

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
Metal and Nonmetal Mine Safety and Health

REPORT OF INVESTIGATION

Surface Nonmetal Facility
(Cement)

Fatal Fall of Person Accident
October 10, 2014

F. T. Silfies
Contractor ID No. E714
at
Lehigh Cement Company LLC
Evansville Plant
Fleetwood, Berks County, Pennsylvania
Mine ID No. 36-00185

Investigators

Thomas J. Shilling
Mine Safety and Health Inspector

David L. Stimmel
Mine Safety and Health Inspector

Michael C. Superfesky
Civil Engineer

Kenneth J. Chamberlain
Supervisory Mine Safety and Health Specialist (Training)

Originating Office
Mine Safety and Health Administration
Northeast District
178 Thorn Hill Road, Suite 100
Warrendale, Pennsylvania 15086
Donald J. Foster, District Manager



OVERVIEW

On October 10, 2014, Lance H. Laity, Contract Truck Driver, age 66, was killed at this cement operation. He was standing inside a loading rack safety cage attempting to close the center hatch on top of a bulk tanker truck. Laity was unable to close the hatch due to the position of the truck's trailer. The fill port on the trailer was not centered within the confines of the safety cage. Consequently, Laity had to raise the safety cage to access the hatch. After he raised the safety cage, Laity tripped and fell through the opening, between the raised safety cage and the rounded side of the tanker truck, approximately 11 feet to the ground below.

The accident occurred due to mine management's failure to establish procedures to ensure that truck drivers properly align the bulk tanker trucks under the loading rack at close hatch station No. 1 in order to safely close the hatch on the trucks. In addition, contract management failed to have policies in place to ensure that truck drivers used fall protection where there was a danger of falling from performing work on top of bulk tanker trucks at the plant.

GENERAL INFORMATION

The Evansville Plant, a surface cement facility owned and operated by Lehigh Cement Company LLC, is located in Fleetwood, Berks County, Pennsylvania. The principal operating official is Daniel M. Harrington, President. Michael Gonzales, Plant Manager, is the person in charge of safety and health at the mine. The plant operates three 8-hour shifts per day, seven days per week. Total employment is 125 persons.

Material is conveyed from a limestone quarry adjacent to the plant. The material is pulverized, heated, and processed to produce cement. The finished product is sold in bulk and by bag and is transported by rail or truck for use in the construction industry.

F. T. Silfies, a commercial over-the-road trucking firm, is located in Allentown, Lehigh County, Pennsylvania. The principal operating official is Chris Silfies, President and Chief Operating Officer. At the time of the accident, Lehigh Cement Company LLC had contracted F.T. Silfies to haul bulk cement to several offsite customers. F. T. Silfies stationed four truck drivers at a staging area located on property adjacent to the Evansville Plant. These truck drivers shuttled empty bulk tankers from the staging area to the mine to get loaded and returned the filled tankers to the staging area where other truck drivers transported the loaded bulk tankers to customers.

The Mine Safety and Health Administration (MSHA) completed the last regular inspection at this operation on October 2, 2014.

DESCRIPTION OF ACCIDENT

On October 10, 2014, Lance H. Laity (victim) arrived for work at 7:00 a.m., his normal starting time. At 7:30 a.m., he loaded a bulk tanker truck at the Evansville Plant and shuttled it to the

F. T. Silfies' staging area located on an adjacent property approximately 460 feet from close hatch station No. 1. At 11:12 a.m., Laity transported a second bulk tanker truck to the No. 1 bulk load out, loaded the truck, and drove it to close hatch station No. 1. Laity accessed the G4 SafeRack gangway to close and latch the truck's center hatch lid.

Due to the misalignment of the truck, the G4 SafeRack safety cage rested on top of the center hatch lid. Rather than repositioning the truck, Laity lifted up the safety cage to about waist high to access the hatch. Laity used a claw hammer to hook the hatch and close it and turned to secure the cam locks on the hatch. He tripped and fell through the opening created by the raised safety cage and the rounded side of the tanker truck approximately 11 feet to the ground below.

