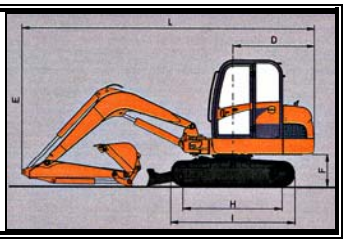
NJ FACE

INVESTIGATION REPORT



Fatality Assessment & Control Evaluation Project

FACE 03-NJ-085 **October 4, 2005**

Hispanic Construction Worker Killed When Struck by Excavator Bucket

On September 12, 2003, a 28-year-old Hispanic carpenter was killed after he was stuck by the bucket of an excavator (trackhoe). The incident occurred at the construction site of a building being renovated into a nursery school. Part of the construction was the installation of stairs leading down from a narrow driveway into the basement of the building. The crew of five workers started at the site in the morning to work on the interior and to excavate a passage for the stairs. Shortly after arriving, the forman at the site was called away by the owner of the company. The foreman instructed one of the carpenters on how to use the excavator before he left. The excavator operator/carpenter and a helper worked in the driveway, while the remaining two carpenters worked in the basement. At approximately 11:00 a.m., one of the carpenters came out of the basement to deposit some trash in a dumpster. The excavator operator saw and warned the carpenter (victim) before moving the excavator to the dumpster. He did not see the victim, who was struck on the head as he walked in the narrow driveway. NJ FACE investigators recommend following these safety guidelines to prevent similar incidents:

- **Excavator operators must be thoroughly trained in the safe operation of the machine and demonstrate proficiency before operating machinery.**
- **Hazardous worksites should be closely supervised and marked out before operating heavy equipment.**
- **Employers should conduct a job hazard analysis of all work activities with the participation of the workers.**
- **The employer should develop, implement, and enforce a comprehensive safety training program in the languages and literacy levels of the employees.**

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INTRODUCTION

On September 29, 2003, a county medical examiner notified NJ FACE staff of a Hispanic construction worker who was killed in a machine-related incident. A FACE investigator contacted the employer, who agreed to participate in a FACE investigation. On February 5, 2004, FACE investigators traveled to the company offices and interviewed the company owner. The following day, a FACE investigator photographed the incident site and briefly spoke with the head of the nursery school where the incident occurred. No witnesses were interviewed nor machinery examined during this investigation. Additional information was obtained from the county medical examiner's report, police report, OSHA investigation file, and excavator manufacturer's website.

The victim's employer was a construction contractor that specialized in general and drywall carpentry (SIC 1751, NAICS 238130). The contractor hired workers as needed and employed 13 workers at the time of the incident. Training was entirely on-the-job, though most of the workers hired were experienced in their trades. Basic safety practices such as wearing hard hats were enforced. The contractor was non-union and had been in business for seven years.

The victim was a 28-year-old Hispanic male carpenter who had worked "on and off" with the company for six months. He was returning to this employer after working out of state for the previous month. The victim was a native of Ecuador and had been living in the US since 1996. His employer stated that he did not speak English well and communicated through a co-worker who interpreted for him. The victim was survived by his wife and two children.

INVESTIGATION

The incident occurred at a construction site in a small New Jersey city. The project was the renovation and conversion of a small single-story brick industrial building, located near the center of town, into a nursery school. The building was separated from a neighboring building on the right side by a narrow, 11-foot, 10-inch driveway leading to the rear. The victim's employer was contracted to do the interior renovation of the building. Work started in July, 2003, and was scheduled to be completed the following October.

