

PRESENTED BY

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AGENDA

- Local Law 196 Overview
- Cold Form Steel
 - Overview
 - Outreach
 - Hazards
 - Incidents & Prevention
- Trenches and Excavations
 - Notification
 - Hazards
 - Requirements
 - Safety Tips



AGENDA

(continued)

- Controlled Access Zone
 - Overview
 - Hazards
 - Incidents & Prevention
- Fall Prevention
 - Overview
 - Hazards & Prevention
- Workers Rights
 - Report Safety Issues



Local Law 196 Overview

REQUIREMENTS



LOCAL LAW 196 OVERVIEW

Local Law 196 Training Requirements

Regular Workers

- OSHA 30-Hour construction safety class or OSHA 10-hour and 20 hours of DOB
 preapproved site safety training.
- Starting March 1, 2021 the requirement increases to 40 hours; 8-hours of fall protection and 2-hours drug and alcohol awareness training.

Safety Manager, Supervisors & Superintendents

OSHA 30-Hour construction safety class as well as an additional 32 hours
 of elective credits, which cover a broad range of topics related to construction safety.



10/04/201

This card acknowledges that the recipion has successfully completed

30-hour Construction Safety and Health

This card issued to:

Safe Construction Worker

WHO NEEDS TRAINING?

- Construction Superintendents (CS)
- Site Safety Coordinators (SSC)
- Site Safety Managers (SSM)
- Concrete Safety Managers (CSM)
- Competent Persons
- Construction Workers

- Journeypersons
- Demolition Workers
- Forepersons
- Employees of DOB Licensees
- Employees of DOB Registrants



WHO DOES NOT NEED TRAINING?

- Building Site Owners
- Developers
- Project Managers &
- Construction Managers
- General Contractors
- Professional Engineer (PE)
- Registered Architect (RA)
- DOB Licensees and Registrants that are not CS, SSC, SSM, or CSM

- Delivery Persons
- Flag Persons
- Special Inspectors/Consultants
- Concrete Testing Laboratories/Concrete Inspectors
- Filing Representatives
- Security Officers & Service Technicians



JOB SITES REQUIRING SST CARDS

Job sites that require a Site Safety Coordinator, Site Safety Manager or Construction Superintendent require SST training.

- A registered Construction Superintendent is required to oversee safety on construction sites up to nine stories in New York City.
- A certified Site Safety Coordinator is required to oversee safety on construction sites 10 to 14 stories in New York City.
- A certified Site Safety Manager is required to oversee safety on construction sites of buildings 15 stories and higher in New York City.
 - Use DOB's searchable map available at: https://www1.nyc.gov/assets/buildings/html/site-safety-construction-map.html



KEY DOs & DON'Ts FOR THE CS, SSC, & SSM

DO. . .

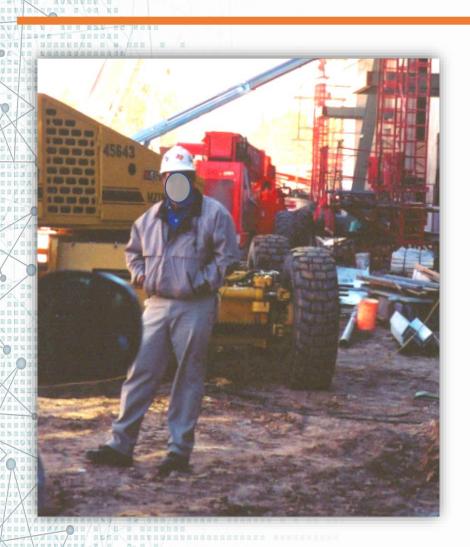
- ✓ Sign the logbook every day.
- Maintain presence on the site while work is being performed.
- Designate somebody as a competent person in the absence of a CS.
- ✓ Indicate specifically who is the Competent Person during your absence in the logbook and have them Sign and Acknowledge they are the competent person.
- SSC & SSM shall maintain presence during all construction operations.

DON'T...

- Forget to sign the logbook.
- Sign the logbook in the morning and leave for the rest of the day.
- CS shall not leave the site without first designating a competent person.
- CS shall not leave the site without documenting who the competent person is that is taking over for you.
- SSC & SSM cannot leave the site.



COMPETENT PERSONS



One who is capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous to employees, and who has authorization to take prompt corrective measures to eliminate them.



COMPETENT PERSONS KEY DOs & DON'Ts

DO...

- ☑ Maintain site safety presence.
- Stay on site during active construction or until you are relieved from duty.
- ☑ Be knowledgeable in the duties performed
- ✓ Continuous training.
- Keep up to date in new means and methods.
- Stop any unsafe activities.

DON'T...

- **区** Ignore safety regulations.
- Leave the site without being relieved.
- Be inexperienced or a novice.
- Take on more than you can handle.
- Be afraid to report issues or concerns.



Cold Form Steel OVERVIEW, OUTREACH, INSTALLATION POINTS, HAZARDS, TIMBER vs. C-JOIST, INCIDENTS & PREVENTION



COLD FORM STEEL C-Joist Overview

- C-Joists are engineered products that perform differently than wood joists.
- C-Joist components provide an economical, lightweight alternative to:
 - Open web steel joists
 - Cast-in-place or hollow-core floor assembly systems
 - Engineered wood joists
- C-Joists come in a variety of depths, flange sizes, and steel thicknesses.





COLD FORM STEEL C-Joist Overview

- Commonly used in a new one to four-story
- buildings
- Allows for quicker installation of multiple stories.
- Special Inspector must verify the construction of CFS as it progresses and before placing ANY load.