Thomas Bumbarger, Truck Driver, had driven a bulk tanker truck into the No. 1 side silo load-out after Laity's truck had been loaded. While his truck was being loaded, Bumbarger observed Laity get out of his truck and access the G4 SafeRack system at the top of the truck to close the center hatch. After looking away for a moment, Bumbarger saw Laity laying on the ground next to the truck. Bumbarger immediately left his truck and walked toward close hatch station No. 1.

At about the same time, Dave Weaver, Truck Driver, drove a bulk tanker truck to close hatch station No. 2 and saw Laity laying on the ground. He immediately left his cab and ran into the No. 2 side silo load-out to get help. Weaver located Michael D. Fink, Bulk Loader, and alerted him of the accident. Fink radioed central control to report the accident and went to the victim.

Scot P. Wallace, Machinist, was informed of the accident and went to assist. Wallace found Laity laying face down on the ground and unresponsive. Wallace radioed central control for immediate medical assistance, and advised them to call 9-1-1. Laity's truck was still idling, so Wallace instructed another truck driver to shut it off.

The plant's first responders arrived and attempted to provide Cardiopulmonary Resuscitation (CPR). At 11:41 a.m., emergency medical services arrived. Jonn Hollenbach, Assistant Chief Deputy Coroner, and Matthew Mears, Deputy Coroner Investigator, arrived and pronounced the victim dead at 12:30 p.m. The cause of death was attributed to blunt force trauma.

INVESTIGATION OF THE ACCIDENT

MSHA was notified of the accident at 11:41 a.m. on October 10, 2014, by a telephone call from Ronald J. Lutz, Jr., Safety Coordinator, to the National Call Center. The National Call Center notified Dennis A. Yesko, Assistant District Manager, and an investigation was started the same day. An order was issued under the provisions of Section 103(j) of the Mine Act. This order was later modified to Section 103(k) of the Mine Act after the arrival of an Authorized Representative at the mine site.

MSHA's accident investigation team traveled to the mine, conducted a physical inspection of the accident scene, interviewed employees, and reviewed documents and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management and employees, contractor management and employees, miners' representatives, and local law enforcement.

DISCUSSION

Truck Loading Facilities

Bulk tanker trucks are loaded with cement products on the north side of the main plant within 1/8-mile of three plant entrances. Trucks entering and exiting the site traverse a 1/2-mile loop through two load-outs located within a cluster of eight finished product silos. The silo cluster is arranged in two rows with each row containing four silos, designated as the No. 1 side to the north and the No. 2 side to the south (see Figure 1). Prior to entering the silos to be loaded, truck drivers stop the trucks at open hatch station No. 1 or No. 2 so they can open the truck trailer's top hatch. After loading, the trucks exit the respective side and stop at close hatch station No. 1 or No. 2 so the drivers can close the top hatch.

Location of the Accident

The accident occurred at close hatch station No. 1 (see Figure 2). Upon exiting the No. 1 side silos, the northern roadway curves with a 230-foot radius or 25-degree curve to the southwest. Close hatch station No. 1 is located to the southwest along the curved roadway, 85 feet from the silo exit doors. Trucks loaded at the No.1 side need to be driven laterally 15 feet to the south so the fill port of the bulk trailer is centered within the safety cage provided at the close hatch station. After the truck drivers close and fasten the hatches, the trucks exit the plant by making a 90 degree turn to the west approximately 55 feet from the close hatch station.

Since the front of each truck typically extends at least 20 feet beyond the close hatch station, there is only 35 feet of roadway left for the truck drivers to negotiate the 90 degree turn. Therefore, the truck drivers align their trucks in a southwest direction before parking at the close hatch station. Truck alignment in the southwest direction provides the truck drivers more room to negotiate the curve by increasing the turning radius and orienting the tractor at an angle with the trailer of approximately 150 degrees before entering the 90 degree turn. With the 150 degree angle between the tractor and trailer, the tractors can make the 90 degree turn while the trailers lag behind and fit diagonally at the entrance of the turn where the width of the roadway is 40 feet.

