

DEMOLITION SAFETY-LEAD SAFETY-SILICA

When demolitions go wrong

May 15, 2019

Cal-OSHA article reported learning points from incidents that have occurred during demolition and significant refurbishment and has collected a number of case studies that cover a range of health, safety and commercial incidents, some of which resulted in [death or serious injury](#) and others which could easily have led to single or multiple casualties. In all cases, even where there were no casualties, additional commercial costs often exceeded any potential saving resulting from shortcuts.

Failure to provide sufficient pre-demolition information by client

A contract to demolish high rise residential blocks built of large precast panels used a ground based high reach demolition machine. The client provided little information on the building structure to the contractor. Structural connection between panels had been poorly designed, poorly built and had deteriorated further during the life of the building. Lack of adequate information (and lack of adequate survey or assessment prior to work starting) led to a premature collapse of multiple floors across several bays during demolition works.



Fortunately, because the high reach machine was large enough, as was the exclusion zone, there were no injuries. However, the project was substantially delayed while the incident was investigated and remedial action taken. This type of building often needs panel connections to be stiffened and floors propped to a formal design prior to demolition.

Contractor competence. Road collapses into a construction site

On June 8, 2019, a large part of a road suddenly collapsed into a building construction site in southern China.

Large cracks in the road appeared before the failure. Fortunately, construction officials that noticed the severe cracking, evacuated the construction site and closed the roadway. Therefore, there were no casualties. The ground beneath the road collapsed carrying away the concrete diaphragm wall that was constructed to support the soil. The causes of the failure are under investigation but rainfalls that struck the area some days before may have contributed to the collapse.

Following the incident, officials and police rushed at the scene to resolve traffic issues and prevent people from entering the hazardous area.



Contractor cited for kicking up dust at demolition site

ST. LOUIS — The city issued a fine Friday to Illinois construction company GreenTrac after the building division found the company wasn't using a required dust control technique on a demolition site to prevent the spread of lead and other toxins.

The demolition crew started Thursday at 1415 Dodier Street in the Old North neighborhood without spraying water to reduce dust.

“We got a rogue contractor, (and) we issued a stop work order,” said Frank Oswald, the city’s building commissioner.

Spraying water on demolition sites can help prevent the spread of lead particles from old paint and building materials, which can enter homes and settle into backyards where people can ingest it. A 2002 study in St. Louis by the U.S. Centers for Disease Control and Prevention found a link between proximity to demolition sites and lead poisoning in children.



INVESTIGATION OF THE SEPTEMBER 9, 2015 COLLAPSE OF AIRCRAFT HANGAR NO. 14 AT NEWARK LIBERTY INT. AIRPORT

On September 9, 2015 at Newark Liberty International Airport, Newark, NJ, around 1:25 p.m. aircraft hangar no. 14, undergoing demolition, unexpectedly collapsed, injuring four employees. The demolition workers were on the first floor (ground floor) and the second floor of the hangar when the hangar building collapsed. Four employees were transported to the hospital with nonlife threatening injuries. One employee was kept overnight in the hospital for evaluation of his head injuries.

Conclusions

1. The demolition contractor failed to follow the instructions of May 20, 2015 prepared by his engineering consultant.
2. The contractor made numerous horizontal V cuts on columns above the first floor, contrary to the consultant's instructions. These additional cuts in the columns compromised the stability of the structure and significantly contributed to the collapse.
3. The general contractor failed to notice and question the numerous cuts in columns made by the demolition contractor in violation of the instructions of the consultant retained by the demolition contractor. These cuts were in plain view of the general contractor.
4. The Port Authority of New York and New Jersey had an incomplete set of original drawings.



