MAI-2009- 06

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

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Cement)

Fatal Fall of Person Accident
April 14, 2009

ThyssenKrupp Safway Services, Inc.
Contractor ID No. D034

at

Holcim (US) Incorporated
Holcim Ste. Genevieve Plant
Bloomsdale, Ste. Genevieve County, Missouri
Mine ID No. 23-00284

Investigators

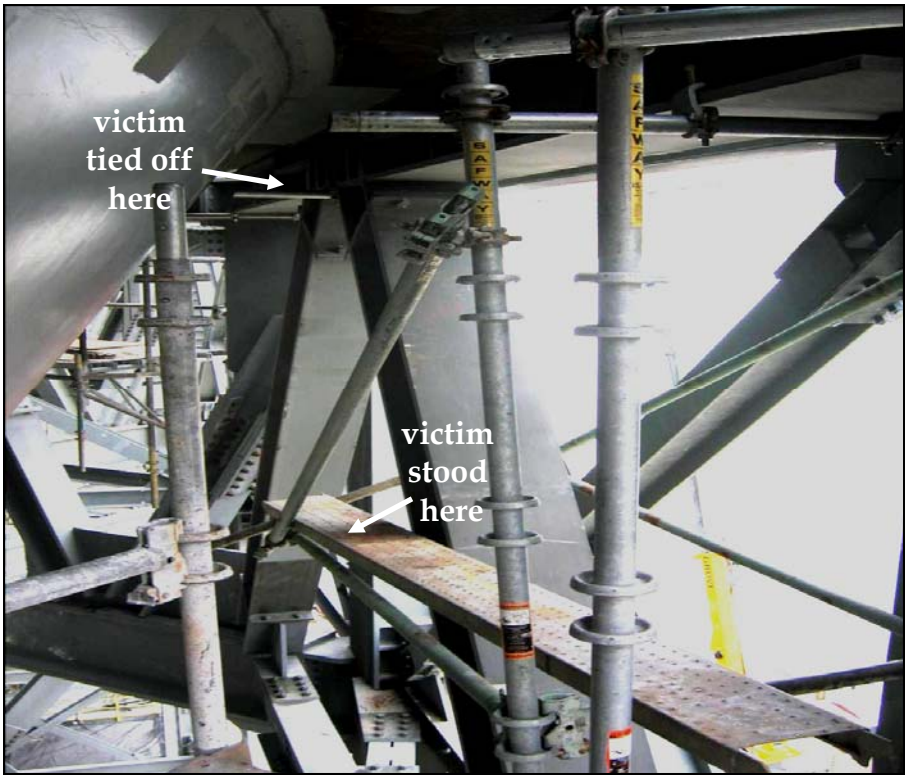
Michael R. Van Dorn
Supervisory Mine Safety and Health Inspector

Lawrence D. Sherrill
Mine Safety and Health Inspector

Darren J. Blank, PE
Supervisory Civil Engineer

Originating Office
Mine Safety and Health Administration
South Central District
1100 Commerce Street, Room 462
Dallas, TX 75242-0499
Edward E. Lopez, District Manager


victim was
working here
victim fell
to here


victim
tied off
here
victim
stood
here

OVERVIEW

On April 14, 2009, Vincent D. Lavite, contractor carpenter, age 38, was fatally injured when he fell about 75 feet from a scaffold platform he was dismantling. The platform he was standing on shifted unexpectedly causing him to lose his balance. The safety lanyard he was wearing then slipped off the suspension pipe where it was attached.

The accident occurred because sub-contractor management policies and safe work procedures were not followed while persons were dismantling the scaffold platform. The victim continued to work from the platform after removing critical support and tie-off components. These components were typically removed when persons were positioned on the structural steel above the platform and tied-off outside the scaffold platform.

GENERAL INFORMATION

Holcim Ste. Genevieve Plant, a surface cement plant under construction, owned and operated by Holcim (US) Incorporated, was located at Bloomsdale, Ste. Genevieve County, Missouri. The principal operating official was Russell L. Wiles, Senior Vice-President. The construction project operated a variety of shifts 24 hours per day, 7 days per week and plant completion was projected for July 2009. Total employment was 250 persons, not including over 2,300 contractor employees.