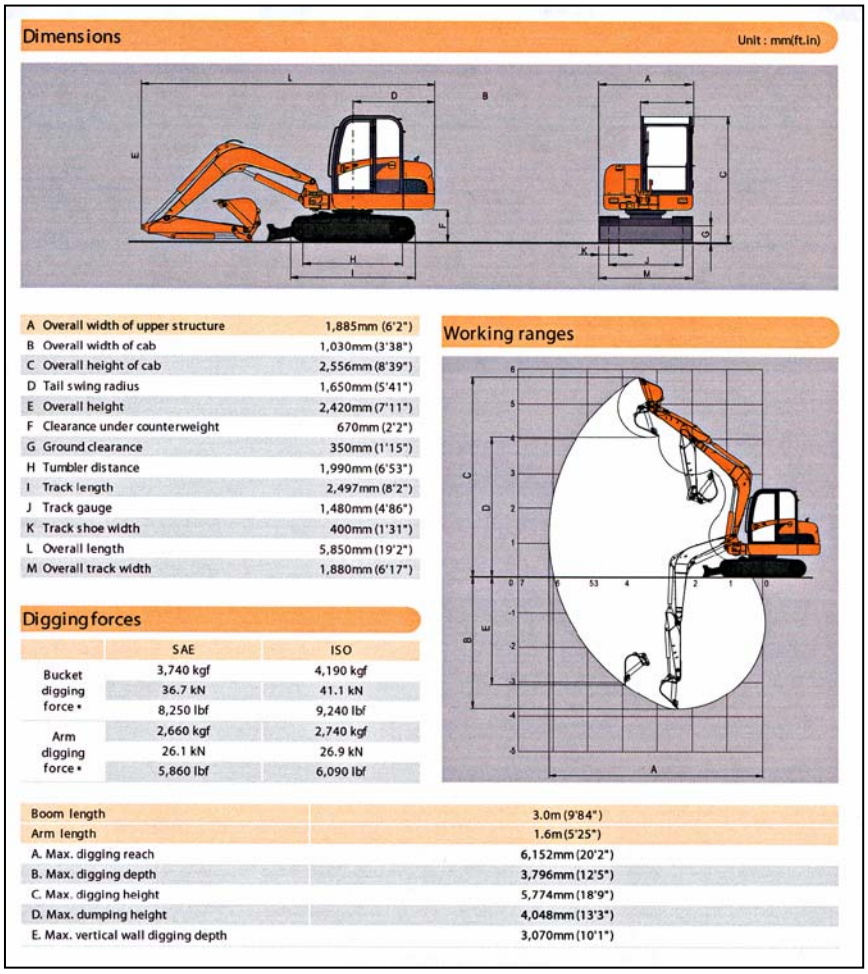
Photo 1
Driveway between two buildings. Incident occurred behind the new fence.

Photo 2
Completed stairway leading to the basement.

Part of the project was to renovate the basement area into classrooms. The main access to the building was to be through an entrance located on the driveway side of the building, with an adjoining outdoor stairwell leading down to the basement. This required excavating the driveway to provide a passage to the basement. The employer was given the contract to install the steps, and ordered a crawler excavator (trackhoe) from a local company that rented construction equipment. The excavator was a 12,100-pound, 52-horsepower trackhoe equipped with a boomed excavator bucket. The machine measured 6'2" wide with a maximum boom-reach of 20'2". The rental company delivered the excavator to the construction site on September 9, 2003.

The incident occurred on Friday, September 12, 2003. The day was dry and clear with temperatures in the 60's°F. A construction crew consisting of a foreman, three carpenters (including the victim), and a laborer arrived on site at 7:00 a.m. The foreman on this job spoke both English and Spanish, as did two other workers. The victim and remaining worker primarily spoke Spanish. The plan for that day was to work on the basement and to prepare the site for the excavation of the basement stairs. Sometime after the crew started work, the company owner

contacted the foreman and asked him to help out at another job site. The foreman, who was to operate the excavator, was told by the company owner to instruct one of the workers on how to use the machine. The foreman selected one of the carpenters and showed him how to use the excavator. This instruction was done with the machine shut off. The foreman then left the site.



Dimensions Unit : mm(ft.in)

A	Overall width of upper structure	1,885mm (6'2")
B	Overall width of cab	1,030mm (3'38")
C	Overall height of cab	2,556mm (8'39")
D	Tail swing radius	1,650mm (5'41")
E	Overall height	2,420mm (7'11")
F	Clearance under counterweight	670mm (2'2")
G	Ground clearance	350mm (1'15")
H	Tumbler distance	1,990mm (6'53")
I	Track length	2,497mm (8'2")
J	Track gauge	1,480mm (4'86")
K	Track shoe width	400mm (1'31")
L	Overall length	5,850mm (19'2")
M	Overall track width	1,880mm (6'17")

Working ranges

Digging forces

	SAE	ISO
Bucket digging force •	3,740 kgf	4,190 kgf
	36.7 kN	41.1 kN
	8,250 lbf	9,240 lbf
Arm digging force •	2,660 kgf	2,740 kgf
	26.1 kN	26.9 kN
	5,860 lbf	6,090 lbf

