Forensic Architect's Investigation of Golf Course Safety

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Introduction

This paper demonstrates the "Generally Accepted Guidelines" for Safety Planning for errant golf shots in the golf course design process. Two contemporary cases will be described.

Key Words

Forensic Architecture, Golf Course Safety, Errant Golf Shot, Golf Course Accidents

The game of golf has fascinated and confounded players for over 200 years. Originating in Scotland and invented by a stubborn and irascible culture, the object of the game is to direct a small ball strategically through a park-like environment, to a 5"diameter hole in the ground. The means of propelling the ball is provided by striking the ball with a club or stick with special heads intended to achieve various results. Professional players have some degree of predictability of where the ball will fly, but even they are occasionally surprised by their errant golf shots.

The design and planning of golf courses is not subject to State or Federal Building Codes, except for environmental or zoning issues. Golf courses are not subject to the Americans with Disabilities Act (at the time of this writing). A few, well respected Golf Course Designers, such as Robert Muir Graves, Michael Hurzdan and Forrest Richardson, have included sections in their golf design and routing books and have established "Generally Accepted Guidelines" to assist the industry in providing reasonably safe conditions for players and adjacent properties.

The golf ball is a hard sphere with a dimpled outside surface weighing approximately 1.78 ounces. The dimples provide lift and affect the trajectory of the ball significantly, both vertically and horizontally. The clubs vary in their length and the shape and angle of the head and the hitting face. Drivers and fairway woods have a large deep head with a slight convex curve. Irons and wedges have various degrees of loft to a blade-like head to shape the height and distance of shorter shots. The putter has a relatively vertical face with a slight loft to encourage the ball to begin rolling in a continuous smooth line.

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As a golfer stands on the tee, the starting point for each hole, there are a myriad of factors that can affect the flight of the golf ball. The natural elements of wind, weather, topography, vegetation, hazards, (streams lakes, ditches, wetlands, etc.) the hole configuration, length and width of the fairway (the closely mown area between the tee and green), buffers, sight lines, adjacent holes or buildings, turf, visual intimidation and man made structures all affect the golfers actions. Several professional golfers have said that golf performance is 10% mechanical and 90% mental, so the confidence or lack thereof, combined with little or no practice makes the result of a golf ball strike for the average golfer, rather unpredictable.

Over 90% of golfers are right handed and at least 80% of those golfers slice the ball, which is a flight pattern that tends to be high with a curve to the right. This consistent pattern is an important factor in laying out a course safely. Current technological improvements to clubs and balls are making the clubs" more forgiving", which means a strike that is not necessarily in the center or sweet spot of the face, will still travel a good distance. The golf ball itself has been improved to add distance to the shot. It is the author's observation that average golfers are now hitting the ball further, which simply puts them further out of bounds or deeper in the woods.

Figure #1.

Figure #1 illustrates depicts the basic elements of a fictitious Par 3, 200 yard golf hole. Par being the standard number of strokes in which a player would be expected to complete the hole. There are at least three tees of varying distances to allow players of different abilities to choose the length they wish to play. The fairway is defined by how the turf is cut and outlined by trees, a deeper cut of grass, potential out of bounds stakes, sand traps and mounding. The green has an even shorter grass height (approximately 1/8") and has a grass halo referred to as the fringe.

The Safety Cone is a pie shaped area generated by drawing a fairway centerline starting at the back of the middle tee (determined by the Golf Course Designer for each unique hole) and then creating two radiating lines at 18 degrees to the right and left of the centerline. The Safety Cone then extends out for a distance of 250 yards. Approximately 80% of drives can be expected to come to rest within the Safety Cone.

