

**ADELAIDE HILLS COUNCIL  
ORDINARY COUNCIL MEETING  
Tuesday 8 August 2023  
AGENDA BUSINESS ITEM**

<b>Item:</b>	<b>12.1</b>
<b>Responsible Officer:</b>	<b>Deryn Atkinson Manager Development Services Development &amp; Regulatory Services</b>
<b>Subject:</b>	<b>Stirling Golf Course Redevelopment by Mount Lofty Golf Estate Pty Ltd 35 Golflinks Road Stirling (declared as a Major Development and described as Mount Lofty Golf Resort)</b>
<b>For:</b>	<b>Decision</b>

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**SUMMARY**

This report provides details of the development proposal by Mount Lofty Golf Estate Pty Ltd to redevelop the Stirling Golf Course as the Mount Lofty Golf Resort. The proposal includes the following elements:

- a) the construction of tourist accommodation in a new hotel building and private retreats (pods);
- b) new clubhouse facility and pro-shop, administration areas and change rooms;
- c) retention and improvements to the 18-hole golf course;
- d) conservation works and adaptive reuse of a local heritage place to accommodate a multipurpose café, retail and function space;
- e) car parking in the order of 200 spaces in two parking areas;
- f) tree removal (including native vegetation) and associated landscaping; and
- g) subdivision of the one allotment into 3 allotments

The Minister of Planning declared the development to one that was to be assessed under the Major Development Assessment Pathway on 17 December 2020. The Minister's delegate has advised Council that a Development Report (DR) has been prepared and released for public comment from 5 July 2023 to 16 August 2023. Adelaide Hills Council, as the Council in which the development is proposed has been invited to provide comment on the DR in the assessment process. A planning report (refer **Appendix 1**) has been prepared about the proposal following consultation with relevant internal departments with recommended comments for the consideration of the elected Council before a formal response to the Minister of Planning is prepared by the CEO.

The main concerns about the redevelopment is the inadequacy of the current form of Golflinks Road and the intersection of Golflinks and Carey Gully Roads to manage traffic and pedestrian movement associated with the proposed resort in a safe manner and the impact of traffic movement will have on the amenity of the locality for local residents. There is a need to assess the potential impact of infrastructure upgrades, service provision upgrades and construction access associated with the development on roadside vegetation health and sustainability. Infrastructure upgrades may include the need for road widening, verge treatment, intersection works and upgrades to the existing access and egress for the Golf Course Resort, underground trenching for new service provisioning and construction access for heavy machinery, should the development be approved. Other concerns relate to the existing waste system capacity to manage the additional loads from the development and the level of native vegetation clearance required for the scale of the development to manage bushfire risk in a high risk bushfire prone area, and construction impacts upon residents along Golflinks Road.

Land division also forms part of the proposal for purposes of tenure and commercial lease arrangements. There are concerns that the sub-division is for purposes of selling the land rather than lease arrangements and the potential for this to be contrary to the existing Proclamation under s61 of the former *Planning and Development Act 1967*. It is understood that there is a separate statutory process for varying or revoking Proclamations and this would only occur if the proposal is granted Planning Consent.

The development will be assessed by the State Planning Commission against the development guidelines established and the Development Report has been prepared in response to these. At this stage the proposal is in the consultative phase and once all feedback is received, the applicant will respond with a Response Document before it is submitted to the State Planning Commission for a recommendation to the Minister for Planning. The Minister for Planning is the final decision authority for major development. The Minister for Planning is the decision authority for applications to vary or revoke Proclamations restricting further land division, as part of separate statutory processes that involve Cabinet and Executive Council deliberations.

## **RECOMMENDATION**

### **Council resolves:**

- 1. That the report be received and noted.**
- 2. To delegate to the CEO and Mayor to lodge a submission in response to the Development Report including a letter of response to the State Planning Commission/Department for Trade and Investment outlining the comments of Council and Council Assessment Panel, with a copy of the staff planning report (*Appendix 1*) in relation to the Mount Lofty Golf Resort by 16 August 2023, with the Council submission to highlight its and its communities concerns regarding the following in particular:**
  - a. Golflinks Road is not considered suitable as the main traffic entrance to the development site given the increased number of vehicles, size of vehicles, current sightlines and current road width which is limited by topography and native vegetation, as well as the risks to all persons in the event of evacuation for a fire or other reason and pedestrians/cyclists. Noting that the Council has commissioned an independent traffic study/assessment which will be provided to the State Planning Commission as soon as it is received.**
  - b. Loss of significant amount of native vegetation without inclusion of a revegetation plan that looks to increase native vegetation plantings on the site.**
  - c. Stormwater management of additional water into Cox Creek which is already above capacity during rain events.**
  - d. Wastewater disposal may not be viable in Council's CWMS system without significant upgrades to the infrastructure.**
  - e. Proposal to subdivide the land to separate out the golf course & club, accommodation building and Perfumery/function centre to enable lease arrangements.**
  - f. Existing gazettal notice registered on the title that prohibits land division to ensure protection of the open space.**
  - g. Visual amenity of the local residents with the scale of the buildings and separate pods, particular concerns about light spill at night.**
- 3. To authorise the CEO to make any changes to the staff planning report (*Appendix 1*) as may be required prior to the date of lodgement.**

## 1. BACKGROUND

### Subject Land

The 39.9 hectare site at 35 Golflinks Road Stirling currently features an 18-hole golf course with associated Stirling Golf Club facilities and car parking and a five room motel. The site also includes a local heritage listed place described as the cottage and previously used as the Scent Factory. Cox Creek runs west to east through the middle of the property. Additionally, the allotment accommodates a large dam and a dense cover of native vegetation. Part of the allotment, along with the unmade Davenport Road also forms part of the Heysen Trail.

The site has multiple road frontages which include Old Carey Gully Road, Golflinks Road, Range View Drive as well as the unmade Davenport Road, all of which are under care and control of the Council. The primary access to the site is gained via the eastern portion of Golflinks Road near the intersection with Hoylake Avenue.

### Zoning/Overlays

Recreation Zone (currently as identified in the Planning and Design Code).

Public Purpose Zone and Recreation and Sports Area (previous zoning in the Adelaide Hills Council Development Plan).

High risk bushfire prone area.

Environment Food Protection Area (land division for residential purposes not permitted by legislation).

### Development Proposal

The development project by Mount Lofty Golf Estate Pty Ltd proposes construction of a 5 level tourist accommodation (hotel) building comprising 56 hotel suites, 15 two bedroom serviced apartments, 15 three bedroom serviced apartments and 2 penthouse serviced apartments, 17 private retreats (pods), 5 level golf course and guest facilities building (ancillary bar, gymnasium, multipurpose function rooms, restaurant, café and wellness centre), together with associated car parking, landscaping, subdivision of land (1 into 3), tree and native vegetation removal & retention of the 18-hole golf course with improvements.

A more detailed breakdown of the proposal includes:

- Construction of tourist accommodation (hotel) building ranging between 3 and 5 storeys in height and comprising 56 hotel suites, 15 two-bedroom serviced apartments, 15 three bedroom serviced apartments and 2 penthouse serviced apartments with back-of-house, plant storage and maintenance areas, function room, restaurant and external terrace, sports bar, gallery, café and wellness centre and associated car parking.
- 17 private retreats (pods) and 1 back of house service pod.
- Adaptive reuse of the Local Heritage Perfumery building as a retail, café and multipurpose function space.
- Construction of golf course facility building ranging between 2 and 5 storey in height and comprising function facilities, cart storage and clubhouse, pro-shop, administrative area, gym and change rooms and associated car parking.
- Two large on-site car parking areas incorporated within the two buildings to provide a combined 200 parking spaces.
- Retention of the 18-hole golf course with improvements and reconfigurations.
- Stormwater detention basin, creek, and lake restoration activities.
- Construction of entry wall and new entry signage at the existing Golflinks Road entry.

- Subdivision of existing allotment 53 of 39.9 hectares into 3 allotments for the development lease/operation arrangements as follows.
  - Proposed allotment 531 of 38.4 hectares will contain the 18-hole golf course.
  - Proposed allotment 532 of 9924m<sup>2</sup> will contain the tourist accommodation building and pods.
  - Proposed allotment 533 of 5056m<sup>2</sup> will contain the golf club and associated facilities.
  - Subdivision is proposed to occur as a very last stage of the proposal once all the construction work has been completed.
- Native Vegetation removal.

#### Major Development Declaration and Process

The Minister for Planning and Local Government declared that the proposed development was to be assessed as a Major Development pursuant to Section 46 of the *Development Act 1993* on 17 December 2020. Major development due to their nature, scale and extent of the potential impacts have economic, social or environmental importance to South Australia and follow a major development/environmental impact assessed pathway. Major developments are assessed against a bespoke set of development guidelines which are developed based on the expected impacts for, and endorsed by the State Planning Commission. The development will be assessed by the State Planning Commission against the development guidelines established. The Development Report for the Project has been prepared by the Applicant in response to the Development Guidelines (refer Appendix 3). The State Planning Commission will assess the development in its final form and make a recommendation to the Minister of Planning. The Minister for Planning is the final decision authority for this development.

Currently the development assessment is in the consultative phase and the development proposal has been released for public consultation and for comment by Council and State agencies. Council has been provided with the opportunity to provide a response.

#### Council Assessment Panel

A copy of the staff planning report and the Development Report for the Mount Lofty Golf Resort with appendices will also be presented to the CAP at its meeting on 9 August 2023, as an information report. Comments of the CAP members will be sent as a separate letter to the State Planning Commission should the CAP wish to express a view on the major development as part of the public consultation process..

## 2. ANALYSIS

### ➤ Strategic Management Plan/Functional Strategy/Council Policy Alignment

#### *Strategic Plan 2020-24 – A brighter future*

Goal 1	A Functional Built Environment
Objective B2	Preserve and enhance the unique character of the Hills for current and future generations
Priority 2.3	Proactively work with developers to ensure that built form complements or enhances existing local character whilst preserving the character and amenity of our towns, historic buildings and scenic environment

Council via its strategies, policies and development assessment functions has a key role to play in preserving and enhancing the character and amenity of the Adelaide Hills.

### ➤ Legal Implications

The then Minister for Planning and Local Government declared that the proposed development was to be assessed as a Major Development pursuant to Section 46 of the *Development Act 1993* on 17 December 2020.

The major development pathway is reserved for major projects of economic, social or environmental importance to the State. The applicant is required to prepare a detailed impact assessment in the form of a Development Report (DR). The DR must consider and respond to assessment guidelines prepared for and endorsed by, the State Planning Commission for this specific development. These guidelines are bespoke but have regard to the previous Development Plan and the Planning and Design Code for the Zone. The development is assessed against the development guidelines.