ThyssenKrupp Safway Services, Inc. (Safway), a scaffolding sub-contractor located in Waukesha, Wisconsin, was hired to erect and dismantle scaffolding for another contractor at the construction site. The principal operating official was William Brayton, Field Supervisor. Total on-site employment was 28 persons. Vincent D. Lavite (victim) was an employee of Safway.

Limestone was drilled and blasted from a single bench in the quarry. Broken rock was transported by truck to the primary crusher where it was crushed and stockpiled while the plant was constructed. Post-construction plans were to convey crushed rock to the plant, mix it with other materials, and produce cement. Finished products were to be shipped by barge, rail, and truck for use in various construction projects.

The last regular inspection was completed on February 10, 2009.

DESCRIPTION OF THE ACCIDENT

On the day of the accident, Vincent D. Lavite reported for work at 6:10 a.m., a few minutes before his usual starting time of 6:30 a.m. After attending a safety meeting, Lavite, Chad Davis, Laborer, and Todd Gaston, Laborer, were instructed by William Brayton, Field Supervisor, to dismantle scaffolding at the fly ash bins and erect other scaffolding at the pre-heater tower. Lavite was designated as the crew leader.

At 8:30 a.m., the crew took a break and Lavite told Davis that he had a plan to change the method of dismantling scaffolding at the fly ash bins. They had previously dismantled scaffolding at the No. 4 and No. 3 fly ash bins and would soon be dismantling scaffolding at the No. 2 and then the No. 1 fly ash bins.

Lavite, Davis, and Gaston ate lunch near the pre-heater tower at noon. At 12:30 p.m., Deaven Mitchell, Laborer, joined them and the crew went to the No. 2 fly ash bin about 12:40 p.m. to dismantle scaffolding there.

The crew was instructed to dismantle two nearly end-to-end scaffold platforms that each measured 5 feet north-south by 10 feet east-west. The two platforms were suspended from the structural steel supporting the south side of the No. 2 fly ash bin. The platforms were erected there so another contractor could weld the joint between the fly ash bin wall and the hopper cone beneath the bin.

Lavite took the lead position, stepped onto the east platform, and began dismantling it. Lavite handed parts to Mitchell as he removed the toe-boards, mid-rails, handrails, brackets, and some scaffold planks. Mitchell handed each part to Gaston who in turn passed them to Davis. Davis then stacked the parts on the west scaffold platform. By 12:55 p.m., Lavite had removed all but the two platform suspension pipes, four vertical posts, two bearing pipes, two runner pipes, and a few scaffold planks.

At that point, Lavite deviated from the typical dismantling procedure. He remained on the platform being dismantled and clamped a 10-foot long section of pipe diagonally between the top end of the northwest vertical post and the east end of the north runner pipe. Lavite clamped another 10-foot long section of pipe between the top end of the southwest vertical post and the east end of the south runner pipe. He then clamped a section of pipe under the east ends of the north and south runner pipes. Lavite was apparently attempting to create a cantilever support for the east end of the scaffold framework so he could remove the east bearing pipe and east vertical posts.

After removing all but one scaffold plank, Lavite stood on the plank and secured his lanyard around the north end of the platform suspension pipe at the east side of the scaffold platform and removed the north-south bearing pipe from the east end of the platform. About 1:15 p.m., he then unclamped all components from the northeast vertical post and used a hammer to knock away the upper end and the lower end of the vertical post.

Removing the northeast vertical post allowed the northeast corner of the platform to unexpectedly drop about 16 inches. Investigators determined that the clamp holding the northwest vertical post to the north end of the west suspension bar rotated on the suspension bar after Lavite removed the northeast vertical post.

Lavite lost his balance and fell backwards off the scaffold plank on which he was standing. Removing the northeast vertical post left the east platform suspension pipe open-ended at the north end allowing Lavite's lanyard to slip off as he fell backward from the scaffold plank. He fell approximately 75 feet before striking a metal beam about 20 feet above ground level. After impacting the beam below, Lavite's lanyard whipped around the beam and held him there until persons working on the ground were able to remove him a few minutes later.

Emergency medical services were summoned and arrived at the gate at 1:26 p.m. Lavite was transported from the mine at 1:35 p.m. to a local hospital. He was then transferred to another hospital where he was pronounced dead at 5:00 p.m. by the attending physician. The cause of death was attributed to blunt force trauma.

