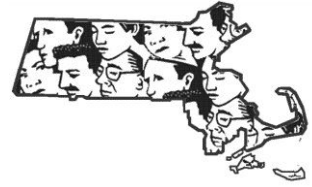


MA FACE

Occupational Fatality Report



Laborer Fatally Injured After Falling from a Home Under Construction – Massachusetts

Release Date: April 11, 2017
Investigation: # 16-MA-001-01

Massachusetts Department of Public Health
Occupational Health Surveillance Program

SUMMARY

On January 14, 2016 a 22-year-old male laborer/carpenter (victim) employed by a residential contractor was fatally injured after falling from a single family house under construction. While on the top plate of a studded exterior second story wall, the victim lost his balance and fell approximately 24 feet to the frozen ground below. The fall was not witnessed by any of the co-workers onsite, but the site foreman heard a noise and while trying to determine what the noise was he found the victim on the ground. The site foreman placed a call for emergency medical services (EMS). EMS and local police and state police arrived within minutes. The victim was med-flighted to a regional trauma center where he was in the intensive care unit and was pronounced dead the next day.

Contributing factors identified in this investigation included: employees were not protected from fall hazards and employees were not provided training.

The Massachusetts FACE Program concluded that to prevent similar occurrences in the future, employers should:

- **Provide fall protection for all employees exposed to fall hazards of six feet or more;**
- **Provide all employees with training on fall protection and other equipment such as ladders and scaffolding that will be used to complete tasks; and**
- **Develop, implement, and enforce a safety and health program that addresses hazard recognition and avoidance of unsafe conditions.**

INTRODUCTION

On January 28, 2016, the Massachusetts FACE Program was alerted by the local media that two weeks before, a male laborer had died from injuries sustained when he fell from a house being built. On May 12, 2016, a representative from the Massachusetts FACE Program traveled to the company's home office and met with the company owner to discuss the incident and then traveled to the incident location. The police report, death certificate, company information, and the OSHA fatality and catastrophe report were reviewed during the course of the investigation.



EMPLOYER

The employer was a small construction company that had been in business for about one year. The company's main business was home building and improvement that included framing, carpentry, additions, decks, window replacement, and siding. The company owner had worked as a carpenter/framer with another company for a short time before starting his own construction company. Previously the company owner had owned a granite countertop business. The company owner spoke both Portuguese and English. The construction company had approximately five employees that were called in to work when needed. Employees did not have union representation.

SAFETY AND HEALTH PROGRAMS AND TRAINING

At the time of the incident, the company did not have a safety and health program or a safety committee. The company did not provide safety and health training or hold tool box talks with employees. The employer did provide fall protection in the form of personal fall arrest systems (PFAS). The employer also asked employees to use the PFAS, but the employer did not enforce the use of fall protection. The company had workers' compensation insurance as required by law in Massachusetts (G.L. c. 152, Sec. 25A).

VICTIM

The victim was a 22-year-old male laborer/carpenter. He had worked at the company for about six months and he had previous experience in the construction industry prior to coming to work for this company. The victim was born in Brazil, but had been in the U.S. for about five years and he spoke Portuguese and English. The day of the incident, a Thursday, the victim and four co-workers arrived at the construction worksite at approximately 7:45 a.m. and started working. The incident occurred at approximately 11:30 a.m., about three hours into the shift.

INCIDENT LOCATION

The incident occurred at a construction site of a single family house that was being built (Figure 1). The building location was within a rural residential area of a town. The colonial style house was two stories with a high-pitch hip roof. There was also an attached garage with living space above. The back part of the house, where the incident occurred, was also two stories high. The land around the house was covered with a few inches of snow. Under the snow was dirt and rocks as the lot had not been landscaped. The day of the incident, framing of the house was continuing. The first floor of the house was framed out and the second story was in progress. At the time of the incident, the workers were installing the ceiling joists for the second floor. The house's rafters were not yet installed.

EQUIPMENT

A standard step ladder was set up on the second floor and the victim had climbed this step ladder to access a section of the top plate (Figure 2). The step ladder was positioned on the second floor along the rear wall of the house. The step ladder was a six foot, type 1A duty rating with a 300 pound load capacity limit. Also, a pneumatic nail gun was being used to secure the ceiling joists into place. At the time of the incident, the nail gun was placed up on a previously installed

second story ceiling joist and was within a couple of inches of the back exterior wall of the house.

INVESTIGATION

At the time of the incident, the temperature was 21 degrees Fahrenheit with mostly cloudy skies and a wind of 9 miles per hour, creating a wind chill of 10 degrees Fahrenheit. There was some light snow earlier in the morning, but at the time of the incident there was no precipitation. The company was hired as a subcontractor to frame out the new single family two story house. The job was expected to take six weeks to complete and they were four weeks into the job. The morning of the incident, the victim and the co-worker met up at the construction site location with four co-workers. Once on site, they continued the task of framing the house. The victim and a co-worker, who was also the foreman, were the only two working on the second level of the house. Prior to the incident, the victim and the co-worker were bringing 2x8 inch boards up to the second floor to be installed as ceiling joists.