Pursuant to Section 46D(5)(a) of the *Development Act* and Regulation 63E(b) of the *Development Regulations 2008* the development proposal has been referred to Council for the opportunity to provide comment by 16 August 2023. State Agencies, including SA Water, the EPA, CFS, and the Native Vegetation Council and also the Government Architect and Council are referral bodies invited to comment on the proposal.

### ➤ Risk Management Implications

A key component of major development assessment is preparation of a detailed impact assessment by the applicant, in the form of a Development Report (DR). This DR needs to respond to the assessment guidelines endorsed by the State Planning Commission.

A lot of research and time is invested in the preparation of the assessment guidelines by State Planning to address the expected environmental, social and economic effects of the proposed development. Referral to the local Council and State agencies is undertaken simultaneously with public consultation for the community to allow formal comment from Council on development.

Not all information required by Council to appropriately assess the impact of the development is included in the Development Report and therefore the Council's ability to fully assess the impacts of the development is limited to the information currently available.

The submission detailing the information that has not been clarified or provided and concerns raised by both Council Elected Members and Administration and the Community will assist in mitigating the risk of:

*Insufficient information provided to Council to enable a thorough understanding of infrastructure and community impacts leading to an inappropriate form of development that does not adequately provide for required infrastructure and results in poor outcomes for both the Council and its Community.*

Inherent Risk	Residual Risk	Target Risk
Extreme (3A)	Medium (3C)	Low

To address this the major development process requires the Applicant to prepare a Response Document on matters arising from the public notification, Council and State agencies. This Response Document may result in amendments to the proposal. The Response Document becomes publicly available and Council will be advised when this occurs. There is no further public consultation opportunity in the process but State Planning do have some discretion on whether consultation should be repeated where a proposal is considered to have been significantly varied.

The process that a major development is required to address is the most rigorous level of development assessment in South Australia and this process provides an existing control to the risk that the development addresses the expected impacts. Council, State agencies and the community providing comment and formal feedback on the development proposal assists State Planning, the State Planning Commission and ultimately the Minister of Planning, in gathering further information on all of the effects of the proposed development. Following the consultative phase the Applicant is able to make amendments to the development to address the responses received and to consider further management plans to assist in mitigating the risk of impacts from the proposed development.

➤ **Financial and Resource Implications**

The review of the Development Report and preparation of the staff report is managed within existing resources across the organisation.

The costs of preparing expert reports for a major development project is borne by the Applicant.

Should the project be approved, unless an agreement exists with the Applicant, Council may be pressured to undertake vegetation management and upgrades along Golflinks Road to address community concerns which is unbudgeted.

➤ **Customer Service and Community/Cultural Implications**

The public consultation and public meetings were conducted by representatives of the Planning and Land Use Services team of State Planning. The public meetings were held on 25 July 2023 and well attended by the community.

The Development Report includes a cultural heritage management plan framework to address the impacts of the development construction on the cultural heritage of First Nations People.

The construction management plan will detail how risks will be managed and the controls that will be implemented during construction.

➤ **Sustainability Implications**

Economic Impact was a requirement of the guidelines developed for this development. This analysis was undertaken by BDO who have the experience and expertise to undertake the economic impact analysis. The report indicates a positive economic impact both during construction and once operational however, Council's Manager Economic Development notes that a cost benefit analysis would have been a better process to understand the development more holistically.

The Major Project Guidelines require a Social Impact Report to be prepared and included in the Development Report. A separate Social Impact Report has not been prepared, rather social impacts have been included throughout the report. This methodology has created angst with the community as they have not been able to clearly see the social impacts of the proposed development.

The Development Report includes a Landscape Plan, Tree Impact Assessment, Environmental Heritage Impact Assessment, Ecological Flora and Fauna Assessment, Environmental Noise Assessment, Construction Environmental Management Plan, Stormwater Management Plan, Native Vegetation Clearance Data Report, and Integrated Water Management Plan which talk to the very complex and considerable impacts on the environment as a result of the proposed development. Despite the provided reports, there remains concern about the impact of the proposed development on native vegetation, native fauna and stormwater quality and management.

➤ **Engagement/Consultation conducted in the development of the report**

Consultation on the development of this report was as follows:

*Council departments:* Open Space & Arboriculture, Engineering, Community Wastewater Management, Sport & Recreation, Economic Development, Community & Cultural Development, & Local Heritage

*Council Committees:* Not Applicable

*Council Workshops:* Update provided Council Workshop 11 July 2023

*Advisory Groups:* N/A

*External Agencies:* Native Vegetation Council

*Community:* The Development Report (DR) was released for public comment from 5 July 2023 to 16 August 2023 and two public meetings conducted by PLUS were held on Tuesday 25 July 2023

➤ **Additional Analysis**

At the time the proposal was declared Major Development, the Adelaide Hills Council Development Plan was in effect. This has now been superseded by the Planning and Design Code. The site has existing use rights as a golf course, clubrooms and tourist accommodation (motel). The Recreation and Sport Policy Area of the Public Purpose Zone in the Development Plan excluded tourist accommodation as an envisaged use. Envisaged uses were those for public and private recreational activities and policies sought development of a high standard of design that preserved native fauna habitats. The building heights envisaged were a maximum height of 10m. The Public Purpose Zone sought development that was sensitive to the natural environment, that was sited unobtrusively and which was available for public use or of social benefit to the community otherwise. Landscaping was considered to be an important aspect of development. The project exceeded guidelines in the Development Plan and land division for the commercial lease arrangements would have been a non-complying form of development.

The Adelaide Hills Council Development Plan has now been replaced with the Planning and Design Code. The land is now located within the Recreation Zone. The intent of the Zone is very similar to that of the Development Plan, and a range of accessible recreational facilities and associated uses are envisaged. The range of elements in the Mount Lofty Golf Resort are commonly associated with golf course developments and broadly accord with the Desired Outcome for the Zone, as the development proposes to retain and upgrade the 18-hole golf course. The adaptive reuse of the former Perfumery building as a local heritage place as a multipurpose café and function space also accords with the concept of being ancillary to the primary purpose of a recreational facility. On balance it is considered that the uses in this proposal are an expansion of the existing uses at a large scale. They will provide an integrated recreational and commercial facility for the community and visitors to the region but there are expected impacts of a development of large scale, which are exacerbated in the high bushfire prone environment of the locality.

The built form has generous set-backs from boundaries and the new multi-storey buildings are nestled within the allotment and clustered primarily in the area where the existing clubrooms and associated facilities are located. The structures are proposed to be well separated from all allotment boundaries with the setback from Golflinks Road in the order of 180m. Whilst numerically the buildings appear large in bulk and scale, they will not present significant visual impacts from public realm or any of the neighbouring properties. Additionally, the proposed tourist pods and café within the Local Heritage Place are of a small scale and will have no visibility from outside of the site. Considering the levels of the land where the buildings are proposed relative to Golflinks Road, the distance of the buildings from the boundaries and vegetation cover, the overall bulk and scale of the buildings will present minimal visual amenity impacts for the locality. However the local heritage adviser has recommended that some aspects of the proposed works to the perfumery building should be reviewed and amended.

The main concerns about the redevelopment is the inadequacy of the current form of Golflinks Road and the intersection of Golflinks and Carey Gully Roads to manage traffic and pedestrian movement associated with the proposed resort in a safe manner and the impact of traffic movement will have on the amenity of the locality for local residents. There is a need for Council to assess the potential impact of infrastructure upgrades, service provision



upgrades and construction access associated with the development on pedestrian safety, roadside vegetation health and sustainability. Should the development be approved, infrastructure upgrades may include the need for road widening, verge treatment, intersection works and upgrades to the existing access and egress for the Golf Resort, underground trenching for new service provisioning and construction access for heavy machinery. It is understood that general construction worker access and heavy vehicle access is intended to be from Old Carey Gully Road. Council staff have commissioned an independent traffic study/assessment which will be provided to State Planning for their consideration as soon as it is received.

Council's Civil Services team consider the offsite works would necessitate negotiation of an Infrastructure Agreement with bonding to be entered into.

Furthermore, it is considered there is a gap in the tree assessment reports which only consider the impact upon on-site vegetation. There is general concern with the level of native vegetation clearance required for this scale of development in a high bushfire prone environment. This environment also means there are additional impacts for evacuation of tourist facilities on high bushfire risk days. As the site is likely to have high usage during the bushfire season it is recommended that the Applicant give further consideration to the appropriateness of Golflinks Road in the bushfire survival plan if there continues to be no upgrade of the road as part of the proposal.

Should any work outside of the site be proposed that impacts Golflinks or Old Carey Gully Roads a shared path is considered important to allow for safe and unrestricted shared travel for pedestrians and cyclists. Alternatively, the developer might consider the use of their land for community access (shared use path) should road widening not allow for additional pedestrian/cycle infrastructure. This would also benefit the broader trail linkages that exist within the locality (the Heysen Trail & Pioneer Women's Trail) and provide connection to Mount George Conservation Park. Such linkages could be an added attraction of the resort as a destination in the Adelaide Hills.

Other concerns relate to the existing waste system capacity to manage the additional loads from the development. The Response Document is expected to address this once the comments of SA Water are received as part of the current consultation phase.

There are concerns that the sub-division is for purposes of selling the land rather than lease arrangements and the potential for this to be contrary to the existing Proclamation under s61 of the former *Planning and Development Act 1967*. *It is understood that there is a separate statutory process for varying or revoking Proclamations and this would only occur if the proposal is granted Planning Consent.*

Council consider there are a number of conditions that need to be included should the development be granted Planning Consent. These recommended conditions are included in the Planning report from Council staff, in **Appendix 1**.

➤ **Conclusion**

Despite the benefits of such a proposal, Council is concerned of the lack of clarity supplied in the assessment documents. Further details allowing Council staff to review matters including but not limited to road upgrades, waste management and biodiversity impact would have been beneficial in order for staff to provide more informed comments.

In particular, Golflinks Road is currently a minor local road which is suited to the current intensity of the golf course. Council hold substantial concerns regarding increased traffic flows on Golflinks Road and hold the view that significant upgrades are required to this road should the development proceed. Upgrades to this road need to be reviewed including impacts that a road upgrade will have to vegetation on the road verge and impacts to Community Wastewater Management System infrastructure.

The extent of vegetation removal, details of off-site public road upgrades, waste management and impact upon the existing Community Wastewater Management System are serious concerns that require further investigation.