INVESTIGATION OF THE ACCIDENT

On the day of the accident, the Mine Safety and Health Administration (MSHA) was notified at 2:05 p.m. by a telephone call from John Jerrels, Safety Manager, to MSHA's emergency hotline. Elwood Burris, Staff Assistant, was notified and an investigation was started the same day. An order was issued pursuant to section 103(k) of the Mine Act to ensure the safety of miners. A citation was issued for untimely reporting.

MSHA's accident investigation team traveled to the mine, made 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 and contractor management and employees.

DISCUSSION

Location of the Accident

The accident occurred at the south side of the No. 2 fly ash bin. The area was outdoors where the temperature was 50 degrees Fahrenheit and cloudy skies. Weather was not considered to be a factor in the accident.

Fly Ash Bins

Four side-by-side steel fly ash bins were under construction at the mine. Each bin was 175 feet high and 60 feet in diameter. Contractor employees were moving from bin to bin, welding the hopper cone to the wall of each bin. These tasks were conducted about 95 feet above the ground and required the assembly of scaffold platforms to be suspended from the structural steel supports around the outside of the bins.

Scaffold Platforms

The Systems™ scaffolding involved in the accident was designed by Safway. The scaffolding, consisting of galvanized steel components clamped together at each junction point, could be suspended from overhead structural steel beams. A typical scaffold platform was 10 feet long and 3 feet wide but could be widened to 5 feet by adding side brackets. Scaffold platforms could be erected end to end as shown on Figure 1 in Appendix B.

Each scaffold platform assembly started with two horizontal suspension pipes clamped onto the bottom flange of structural steel beams keeping the pipes parallel and 10 feet apart. The tops of two 10-foot vertical posts were clamped 3 feet apart onto each suspension pipe. Each vertical post had six evenly spaced ring sets along its length that were used as clamping points for bearing pipes, runner pipes, and side brackets.

A 3-foot long bearing pipe was clamped between each pair of vertical posts at the elevation where the working floor was to be located. A side bracket could be added to each of the vertical posts on one side or the other to widen the platform to 5 feet. A runner pipe was placed along both long sides of a platform to add stability and to

accommodate toe boards. Mid-rails and handrails were provided along as many sides as possible for safety. Perforated galvanized steel scaffold planks were laid from bearing pipe to bearing pipe and were held in place with hooks. Six 9-inch wide by 10-foot long planks were required for a 5-foot wide by 10-foot long scaffold platform.

The two scaffold platforms on the south side of No. 2 fly ash bin (Appendix C) were each 5 feet north-south by 10 feet east-west. They were not placed squarely end to end because of the need to keep them close to the curving wall of the bin. The northeast corner of the west platform was positioned next to the northwest corner of the east platform without sharing any components between the two platforms. They were positioned adjacent to the hopper cone with the bearing pipes, runner pipes, and side brackets clamped to the fourth ring set down from the top of the four vertical posts. The working level (scaffold planks) of each platform was about 5 feet lower than the junction of the hopper cone and the bin wall.

Mid-rails and handrails extended in the east-west direction on the south side of the scaffold platforms. Only a continuous mid-rail was installed on the north side of the scaffold platforms because they were built too close to the hopper cone to accommodate continuous handrails. The scaffold planks were laid in the east-west direction on each scaffold platform. Plywood was used to cover the gaps where scaffold planks could not be placed due to the presence of the diagonal steel beams.

Scaffold Platform Dismantling Procedures

The procedures for dismantling a scaffold platform had been established by Safway and all persons were trained accordingly. The procedure was to remove the toe boards, mid-rails, handrails, side brackets, and some planking while working from the scaffold platform being dismantled. Runner pipes and the remainder of the scaffold planks could be removed from a position adjacent to the platform. The bearing pipes, runner pipes, and suspension pipes were to be removed while persons worked from the structural steel beams overhead. Lavite deviated from the established procedures when he remained on the scaffold platform to remove the east bearing pipe and the northeast vertical post.

