

MIFACE Investigation #06MI117

Subject: Male Siding Installer Dies After Falling From a Roof While Installing a J Channel on a Dormer

Summary

On August 16, 2006, a 63-year-old male siding installer was critically injured when he fell from a roof while installing a J channel on a dormer for a home under construction. The decedent had erected a roof bracket scaffold platform on a high pitch roof (14/12) approximately three feet from the roof edge. The roof brackets that he installed were spaced approximately 11 feet apart and were secured by two 2-inch screws instead of 16d nails. The screws were installed in the roof sheathing, not secured into a roof rafter. The decedent had placed two 2x6-inch wood planks laid on their side across the span of the roof brackets. He then placed a ladder on the planks to use as a climbing device to reach the dormer to install the J channel. He was on the ladder when it appears that either the north roof bracket failed, or the decedent fell from the ladder. The decedent slid down the roof, off the roof edge and fell nine feet to the asphalt below. Another contractor's employee notified the decedent's employer who had just arrived on site that the decedent fell. 911 was called and the decedent was transported to a local hospital where he died approximately two weeks later.



Figure 1. Re-enactment of incident scene showing placement of the roof brackets, planks and ladders.

RECOMMENDATIONS

- Employers should ensure employees use the correct roof brackets and are trained and follow the “best safe work practice” when installing a roof bracket scaffold platform – using the correct roof bracket for the roof pitch and securing the bracket by 16d nails anchored into a roof rafter.
- Employers should develop an accident prevention program compliant with MIOSHA Construction Safety standard requirements and train employees on its contents.

Key Words: Construction, Fall, Roof Bracket Scaffold Platform, Residential

- Employers should consider utilizing an independent health and safety consultant (e.g., MIOSHA Consultation Education and Training (CET) division, private consultant, insurance company safety consultant, trade group safety consultant, etc.) to assist them in hazard identification and employee training.

INTRODUCTION

On August 16, 2006, a 63-year-old male siding installer was critically injured after falling from a roof while installing a J channel for a dormer on a home under construction. On September 1, 2006, MIFACE investigators were informed by the Michigan Occupational Safety and Health Administration (MIOSHA) personnel who had received a report on their 24-hour-a-day hotline that a work-related injury had occurred on August 16, 2006, and the individual died on August 31, 2006. On January 29, 2007, MIFACE interviewed the decedent's employer and viewed the incident scene. During the course of writing this report, the medical examiner's report and the MIOSHA file and citations were reviewed. There was not a police response to this incident. MIOSHA and the decedent's employer recreated the incident scene at the time of the MIOSHA inspection. The MIOSHA pictures taken of this recreated incident scene are used in this report and are courtesy of the MIOSHA compliance officer.

The decedent's employer, who was also the owner of the company, had been in the vinyl siding installation business for nearly 18 years. For 16 years, the business was primarily a two-person operation, the owner and the decedent. During these 16 years, when the workload dictated, the owner hired extra employees to work on a temporary basis until the job was completed. The decedent had worked full time for the owner for these 16 years and had officially retired for approximately one and one-half years. After the decedent retired, the business owner did not hire any other workers. The owner recently rehired the decedent on a part-time basis because the owner could not meet his contract workload. The decedent had worked in construction for 40 to 45 years. He had been a bricklayer prior to working for this employer.

The owner and the decedent usually worked an 8-hour shift. The decedent began work at approximately 10:00 a.m. that day on another jobsite. The incident occurred at approximately 2:45 p.m. The decedent was very familiar with installing siding but was unfamiliar with working on such a high-pitched roof. The employer stated that they had not worked on this type of roof in the past. The employer also stated that he had trained the decedent on the installation of the roof brackets. When the decedent practiced an unsafe behavior that was witnessed by his employer, the employer stated he would talk to the decedent about it.

After the incident, the employer stated he requested and received a safety program from another company. He tailored this program to meet his work site conditions. MIFACE did not see this program nor was a copy of it in the MIOSHA case file.

MIOSHA Construction Safety and Health Division issued the following alleged Serious citations to the decedent's employer at the conclusion of their investigation.