Council should include in its response the request for an opportunity to engage further with the State Planning Commission after the release of the Response Document from the Applicant in due course.

**3. APPENDICES**

- (1) Planning Report & Council Local Heritage Referral Response
- (2) Development Report - Mount Lofty Golf Resort Project
- (3) Appendix A of Development Report - Guidelines
- (4) Appendix B of Development Report – Detail survey
- (5) Appendix C of Development Report – Plan of subdivision
- (6) Appendix D of Development Report – Architectural drawings
- (7) Appendix E of Development Report – Landscape plan
- (8) Appendix F of Development Report – Economic analysis
- (9) Appendix G of Development Report – Tree impact assessment
- (10) Appendix H of Development Report – Sustainability strategy report
- (11) Appendix I of Development Report – Traffic and access impact statement
- (12) Appendix J of Development Report – Waste management and minimisation plan
- (13) Appendix K of Development Report – Geotechnical investigations
- (14) Appendix L of Development Report – Design Statement
- (15) Appendix M of Development Report – Environmental heritage impact assessment report
- (16) Appendix N of Development Report – Cultural heritage management plan framework
- (17) Appendix O of Development Report – Ecological flora and fauna assessment
- (18) Appendix P of Development Report – Hazard management plan
- (19) Appendix Q of Development Report – Bushfire survival plan
- (20) Appendix R of Development Report – Environmental noise assessment report
- (21) Appendix S of Development Report – Services infrastructure summary
- (22) Appendix T of Development Report – Construction environmental management plan
- (23) Appendix U of Development Report – Stormwater management plan
- (24) Appendix V of Development Report – Bushfire attack level (BAL) assessment
- (25) Appendix W of Development Report – Letters of support
- (26) Appendix X of Development Report – Operational environment management plan
- (27) Appendix Y of Development Report – Bushfire management strategy
- (28) Appendix Z of Development Report – Native vegetation clearance data report

- (29) Appendix AA of Development Report – Renders of the proposed development
- (30) Appendix BB of Development Report – Heritage impact statement
- (31) Appendix CC of Development Report – Certificate of title
- (32) Appendix DD of Development Report – Integrated water management plan
- (33) Appendix EE of Development Report – Perfumery landscape plans
- (34) Appendix FF of Development Report – Perfumery detail survey

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# **Appendix 1**

*Planning Report & Council Local Heritage Referral  
Response*

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## COUNCIL STAFF PLANNING REPORT

<b>Applicant:</b> The Mount Lofty Golf Estate Pty Ltd	<b>Landowner:</b> The Mount Lofty Golf Estate Pty Ltd
<b>Agent:</b> Matthew King-URPS	<b>Originating Officers:</b> Doug Samardzija & James Booker
<b>Development Application:</b>	21/444/473
<b>Application Description:</b> Redevelopment of the Stirling Golf Club – which includes: <ul style="list-style-type: none"> <li>a) the construction of tourist accommodation in a new hotel building and private retreats (pods);</li> <li>b) new clubhouse facility and pro-shop, administration areas and change rooms;</li> <li>c) retention and improvements to the 18-hole golf course;</li> <li>d) conservation works and adaptive reuse of a local heritage place to accommodate a multipurpose café, retail and function space;</li> <li>e) car parking in the order of 200 spaces in two parking areas;</li> <li>f) tree removal (including native vegetation) and associated landscaping; and</li> <li>g) subdivision of the one allotment into 3 allotments</li> </ul>	
<b>Subject Land:</b> Lot:53 DP:59212 CT:5891/805	<b>General Location:</b> 35 Golflinks Road Stirling  <b>Attachment – Locality Plan</b>
<b>Assessment:</b> GUIDELINES set by State Planning Commission, March 2022	<b>Zone/Policy Area:</b> Recreation Zone under the PDI Act  Public Purpose Zone and Recreation and Sports Policy Area under the Development Act 1993.
<b>Form of Development:</b> Major Development	<b>Site Area:</b> 39.9 hectares
<b>Public Notice:</b> Formal public consultation occurs between 05 July 2023 and 16 August 2023.  Notice was published in both The Mount Barker Courier and The Advertiser on 05 July 2023.	<b>Representations Received:</b> N/A  <b>Representations to be Heard:</b> N/A

### 1. EXECUTIVE SUMMARY

The application involves the redevelopment of the Stirling Golf Club – which includes:

- a) the construction of tourist accommodation in a new hotel building and private retreats (pods);
- b) new clubhouse facility and pro-shop, administration areas and change rooms;
- c) retention and improvements to the 18-hole golf course;
- d) conservation works and adaptive reuse of a local heritage place to accommodate a multipurpose café, retail and function space;
- e) car parking in the order of 200 spaces in two parking areas;
- f) tree removal (including native vegetation) and associated landscaping; and
- g) sub-division of the one allotment into 3 allotments.

The subject land is located within the Recreation Zone as identified in the Planning and Design Code. It was previously located within the Public Purpose Zone and Recreation and Sports Policy Area as identified in the revoked Adelaide Hills Development Plan. On 17 December 2020, the Minister for Planning and Local Government declared that the proposed development is to be assessed as a Major Development pursuant to Section 46 of the *Development Act 1993*.

The Major Development assessment pathway is considered the most rigorous level of development assessment in South Australia and is reserved for major projects of economic, social or environmental importance to the State. Major Developments cannot be properly considered under existing assessment pathways (such as an assessment under the Development Plan or the Planning and Design Code), due to the nature, scale and extent of their potential impacts; where the effects of those impacts are unknown or more uncertain, or in situations where the environment is considered sensitive. The State Planning Commission (SPC) is responsible for setting the level of assessment required with the potential for it to fall within 3 different categories. These categories are Environmental Impact Statement (EIS), Public Environmental Report (PER) or Development Report (DR). In this instance SPC determined that the proposal's best fit was within the Development Report assessment pathway due to nature and scale of the issues which needed to be considered.

The Department for Trade and Investment - Planning and Land Use Services have advised that the public consultation period for the development is between 5<sup>th</sup> of July 2023 and 16 August 2023. Adelaide Hills Council has also been invited to provide comments on the Development Report (DR) Pursuant to Section 46D(5)(a) of the *Development Act 1993* and Section 63E(b) of the *Development Regulations 2008*, with comments due within the same timeframe allowed for notification.

Council's administration has undertaken a thorough review of the documentation provided and formally consulted with all the relevant departments and stakeholders within Council. The report below has been structured to provide commentary on the following matters:

- General description of the proposal.
- Description of the subject land and the locality.
- Planning commentary which includes outlining the role of planning policies in the process, describing the relevant zoning policies under the revoked Adelaide Hills Council Development Plan and the current Planning and Design Code policies, including relevant policies of the Recreation Zone.
- Detailed review and comments/concerns from relevant Council Departments which include Open Space Team, Community Waste Management, Economic Development/Community Capacity, Local Heritage, Community & Cultural Development, Engineering Department and Sports and Recreation.
- A list of matters still to be adequately addressed and recommended conditions that relevant department deemed appropriate should the proposal be approved.

## **2. DESCRIPTION OF THE PROPOSAL**

The purpose of this application is construction of a 5 level tourist accommodation (hotel) building comprising 56 hotel suites, 15 two bedroom serviced apartments, 15 three bedroom serviced apartments and 2 penthouse serviced apartments, 17 private retreats (pods), 5 level golf course and guest facilities building (ancillary bar, gymnasium, multipurpose function rooms, restaurant,

café and wellness centre), together with associated car parking, landscaping, subdivision of land (1 into 3), tree and native vegetation removal & retention of the 18-hole golf course with improvements.

A more detailed breakdown of the proposal includes:

- Construction of tourist accommodation (hotel) building ranging between 3 and 5 storeys in height and comprising 56 hotel suites, 15 two-bedroom serviced apartments, 15 three bedroom serviced apartments and 2 penthouse serviced apartments with back-of-house, plant storage and maintenance areas, function room, restaurant and external terrace, sports bar, gallery, café and wellness centre and associated carparking.
- 17 private retreats (pods) and 1 back of house service pod.
- Adaptive reuse of the Local Heritage Perfumery building as a retail, café and multipurpose function space.
- Construction of golf course facility building ranging between 2 and 5 storey in height and comprising function facilities, cart storage and clubhouse, pro-shop, administrative area, gym and change rooms and associated carparking.
- Two large on-site carparking areas incorporated within the two buildings to provide a combined 200 parking spaces.
- Retention of the 18-hole golf course with improvements and reconfigurations.
- Stormwater detention basin, creek, and lake restoration activities.
- Construction of entry wall and new entry signage at the existing Golflinks Road entry.
- Subdivision of existing allotment 53 of 39.9 hectares into 3 allotments for the development as follows:
  - Proposed allotment 531 of 38.4 hectares will contain the 18-hole golf course,
  - Proposed allotment 532 of 9924m<sup>2</sup> will contain the tourist accommodation building and pods and
  - Proposed allotment 533 of 5056m<sup>2</sup> will contain the golf club and associated facilities.
  - Subdivision is proposed to occur as a very last stage of the proposal once all the construction work has been completed.
- Native Vegetation removal

### **3. THE SUBJECT LAND AND PHYSICAL CHARACTERISTICS**

The subject land is an undulating irregular shaped allotment of approximately 39.9 hectares identified as 35 Golflinks Road, Stirling or Allotment 53 in Deposited Plan 59212 contained in Certificate of Title Volume 5891 Folio 805.

The site has multiple road frontages which include Old Carey Gully Road, Golflinks Road, Range View Drive as well as the unmade Davenport Road, all of which are under care and control of the Council. The primary access to the site is gained via the eastern portion of Golflinks Road near the intersection with Hoylake Avenue.

The site currently features an 18-hole golf course with associated Stirling Golf Club facilities and

car parking and a five room motel. The site also includes a local heritage listed place described as the cottage and previously used as the Scent Factory. Cox Creek runs west to east through the middle of the property. Additionally, the allotment accommodates a large dam and a dense cover of native vegetation. Part of the allotment, along with the unmade Davenport Road also forms part of the Heysen Trail.

The land is located approximately 2.5km north-east of the township of Stirling.

The land has an Open Space Proclamation registered on the Title to preserve the land as open space and to prohibit the land being divided into allotments for any purpose not in keeping with its character as an open space. The proclamation was made by the Governor of South Australia on 10 July 1975 under section 61 part VI of the revoked *Planning and Development Act 1967*. Even though the Proclamation predates current legislation it remains in force under legislative transitional provisions. Pursuant to S61(2) of the revoked *Planning and Development Act 1967* the owner of land can make application to vary or revoke the existing Proclamation. There is a separate defined statutory process to vary or revoke an open space proclamation and State Assessment staff advise it is a matter for the Minister for Planning to consider and action subject to Cabinet and Executive Council deliberations but only once there is a decision on the proposal.

