

KILLARA GOLF CLUB

Independent Assessment of Golf Course Safety Measures associated with the proposed 2nd hole at Killara Golf Club, Pacific Highway, Killara

Prepared for:

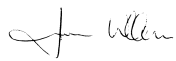
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1. FOREWORD

The Killara Golf Club Committee hope to implement a number of course upgrades as detailed in a new, member - sanctioned master plan developed by Antony Cashmore and Associates Pty. Ltd (hereafter referred to as Cashmore).

Following the Club's lodgement of the requisite Development Application to Ku-ring-gai Council, neighbouring residents of the golf course engaged the services of another golf course architectural company, Kruse Golf, to assess the potential safety impact upon their properties in the event that Council approves the construction of a new 2nd hole as proposed in the new master plan. The neighbouring properties include 1, 3, 5 and 7 Mildura Road Killara. Kruse Golf raised concerns about the proposed new 2nd hole on the grounds that it would significantly reduce the amenity for these residents as well as pose a heightened safety risk through an increased number of errant balls into these properties.

Golf *by* Design (GBD) has been commissioned by Killara Golf Club to independently review the potential safety issues arising from the construction of the new 2nd hole. For this reason, GBD has been provided with a copy of the report undertaken by Kruse Golf, a copy of the Cashmore master plan and a letter from Cashmore presenting the rationale behind their siting of the new green in terms of safety setbacks.

GBD is a Sydney based golf course architectural consultancy with an international clientele founded by James Wilcher. James has in excess of 25 years experience designing golf courses throughout Australasia - a pedigree ably underpinned by his team's collective 35 years of experience designing, constructing and landscaping golf courses (a GBD project resume is supplied as an addendum to this document for the Committee's reference). Many of GBD's commissions involve the planning of golf courses in and around residential communities and as such we are experienced in managing safety issues posed by such developments. Also, of note, GBD has advised various clients on how to manage existing safety related issues. They include:

- Pennant Hills Golf Club
- Beverley Park Golf Club
- The Coast Golf Club

Following is a review of contemporary golfing industry standards pertaining to safety combined with an assessment of whether the new 2nd hole proposed in the Cashmore master plan satisfies these theoretical standards and our knowledge of what works in practice. Broadly speaking, we have concluded that the 2nd hole proposed by Cashmore is fundamentally acceptable from a safety standpoint though there is scope to improve safety further and we render suggestions on how to achieve this.

2. SAFETY SETBACKS – GOLFING INDUSTRY PRACTICE

Unlike much of the property development arena, golf course development is not strictly governed by safety legislation. Instead safety disputes are typically reconciled on a case-by-case basis on the strength of judicious argument, which, sometimes, leverages guidelines advocated by various Golfing authorities. Indeed, both Cashmore and Kruse Golf refer to various safety guideline protocols; in particular, those outlined by the Australian Golf Course Architects Society, the European Institute of Golf Course Architects and Golf NSW.

We acknowledge the use of the word “guidelines” and emphasise that, in our experience, the interpretation of these guidelines is heavily context dependent. That said we concur with the overarching principle implicit in these guidelines; specifically, that it is near impossible to retain 100% of golf balls within a golf course where they abut residential precincts. Nevertheless, it is something that should be strived for.

To this end, we adhere to conventional wisdom and generally aim to ensure minimum setbacks from a green / hole centreline of 55 metres, even though ideally we would deliver greater setbacks if our clients’ financial metrics accommodated this. Setbacks aside, there are a number of other factors that can impinge on the safety of holes located adjacent to residences and we aim, where applicable, to give due weight to each of these in our designs as well. They include:

1. Angle of play relative to adjacent boundary;
2. Elevational differences between golf hole and adjoining properties;
3. Length of hole;
4. Detailed design of the hole / positioning of hazards;
5. Vegetation screen between hole and properties;
6. Prevailing winds;
7. Whether the hole is on the ‘hook’ or ‘slice’ side (for right handers);
8. Variation in teeing location; and
9. Location of safety fences.

