Workplace Fatality Summary Report:

Worker Fatally Injured when Crane Collapsed

The Contents of this Report

This report summarizes the Ministry of Labour Relations and Workplace Safety's Occupational Health and Safety Division investigation of a fatal incident. The information contained is intended for educational purposes only.

Incident Summary

The incident occurred during the construction of concrete panels for a hog barn floor. Three workers were using a non-professionally engineered gantry crane – made of two A-frames on wheels, a metal cross beam, a chain and an industrial metal bucket – to fill a long, narrow row of wooden forms with concrete. Workers 1 and 2 positioned themselves on either side of the crane and pushed it in a straight line as the bucket poured concrete into the wooden forms. When the bucket was empty, they wheeled the crane back to the end of the forms. Worker 3 unhooked the bucket so the telehandler could transport it to the cement truck for a refill. The crane was crooked so worker 1 grabbed the A-frame to re-adjust the device. At this point the A-frame slid off the crane's main beam and toppled over. Worker 1 stumbled and fell backwards. The main beam which was still attached to the A-frame on the other side of the crane dropped and struck Worker 1 causing a fatal injury.

Background Information

Worker 1:

Worker 1 had completed the full workplace orientation and earned the required training certificates to perform the job.

Equipment and Materials

Gantry Crane:

The crane had wheels and was erected over the hog barn's pit. Its purpose was to support an industrial metal bucket filled with concrete. The bucket was attached to a chain in the centre of the main beam and lifted into position with two winches. Two workers pushed the crane in a straight line as concrete poured out of the bucket into the wooden forms (see Figure 1).

Figure 1

Bucket:

The industrial bucket had a hatch on the bottom. The workers opened the hatch to pour the concrete into the wooden forms. When it was empty a worker would unhook it from the chain on the crane's main beam. A telehandler, equipment similar to a forklift, was used to lift and transport the bucket to a cement truck for refills (see Figure 2).

Figure 2

A-frames:

The crane was made of two metal A-frames connected with a main beam. Workers would grab and re-adjust the A-frames to keep the crane straight as they pushed it along the track (see Figure 3).

Figure 3

Square Tubing and Bolts:

The main beam was inserted in and bolted to the A-frames' square tubing. The bolts applied pressure to the beam to wedge and hold it in place. On the day of the incident, the weight of the bucket, pushing and re-adjusting of the crane loosened the bolts' grip on the beam. Consequently, when worker 1 grabbed the A-frame to straighten the crane, it slid off the beam. The beam, still attached to the other A-frame, dropped and struck worker 1 (see Figures 4 and 5).

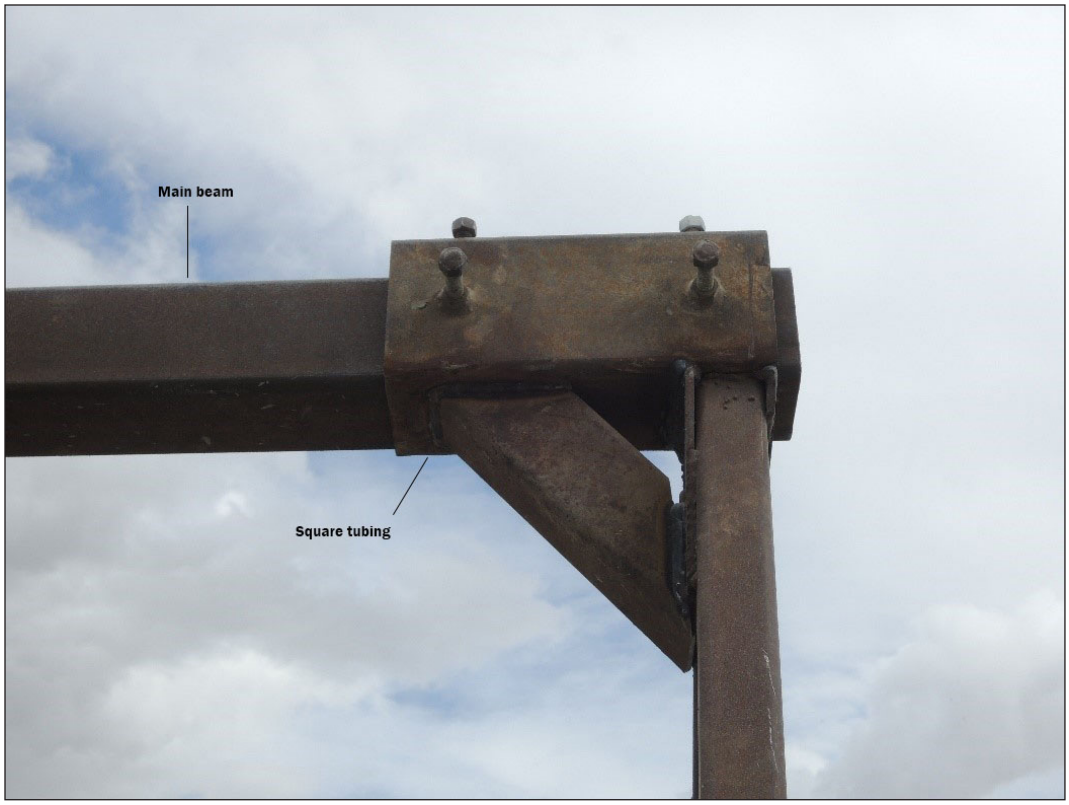

Figure 4

Figure 5

Sequence of Events

The day began with the prime contractor's weekly safety meeting and was followed by the employer's daily discussion of the crew's tasks and associated hazards. The workers would spend the day pouring concrete beams to support the hog barns' floors.

The crew worked in various locations at the farm throughout the day and had poured two beams before the incident occurred.

Shortly after 5:00 p.m. the crew was directed to move the crane from barn three to barn one.

Once it was assembled over the wooden forms in the barn's pit, worker 1 and worker 2 positioned themselves on either side of the crane. Worker 1 stood on the west (right) side; worker 2 on the east (left).

The workers pushed the crane in a straight line as concrete poured out of the bucket into the forms. They were performing the task as they had been trained, but because the crane tended to wander off track, workers 1 and 2 needed to grab its metal A-frames regularly to re-adjust it and keep it from falling into the pit.

Approximately halfway down the beam, the bucket was empty. Workers 1 and 2 wheeled the crane back to the north end of the wooden forms for a refill. Worker 3 unhooked the bucket from the chain on the crane's main beam. The telehandler (operated by the employer) picked the bucket up and began backing away to transport it to the cement truck.

Worker 1 noticed the crane was crooked and grabbed the metal A-frame to re-adjust the device. The A-frame, whose bolts had loosened, slid off the main beam and toppled over. Worker 1 stumbled and fell backwards. The main beam, still attached to the A-frame on the east side of the crane, dropped, struck and fatally injured worker 1.

Completion

The employer pleaded guilty to subsection 201(1) of *The Occupational Health and Safety Regulations, 1996* (being an employer, failed to ensure that every hoist, crane and lifting device, including all rigging, used at the place of employment is designed, constructed, installed and maintained and operated to perform safely any task for which the hoist, crane, lifting device or rigging is used, resulting in the death of a worker). The employer was fined $65,000 plus a victim surcharge of $26,000.