At this point, the victim climbed the step ladder that was next to the back exterior studded second story wall and then climbed onto the top plate of this back exterior studded wall of the house. A top plate is a structural load-bearing member on top of a stud wall on which joists rest to support an additional floor or to form a ceiling. The height of the top plate to the interior second story floor was seven feet and seven inches and the height of the top plate to the ground below on the exterior side of the house was 24 feet. Since the incident was not witnessed there is some conflicting information about what exactly occurred after the victim climbed onto the top plate. The conflicting information is that once on the top plate, the victim either started to adjust and install the 2x8 inch ceiling joists, or the victim had climbed onto the top plate solely to retrieve the nail gun that was previously placed on one of the ceiling joists.

In either case, the victim was not wearing fall protection. It was reported that the foreman observed the victim on the top plate and asked the victim to get down off of the top plate and to perform the task from the step ladder. The foreman then walked away and went to his car to get something. While by his car, the foreman heard a noise that came from behind the house. The foreman went behind the house and discovered the victim on the ground.

It appears that while the victim was starting to come down from the second floor rear wall top plate, he lost his balance and fell outside of the house, approximately 24 feet to the frozen ground below. The victim sustained head and neck injuries when he landed on the ground. When the foreman found the victim, he immediately placed a call for emergency medical services (EMS). EMS along with local and state police arrived within minutes. The victim was then med-flighted to a regional trauma center where he was in the intensive care unit and was pronounced dead the next day.

CONTRIBUTING FACTORS

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in the injury or fatality. The Massachusetts FACE team identified the following contributing factors in this incident.

- Employees not protected from fall hazards
- Employees not provided training

CAUSE OF DEATH

The medical examiner listed the cause of death as blunt force injuries of head.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should provide fall protection for all employees exposed to fall hazards of six feet or more.

Discussion: The Occupational Safety and Health Administration (OSHA) guidance on fall protection in residential construction: STD 03-11-002, *Compliance Guidance for Residential Construction* states that employers engaged in residential construction must comply with the OSHA fall prevention standard 29 CFR 1926.501. OSHA's construction fall prevention standard requires employers to protect employees engaged in construction activities and exposed to a fall hazard of six feet or more by the use of conventional fall protection.¹ Conventional fall protection includes guardrail systems, safety net systems, or personal fall arrest systems (PFAS).² Two widely used options of conventional fall protection in residential construction are:

1) Personal fall arrest system (PFAS). A PFAS is designed to stop a worker's fall before they strike a lower level. A PFAS includes three major components:

- a) Anchorage (tie-off point). Anchors must be capable of supporting at least 5,000 pounds or twice the intended load.
- b) Body harness. A full body harness is required. Body belts can cause serious injury during a fall and are not allowed to be used as part of a fall arrest system.
- c) Connector. A connector links the harness to the anchorage and typically includes lanyards or lifelines.

2) Guardrail system. Guardrails are designed to stop a worker from falling. In residential construction when workers are accessing the roof or a section of a building that is not fully framed, guardrails can be installed along the edge off a floor, roof, and rake, across door and window openings, and around unfinished interior stairwells. Some of the guardrail requirements include that:

- a) Top edge height of top rails must be installed at a height between 39 inches and 45 inches above the walking/working level and must be able to withstand a force of at least 200 pounds applied in any downward or horizontal direction;
- b) Midrails must be installed at a height midway between the top edge of the guardrail system and the walking/working level.

Because this job was new construction of a house, a guardrail system may have been a good choice for fall protection.^{3,4} The guardrail system could have been installed early in the project and stayed in place for most of the construction process and moved as needed.

Recommendation #2: Employers should provide all employees with training on fall protection and other equipment such as ladders and scaffolding that will be used to complete tasks.

Discussion: Employees, including the victim, were not provided training on fall protection, ladders, and other equipment and tools that were used to complete the framing task. Framing a house typically exposes employees to falls greater than six feet and will require the use of ladders, among other equipment, which was the case for this incident. Therefore OSHA would require the employer to provide training to employees on fall protection and ladders.⁵

The OSHA regulation 1926.503, *Training requirements* for fall protection states that employers must provide training to all employees exposed to fall hazards and that the training should include how to recognize the hazards of falling and the procedures to minimize these hazards. Fall protection training should include, but not be limited to:

- How to choose to the most effective fall protection for a task and entire project.
- Proper procedures for erecting and disassembling fall protection systems.
- Proper inspection and maintenance of fall protection systems.
- Proper use and operation of guardrail systems, personal fall arrest systems, and other protection to be used.