Equipment Involved in the Accident

Close Hatch Station No. 1

Close hatch station No. 1 consists of a 12-foot high elevated access platform with a 4-foot long retractable flat ramp gangway. The model G4 series system with associated gangway and safety cage was manufactured by SafeRack. The user initiates the movement of the gangway for deployment and retraction by applying a push or pull that is assisted by two counterbalancing springs with one located on each side of the gangway. Safety chains are installed parallel with the springs to limit use of the gangway to angles of 15 degrees above and below the horizontal.

The extent the gangway allows access above or below the elevated platform is controlled by the relative difference in height between the ends of the spring which are adjusted by changing the vertical position of the platform end of the spring via a threaded steel rod. At the time of the

accident, the gangway was set to allow it to rotate 15 degrees below the horizontal and permit a one foot elevation difference between the ends of the gangway.

A four rail safety cage attached to the free end of the gangway is 74 inches long, 50 inches wide, and 37 inches high with its long end perpendicular to the gangway. The bars of the rails are 2 inches in diameter and the rails are spaced 12 inches apart vertically. Vertical bars are located between the rails at mid-length of the sides. The gangway side of the cage has a 2-foot-wide opening for access. The cage is fixed to the gangway with bolts allowing no relative movement between the two. Due to the curvature of the walls of the trailer tank, the more the fill port of the trailer is off center (side to side and bumper to bumper) from the center of safety cage, the larger the vertical separation between the bottom of the safety cage and the top of the tanker. Also, proper alignment of the fill port with the safety cage requires that the gangway is aligned perpendicular to the length of the trailer.

At the time of the accident, due to the position of the truck's trailer, the fill port on the trailer was not centered within the confines of the safety cage (see Figure 3). The dimensional offsets were one foot too close to the gangway at the south side and two feet too far forward to the west. The misalignment of the trailer caused three conditions that contributed to Laity's fall. These conditions were:

1. The safety cage had to be picked up manually in order to access and close the hatch of the fill port;
2. A large vertical separation between the top of trailer and the bottom of the cage existed (see Figure 4);
3. The area that Laity could position his feet to establish a stable base and stay clear of potential tripping hazards was reduced on the east end of the cage where he was standing before he tripped and fell to the ground below.

F. T. Silfies trained the truck drivers in the use fall protection. Safety harnesses were provided and stored at the company's offsite staging area. On the day of the accident, Laity did not take a safety harness with him to the plant.

Bulk Tanker Truck (Tractor-Trailer)

The tractor pulling the bulk trailer was a 2004 model M2 Business Class Freightliner with a rear tandem axle and a 10-speed Eaton Fuller transmission. The Freightliner had a day cab with a height of 9 feet, a width of 8 feet and was equipped with passenger and driver side dual mirrors. The rear tandem axle gave the tractor a total length of 20 feet and the coupling pivot hitch on the tractor was set at 18 feet from the front bumper.

The bulk trailer was a metal container tanker with a storage capacity of 1,000 cubic feet. The trailer, originally manufactured by Fruehauf in 1972, had recently been refurbished. The overall dimensions of the trailer were 11 feet high, 8.5 feet wide, and 40 feet long. When the trailer was coupled with the tractor the overall length was 55 feet. The top of the tanker had a width of 40 inches and it pitched at 12 degrees down on both sides from center width. Beyond the 40-inch top width, the pitch of the sides of the tanker approached vertical. At the outside edges of the top

width of the tank, toe bars 1.3 inches in diameter and extending 4 inches in height above the top of the tank were mounted for 20 feet along the length of the tanker.

The tanker had one fill port that was a 20-inch-diameter opening located at the center on top of the tanker. The ring wall of the fill port extended vertically 4 inches above the top of the tank. The hatch, a 21.5-inch-diameter metal plate weighing approximately 15 pounds, was hinge mounted to the outside of the ring wall and covered the opening in its closed position. When opened, the hatch laid against the top surface of the tanker with its outer edge 31 inches from the fill port center. When the truck was properly aligned, the open hatch was located near the step off of the G4 SafeRack gangway. Six cam locks were also mounted on the outside of the ring wall for securing the closed hatch.

