

Rope Access & General Industry

Taking Safety & Access
to the Next Level



TODAY'S TOPICS

What is Industrial Rope Access

Where to use IRA

Why should you use IRA

How to use IRA

PRESENTERS



Matthew Mowrer, PE
Sr. Associate / Director of Restoration Services
SPRAT Level 1



Tom Beal
Manager, Rope Access & High Angle Rescue
SPRAT Level II



O'Donnell & Naccarato is dedicated to using a Progressive Design and Team Oriented Approach to provide Structural Engineering services that contribute to the success of our clients, employees, and community.

WHAT DOES O&N PROVIDE?

- + Facility Condition Assessments
- + Vertical & Horizontal Enlargements
- + Facade / Parking Structure Inspections & Restoration
- + New Construction
- + Adaptive Reuse
- + Central Plant Alterations
- + Interior Fit-outs
- + Master Plan Support



Med-Tex Services, Inc. has been providing Safety, Health and Rescue Services for over 30 years. As a valued partner, we have successfully addressed the strategic and day-to-day needs of facilities and contractors.

WHAT DOES MED-TEX PROVIDE?

- + Confined Space & High Angle Rescue Teams
- + Workplace Safety Training
- + Substance Abuse Screening
- + Industrial Hygiene Consultation
- + Rope Access & Rigging Solutions
- + Respirator Fit Testing
- + Medical Standby Personnel
- + Safety & Rescue Equipment Sales

HOW IT'S USED

Civil, Structural, & Geotechnical Engineers



Window Cleaners



Motion Picture & Theatrical Set



Operations & Maintenance Workers



Tower & Antenna



Construction Workers & Painters



HISTORY OF IRA

Caving to Industry.

- The genesis of rope access can be traced back to the 1980s when offshore oil and gas platforms in the North Sea faced complex maintenance tasks amid ever-changing and harsh weather conditions.
- Traditional methods, such as scaffolding and cranes, proved cumbersome and impractical in these challenging environments. Seeking alternative approaches, oil companies turned to mountaineers, cavers, and rock climbers who possessed the requisite skills for working at heights and in extreme conditions. Drawing inspiration from these disciplines, the foundations of industrial rope access were established, and applications have crossed into diverse sectors, revolutionizing the way industries approach maintenance and inspection tasks. (<https://content.ampp.org/coatingspro/article-split/23/4/28/72592/From-Origins-to-Current-Uses-The-Evolution-of-Rope>)
- Nevertheless, their system only used one rope and there was a necessity to add an extra level of safety when used for working at height. As a result, a back-up security rope was added for fall protection purposes – and so began the system we are familiar with today. (<https://mclheightsafety.com/a-brief-history-of-rope-access/>)
- Without specific standards and legislation in North America to support rope access systems, companies and operators were at times prevented from working by safety managers and legislators. SPRAT's development of industry-consensus standards, including Safe Practices for Rope Access Work and Certification Requirements for Rope Access Work, not only raised the awareness of the safety and effectiveness of rope access systems, but also paved the way for California's Department of Industrial Relations effort to create one of the first laws sanctioning the use of rope access systems in North America (<https://sprat.org/brief-history/>)



GOVERNING BODIES



SPRAT

- + Established in mid 1990's
- + Headquartered in Wayne, PA
- + Strictly North America based
- + Recognized as min. requirement in NYC



IRATA

- + Established in late 1980's
- + Headquartered in UK
- + Recognized in US and World

SPRAT CERTIFICATION

LEVEL 1

- Fundamental maneuvers
- Edge negotiation w/rope pro
- Deviation
- Passing Knots
- Rope-to-rope transfer
- Reanchor
- Horizontal aid climbing
- Knots knowledge
- Construct a two-rope system
- Construct a hauling and lowering system
- Rescue – adjacent rope set

LEVEL 2

- Proficiency in all Level 1 maneuvers
- *500 documented hours of Level 1 RA work*
- Level 1 for at least 6 months
- System Analysis
- Vertical aid climbing
- Retrievable two-rope system
- Remote rescue system
- Raising and lowering suspended candidate
- Raising and lowering suspended load
- Cross haul
- Same rope set, rope-to-rope transfer rescue
- Rescue from fall arrest – same rope set

