

Proposed Golf Course Expansion:
Big Bay Point Golf Club
Town of Innisfil, Simcoe County

Prepared For:
Next Nine Ltd
June 2018

Report Title:

Golf Ball Spray and Safety Analysis



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List of Drawings

Spray Analysis_1	Safety Envelope without woodlot
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1.0 Introduction

This report satisfies the Official Plan Amendments and Rezoning. The following golf ball spray safety analysis is to be read in conjunction with the nine-hole routing provided by MSLA Landscape Architects on June 8, 2018. The proposed Next Nine Golf Course is a nine-hole addition to the existing nine-hole Big Bay Point Golf and Country Club. The proposed golf holes offer a mixture of par 4's and 3's with the longest hole approximately 400 yards and the shortest approximately 110 yards. The spray analysis is applied to holes 9, 10, 13 green, 14 and 17 because of their location adjacent to a property line.

The woodlot surrounding the proposed holes is a critical element to ensure a satisfactory safety buffer between the proposed holes, adjacent development and transportation corridor.

It is important to note, that no golf course is entirely safe from stray golf shots. It is impossible to apply a standardized set of measurements when establishing safety envelopes for a golf course. This is in part because each golf property offers different attributes that impact the ball flight and the inability to take into account personal judgement of the golfer when executing a shot. Items such as elevation, wind and sun direction, vegetation cover, proximity to adjacent lands, hole alignment, type of golf course and golfer ability all determine the appropriate safety envelope for a hole.

I have applied general industry guidelines to determine where the majority of balls will land. These general guidelines are distances that establish limits of a safety envelope surrounding a hole. These setbacks give a high degree of certainty that the majority of players will keep their shots within the confines of a golf hole.

2.0 Assumptions

The following assumptions were used for the Next Nine Golf Course.

- The proposed nine-hole course is not of championship expertise but more of a short or executive style, frequented by cottagers, vacation players and local residents. Typically a short or executive style course is shorter in length and is more forgiving to the average and high handicap player.
- With this type of player in mind I have used a turning point of 235m (255 yards) to determine the center of the fairway on a par 4. This is in contrast to 250m (273 yards) used on championship or regular length courses.
- A transportation corridor (Big Bay Point Road) borders the property to the north. An adjacent development (Friday Harbour) is to the west and south and a housing development to the east.
- Based on the significant height and density of the current woodlot, safety setback distances will be reduced from 15-50%.
- Woodlot edge condition will be preserved as per routing plan.

3.0 Establishing a Safety Envelope

The term safety cone is used to describe an imaginary cone shape formed by the point at which a golf shot is hit from the tee with two outward lines projecting from either side of this point. The two sides of the cone represent left and right margins between which the majority of golf balls are likely to travel. Safety envelopes include the safety cone extending from tee area and continuing to include an area all

around the green. The limits of the safety envelope are the area around the teeing area, the two side margins of the safety cone, the continuing width to the green and an area around the green. The envelope depicts the area in which golf balls are most likely to fall and come to rest. This envelope is not an absolute limit and balls can go beyond this limit.

Identifying the key sections of a golf hole will provide a better idea of how a hole is laid out. The first area is the tee area, followed by the target area and finally the green area. In the case of par 3's the target area is the green area. When placing a hole we locate a flight line originating from the most highly used tee and running down the middle of the hole. At a point of 235m (255 yards) from the tee we mark a turning point (or pivot point). From this point the hole may continue straight, left or right. From this turning point our flight line continues to the centre of the green in the case of a par 4.

For each hole a safety envelope will be established based on no tree cover. The envelope will then be adjusted to reflect the presence of tree cover (woodlot) between the hole and an adjacent boundary. See drawing numbers Spray Analysis_1 and Spray Analysis_2.

4.0 Golf adjacent to Big Bay Point Road

Hole number 9, a par 4 of approximately 284 yards is the only hole next to this road. It plays in an east west direction angling towards the south as you approach the green. The distance from the property boundary to the edge of the road is approximately 7 metres. The deciduous tree cover along the property line, from the tee to the green is very dense and tall. Species are approximately 10.5m to 12m (35-40') in height, sufficient to block shot trajectories. (Appendix A, figures 1 & 2) This provides a significant buffer between the proposed golf hole and the property line. Safety setback distances can be reduced approximately 40% where woodlot is providing cover.