3. CASHMORE’S PROPOSED 2nd HOLE

We note that historically there has been a concern about the incidence of golf balls leaving the Killara Golf Club and being deposited in the yards of 1, 3, 5 and 7 Mildura Avenue from a spare, presently unused hole. In fact, a safety fence was installed and remains in place close to the property at No.3 Mildura Avenue, presumably, in an attempt to prevent this from happening.

In the new Cashmore master plan it is proposed that the tee site on the existing (presently unused) spare hole will be recommissioned in some form for the new 2nd hole. It is our understanding that neighbouring residents are concerned that the proposed new 2nd hole will generate similar safety issues to those experienced when the existing spare hole was last played.

To assess the risk associated with the proposed new 2nd hole the following factors bear consideration:

Green location

We note that the new centre of the green is proposed to be 55 metres from the boundary of adjoining landowners. Whereas the centreline of the green on the spare hole that was subject to complaints when in play some time ago was around 25 metres. Thus the new hole delivers an increase of the order of 30 metres or around 120% and hence satisfies “guidelines”. The photograph below (taken from the proposed location of the new tees) clearly identifies both the old (existing) green centre for the spare hole relative to the location of the new green centre for the proposed 2nd hole.



Angle of the hole relative to the alignment of the adjacent properties

The angle of the centreline of the proposed new hole with the alignment of the property boundary is in excess of 20%. This compares favourably with the situation associated with the original hole, which was around 10% and again seems to satisfy “guidelines”.

The length of the hole

As the hole is a maximum of 145 metres it reduces enormously the potential of golf balls leaving the site. It is with the driver in hand (a club that can travel as much as 250 metres for better golfers) that greater latitude for errant golfers needs to be made. Clearly, at 145 metres this proposed hole represents a much safer alternative to if the hole was 250 metres in length.

Detailed design of the hole

The detailed design of a golf hole can influence greatly the way it is played and the ideal line of play from a tee for golfers of varying abilities. For instance, if the danger on a golf hole is on its right hand side then a greater proportion of golfers (particularly those of more conservative ability) are likely to attempt to play away from the danger. Danger would typically be in the form of lakes, wetlands or other golfing hazards such as bunkers. By

incorporating these into the detailed design of a golf hole, the way a hole is played can be greatly influenced.

In much the same way as hazards such as bunkers can influence a golfer's line of play we have, on several occasions, removed or relocated bunkers to avoid "skulled" shots from causing harm. Skulled shots are where a bunker shot for instance is hit 'thin' and flies a great deal further than intended. Therefore, siting bunkers on the non-neighbours side of a green can introduce the risk of this happening, particularly if bunkers are not particularly deep. Thus avoiding doing this may well prove instrumental in minimising safety risks.

Size, dimension and scale of the vegetation screen between the hole and the adjoining properties

The existing trees sited between the new hole and the subject properties are of a size that will reduce the likelihood of golf balls leaving the property. That said, there is a significant opportunity to increase the amount of trees in this area with new plantings and in so doing strengthen the screening afforded by them. The problem with this is that any additional tree planting will take some years to be effective. Please note that below an assessment of other holes on the course would suggest that a screen of mature trees is a very effective safety barrier.

Size, scale and location of safety screens between the hole and the neighbouring properties

The existing safety screen behind No.5 Mildura Street, whilst being an effective screen in stopping balls from finding their way into the back yard of No.5, does little to reduce the potential of this happening to balls heading into adjacent properties.

Prevailing winds

The prevailing wind would be considered to be a nor-Easterly and this should assist in pushing balls away from the adjoining properties and not toward them.

Elevational Changes between the tee and the green

The hole is relatively flat and therefore this issue is not applicable to the situation. It is only a concern if the tee is particularly elevated.

Variance of teeing location

In the case of the proposed hole the tees are aligned which means that balls hit from them are more easily contained by the strategic location of screening trees and safety barriers.

