

Blunt Oatmeal Trauma  
Marlin E. Buckley / Master Plumber

**Case Synopsis:** A builder was in the process of renovating several floors of a downtown Philadelphia high-rise office building. Part of that work included the installation of a new mop receptor in a janitor’s closet. The plumbing contractor furnished and installed the specified mop receptor, and the plumbing inspector approved the work. Various other trades were performing finish work in the new offices, including carpentry, drywall, and painting. It is common practice for these trades to utilize new plumbing fixtures to wash their tools and brushes. An unidentified person dumped a large pail of water into this mop receptor, and in the process dumped a large portion of the water onto the floor adjacent to the receptor. Plaintiff was seated at her computer in the office located directly below this mop receptor. The spilled water found its way down through various pipe penetrations in the concrete floor and saturated the acoustical ceiling tile in the ceiling below. The saturated ceiling tile collapsed and landed on the plaintiff’s head. Plaintiff filed suit claiming serious personal injuries.

**Expert Analysis:** Plaintiff’s counsel alleged that the plumbing contractor failed to comply with project plans, specifications, city plumbing code, and product manufacturer’s installation instructions by not caulking the mop receptor. A close examination of the aforementioned documents indicated caulking was not required. Plan details revealed the floor and walls in this new janitor’s closet were never intended to be watertight. At a site inspection, it was discovered that abandoned piping inside an adjacent partition, outside the scope of the plumbing contractor’s work, penetrated the concrete floor. Had the new mop receptor been caulked, the spilled water would have easily run through the hole space around this abandoned piping. A package of the exact acoustical ceiling tile was obtained and a re-creation of the wet tile collapse was undertaken and documented with photographs. It was readily discovered that this particular ceiling tile had little resistance to water, absorbing water much like a sponge. Upon saturation the tile became a consistency similar to cooked oatmeal.

**Result:** Case settled prior to jury selection.

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Trolley Door Failure  
R. Scott King, BSME  
Mechanical Engineer

**Case Synopsis:** A passenger on a sightseeing trolley was injured while exiting the trolley. She, along with several witnesses, reported that while she was climbing down the exit steps the bi-fold trolley door suddenly shut, thrusting the passenger out on to the ground, resulting in moderate injuries. There were two sets of door controls, one at the driver’s seat, and another at the side door. However, the trolley operator was confident he did not activate his controls and witnesses were likewise confident no one was near the side door controls. As a result, a potential mechanical malfunction was suspected.

The trolley company, which performed its own maintenance and repairs, inspected and tested the door, its air-powered control system, and interlock safety mechanism, but did not detect any abnormal operation. To be sure, they retained an engineer to evaluate the door and its related systems.

**Expert Analysis:** Upon compiling a composite of the witness statements, and known circumstances, and allowing for variation in air system pressures and other operational variables, a series of reenactment tests was conducted. The early phases of testing did not reveal any operational abnormalities, consistent with the trolley company’s post incident inspection findings; however, the full range of testing exposed the condition. Specifically, the testing exposed a malfunctioning control circuit that, under the requisite conditions, repeatedly caused the door to forcefully close independent of either set of door controls thus demonstrating the viability of the passenger’s claim and witness statements.

**Result:** Although a suit was never filed, the engineering testing, findings, and conclusions provided the trolley company the accurate information upon which a settlement was offered and accepted.

Assault in Laundromat  
Keith Howse / Security and Law Enforcement

**Case Synopsis:** A mother, accompanied by her five-year-old daughter, was doing laundry at a local laundromat. The child, after entering the laundromat restroom, was attacked by a man armed with a box cutter and ice-pick. The child was unable to lock the door behind her. The child survived, but not before she was stabbed several times.

**Expert Analysis:** A security assessment of the laundromat and surrounding neighborhood identified security risks associated with the operation of the business, which primarily

catered to women who were regularly accompanied by their children. An analysis of the restroom door lock revealed the door hardware required a complicated push and twist maneuver to lock the door, as opposed to being outfitted with a single motion, push-button lock that was “kid-friendly.” Management also covered the office window with paper, eliminating natural surveillance of the laundromat area by on-site personnel.