To determine the safety envelope perpendicular distances are measured at certain points along the flight line as it travels the length of the hole. Beginning at the tee, boundaries adjacent to tees can be 20-25metres (65-82 feet) from the flight line. These measurements are based on not having any tree cover between the flight line and the property boundary. As the right margin of the safety cone leaves the tee area it is gradually angled away from the flight line to a 60m (196 feet) perpendicular distance at a point 137m (450 feet) from the tee. This 60m (196 feet) setback is required because of the proximity of the hole to a transportation corridor. This envelope limit will continue the length of the hole maintaining that 60m perpendicular distance, until approaching the green. At the green I have reduced the 60m measurement to 45m (147 feet) because the golfer is hitting a shorter shot into the green, using the assumption that they have more control.

For safety behind a green site a minimum of 30metres (99 feet) from the edge of the green to the property line is required.

Conclusions:

Adjacent transportation corridors are treated with greater scrutiny as people in vehicles cannot be expected to be aware of approaching golf balls. Because of the presence of significant trees along the northern boundary the 15m distance at the tee is a sufficient safety setback. Similarly, as we travel the length of the hole, the tree cover increases in depth. As a result our 60m setback in the main landing area can be reduced to a minimum of 36m (118 feet). This is a reduction of approximately 40%. The area surrounding the green also has very good tree cover and a 44m (144 feet) setback from green

center to property line is more than adequate to protect balls from straying from the property. The density and quality of tree cover from tee to green is critical for the safety of this hole.

This hole satisfies all safety setback requirements.

5.0 Golf adjacent to Western boundary (Friday Harbour Development)

Hole 10, a par 4 of approximately 405 yards plays in a north south direction parallel to the western property line. The deciduous tree cover along the property line, from the tee to the green is dense near the tee area but becomes less dense approximately 150m (164yds) from the tee. Species from this point to the green are a mixture of mature trees and successional growth. (Appendix A, figure 3). Although these trees provide protection, the density of the species and height is not as significant as the northern boundary woodlot. As a result the amount of safety setback reduction will range from 15-20%.

Similarly, safety envelop limits start with perpendicular distances measured at certain points along the flight line as it travels the length of the hole. Beginning at the tee, boundaries adjacent to tees can be 20-25metres (65-82 feet) from the flight line. As the right margin of the safety cone leaves the tee area it is gradually angled away from the centreline to a 55m (180 feet) perpendicular distance at a point 137m (450 feet) from the tee. This envelope limit will continue the length of the hole maintaining that 55m perpendicular distance, until approaching the green. At the green I have reduced the 55m measurement to 45m based on the idea that approach shots below 160 yards are executed by golfers with clubs generally capable of producing more controlled results (approximately 145 yard approach shot for hole 10). The use of a 55m (180 feet) setback is appropriate for holes adjacent to existing development. Similar to hole 9 the safety setback behind green requires a minimum of 30metres (99 feet) from the edge of the green to the property line.

Conclusions:

Adjacent development is treated a little less stringent than that of a transportation corridor. As a result there is a 10% reduction in safety setback distances. The depth of trees and height of trees at the tee area presents a decent buffer between golf and property boundary. The distance of 20m (65 feet) from the edge of tee to the property line is also sufficient for safety. As we move down the length of the hole, the tree cover decreases in height and depth (amount of trees between the cleared golf hole edge and the property line). At a point 80m (262 feet) from the tee, the height of trees is approximately 20-25 feet on average. The minimum depth of woodlot starting at 80m from the tee is 7m (23 feet) and reaches 13m (43 feet) at the turning point. As a result of a less dense cover, a 20% reduction in safety setback will be applied to our 55m (180 feet) setback distance. This still leaves us with a 45m (147 feet) perpendicular distance from the flight line and the resulting safety envelope still outside the property boundary. From the turning point to the centre of the green the tree cover has a greater depth but still lacks in the height and density that we find on the north end. A 20% reduction in safety setback is appropriate here too. A similar 45m (147 feet) setback still leaves our safety envelope outside the property bounds.

Our 45m (147 feet) set back at the green can be reduced to 36m leaving us just outside the property boundary. Moving counter-clockwise around to the back of the green a required distance for safety setback is 30m (98 feet) from green edge to property line. The safety envelope is still outside the property line.

