

Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839

FOR INCIDENT HIGHLIGHTS

**DATE:**

January 11, 2022

**TIME:**

2:20 p.m.

**VICTIM:**

57-year-old male Caucasian
delivery driver

**INDUSTRY/NAICS CODE:**

Brick, Stone, and Related
Construction Material
Merchant
Wholesalers/423320

**EMPLOYER:**

Natural stone supplier

**SAFETY & TRAINING:**

Employer provided limited
worker safety training

**SCENE:**

Countertop merchant
parking lot

**LOCATION:**

Kentucky

EVENT TYPE:

Struck by

REPORT#: 22KY00601

REPORT DATE: 08/01/2022

Delivery Driver Crushed by Granite Slab— Kentucky

SUMMARY

A 57-year-old delivery driver was killed when he was struck by a slab of granite. At the time of the incident, the driver was assisting the kitchen counter merchant in the off-loading slabs of granite from his flatbed trailer. During the off-loading process an unsecured slab tipped over and struck the delivery driver. It fell onto him and forced him to strike the ground. He received fatal injuries as a result of the incident.

[READ THE FULL REPORT>](#) (p.3)

CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- *Lack of adequate worker safety practices*
- *Failure of utilizing adequate safety features while using equipment.*
- *Lack of a comprehensive worker safety program and training*

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RECOMMENDATIONS

Kentucky investigators concluded that, to help prevent similar occurrences, employers should:

- Use stone slab storage racks with individual compartments for storage.
- Identify fall shadow zones and restrict employees from placing themselves in the shadow zones.
- Provide written worker safety programs and training for employees.

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KENTUCKY

State **FACE** Program

Fatality Assessment & Control Evaluation

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Fatality Assessment and Control Evaluation (FACE) Program

This case report was developed to draw the attention of employers and employees to a serious safety hazard and is based on preliminary data only. This publication does not represent final determinations regarding the nature of the incident, cause of the injury, or fault of employer, employee, or any party involved.

This Case report was developed by the Kentucky Fatality Assessment and Control Evaluation (FACE) Program. Kentucky FACE is a NIOSH-funded occupational fatality surveillance program with the goal of preventing fatal work injuries by studying the worker, the work environment, and the role of management, engineering, and behavioral changes in preventing future injuries. The FACE program is located in the Kentucky Injury Prevention and Research Center (KIPRC). KIPRC is a bona fide agent for the Kentucky Department for Public Health.

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INTRODUCTION

On Tuesday, January 11, 2022, a 57-year-old delivery driver was killed when he was struck by a slab of granite. The driver was employed by a granite wholesaler and was in the process of delivering a load of granite slabs to a merchant's place of business. The delivery process required that the slabs be off-loaded from the driver's flatbed trailer using the merchant's forklift. The delivery driver was positioned on the bed of the trailer to assist in the off-loading of slabs. During the off-loading process, an unsecured slab tipped and struck the delivery driver. The driver was knocked off the trailer to the ground and crushed beneath the slab. He died of his injuries.

EMPLOYER

The granite wholesaler had 1 employee on-site the day of the incident.

WRITTEN SAFETY PROGRAMS and TRAINING

At the time of the incident, the granite wholesaler did not have a written worker safety program or training regarding moving and lifting of granite slabs, or hazard control measures.

WORKER INFORMATION

The 57-year-old male Caucasian delivery driver was married with one daughter. He had worked as a delivery driver for the granite wholesaler for just over five years. His work duties for the granite wholesaler included delivery of stone products to customers, loading delivery trucks using a forklift, and warehousing. At time of the incident, the delivery driver was not wearing personal protective equipment.

INCIDENT SCENE

The merchant's facility consisted of a retail showroom, offices, indoor workshop/production area, outdoor storage area, and parking lot. The incident occurred in the merchant's parking lot (Photo 1 and Photo 2). The parking lot provided a limited but sufficient amount of clearance for trucks to park for offloading. Although the parking lot was topped with asphalt, it was unevenly graded in some areas. Terrain is not considered to have been a factor in the incident.