Whether the boundary is on the hook or slice side of the hole

Ideally the property boundary would be on the left hand side of the hole as statistically this reduces the potential of golf balls leaving the site. It does so because the greater number of modest golfers 'slice' the ball and as 87% of

golfers are right handed this means that the right hand side of the hole is more likely to attract miss-hit shots.

4. KILLARA CONTEXT

The proposed new 2nd hole should not be assessed in isolation given that it is a component part of an established context - the greater golf course! Accordingly, we have assessed several existing holes at Killara where they abut roads or residences and note the following:

Hole 7 - We note that the distance from the centreline of the hole to the neighbouring property ranges from 45 metres to approximately 37 metres, well short of the 55-metre guideline. Thus theoretically this should present a high level of risk, particularly given that the hole typically calls for a driver from the tee and that the neighbouring properties are on the right-handed slice side. However, we are led to believe that there are in fact few issues associated with balls leaving the course from this hole.

Hole 8 - We note that the distance from the centreline of the hole to the boundary of the golf course is approximately 35 metres. Again, theoretically this should pose a heightened level of risk for the Golf Club but we understand that this not the case. In addition, unlike the proposed 2nd hole, this hole is not angled away from the property boundary as would be the preference.

Hole 9 - We note that the centreline of this hole ranges from 23 to 35 metres. This is a problematic hole for the Golf Club as it calls for a driver from the tee and the proximity of the boundary to the hole falls well short of the ideal. Moreover, the tee is elevated which further exacerbates the safety issue. It is our understanding and expectation that this hole does pose a risk from errant balls leaving the course.

Hole 12 - The centreline of the hole ranges from 15 metres (at the green end) to 27 metres in the fairway. Again, the boundary is on the 'slice' side of the hole so in theory this should be a particularly problematic hole in terms of safety. Whilst not sufficient to require changes to the hole the proximity of the hole centreline from the course boundary does have a record of balls leaving the site.

Hole 15 - The centreline of this hole ranges from 35 to 38 metres. Again, this boundary is on the non-preferred 'slice' side of the hole, which increases the chance of the balls leaving the course. However, due almost entirely to the robust vegetative screen between the hole and the boundary this situation does not pose any out-of-bounds problems.

Each of the above cases would suggest that the safety setbacks allowed for in the planning of the proposed new 2nd hole are far superior to those nominated above. That these holes are considered to present acceptable safety risks tends to support the notion that the new hole has been sensibly thought through and relative to other holes, could be expected to be acceptably safe.

5. SOME SUGGESTIONS

Option 1. Replacing the current safety screen with one adjacent to the edge of the Proposed 2nd Tee

This option is designed to reduce the potential of golf balls leaving the site by placing a screen very close to the source of the subject shots played. The closer the screen is to the source the more effective it will be in blocking errant shots. We believe that the most likely shots that would trouble the houses under the proposed arrangement would be either: shanked shots played by the right handed golfer or otherwise; skyed shots played right of the intended target and carried further right by the prevailing winds. We note that the prevailing wind in this location is likely to be a nor-Easter which would help this situation rather than exacerbate it.

Therefore, by sizing and locating a safety screen close to the edge of the new tee we contend that the potential risk from poorly struck golf balls would be greatly reduced beyond that which might be the case under the current arrangement. Further, given time, the newly planted trees between the existing trees along the property boundary would grow appreciably and this then would likely result in the screen being able to be removed from the edge of the tee. We have inspected and know of many golf holes where a separation of this distance between the hole and adjacent property is, with an adequate vegetative screen, more than ample in terms of reducing balls leaving the course to an acceptable level. We note that in point 10 of the Golf NSW report that there is a 'balancing exercise required to achieve a reasonable balance in the competing uses of the land' and without placing 35 metre high fences around the perimeter of every golf course you will never reduce the risk of golf balls leaving the site to zero.

Option 2. Realignment of the green and relocation of the proposed location of hazards (bunkers) on the new hole.

