



Plick and Associates, Forensic Engineers

# Forensic Engineering Newsletter

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**Engineers aren't boring people, they just get excited over boring things.**

- Anonymous

**Plick and Associates has a slip meter available to assist in slip and fall investigations.**



## Why Underpinning is So Important

Older cities are experiencing an urban renaissance, as demonstrated by increased interest in older neighborhoods. Many older row homes and former non-residential structures are being renovated for new residential uses. One aspect of these renovations is the construction of usable, below grade levels, adjacent to existing older buildings with cellars with limited headroom. This involves excavating for the new basement below the elevation of the adjacent foundation and basement wall of the adjacent building.

**“First and foremost, a plan must be developed for the adjacent existing foundation to be underpinned”**

Such an excavation presents many challenges to be dealt with before the first bucketful of dirt is moved. First and foremost, a plan must be developed for the adjacent existing foundation to be underpinned to a depth equal to the depth of the foundation for the new construction. This requires the soil beneath the existing foundation be removed and replaced with a constructed element, such as a concrete wall. The soil beneath the entire length of an existing wall cannot be removed without the existing foundation collapsing. Therefore, underpinning is accomplished in sections, sometimes as little as two feet at a time, while the remainder of the foundation remains supported by soil or by previously constructed sections of underpinning. Failures often occur when a contractor does not underpin or elects to underpin a section of the existing foundation that is too long to support itself. The proper length of each section is a factor of the soil conditions and the strength and integrity of the existing foundation.

Another challenge is the risk there will be a collapse during the process of excavating down to the bearing elevation of the existing foundation, before the underpinning is initiated. The probability of this type of failure is high in older cities where the adjacent foundation wall may be 100 years or older. In the past, some foundations were constructed by digging a trench and filling it with rubble. This type of foundation has no inherent strength once the soil on one side is removed. Similar failures can occur in old stone masonry foundations where the mortar originally securing the individual stones has long since deteriorated.



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**Do you have a matter requiring forensic investigation or a question about your case which can be answered by a professional engineer or architect?  
Call us anytime at 610-747-0675 or email us at [experts@plickandassociates.com](mailto:experts@plickandassociates.com)**

## Anatomy of a Recall Part 2

Anatomy of a Recall, part 1, outlined the causation for an automotive recall. In this second part we will look at the different types of recalls and the factors considered in making the decision to issue a recall.

**From a Safety Defect to Vehicle Recall:** Vehicle/vehicle component recalls are initiated in two different manners. The first is a voluntary recall from the vehicle/component manufacturer. The second is a recall through the National Highway Transportation Safety Administration (NHTSA).



**The Voluntary Recall:** Most recalls conducted through a manufacturer are initiated without any involvement from NHTSA. Manufacturers conduct inspections and perform tests on their vehicles that reveal a safety defect exists or when Federal Motor Vehicle Safety Standards (FMVSS) are not achieved. The manufacturer is obligated to report any defects or non-compliance of FMVSS to NHTSA. The manufacturer is also obligated to remediate the defect, at no charge to the vehicle owner, via a voluntary recall and prevent future occurrences of the defect.

**The NHTSA Recall:** As vehicles age, certain vehicle systems may exhibit design and performance issues that are reported to NHTSA by the vehicle owners. These reported issues create the foundation which often result in NHTSA safety recalls being conducted. NHTSA recalls are conducted in several phases.

**The NHTSA Investigation:** NHTSA begins the recall process by conducting an investigation. NHTSA investigates every phone call, letter and complaint to determine if a possible defect or safety issue exists. This information is entered into a database which is updated and reviewed weekly to evaluate the number of complaints and the severity of the potential defect. The number of complaints is compared to the number of vehicles/vehicle equipment manufactured and how long the vehicle(s)/equipment has been in service with the potential defect or non-compliance issue. NHTSA will further evaluate the data and determine if the reported incidents are isolated or if a trend is developing. If NHTSA suspects a trend is developing and a potential defect and/or safety hazard exists, the information will then be presented to NHTSA's Office of Defects Investigation (ODI).