LEVEL 3

- Proficiency in all Level 1 & 2 maneuvers
- 500 documented hrs. of Level 2 RA Work
- Level II for at least 6 months
- System Analysis
- Two rope system for deviation or re-anchor
- Raising and lowering past knots
- Tensioned rope-system
- Rescue from two separate maneuvers

SPRAT CERTIFICATION

- Typically, a 5-day course: 4 days of learning/practice, 1 day of testing.
- Testing involves 50 question written exam, then performance evaluation by independent evaluator.
- Failure occurs by either failing the written exam, accumulating three discrepancies during evaluation, or immediate failure of evaluation.

5. Rope Access Evaluation Scheme and Supplementary Information

	Level 1	Level 2	Level 3
General			
Performance Principles	6.1	7.2	8.2
System Analysis		7.3	8.3
Maneuvers			
Fundamental Maneuvers	6.2		
Edge Negotiation with Rope Protection	6.3		
Deviation	6.4		
Knot Pass	6.5		
Rope-to-Rope Transfer (> 2 m)	6.6		
Re-anchor (> 2 m)	6.7		
Aid Climbing			
Horizontal	6.8		
Vertical		7.4	
System Construction and Operation			
Knots: ☐ Termination ☐ Middle ☐ Stop ☐ Join	6.9		
Two-Rope System			
Anchorage < 1 m apart	6.10		
Edge Negotiation, Anchorages 1 m - 4 m apart		7.5	
Retrievable Two-Rope System		7.6	
Deviation or Re-anchor			8.4
Raising and Lowering			
Ground or Platform-Based	6.11		
Suspended Candidate		7.7	
Suspended Load		7.8	
Through Knots			8.5
Lateral Movement			
Cross-Haul		7.9	
Tensioned Rope System			8.6
Remote Rescue System		7.10	
Rescue			
Adjacent Rope Set, Ascent to Descent Transition	6.12	See 5.1.2.1	See 5.1.2.1
Same Rope Set, Rope-to-Rope Transfer		7.11	
From Fall Arrest System		7.12	
From Maneuver 1			8.7
From Maneuver 2			8.7

SPRAT CERTIFICATION



WHAT ABOUT OSHA?

May 21, 2020

Mr. Stefan Bright
Safety Director
International Window Cleaning Association
7918 Jones Brunch Drive, Suite 300
McLean, Virginia 22102

Dear Mr. Bright:

This is in response to a letter to the Occupational Safety and Health Administration (OSHA) from International Window Cleaning Association's past-president Jason York, requesting clarification of the OSHA standard at 29 CFR § 1910.27(b), *Rope descent systems*, as it may apply to the Industrial Rope Access Systems (IRAS). This letter constitutes OSHA's interpretation only of the requirements discussed and may not be applicable to any question not delineated within your original correspondence. Your paraphrased questions and our responses are below.

Question 1: If an industrial rope access system is used on a building in a manner which allows a worker to descend in a controlled manner and, as needed, stop at any point during the descent to perform work, then will it be considered by OSHA to be a rope descent system (RDS) as defined in 29 CFR § 1910.21(b)?

Response 1: No. Under 29 CFR § 1910.21(b), RDS means “a suspension system that allows an employee to descend in a controlled manner and, as needed, stop at any point during the descent. A rope descent system usually consists of a roof anchorage, support rope, a descent device, carabineer(s) or shackle(s), and a chair (seat board). A rope descent system also is called controlled descent equipment or apparatus. Rope descent systems do not include industrial rope access systems.” The definition for RDS clarifies that rope descent systems do not include IRAS. As such, 29 CFR § 1910.27(b) does not cover or apply to IRAS. However, other OSHA fall protection standards, including 29 CFR §§ 1910.28, 1910.29, 1910.30, 1910.140 apply to IRAS, and IRAS anchorage requirements are covered under 29 CFR §§ 1910.140(c)(12), 1910.140(c)(13) through 1910.140(c)(13)(ii).

Question 2: Do identification and certification requirements for anchorages under 29 CFR § 1910.27(b) apply to building owners or employers when IRAS are used on a building to perform work in the same manner that an RDS would be used?