Weather

On the day of the accident, skies were cloudy with an average temperature of 56 degrees Fahrenheit. Wind conditions were mostly calm with occasional gusts between 4.6 to 5.8 mph. Sunrise was at 6:18 a.m. The investigators determined that the weather conditions and lighting were not contributing factors in the accident.

TRAINING AND EXPERIENCE

Lance H. Laity had 11 years, 22 weeks of mining experience as a contract truck driver, all at this mine. On September 1, 2014, he retired from F.T. Silfies and was rehired the next day as a part-time employee working about 30 hours per week. A representative of MSHA's Educational Field Services reviewed the mine operator's Part 46 training records for Laity. The records documented that he had received all required training, including truck driving and tanker loading and unloading from Quality Carriers, J. P. Donmoyer Inc., and F. T. Silfies. He received site-specific hazard training through Lehigh Cement Company LLC at the Evansville Plant, which included the use of the G4 SafeRack system.

ROOT CAUSE ANALYSIS

The investigators conducted a root cause analysis and identified the following root causes:

Root Cause: Mine management failed to establish procedures to ensure that truck drivers properly align the bulk tanker trucks under the G4 SafeRack system at close hatch station No. 1 in order to safely close the hatch on the trucks.

Corrective Action: To ensure proper alignment of bulk tanker trucks, mine management installed cement barriers and painted delineating lines along the roadway leading to close hatch station No. 1. In addition, overhead cameras have been installed at close hatch stations No. 1 and No. 2, complete with video display monitors, to enable truck drivers to view the top hatch and properly position their trucks under the G4 SafeRack system. Multilingual warning signs have also been posted at the scale house and bulk load out station exits to warn truck drivers of the hazards associated with misalignment of bulk tanker trucks.

Root Cause: Contract management failed to establish policies requiring their truck drivers to wear fall protection when there was a danger of falling from performing work on top of bulk tanker trucks at the plant.

Corrective Action: Contract management established a written policy and safe work procedures, including the use of fall protection when there is a danger of falling from performing work on top of bulk tanker trucks at the plant. All contract truck drivers were trained in these new policies and procedures.

CONCLUSION

The accident occurred due to mine management's failure to establish procedures to ensure that truck drivers properly align the bulk tanker trucks under the loading rack at close hatch station No. 1 in order to safely close the hatch on the trucks. In addition, contract management failed to have policies in place to ensure that truck drivers used fall protection where there was a danger of falling from performing work on top of bulk tanker trucks at the plant.

ENFORCEMENT ACTIONS

Issued to Lehigh Cement Company LLC

Order No. 8803824 – Issued on October 10, 2014, under the provisions of Section 103(j) of the Mine Act. An Authorized Representative modified this order to Section 103(k) of the Mine Act upon arrival at the mine site:

An accident occurred at this operation on October 10, 2014 at approximately 11:18 hours. This order is being issued under Section 103(j) of the Federal Mine Safety and Health Act of 1977, to prevent the destruction of any evidence which would assist in investigating the cause or causes of the accident. It prohibits all activity at the exit area at the scale #1 until MSHA has determined that it is safe to resume normal mining operations in this area. This order was initially issued orally to the mine operator at 12:05 and has now been reduced to writing.

This initial order is modified to reflect that MSHA is now proceeding under the authority of Section 103(k) of the Mine Act. This Section 103(k) order is intended to protect the safety of all persons on-site, including those involved in the rescue and recovery operations or investigation of the accident. The mine operator shall obtain prior approval from an authorized representative for all actions to recover and/or restore operations to the affected area. Additionally, the mine operator is reminded of its existing obligations to prevent the destruction of any evidence which would assist in investigating the cause or causes of the accident.

The order was terminated October 14, 2014, after conditions that contributed to the accident no longer existed.