Our concern about what has been proposed by Cashmore centers on the detailed design of the hole itself. The green is orientated against the contours and faces the tees with the most difficult aspect of the hole being the size and location of the bunkers fringing the green to its front left. We would prefer to see the hole orientated such that its length lies parallel to the contours of the native ground with bunkering to the immediate front right of the green. Doing this would help encourage less able golfers to play to the left of the green in order to avoid the bunkers. For golfers' who require a steeper faced club to reach the green, this will likely apply more so. The green itself could also be sized and contoured to favour a shot played 'left to right' further requiring golfers to aim left of the target. By realigning the green, re-contouring it and strategically placing bunkers as hazards in the front right hand side of the green, the 'ideal' line of play can be forced further from the houses.

Option 3. It would appear that the green could be moved further away from the property boundary

Whilst we do not believe that it is absolutely necessary it does appear that the new green could be moved further than the 55 metres suggested from the

Club's property boundary without impacting adversely on any other planned holes. This would not only increase the absolute distance between the proposed green and the neighbours but it would also increase the angle of the hole relative to the boundary alignment. Given one aspect of the 'guidelines' focusses on the line of play of the hole relative to the property boundary this would further reduce the risk of balls leaving the course.

6. CONCLUSION

No golf course is ever 100% safe, however we believe that Cashmore's design for the new 2nd hole is a workable proposal for the reasons outlined above. That said, we maintain that with some minor modifications the safety concerns harboured by the adjoining residents can be relieved further. Accordingly, we have rendered several suggestions on how to reduce the risks associated with what is proposed but acknowledge that it will take time for a large thick vegetative screen to become an impenetrable barrier to golf balls leaving the site.

7. APPENDIX – GBD Project Resume.

PROJECT RESUME

As Golf by Design

Top City Beijing, China	Design of a new 27-hole golf course complex as part of a residential community. Project completed.
'The Cut' at Port Bouvard WA, Australia	Design of new 18-hole golf course as part of a residential community. Opened in January 2005.
Bayview Golf Club NSW, Australia	Redesign of 6 greens and supervision and project management of construction.
Elanora Country Club NSW, Australia	Master Plan for the upgrade of the entire 18 holes. After securing overwhelming support for the master plan from the Members GBD has been commissioned to detail design changes. Reopened May 2004.
Eastlake Golf Club NSW, Australia	Redesign and Construction Supervision of the 8 th hole. Completed Master Plan for upgrade to the entire 18 holes.
Mt Broughton Golf & Country Club NSW, Australia	Master Plan and thence redesign for the entire 18 holes.
Monash Country Club NSW, Australia	Master Plan and various design changes including all greens, bunkers, tees and practice area.
Pennant Hills Golf Club NSW, Australia	Various design changes including greens, tees and bunkers. Also commissioned to provide conceptual changes to satisfy 'duty of care' issues in relation to golf balls leaving the site.
Kogarah Golf Club NSW, Australia	Design of an 18-hole golf course on a severely degraded and flood prone site adjacent to Sydney airport. GBD secured this commission after winning a national design competition.
Kareela Golf Club NSW, Australia	Commissioned to rectify safety issues experienced by adjacent homes where ball damage had become acute. Detailed design of several greens.
'The Ridge' Golf Course NSW, Australia	Commissioned to Master Plan; undertake bulk earthworks design; and thence detail design all greens, tees, bunkers and landscaping for a new 18-hole municipal golf course on an old land fill site. Second nine holes currently under construction.
The Romanian Golf Club Bucharest, Romania	Commissioned to Master Plan an 18-hole golf course as part of a development that includes a horse racing track, hotel, convention centre and various residential products.
Pacific Dunes Golf & Country Club NSW, Australia	Commissioned to Master Plan and detail the design of an 18-hole golf course as part of a new golf/residential community with a resort and associated facilities attached. Opened in April 2005.
Cromer Golf Club NSW, Australia	Commissioned to Master Plan layout changes to overcome planning and safety issues before detailing complete design changes for each hole. Project completed.