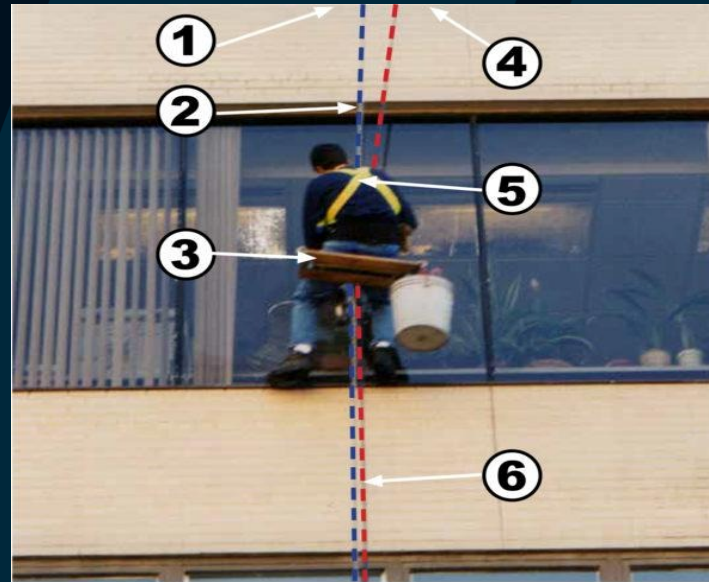
Response 2: No. The requirements contained in 29 CFR § 1910.27(b), including the identification and certification requirements for anchorages, do not apply to IRAS.

ROPE ACCESS **vs.** ROPE DESCENT



Industrial Rope Access:

Def: Techniques using rope and other equipment to provide continuous support and ensure limited free fall potential while getting to and from and while completing a task at a location. Typically, these techniques use two-rope systems.



Rope Descent System:

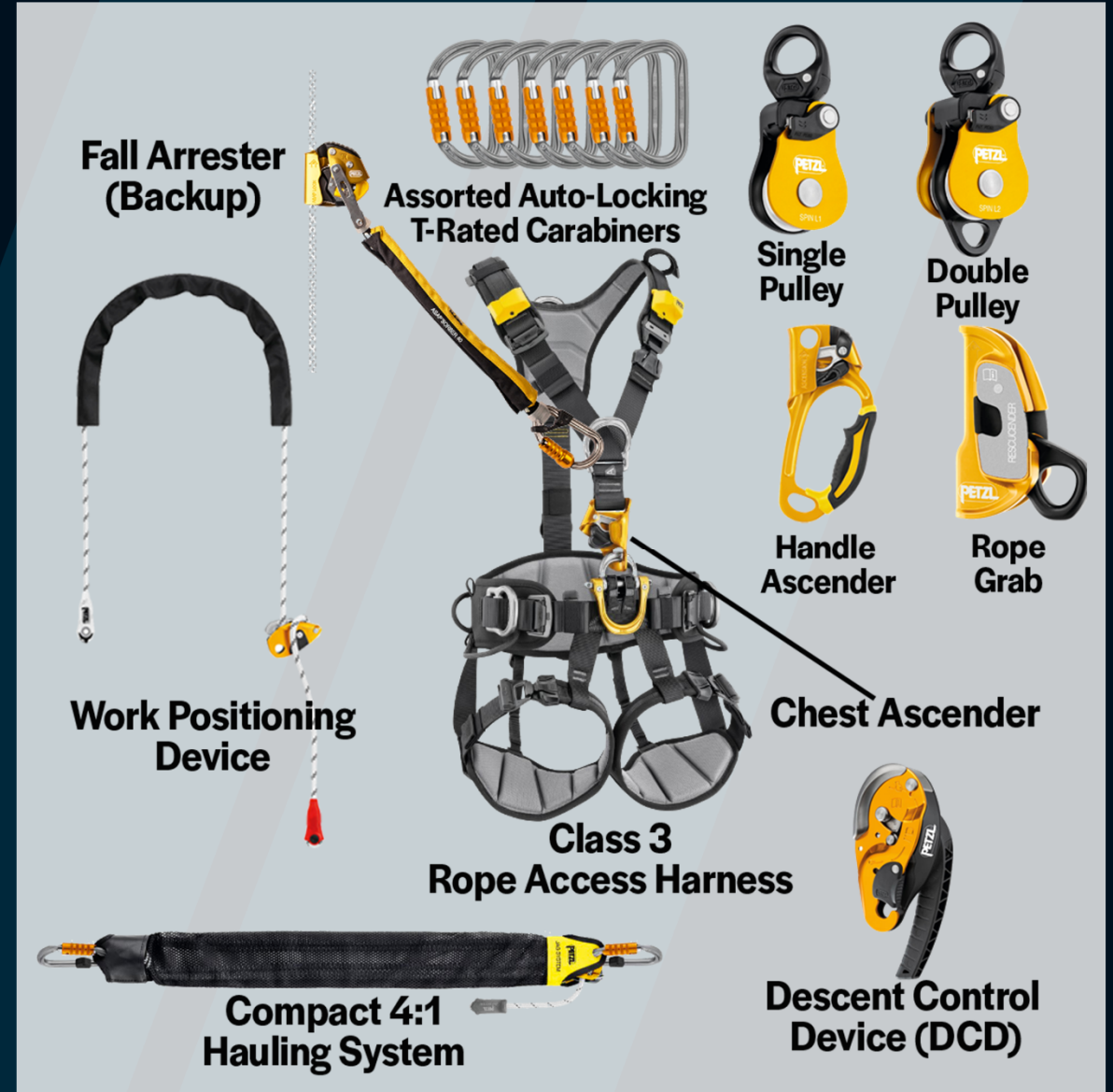
Def: RDS as a suspension system that allows a worker to descend in a controlled manner and, as needed, stop at any point during the descent to perform work. An RDS usually consists of a roof anchorage, support rope, descent device, carabiners or shackles, and **chair (seatboard)**. An RDS also is called controlled descent equipment or apparatus, **but it does not include industrial rope access systems.**

