TO: Director, National Institute for Occupational Safety and Health

FROM: California Fatality Assessment and Control Evaluation (FACE) Program

SUBJECT: A construction inspector dies after being backed over by a ten-wheel asphalt dump truck.

SUMMARY
California FACE Report #00CA005

A 36 year-old male construction inspector for the county died when an asphalt dump truck backed over him. The truck was bringing hot asphalt to a new road being constructed in a new housing project. The decedent was wearing an orange reflective vest and hardhat at the time of the incident. The asphalt dump truck was greater than 2.5 ton capacity and the back-up alarm was operational and functioning properly. The truck traveled approximately 770 feet in reverse before backing over the decedent. The decedent had his back to the vehicle. The truck driver stated he was traveling approximately 5 to 10 miles per hour when the incident occurred and that he never saw the decedent. Emergency medical personnel responded within seven minutes of being called and pronounced him dead at the scene.
The CA/FACE investigator determined that, in order to prevent future occurrences, employers should, as part of their Injury and Illness Prevention Program (IIPP):

- Always use a second person as a spotter when backing heavy equipment with blind spots.
- Minimize the distance heavy equipment needs to back up in order to gain access to the work area.
- Consider using additional safety devices for heavy equipment to warn workers of a backing vehicle and to warn drivers when someone is in their blind spot.

INTRODUCTION

On April 12, 2000 at 11:15am, a 36-year-old male construction inspector died from injuries received when a ten-wheel asphalt dump truck ran over him. The CA/FACE investigator learned of this incident on May 1, 2000 from the State of California's Department of Industrial Relations, Division of Occupational Safety and Health's Legal Unit. On May 16, 2000, the CA/FACE investigator traveled to the incident site and interviewed a safety specialist with the decedent's employer and the superintendent of the general contractor. The CA/FACE investigator also requested and reviewed copies of the accident report from the county and the

general contractor, the Highway Patrol traffic collision report, training records of the decedent, and pictures of the incident site and vehicle involved.

The employer of the decedent was the county in which the incident took place. The decedent had worked as a county inspecting engineer in construction for 12 years and had been on this particular job for one year. At the time of the incident, there were approximately 20 construction workers at the work site. The decedent and his supervisor were the only county employees at the incident site. The decedent was wearing an orange reflective vest and hardhat at the time of the incident.

The county had an established safety plan with a written Injury and Illness Prevention Program (IIPP). It also employed safety specialists who conducted safety meetings, accident investigations, and work site audits. Training was accomplished through classroom, jobsite instruction, and on the job training *(*OJT). The decedent was experienced and trained in many aspects of his work. He was qualified to operate over 20 different types of construction equipment, received driver's training for heavy equipment, and was also trained as a supervisor.

INVESTIGATION

The incident took place at a new housing development where roads were being built. The process consisted of applying asphalt to one half of the roadway at a time. The road being paved was approximately 1,100 feet long and ran in a west-east direction with a 90-degree turn to the south at the eastern end. The southern portion of the road had just been paved and two asphalt rollers were compacting the asphalt. One roller was in the vicinity of the incident and the other was at the eastern end of the road near the asphalt machine.

Work crews were in the process of paving the northern portion of the road, starting at the eastern end around the 90-degree turn and working west. The road is level and has no obstructions. The width of the road measured approximately 36 feet. The unpaved northern portion of the street measured approximately 18 feet and the paved southern portion measured the same. The road was bordered by concrete curbs with cut outs for driveways for the new homes. The trucks had to back down the entire length of the unpaved half of the road because no means were provided to turn the vehicle around once it reached the paving machine. The trucks could not drive on the freshly paved portion because the weight of the vehicles would damage the new road.

