

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF THE TRIAL COURT

ESSEX, ss.

SUPERIOR COURT
C.A. No. 03-1397-D

JULIET M. BRYCE AND SCOTT
LACAVA ,
Plaintiff(s)

v.

RYAN CARROLL; BIG PAPA'S LLC;
AND JOSEPH A. MARCUS, AS
TRUSTEE OF BIG PAPA'S REALTY
TRUST ,
Defendant(s)

AFFIDAVIT OF JAMES D'ANGELO, P.E.

I, James D'Angelo, being duly sworn, hereby depose and state under pains and penalties of perjury:

1. I am above the age of majority.

2. I am the President and founder of Transportation, Engineering and Construction, Inc. (TEC), of Andover, Massachusetts. TEC provides transportation, engineering design and construction management services to public and private sector clients. I am a registered professional engineer and am licensed in Massachusetts, New Hampshire, Florida and Arizona. One of my areas of specialization has been traffic engineering, which includes site planning and traffic analysis in the design and layout of parking lots and parking facilities. I am a member of several professional organizations dedicated to furthering traffic safety in such projects, including the Institute of Transportation Engineers (ITE). I have been designated or have testified as an expert witness in several cases involving a question of the safety of parking area layouts.

3. In arriving at my opinion and preparing this affidavit, I reviewed :

- a. Accident Report of previous accident next door to the site dated December 11, 1999
- b. Copies of Photos taken of the Site by police photographers and Plaintiffs' investigators
- c. Mass State Police Collision Analysis and Reconstruction Report

- d. Plan of site by Stephen Benanti prepared January 14, 2004
- e. Plan of Rantoul/Cabot Street approach to the site prepared January 14, 2004
- f. Victim's Statement by Juliet Bryce
- g. Article from The Salem Evening News dated March 22, 2001
- h. Article from The Salem Evening News Online Plus Edition dated March 22, 2001
- i. Police Office's Formal Report, including accident reports and witness statements.
- j. Motor Vehicle Data for vehicles involved in the accident
- k. Affidavit of Norman Ganley dated November 1, 2004
- l. TEC Visit to the site - October 21, 2003

Parking Layout and Enforcement

4. It is apparent from a field review of the site and a review of the above information listed above that the Big Papa's parking lot is severely restricted and provides minimal area for parking, storage, and maneuvering. The building occupies approximately 1,700 sf of the 5,596 sf site and as shown in the partial site layout plan by the accident reconstruction specialist, Stephen Benanti prepared January 14, 2004, a portion of which is attached as Exhibit A. The traffic aisle width in front of the store front is only about 10 feet and therefore should operate as one way in from the south (the Bridge approach) and one way out to the north. See, Photo 1. The curb openings however are inconsistent with this minimal maneuvering area and limited distance to the front of the store. The southernmost curb opening is approximately 28 feet and the northern opening is approximately 35 feet. Parking was not permitted in the front of the building, near the site of the pedestrian collision, based on the affidavit of the City of Beverly Disability Commissioner, Norm Ganley, and photos of the site at the time of the accident. See, Photo 2. It was also noted that the Disability Commission commented on the less than adequate sidewalk space in front of the store prior to the accident.

Photo 1

5. A review of information supplied by the Beverly Building Department indicates that there is not sufficient parking supply to meet the existing zoning regulations. A take-out restaurant of 1,700 square feet requires approximately 9 parking spaces based on a parking supply rate of 1 space per 200 square feet. Based on photographs and a site inspection, this site had only 6 striped parking spaces at the time of the accident. This falls 3 spaces below the City's requirements. This deficiency was likely a factor influencing patrons to use unmarked and/or restricted areas. It appears that the site may have been allowed as a non-conforming existing use for the issuance of an occupancy permit to operate Big Papa's, but we have not conducted any further research as to the approval process leading to the occupancy and operation of the restaurant.

6. The signalized intersection of Route 1A at Cabot Street lies at the southwestern corner of the subject parcel. Due to the alignment and design speed of Route 1A just to the south of this intersection, patrons often entered the site at a high rate of speed with very little room to make the transition from the street and negotiate into a parking stall. See, Photo 3 below. The posted speed limit in the immediate vicinity of the site is 30 miles per hour. As mentioned previously, the pavement area in front of the store along the face of the building, just south of the door, was striped as “No Parking” at the time of this accident. Due to the possibility of a high-speed motorist entering the site, it was appropriate to prohibit head-in parking in this area.

Photo 2

7. Multiple data sources have indicated that, prior to this accident, there had been several other accidents in the immediate area, presumably contributed to by the alignment and design of the intersection south of the subject parcel. In fact, about a year earlier, a vehicle left the roadway and caused significant damage to the building next door, which is shown in photo 4.