- 1/2. Main suspension line to independent anchor
- 3. Seat board (boatswain chair)
- 4/6. Backup line to independent anchor
- 5. Harness

ROPE ACCESS EQUIPMENT

“Typical” Technician Setup

- + Rope Access is used across a variety of industries and some equipment used will be dependent on the specific needs of the job.
- + However, navigating a two-rope system will always require the technician to be able to change between an ascent system and descent system.
- + T-Rated equipment is preferred due to its high strength but lower weight.
- + While rescue considerations are a part of every access/work plan, technicians carry equipment that can be used in different configurations to aid in a self-rescue.



ROPE ACCESS EQUIPMENT

Recent Advancements

- + Anchor slings have become stronger, more lightweight, malleable and abrasion resistant all while remaining cost-effective. Many slings on the market have breaking strengths beyond 15,000 lbs. The sling pictured has a 100Kn (22,000 lb) breaking strength.
- + Compact, adjustable and able to be deployed quickly, anchor clamps can provide a temporary and non-invasive rated connection point.
- + In lieu of building traditional hauling systems or setting up more cumbersome solutions, there are now a variety of drill powered progress-capture devices that can be used to move both materials and personnel.
- + While more robust, battery powered ascenders are popular for long ascents on fixed lines as well as in some technical rescue scenarios.
- + Artificial high directionals are portable rigging frames that aid in creating elevated anchor a directional rope systems. They are much more versatile than a standard tripod. AHDs require in-depth considerations when it comes to securing them and keeping the resultant forces of your rope system within safe parameters.