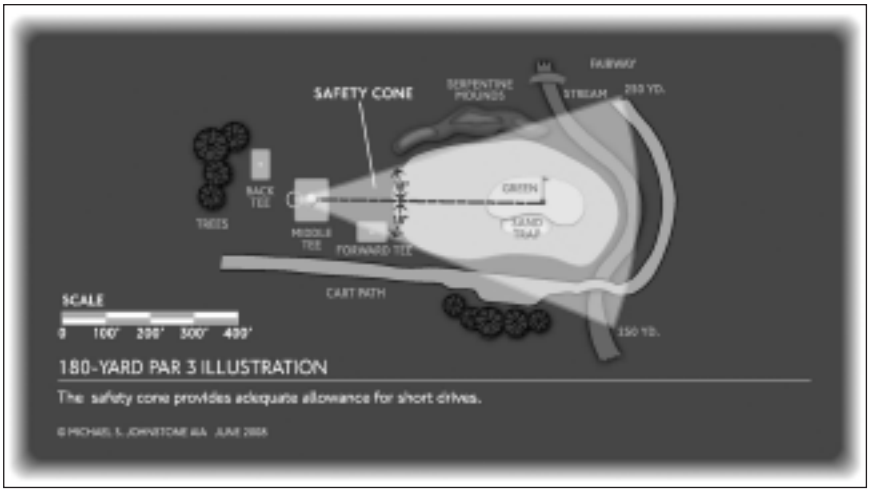

Figure 1

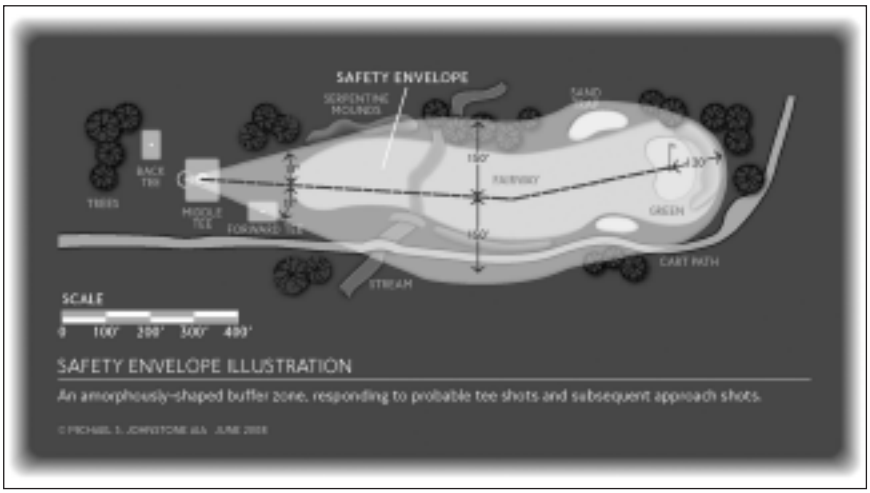

Figure 2

Figure #2.

The Safety Envelope extends beyond the Safety Cone to define a space buffer around the entire fairway and green. The side limits of the envelope should be at least 150 feet from the centerline of the fairway. The limit behind the green should be at least 120 feet. Planting, trees, hazards, mounding and screening can also be employed to help contain errant golf shots.

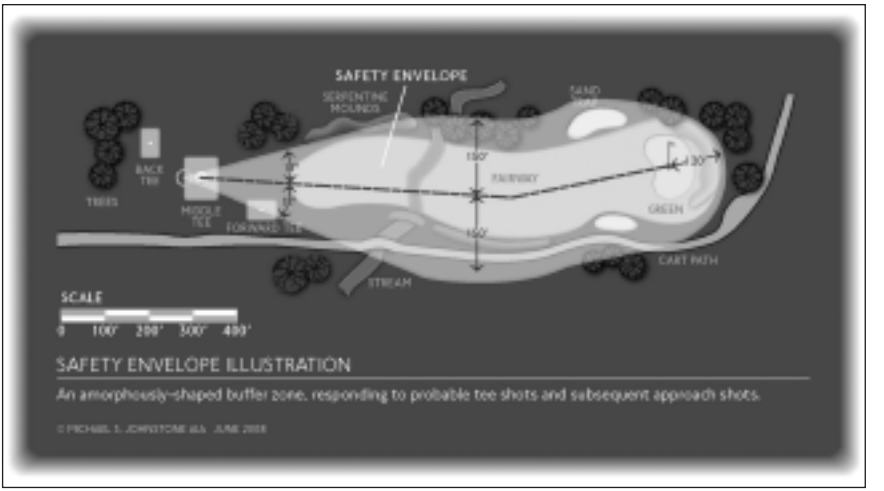

Figure 3

Figure #3.