Statement Assessment staff have advised that the Proclamation was noted at the time the major development declaration was made, but it was considered it did not prevent the major development assessment being undertaken, nor a decision being made on the proposal. Furthermore, they advise that many golf courses in the 1960s and 1970s have this Proclamation but no new proclamations have been made since 1980. It is understood that one of the main purposes of the proclamations on private land and the restriction of further sub-division was for the assessment of rates and taxes that are based upon land valuation. There is a layer in SAPPA to map their locations to assist with the assessment of facilities as they are redeveloped.

#### **4. THE LOCALITY**

The locality is defined by a mixture of allotment sizes and patterns with varying land uses. Both the immediate and the wider locality are separated into three different zones all with varying envisaged uses. Immediately to the south of the subject land along Golflinks Road and Old Carey Gully Road is a cluster of residential allotments ranging in size between 800m<sup>2</sup> and 7000m<sup>2</sup>. These allotments are in a Rural Neighbourhood Zone under the current Planning and Design Code (formerly known as the Country Living Zone under the revoked Adelaide Hills Council Development Plan). This zone predominantly anticipates residential uses. Immediately to the west and the north are allotments in the Productive Rural Landscape Zone (formerly known as the Watershed Primary Production Zone). These allotments vary in sizes and uses but are predominantly used for either rural residential or primary production related activities. That being said, the allotment immediately to the north and directly on the opposite side of Old Carey Gully Road contains the Scouts SA Woodhouse complex. All the land immediately to the east of the subject land is Council owned land which forms part of the Mount George Conservation Park and is located in the Recreation Zone (formerly known as the Public Purpose Zone). All of these properties are predominantly serviced by low volume Council owned roads, constructed and maintained at a standard appropriate for the rural living zone and its uses.

The immediate locality is also defined by natural features which include water courses and dense native vegetation, located on private allotments as well as Council road reserves and within the Mount George Conservation Park.



Within the wider locality to the west and south-west of the subject land is the suburb of Crafers. Immediately to the south adjacent to the freeway is the suburb of Stirling. The majority of the properties in these areas are of residential nature with a mix of commercial uses predominantly in town centres and along the main streets of Crafers and Stirling. Further north of the subject land is the suburb of Piccadilly whilst to the east is the suburb of Mount George. The majority of these properties are used for rural residential or primary production related activities.

Other notable elements of the locality include the small cluster of local and state heritage listed buildings on allotments immediately opposite the subject land on Old Carey Gully Road as well as the South Eastern Freeway, which is approximately 375m south of the subject land.

## **5. PLANNING OVERVIEW**

### **5.1 The role of planning policies in the process:**

The *Development Act 1993* requires the DR to state the consistency of the expected impacts of the proposed development with the relevant Planning Policy and specific assessment guidelines endorsed by the independent State Planning Commission (SPC). As a point of clarification, it's important to outline that at the time when the proposal was declared Major Development by the Minister, the *Development Act 1993* and Adelaide Hills Council Development Plan were in effect. Since then, the *Planning, Development and Infrastructure Act 2016* as well as the Planning and Design Code came into effect.

To provide context of the locality and what is envisaged, the below commentary provides a summary and a breakdown of the zoning policies under the revoked Adelaide Hills Council Development Plan as well as the current Planning and Design Code for clarity on what the zoning used to envisage under the previous planning system and how those policies transferred across into current system.

### **5.2 Policy and zone intent under revoked Adelaide Hills Council Development Plan:**

Under the revoked Adelaide Hills Council Development Plan the subject land was located in a Public Purpose Zone and within the Recreation and Sport Policy Area. In the order of hierarchy for assessment the policy area provisions were of higher priority than the zone provisions, and provided more specific policies for that particular locality whilst, the zone policies considered a wider locality. In this instance, the policy area objectives were seeking to accommodate development for a range of sporting, recreational, entertainment, cultural and exhibition events and associated spectator facilities with car parking within a landscaped setting. A multipurpose sporting facility was envisaged for the policy area, which minimised impacts on nearby residents and the locality.

Some of the envisaged uses for the Policy Area included childcare facilities, clubrooms associated with sporting facilities, facilities for the use of tourists and visitors, indoor and outdoor recreation facility, shop associated with the community club or services, spectator and administrative facilities ancillary to recreation development, and playground along with a range of other uses associated with community or recreational facilities. Notably the Policy Area excluded tourist accommodation as an envisaged land use.

All the provisions of the policy area associated with uses envisaged encourages these to be primarily for public and private recreational and community purposes. High emphasis is placed on active multipurpose recreational activities with associated spectator facilities. All structures designed for those uses were required to exhibit a standard of design which would enhance the

visual attractiveness of the zone whilst ensuring the preservation of native fauna habitats. Buildings were generally envisaged to a height of 6m whilst buildings associated with active indoor recreational activities were anticipated to the height of 10m. Although the buildings proposed do not include active indoor recreational uses, the 10m provision could be used as a guide. The proposed building has a maximum height of 20.9m, well above the 10m provision for the Policy Area. Despite this, the development provides generous setbacks, is located on the footprint of existing buildings and includes significant variation of building height which adds visual interest.

The Public Purpose Zone envisaged development being primarily for public use or in the case of private, being of social benefit to the community, whilst being sensitive to the natural environment. Development was generally sought to be integrated in function whilst also being of a scale compatible with existing buildings and the surrounding area whilst exhibiting high architectural standard with associated landscaping to enhance the amenity of the locality. The general uses envisaged included education facilities, community centres, recreation reserves, conservation park tourist facilities, research facilities as well as facilities for the aged within certain parts of the zone.

From a built form perspective, the Zone provisions envisaged development designed in such a way that it was of a scale and situated in a location which was unobtrusive and did not detract from the natural character. To achieve this, it was anticipated that buildings were located below the ridge line and within a valley, were set well back from public roads and clustered where possible to ensure that the majority of the site remained open in appearance. To further reduce the mass of buildings, incorporation of variations in wall and roof lines and external materials of natural colours to blend in with the natural and rural landscape were sought. High emphasis was also placed on conserving natural features and on the inclusion of appropriate landscaping in the design. As the proposed built form has generous set-backs provided, it is considered that the general intent of the Appearance of Land and Buildings section of the zone is achieved.

It is also noted that the design of the buildings have been assisted by advice provided by the Government Architect.

### **5.3 Policy and zone intent under the current Planning and Design Code:**

Under the Planning and Design Code the subject land is located within the Recreation Zone. The intent of the Zone is very similar to that of the Recreation and Sport Policy Area of the Development Plan described above. The Desired Outcome of the Recreation Zone simply seeks a provision of a range of accessible recreational facilities. This is further summarised by the first Zone Performance Outcome which seeks development that is associated with or ancillary to the primary purpose of structured, unstructured, active and or passive recreational facilities with the corresponding Designated Performance Feature providing a list of specific envisaged uses that fall within the sphere of recreational uses.

From a land use perspective, it is evident from other policies in the zone that it is envisaged for properties to be used for a variety of different recreational purposes with emphasis also put on allowing uses which could be subordinate to the principle recreational purpose(s). These uses range from a restaurant, office and tourist accommodation whilst also encouraging complementary activities such as horse breeding and keeping, sales and training activities as well as storage and maintenance of racing vehicles associated with motorsport racing which is also one of the envisaged uses which fall under the ambit of recreation facilities.

From a built form perspective, the zoning provides lot more flexibility for building heights than what was envisaged under the Development Plan, especially for larger allotment sites such as the subject land. The Recreation Zone does not provide guidance on building height, nor does it provide a Technical and Numeric Variation (TNV) in relation to building height.

#### **5.4 Development in reference to Recreation Zone under Planning and Design Code:**

As outlined in the above paragraph, the Desired Outcome of the Recreation Zone in the Planning and Design Code seeks a range of accessible recreational facilities. The existing use of the land is predominantly an 18-hole golf course with associated golf club facilities all which fit in the ambit of recreational use of land. The proposed development is seeking to continue the use of the land by retaining and upgrading the 18-hole golf course including its reconfiguration. The proposal also involves further intensification through construction of a golf course facility ranging from 2 to 5 storeys in height and comprising function facilities, cart storage and clubhouse, pro-shop, administrative area, gym and change rooms. It is therefore considered that this proposed element of the development fits within the Desired Outcome of the Zone.

As outlined in the description of the proposal, there are a number of different elements to this project. Apart from the continued and increased recreational use, the construction of a large tourist accommodation facility with added function room, restaurant, sports bar, café, wellness centre along with the adaptive reuse of an existing Local Heritage building as a separate multipurpose café and function space are additional uses proposed in association with the recreational facility. Performance Outcome 1.1 in the Zone seeks development which is associated with or ancillary to the primary purpose of the structured, unstructured, active and/or passive recreational facilities. The corresponding DPF provides a broad list of some of those envisaged uses with tourist accommodation and shops both specifically listed. Whilst not all the proposed uses such as a function venue is listed, it is not uncommon for those activities to be associated with large scale tourist accommodation use or a recreational facility. On balance, the proposal satisfies the intent of the Performance Outcome 1.1 by providing integrated and compatible recreational and commercial land uses, albeit at a large scale.

As mentioned earlier in the report, the proposal will include extensive building work. The two largest proposed buildings are the golf club facility building and the tourist accommodation (hotel) building. The tourist accommodation facility is a stepped design ranging between 3 and 5 storeys in scale with a combined overall height of 20.9m. The building features accommodation rooms, with back-of-house, plant storage and maintenance areas, function room, restaurant and external terrace, sports bar, gallery, café, wellness centre and associated carparking with a combined floor area of 11,024m<sup>2</sup>. The golf club facilities building is similar in nature and design ranging from 2 to 5 storey in scale with a combined overall height of 20.2m. It features function facilities, cart storage and clubhouse, pro-shop, an administrative area, gym, change rooms and associated carparking, with a total combined floor area of 8839m<sup>2</sup>. The two buildings combined have a total proposed floor area of 19863m<sup>2</sup>.