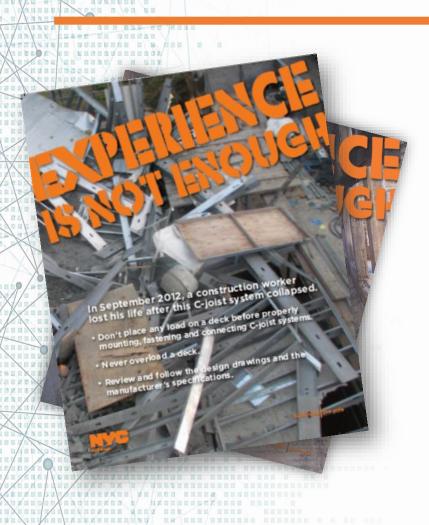




TIMBER vs. C-JOIST	
Timber joists are combustible	C-Joists are non-combustible
Timber joists weigh 7 lbs. per linear foot	C-Joists weigh 3 lbs. per linear foot (10" deep joists)
Timber joists are generic, organic, and sustainable	C-Joists are <u>engineered products</u> and have a high proportion of recycled steel (vehicle parts), high-grade steel.
Timber joists do not easily accommodate pipe/ducts:	C-Joists are manufactured with mechanical pass-throughs.
Timber joists are not dimensionally stable (shrink 6 %)	C-Joists are dimensionally stable.
Timber joists develop a full load capacity Safety Factor of 8 times the rated capacity of the floor. e.g., If the floor has a load capacity of 100 lbs./sqft. The load capacity with Safety Factor: 8 x (100 lbs./sqft.) = 800 lbs./sqft. (collapse load) NOTE: Factors of Safety account for minor errors in design, construction, and materials defects. e.g., Knots in wood and splits, moisture content, etc.	C-Joist does not develop their carrying capacity until fully installed, with a Safety Factor less than ½ the rated floor capacity UNTIL fully braced; then, it equals 2.5 times rated floor capacity when braced. e.g., When not braced If the floor has a load capacity of 100 lbs./sqft. The load capacity with Safety Factor: (½) x (100 lbs./sqft.) = 50 lbs./sqft. When braced, If the floor has a load capacity of 100 lbs./sqft. The load capacity with Safety Factor: 2.5 x (100 lbs./sqft.) = 250 lbs./sqft.
Timber joists are symmetrical/robust.	C-Joist is asymmetrical. If not braced, fail instantly.



COLD FORM STEEL: OUTREACH & AWARENESS



- DOB has published C-Joist systems awareness handouts that address issues of bracing and overloading.
- DOB has embarked on an industry outreach campaign that includes C-Joist manufacturers and providers.
- Key points of reminders which target common issues with improper installation:
 - Don't place any load on a deck before properly mounting, fastening, and connecting the C-Joist systems
 - Decking MUST be completely fastened to C-Joist system before loading.
 - Never overload a deck.
 - Review and follow the design drawings and the manufacture's specifications.



COLD FORM STEEL Installation Points

- These drawings and photos do not take into consideration the overall stability of the structure.
- Licensed Professional to design the floor diaphragm and all relevant connections to complete the building stability load path due to wind and seismic loads.
- Precautions must be taken to avoid construction overloads and exceeding design live loads.



Photo Source: ascelibrary.org



COLD FORM STEEL Installation Points

(continued)

- Temporary bracing must be installed at the time of the erection.
- Joist bridging must be installed at the time the floor is erected.

FAILURE TO INSTALL THE BRACING AT THIS TIME MAY COMPROMISE THE STRUCTURAL INTEGRITY.



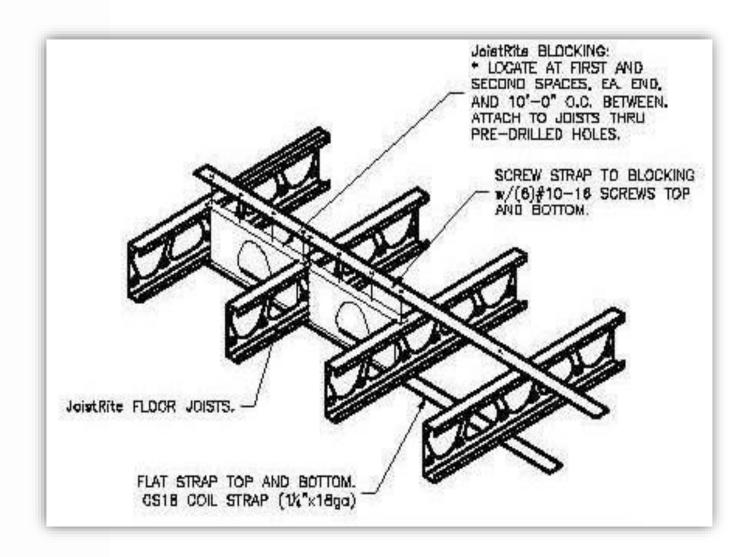


COLD FORM STEEL Installation Points

(continued)

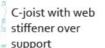
- Notice of the number of required parts to properly brace the cold form deck.
- The flat straps (top and bottom).
- Joist Blocking.
- Screwing Straps (making sure they are screwed into each brace and joist).
- Decking MUST be completely fastened to the C-Joist system before loading.

FAILURE TO INSTALL THE BRACING AT THIS TIME MAY COMPROMISE THE STRUCTURAL INTEGRITY.



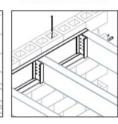


EXAMPLE 2:





C-joist pocketed to wall; anchor joist to wall per design



EXAMPLE 3:

C-joist with stiffener attached to track at wall

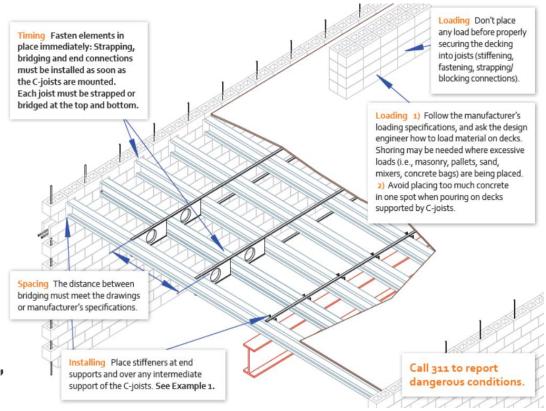


EXAMPLE 4:

Bridging of C-joist with straps and blocks

Installation Points (continued)

- Manufacturer specifications are part of the APPROVED DRAWINGS; the system will fail if not followed.
- The system is not secured until all supports, web stiffeners and connections, and bridging properly are installed.
- Pour the lower level floors BEFORE installing the upper floors, to help carry the upper floor loads.