Fall Protection

Lavite was wearing a full-body fall protection harness manufactured in June 2008 that met American National Standards Institute (ANSI) and Occupational Safety and Health Administration (OSHA) standards. There were no signs of damage or failed components on the harness. He was using a shock-absorbing double-leg lanyard with a harness D-ring locking snap hook and two locking rebar hooks. The keeper latch on one of the rebar hooks was slightly bent and did not properly seat into the hook. Investigators were unable to determine if the latch was damaged prior to or during the accident. However, since the lanyard slipped off the suspension pipe, the damaged latch would not have contributed to the accident. Each leg of the lanyard included a tubular-style shock absorber. Neither of these legs had been activated, indicating the fall protection had not taken any significant weight.

Training and Experience

Vincent Lavite had 8 years of experience, including 10 months at this operation. He had received site specific hazard awareness training as required by 30 CFR Part 46.

Chad Davis had 6 months of experience, all at this operation. He had received site specific hazard awareness training as required by 30 CFR Part 46.

Todd Gaston had 1 month of experience, all at this operation. He had received site specific hazard awareness training as required by 30 CFR Part 46.

Deaven Mitchell had 4 months of experience, all at this operation. He had received site specific hazard awareness training as required by 30 CFR Part 46.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted and the following root causes were identified.

Root Cause: Sub-contractor management did not ensure that all established safe operating procedures were followed during scaffold dismantling.

Corrective Action: Sub-contractor management established additional policies to ensure that established safe operating procedures are followed when dismantling scaffolding. Persons performing the task were trained and will be monitored to ensure the procedures are being followed.

Root Cause: Sub-contractor management did not ensure that all persons employed safe tie-off procedures while working where there is a danger of falling.

Corrective Action: Sub-contractor management established additional policies to ensure that safe tie-off procedures are followed while working where there was a danger of falling. Persons working where there is a danger of falling were trained and will be monitored to ensure the procedures are being followed.

CONCLUSION

The accident occurred because sub-contractor management policies and safe work procedures were not followed while persons were dismantling the scaffold platform. The victim continued to work from the platform after removing critical support and tie-off components. These components were typically removed when persons were positioned on the structural steel above the platform and tied-off outside the scaffold platform.

ENFORCEMENT ACTIONS

Issued to Holcim (US) Incorporated

ORDER No. 6463930 was issued on April 14, 2009, under the provisions of Section 103(k) of the Mine Act:

A fatal accident occurred at this operation on April 14, 2009, when a contractor employee fell while attempting to dismantle scaffolding at the No. 2 fly ash bin. This order is issued to assure the safety of all persons at the operation. It prohibits all activity at the No. 2 fly ash bin area until MSHA has determined that it is safe to resume normal operations. The operator shall obtain prior approval from an authorized representative for all action to recover and /or restore operation to the affected area.

This order was terminated on April 16, 2009, after conditions that contributed to the accident no longer existed.

Issued to ThyssenKrupp Safway Services, Inc.

CITATION No. 6242467 was issued on April 29, 2009, under the provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 56.15005:

A fatal accident occurred at this operation on April 14, 2009, when a miner fell about 75 feet while dismantling a section of scaffolding. The victim lost his balance and fell when one end of the scaffold plank on which he was standing shifted unexpectedly. As he fell backwards the victim's safety lanyard slipped off the open-ended horizontal scaffolding bar to which he was tied.

This citation was terminated on April 29, 2009, after contractor management retrained all employees regarding proper tie-off procedures while dismantling scaffolding.

Approved:_____ Date:_____

Edward E. Lopez
District Manager

LIST OF APPENDICES

APPENDIX A

PERSONS PARTICIPATING IN THE INVESTIGATION

Holcim (US) Incorporated

John Jerrels……Safety Manager
Mark Brinkley……Construction Safety Manager

ThyssenKrupp Safway Services, Inc.