Parallel Opposing Fairways present an unusual challenge with golfers hitting on parallel lines in opposing directions. If possible, the directions selected should take advantage of the tendency for right handed golfers to slice away from one another, as depicted above. The distance between the two fairway centerlines, should be at least 250 feet. Additional buffers such as trees, shrubbery, earth mounding, screening and deep rough can also contribute to safer conditions.

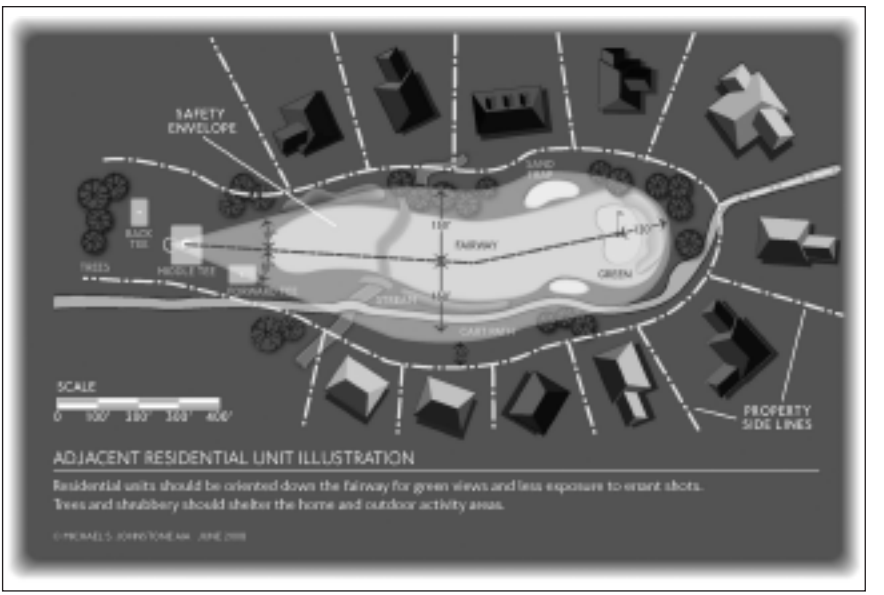

Figure 4

Figure #4.

In residential golf communities, the adjacency of the golf course and residences and backyards creates the potential for personal injury and property damage. After applying the Safety Envelope test, the shared property should be set outside of the Safety Envelope and take into consideration the topography, vegetation, prevailing winds and fairway layout. At this point the Covenants, Conditions and Restrictions of the residential development should describe an additional setback for the home and amenities such as swimming pools and out buildings to further protect residential property and maintain the residence views. Homes should be oriented to face down the fairway to reduce the amount of glass exposed to incoming errant shots.