Both buildings are proposed to be nestled within the allotment and clustered primarily in the area where the existing clubrooms and associated facilities are located. The structures are proposed to be well separated from all allotment boundaries with the setback from Golflinks Road in the order of 180m. Whilst numerically the buildings appear large in bulk and scale, they will not present significant visual impacts from public realm or any of the neighbouring properties. Additionally, the proposed tourist pods and café within the Local Heritage Place are of a small scale and will have no visibility from outside of the site. Considering the levels of the land where the buildings are proposed relative to Golflinks Road, the distance of the buildings from the boundaries and

vegetation cover, the overall bulk and scale of the buildings will present minimal visual amenity impacts for the locality. The proposed development is therefore considered to satisfy the built form requirements envisaged for the Zone. Additionally, the design adequately addresses the mass and scale of the buildings from an interface perspective with nearby residential properties in the adjacent Rural Neighbourhood Zone.

## 6. REFERRAL RESPONSES FROM COUNCIL DEPARTMENTS

### 6.1 Open Space Team:

Council's Open Space Team have reviewed the relevant documents, inspected the locality, and provided detailed comments in relation to the project. The Open Space team have identified a list of concerns with the proposal and have also advised that the level of information provided is lacking and does not adequately address impacts on vegetation. Below is a summary of the comments provided along with the list of recommendations.

#### 6.1.1 Commentary:

- The landscape drawings only provide approximate locations of the proposed vehicle crossovers to Council roads. No measurements or formal design specifications have been provided that enable impacts to the existing vegetation within the road reserves to be fully established.
- Based upon the approximate vehicle crossover locations provided, minimal impacts to Council managed vegetation of value appear likely in the following locations:
  - Existing Old Carey Gully Road crossover (north of hole 8)
  - New western crossover location on Golf Links Road
  - Existing eastern main entry crossover location on Golf Links Road
- A variety of Council managed mature native trees are situated to either side of the central, new proposed vehicle crossover location on Golf Links Road. Careful consideration is required to ensure the design of this crossover does not adversely impact tree health or sustainability.
- The scope of the Arboriculture report only provides information regarding recommendations to tree management directly around the building works within the centre of the Golf Links itself. While the report is comprehensive, and controls recommended are sufficient to ensure trees are substantially maintained. The scope of the report is constrained to the main development site.
- No formal assessment appears to have been undertaken of development impacts to trees throughout the remainder of the impacted land parcel or within the impacted road reserve areas.
- No information has been provided regarding the required underground service provisions that would likely need to traverse through the road reserves or other area of private land.
- The road verge reflects native tree species of note *Eucalyptus dalrympleana* - Candlebark (Conservation Status - Rare), the understory unfortunately is degraded with notable weed infestation in several places.
- At a landscape scale the loss of the trees would contribute to environmental amenity loss and diminish ecological habitat value, which is obviously a concern, particularly clearance into the adjoining Mount George Conservation Park.

- Post development, what steps or measures are going to be taken to ensure the clearances are to specified standard? Is there a level of subsequent monitoring and evaluation? The Mount Lofty Golf Estate road reserve offers a level of scrutiny with blackberry clearly evident in several places.
- With a development complete, long-term changes in the environment are often found in the edge effect clearances. Council has specific concerns around any weed incursion into the cleared zones adjacent Mount George.
- Whilst the native vegetation offset is noted. What portion of this fund is attributed to the long-term ecological management of the surrounding natural environment? This is in addition to any NRM Levy payment.
- Golflinks Road has a potential listing under the Native Vegetation Marker System (NVMS), based on the Candle barks present. Currently this is heavily dependent on controlling the Blackberry along this road reserve which from observation occurs from within the Mount Lofty Golf Estate property.

### 6.1.2 Recommendations:

The following recommendation have been proposed by Council's Open Space Team. These recommendations have also been adopted into recommended conditions:

- Council requires that a suitably qualified project arborist must be employed by the applicant to oversee the development activities throughout the duration of the project and to provide periodical reports to Council's development assessment team regarding compliance checks undertaken after installation of tree protection zones prior to commencement of any work, during demolition and bulk earthworks, driveway construction, construction of footings, superstructure, installation of underground services and at completion.
- Council requires that all tree protection zone guidelines are enforced as per the recommendations of the report.
- Consideration should also be given, and advice received regarding the impacts to neighbouring vegetation directly surrounding the areas of mass tree clearance.
- Council requests for applicant to demonstrate through the provision of an Arboriculture impact assessment report that the location of supporting infrastructure has been established with intent to minimise impacts to vegetation to the lowest possible level.
- Tree management advice should be provided around the following new or modified assets to ensure the placement and installation methods used do not adversely impact upon tree health or compromise tree sustainability through the development actions:
  - All buildings / Structures / outbuildings
  - Upgraded or new roadways
  - Upgraded or new walking paths
  - New fencing locations
  - Other supporting infrastructure (such as light poles)
  - Vehicle road reserve cross-overs locations
  - Main service provision of underground infrastructure to the buildings
  - Underground service provision in between all accommodation and supporting infrastructure required as part of this development
- The road reserve and primarily the Mount Lofty Golf Estate boundary has several weeds species (in large numbers), clearly visible mainly Blackberry, Gorse, Ivy and Broom. The real concern is the land to be cleared along the perimeter, Mount George Conservation Park in particular. In time this boundary is likely to reflect the scenario already in place along the Council property. Council considers that this should be recorded and the fence line is

inspected for several years post development ensuring weed incursion is controlled. Otherwise, the weed and ecological risk to surrounding properties from the Mount Lofty Golf Estate could be a future problem based on the evidence. Council considers that this requires a long-term bond with a management plan and reporting.













### **6.2 Trails:**

Council advises that the Pioneer Women’s trail and Heysen trail bisect the site using the Davenport Road reserve. Upon inspection it is evident that these trails use the corridor and as such should remain untouched as part of the development. However, if they were to be altered, then consultation with Council and the community groups that plan these trails (National Trust of SA and Friends of Heysen Trail, respectively) should be undertaken.

From traffic management and information provided demonstrates management within the site, and briefly describe access required from local roads and the impact this may have. Consideration must be given to the opportunities that exist in providing safer pedestrian access to and from the site for people moving from the south and the north via the local road networks. Should any work outside of the site be proposed that impacts Golflinks or Old Carey Gully Road a shared path should be considered to allow for safe and unrestricted shared travel for pedestrians and cyclists wishing to use the site. Alternatively, the developer may consider the use of their land for community access (shared use path) should road widening not allow for additional pedestrian/cycle infrastructure. This will also benefit the broader trail linkages that exist within the locality – existing local trails, the Heysen, Pioneer Women’s and connection to Mount George Conservation Park.

### **6.3 Community Wastewater Management System (CWMS):**

Council’s current CWMS pump station located at Golflinks Rd, Stirling will need to be upgraded to accommodate the wastewater produced by the Mount Lofty Golf Estate development. The works to upgrade the station will need to include the following:

- Installation of a balance tank is on the subject site for collection of waste-water before entering Councils CWMS pump station. This will ensure that the wastewater enters in a controlled manner.
- Upgrade of pump capacity.
- Emergency storage capacity to increase.
- Back up diesel generator in case of power failure.
- Any trade waste generated will need to be managed onsite before entry into CWMS infrastructure.

The developer is also advised that they will need to seek approval from SA Water to dispose of the extra wastewater generated by the development into the Heathfield WWTP and will be responsible for all augmentation costs.

As a different approach, it is also advised for the developer to consider an alternate wastewater disposal method such as an indirect SA Water sewer connection from the proposed development along Old Carey Gully Rd to the SA Water Heathfield WWTP. There is an existing SA Water pressure sewer line that connects Woodhouse on Spring Gully Rd to the Heathfield WWTP.



#### **6.4 Economic Development/Community Capacity:**

Council understands that Economic Impact was a requirement of the Guidelines developed for this development. This analysis was undertaken by BDO who have the experience and expertise to undertake the economic impact analysis.

While the purpose of economic impact analysis is to quantify and describe the pertinent impacts such as the number of jobs or the amount of income generated, they do not in themselves indicate the magnitude of the benefits and costs and whether the project is desirable from a public viewpoint. In fact, even a negative event such as a bushfire will provide a positive economic impact using the approach taken in this assessment. Economic impact analysis is therefore an attempt to predict, but not evaluate the full effects of the project.

It is therefore considered that a Benefit Cost Analysis would have provided a far more systematic assessment of the development where every potential cost and benefit associated with a project would have been considered and even the less-than-obvious factors like indirect or intangible costs be uncovered. For example, as mentioned elsewhere, Council considers that there are significant native vegetation impacts associated with this development. A Benefit Cost Analysis would have enabled these impacts to be costed and compared with the expected benefits of the development.

Consistent with Treasurer's Instructions 17, Council encourages the State Planning Commission to seriously consider this approach for future Major Development assessments.

#### **6.5 Local Heritage:**

Council's Local Heritage advisory reviewed the proposal and consider the direct works to the local heritage place (LHP) and the design of the new five storey buildings. The comments are summarised below:

##### **6.5.1 Works to a local heritage listed places:**

Generally, the proposed works are supported, as they will see the refurbishment of the heritage building, and removal of non-significant later additions to the stone structure. The following aspects of the proposed works to the LHP should be reviewed and amended:

- Existing stone walls should NOT be sandblasted, this will damage the stone and mortar. If the walls require cleaning this should be done with low pressure water and stiff bristle brush. Organic growth can be removed with a weak biocide, applied and removed in accordance with the supplier's recommendations, and paint can be stripped with a chemical stripper such as 'Peelaway'.
- A moisture barrier should be provided between the stone walls and the new polished concrete floor internally.
- The roof can be replaced in either a red Colorbond to reference the original roof colour; alternately a galvanised sheet metal would be an appropriate material.

The proposed steel and glazed doors to the main entry to the proposed gift shop are acceptable to provide some visual connection with the inside of the building, however it would be preferred if all other doors and windows are retained as timber framed glazed windows, which better reflects the construction methodology of the original building.

The proposed redesign for the grounds of the heritage place includes a new modern glass, sandstone and metal building situated adjacent to the local heritage place. This is a contemporary design and is located at some distance from the LHP. No heritage issues with the proposed new building and associated landscape and paving works, however it is recommended the black roof be substituted for a lighter colour, as typically black or very dark roofs are not supported in a heritage context.

#### **6.5.2 Comment on design of new facilities:**

Whilst located at some distance from the Local Heritage Place, we provide the following comments on the design of the main structures proposed as part of the development:

- The Hotel and Facilities Buildings are located well within the golf club site, and will not be highly visible from adjacent roads.
- The scale of the development is extensive, with the both the Facilities and Hotel Buildings rising to 5 storeys from ground, albeit cut into the slope of the ground so that they primarily read as 3 to 4 storeys.
- The form of the buildings is also very contemporary, with flat roofs, strong vertical and horizontal articulation of building materials, and curved corners.
- Car parking appears to be largely contained within the building footprints, which is contributing to the scale of the buildings.
- The proposed material palette appears very stark, with concrete, metal cladding and glass in dark and grey tones – this could potentially be reviewed to better reflect the natural setting of the surrounding area.