Photo 3

Definition and Protection of Pedestrian Areas

8. In designing a parking area, it is imperative to keep in mind that more than 10%, and possibly as many as 25%, of all collisions involving pedestrians and motor vehicles occur in parking lots, according to a recent study. Federal Highway Administration study: “Injuries to Pedestrians and Bicyclists: An Analysis Based on Hospital Emergency Department Data,” FHWA-RD-99-078 (attached hereto as Exhibit B); North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation study: “Pedestrian Crash Types Summary Report” (attached hereto as Exhibit C).

9. The entrance(s) to the store or restaurant is logically the place of highest pedestrian exposure, since each customer or employee must enter and exit through that area(s). Thus, in an establishment serving hundreds of customers on a fast-food, ATM or convenience-store basis daily, the risk of an accident is significantly increased compared to other, “quieter” parking locales.

10. Furthermore, “unintended” or “sudden” acceleration of vehicles in parking lots is a well-recognized phenomenon. It involves a vehicle accelerating, usually from a stopped position or while parking, and moving in a manner or direction not intended by the operator. Usually, a collision follows. This happens with enough frequency that such collisions with buildings or property are known as “run-ins,” “drive-throughs” or “car strikes” in the convenience store industry.

11. In a Risk Management letter published by the National Association of Convenience Stores in November of 2000 the “top 10” industry loss types were identified. The risk of a motor vehicle accident affecting store operations was one of them and was thought to average one per year per store. Such losses were noted to be preventable by use of “barrier protection, car stops, ballards(sic)...” *Risk Management Update*, November 17, 2000-Vol.3, No. 11
<http://www.cstorecentral.com/register/resource/resource/risk3.11.html> (attached hereto as Exhibit D).

12. Since at least 1991, the Commonwealth of Massachusetts has required all garages and service stations which store or dispense gasoline to install a “vertical barrier” (defined as “...guard posts, guard rails or pipe bollards, that prevents a motor vehicle from contacting a protected item...”) at both ends of gasoline pumps. 527 CMR 5.02 and 5.07(8)(b)(1) (attached hereto as Exhibit E). Industry standards have moved towards greater protection of people and property through the use of bollards.

13. I was recently retained as an expert witness in a case against a 900-store convenience chain arising out of an accident involving the sudden acceleration from a head-in parking spot of a vehicle which struck a pedestrian on the walkway in front of the parking spot. In the course of pre-trial discovery, evidence of at least 165 similar incidents in a 5-year period was disclosed, in that vehicles from head-in parking spots had overrun the space and the walkway and had struck either persons on the walkway or the store itself. Regarding one particular store in Deerfield, Massachusetts, the Building Commissioner ordered the chain to take immediate steps to protect pedestrians on the walkway in front of the store. Using the plans for the store in question which I prepared, the chain has begun to improve its parking lot layouts by installing bollards between parking and pedestrian areas.



Photo 4

14. The National Transportation Safety Board has recognized that “[s]egregating pedestrian from vehicular traffic is a key element in pedestrian safety. Positive barriers between pedestrians and vehicles, although not always viable, are the best method of ensuring this segregation.” *Highway Accident Report NTSB/HAR-04/04*, adopted August 3, 2004, at p.44 (attached hereto as Exhibit F).

15. One commentator, writing in “Professional Safety” in 1988 noted that one 300-store division of a national chain of convenience stores suffered 5 incidents per week of cars striking the fronts of its buildings prior to the installation of protective barriers. This same article noted the regular use of vertical barriers by other convenience store chains. Miller, Barrett C., “Pedestrian Protection at Convenience Stores”, *Professional Safety*, June 1988, pp. 21-22 (attached hereto as Exhibit G).

16. In planning the layout of a parking space which must utilize head-in parking, safety concerns dictate a recognition that “[w]heel stops, curbs, bumpers and bollards are used to protect structures, [and] limit parking encroachment onto pedestrian pathways ...[S]ome vehicles overhang their wheels farther than the overhang setbacks recommended here, and cars occasionally ride up or over curbs and wheel stops. *Thus, curbs and wheel stops should not be used when positive limitation is required.* Bollards at least 36 inches (~.9m) tall or bumpers can be used to protect buildings, trees, fire hydrants, or other structures within harm’s way.” *Parking Spaces, A Design, Implementation and Use Manual For Architects, Planners, and Engineers*, Mark C. Childs, McGraw-Hill 1999 at pp. 243-244 (emphasis supplied) (attached hereto as

Exhibit H). At the time of the accident, bollards were in place at the site protecting a signal box and a pay phone at the southern end of the parking lot, as shown in the photographs below.