Photo 1. Parking Lot (Property of KYFACE Program)

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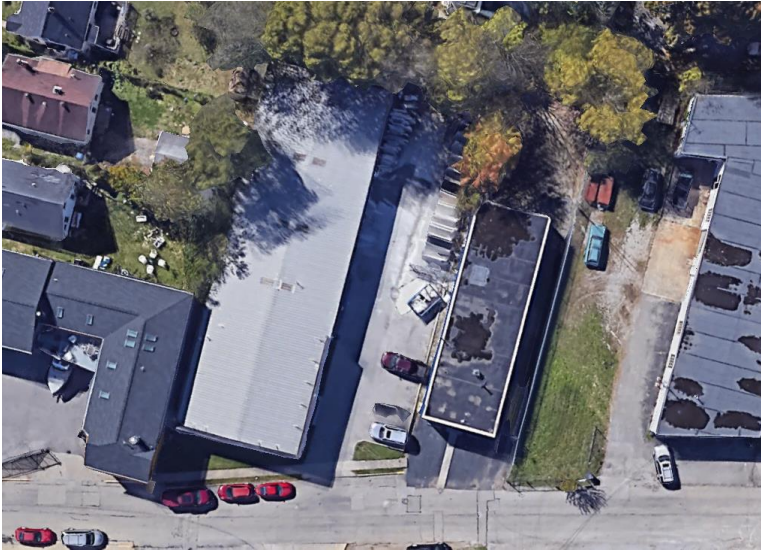


Photo 2. Parking Lot (Google Earth)

EQUIPMENT

The granite countertop wholesaler had secured granite slabs for transport on the flatbed trailer using a metal “A-frame” rack, which held multiple slabs in a near-vertical orientation. Stone slabs were off-loaded by the merchant’s employees using a forklift equipped with a boom attachment (Photo 3).



Photo 3. Forklift with Boom Attachment (Property of KYFACE Program)

The boom attachment was equipped with a device designed to clamp onto an individual slab to allow it to be lifted, moved, and lowered. The device, referred to as a “slab clamp”, was an Abaco Little Giant Lifter, Model AFG50, manufactured by Abaco Machines (Photo 4).

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Photo 4. Abaco Little Giant Lifter, Model AFG50 (Property of KYFACE Program)

WEATHER

The weather at 1:54 pm on the day of the incident was 29 degrees Fahrenheit, 49% humidity, 10 mph average southwesterly wind speed, 0 mph wind gust speed, with 0 inches of precipitation [Weather Underground 2022]. The weather is not believed to have been a factor in this incident.

INVESTIGATION

Prior to the incident, the delivery driver had driven his flatbed trailer into the merchant's parking lot to deliver the cargo of granite slabs. The incident was recorded by a video camera mounted on the merchant's building and reviewed by the KYFACE investigator.

Two of the merchant's employees assisted the delivery driver in offloading the granite from the flatbed trailer. One employee operated the forklift used to move slabs, while the other employee served as a spotter. The delivery driver climbed onto the flatbed to remove straps used to secure the slabs during transportation. He then readied each slab for rigging and offloading, starting with the outermost slab on the A-frame rack. The process to offload the slabs was such that only one slab was moved at a time using the slab clamp device attached to the forklift's boom.

The incident occurred while the delivery driver was attaching the slab clamp device to a slab in the flatbed area of the trailer. The delivery driver separated the first slab from the others that were stacked on an A-frame to provide the necessary room to attach the slab clamp device over the slab. The slab clamp device was positioned in the center of the slab prior to securing so that the slab can be lifted from its center of balance, similar to that illustrated in Photo 5.

The forklift operator positioned the boom and slab clamp device above the approximate center of the slab, while the delivery driver separated the slab from the other slabs on the rack. Once the slab clamp device was positioned onto the slab, the delivery driver released the lifting device/slab clamp's locking latch to allow it to lock the slab, a process similar to that designated by the arrow in Photo 5.