Partial west view
FIGURE 13



Partial north view from column line A14
FIGURE 14



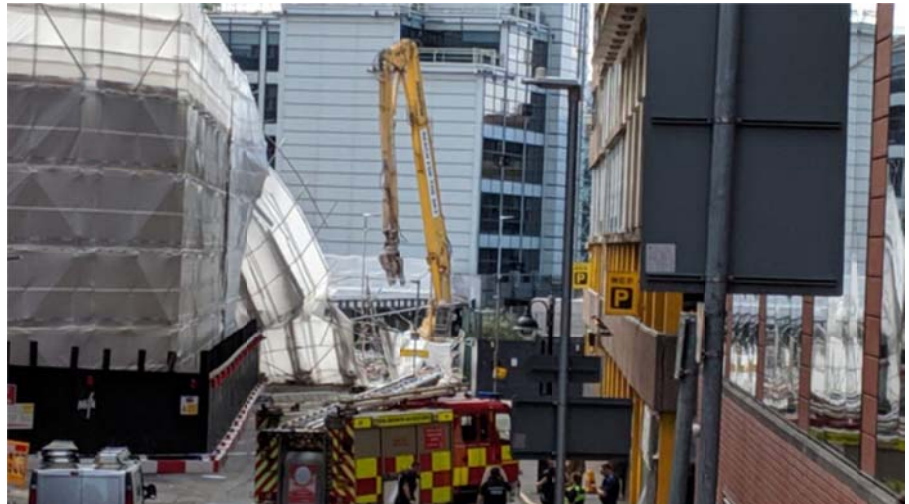
Partial north view
FIGURE 15



Partial north view
FIGURE 16

Scaffolding collapses at demolition site

A large sheeted scaffold screen incorporating access platforms was designed and erected to encase a building. The sheeting prevented dust and debris falling into surrounding public areas while the building was demolished floor by floor by small excavators. The scaffold was supposed to be dismantled progressively as each floor was demolished. It was not. The wind got up and the sail effect overloaded ties into the remains of the building. These failed and the scaffold collapsed onto a roadway below. The Fire Department arrived and were able to evacuate the area so there were no casualties. Demolition work should have been halted at the right stage until the scaffold contractor had attended to reduce the height of the scaffold.

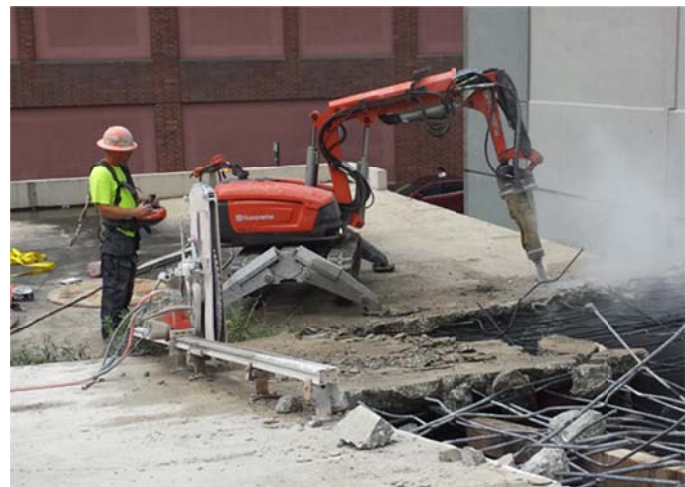


Existing structure overloaded by remote controlled demolition machines

Two sister companies have been ordered to pay out over \$380,000 in fines and costs after a worker died when concrete joists fell on top of him during a demolition project.

Electrician John Walker was working next to some remote controlled demolition machines on a site in Elephant and Castle in New York in August 2017 when one of the machines broke through a structural beam. This dislodged several concrete joists which then fell and struck him.

The district attorney said principal contractor, 777 Demolition and Haulage Co Ltd, and its subcontractor and sister firm, 777 Environmental Ltd, failed to properly plan, manage and monitor the demolition of the structure, which led to the collapse of the joists.



Concrete wall collapses on construction workers in El Cajon, killing one 8:51 AM PDT April 3, 2017

EL CAJON (CBS8/CNS) - Authorities Tuesday released the name of a 51-year-old construction worker killed in a structural collapse at an East County job site.

Fernando Martinez was taking a lunch break in a trench at the site of a planned car dealership at Wagner Road and North Marshall Avenue in El Cajon shortly before 12:30 p.m. Monday when a concrete-block wall at the edge of an adjacent residential yard fell on him, according to the county Medical Examiner's Office.

The contractor is being investigated by Cal-OSHA for failure to properly support the wall being demolished and for not creating a safety zone for unauthorized entry. Later the



contractor was cited for failure to conduct an engineering survey to determine the condition of the structure prior to demolition.