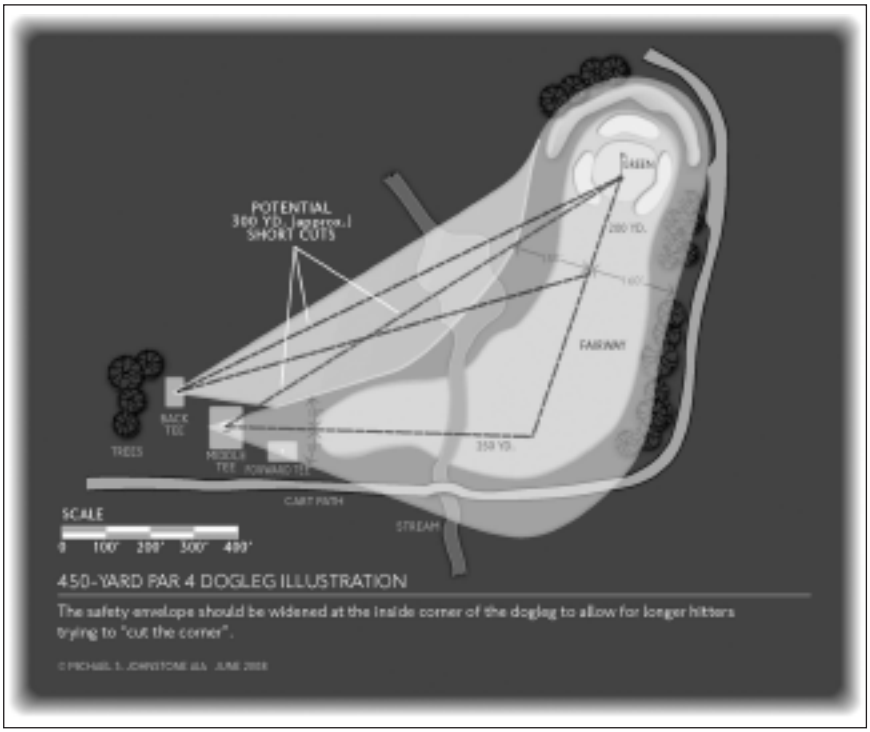

Figure 5

Figure #5.

A sharp "Dogleg" fairway creates an invitation to longer hitters to cut the corner of the Dogleg in order to shorten the hole. Residences, commercial structures and adjacent fairways should not be placed in the inside corner zone.

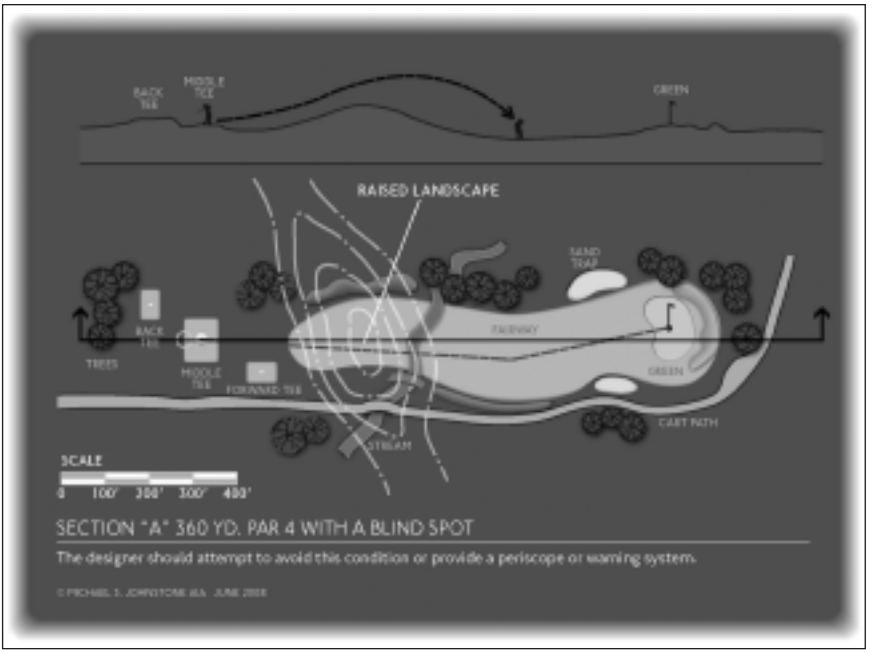

Figure 6

Figure #6.

Topography can create a circumstance where the golfer teeing off may be blind to other players ahead. If this can be avoided by new contouring the safety problem can be avoided. Otherwise course policy should warn the player on the tee or at least provide a periscope so that the player can check to see if the fairway is clear before teeing off.