Boom length	3.0m (9'84")
Arm length	1.6m (5'25")
A. Max. digging reach	6,152mm (20'2")
B. Max. digging depth	3,796mm (12'5")
C. Max. digging height	5,774mm (18'9")
D. Max. dumping height	4,048mm (13'3")
E. Max. vertical wall digging depth	3,070mm (10'1")

Illustration 1
Manufacturer's specifications for excavator

The crew continued work, with two carpenters in the basement, and the laborer and third carpenter (now operating the excavator) working in the driveway. The laborer used a concrete saw to cut through sections of the asphalt driveway that was to be removed. The machine operator warned the workers twice to watch out for the machine, and began to remove the asphalt with the excavator. The alleyway was 10 feet, 11 inches wide, leaving only a few feet on either side of the six-foot-wide excavator. Shortly after 11:00 a.m., the excavator operator/carpenter saw the victim and warned him as the victim went to throw some trash into

the dumpster. He then moved his excavator forward about 33 feet to deposit his first load of asphalt into the dumpster. As he moved back into position, the excavator operator/carpenter saw the victim sitting against the wall, holding his head. The excavator operator/carpenter immediately called 911, and the police started CPR when they arrived and found the victim unresponsive and not breathing. The paramedics arrived soon after, started advanced life support, and transported the victim to the local hospital emergency room, where he was pronounced dead at 11:42 a.m.

RECOMMENDATIONS/DISCUSSIONS

Recommendation #1: Excavator operators must be thoroughly trained in the safe operation of the machine and demonstrate proficiency before operating machinery.

Discussion: In this case, the machine operator was a carpenter who had little or no knowledge on how to operate the excavator, and received only brief instructions by the foreman before he left the site. NJ FACE recommends that all machine operators should be thoroughly instructed on machine operation and safety before being allowed to use the machine. Training is best done with a combination of theory and hands-on instruction, and should also be done by a qualified person, such as a manufacture's representative (possibly the rental agency) or an experienced user. The operator should also demonstrate the ability to safely operate the machine under the supervision of the trainer.

Recommendation #2: Hazardous worksites should be closely supervised and marked out before operating heavy equipment.

Discussion: This worksite was extremely hazardous in that heavy machinery was being operated in the close quarters of the driveway between two buildings. In addition, a supervisor was not present to oversee and direct the work. NJ FACE recommends that a supervisor inspect the worksite for hazards and restrict access by marking off the area with warning barriers or tape. The work should be closely supervised to prevent workers and others from entering the restricted area.

Recommendation #3: Employers should conduct a job hazard analysis of all work activities with the participation of the workers.

Discussion: To prevent incidents such as this, NJ FACE recommends that employers conduct a job hazard analysis of all work areas and job tasks with the employees. A job hazard analysis should begin by reviewing the work activities that the employee is responsible for and the equipment that is needed. Each task is further examined for mechanical, electrical, chemical, or any other hazard the worker may encounter. The results of the analysis can be used to design or modify the written standard operating procedures for the job. Additional information is available in the publication, *Job Hazard Analysis*, which is available on the federal OSHA website at *www.osha.gov/Publications/osha3071.pdf* .

Recommendation #4: The employer should develop, implement, and enforce a comprehensive safety training program in the languages and literacy levels of the employees.

Discussion: The employer in this incident had a Spanish-speaking foreman to instruct the workers, but did not have safety and training materials in Spanish. To improve work and safety practices, NJ FACE recommends developing, implementing, and enforcing a comprehensive safety program. The program should be written in the primary languages of the employees and include topics such as hazard recognition, safe work practices, and proper use of equipment. In this case, training and materials should be provided in Spanish.