Citation No. 8798294 – Issued under the provisions of 104(a) of the Mine Act for a violation of 30 CFR 56.9100(b):

A fatal accident occurred at this mine on October 10, 2014. A contract truck driver (victim) positioned his tank trailer at an angle to the SafeRack system resulting in the safety cage not being centered over the middle tank hatch lid. This left a 30-inch opening between the top of the truck and the bottom rail of the SafeRack safety cage through which he fell 10 feet to the ground below. The mine operator did not provide warning signs at close hatch station No. 1 to identify the potential hazards associated with improper alignment of bulk tanker trucks.

Issued to F. T. Silfies

Order No. 8798295 – Issued under the provisions of 104(a) of the Mine Act for violation of 30 CFR 56.15005:

A fatal accident occurred at this mine on October 10, 2014. A contract truck driver (victim) had accessed the top of a bulk tanker truck at the #1 close hatch station via the G4 SafeRack system. The truck was not aligned properly creating a 30-inch opening between the top of the truck and the bottom rail of the SafeRack safety cage. While attempting to close the hatch, the driver tripped and fell through the opening to the ground below, a distance of approximately 10 feet. The victim was not wearing fall protection.

Approved: K-H Abel for
Donald J. Foster, Jr.
District Manager

Date: 12/30/2014

LIST OF APPENDICES

Appendix A: Persons Participating in the Investigation

Appendix B: Victim Information

Appendix C: Accident Scene Photos (Figures 1, 2, 3, and 4)

APPENDIX A

PERSONS PARTICIPATING IN THE INVESTIGATION

F. T. Silfies

Kellie M. Heffley	Vice-President Safety & Human Resources
Chris F. Silfies	President and Chief Operating Officer
Paul R. Mosser	Operation Manager

Lehigh Hanson Heidelberg Cement Group

Ronald J. Lutz, Jr.	Safety Coordinator
Nathan R. Kimball	EHS Director
Michael A. Gonzales	Plant Manager
Bruce A. Kemmerer	Miners' Representative

Ogletree Deakins

Michael T. Heenan	Attorney for Lehigh Hanson
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Office of the Coroner, Berks County

John M. Hollenbach	Assistant Chief Deputy Coroner
Matthew L. Mears	Deputy Coroner/ Investigator

Northern Berks Regional Police Department

Steven Hoptly	Officer
Scott W. Eaken	Chief

Mine Safety and Health Administration

Thomas J. Shilling	Mine Safety & Health Inspector
David L. Stimmel	Mine Safety & Health Inspector
Michael C. Superfesky	Civil Engineer
Kenneth J. Chamberlain	Supervisory Mine Safety & Health Specialist (Training)

APPENDIX B

VICTIM INFORMATION

Accident Investigation Data - Victim Information

U.S. Department of Labor
Mine Safety and Health Administration



Event Number:

Victim Information: <input type="text" value="1"/>																								
1. Name of Injured/ill Employee: <i>Lance H. Lally</i>			2. Sex: <i>M</i>		3. Victim's Age: <i>66</i>		4. Degree of Injury: <i>01 Fatal</i>																	
5. Date(MM/DD/YY) and Time(24 Hr) Of Death: <i>a. Date: 10/10/2014 b. Time: 12:30</i>						8. Date and Time Started: <i>a. Date: 10/10/2014 b. Time: 11:18</i>																		
7. Regular Job Title: <i>076 Bulk truck driver</i>				8. Work Activity when Injured: <i>076 Closing hatch on a bulk tanker</i>				9. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>																
10. Experience																								
a. This	Years		Weeks		Days		b. Regular	Years		Weeks		Days		c. This	Years		Weeks		Days		d. Total	Years	Weeks	Days
Work Activity:	<i>11</i>		<i>22</i>		<i>0</i>		Job Title:	<i>11</i>		<i>22</i>		<i>0</i>		Mine:	<i>11</i>		<i>22</i>		<i>0</i>		Mining:	<i>0</i>	<i>0</i>	<i>0</i>
11. What Directly Inflicted Injury or Illness?: <i>120 tripped on hatch and fell to ground</i>											12. Nature of Injury or Illness: <i>390 blunt force trauma</i>													
13. Training Deficiencies:																								
Hazard:			New/Newly-Employed Experienced Miner:				Annual:			Task:														
14. Company of Employment: (if different from production operator) <i>F. T. Silfies</i>											Independent Contractor ID: (if applicable)		<i>E714</i>											
15. On-site Emergency Medical Treatment:																								
Not Applicable:			First-Aid:		<input checked="" type="checkbox"/>		CPR:		EMT:		Medical Professional:		None:											
16. Part 50 Document Control Number: (form 7000-1)							17. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>																	

