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Anatomy of a Forensic Engineering Case

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Introduction

There are two cases that will be discussed. The first case involved three domains of the writer's practice that included Building Codes, Street Construction, and Vehicular Accident Reconstruction, and to the extent that opposing experts have opined in attempts to try and "win" a case for their clients. The second case involved old building codes, but more importantly it involved the definitions of words within the building code as defined by the opposing attorney, which had to be rebuffed in the process of defending the writer's opinion.

Case #1.

The Plaintiff was standing in a strip mall in front of an office waiting for the owner to open for business. The stores and offices were adjacent to and along side of the mall parking lot. A sidewalk was between the edge of the parking lot and the front of the store/offices. (See figure 1.) The store owner arrived through the driveway parking lot in 1997 Volkswagen Passat and was attempting to park in a painted stall in front of the office where the plaintiff was standing. The Passat accelerated instead of slowing and jumped a 3-1/4" high curb pinning the Plaintiff between store front and car. The air bags of Passat did not deploy. The Passat insurance company paid the full policy. The Plaintiff's physical and mental condition deteriorated with time and the Plaintiff was confined to a nursing home, probably for the rest of her life. Plaintiff sued the property owner and asphalt contractor who resurfaced parking lot several months prior to accident. The writer was consulted and was disclosed as the expert for asphalt contractor. The Plaintiff engaged an expert to prepare a case against the owner and asphalt contractor.

As part of his report the opposing expert cited section §27-481 (Protection of Adjoining Property) from the current 1968 Building Code of the City of New York which stated in part;

> §[C26-712.3] 27-481 Protection of adjoining property.
>
> (a) Curbs and bumpers. – Open parking lots shall be completely separated from adjoining land by curbs or bumpers of concrete, masonry, steel, heavy

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timber, or other similar and equally substantial materials, securely anchored so as to stop motor vehicles. Curbs and bumpers shall be at least eight inches high and eight inches wide.

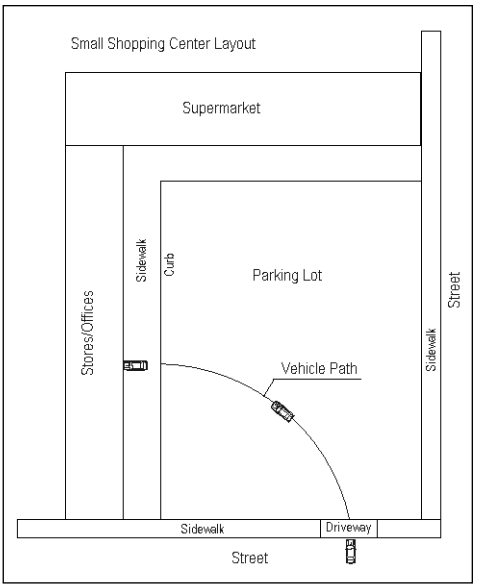


Figure 1

The purpose of opposing expert citing this section was to establish that the 3-1/4" curb reveal was not sufficient and was a result of the resurfacing, and that this type of accident should have been foreseen, i.e., vehicles mounting the curb. He opined that an 8" curb should have been maintained when the parking lot was resurfaced. In addition, the contractor was negligent when he allowed the curb reveal to become less than the "required" 8". The writer opined that this section did not apply for 2 reasons;

1.) The parking area, curb and store front were not adjoining land or property, it was within the owner's property. Black's Law Dictionary defines adjoining as, "... touching or contiguous as distinguished from lying near to or adjacent. To be in contact with. To abut upon." Adjoining owners; "... persons who own land touching the subject land..."

