

**TO: Director, Occupational Health Surveillance Program,  
Massachusetts Department of Public Health**

**FROM: Massachusetts Fatality Assessment and Control  
Evaluation (MA FACE) Field Investigator**

**SUBJECT: Carpentry/Roofing Foreman Dies in Fall Through Roof  
Opening in Massachusetts - MA-92-16**

**DATE: January 8, 1993**

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### **SUMMARY**

A 21 year old male carpentry/roofing foreman died from injuries sustained in a 26 foot fall through a roof opening at a 120,000 square foot building under construction. Following installation of a 14 inch high curbing unit around a 6 foot by 12 foot square roof opening, the victim was flashing (installing a weather barrier) around the unit when the incident occurred. As he stood up, he tripped over the curbing and fell through the opening to the concrete floor below. The victim was transported to the regional hospital where he died the following morning.

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

- Consider and address worker safety in the planning phase of construction projects and do so on a daily basis if necessary.
- Develop, implement, and enforce a comprehensive safety program that includes, but is not limited to, worker training in fall hazard recognition and the use of fall protection.
- Require floor openings to be adequately protected and/or personal protective equipment to be used in the presence of fall hazards.

### **INTRODUCTION**

On July 27, 1992, the Massachusetts FACE Investigator was notified by the Massachusetts Department of Labor and Industries that a 21 year old male had died July 23, 1992 as the result of a 26 foot fall the previous day. An immediate investigation into the incident was initiated.

On July 29, 1992, the MA FACE Investigator traveled to the construction site and conducted interviews with the victim's employer and the responding Massachusetts Department of Labor and Industries Safety and Health Inspector. The death certificate, the employer's first report of injury and jobsite safety checklist, and multiple photographs were obtained during the investigation.

The employer was a regional construction company in business for 13 years. The company

specialized in single-ply roofing systems and employed 5 - 8 persons. Two of these employees were foremen.

The victim was a 21 year old male employed by the company for 6 1/2 years. He had been performing this specific type of roofing work for 2 years and 2 months. The final 12 months of his employment were as job foreman. He was also the designated safety person. However, the employer did not have written safety rules, procedures or programs in place at the time of the incident.

## **INVESTIGATION**

On the day of the fatality, the employer had been under contract to apply a finished roofing membrane on a flat 120,000 square foot building under construction. Application of this roofing membrane included the flashing and sealing of 132 skylight openings and 19 HVAC unit openings which were cut into the exposed steel decking of the rooftop. The roofing membrane and flashing/sealing of rooftop openings were to act as the building's weather barrier against the elements.

While each of the 132 skylight openings were equipped with a 3/4 inch steel reinforcement rod mesh system for future building security, the 6 foot by 12 foot HVAC openings were not. The building plans called for rooftop HVAC openings to be cut into the steel roof decking. Usually, HVAC systems are mounted on top of existing roof decking.

The purpose of openings in the roof decking was to weld a 6 foot by 12 foot by 14 inch high steel HVAC system support curb directly to the building's structural steel. Once the support curbing units were welded in place, aluminum flashing, tar paper and an asphalt encapsulant were used to create the weather tight seal around each support curb. At a later date, the HVAC systems would be lowered onto the support curbs by crane and be fastened in place.

At the time of the incident, the victim and his employer were jointly working at a curbsite. When the victim stood up to maneuver around a corner of the curb, the employer claimed he appeared to be startled by his proximity to the roof opening. He then tripped over the curb and fell through the opening 26 feet to the concrete floor of the building. Within 3 to 4 minutes of the incident a fellow worker administered CPR until emergency medical services arrived at the site. The victim was then transported to the regional hospital where he died the following morning.

## **CAUSE OF DEATH**

The medical examiner listed the cause of death as blunt trauma and multiple injuries.

## **RECOMMENDATIONS/DISCUSSION**

Recommendation #1:Employers should consider and address worker safety in the planning phase of construction projects and do so on a daily basis if necessary.

Discussion: Prior to project engagement and prior to each phase thereafter, the employer and/or project supervisor should identify and review the potential hazards with the employees and discuss how to control the hazards and how the work can be performed safely. These discussions should include information about hazards in the immediate work area as well as information about the overall site that could create additional hazards for workers.

Recommendation #2:Employers should develop, implement, and enforce a comprehensive safety program that includes, but is not limited to, worker training in fall hazard recognition and the use of fall protection.

Discussion: The company did not have any written safety or training programs. Comprehensive safety programs should include, but not be limited to, training workers in the recognition and avoidance of fall hazards and proper training in the selection of personal protective equipment, guardrailing systems, motion stop systems, and/or suitable covering of wall/floor openings, etc. Daily, weekly, and/or monthly safety meetings should be conducted by a designated safety person and cover such vital areas as fall protection and personal protective equipment to constantly remind employees of the dangers associated with their occupation(s) and how best to deal with them.

Recommendation #3:Employers should require floor openings to be adequately protected and/or personal protective equipment to be used in the presence of fall hazards.

Discussion: There were 151 rooftop openings on this construction site. Of these, 132 skylight openings had been equipped with concrete reinforcement rod style burglar bars which would not only prevent future unauthorized entry into the building, but prevented personnel from falling through the openings during construction. The remaining 19 HVAC system roof openings remained fully exposed. Although the employer in this incident claimed to have fundamental knowledge of fall protection requirements, unwritten company policy only called for the use fall protection devices and/or personal protective equipment when within five feet of roof perimeters. Consequently, no such measures were implemented at the time of this incident. Massachusetts Department of Labor and Industries Standard 454 CMR 10.111 (2)(f) and OSHA Standards 29 CFR 1926.500 (b) and 1926.500 (f)(5)(ii) require that floor openings be guarded by a standard railing and toeboards, or a cover capable of supporting the maximum intended load, and be so installed as to prevent accidental displacement.

In the absence of guardrailing or covering of the opening, the alternative may have included

compliance with the provisions of Massachusetts Department of Labor and Industries Standard 454 CMR 10.03 and OSHA Standard 29 CFR 1926.28 requiring the guarantee of a safe and healthful workplace and the use of personal protective equipment for workers exposed to hazardous conditions.

## **REFERENCES**

Office of the Federal Register: Code of Federal Regulations,  
Labor 29 Parts 1926.28, 1926.500 (b), and 1926.500 (f)(5)(ii) (1990)

Commonwealth of Massachusetts, Massachusetts Department of Labor and Industries - Rules and Regulations for the Prevention of Accidents in Construction Operations - Code of Massachusetts Regulations, Labor 454 Parts 10.03, 10.111 (2)(f) and 10.25 (7)(d)