The county's presence was mandated to inspect the work and assure it met current code requirements. On the day of the incident, the decedent was at this job site to measure the depth of the asphalt being applied to the new road. The decedent was in the construction trailer, located at the northwest corner of the road being paved. Seeing the truck enter the site and start backing down the unpaved portion of the street, the decedent told the superintendent that he was going to the asphalt machine. He left the office trailer and started walking down the unpaved portion of the road toward the paving machine.

As the truck driver backed his ten-wheel dump truck down the unpaved portion of the road he used his mirrors to navigate his vehicle backward to its destination. He stated his speed varied between 5 and 10 mph and he saw no one behind him as he backed his vehicle. The dump truck was greater than 2½ ton capacity and was equipped with a functional audible back-up alarm. The truck proceeded backwards approximately 770 feet when the truck driver felt a bump. He did not see anything in his mirrors so he adjusted his wheel so as to not run over the same bump with his front wheels and continued backwards. He stated he continued on

approximately 50 more feet when he saw the decedent lying in the road in front of his truck. The driver stopped his truck, opened the door, and yelled for help.

Several employees of the paving crew noticed the driver waving his hands in the air so they ran to the truck to see what happened. Realizing what happened, one employee ran to the construction trailer yelling that the county inspector had been run over by a dump truck. The project superintendent immediately called 911, and then ran to the incident site. He found the decedent lying face down in the road without pulse or spontaneous respirations. The fire department arrived approximately seven minutes later and pronounced the decedent dead.

CAUSE OF DEATH

The cause of death according to the coroner's report was blunt force trauma to the pelvic, abdomen, and chest.

RECOMMENDATIONS / DISCUSSION

Recommendation #1: Always use a second person as a spotter when backing heavy equipment with blind spots.

Discussion: Side view mirrors on trucks only show the driver what's behind them on the sides of the vehicle, not directly behind them. Mirrors cannot reflect blind spots directly behind large pieces of construction equipment. Even when they physically check the rear of vehicles before backing, conditions can change unexpectedly. Using another employee as a spotter when backing heavy equipment with blind spots assures drivers that when conditions change on the work site, they will be able to react appropriately.

Recommendation #2: Minimize the distance heavy equipment needs to back up in order to gain access to the work area.

Discussion: The distance the asphalt dump trucks had to back up in this incident exceeded 1,000 feet of straight unobstructed road before having to negotiate a curve. Although the vicinity may have been checked for obstructions prior to backing, conditions are constantly changing in a construction environment. Periodic turnouts closer to the work area should be used to minimize the distance required for backing. In this case, the curb cutouts could have been used for that purpose.

Recommendation #3: Consider using additional safety devices for heavy equipment to warn workers of a backing vehicle and to warn drivers when someone is in their blind spot.

Discussion: Workers on construction sites often work in close proximity to moving heavy equipment. Being exposed on a daily basis to the noise and warning devices of backing equipment can desensitize individuals to the presence of such vehicles. Other devices such as a strobe light or different noises should be considered as additions to the standard back-up alarm to warn workers of a backing vehicle. There are also devices available that can detect the presence of persons in the blind spots of vehicles and provide a warning to the driver. These additions should be considered especially when the standard practice has failed. If such a device had been used this incident may have been prevented.

References:

California Code of Regulations, Vol. 9, Title 8, Subchapter 4, Article 10, Sections 1592

Haapaniemi P (1996) "Will High-Tech Systems Help Drivers Avoid Crashes?"

Traffic Safety Vol. 96, No. 5, pp 16-19. National Safety Council, September/October 1996.

Parlay International. Transportation and Traffic Safety 1989, "Backing Up", 1050.012, 1050.078.

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the California Public Health Institute, and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations on work-related fatalities. The goal of this program, known as the California Fatality Assessment and Control Evaluation (CA/FACE), is to prevent fatal work injuries in the future. CA/FACE aims to achieve this goal by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

NIOSH funded state-based FACE programs include: Alaska, California, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas, Washington, West Virginia and Wisconsin.

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Additional information regarding the CA/FACE program is available from:

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