**Anchor Slings
100Kn MBS**



Anchor Clamps



**Drill Powered
Pulleys/Ascenders**



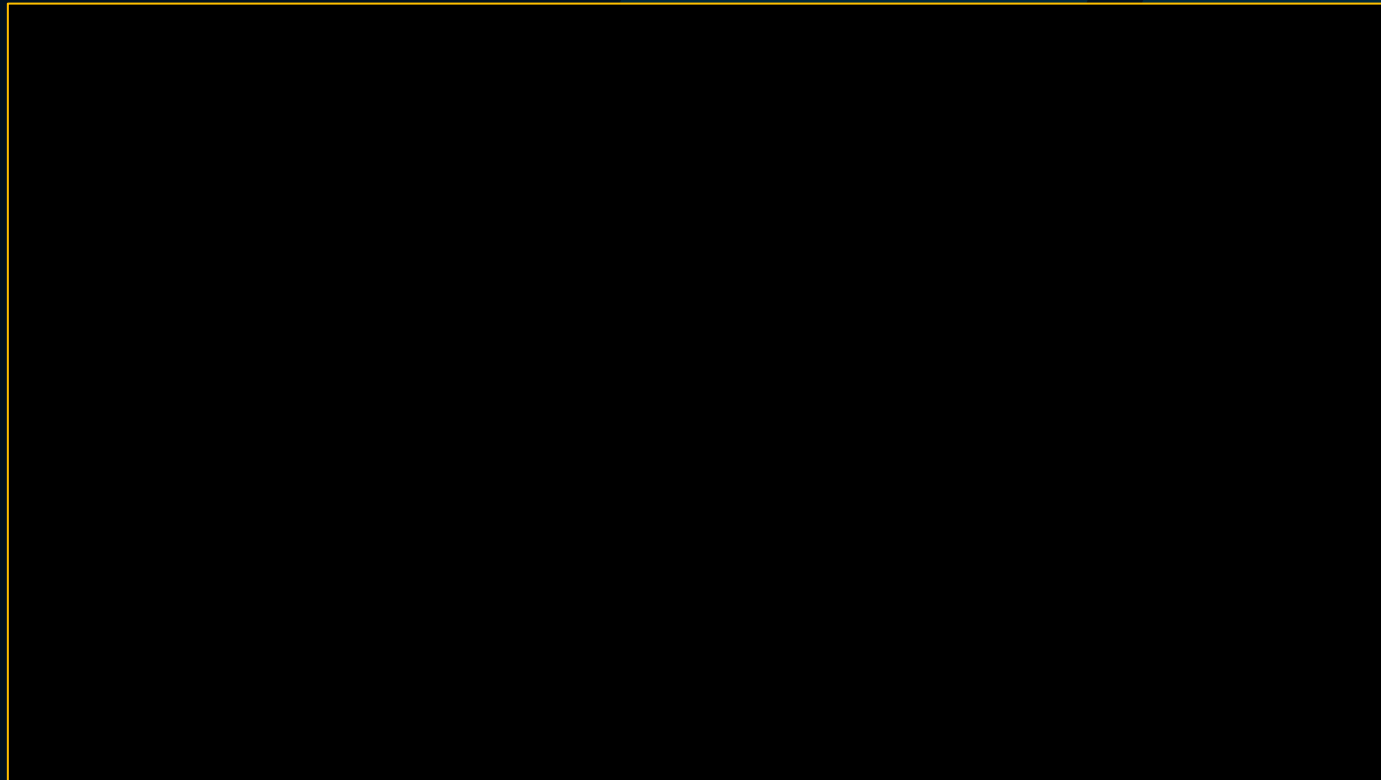
**Battery Powered
Ascenders**

Artificial High Directionals



ROPE ACCESS MANEUVERS

Core Skill: Ascending & Changing Into Descent



ROPE ACCESS MANEUVERS

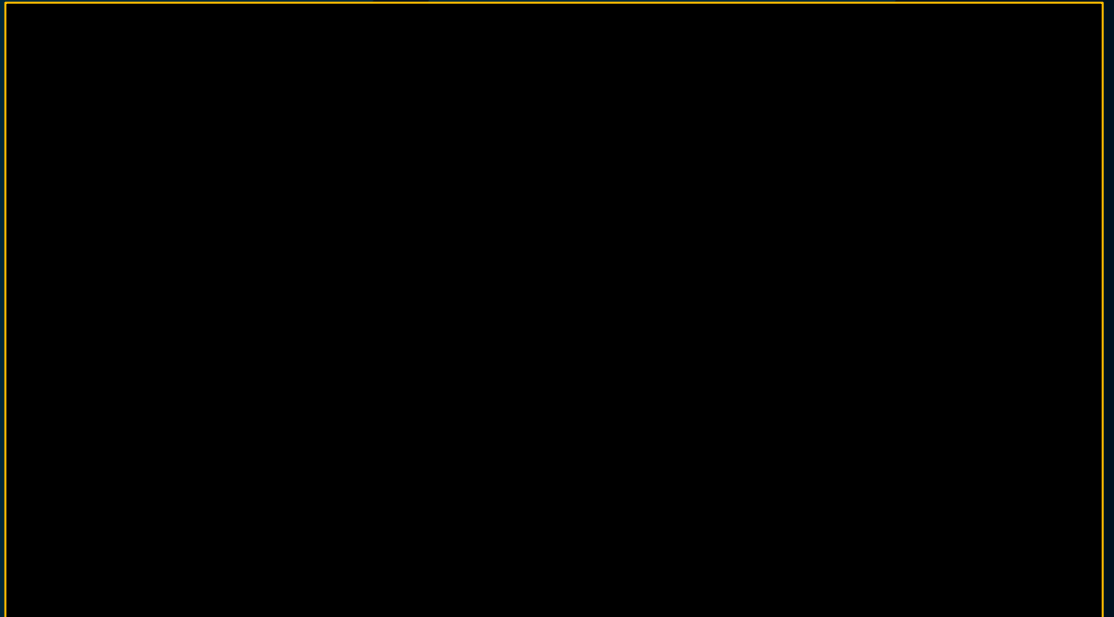
Core Skill: Sideways Movement



Rope To Rope Transfer

This maneuver can be utilized to move horizontally from one anchorage to another and access multiple vertical zones.