COLD FORM STEEL HAZARDS

- During construction, placing even light material on the un-braced top flange of the C-Joists can cause instantaneous sideways buckling and an instant progressive collapse of all the joists resulting in a large opening in the floor. Keep in mind:
 - C-Joist bracing is critical in the stability of cold form steel structures.
 - Top flange bracing is critical.





COLD FORM STEEL HAZARDS

(continued)

- Until fully installed and braced, C-Joists can be structurally unstable and occasionally, can collapse without warning.
- The Factor of Safety is less than 1.
- Must be installed per manufacturer's specification and/or approved drawings or it will fail.





COLD FORM STEEL HAZARDS

(continued)

- Collapse is rapid and progressive.
- Often comes without warning and does not leave enough time for workers to evacuate.
- It is associated with overloading a platform or not properly fastening joist.







Hazards (continued)

- Other causes of the collapse are due to overloading.
- Stiffeners, bracing, and bridging are usually missing.
- Failure to pour concrete floors below can cause the exterior walls to buckle.



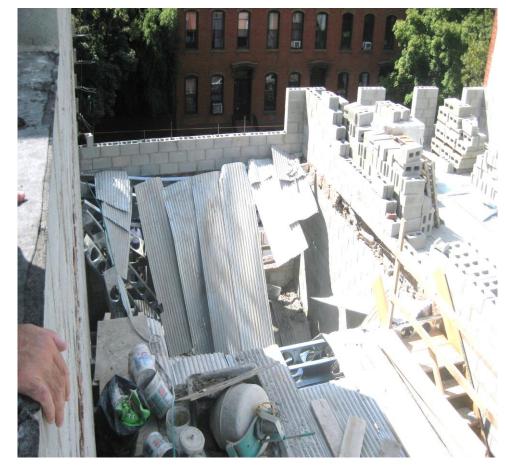
Incident

Overview

- Bronx -August 2019
- An overloaded elevated deck collapsed.
- The front half of the third-floor deck fell onto the second floor.

Cause & Effect

- A four-story new building, CMU blocks that were delivered to the site.
- The third-floor deck was in the framing stage and was not shored and braced against rotation or lateral movement.
- This collapse caused the death of one worker and injuries to five other workers.





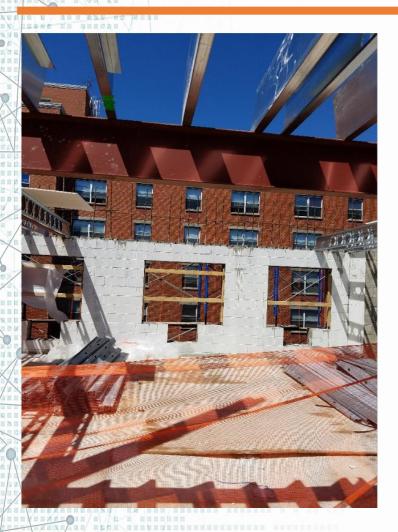
Cold Form Steel C-Joist



PREVENTION:

- Daily Pre-Shift Meeting & Toolbox to review work and identify dangers for the tasks.
- Never store materials and equipment on floors that are not entirely constructed.
- Prior to loading a deck, ensure it is properly installed per the manufacturers or PE's instructions.
- Check with NYS PE to determine if shoring is required under the area of the deck is loaded.
- Prior to placing a load on a deck, verify with NYS PE.







Incident

Overview

- Bronx –August 2019
- Loading CMU delivery, C-Joist rolled over and collapsed when loaded.
- C-Joist and materials struck two workers.







Incident

Cause & Effect

- An eight-story new building, CMU blocks that were being delivered to the site and lifted to the 7th floor.
- No floor decking on the 7th floor.
- C-Joist were not secured and braced.
- This collapse caused two workers to be injured.







PREVENTION:

- Daily Pre-Shift Meeting & Toolbox to review work and identify dangers for the tasks.
- Workers should have OSHA 30-Hour Training, Fall Protection Training, Site Safety Training.
- Fastening and securing with a preinspection should have occurred prior to loading.
- Complacency can cause workers to think they will never be injured.



Trenches & Excavations REQUIREMENTS, HAZARDS, INCIDENTS & PREVENTION, SAFETY TIPS



Notifying DOB

- Section of Code BC 3304.3.1
- DOB shall be notified prior to the commencement of soil or foundation work.
- DOB must be given 24 to 48 hour notice before beginning excavation, rock blasting, or rock chipping.
- Call 811 before you dig, then call (212) 393-2550 with the ticket number.



INDUSTRY NOTICE

Earthwork Notification: 811 (Call Before You Dig) One Call Ticket Number Requirement

Beginning May 1, 2017, the Department of Buildings requires Earthwork Contractors to provide the 811 (Call Before You Dig) One Call ticket number when making normal notification of the commencement of earthwork. The required ticket number can be obtained through the 811 One Call phone number or online at www.newyork-811.com.

Notification is not complete unless the 811 ticket number is provided to the Department. Once the Department receives the required ticket number, the information will be recorded in the Department's notification database. All documents related to the notification **must** be kept on-site and available upon request.

NOTE: The 811 ticket number must address all street frontages associated with the excavation.

To complete the Department's Earthwork Notification, please call (212) 393-2550. For questions or additional information, please email Elnquiry@buildings.nyc.gov.



Hazards

- A worker passing by can fall in.
- The equipment is not adequately supported and could tip into the hole.
- A cave-in can trap workers underneath accumulating soil.
- Workers can be struck by moving excavators or front loaders.





Hazards

- Workers should not be working any excavations exceeding five ft. without shoring and bracing or sides sloped not steeper than 45 degrees or stepped so that the average slope is not steeper than 45 degrees with no step more than five feet high.
- Poorly ventilated trenches may fill with hazardous gases or liquids.
- Landslides/rockslides can trap workers and machinery in their path.
- A single cubic yard of soil weighs approximately: 3,250 lbs.