- MIOSHA Construction Safety Standard - Scaffolds and Scaffold Platforms, Part 12.
 - Rule 1209(2) - Employer did not train his employee who was involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold by a competent person to recognize any hazards associated with the work in question.
 - Rule 1253(2) - Spacing between the brackets supporting a work plank on a roof were more than 8 feet.
 - Rule 1253(3) - Working plank on roof shall not be less than 2 by 6 inches. The employee laid the 2- by 6-inch planks on their side instead of perpendicular to the roof.
 - Rule 1253(4) - Roofing brackets and crawling board— The employee used two two-inch screws instead of nails to secure the roof bracket in place. When it is impractical to nail brackets, rope supports shall be used. When rope supports are used, they shall consist of first-quality manila rope of at least 3/4 –inch diameter or its equivalent.
- MIOSHA Construction Safety Standard – Fall Protection, Part 45.
 - Rule 4502, REF 1926.503(a)(1) - Employer did not provide training to the employee who was exposed to fall hazards to recognize the hazards of falling and the procedures to be followed in order to minimize these hazards.
 - Rule 4502, REF OSHA 1926.501(b)(13) - The employee was not protected by guardrail systems, safety net systems, or personal fall arrest system while engaged in residential construction activities six feet (1.8 m) or more above a lower level.
- MIOSHA Construction Safety Standard - Fixed And Portable Ladders- Part 11.
 - Rule 1112(1) - Employer did not provide ladder training to the employee.
 - Rule 1122(3) – The employee was using a ladder as a climbing board. A ladder shall not be used as a brace, slide, guy, gin pole, gangway, or for any other use than that for which it is designed.
- Administrative Rule 2139, Recording & Reporting Of Occupational Injuries and Illnesses.
 - Rule 1139(1) - Employer failed to report orally, work related fatalities or hospitalization of three or more employees as described in rule 408.2110 with in eight hours to the Michigan Department of Labor and Economic Growth, Michigan Occupational Safety and Health Administration.
- General Rules, Part 1.
 - Rule 114(1) - Employer did not develop, maintain, and coordinate with employees an accident prevention program, a copy of which was not available at the worksite.

INVESTIGATION

The employer of the decedent had been hired by the general contractor of the residential construction project to install vinyl trim on the house and the associated garage. The decedent's employer had been on the site for approximately one and one-half months. According to the company owner, the metal roof brackets the company used were purchased from the vinyl siding distributor and did not have installation instructions.



Figure 2. Another view of the re-enacted incident scene.
Note placement of 2x6-inch planks

On the day of the incident, the employer and the decedent had worked on another small two-day job. They finished this job early in the afternoon, and because there was still work time available, the employer left to get supplies, and the decedent went to the incident site. The day was sunny and the temperature was in the low 80s. Wind was out of the east and varied between 5 to 10 mph. The morning and early afternoon sun shone on roof the decedent was working upon.

The decedent and his employer were going to perform siding installation on a soffit on the garage dormer. The east-facing garage roof was a steep roof – 14/12 pitch.

After arriving on the worksite, the decedent, who was working by himself, installed the metal roof brackets for the roof bracket scaffold platform. The brackets were designed for a 2x4-inch wood plank (Figure 2). He positioned the brackets 11 feet apart (Figures 1 and 2). The employer stated that the decedent had not screwed the bracket in the way the he had been trained nor in the way the company normally installed the roof brackets.



Figure 3. Roof bracket similar to one decedent installed



Figure 4. Roof bracket similar to type decedent installed



Figure 5. 2-inch drywall screw used by decedent compared to 16d nail.

The company usually installed the roof brackets by placing one 2-inch drywall screw straight down and then placing another screw on an angle over the first screw to “secure” it. This procedure would be performed in at least one other securement point. On the day of the incident, the decedent only used one 2-inch drywall screw at the top securement point and one 2-inch drywall screw at the 3rd securement point (Figures 3, 4, and 5).

