)
- UK outcome over the past about 15 years
  - The initiative above was a driver for change;
  - Improvement in safety attained;
  - The process implemented now has a track record on projects; and
  - The process and approach have gained universal acceptance in the UK

# 5

# WORKING SURFACE EXAMPLE BRIDGE CONSTRUCTION



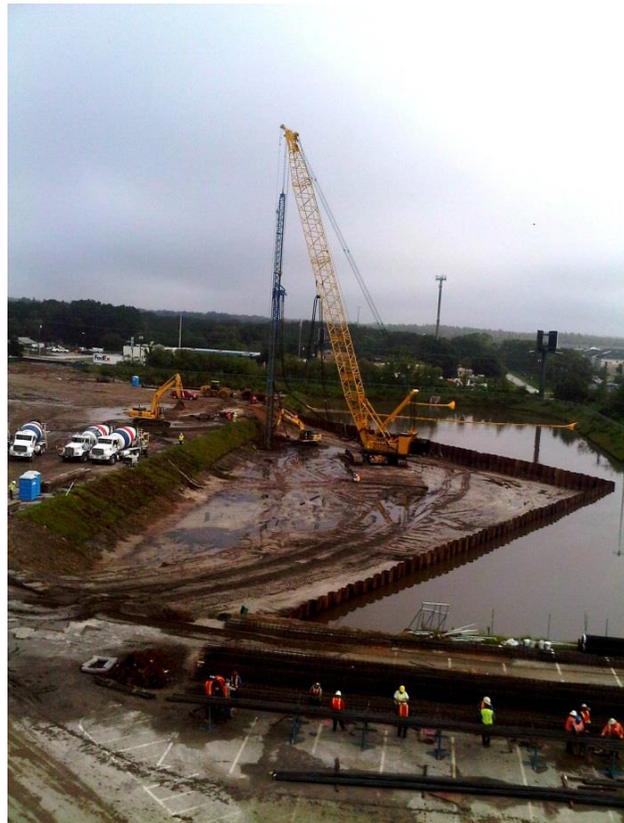
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# 6

# WORKING PLATFORM APPROACHES PROBLEMATIC SOIL CONDITIONS

## Stability Provided by Timber Mats and Rigid Support



# HEALTH AND SAFETY MINUTE: WORKING PLATFORMS (AKA WORKING SURFACE)

PHOTO #1

**DEFINITION:** The part of the construction site on which the Contractor puts their rig. The working platform holds the specialty contractor's drill rig, crane or other equipment level and prevents the rig from tipping over.

PHOTO #2

## CONTRACTOR'S PERSPECTIVE

### Issues Observed on Poor Working Platforms

- Inadequate traction/slick surface
- Messy site
- Unsafe for workers to walk upon
- Too steep for equipment to operate
- Inadequate bearing/excessive rutting and overall stability

### Consequences of Poor Working Platforms

- Injury to worker
- Tipped or flipped crane, rig or excavator
- Damage to equipment
- Delays
- Poor quality work results
- Low morale

## ON-SITE FIELD ENGINEER'S PERSPECTIVE

- Need a safe working surface for day to day observation/monitoring activities
- Need a safe working surface to drive vehicles upon and transport field equipment
- Inundated sites have below water level hazards – pay special attention to these
- Karst geologic conditions may require special considerations
- Pre-drilling and leaving of open holes for expeditious construction poses hazards

PHOTO #3

The construction of an adequate, safe and properly designed stable working platform including maintenance of platform provides safety for personnel and equipment.