TRENCHES & EXCAVATIONS PROTECTION



Construction Fence

Section of Code: BC 3307.7

- A temporary construction fence is required to protect the public against possible hazards related to ongoing construction.
- A construction fence is required to enclose the construction site of an open excavation.
- A construction fence is installed prior to the commencement of work.











Guardrails

- Section of Code: BC 3304.4.4
- Excavation with a depth of 6 ft. or greater shall be protected by a guardrail system. Guardrails shall include:
 - Top rail the height of 39 to 45 inches above the floor.
 - Mid rail height midway between the top rail and the floor
 - Toe board at least $3^{1}/_{2}$ inches high and shall be installed so that there is not more than a $^{1}/_{4}$ inch gap between the floor and the bottom of the toe board.

- OR -

- A solid enclosure at least 3 ft. 6 inches high.









Support of Excavation (SOE) Collapse

Overview

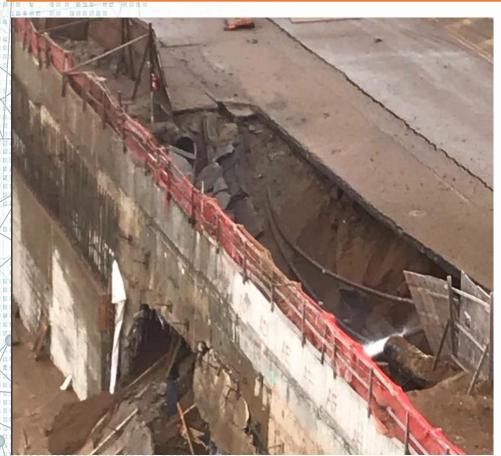
Queens - January 2019

- SOE collapsed into the site.
- A section of roadway along Northern Boulevard.
- Workers expressed concerns for their lives working in the hole.



Picture Source: NYCEM





Picture Source: NYCEN

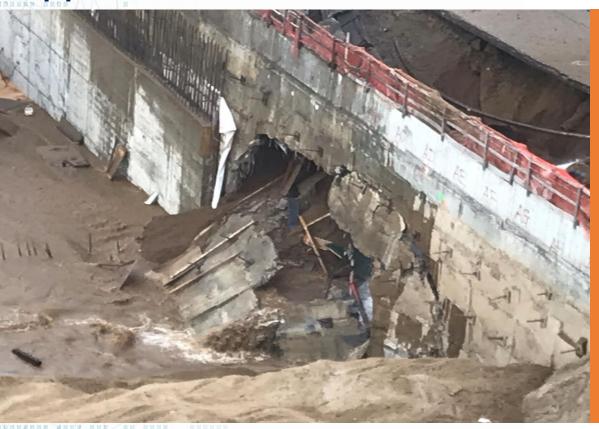
Support of Excavation (SOE) Collapse

Cause

- SOE was not appropriately maintained.
- SOE collapsed.
- A 40 ft. section of roadway along Northern Boulevard.
- Gas explosion; water main break.
- Water, gas, and electricity had to be shut off.



Support of Excavation (SOE)



PREVENTION:

- Daily Pre-Shift Meeting & Toolbox to review work and identify dangers for the tasks.
- Install SOE to the approved drawings.
- Periodic checks of SOE installation.
- Monitoring all movement of the wall.





Support of Excavation (SOE)

Section of Code: BC 3304.4.1

- All sides of an excavation with a depth of five ft. or greater shall be supported in accordance with one or more of the following means:
 - Sheeting: Bracing
 - Shoring: Other retaining structures

- OR -

Sides sloped not steeper than 45 degrees or stepped so that the average slope is not steeper than 45 degrees with no step more than five feet high.