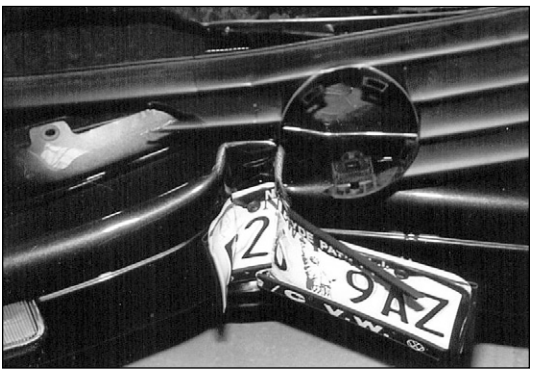
2.) The section cited was from the 1968 Building Code of the City of New York.

The mall stores and parking lot were constructed circa 1965. This indicated that the shopping center was constructed under the 1938 Building Code of the City of New York.

There were no provisions in the 1938 Building Code that required an owner to place curbs or bumpers between parking areas, sidewalks, store fronts or adjoining land. In addition, the building department did not issue any Directives that required owners to add barriers or bollards between parking lots and/or land or store fronts. Although, it should be noted that presently when gas stations, for example, are constructed, bollards are installed between the parking area and the store front.

The opposing expert also cited Section 27-127 (Maintenance requirements) from the current 1968 Code which stated;

> "… All service equipment, means of egress, devices, and safeguards that are required in a building by the provisions of this code or other applicable laws or regulations, or that were required by law when the building was erected, altered, or repaired, shall be maintained in good working order (emphases added)."



Opposing expert also cited Section 27-128 (Owner responsibility) from the current 1968 Code which stated;

> §[C26-105.2] 27-128 Owner responsibility. – The owner shall be responsible at all times for the safe maintenance of the building and its facilities.

The owner resurfaced the parking lot in order to maintain the surface in a safe condition and therefore did not violate Section 27-128 (Owner Responsibility) of the current 1968 Building Code. Prior to resurfacing the surface of the parking lot was uneven and contained potholes.

The opposing expert elected not to use the alteration sections of the 1968 New York City Building Code. Section §27-117 stated that alterations under

30% of the building value within 12 month period can be performed to Old Code. The cost of resurfacing of the parking lot was approximately 9% of the value of the building. This information was obtained and available at the Department of Buildings.

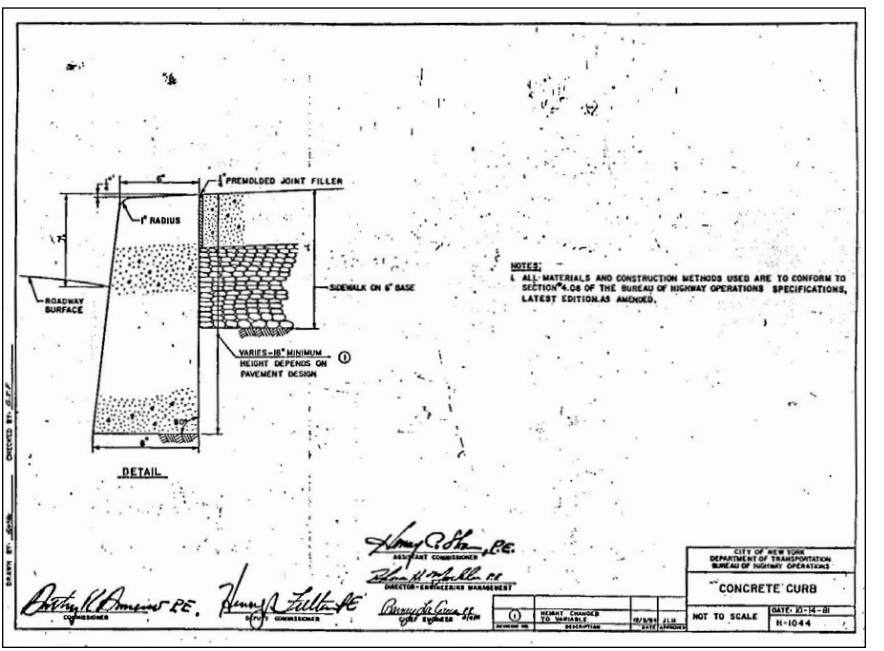
The opposing expert relied on New York City Highway Details of Construction for new curb construction.