Photo 5

Photo 6

17. The sidewalk along the front of the building was 32 inches wide at the time of the accident. The preferred useable width of a sidewalk is 5 feet (60 inches), which gives pedestrians enough room to comfortably pass one another while walking in opposite directions. At a minimum, the Commonwealth, through the Architectural Access Board (AAB), requires 48 inches of sidewalk width, excluding curbs, with an unobstructed path of travel of at least 36 inches. 521 CMR 22.2 The use of wheel stops is appropriate for head-in parking spaces to keep the front bumper of a vehicle from extending over the curb. This is only used to define the limit of the vehicle space and the start of the pedestrian space under normal operating conditions. Based on the affidavit from Norman Ganley, the City had requested a handicapped parking space in front of the store with ramp access to the door as well as wider sidewalks in the fall of 2000, approximately 6 months prior to the incident with Ms. Bryce. Although a new ramp access was constructed prior to the accident, the concrete sidewalk/apron remained 32 inches wide and no handicapped parking space had been marked.

18. A review of the vehicle characteristics of the 2000, 4-Door Hyundai Elantra that pinned Ms. Bryce to the building shows a front overhang dimension of 33 inches, measured from the face of the front bumper to the centerline of the front axle. With standard 14 inch diameter rims and a tire profile of approximately 6 inches, this means only ± 18 inches would be available for pedestrian passage in front of the vehicle before the tire hit the 6-inch curb defining the walkway. Vehicles can overrun a curb, when traveling perpendicular to the curb, at low speeds, depending on the size and profile of the tire.

19. Based on the minor, aesthetic , damage of the building facade from this accident (see, Photo 8 below and Photo 2 on p. 3), it appears that the Hyundai which struck Ms. Bryce was traveling at a low speed following the secondary impact from the pick-up truck. It was nevertheless able to mount the curb and pin Ms. Bryce to the wall despite being in gear with the parking brake on. Based on the physical damage of the building façade, it appears that a significant amount of collision energy was absorbed prior to the impact with Ms. Bryce. A bollard would have absorbed the residual energy and afforded her a significantly higher level of safety.



Photo 7

20. In addition to the foregoing, the lack of transition room for parking, and limited transition space for vehicles to decrease their speed as they turn off Cabot Street, necessitates the use of permanent bollards to protect the pedestrian spaces.

21. Permanent bollards have been used at many sites where there is limited parking room and sub-standard pedestrian accommodations, such as in this case. The use of bollards, with an expanded sidewalk width, was appropriate for this site and should have been in place prior to the accident. Many commercially available 8-inch bollards can withstand a vehicle weighing 4500 pounds at a speed of 30 miles per hour. Some 6-inch diameter bollards can actually withstand a 15,000-pound object at 62 miles per hour (e.g. Delta Scientific Corporation). The approximate weight of a standard 2000 Hyundai Elantra is only 2600 pounds¹. If sidewalk safety improvements, including bollards, had been installed at the Big Papa's site, Ms. Bryce would not have sustained her injuries.

Conclusion

22. I can state based on my review that,

- a. The parking layout and the excessively wide driveway openings made the site more hazardous.
- b. The narrow width of the sidewalk to access the parking on the south side of the building created a hazard for all who used it as they passed in front of any vehicle parked in front of the building.
- c. Enforcement of the handicapped parking area would have significantly reduced the number of vehicles being parked in this area and creating the hazard to pedestrians using the narrow sidewalk area.

¹ Source: Hyundai Motors 2000 Elantra 4-Door Sedan, Front-Wheel Drive; Motor Vehicle Data, Twinsburg, Ohio

- d. The limited parking area at the site required increased traffic engineering protection measures to improve pedestrian safety.

23. Had the following civil and traffic engineering measures been designed and constructed prior to the accident in response to the request by the City of Beverly and in conformity with reasonable safety concerns , the safety characteristics of the vehicle and pedestrian operations at this site would have improved significantly and averted the pedestrian injuries sustained by Ms. Bryce:

- a. Reconfigure parking as shown on the accompanying plan (attached as Exhibit I) to define parking parallel to the front face of the building as well as to the sides. This provides an additional, seventh, parking space.
- b. Reconstruct the front walkway to five feet wide, maintaining a 6-inch vertical curb face.
- c. Install Bollards along the sidewalk edge to create secure pedestrian space.
- d. Educate store managers about the need to enforce parking prohibitions at the site.

Further Affidavit, Sayeth Not.

James D'Angelo, P.E.

Dated: _____