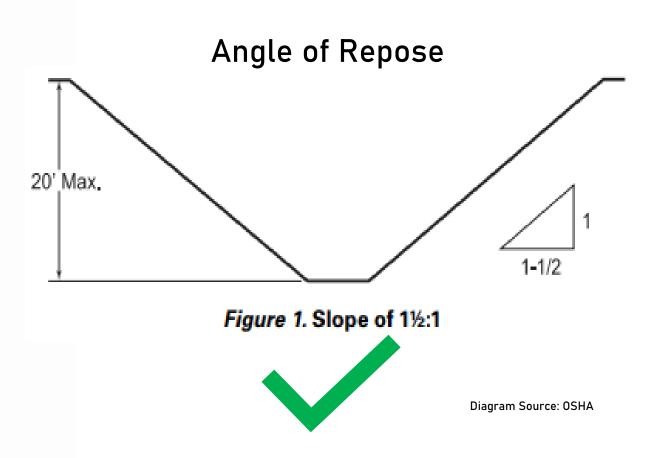




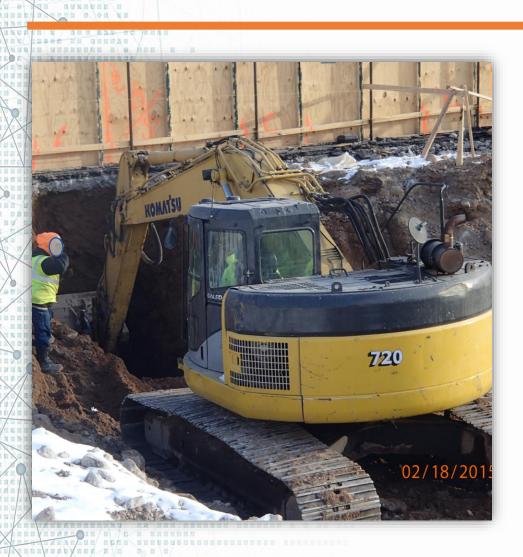








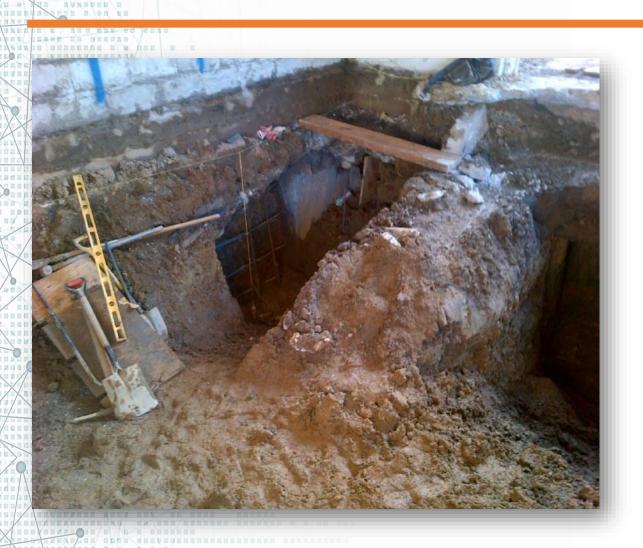




Caught In Between

- Workers can be caught-in between the sides of the excavation and pipes or other objects inside the excavation.
- The un-shored ground underneath the sidewalk can potentially collapse into the excavation site and endangering the public and workers.
- Keep heavy equipment away from edges of trenches and excavations, as it should be 1½ times the depth of excavation until shored and braced.



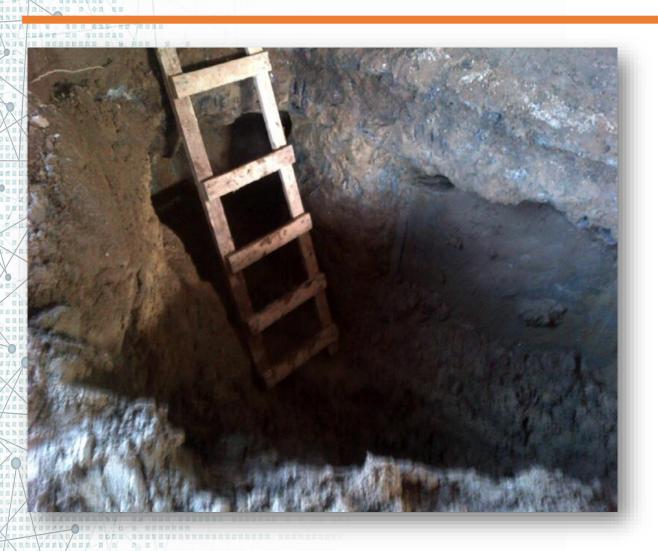


Rainfalls

Section of Code: BC 3304.4.2

All sides or slopes of excavations or embankments shall be inspected after rainstorms or any other hazard-increasing event, and safe conditions shall be restored.





SAFETY TIPS

- Inspect trenches at the start of each shift.
- Keep loads and spoils at least two ft. from edges of trenches and excavations.
- Do not work under a raised load.
- Know where underground utilities are located. (Call 811)
- Test for low oxygen, hazardous fumes, and toxic gases.



Controlled Access Zone

OVERVIEW, HAZARDS, INCIDENTS, PREVENTION



CONTROLLED ACCESS ZONE (CAZ)

Overview

- Areas designated as CAZ must be clearly and visibly marked to alert workers of the presence of the increased risks in these areas:
 - Wire, tape, or rope control lines may be used to cordon off the hazardous areas
 - The control lines must be flagged at intervals of not more than 6ft. with highly visible materials.





CONTROLLED ACCESS ZONE (CAZ)

Overview (continued)

- control lines must be connected on both sides to a wall or secure guardrail system and must run parallel along the entire length of the leading edge.
- They must be strong enough to withstand the force or impact of at least 200 pounds.







Overview (continued)

- Risk is higher in all directions of an established the CAZ. Avoid CAZ area if you are not working in that area.
- Workers should be trained in the proper use of fall protection equipment, procedures for working in the CAZ, and identifying workplace hazards.
- Incorporating fall protection requirements into everyday activities will ensure workers' safety in areas deemed hazardous due to high elevation or the potential of serious falls.

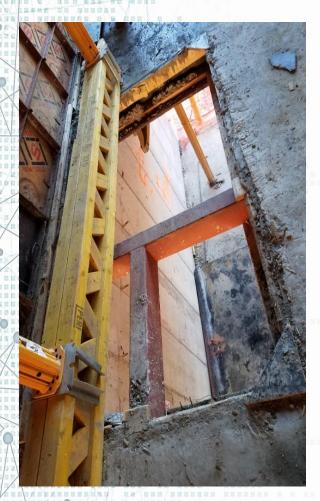




CAZ Hazards

- When in a CAZ, workers must be tied off as they may not have access to Guardrails, Safety Nets, and Personal Fall Arrest Systems to rely on.
- When in a CAZ, ensure you are aware of the boundaries establishing the restricted area and the limitations established.
- Ensure someone is monitoring workers and are not engaged in unsafe activities or methods at any time.







CAZ - Incident

Overview

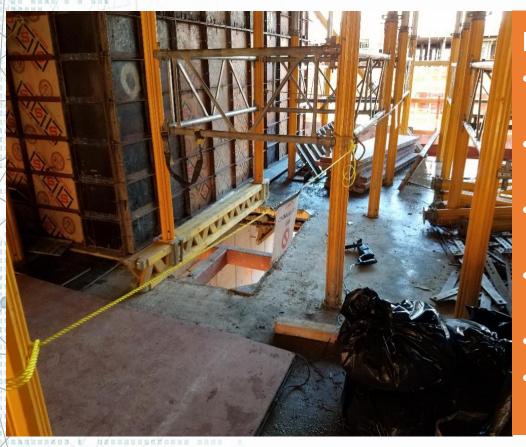
Manhattan – January 2019

- The worker fell from the 6th floor to the 5th floor.
- The opening was covered with unsecured plywood and not properly marked; a worker slipped and fell.

Cause & Effect

- Improperly secured plywood.
- Lack of markings.
- No signage was posted with an indication of the opening.
- No CAZ was in place in this area.