It can also be utilized in a dual-system setup to access very specific points along an X/Y axis.



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ROPE ACCESS MANEUVERS

Key Advantage: Hauling Systems

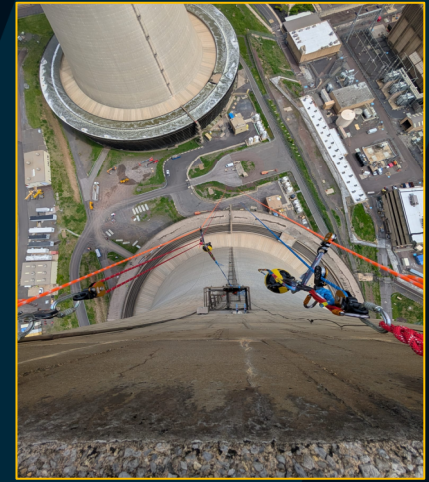
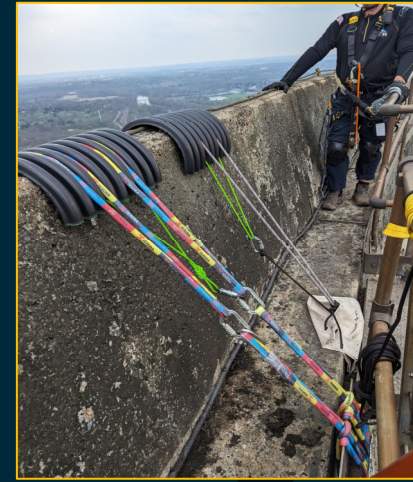
About the Project:

- + The 520' tower was constructed without a hauling system.
- + Winches, rope and temporary anchorages were utilized to establish a temporary system.
- + Rope access techniques for access and redundancy were utilized.