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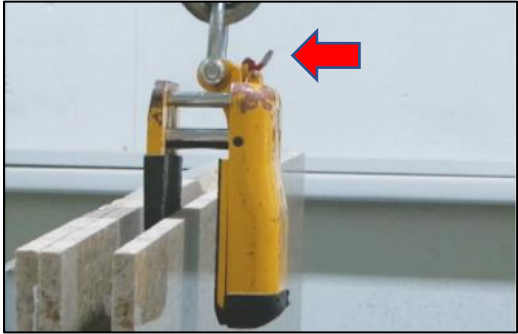


Photo 5. Positioning Lifting Device [Natural Stone Institute]

During the rigging process, a miscommunication occurred between the delivery driver and forklift operator. This caused the forklift operator to drive the forklift away from the flatbed before the slab clamp device had been secured to the slab; and before the driver was positioned outside of the fall shadow of the slab. This resulted in the slab being pulled forward past its tipping point towards the forklift. The delivery driver, who was standing on the flatbed truck and in the fall shadow of the slab, was struck by the slab as it fell off the flatbed. He was crushed beneath the slab upon contact with the ground at approximately 1:31 pm Eastern time. Emergency medical services were called for the driver by an employee of the merchant. At approximately 2:20 pm, the driver died from his injuries.

On January 12, 2022, the Kentucky Occupational Safety and Health Program (KYOSHA) notified the Kentucky Fatality Assessment and Control Evaluation Program (KYFACE) of the incident. KYFACE launched an investigation of the fatality by visiting the incident site, interviewing involved parties, examining video of the incident, assessing equipment involved, and reviewing the circumstances of the incident. Also, information relating to the incident, video and photographs, and witness statements taken by KYOSHA were reviewed and the investigating KYOSH compliance officer was interviewed.

CAUSE OF DEATH

According to the Coroner's report, the cause of death was injury by crushing.

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. Kentucky investigators identified the following hazards as key contributing factors in this incident:

- *Lack of adequate work safety practices*
- *Failure of utilizing adequate safety features while using equipment.*
- *Lack of comprehensive worker safety program and training*

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should use stone slab storage racks engineered with individual compartments to support stone slabs.

Employers should use engineered, heavy-duty stone slab storage racks with fixed support pins that form individual compartments, as shown in Images 1 and 2. Various designs of slab racks are available, such as the W-Frame rack below, which is essentially an A-Frame rack with individual compartments for each stone slab.

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Slab racks should be used for warehouse storage and for transport on flatbed and covered trailers. These types of racks can provide a positive means for preventing stone slabs from inadvertently falling onto employees during handling, which could result in serious crushing injuries and death.

Slab racks must be used according to the manufacturer's specifications regarding their safe carrying capacity. Overloading can deform the rack's components, reducing stability which could result in failure of the slab rack to keep slabs secure. Slab racks should be inspected prior to loading to look for: cracked welds, cracked or deformed structural members, other signs of damage or deterioration that could affect the structural integrity.

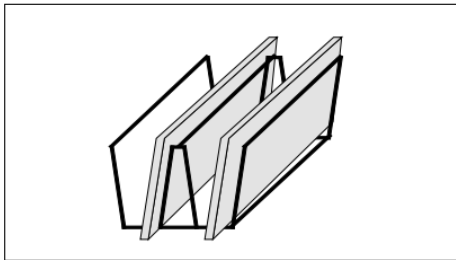


Image 1: W-Frame [FACE #96-NJ-080-01]

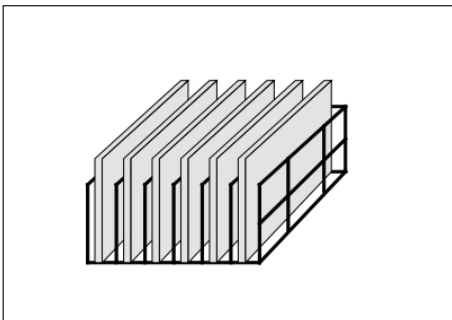


Image 2: Slab Rack [FACE #96-NJ-080-01]

Recommendation #2:

Employers should identify slab fall shadow zones and restrict employees from placing themselves in the zones whenever a slab can fall.