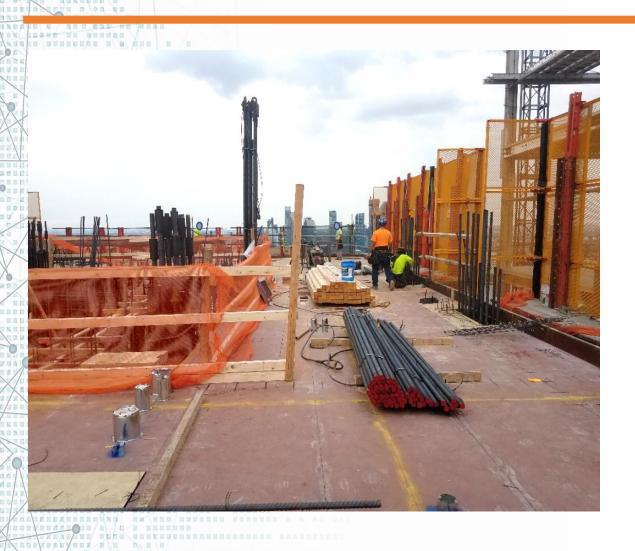




PREVENTION:

- Daily Pre-Shift Meeting & Toolbox to review work and identify dangers for the tasks.
- Workers should have OSHA 30-Hour Training, Fall Protection Training, Site Safety Training.
- The opening should have been covered with plywood, screwed down, and marked.
- Be aware of your surroundings when walking on a construction site.
- If you see a hazard, report it.
- Complacency can cause workers to think they will never be injured.





CAZ Incident

Overview

- Manhattan –September 2019
- A panel fell during stripping operation on the 26th floor.
- Work was walking under the area of work when the panel fell.

Cause & Effect

- Stripping operations was not clear.
- No removal sequence was being followed.
- No Caz area was established around the fall zone during operations.



CAZ Incident



PREVENTION:

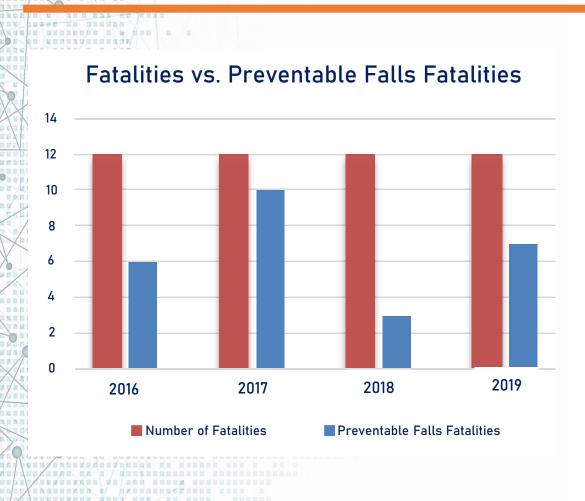
- Daily Pre-Shift Meeting & Toolbox to review work and identify dangers for the tasks.
- Workers should have OSHA 30-Hour Training, Fall Protection Training, Site Safety Training.
- Establish CAZ zones with proper means and methods to perform operations safely.
- Provide signage and set up monitoring during operations.
- Be mindful of potential areas where debris can fall on the site and create a CAZ.



Fall Protection & Leading Edge

OVERVIEW, ANATOMY OF A FALL, INCIDENTS & PREVENTION, FALL PROTECTION SYSTEM

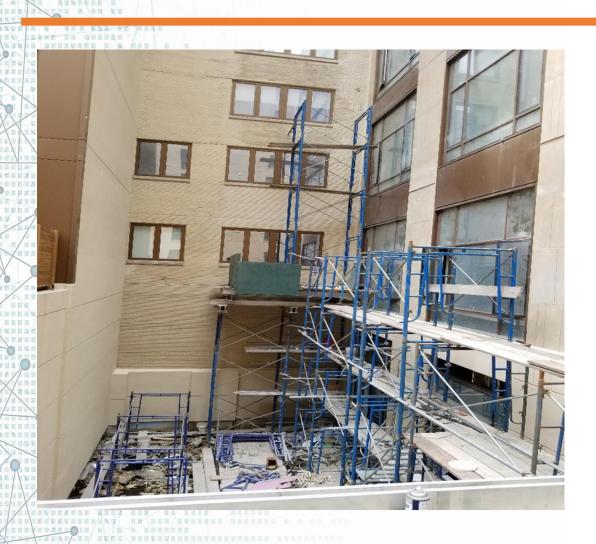




Overview

- Falls are the leading cause of injuries and fatalities in NYC Construction.
 - 38% of Incidences
 - 58% of Fatalities
- 2016 6 of the 12 fatalities would have been alive today if they were wearing fall protection
- 2017 10 of the 12 fatalities would have been alive today if they were wearing fall protection.
- 2018 3 of the 12 fatalities would have been alive today if they were wearing fall protection.
- 2019 7 of the 12 fatalities would have been alive today if they were wearing fall protection.





Overview

- Sites should be set up to prevent workers from falling off
 - Overhead Platforms
 - Elevated Work Stations
 - Into Holes: Floor and Walls





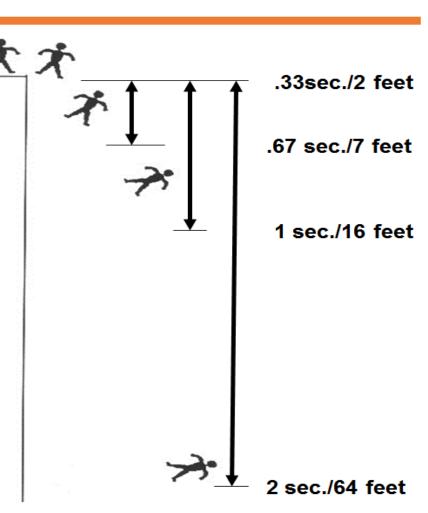
Overview (continued)

- Fall protection is required when
 - Work is being performed in an area over 6 ft.
 - Work being performed on scaffolding over 6 ft.
 - Fixed vertical ladder without cages over 24 ft.



Anatomy of a Fall

- 1/3 of a second to become aware of fall
- 2/3 of a second for the body to react
- 2/3 of a second to fall seven ft
- 1 second to fall 16ft
- 2 seconds to fall 64ft





FALL PROTECTION & LEADING EDGE INCIDENT



Overview

- Brooklyn April 2019
- The material was delivered to the second floor.
- A worker was unloading delivered materials when he tripped and fell.