ROPE ACCESS MANEUVERS

Key Advantage: Hauling Systems



FACADE ACCESS

TRADITIONAL



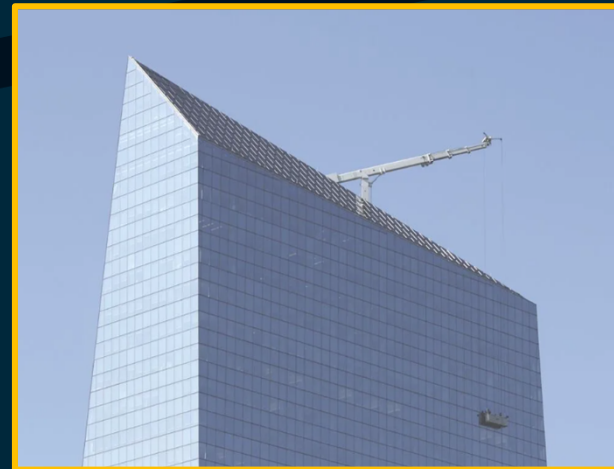
Swing Scaffolding

- + Work platform
- + Heavy loads
- + Multi workers



Boom Lift / High Reach

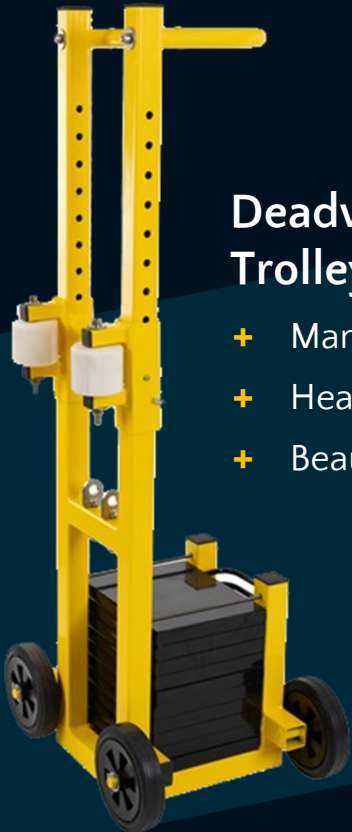
- + Increases speed
- + Great with open spaces around building



Building Maintenance Units

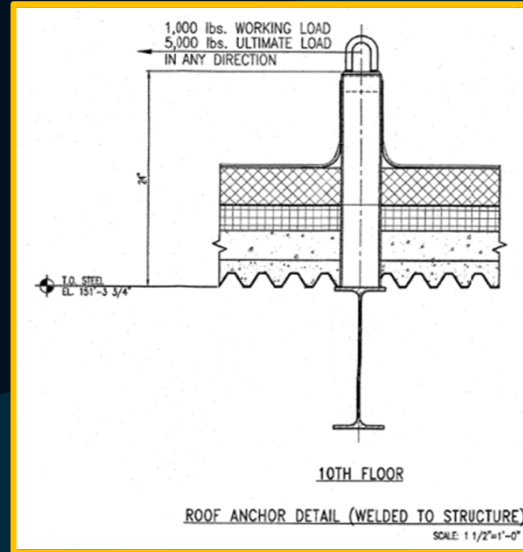
- + Mounted to structure
- + Typically connected to swing scaffold

FACADE ACCESS IRA



Deadweight Anchor Trolley

- + Maneuverable
- + Heavy
- + Beautiful



Individual Anchorages

- + Connected to structure
- + Each capable of supporting 5,000 lb. ultimate load
- + Each anchor tested
- + Typically, numerous in frequency and location
- + Value engineering



Structure

- + Increases speed
- + Great with open spaces around building
- + Evaluate capacity in field

OSHA 1910.27

Scaffolds & Rope Descent Systems

OSHA 1910.27(b)(1)(i)

Before any rope descent system is used, the building owner must inform the employer, in writing that the building owner has identified, tested, certified, and maintained each anchorage so it is capable of supporting at least 5,000 pounds (2,268 kg), in any direction, for each employee attached.

The information must be based on an annual inspection by a qualified person and certification of each anchorage by a qualified person, as necessary, and at least every 10 years.

The employer must ensure that no employee uses any anchorage before the employer has obtained written information from the building owner that each anchorage meets the requirements of paragraph (b)(1)(i) of this section. The employer must keep the information for the duration of the job.

Implemented no later than November 20, 2017

Who Completes Roof Anchor Verification?

1910.140(c)(13) specifies that anchorages need to be “designed, installed, and used under the supervision of a qualified person”. To ensure OSHA compliance, a qualified person should design and supervise the installation of a complete fall protection system. A competent person can examine an anchorage point to determine the safety for roof anchor verification and whether it can support 5,000 lbs.