**Result:** Case settled.

## Got it Wrong

**Steven Schorr, PE / Curtis Beloy, PE**  
Collision Reconstruction Engineers

**Case Synopsis:** A collision occurred on a divided highway where two vehicles collided, essentially head-on, before coming to rest off the roadway. The collision resulted in extensive damage to both vehicles and a considerable amount of physical evidence on the road, including tire marks, debris, and gouges. There were no witnesses to the collision and the drivers of the vehicles did not survive. The question that needed to be answered was which direction each vehicle was traveling prior to the collision.

**Expert Analysis:** The damaged vehicles were inspected and three-dimensional measurements were collected utilizing a high-definition survey [HDS] laser scanner. The crush profiles and imprints on the vehicles, along with other physical evidence, established the relative positions of the vehicles to one another at impact. Specifically, the damage established that instead of a head-on collision, one of the vehicles was actually angled slightly toward the other. Tire marks from the collision were examined. Portions of tire tread marks were visible on the roadway near the point of rest of the vehicles. Further, the tire marks suddenly changed direction indicating the location of the point of impact. Matching the tread pattern from the tire marks to one of the vehicles allowed for the placement of that vehicle on the roadway at impact. The orientation of the other vehicle, as defined by the angle of impact, clearly established the pre-impact direction of both vehicles.

**Result:** The direction of travel of the vehicles, as defined by the reconstruction analysis of the available physical evidence, was opposite the conclusion reached by the investigating officer. Further investigation established that the investigating officer did not reach his conclusions based on the physical evidence. After reviewing the reconstruction analysis based on the physical evidence, the investigation police officer recanted his report and changed his original findings.



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## “Guarding” from Injury

**Thomas J. Cocchiola, PE, CSP**  
Mechanical Engineer

**Case Synopsis:** A technician was injured while diagnosing a problem after performing preventive maintenance on a belt conveyor in a package handling facility. After completing his work, the technician unlocked the electrical disconnect switch and energized the conveyor to check it. He heard a noise coming from a drive unit so he decided to investigate the problem from a maintenance area under the conveyor, which was elevated about 3-feet above the floor. The technician was on the floor, under the conveyor, when he felt something contact his leg, causing him to react and move suddenly.

The sudden movement caused his hand to accidentally enter an unguarded in-running nip between the conveyor belt and a rotating drive pulley. Co-workers heard the technician scream and came to his aid.

**Expert Analysis:** Applicable safety codes and standards require guards for accessible in-running nip points formed between conveyor belts and pulleys. In this particular application, the manufacturer equipped the conveyor with guards for a floor-mounted application. The manufacturer claimed that it was unaware the customer planned to elevate the conveyor and agreed this application required a guard for the conveyor belt/pulley. The package handling facility owner claimed the manufacturer was informed the conveyor would be elevated. Nevertheless, the conveyor belt/pulley nip point was not guarded in accordance with the requirements of the manufacturer as well as applicable safety standards. A properly designed guard would have prevented the accident.

**Result:** The case was tried in federal court and resolved after expert testimony.

## Property Damage Due to Errant Golf Balls

**Michael S. Johnstone, AIA**  
Forensic Architect

**Case Synopsis:** Plaintiff purchased a home on a Country Club golf course. After living in the home only a few days, a golf ball flew through the picture window, spreading broken glass throughout the room. He went outside and found no one who might confess to the deed. Looking more closely at the exterior of the house, he noticed there were golf ball-sized dents in his garage doors, gutters and downspouts, siding and window frames. Closer inspection revealed golf balls in the bushes and gutters, and holes through the screened porch. He collected over 900 golf balls over the next few months and saved them in a big barrel, to be used as evidence in the event of a trial. He approached the club management to see if they were aware of the problem.

The club management responded by parking a golf cart in his backyard on a Saturday for three hours and noted that no balls landed on his property. The golf cart and club pro were visible from the tee. Club management concluded that there was no problem.

**Expert Analysis:** Suit was filed against the Country Club to cease and desist playing that hole. A golf course design expert visited the site, and documented the existing conditions and plotted the probable flight of a high percentage of tee shots.

The house sat at “ground zero” for slicing flight of right handed players teeing off from an elevated tee. The expert took the owners statement about his experiences, obtained scaled aerial photos, and reviewed photos of the damage. During a discussion with the original golf course designer, it was brought

to the expert’s attention that there was much less intrusion of golf balls when the grove of substantial trees was placed in front of the plaintiff’s house. The trees, subsequently, have been blown down during the storms of Ivan and Francis. As a result of the expert’s analysis, the following changes were proposed and documented for the hole: (1) re-orient the tee boxes to aim toward the

intended landing area to the left side of the fairway; (2) place a target pole in the center of the intended landing area; (3) replace the trees that had been blown down in previous hurricanes; (4) place a tall hedge to the right of each tee to channel drives to the left; and, (5) the owner should add a “natural grasses” garden at the rear of his property to create an area which makes the retrieval of out of bounds shots very difficult. The Country Club agreed to all the solutions except the hedge and the owner provided the grass garden.