Cause & Effect

- As the worker was unloading the delivered material when the worker tripped and fell.
- The worker fell through a hole in the floor, falling to the first floor.
- The injured worker was wearing fall protection equipment, but the PPE was not clipped in and tied-off.



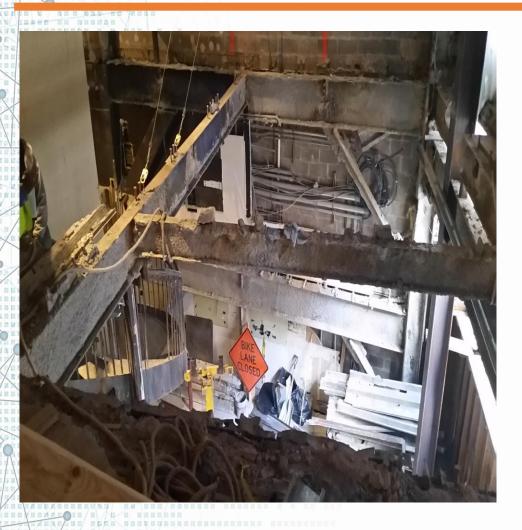
Incident



PREVENTION:

- Daily Pre-Shift Meeting & Toolbox to review work and identify dangers for the tasks.
- Connect joists and secure the floor prior to working on the surface.
- Set up guardrails around the perimeter of the opening.
- Wear appropriate PPE correctly.





Overview

- Manhattan April 2017
- Removing debris from the second floor of the site.

Cause & Effect

- The worker was discarding a demoed steel member from the site through the opening.
- He was throwing materials down to the 1st floor with no leading-edge protection.
- The lug welded to the steel member caught on the belt loop of the worker and pulled him into the hole.
- The worker was not tied off and fell 20 ft. to his death.



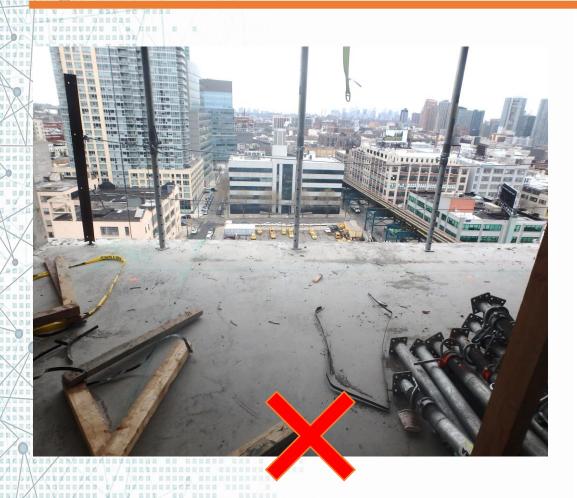
Incident

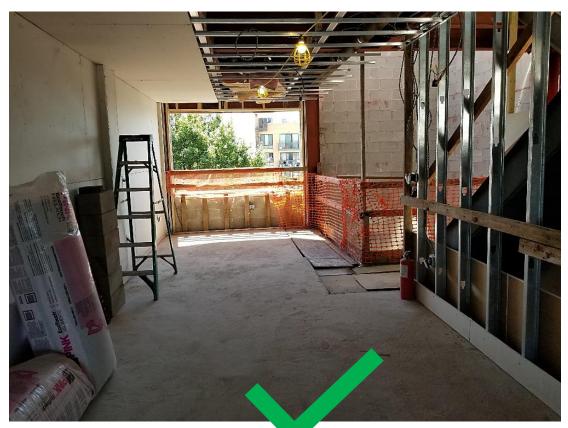


PREVENTION:

- Daily Pre-Shift Meeting & Toolbox to review work and identify dangers for the tasks.
- Wear appropriate PPE correctly; tie off when wearing a Personal Fall Arrest System (PFAS).
- Set up guardrails around the perimeter of openings, where possible.











Overview

- September 2017
- Peri System panel was removed from its secured rails for raising to another level.

Cause & Effect

- Peri System was being moved for a backset exterior wall.
- Workers were standing on the Peri System while performing work.
- Worker not tied-off and fell 27 stories to his death.



Incident



PREVENTION:

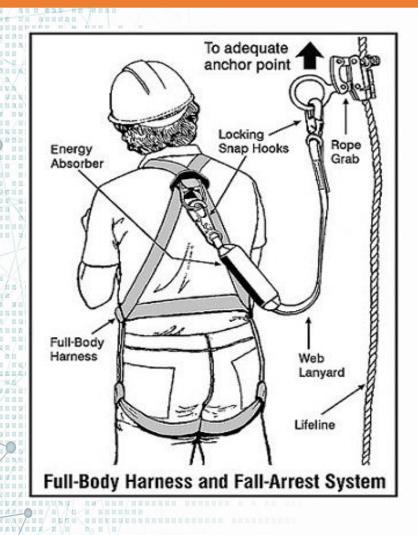
- Daily Pre-Shift Meeting & Toolbox to review work and identify dangers for the tasks.
- Wear appropriate PPE correctly; tie yourself off when wearing a Personal Fall Arrest System (PFAS)
- The method of work did not follow the manufacturer's instructions.
- Never ride materials being lifted by a crane and use tag lines.