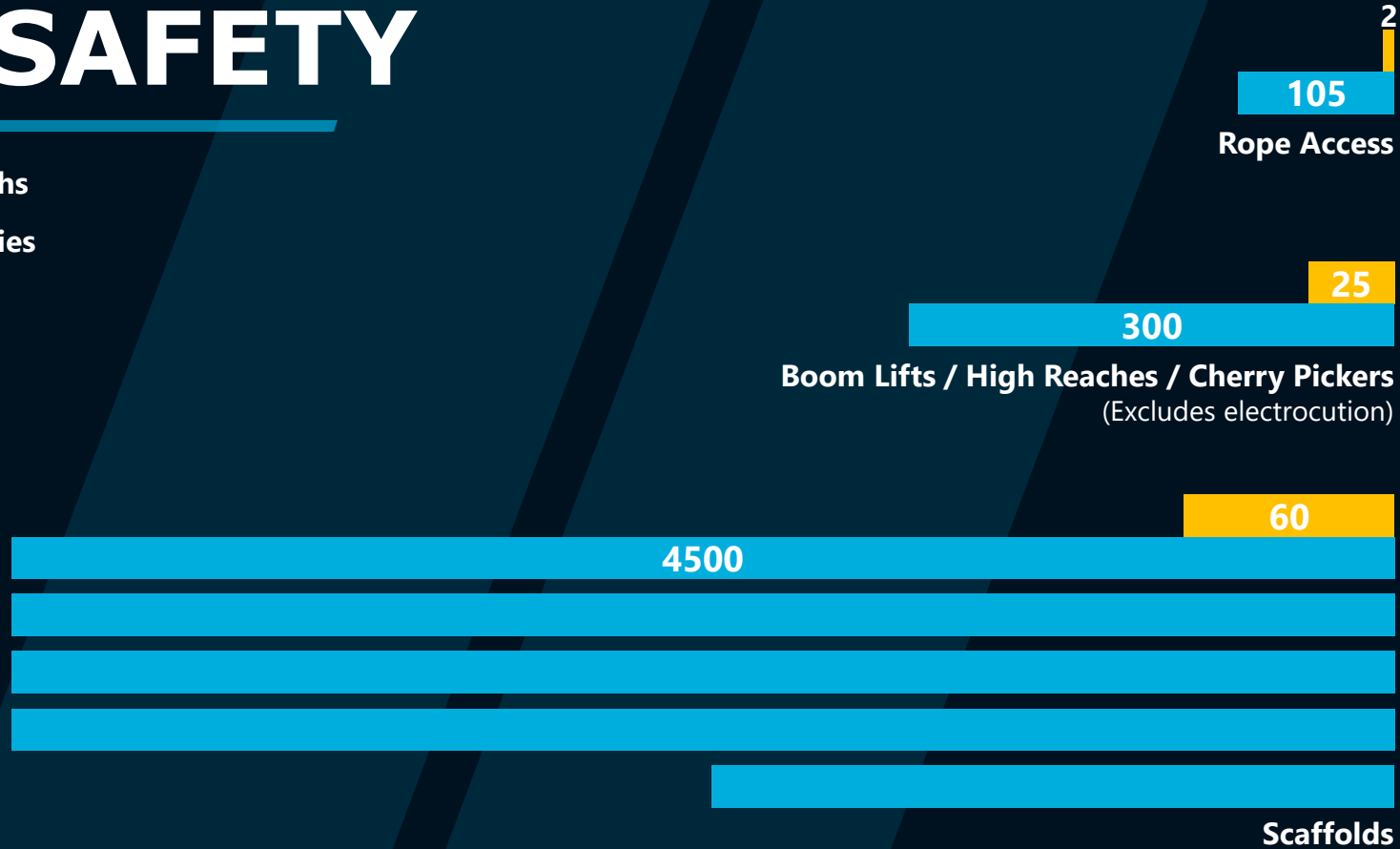
REMEMBER!

Qualified describes a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

Competent person means a person who is capable of identifying existing and predictable hazards in any personal fall protection system or any component of it, as well as in their application and uses with related equipment, and who has authorization to take prompt, corrective action to eliminate the identified hazards. A licensed structural engineer with SPRAT training would meet the criteria of a competent person!

SAFETY

Deaths
Injuries



INSPECTION WITH ROPE ACCESS TYPICAL BUILDING FACADE

SWING-STAGE SCAFFOLDING

VS.

ROPE ACCESS

\$150,000	ACCESS COSTS	\$15,000
5	VISITS REQUIRED	1
Weeks	SCHEDULE	Day
Steels Beams & Weights	ROOFTOP EQUIPMENT	Ropes
Large areas of sidewalk protections, roof protections, wheel rollers on facade.	PROTECTIONS	Rope edge protection sleeve.



THANK YOU!

**Any
Questions?**