Case No. One – Property damage due to errant golf balls

A new husband and father had recently purchased a home on a Country Club Golf Course in Eastern North Carolina in 2006. As he sat in the living room reading the paper, 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. He began to look more closely at the exterior of the house. There were golf ball sized dents in his garage doors, gutters and downspouts, siding and window frames. Closer inspection turned up 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 course 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 prop-

erty. The golf cart and Club Pro were visible from the tee. Club Management concluded that there was no problem.

The home owner retained an attorney and filed suit against the Country Club to cease and desist playing that hole. The author was retained directly by the home owner as a golf course design consultant. The author visited the site, 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 author took the owners statement about his experiences, obtained scaled aerial photos, and reviewed photos of the damage. After a discussion with the original Golf Course Designer, he stated that he had heard about the problem at this home and mentioned that they had much less intrusion when the grove of substantial trees that he had placed in front of this home had been blown down during the storms Ivan and Francis!

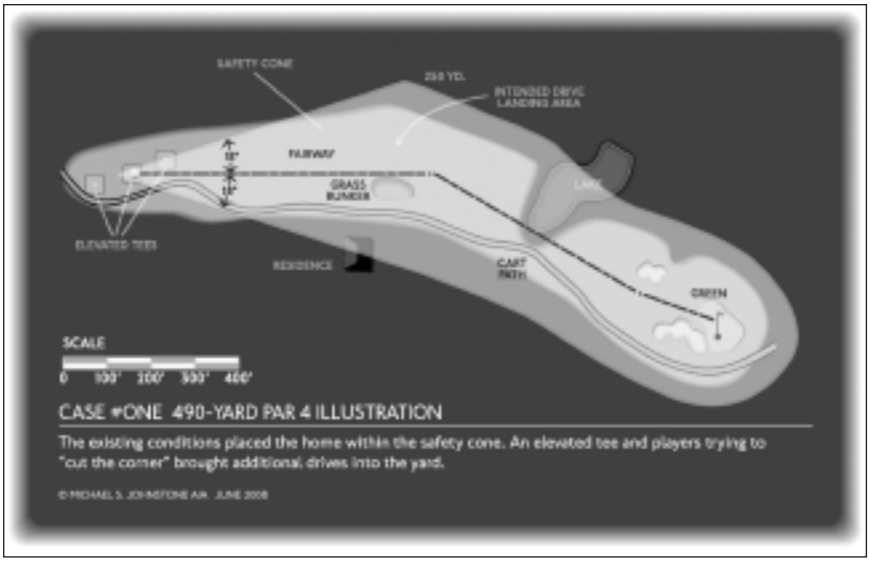

Figure 7

Figure #7.

As a result of the author'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.
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. The owner and the Country Club settled the case with an undisclosed payment to the owner and the number of balls landing in the property has been greatly reduced.

Case No. Two – Personal Injury due to errant golf ball

In January of 2006 on an Executive Course in a resort town in Virginia, a young woman was accompanying her boy friend while he played golf. Two golfers were still on the #1 Par 3 Green and proceeded to the #2 Par 5 Tee to continue play. As she sat in the cart and her companion prepared to hit his shot to a short Par 3 over a lake, a golf ball entered the cart from the left in a high speed line drive, striking the woman in the left temple. She was severely injured and lost sight in her left eye for a period of approximately a year. She has limited vision in that eye today.

The tee on the #1 Par 3, where the accident occurred, was located parallel to the #2 Par 5 that played in the opposing direction with the tee only 160 feet from the accident scene. The center line of the #1 Par 3 Fairway was only 140 feet from the #2 Par 5 center line and well within the Safety Envelope. Trees that formed a partial buffer between the two fairways were mature, widely spaced and the leaf canopy began at about 30 feet from the ground. There was no other protection, such as additional lower vegetation, shrubbery or safety screens and no warning signs at either tee.