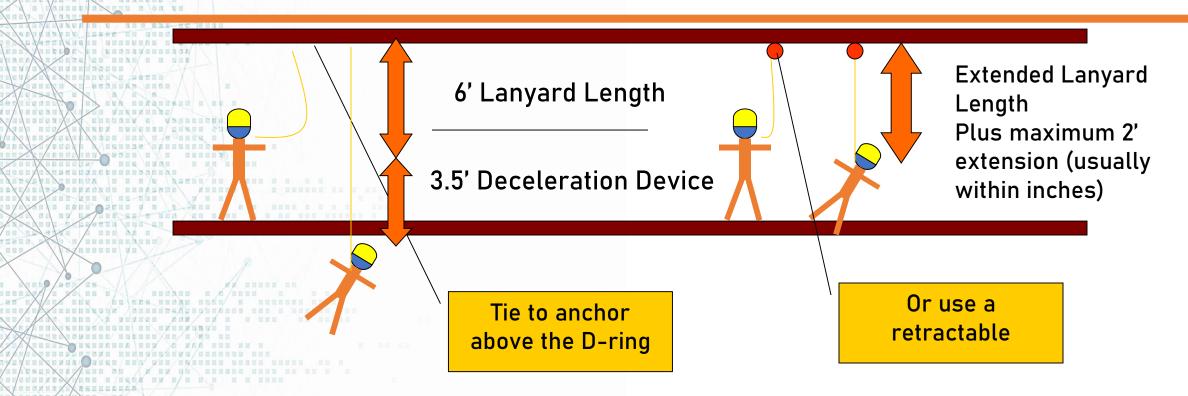




Personal Fall Arrest System

- PFAS should be used as an alternative fall prevention means.
- A harness needs to be inspected before each use by the worker and checked and documented annually by a Competent Person.
- Harnesses should never be modified.
- Should be taken out of service immediately if defective or exposed to an impact.





Using an anchorage above the D-ring and a standard lanyard may still allow an employee to fall a distance that may be difficult to rescue from. Using a retractable minimizes forces on the body, and may make the rescue easier (and therefore more timely)

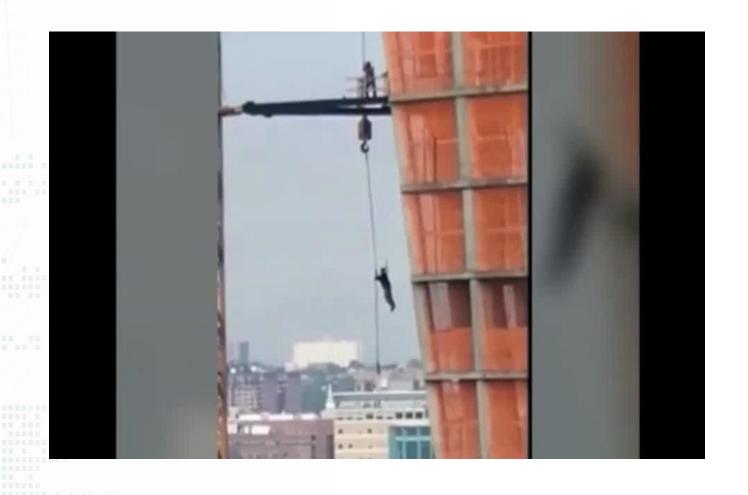


FALL PROTECTION SAVES LIVES



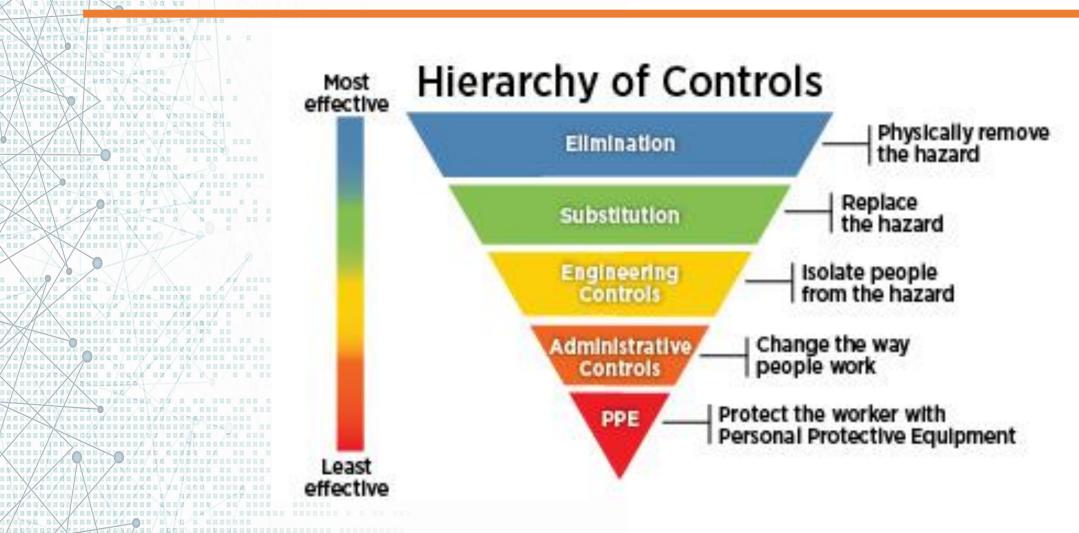








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Fall Protection Systems

- Guardrail Systems
- Safety Net Systems
- Personal Fall Protection Systems
- Warning Lines
- Designated Areas
- Control Access Zones
- Hole Covers



Workers' Rights REPORT SAFETY ISSUES, PROTECT YOURSELF, HOW TO REPORT



- Right to a safe workplace.
- Receive training and information on hazards and how to prevent them.
- Review records of work-related injuries & illnesses that occurred in the workplace.
- Receive copies of test results & Monitoring performed to find and measure workplace hazards.
- Receive copies of workplace medical records.
- Participate in an OSHA investigation.
- Report hazards without retaliation.



Protect Yourself by Keeping Yourself Safe

- ✓ Safety awareness is critical.
- ✓ Workers have a right to a safe working environment.
- ✓ Contractors have an obligation to train workers in their work tasks and provide proper safety equipment.
- ✓ Anonymous complaints can be made to 311 Call Center about unsafe construction sites.



HOW TO REPORT: What to do if there is an incident at your construction worksite.

- In the case of an Emergency call 911.
- For a Non-emergency or Safety Hazards, call 311, you do not need to give your name, or call DOB at (212) 602-0431; DOB will not ask for your immigration status.
- Report all incidents to your site-safety professional, if any, and your supervisor.
- Stay at the site until government safety investigators get there and wait for their direction.



- To learn more about your rights, construction safety, and training resources, visit <u>nyc.gov/nycsafety</u>.
- For questions about the training requirements, please contact the Department of Buildings at LocalLaw196@buildings.nyc.gov.
- For more information, visit: https://www1.nyc.gov/site/buildings/safety/safety.page.



THANK YOU!