Muirfield Golf Club NSW, Australia	Commissioned to Master Plan layout changes to overcome planning, water storage and safety issues. Also engaged to detail design several holes.
Oatlands Golf Club NSW Australia	Commissioned to redesign several tees and bunkers as part of an ongoing upgrading program. Detailed design changes ongoing.
Woodbury Park Estates NSW, Australia	Feasibility study for new golf course as part of a residential community.
Dunheved Golf Club NSW, Australia	Redesign of green 3 and Master Plan changes to entire course.
Liverpool Golf Club NSW, Australia	Redesigned all bunkers on golf course.
The Coast Golf Club NSW, Australia	Redesign green and tee changes as part of adjoining residential project by Landcom.
Musswellbrook Golf Club NSW, Australia	Redesign several greens and tees as part of a course upgrade.
Camden Valley Country Club NSW, Australia	Currently replanning 27-hole golf course to incorporate in excess of 650 residences as part of a community master plan.
Roseville Golf Club NSW, Australia	Commissioned to Master Plan layout changes to overcome planning, water storage and safety issues. Dam and associated golf hole changes complete.
Pseez Golf Club, Iran	Completed detailed design of a 9-hole golf course for a government authority on the Persian Gulf in conjunction with PTW architects.
Jin Cheon Country Club, South Korea	Commissioned by Shinchang Construction Company to plan and design a new 36-hole golf course near Seoul in South Korea.
Northbridge Golf Club NSW, Australia	Commissioned to undertake design of an on-site water storage facility and associated adjustments to the golf course, including 3 new golf holes. Now complete.
Moore Park Golf Club NSW, Australia	Commissioned to Master Plan layout changes to overcome playability, maintenance and safety issues on one of Australia's busiest public golf courses. Detailed design changes ongoing.
Bhatiary Golf and Country Club, Chittagong, Bangladesh	Commissioned to complete Master Plan and undertake complete reconstruction of existing golf course including all greens and tees. Complete.
Waratah Golf Club, Newcastle NSW	Commissioned to complete master plan of golf course focussing in particular on both internal and external safety issues. Complete.
Gimpo Deanung Golf Course, Seoul Korea	Commissioned to Plan and detail design this 9-hole golf course on a particularly steep site. Now complete.
Lotus Lake, Tieling, China	Commissioned to plan, design and supervise construction of a new 18-hole golf course. Course currently under construction.
Manuro Shores, Vanuatu	Commissioned to plan, design and supervise construction of a new 18-hole golf course. Master planning completed and currently in negotiating with new joint venture partner.

Ocean Blue, Vanuatu	Commissioned to plan, design and supervise construction of a new 18-hole championship golf course. Awaiting joint venture partner.
Nudgee Golf Club Queensland, Australia	Commissioned by DMR and now golf club to Master Plan layout changes to overcome planning issues associated with construction of new adjacent freeway. Ongoing.
Port Kembla Golf Club NSW, Australia	Ongoing redesign of greens as part of a course upgrade.
Beverley Park Golf Club NSW, Australia	Commissioned to undertake a new Master Plan for the existing golf course. Completed and currently detail designing 4 new golf holes.
Woolooware Golf Club NSW, Australia	Compiled a new Master Plan for this 50 year old member's golf course. Complete.
Comberton Grange NSW, Australia	Commissioned to undertake Master Planning for the golf course which is to be the central facility of this new residential development on the NSW south coast. Ongoing.
North Turrumurra Golf Course NSW, Australia	Commissioned to design and project manage construction of a water storage dam within the existing golf course as part of on-going upgrades to the facility. Complete
Belmont Golf Club NSW, Australia	Compiled a new Master Plan for the existing golf course. Now undertaking detailed design of new greens.
North Ryde Golf Club NSW, Australia	Compiled a new Master Plan for the existing golf course including incorporation of water storage dams. Complete and about to embark on detailed design of new holes.
Pennant Hills Golf Club NSW, Australia	Commissioned to undertake a new Master Plan for the existing golf course.
North Turrumurra Golf Course NSW, Australia	Commissioned to undertake a new Master Plan for the existing golf course, including the incorporation of new community sports fields and other facilities. Now undertaking complete design of 11 new golf holes.
Aore Island, Vanuatu	Commissioned to undertake detailed site planning for a new resort including an 18-hole Championship golf course.
The Coast Golf Club NSW, Australia	Completed design of new spare hole.
Royal South India, Chennai, India	Compiled a Concept Master Plan for new residential golf course near Chennai. Awaiting final funding.