The golf holes will be playable and the adjacent development will be safe as long as mitigation is implemented. Where the safety envelope remains outside the property boundaries, mitigation in the form of netting will be required. Netting will start along the property line near the tee and finish at the mid-point of the green. The height of the netting will be determined by a netting consultant who factors in the trajectories of golf shots from various distances. Netting is not required behind the green. In this area the height of shots is not as crucial but taking away the mishit line drives as they travel beyond the green is important. Mitigation behind the green can be dense plantings with a minimum starting height of 4.5m (15 feet).

The quality and height of woodlot along this hole is not of the same caliber as the northern woodlot. As a result smaller reductions in safety setbacks were applied. Netting mitigation is needed for protection.

6.0 Golf adjacent to Southern boundary (Friday Harbour)

The 13th green is the final target area for a 350 yard par 4 hole. The approach to the green is approximately 131m (143 yds.) from the fairway turning point. The need for safety on this hole pertains to shots going over the green and leaving the property. For safety behind the green a minimum of 30m (99 feet) from the edge of the green to the property line is required. There is no current tree cover behind the green so no reduction in safety setback can be realized.

Conclusions:

Although the safety envelope stretches beyond the property boundary netting is not required. It is important to reduce the chances of stray balls traveling beyond the green and leaving the property. Dense plantings similar to 10 green should be planted with a minimum starting height of 4.5m (15 feet). They can be planted on the southern edge of the proposed storm water management pond, which is located behind the 13 green.

7.0 Golf adjacent to Eastern boundary (existing sub-division)

- A. The 14th hole is a par 3 hole, 127 yards long. For par 3 holes less than 200 yards long we can reduce the safety setbacks based on the notion that golfers execute these shots with clubs that they have more control over. Generally, greater accuracy is achieved. For this hole a perpendicular distance of 40m (131 feet) from the mid-point of the green to the right margin of the safety cone is placed. For safety behind the green site a minimum of 30m (99 feet) from the edge of the green to the property line is required. There is a minimum 23m (75 feet) depth of trees from the green edge to the property line.

Conclusions:

This hole satisfies all safety concerns even without 23m (75 feet) tree buffer. No mitigation required.

- B. The 17th hole is a par 3, 185 yards long. It plays in a northerly direction, angling away from the property line as you reach the centre of the green. The deciduous tree cover along the property line, from the tee to the green is mature and moderately dense. There are some gaps where

young growth is present. Species are approximately 10.0m (32 feet) in height, sufficient to block low shot trajectories. This provides a reasonable buffer between the proposed golf hole and the property line. The depth of cover near the proposed bridge crossing is thin. Safety setback distances can be reduced approximately 20% in this area while safety setbacks approaching and surrounding the green can be reduced by 40%.

Similar to Hole 14 safety envelope, perpendicular distances are measured at a point at the tee and the centre point of the green. Beginning at the tee, boundaries adjacent to tees can be 20-25metres (65-82 feet) from the flight line. As the right margin of the safety cone leaves the tee area it is gradually angled away from the centreline to a 50m (164 feet) perpendicular distance at the centre of the green.

The use of a 50m (164 feet) setback for this hole is appropriate for a par 3 of this length. A proportional reduction in safety setback is based on how many yards less than 200 yards the hole plays. For example, the right margin safety setback on hole 14 is 40m (131 feet) compared to the 50m (164 feet) setback on hole 17. Similar to other holes the safety setback behind a green requires a minimum of 30metres (99 feet) from the edge of the green to the property line.

Conclusions:

Because of the presence of mature trees along the eastern boundary the 17.8m (58 feet) distance at the tee is a sufficient safety setback. Similarly, as we travel the length of the hole, the tree cover increases in depth. As long as the proposed depth of woodlot is maintained the 50m (164 feet) setback at the green can be reduced to a minimum of 30m (98 feet). This is a reduction of approximately 40%. The quality of tree cover from tee to green is critical for the safety of this hole as safety margins are at their minimum.

This hole satisfies all safety setback requirements.

8.0 Conclusions

It is concluded that the proposed development can meet the golf ball spray safety objectives of the Town of Innisfil and County of Simcoe with proper mitigation on hole numbers 10 and 13 green. As such I support the Official Plan and Zoning By-Law Amendment for the subject lands. Should you have any questions regarding this report please contact me.

Regards,

Cam Tyers, President

Cam Tyers Design Inc.

Appendix A



Figure 1 Looking west



Figure 2 Looking east



Figure 3