APPENDIX C

ACCIDENT SCENE PHOTOS

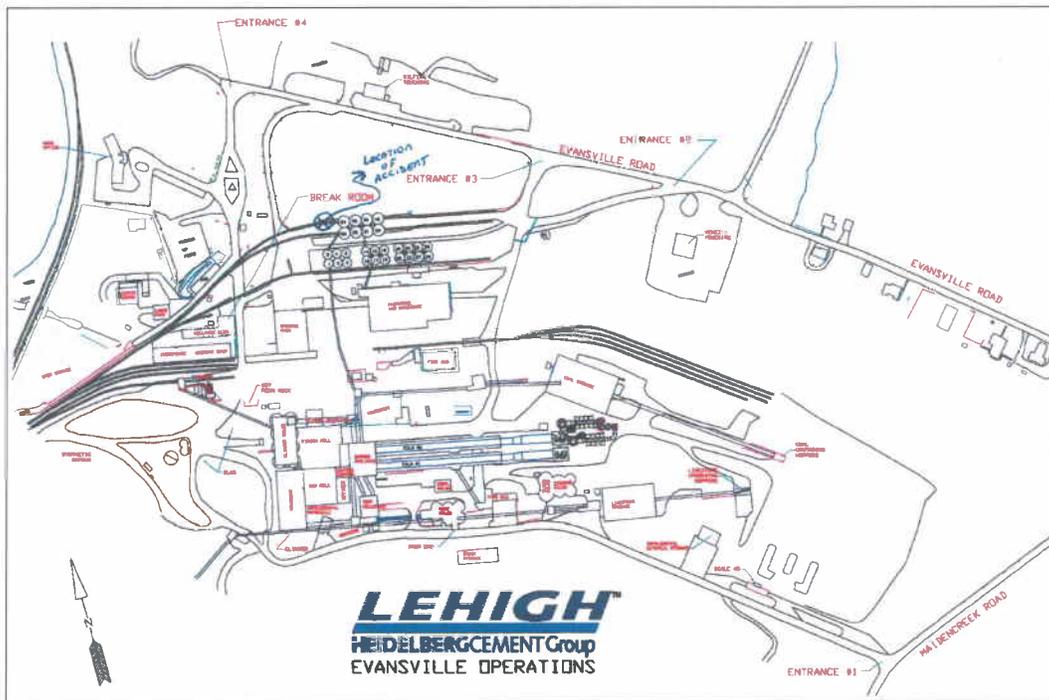


Figure 1 - Schematic of Evansville Plant

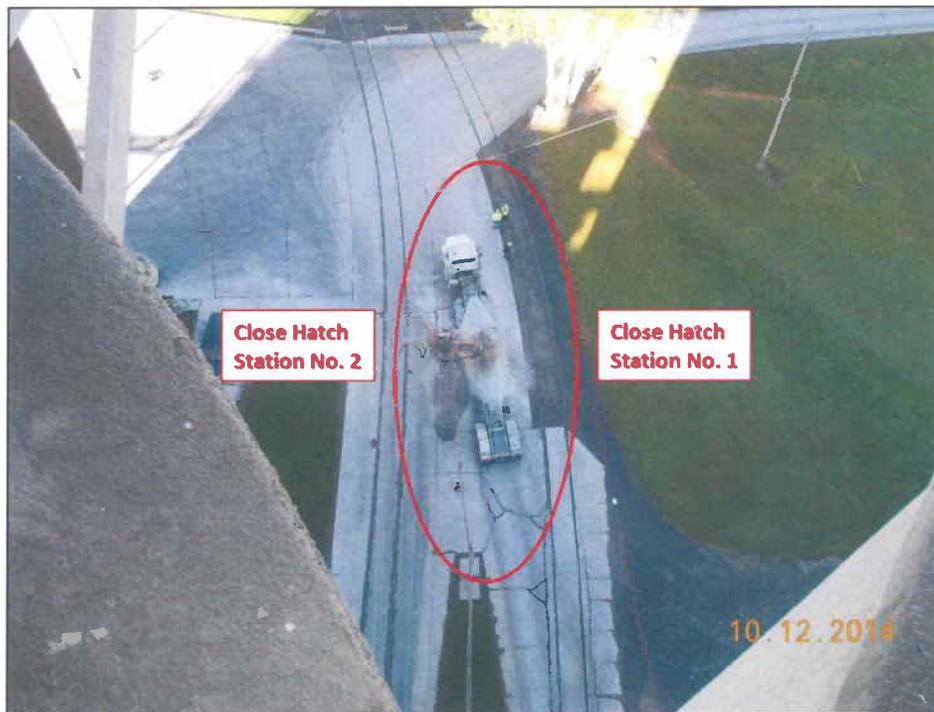


Figure 2 - Aerial View of accident site from top of adjacent silo showing alignment of bulk tanker truck.