**The Office of Defects Investigation (ODI):** The ODI conducts their investigation(s) in two phases. First, they initiate a Preliminary Evaluation (PE); second they conduct an Engineering Analysis (EA) if they determine a safety defect exists.

**The Preliminary Evaluation (PE):** The PE is usually initiated from the data collected from consumer complaints. During this phase, the ODI will request information from the manufacturer of the vehicle/component. This information may include data on complaints, fires, crashes, injuries, warranty claims, modifications, and parts sales. NHTSA will also contact other manufacturers to conduct a "peer" review. A peer review consists of information submitted by manufacturers who construct similar vehicles or equipment as the manufacturer of the alleged defect. This information assists NHTSA in determining the limitation(s) of a product/design or if a defect exists. The following is an example of how a peer review was utilized to assist NHTSA in making a determination of a defect versus product/engineering limitations.

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## Introducing Plick and Associates Reconstruction Services

Plick and Associates, Forensic Engineers' highly trained and experienced team of engineers can handle all of aspects of your case, from forensic investigation to design and reconstruction. Following a loss, our engineers and architects are available to lead the reconstruction effort for you. We are presently providing engineering and architectural services to reconstruct a heavily fire damaged condominium complex, as well as a fire-damaged commercial strip mall.



This is just another example of how Plick and Associates, Forensic Engineers is your full-service engineering firm. Please call 610-747-0675 for more information or to discuss your particular needs.



## The Anatomy of a Recall, Part 2 continued from Page 2

Example: December 2004, NHTSA initiated a PE with Volkswagen of America regarding side/thorax airbag deployment from a non-collision impact to the vehicle. NHTSA also contacted other vehicle manufacturers requesting their information regarding the same allegation of side/thorax airbag deployment. The result of NHTSA's investigation revealed other manufacturers had a similar number of deployments. NHTSA concluded no defect existed, and the deployments were an acceptable result of the non-collision impact.

During this phase, the manufacturer has the opportunity to initiate the recall or comment in regard to the alleged defect. PEs usually take between three to four months to conduct. They are closed on the basis that no safety issue/defect exists or because the manufacturer has decided to conduct a recall. When ODI believes further analysis is necessary and the manufacturer does not initiate the recall, the PE is upgraded to an EA.

In the next addition of the newsletter, part 3 will address the Engineering Analysis (EA) of a safety issued recall, manufacturer's refusal to conduct a recall and the consumer's role.

## Why Underpinning is So Important, continued from Page 1

On December 2, 2005, the City of Philadelphia Department of Licenses and Inspections issued a Code Bulletin of Information, No. 0503. It states, in part:

“The City has recently experienced several building collapses attributed to builders digging basements and footings too close to existing buildings. In particular, many older buildings in Philadelphia are supported on rubble stone foundation walls with minimal or no spread footings below. When such walls are exposed or undermined they become unstable and are prone to sudden catastrophic failure. Building collapses have also been caused by property owners that attempt to increase the height of their basements by digging out the basement floor. Though the danger is most acute with rubble stone foundation walls, damage and failure can occur whenever structures are undermined, regardless of their age or condition. This Code Bulletin will set forth construction document requirements to aid in enforcing the code section that addresses this concern.”

The bulletin requires a registered professional engineer plan the underpinning process and engineer perform special inspections during the process. However, the continued frequency of recent building wall collapses suggests these requirements are not being implemented with adequate vigilance.

## A Picture is Worth a Thousand Words

The Worker's Compensation Act generally establishes liability of an employer for injuries or sickness arising during the course of employment. The liability is created without regard to the fault or negligence of the employer. Benefits generally include hospital, other medical and compensation payments. Except in extreme circumstances, there is usually no other remedy against the employer. This being the situation, injured employees will sometimes seek compensation from others who they allege caused the injury. The following case depicts such a circumstance.

John Doe was a longshoreman working aboard a commercial seagoing vessel in the early morning hours in the month of April. The ship was docked in a Philadelphia port and was in the process of having cargo containers removed. Mr. Doe was part of a long-shoring gang involved in the removal of the containers. Mr. Doe alleged he slipped on a rope on the deck and fell. It was nighttime at the time of the accident. Mr. Doe sued the owner of the vessel, who was not his employer, claiming inadequate lighting caused the accident. Mrs. Doe also sued for the loss of conjugal rights. The lighting was furnished by lights aboard the vessel as well as from a shore side crane being used to remove containers from the vessel.