The opposing expert ignored or was not aware of the construction detail for the overlay of roadway surfaces where the curb height was allowed to be an absolute minimum of 2-1/2" with a desirable height of 4".

The new construction of curb did not apply because the parking lot was overlaid and not newly constructed surface.

The resurfacing practice had been in effect in the City of New York since 1980. The reveal of the curb height in front of the store was 3-1/4" and was therefore within the minimum acceptable range of 2-1/2" and 4".

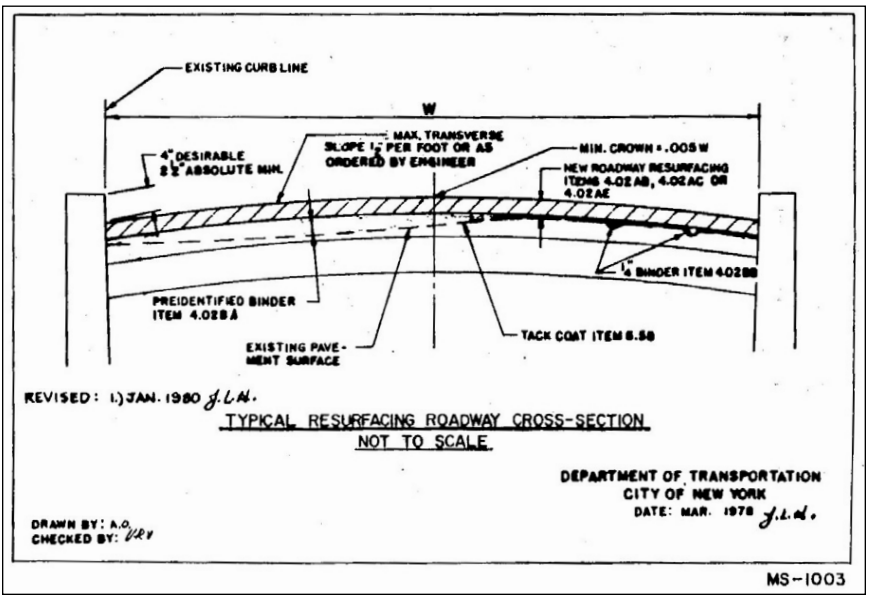
The Plaintiff's expert also relied on the AIA Architectural Standard Graphics to support his opinion that the minimum height of a concrete curb above pavement should be 6" and that precast concrete parking bumpers 6" high



should have been installed. The AIA standards are used by highway design engineers and architects as a guide. In fact, when curbs are constructed their heights are generally between six inches (6") and seven inches (7") not 8" as opposing expert opined.

The curriculum vitae of the Plaintiff's expert did not state that he had experience in vehicular accident reconstruction and analysis. Because of his inexperience in this area, he used terms in his report like "very, very slow" when expressing the speed of the Passat. He did not examine or analyze the crush damage and other evidence of the vehicle to determine the approximate speed of the vehicle at impact. The Plaintiff's expert stated that if the curb height was eight inches (8"), the vehicle's undercarriage would have struck the eight inch (8") curb and, "... stop(ped) the vehicle in its tracks." This statement revealed Expert's "naiveté" in vehicular accident reconstruction. The force to slow the vehicle if it was scrapping its chassis on the top to the curb was not calculated. Therefore, the expert did not support his statement that the vehicle would have stopped if the undercarriage would have struck the eight inch (8") curb, had that curb been in place. Plaintiff's expert also demonstrated his lack of experience in vehicular accident reconstruction when he stated, that the bumpers, (concrete wheel stops) "…alert(ed) the driver to step on his brake and stop his vehicle."