#### **6.6 Community & Cultural Development:**

- Developer needs to be aware of their obligations under the Aboriginal Heritage Act whilst undertaking development works. Council is satisfied that this has been thoroughly addressed in the Cultural Heritage Management Plan provided as part of the submission documents.
- Council considers that there is an opportunity to recognise First Nations and add value to the visitor experience.
- Council considers that there is opportunity to engage with Adelaide Hills artists through the gallery/café.

#### **6.7 Engineering Department:**

Adelaide Hills Council was consulted at the start of the year by The Department for Trade and Investment - Planning and Land Use Services to provide preliminary comments on the draft Development Report and the level of information that was provided. At that time Council's Engineer Department provided clear feedback raising concerns, queries, and comments in relation to the proposal and the level of information. At that time, it was expected that this feedback would be considered by the applicant and addressed in the finalised submission. However, after reviewing the finalised documents as part of the formal referral process, Council's Engineer Department have advised that the original comments provided have not been addressed at all and as such are reiterating the same comments as originally provided. Additionally, given that the original comments have not been addressed, Council is of the opinion that it has not been afforded the opportunity to provide clear and most accurate feedback on the proposal and therefore reaffirms its concerns.

Accordingly, the following comments were provided:

- Applicant proposes some upgrades to Golflinks Rd, but does not provide detail of what is proposed.
- Applicant claims increase in operational traffic on Golflinks Rd is within acceptable levels, but doesn't clearly articulate what is considered acceptable for Golflinks Rd specifically.
- Applicant's updated traffic report details acceptable level of service for traffic volumes at key intersections, but does not address pavement strength or road geometry and their ability to cope with the increase in large and heavy vehicles accessing the site.
- Applicant proposes additional formal accesses off Golflinks and Carey Gully Rd, but does not provide detail of what is proposed at those locations.
- Applicant proposes to manage the majority of waste water onsite, and acknowledges that some 'augmentation' (upgrade) of the Golflinks Rd pump station may be required, the details of which are yet to be confirmed.

Council considers Golflinks Rd to be a minor local, low volume road, constructed and maintained at a standard appropriate for the rural living zone it is located in. It is not suitable to service a major commercial development of this nature. The developer needs to upgrade Golflinks Rd to meet an appropriate standard for an urban road, which would include at a minimum road widening and edge treatment. The design and construction of this upgrade must be undertaken to Council's satisfaction, and an Infrastructure Agreement including bond needs to be entered into. The developer's Arboriculture Pre Development Impact Assessment Report needs to be extended to cover roadside vegetation impacted by the road upgrade to ensure development generated by road construction does not adversely impact tree health or sustainability. These concerns also relate to the intersection of Golflinks Rd and Old Carey Gully Rd and the required upgrades in this location.

Council would like to advise that it supports the use of access from Old Carey Gully Road during the construction process. Additionally, the measures implemented to improve water quality and water course health is positive and would support Council's Aldgate, Bridgewater, Crafers and Stirling Stormwater Management Plan.

Council would also like to reaffirm that it is not satisfied with the level of information provided. Additionally, the developer is advised that Council will not approve any works on Council owned land or to Council owned infrastructure without first receiving appropriate details which are to Council's satisfaction.

#### **6.8 Sports and Recreation:**

- Golf is an important recreational activity in the Adelaide Hills region, & Council is therefore supportive of improvements proposed from a recreational perspective that will improve the quality & accessibility of the activity.
- Refurbishments to changerooms, (that we assume will provide, more accessible and equitable provision) are a welcome addition.
- Space for the community to gather is also an important consideration, so we are pleased to see that refurbishments to the clubhouse have also been included.

## 7. CONCLUSION

Council is aware of the positive economic impact such a development would have on the region and are supportive of such a proposal in principle. The upgrade of this facility is welcomed and will provide much needed recreation and accommodation options in the region.

Despite the benefits of such a proposal, Council is concerned of the lack of clarity supplied in the assessment documents. Further details allowing Council staff to review matters including but not limited to road upgrades, waste management and biodiversity impact would have been beneficial in order for staff to provide more informed comments.

In particular, Golflinks Road is currently a minor local road which is suited to the current intensity of the golf course. Council hold substantial concerns regarding increased traffic flows on Golflinks Road and hold the view that significant upgrades are required to this road should the development proceed. Upgrades to this road need to be reviewed including impacts that a road upgrade will have to vegetation on the road verge and impacts to Community Wastewater Management System infrastructure.

The extent of vegetation removal, details of off-site public road upgrades, waste management and impact upon the existing Community Wastewater Management System are serious concerns that require further investigation.

Should the application be successful, Council invites further discussion with the applicant in order to resolve the infrastructure issues that this proposal presents.

## 8. RECOMMENDED CONDITIONS

Should this development be granted consent, Council recommends the following conditions:

1. Site work and building work shall be carried out only between the hours of 7.00am to 5.00pm Monday to Saturday. No works are permitted on Sundays other than those necessary for dust control, emergency works or works that cannot be carried out at any other time without causing unnecessary disruption, as may be approved by Council on written application as per EPA requirements for work of this nature.
2. Prior to Building Consent being issued, a Construction Environment Management Plan (CEMP) including a Soil, Erosion and Drainage Management Plan (SEDMP) must be prepared and submitted to Council with the civil design drawings submission for Council approval. The CEMP and SEDMP shall be implemented prior to construction commencing to prevent soil sediment and pollutants leaving the site or entering watercourses during development of the site. The CEMP should also include details of underground service connections on site and within road reserves.

NOTE: The EPA Guideline Construction environmental management plans (CEMP) and Code of Practice for the building and construction industry provides useful information on the preparation of CEMPs and SEDMPs.

3. As-built" drawings of the approved and installed infrastructure shall be submitted to the Council along with certification from a professional engineer that the works for that stage have been completed in accordance with the approved design.

4. All trenches or excavation are to be reinstated to the satisfaction of Council. All excavation, trenching of underground services and reinstatement in existing road pavements and verge areas shall be done to satisfaction of Council.
5. All approved works and infrastructure required for construction shall be constructed for the relevant stage to the satisfaction of the Council. All costs for the construction of all approved infrastructure shall be borne by the owner/applicant. Following agreement by Council that Practical Completion has been achieved the developer shall be responsible for all maintenance for a period of 12 months or such other period of time as agreed.
6. An asset register of the infrastructure constructed on Council land shall be provided in digital format to the satisfaction of Council.
7. Any costs associated with any vegetation clearance within Council Land including costs associated with Native Vegetation Significant Environmental Benefit payments is to be the responsibility of the applicant.
8. Proposed new (or modifications to existing) vehicle driveway connection points to Golflinks Rd and Old Carey Gully Road needs to be designed and constructed to meet relevant Australian Standards and to Council's satisfaction. The design needs to be approved by Council before any construction at the site is permitted to occur (NB especially as one proposed connection seems unlikely to meet relevant standards for sight distance).
9. The applicant shall provide an expanded Arboriculture Pre-development Impact Assessment report detailing tree management advice for any tree including impacted trees within the road verg (outside of the provided reports geographical area of scope) that could be impacted directly or indirectly by this development. Tree management advice should be provided around the following new or modified assets:  
  
All buildings / Structures / outbuildings, upgraded or new roadways, upgraded or new walking paths, new fencing locations, other supporting infrastructure (such as light poles), vehicle road reserve cross-overs locations, main service provision of underground infrastructure to the buildings and underground service provision in between all dwellings and supporting infrastructure required as part of this development.
10. Prior to any civil works or earthworks commencing on-site, tree protection zone (TPZ) measure shall be implemented in accordance with the recommendations stipulated in the Arboricultural Impact Assessment and Development Impact Report prepared by Arborman Tree Solutions. The works in relation to the tree(s), outlined in the Arborist's Report are to be undertaken simultaneously with any building works on the site.
11. All works are required to be supervised by the suitably qualified project arborist throughout the duration of the project. If any tree roots are discovered during the works, the project arborist is to assess and address accordingly.

**NOTE MANDATORY NOTIFICATION:** Provide at least 48hours notice for Council to be present at excavation in tree protection zones of any Council owned trees.



12. The vegetation along the fence line of the Mount Lofty Golf Estate and in particular along Mount George shall be recorded and inspected for at least 3 years post development ensuring weed incursion is controlled. A long-term bond with a management plan and reporting shall be undertaken.
13. Council shall be provided with reporting updates at each stage of construction.
14. Existing stone walls of the Local Heritage Place should NOT be sandblasted, this will damage the stone and mortar. If the walls require cleaning this should be done with low pressure water and stiff bristle brush. Organic growth can be removed with a weak biocide, applied and removed in accordance with the supplier's recommendations, and paint can be stripped with a chemical stripper such as 'Peelaway'.
15. In regards to the Local Heritage Place, a moisture barrier should be provided between the stone walls and the new polished concrete floor internally.
16. The roof of the Local Heritage Place shall be replaced in either a red Colorbond to reference the original roof colour; or alternately galvanised sheet metal.