The defense presentation consisted of the following: medical opinions concerning Mr. Doe's injuries, expert opinion on the procedure and methods of storing and unloading cargo from a vessel, and expert opinion concerning the level and adequacy of the illumination at the time of the accident. Plick and Associates, Forensic Engineers was requested to conduct an independent investigation to evaluate lighting levels at the time of the accident, and determine if the lighting was adequate for the tasks being performed.

The investigation dictated that cargo unloading circumstances be similar to the time of the accident. This required the ship be in port and unloading at the same time, under similar weather conditions and lighting levels as the accident. It was difficult to coordinate the ship's schedule with the weather conditions.

There were times when the ship arrived and left during daylight, not at nighttime. There were times when the weather conditions were proper, but the ship's departure time did not allow for the investigation. There was also the additional complication that the investigation could not interfere with the normal activities of the ship. ie; unloading cargo.

Finally, an occasion arose when the ship was in dock and unloading under similar conditions as the time of the accident, with sufficient time to allow for the investigation. The weather conditions were similar and illumination levels were taken with light meters. Most importantly, color photographs were taken with a 35mm camera without the use of a flash attachment. The photographs taken were in the environment of the existing lighting on the ship.

The suit was tried in the United States District Court for the Eastern District of Pennsylvania. The trial was a "bench" trial, tried only in the presence of a judge. The defense received a favorable verdict. Whereas, the case was decided by many factors, an important and deciding contribution was the photographs taken of the location and under similar conditions of the accident. The old adage prevailed: "A picture is worth a thousand words."





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 previous editions.

## Plick and Associates, Forensic Engineers On The Road!

Plick and Associates, Forensic Engineers, was recently asked to speak at the National Association of Subrogation Professionals (NASP) September Meeting at PSE&G. Sidney Rubin, P.E. C.F.E.I., gave a presentation entitled "Subrogation Recovery from Electrical Fire". The talk was informative, generated a tremendous response and many questions. It is safe to say the audience walked away knowing much more than when they arrived at the meeting.



Sidney Rubin, P.E., C.F.E.I.

Plick and Associates, Forensic Engineers, attended the NASP Annual Conference in Hollywood, Florida. This conference drew a diverse crowd of people from the legal and insurance community who were all interested in expanding their knowledge of variety of subrogation issues. It also provided us an opportunity to reunite with friends from around the country.



Michael Plick, P.E. and Richard Klein

## Engineer Spotlight

WILLIAM B. ALBER, Mechanical Engineer

Bill Alber is a graduate of Drexel University with a B.S. in Mechanical Engineering and more than 20 years of engineering experience. Bill is also a third generation Heating, Ventilating, Air Conditioning (HVAC) service technician. Bill is the owner of the Alber Service Company, an HVAC firm started by his grandfather in 1948. He has over 30 years experience in HVAC system design, diagnosis, system retrofitting, air distribution problems, and specialized heating and geothermal operations. Bill has conducted hundreds of investigations and analyses of various equipment malfunctions, failures, fires, and accidents. He provides mediation assistance and expert testimony when required. In addition, Bill has conducted seminars for national, state and local audiences. He is a member of the American Society of Heating, Refrigeration and Air Conditioning Engineers, Radiant Panel Association, International Ground Source Heat Pump Association, and the New Jersey Heat Pump Council. Recently, Bill received certification from the Building Performance Institute to identify and remediate building issues related to health and safety, air leakage, insulation levels, appliance efficiencies and duct leakage.



For the past 5 years, Bill has been actively involved in the world of physical fitness. He has competed in strength training, "strong man" and kettlebell competitions. A kettlebell is a traditional Russian cast iron weight, which looks like a cannonball with a handle. They increase strength, endurance, agility and balance, and have been nationally recognized and used throughout the world for decades. When Bill isn't working or competing, he's home with his wife of 27 years, Pat and his two children. In his free time, you'll find him fishing, enjoying a good cigar or playing the guitar.