Figure 3 - Tanker truck found with hatch closed (Note: close proximity of hatch hinge to the gangway).

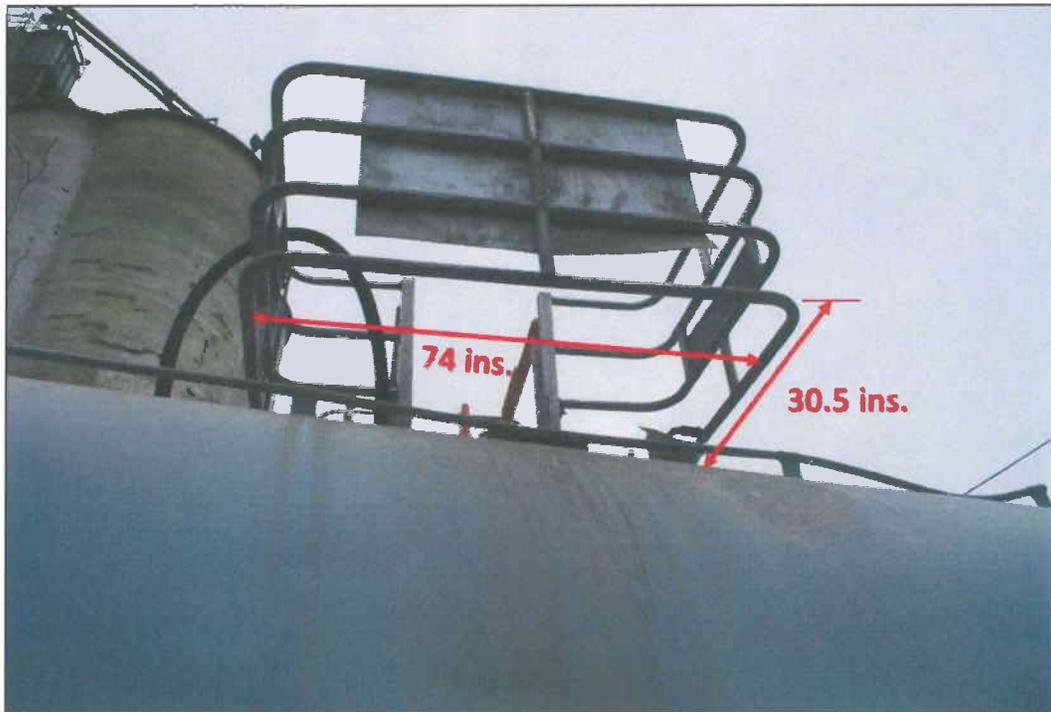


Figure 4 - Open area between G4 SafeRack safety cage and top of bulk tanker truck.