## ADELAIDE HILLS COUNCIL - HERITAGE ADVISORY NOTE

<b>ID Number</b>	N/A – Major Project
<b>Heritage Listing</b>	LHP – Local Heritage Overlay <i>“Cottage, Mount Lofty Golf Club, Former Scent Factory, ‘Le Chateau’, ‘Le Chateau a la Pong”</i>
<b>Address</b>	35 Golflinks Road, Stirling
<b>Proposal</b>	The Mount Lofty Golf Estate Pty Ltd proposes to redevelop the Stirling Golf Club, to include: (a) the construction of tourist accommodation in a new hotel building and private retreats (pods); (b) new clubhouse facility and pro-shop, administration areas and change rooms; (c) retention and improvements to the 18-hole golf course; <b>(d) conservation works and adaptive reuse of a local heritage place to accommodate a multipurpose café, retail and function space;</b> (e) car parking in the order of 200 spaces in two parking areas; and (f) tree removal (including native vegetation) and associated landscaping

<b>Heritage Value Assessment</b>	<p>Stone building with brick quoins and surrounds. The gabled roof is clad with corrugated iron and windows are barred. The entrance to a cellar on one elevation has been covered. The building is extensively covered with ivy.</p> <p>The area in the vicinity of the Mount Lofty Golf Club was, in earlier times, used for dairying and mixed farming. By the turn of the century a small portion of this land was devoted to the production of perfume, growing plants from which various essences could be extracted. The Mount Lofty Flower Farm and Scent Factory were established by James Cowan in 1889. This business was associated with M Renaud's perfumery in Adelaide. By late 1896 the perfume factory closed and the property was put on the market. It was later purchased by the Mount Lofty Golf Club. Arthur Harrip lived in the cottage in the early days of the golf club and the building was later tenanted.</p> <p>A remnant of a more unusual horticultural and manufacturing business in the district, that of scentmaking.</p> <p>It was identified as meeting the following criteria:          (a) it displays economic themes that are of importance to the local area (Stirling District Heritage Survey, 1997)</p>
<b>Previous Advice</b>	Nil
<b>Description of Proposal</b>	<p>The existing perfumery will be adaptively reused as part of the redevelopment and will entail:</p> <ul style="list-style-type: none"> <li>• Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.</li> <li>• Extension to the Perfumery to include a covered outdoor dining area.</li> <li>• Orchard and perfumery garden plantings to reimagine the former use of the building as a “Scent Factory”.</li> <li>• The perfumery building will temporarily house the golf club whilst construction is occurring.</li> </ul>

*External Works:*

- A large modern shed that currently abuts the heritage building will be demolished.
- A small wooden lean-to at the rear of the building will be demolished.
- Three doors which are located at the front, rear and western side of the building will be replaced with new black steel and glass doors.
- All existing windows are to be replaced with new black steel windows.
- Existing cellar access stair to be refurbished

The current metal roof sheeting will be removed and replaced to match existing.

- New half round steel gutter to be installed and replace existing.
- Existing external walls to be sandblasted, refurbished and repointed.
- Paving to be laid around existing building.

*Internal:*

- New Hardwood timber roof trusses to replace existing,
- Internal timber lining to underside of trussed plus insulation.
- Internal door to be removed and opening retained,
- Existing brick walls to be sandblasted and refurbished,
- Plastered walls to be repaired where cracking occurs,
- Fire place bricks to be sandblasted to expose brick,
- Existing concrete slab to be removed and flooring to be replaced with polished concrete floor.
- The existing ceiling in the rear room (southern end of building) will be removed and replaced with raked ceiling and new trusses which will be exposed.

*Structural repairs:*

- The roof will be retained with the replacement of some purlins
- The walls do not appear to require structural repairs other than repairs to cracking.

Painting of the exterior of the building will be dependent on the roof colour as the fascias, gutters and downpipes are to match. Potential roof colours are:

Red - Current roof is red corrugated iron - this is most likely the original roofing material. Painting the exterior woodwork red would match the red brick accents and existing roof colour.

Grey - The architectural design plan is to replace the roof with grey Colourbond steel. If this colour choice was to be approved, then the external woodwork will be painted grey to match.

(EBS Heritage Impact Statement)

A new pavilion is also proposed adjacent to the existing LHP, housing a function centre and amenities. The form of this building comprises a strong gable roof form repeated over four bays, with limited wall cladding other than to the amenities which is proposed to be stone cladding (noted as Basket Range sandstone). The roof is proposed as a standing seam profile in black.

<p><b>Heritage Advice</b></p>	<p>Generally, the proposed works are supported, as they will see the refurbishment of the building, and removal of non-significant later additions to the stone structure.</p> <p>The following aspects of the proposed works to the LHP should be reviewed and amended:</p> <ul style="list-style-type: none"> <li>- Existing stone walls should NOT be sandblasted, this will damage the stone and mortar. If the walls require cleaning this should be done with low pressure water and stiff bristle brush. Organic growth can be removed with a weak biocide, applied and removed in accordance with the supplier's recommendations, and paint can be stripped with a chemical stripper such as 'Peelaway';</li> <li>- A moisture barrier should be provided between the stone walls and the new polished concrete floor internally;</li> <li>- The roof can be replaced in either a red Colorbond to reference the original roof colour; alternately a galvanised sheet metal would be an appropriate material;</li> <li>- The proposed steel and glazed doors to the main entry to the proposed gift shop are acceptable to provide some visual connection with the inside of the building, however it would be preferred if all other doors and windows are retained as timber framed glazed windows, which better reflects the construction methodology of the original building.</li> </ul> <p>The proposed redesign for the grounds of the heritage place includes a new modern glass, sandstone and metal building situated adjacent to the local heritage place. This is a contemporary design and is located at some distance from the LHP. No heritage issues with the proposed new building and associated landscape and paving works, however it is recommended the black roof be substituted for a lighter colour, as typically black or very dark roofs are not supported in a heritage context.</p>
<p><b>Comment on design of new facilities</b></p>	<p>Whilst located at some distance from the Local Heritage Place, we provide the following comments on the design of the main structures proposed as part of the development:</p> <ul style="list-style-type: none"> <li>- The Hotel and Facilities Buildings are located well within the golf club site, and will not be highly visible from adjacent roads;</li> <li>- The scale of the development is extensive, with the both the Facilities and Hotel Buildings rising to 5 storeys from ground, albeit cut into the slope of the ground so that they primarily read as 3 to 4 storeys;</li> <li>- The form of the buildings is also very contemporary, with flat roofs, strong vertical and horizontal articulation of building materials, and curved corners;</li> <li>- Car parking appears to be largely contained within the building footprints, which is contributing to the scale of the buildings;</li> <li>- The proposed material palette appears very stark, with concrete, metal cladding and glass in dark and grey tones – this could potentially be reviewed to better reflect the natural setting of the surrounding area.</li> </ul>

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## **Appendix 2**

*Development Report Mount Lofty Golf Resort Project*

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Mt Lofty Golf Estate Pty Ltd  
20ADL-0075  
8 June 2023

# Development Report – Mount Lofty Golf Estate

35 Golflinks Road, Stirling

# Development Report

8 June 2023

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<b>In association with</b>	RArchitecture, Trice, Hudson Howells, Oxigen Landscape Architects, Cirqa, Dsquared, EBS Ecology, FMG Engineering, LUCID Engineering, Environmental Projects, BESTEC, Arborman
<b>Prepared for</b>	Mount Lofty Golf Estate Pty Ltd
<b>Consultant Project Manager</b>	Mathew King, Managing Director mking@urps.com.au
<b>URPS Ref</b>	20ADL-0075

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V2	04/04/23	CJ	MK	Final
V3	08/06/23	CJ	MK	Amended

We acknowledge the Kaurna People as the Traditional Custodians of the land on which we work and pay respect to their Elders past, present and emerging.

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## Glossary and Abbreviations

BAL	Bushfire Attack Level
CT	Certificate of Title
CEMP	Construction Environmental Management Plan
CFS	Country Fire Service
CHMP	Cultural Heritage Management Plan
DP	Deposited Plan
DR	Development Report
EPA	Environmental Protection Authority
EFPA	Environment Food Production Area
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FTE	Full Time Equivalent
GSP	Gross State Product
GRP	Gross Regional Product
HIS	Heritage Impact Statement
MGCP	Mount George Conservation Park
MLGE	Mount Lofty Golf Estate
TIA	Traffic Impact Assessment
The Code	The Planning and Design Code
The Guidelines	Guidelines for the Preparation of a Development Report, Mount Lofty Golf Estate
The Proponent	Mount Lofty Golf Estate Pty Ltd
The Minister	The Minister for Planning
PDI Act	Planning, Development and Infrastructure Act 2016
SA	South Australia
SAGR	South Australian Government Region
SPC	State Planning Commission
WMP	Waste Management Plan

## Summary

On 17 December 2020, the Minister for Planning and Local Government (the Minister) declared the Mount Lofty Golf Estate (the proposed development) to be assessed as a Major Development pursuant to Section 46 of the *Development Act 1993* (the Act). Section 46 of the Act ensures that matters affecting the environment, the community or the economy to a significant extent, are fully examined and taken into account.

The State Planning Commission (SPC) is responsible for setting the level of assessment required (Environmental Impact Statement, Public Environmental Report or Development Report) and provides Guidelines. Impact assessment enables the holistic consideration of proposals that might otherwise be of a nature or scale that is not expected through the regular development assessment process and/or Planning and Design Code.

Due to the nature of the proposed development, the need for a broader assessment and investigation of the following was required:

- Tourist accommodation and associated land uses, including events,
- Bushfire protection requirements,
- Native vegetation clearance and tree removal,,
- The interface with the Mount George Conservation Park,
- The potential impacts on the Mount Lofty Ranges Watershed including water resources such as watercourses, dam, lakes, wetlands and floodplains, and associated water quality,
- The impacts on the surrounding traffic networks during construction and operation, and
- Servicing and infrastructure required for the site.

The proposed development is subject to the processes of a Development Report (DR). A DR was considered appropriate due to the nature and scale of the issues to be investigated. This DR covers both the construction and operation of the development and outlines a suite of management plans which will assist the operator in the on-going management of the facility. This DR is based on the 17 Guidelines prepared by the SPC (**Appendix A**). It provides a statement of the expected environmental, social and economic effects of the proposed development and the extent to which the expected effects of the development are consistent with relevant legislation.

## Project Summary

Proponent and Owner:	Mount Lofty Golf Estate Pty Ltd (ACN: 625 359 837)
Property Location:	35 Golflinks Road, Stirling
Site Area:	39.9 hectares
Relevant Authority:	Minister for Planning
Council Area:	Adelaide Hills Council
Development Plan:	Adelaide Hills Council Development Plan
Zone and Policy Area:	Recreation Public Purpose and Policy Area 69 Public Purpose (Recreation & Sports)
Planning and Design Code Zone:	Recreation Zone
Current Land Uses:	Golf course and tourist accommodation
Description of Development:	Tourist accommodation and golf course and associated club facilities (ancillary bar, gymnasium and function rooms), together with landscaping, subdivision, tree and native vegetation removal

## The Proposed Development

The proposed development is for tourist accommodation and golf course and associated club facilities (ancillary bar, gymnasium and function rooms), together with landscaping, subdivision, tree and native vegetation removal. The proposed development is summarised as follows:

- Construction of a 3-5 level tourist accommodation building comprising 56 units, 15 two bedroom serviced apartments, 15 three bedroom serviced apartments and 2 penthouse serviced apartments. Together with, back of house, plant storage and maintenance areas, function room, restaurant and external terrace, sports bar, gallery and cafe and wellness centre.
- 17 Private retreats – 'Pods' and 1 back of house service Pod.
- Adaptive reuse of the Local Heritage Perfumery building as a retail, cafe and multipurpose function space.
- Golf course facilities building - 2-5 level building comprising function facilities, cart storage and clubhouse, pro-shop, administration areas, gym and change rooms.
- Retention of the 18-hole golf course with improvements.
- Car Parking, access and waste management including a total of 200 car parking spaces in two car parking areas.
- Subdivision of the land (1 into 3) allotments to formalise the areas for tourist accommodation, golf course facilities building and balance of the site for leasing purposes.
- Stormwater detention basin, creek and lake restoration activities including planting natives in the beds, erosion control works and creek crossings.
- Construction of entry wall and new entry signage at the existing Golflinks Road entry.