William Brayton……Field Supervisor
Steve Oliver……Multi-Branch Safety Manager

Mine Safety and Health Administration

Michael R. Van Dorn……Supervisory Mine Safety and Health Inspector
Lawrence D. Sherrill……Mine Safety and Health Inspector
Darren J. Blank, PE……Supervisory Civil Engineer

APPENDIX B

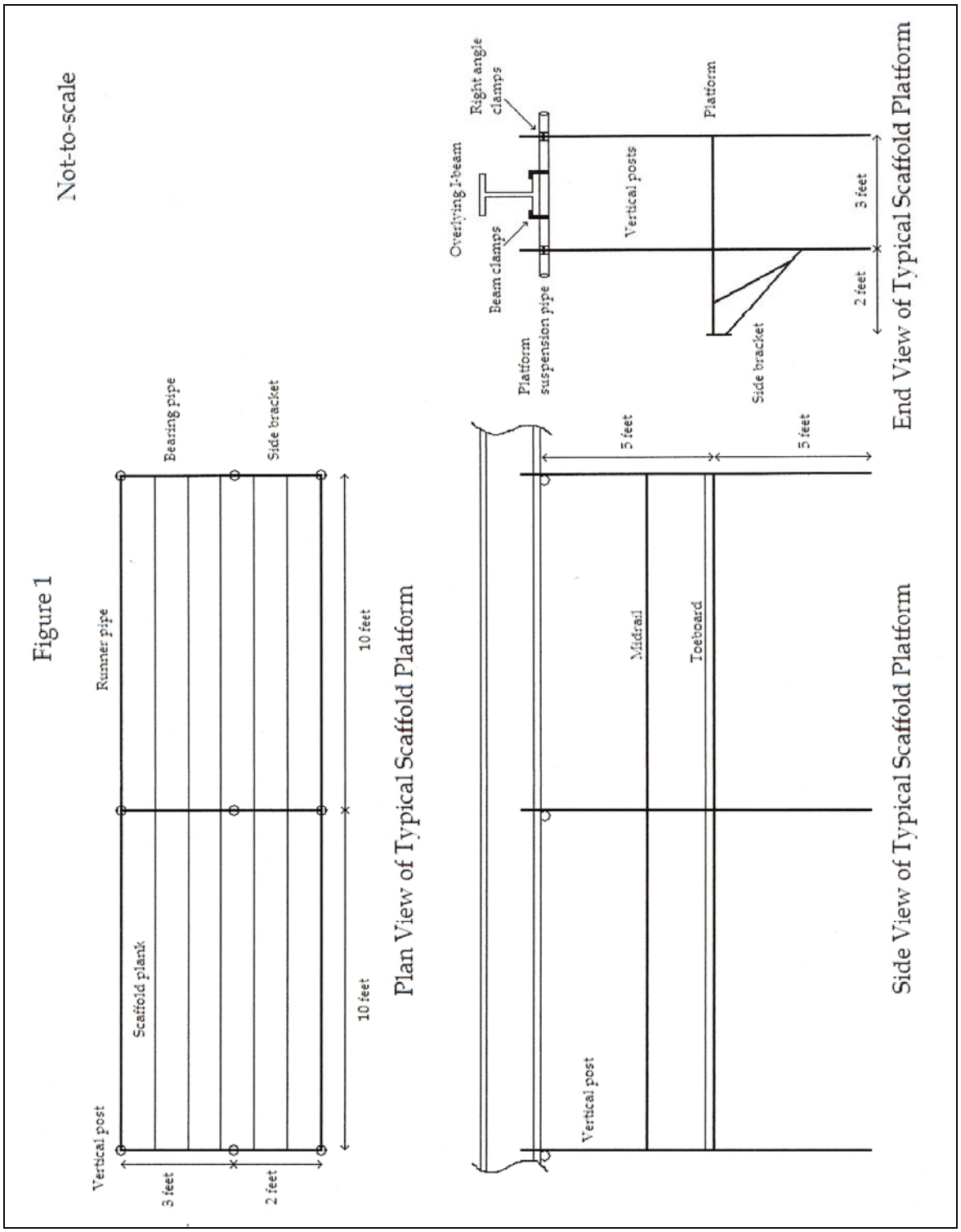
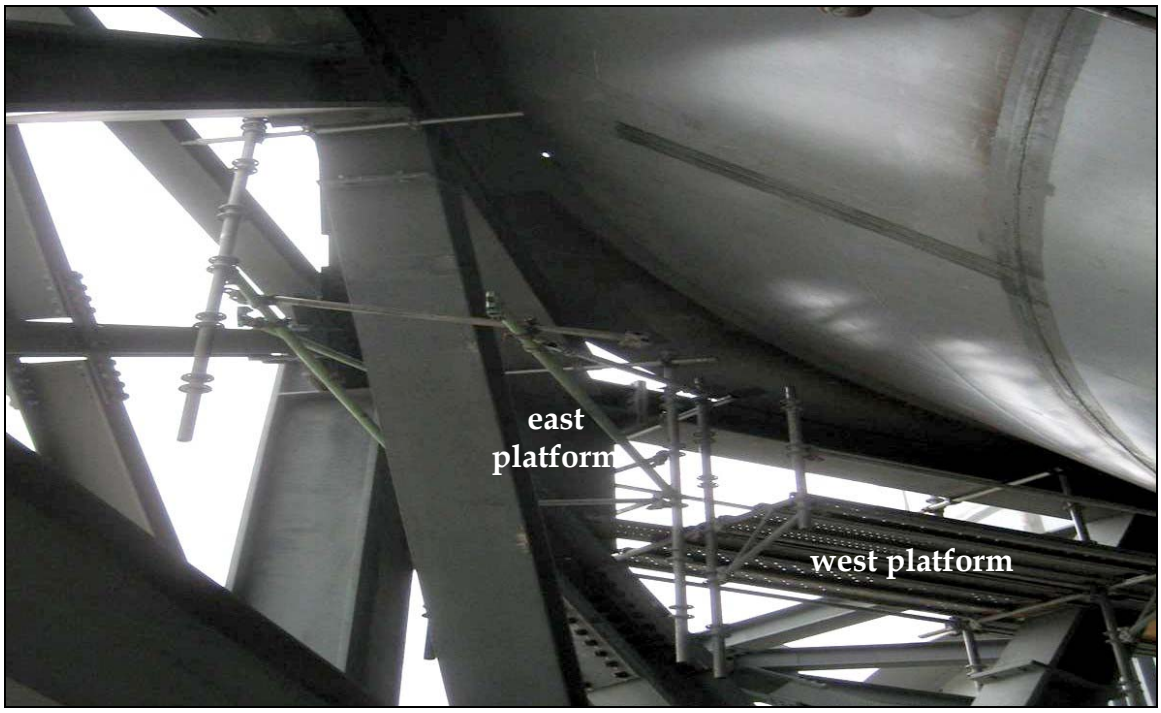