RECOMMENDED RESOURCES

It is extremely important that employers obtain accurate information on health, safety, and applicable OSHA standards. NJ FACE recommends the following sources of information which should help both employers and employees:

U.S. Department of Labor, Occupational Safety & Health Administration (OSHA)

Federal OSHA will provide information on safety and health standards on request. OSHA has four area offices in New Jersey that cover the following counties:

☏ Hunterdon, Middlesex, Somerset, Union, and Warren counties (732) 750-3270

☎ Essex, Hudson, Morris, and Sussex counties (973) 263-1003

☎ Bergen and Passaic counties (201) 288-1700

☎ Atlantic, Burlington, Cape May, Camden, Cumberland, Gloucester, Mercer, Monmouth, Ocean, and Salem counties (856) 757-5181

💻 Federal OSHA Website: *www.osha.gov*

New Jersey Public Employees Occupational Safety and Health (PEOSH) Program

The PEOSH Act covers all NJ state, county, and municipal employees. Two state departments administer the act; the NJ Department of Labor and Workforce Development (NJDLWD), which investigates safety hazards, and the NJ Department of Health and Senior Services (NJDHSS) which investigates health hazards. PEOSH has information available that may also benefit private employers.

NJDLWD, Office of Public Employees Safety

☎Telephone: (609) 633-3896

💻 Website: *www.nj.gov/labor/lsse/lspeosh.html*

NJDHSS, Public Employees Occupational Safety & Health Program

☎Telephone: (609) 984-1863

💻 Website: *www.nj.gov/health/eoh/peoshweb*

New Jersey Department of Labor and Workforce Development,
Occupational Safety and Health On-Site Consultation Program

This program provides free advice to private businesses on improving safety and health in the workplace and complying with OSHA standards.

☎Telephone: (609) 984-0785

💻 Website: *www.nj.gov/labor/lsse/lsonsite.html*

New Jersey State Safety Council

The New Jersey State Safety Council provides a variety of courses on work-related safety. There is a charge for the seminars.

☎Telephone: (908) 272-7712.

💻 Website: *www.njsafety.org*

Internet Resources

Other useful Internet sites for occupational safety and health information:

💻 CDC/NIOSH website - *www.cdc.gov/niosh*

💻 Employment Laws Assistance for Workers and Small Businesses - *www.dol.gov/elaws*

💻 National Safety Council - *www.nsc.org*

💻 American National Standards Institute (ANSI) - *www.ansi.org*

💻 Product recall information - *www.recalls.gov*

💻 NJDHSS FACE reports - *www.nj.gov/health/eoh/survweb/face.htm*

💻 CDC/NIOSH FACE website - *www.cdc.gov/niosh/face*

REFERENCES

1. *Job Hazard Analysis*. US Department of Labor Publication # OSHA-3071, 2002 (revised). U.S. Department of Labor, OSHA Publications, P.O. Box 37535, Washington D.C. 20013-7535 Telephone (202) 693-1888, Fax (202) 693-2498

DISTRIBUTION LIST

NIOSH

Employer

NJ State Medical Examiner

County Medical Examiner

Local Health Officer

USDOL-OSHA New Jersey Area Offices (Avenel, Hasbrouck Heights, Parsippany, and Marlton)

NJDLWD Office of Public Employees Safety

NJDLWD Occupational Safety and Health On-Site Consultation Program

NJDHSS Public Employees Occupational Safety & Health Program

NJDHSS Occupational Health Service Internet Site

NJDHSS Census of Fatal Occupational Injuries (CFOI) Project

Fatality Assessment and Control Evaluation (FACE) Project
Investigation # 03-NJ-085

Staff members of the New Jersey Department of Health and Senior Services, Occupational Health Service, perform FACE investigations when there is a report of a targeted work-related fatal injury. The goal of FACE is to prevent fatal work injuries by studying the work environment, the worker, the task and tools the worker was using, the energy exchange resulting in the fatal injury, and the role of management in controlling how these factors interact. FACE gathers information from multiple sources that may include interviews of employers, workers, and other investigators; examination of the fatality site and related equipment; and reviewing OSHA, police, and medical examiner reports, employer safety procedures, and training plans. The FACE program does not determine fault or place blame on employers or individual workers. Findings are summarized in narrative investigation reports that include recommendations for preventing similar events. All names and other identifiers are removed from FACE reports and other data to protect the confidentiality of those who participate in the program.

NIOSH-funded state-based FACE Programs include: Alaska, California, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, Nebraska, New Jersey, New York, Oklahoma, Oregon, Washington, West Virginia, and Wisconsin. Please visit the NJ FACE website at *www.state.nj.us/health/eoh/survweb/face.htm* or the CDC/NIOSH FACE website at *www.cdc.gov/niosh/face* for more information.

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