The OSHA regulation 1926.1060, *Training requirements* for stairways and ladders states that training shall enable each employee to recognize hazards related to ladders and stairways, and shall train each employee in the procedures to be followed to minimize these hazards.⁶ Routine training on ladders can remind workers about proper ladder usage. Ladder training should include, but not be limited to:

- How to choose the correct ladder for the job, including type of ladder, length, and duty rating.
- Proper inspection of the ladder prior to use.
- Proper handling and placement of ladders.
- Proper set up and use of a ladder.

Quite often scaffolding and aerial lifts are used on construction sites. The OSHA regulation 1926.454, *Training requirements* for scaffolds requires employers to provide employees with training when they will be using scaffolding and aerial work platforms to complete tasks.⁷ Scaffolding and aerial work platform training should include, but not be limited to:

- How to choose the correct scaffold or aerial work platform for the job.
- Maximum weight capacity of the scaffold or aerial lift.
- Proper set up and use of scaffolds and aerial lifts.
- Proper selection and use of fall protection with scaffolds and aerial lifts.

All trainings should be performed by a *competent person* as defined by OSHA as “one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take

prompt corrective measures to eliminate them.” Retraining should be provided for each employee as necessary. In addition, all training should be documented and the documentation should include who provided the training and their qualifications, the content of the training, workers who were trained, and the assessments of workers’ comprehension of the training.

Recommendation #3: Employers should develop, implement, and enforce a safety and health program that addresses hazard recognition and avoidance of unsafe conditions.

Discussion: Having a company safety and health program is an important part of keeping employees safe. A safety and health program should include the systematic identification, evaluation and prevention or control of general workplace hazards and the hazards of specific jobs and tasks. The core elements of an effective safety and health program are management leadership, worker participation, hazard identification and assessment, hazard prevention and control, education and training, and program evaluation and improvement.⁸ The program should also include an explanation of the workers’ rights to protection in the workplace, and outline safe work practices workers are expected to adhere to, specific safety protection for all tasks workers perform, how workers can identify and avoid hazards, and who workers should contact when safety and health issues or questions arise.⁸

When developing a safety and health program, employers should start by performing a hazard analysis of all routine tasks performed by employees for potential hazards and incorporate information about these identified hazards and their controls into the program.⁸ When determining potential hazards associated with equipment, the manufacturer’s operator’s manual and the equipment’s warning decals should be reviewed and incorporated into the safety and health program procedures.

Employers should also use their employees’ expertise throughout the program development process by seeking employee input. Once the program is developed, employers should continue to seek employees’ input during the routine updating of the program. The program should be updated when safety concerns arise and when new equipment, tasks and chemicals are introduced into the workplace. In addition, for industries where work sites change with each job, such as construction, the safety and health program should also require that a hazard analysis be performed for each job site before work begins to ensure that the required tools and personal protective equipment (PPE) needed to complete the tasks are available.

Employers should make sure that they have fully and effectively implemented their safety and health program. As part of the program’s implementation, training should be provided to all employees on the program’s topics and procedures, and include the concept of hazard recognition and the avoidance of unsafe conditions. All training provided to employees should be documented (recommendation #2). Employers should also routinely assess tasks employees are performing and immediately address any observed unsafe conditions and practices. If the same unsafe conditions and practices continue to occur, then the employer should work to correct the program’s short comings, which are leading to these unsafe conditions, and adjust the program to

prevent the recurrence of the unsafe conditions and practices. Disciplinary measures should only be used in situations in which an individual manager or worker is uncooperative.

In this case, the safety and health program for a construction company should also include, but not be limited to, a section on fall protection, ladders, and corresponding training (recommendations #1 and 2). Some other topics that could be included in the program for construction companies are scaffolding, floor openings, nail guns, and PPE, such as hardhats and safety glasses.

The Massachusetts Department of Labor Standards (DLS) offers free consultation services to help small employers improve their safety and health programs, identify hazards, and train employees. DLS can be contacted at 978-242-1351. More information about DLS can be found on their Web site at www.mass.gov/dos/consult.

The Massachusetts Department of Industrial Accidents (DIA) has grants available for providing workplace health and safety training to employers and employees. Any company covered by the Massachusetts Workers' Compensation Insurance Law is eligible to apply for these grants. More information about these DIA grants can be found on their Web site at www.mass.gov/dia/safety.

REFERENCES

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4. Washington University School of Medicine, St. Louis, MO, Fall Protection Resource for New Home Construction. www.ot.wustl.edu/fptech/index.htm
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7. OSHA. Code of Federal Regulations. 29 CFR 1926.454. Training requirements. Washington, D.C.: U.S. Printing Office, Office of the Federal Register.
8. OSHA. Recommended Practices for Safety and Health Programs. OSHA 3885. 2016.
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Figure 1 – The house being constructed at the time of the incident



Figure 2 – Example of a construction worker setting a ceiling joist (connected to a roof rafter) on a top plate



Photo from: www.osha.gov/doc/guidance.html