CAL-OSHA REGULATIONS

Demolition safety requirements are governed by Cal-OSHA per Subchapter 4. Construction Safety Orders Article 31. Demolition (Three Sections – Abridged)

§1734. Supervision;

(a) Demolition work shall at all times be under the immediate supervision of a **qualified person** with the authority to secure maximum safety for employees engaged in demolition work.

(b)(1) Prior to permitting employees to start demolition operations, a **qualified person shall make a survey of the structure** to determine the condition of the framing, floors, and walls, and the possibility of an unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also be similarly checked.

(2) The **survey shall be in written form, kept on the job-site** and made available to the Division upon request. The written survey shall be maintained for the duration of the demolition project.

§1735. Demolishing Buildings

- (a) Utility companies shall be notified and all utility service shut off, capped, or otherwise controlled, at the building or curb line before starting demolition, unless it is necessary to use electricity or water lines during demolition.
- (b) It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in any pipes, tanks, or other equipment on the property. **When the presence of any such substances is apparent** or suspected, testing and purging shall be performed and **the hazard eliminated before demolition** is started.
- (c) Pipe-covering insulation, steel beam and column fire protection, and heating, ventilating and air-conditioning duct work shall be surveyed for asbestos. **If asbestos is present**, the employer shall comply with Section 1529.
- (d)(1) Prior to starting demolition operations, all structural or other hazardous deficiencies noted during the survey required by Section 1734(b)(1) shall be shored, braced or otherwise corrected as recommended in the survey
- (e) In demolishing any building or structure or alteration involving partial demolition thereof, all material displaced, unless required for reconstruction, shall be **transported immediately to the ground**. The amount of material stored upon any structure or any portion of such structure shall not exceed its safe carrying capacity.
- (j) All persons on demolition projects shall be protected from falling material at employee entrances to multi-story structures being demolished, by sidewalk sheds or canopies or both, providing **protection extending from the face of the building for a minimum of 8 feet**. All such canopies shall be at least two feet wider than the building entrances or openings (one foot wider on each side thereof) and shall be capable of sustaining a load of 150 pounds per square foot.
- (q) In a multi-story building, when a stairwell is being used for access or egress, it shall be properly illuminated by either natural or artificial means, and completely and substantially covered over at a point not less than two floors below the floor on which work is being performed, and access to the floor where the work is in progress shall be through a properly lighted, protected, and separate passageway.

§341. Permit Requirements.

- (d) Work Activities Subject to Permit Requirements and the Types of Permits Required to Conduct the Activities.
- (3) To conduct the demolition or dismantling of any building or structure more than 36 feet in height, the Project Administrator shall hold a Project Permit and all other employers directly engaging in demolition or dismantling activity shall hold an Annual Permit.

§1736. Disposal of Waste Material.

- (a) Whenever waste material is dropped to any point lying outside the exterior walls of the building, enclosed chutes shall be used unless the area is effectively protected by barricades, fences or equivalent means. **Signs shall be posted to warn employees** of the hazards of falling debris.
- (b) When chutes are used to load trucks, they shall be fully enclosed. Gates shall be installed in each chute at or near the discharge end. A **qualified person shall be assigned** to control the operation of the gate, and the backing and loading of trucks.
- (c) Enclosed chutes should be designed for free flow of material, but if clogging or stoppages occur, employees shall not remove material from the chutes with their hands. Picks or other suitable implements shall be used for this purpose.
- (d) Any chute opening, into which employees dump debris by hand, shall be protected by a guardrail. Any open spaces between the chute and the edge of floor openings through which the chute passes shall be covered over.
- (e) When operations are not in progress, the discharge end of the chute shall be securely closed off, or the area barricaded or fenced as provided in Section 1736(a).

§ 1532.3. Occupational Exposures to Respirable Crystalline Silica

1. Scope and application. This section applies to all occupational exposures to respirable crystalline silica in construction work, except where employee exposure will remain below 25 micrograms per cubic meter of air (25 µg/m³) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.

This regulation identifies three primary methods of reducing risks associated with respirable crystalline silica

- 1) Use equipment with integrated water delivery system that continuously feeds water to the cutting surface
- 2) PPE - Respiratory protection.
Where respiratory protection is required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this subsection and Section 5144.
- 3) Housekeeping
The employer shall not allow dry sweeping or dry brushing where such activity could contribute to employee exposure to respirable crystalline silica unless wet sweeping, HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure are not feasible.