Slabs can weigh in excess of 1,000 pounds [Natural Stone Institute, pg. 7] and they are typically stored on slab racks such that they rest on their narrow long edge. A slab has the potential to fall when not actively secured from tipping beyond its absolute vertical alignment. A slab can also fall while being lifted and moved; if the rigging fails, the load becomes insecure, or the slab breaks. Locations where individuals could be struck, or crushed, are referred to as the fall shadow, as illustrated in Figure 1. The Natural Stone Institute has warned in its guidance, that employees must “Stay out of the shadow to reduce your risk of being crushed,” [2021, pg. 8].

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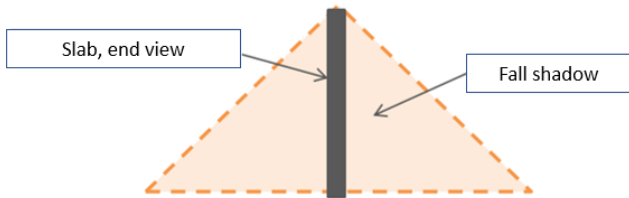


Figure 1: Fall Shadow

When moving slabs to a near vertical position for rigging, employees should be positioned outside of the fall shadow. When preparing a slab for moving, a wedge tool is often used to separate a single slab from others so that a clamp lifter can be attached, Photo 6 illustrates an A-frame rack with wedge used to separate slabs enough to attach a clamp. Employees should be located outside the fall shadow when the wedge is inserted and for the remainder of the time the slab is being moved. Photo 7 depicts the location of the fall shadow and the correct position of the employee relative to slabs stored in a rack.



Photo 6: Positioning Relative to Rack [Wehausea.com]

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Photo 7: Positioning Relative to Rack [OSHA 2008]

Safe work practices should be utilized which allow employees to remain outside the slab shadow. If using a slab clamp device, the device should be positioned at a slab's center using a push/pull pole device which is long enough to allow the employee to remain out of the fall shadow during rigging. When using slab clamp devices equipped with a manual unlocking latch as shown in Photo 7. Employees should remain out of the slab fall shadow by releasing the latch using a push/pull pole device. Alternative methods which would allow employees to remain outside the fall shadow include using more advanced lifting device equipment. These include the use of a clamp which has an automatic locking/unlocking mechanism, and clamp with an electronic remote-control latch.



Photo 7. Unlocking of Latch of Lifting Device [ABACO Machines]

Recommendation #3: Employers should provide written safety programs and training for their employees.

Employers should develop written safety programs to protect employees from the hazards associated with handling stone slabs. Program information and training should be provided in the primary language spoken by employees. These programs should include specific information regarding:

- The potential hazards faced by employees. This should include the potential for being struck and crushed by falling slabs, which could result in fatal injuries.
- The means by which employees can control their exposure to stone slab hazards. This should include a universal requirement for employees to remain outside of the slab fall shadow at all times, with an emphasis on operations

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when slabs are being handled outside of compartmentalized slab racks. This should also include details on the use of compartmentalized slab racks, and operation of equipment used to move stone slabs (i.e., forklifts and overhead lifts).

- Training for employees regarding specific hazards and controls and the program overall. This should include a means to ensure that training was effective and that employees are competent to perform stone slab work safely, prior to being assigned such work. Also, provisions should be made for retraining employees should the need become apparent.
- Provide training regarding effective communication between equipment operators and persons assisting in the movement of stone slabs.
- Information on how employees can report concerns regarding stone slab hazards to their employers without fear of reprisal.
- The mechanism by which the employer will periodically review the program and address any deficiencies found.

DISCLAIMER

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INVESTIGATOR INFORMATION

This investigation was conducted by Dr. David Stumbo, OHST, CSP.

ACKNOWLEDGEMENT

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