Whilst employed by Greg Norman James was responsible for:

Oyster Cove Queensland, Australia	An 18-hole golf course built on a sensitive site within a flood plane as part of a residential development.
Kai Kou Xiamen, China	A 36-hole course as part of a resort and residential development. First 18-holes opened in July 1994.
Pantai Tering Indah Batam Island, Indonesia	An 18-hole golf course as part of a residential/recreational resort located close to Singapore. Opened in September 1995.
Banyan Tree Club Bintan Island, Indonesia	An 18-hole golf course as part of a resort development close to Singapore. Opened in June 1998.

Sterling Grand Delhi, India	A 36-hole golf course as part of resort/ residential project outside of Delhi.
Thana City Bangkok, Thailand	An 18-hole residential golf course. Opened in 1992.
Splendido Taal Tagatay, Philippines	An 18-hole golf course as part of a residential/ resort project located within an old volcano crater.
Eagle Ridge Manila, Philippines	An 18-hole golf course as part of a 72-hole golf/residential project.
Looc Cove Batangas, Philippines	An 18-hole golf course as part of a 36 hole integrated golf/ residential/ tourist development. Master plan and earthworks design complete.
Treasure Island Batangas, Philippines	An 18-hole golf course as part of an oceanfront fully integrated destination resort. Master plan complete.
Chun Chon Hanwha Chun Chon, South Korea	An 18-hole golf course as part of a fully integrated golf/ skiing resort for the Hanwha Group.
Cheju Ae-wol Cheju, South Korea	An 18-hole private members course. Master plan and detailed design complete.
Koje Adonis Koje, South Korea	An 18-hole golf course as part of a large fully integrated tourist resort. Master plan and detailed design complete.
Summerset at Rompin Beach, Malaysia	An 18-hole golf course as part of a large residential/ tourist destination resort.
Dago Pakar Resort Bandung, Indonesia	An 18-hole golf course as part of a large residential development close to the centre of Bandung and on a severely undulated site. Master plan and detailed design complete.
Martabe Sejahtera Medan, Indonesia	An 18-hole golf course as part of a 36-hole golf/residential development.
Fuji Nagoya, Japan	An 18-hole private members club. Opened June 1993.

In Association with Nick Faldo:

Windmill Park Bangkok, Thailand	An 18-hole golf course as part of an exclusive residential community. Opened May 93.
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In Association with Ian Baker-Finch:

Sanctuary Cove Queensland, Australia	Redesign of several greens on both the Pines and Palms courses.
Kingscliff NSW, Australia	An 18-hole golf course as part of an upmarket tourism facility. Master planning complete.

Whilst employed by Graham Marsh James was responsible for:

Robina Kerrydale, Queensland, Australia	An 18-hole golf course located in the Merrimac flood-plane on the gold coast.
Cairns Golf Club, Queensland, Australia	Redesign of 3 holes.

**Windsor Golf Club,
Nagoya, Japan** An 18-hole Members course.

Peach Valley, Kobe, Japan An 18-hole Members course.

Whilst employed by Golf and Recreation Planners:

**Murrumbidgee Country
Club, Canberra, Australia** An 18-hole golf course as part of a residential
development. Opened in 1989.

**Queanbeyan Golf Club,
NSW, Australia** Redesign of several golf holes as part of an overall master
plan of renovations.

**Northbridge Golf Club,
Sydney, Australia** Redesign and construction supervision of several holes to
alleviate safety problems.