**Result:** Case Settled.



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## Improper Braking Techniques

**Ronald E. Tomasetti, CDS, CDT**  
Trucking Safety Consultant

**Case Synopsis:** A tractor-trailer was traveling north on I-81 following in a line of heavy traffic, in a heavy rain, when the vehicle in front suddenly began to brake. The tractor-trailer driver attempted to avoid colliding with the automobile, but was not able to stop in time. A collision occurred between the tractor-trailer and the rear of the automobile. The tractor-trailer pushed the automobile into several other vehicles that had come to a complete stop causing serious injury to several occupants in the automobiles.

**Expert Analysis:** The investigation revealed that the driver had performed a pre-trip inspection that morning before departing his terminal. The police report noted no defects on the tractor-trailer after its collision inspection analysis. After inspecting the tractor-trailer, the expert was able to determine

that the tractor had an Anti-Lock Brake System (ABS) and the trailer had a standard air-brake system. The driver had used only hard braking (jammed on the brakes) in an attempt to stop and avoid the collision. Because of the uneven braking system, the wet roadway, and following too closely, the trailer swung into the left lane, passing the tractor portion of the combination unit (jack-knifed) and impacted the automobile. The expert testified to the lack of training and knowledge by the tractor-trailer driver in controlling a unit with two different braking systems, improper braking techniques, and not maintaining a proper following distance for the weather conditions that existed at the time of the collision.

**Results:** Verdict for plaintiff.

## Sledgehammer Blows


**Daniel Banks, PE / Premise Liability**

**Case Synopsis:** In 2002, an examination of a two-story mid-19th century brick building was conducted and nothing was found regarding any dynamic disturbance to the building. The front wall at that time had bulged outward and star bolting was specified. Three stars were installed at the first floor ceiling level. An engineering report noted no instances of any cracks or any bulging of the rear wall, or any damage whereby the doors did not close, and no racking or cracking within the interior was found. In 2008, another engineer visited the property and provided a survey of the general structural conditions. On the right side of the party wall of the building, he noted that the contractor working at the adjacent house removed the rear wall of that house and broke the bond between the rear wall at the right side party wall. This caused the rear wall to bow outward and lean out toward the rear of the property because this was an unsupported, 8-inch thick wall for two-stories.

**Expert Analysis:** Upon being retained, a new visit was conducted and it was noted that shoring had been provided to the bulged rearward leaning wall. Work that was done at the adjacent property had turned what was a structurally sound and stable structure into an unstable one. The wall had moved outward by a distance of 1½- to 3-inches, which would not have occurred if the property walls were bonded together. Additionally, the floor in the basement of this property had moved outward by 1½-inches due to an improper underpinning procedure, resulting in cracks. This caused settlement of the wall,

sloping of the joists and diagonal cracking at the second floor rear, whose directionality is toward the front of the house.

Defendants' engineers stated that the occupied house was originally defective and that the damage was not a result of the demolition operations. Upon examination, it was apparent that a sledgehammer, rather than saw cutting, was used to cut the rear wall of the house that was demolished and thus, by the dynamic actions, had removed any keying action of the brick and any tie material. Instead of installing a bolting procedure to tie the wall together, they had done nothing and the wall had bulged outward, now approaching 3-inches.

**Result:** Engineering analysis revealed that the 8-inch thick brick was not properly restrained, and was now free to move, leading to buckling. The allowable height for an 8-inch thick masonry wall is 13-feet, which is 20-times its thickness, thus, corroborating the conditions that were found. Sledgehammer blows and breaking of the bond between the party wall and the rear wall, shown in photographs, led to the conditions that occurred. The failure of the contractor to pin the wall together led to the racking of the rear exit door, and the bulging of the rear wall of the building. Additionally, the poor underpinning at the east side has caused the floors to slope within the interior of this building. All damage that was seen within this building could be traced to recent operations and the construction of the new house to the east. 

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