After installing the roof brackets, the decedent placed two 2x6-inch pieces of wood planks in the bracket channel parallel (instead of perpendicular) to the roof surface across the roof bracket span (Figure 2). After placing the straight wood ladder against the 2x6-inch wooden plank, he used the ladder as a climbing device to access the dormer to install the 12-foot J channel. The decedent was not wearing any equipment that would protect him in case of a fall from the roof.

The fall event was unwitnessed. Two event scenarios were developed, both with the decedent approximately three feet up on the ladder.

- The north roof bracket securement failed.
- The decedent fell from the ladder and grabbed the 2x6-inch planks as he was falling, causing the roof bracket to pull away from the roof.

The 2x6-inch planks, ladder, and the decedent fell nine feet to the asphalt drive where the decedent struck his head. Another contractor's employee heard a noise and went to investigate. He saw the decedent on the ground and called 911. He then went to find the decedent's employer who had just arrived on site and who was unloading the supplies from his work vehicle. Emergency response (ambulance and fire) arrived and the decedent was transported to a local hospital, where he died approximately two weeks later.

CAUSE OF DEATH

The cause of death as stated on the death certificate was cranial cerebral trauma. Toxicological tests were not performed upon admission to the hospital.

RECOMMENDATIONS/DISCUSSION

- Employers should ensure employees use the correct roof brackets and are trained and follow the "best safe work practice" when installing a roof bracket scaffold platform – using the correct roof bracket for the roof pitch and securing the bracket by 16d nails anchored into a roof rafter.

The employer was not securing the roof brackets in a "best safe work practice" manner; using the correct roof bracket for the roof pitch secured by 16d nails anchored into a roof rafter. Employers should ensure that they have roof brackets available for roof pitches they work upon. Roof brackets are offered in sizes to accept 2x6-inch, 2x8-inch and 2x10-inch planks and to meet different roof pitch requirements. The employer relied on 2-inch drywall screws placed into the roof shingles to act as securement for the roof bracket scaffold. The shingles in this incident were exposed to sun all morning and early afternoon, and may have become softened and therefore did not have the "holding power" they may have had initially. Additionally, when using screws, if the brackets are pushed sideways back and forth, there is a possibility that a screw could be unscrewed.

The MIOSHA investigation identified the following issues with the roof bracket scaffold:

- Two 2-inch screws were used to secure the brackets to the roof. 16d-20d nails recommended.
- Metal roof bracket was for a 4-inch plank not a 6-inch plank as required.
- Metal roof brackets were spaced 11-foot apart. 8-foot or less spacing is required
- 6-inch planks were not perpendicular to the roof.
- Ladder was used as not intended by the manufacturer, by laying it on the roof and climbing it.
- No fall protection provided when working on a high-pitched roof.

- Employers should consider utilizing an independent health and safety consultant (e.g., MIOSHA Consultation Education and Training (CET) division, private consultant, insurance company safety consultant, trade group safety consultant) to assist them in hazard identification and employee training.

One of the factors in this incident was that the employer did not have the knowledge to properly instruct the decedent in the proper installation of the roof bracket or for the need of fall arrest equipment while working on the roof. When the MIFACE researcher spoke with the company owner, he was unaware of the best work practice of securing a 16d nail in a roof truss. He had never had an adverse incident using the screws as described in the report as the securement method. MIOSHA Construction Safety Standard, Scaffolds and Scaffold Platforms, Part 12, Rule 1209 states that an employer shall have each employee who is involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold *trained by a competent person* to recognize any hazards associated with the work in question. The training shall include the following topics, as applicable:

- (a) The nature of scaffold hazards.
- (b) The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold being used.
- (c) The design criteria, maximum intended load-carrying capacity, and intended use of the scaffold.
- (d) Any other pertinent requirements.

Additionally, the standard states that if an employer has reason to believe that an employee lacks the skill or understanding needed to safely perform work that involves the erection, use, or dismantling of scaffolds, then the employer shall retrain the employee.