The author reviewed aerial photos of the site obtained from the local City Planning Department, the course scorecard; photos provided by the plaintiff and the attorney, the depositions of the plaintiff and her companion and researched the parameters of opposing parallel fairways. (Figure #3.)

The author visited the site and measured the conditions with a Surveyor's Wheel and Laser Measuring Device and took pictures. The author provided a report of his findings and opinions. The key opinions included:

1. The playing circumstances, angle of flight and proximity of the tees indicated that the line drive golf ball shot that struck the plaintiff, came from the #2 Par 5 tee.
2. The #1 tee, where the plaintiff was struck, was well within the Safety Envelope and therefore the accident was foreseeable.

3. The center lines of the two fairways were only 140 feet apart, which is less than the generally accepted 250 feet.
4. The sparse tree buffer, lack of additional vegetation or screening and the lack of any warning signs contributed to the likelihood of this accident occurring.

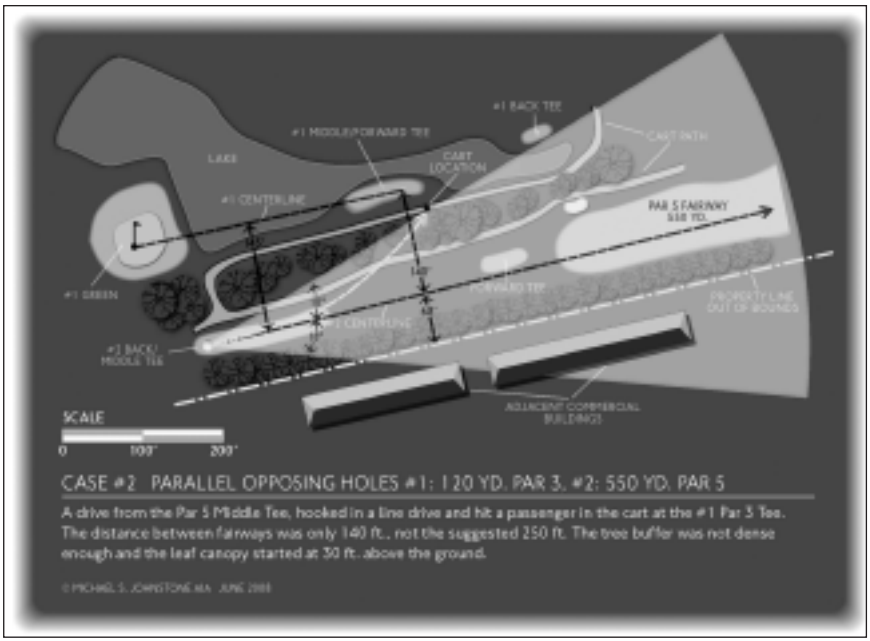

Figure 8

Figure #8.

In an attempt to provide a long Par 5 hole the Golf Course Designer shoehorned the fairway along the exterior property line violating the Safety Envelope on both sides of the fairway and creating a hazardous condition for golfers on the #1 Par 3 Tee and the adjacent commercial properties.

The author was deposed by the Defense Council. The other golf expert refuted the basic dimensions in the author's report and disagreed with the placement of the center line, which became a question of fact. The case proceeded to court with the author testifying first and rebutting the opposing expert three days later. The jury returned with a non-verdict. The judge sent the jury back to deliberate again late on a Friday afternoon, with the statement that the Plaintiff's Council had not adequately proved where the errant golf shot originated, that injured the Plaintiff. Upon returning, the jury found for the Defendant. The judge had stated in his instructions to the jury, that the

Plaintiff's Council had not adequately proved the origin of the errant golf shot that stuck the Plaintiff.

All golfers assume some risk for injury from errant golf shots. However, following well known, reasonable guidelines for the allowance of safety cones and envelopes, along with design decisions dictated by the unique conditions of each hole, the golf course designer can significantly reduce the risk of personal injury and property damage.