This statement ignored the perception/reaction/decision time of drivers. More probably than not, the driver had his foot on the accelerator when he thought he had his foot on the brake. This is common in "sudden acceleration"

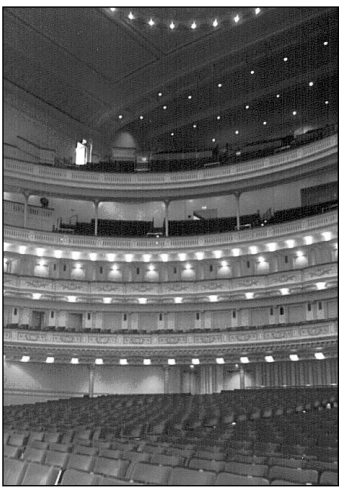


cases. The driver does not realize that his foot is on the accelerator but thinks his foot is on the brake, making him press harder on the accelerator and he does not understand why the vehicle is moving faster. The perception and understanding of what is happening take time to realize. It could take up to 10 seconds to correct, which is usually too long. The opposing expert did not perform; any calculations to support his opinions; any analysis of crush damage measurements from photographs; any force calculations from damaged store front columns; any analysis of any changes in energy from the vehicle mounting curb and scraping the concrete sidewalk to support his opinion; any analysis of any evidence as to why the air bag did not deploy on impact; any analysis of any perception/reaction times and calculations to prove or disprove his theory of the cause of the accident; and any research on the building history, for example, date of construction.

The case was settled just prior to the writer testifying in court. The Plaintiff's expert was not present in court and did not testify during the direct portion of the trial. Judge brokered a settlement that resulted in various percentages of damages.

Case #2

A Woman tripped and fell descending the upper balcony steps of an old auditorium. The New York City Building Department Public Access Property Profile Overview classified the building as a public assembly building with landmark status. There were New Building Permits (NB) issued in the years 1882, 1883, 1889, 1925, 1983 and 1986. This indicated that the building was constructed in compliance with the 1882 Building Code of the City of New York, and according to the 1916 and 1968 Building Codes of the City of New York depending on the year of the alteration. The Judge ruled that the 1892 Building Code would apply. The balcony section was the original construction with only cosmetic changes. The 1892 Building Code amended to 1885, required that for the construction of theaters, stairs and stairways shall have risers no higher than 7-1/2". The defendant had an expert at the time of the inspection but did not disclose the expert as the case progressed.



The Defendant's argument was the following:
Aisles were not staircases or stairs so that they did not have to comply with

the section of the Code for stairs. To rebut that argument the definitions of step, stair, staircase and aisle, using Black's Law Dictionary[1] and the Universal Oxford Dictionary[2] were the following:

Step: Something on which to place the foot in ascending or descending. A flat-topped structure, normally made of wood or stone and some six or seven inches high, used, singly or as one of a series, to facilitate a person's movement from one level to another.

Stair: An ascending series or "flight" of steps leading from one level to another.

Staircase: The inclosure of a flight of stairs.

Aisle: Orig. A passage in a church between the rows or seats.

Aisle: Modern: A walkway between or along sections of seats in a theater, classroom, or the like.

Aisles were not defined as either being steps, ramps or level. Aisles were only defined as being separations between rows of seats. Therefore, this particular aisle which included a series of steps, violated the riser height of the Old Building Code, the code to which the auditorium was constructed.

Conclusion

When analyzing a forensic engineering case the expert must carefully read the codes that apply to the case, and the codes that the opposing expert is relying, and if necessary with a dictionary. Be sure the codes apply to the details of the case being examined and not to another application. In the words of E. Joyce Dixon, "Define your terms." If necessary, use a standard dictionary and/or Black's Law dictionary. Most importantly, stay within your area of expertise and use calculations to support your theories whenever possible.

References

1. Black's Law Dictionary, Sixth Edition, West Publishing Company, St. Paul, Minnesota.

2. The Oxford Universal Dictionary on Historical Principles, 3rd Edition, Oxford at the Clarendon Press, 1955.