Figure 1
Not-to-scale
Plan View of Typical Scaffold Platform
Vertical post
Runner pipe
Bearing pipe
Side bracket
Scaffold plank
3 feet
2 feet
10 feet
10 feet
End View of Typical Scaffold Platform
Right angle clamps
Overlying I-beam
Beam clamps
Platform suspension pipe
Vertical posts
Platform
3 feet
2 feet
Side bracket
Side View of Typical Scaffold Platform
5 feet
5 feet
Midrail
Toeboard
Vertical post

APPENDIX C



APPENDIX D

Accident Investigation Data - Victim Information
Event Number: 1 0 6 0 4 0 4

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

Victim Information: 1

1. Name of Injured/Ill Employee:	2. Sex	3. Victim's Age	4. Degree of Injury:
Vincent D. Lavite	M	38	01 Fatal

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:
a. Date: 04/14/2009 b.Time: 17:00

6. Date and Time Started:
a. Date: 04/14/2009 b.Time: 6:10

7. Regular Job Title:
199 carpenter

8. Work Activity when Injured:
098 dismantling scaffolding

9. Was this work activity part of regular job?
Yes X No

10. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	3	0	0	b. Regular Job Title:	6	0	0	c. This Mine:	0	38	0	d. Total Mining:	4	0	0

11. What Directly Inflicted Injury or Illness?
019 structural steel beam

12. Nature of Injury or Illness:
370 mutliple injuries from fall

13. Training Deficiencies:
Hazard: | New/Newly-Employed Experienced Miner: | Annual: | Task:

14. Company of Employment: (If different from production operator)
ThyssenKrupp Safway Inc.

Independent Contractor ID: (if applicable) D034

15. On-site Emergency Medical Treatment:
Not Applicable: | First-Aid: | CPR: | EMT: X | Medical Professional: | None:

16. Part 50 Document Control Number: (form 7000-1)

17. Union Affiliation of Victim: 2482 United B. Carpenters & Joiners