An independent health and safety consultant, (MIOSHA CET safety consultant, private health and safety consultant, insurance company's safety consultant, trade group consultant) can assist you in the hazard identification process, review of an existing health and safety policy, developing a new health and safety policy, raising staff awareness of health and safety issues, and developing and providing employee health and safety training. MIOSHA CET can offer you free help your efforts to come into compliance with MIOSHA health and safety standards and to establish or improve your safety program. MIOSHA CET also sponsors training in various construction-related topics, such as Fall Protection for Residential Construction, Self –Inspection to Identify Hazards and Safety Training Needs, and Excavations-The Grave Danger and Mobile Equipment Hazards. To learn more about what CET may be able to offer your company, contact them by Phone: (517) 322-1809, Fax: (517) 322-1374 or Internet: www.michigan.gov/cis/0,1607,7-154-11407_15317---,00.html. Other options include a private health and safety consultant or your insurance company's safety consultant (if applicable).

- Employers should develop an accident prevention program compliant with MIOSHA Construction Safety standard requirements and train employees on its contents.

MIOSHA Construction Safety and Health Standard, General Duty, Part 1 requires all construction employers to develop and implement an accident prevention program, train employees on the contents of the program, and keep a copy of the program at the worksite. The decedent's employer did not have a written program, although after the incident he obtained a copy of a program from another employer and modified it to fit the type of work he performed. Although he had only himself and the decedent as employees, the standard does not exempt employers that have only a few employees. The accident prevention program requirements directly applicable to the siding installation work the employer performed were:

- a) Designation of the qualified employee or person who is responsible for administering the program.
- (b) Instruction to each employee regarding the operating procedures, hazards, and safeguards of tools and equipment when necessary to perform the job.
- (c) Inspections of the construction site, tools, materials, and equipment to assure that unsafe conditions which could create a hazard are eliminated.
- (d) Instruction to each employee in the recognition and avoidance of hazards and the regulations applicable to his or her work environment to control or eliminate any hazards or other exposure to illness or injury.

MIOSHA Consultation Education and Training Division has developed a sample Construction Safety Program that can be found on the MIOSHA website at http://www.michigan.gov/documents/CIS_WSH_CET_SP1_64019_7.doc. The employer's sample program should be augmented with separate sections on roof bracket scaffold installation, ladder safety and fall protection due to the nature of the work the employer performed. Employees should receive training on the accident prevention program and employers should retain a copy in the work vehicle at the construction site.

REFERENCES

MIOSHA standards cited in this report may be found at and downloaded from the MIOSHA, Michigan Department of Labor and Economic Growth (DLEG) website at: www.michigan.gov/mioshastandards. MIOSHA standards are available for a fee by writing to: Michigan Department of Labor and Economic Growth, MIOSHA Standards Section, P.O. Box 30643, Lansing, Michigan 48909-8143 or calling (517) 322-1845.

The MIOSHA Consultation Education and Training (CET) Division offers many free services to both public and private sector employers in Michigan. For free help in establishing or improving your safety program, contact: MIOSHA Consultation Education and Training Division, 7150 Harris Drive P.O. Box 30643, Lansing, MI 48909-8143. Phone: (517) 322-1809. Fax: (517) 322-1374
Internet Address: www.michigan.gov/cis/0,1607,7-154-11407_15317---,00.html.

REFERENCES, CONT.

- Administrative Rule 2139, Recording & Reporting of Occupational Injuries & Illnesses.
- MIOSHA Construction Safety Standard, General Rules, Part 1.
- MIOSHA Construction Safety Standard, Fixed and Portable Ladders, Part 11.
- MIOSHA Construction Safety Standard, Scaffolds and Scaffold Platforms, Part 12.
- MIOSHA Construction Safety Standard, Fall Protection, Part 45, Rule 4502, REF OSHA 1926.501.
- Creative Homeowners: Smart Guide- Roofing. Internet Address: <http://www.creativehomeowner.com/book.php?bookid=287945>
- OSHA Construction E-tool: Scaffolding. Internet Address: <http://www.osha.gov/SLTC/etools/scaffolding/overview.html>
- MIOSHA Consultation Education and Training Division Construction Safety Program. Internet Address: http://www.michigan.gov/documents/CIS_WSH_CET_SP1_64019_7.doc.

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5/17/07

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Please rate the report using a scale of:

Excellent	Good	Fair	Poor
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What was your general impression of this MIFACE investigation report?

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