A whole of site plan is provided overleaf which details the proposed development.

## Response to the Guidelines

The following supporting information is appended to the DR, where the information directly responds to the guidelines, the relevant Guideline is also cited.

**Table 1 - Technical Appendices in Response to the Guidelines**

Appendix	Supporting Information	Guideline #
A	The Guidelines	-
B	Detail Survey - Alexander & Symonds	17
C	Plan of Subdivision - Alexander & Symonds	17
D	Architectural Drawings - RArchitecture	2, 14
E	Landscape Architecture Drawings and Species List - Oxigen	2, 3
F	Economic Analysis - Hudson Howells	1
G	Tree Impact Assessment - Arborman	9
H	Sustainability Strategy Report - DSquared	7
I	Traffic and Access Impact Statement - Cirqa	4, 8
J	Waste Management and Minimisation Plan - Cirqa	15
K	Geotechnical Investigations - FMG	-
L	Architectural Design Statement - RArchitecture	8, 16
M	Environmental Heritage Impact Assessment Report - EBS Ecology	9, 14
N	Cultural Heritage Management Plan - EBS Heritage	6
O	Ecological Flora and Fauna Assessment - EBS Ecology	6, 9, 10
P	Hazard Management Plan - Mount Lofty Golf Estate	8
Q	Bushfire Survival Plan - BSP Design	5
R	Environmental Noise Assessment Report - BESTEC	8
S	Services Infrastructure Summary - LUCID	-
T	Construction Environmental Management Plan - FMG	15, 16
U	Stormwater Management Plan - FMG	11, 12, 13, 16
V	BAL Assessment - BSP Design	5
W	Industry Letters of Support	1

Appendix	Supporting Information	Guideline #
X	Operational Environmental Management Plan - Environmental Projects	15
Y	Bushfire Management Strategy - BSP Design	5
Z	Native Vegetation Clearance Data Report - EBS Ecology	6, 9
AA	Architectural Renders - RArchitecture	2, 16
BB	Heritage Impact Statement - EBS Ecology	14
CC	Certificate of Title	-
DD	Integrated Water Management Plan - FMG	11, 12, 16
EE	Perfumery Landscape Plans - Oxigen	14
FF	Perfumery Detail Survey	14

## Conclusion

Given its scale, the proposed development results in positive, neutral and negative impacts. On balance, the proposed development results in neutral to positive environmental, social and economic impact. In summary, the neutral impacts i.e. those which do not result in adverse amenity impact and/or can be managed through avoidance, mitigation and/or control, are:

- Vegetation and tree removal.
- Increased traffic movements to Golflinks Road.
- Increased demand for car parking.
- Increased vehicles using Old Carey Gully Road during construction.
- Increased number of people in High Risk Bushfire Area.
- Visual impacts from the Heysen Trail.

The positive impacts are:

- Improvement to landscape quality.
- Adaptive reuse of a local heritage item.
- Improvement to water quality treatment compared to pre-development.
- Better connectivity to Heysen Trail.
- Internal site upgrades to facilitate better accessibility for service vehicles and fire-fighting vehicles compared to pre-development.
- Increased local employment during construction in the Adelaide Hills
- Increased employment during construction and operation.
- Minimal visual impact from Golflinks Road.
- Retention and improvement to the golf club as an important community asset which has positive social impacts.
- Improved meeting facilities for social and community interaction which has positive social impacts.
- Promotion of golf in the area – a healthy pass-time which has social and economic benefits.
- Positive economic contribution to the Adelaide Hills economy during construction.
- Positive economic contribution to the States economy.
- Positive economic contribution to the Adelaide Hills economy.

The proposed development has demonstrable need in the Adelaide Hills. It is of high quality and design and on balance, the additional investigations sought by SPC have been addressed in this DR. The Minister for Planning can reasonably proceed this application to public exhibition.



# 1. Introduction

This report follows receipt of the Guidelines for the Major Project Application for a new tourist accommodation development at the Stirling Golf Club (the proposed development). It was declared a Major Project on the 17th December 2020.

The subject land (the land) is located at 35 Golflinks Road, Stirling. The site is an irregular shaped parcel with frontages to Old Carey Gully Road, Rangeview Drive and Golflinks Road. The site comprises a single allotment with a combined area of approximately 39.9 hectares. It is formally described as Allotment 53 in Deposited Plan 59212 contained in Certificate of Title Volume 5891 Folio 805.

It contains an 18-hole golf course and golf clubhouse, car park and a local heritage building.

The Proponent is Mount Lofty Golf Estate Pty Ltd (ACN: 625 359 837).

## 1.1 Background and Objectives

The Stirling Golf Club was founded by five members of the Royal Adelaide Golf Club in 1925 and was originally named Mount Lofty Golf Estate. The Proponent's vision is to return to the Stirling Golf Club to its original name; the Mt Lofty Golf Estate. The year 2025 marks its 100th year in operation. Completion of the proposed development is sought to align with the club's centenary celebrations.

The project objectives are:

- Minimise impact to existing site topography,
- Preserve and enhance native flora and fauna,
- Preserve and enhance the original publicly accessible golf course,
- Respect Traditional Owners,
- Reflect the history and character of the Adelaide Hills,
- Optimise views,
- Prioritise to sustainable practices by improving the current natural resources at the property to create a unique hospitality experience,
- Showcase local produce,
- Preserve and enhance local amenity, and
- Grow regional tourism and make a positive economic contribution.

## 1.2 Staging and Timing

The expected date for commencement of construction is end of 2024. The construction program is estimated to take 24 to 30 months. The expected date for operation is 2026. The three stages of construction are:

### Stage 1:

- Upgrade access and road from old Carey Gully Road

- Provide new parking for adjacent to perfumery.
- Demolition of existing golf club and accommodation.

#### Stage 2:

- Site preparation
- Construction of pods and tourist accommodation / new buildings
- Existing access to be used for construction only
- Holes 1 and 2 to be used for construction hubs / parking etc.

#### Stage 3:

- Construct new function pavilion and refurbish perfumery.
- Upgrade / refurbish golf course.

### 1.3 The Development Report Process

The State Planning Commission (SPC) is responsible for setting the level of assessment required for this Development Report (DR) through provision of the Guidelines. A DR was considered appropriate due to the nature and scale of the issues to be investigated. This DR is prepared in response to the Guidelines (**Appendix A**).

Pre-lodgement engagement was undertaken with the following agencies:

- Department of Environment and Water (DEW).
- Native Vegetation Council (NVC).
- Country Fire Service (CFS).
- Adelaide Hills Council.
- SA Water.
- Environment Protection Authority (EPA).
- Hill & Fleurieu Landscape Board

The *Development Act 1993* requires that a DR be publicly exhibited for a period of at least 15 business days and for a public meeting to be held during this period.

The Proponent has undertaken targeted engagement with the nearby residents on Golflinks Road through a letterbox drop and door knocking. The Proponent's representative URPS, met with Stirling Golf Club executive members (General Manager, President and Captain) and socialised the proposed development and an engagement process with members and neighbours. This engagement was voluntary and intended to supplement statutory public notification due to commence in mid 2023.

This DR covers both the construction and ongoing operation of the development. A suite of management plans and strategies are also provided in **section 5** of this DR and **Appendices J, N, P, Q, T, U, X and Y** which plan for the operation and on-going management of the Mount Lofty Golf Estate.

## 2. Need for the Proposed Development

### 2.1 Proponent Objectives

The Proponent saw a need for the proposed development to achieve the following objectives:

- Create a high amenity 18-hole golf course which attracts local and interstate visitors,
- Provide an attractive location for local and interstate function and conference visitors,
- Respond to local tourism industry demand by providing tourist accommodation with unique value-adds,
- Retain and attract new golf club members,
- Provide high-end tourist accommodation in a unique Adelaide Hills setting,
- Attract local residents and tourists to showcase local produce and promote local history in refurbishment of the Local Heritage, Scent Factory (Perfumery Building).

### 2.2 A Need for Tourist Accommodation and Unique Tourism Industry Value-Adds

The Proponent engaged with the South Australian Tourism Commission (SATC) to determine if there was a need for the proposed development. The review confirmed that the proposed development would directly respond to three of the six priority areas listed in the *South Australian Visitor Economy Sector Plan 2030* (SATC, 2019) (the Sector Plan) and that there was a need for tourist accommodation in this location. The three relevant priorities of the Sector Plan were:

- Experience & Supply Development
- Industry Capability, and
- Leisure & Business Events.

The Sector Plan noted that “experience development” also includes the ongoing improvements to South Australia’s accommodation supply. South Australia falls behind our competitor states in quality accommodation options and being able to cater to larger groups to accommodate ‘leisure and business’ events. This is a particular challenge in our regions where travellers are increasingly expecting accommodation to include a strong experiential component. The Sector Plan demonstrated that it was essential that accommodation operators deliver superior service and unique value-adds.

The Adelaide Hills region has relatively few large-scale facilities and the proposed development directly addresses this observed shortfall. A key action of the Sector Plan was to upgrade and refresh the quality of accommodation across South Australia to match consumer expectations and create immersive experiential accommodation options.

The Sector Plan set a bold ambition to grow the visitor economy to \$12.8 billion by 2030 and generate an additional 16,000 jobs. The Economic Analysis of the Mount Lofty Golf Estate prepared by BDO EconSearch and Hudson Howells at **Appendix F** summarises the positive contribution that the proposed development will have on the local Adelaide Hills South Australian Government Region (SAGR) economy and for South Australia. The contribution of the proposed development to South Australia’s Tourist Economy is even more prevalent as the State promotes itself post Covid-19.

## 2.3 Strong Local Industry Support

The proposed development also has strong local industry support as demonstrated in the letters of support provided at **Appendix W** from:

- South Australian Tourism Commission,
- The Stirling Golf Club Members,
- A PGA Golf Professional and Representative of the South Australian Chapter of the PGA, and
- Adelaide Hills Tourism.

These provide support for the potential contribution that the proposed development can have on local golf tourism and visitor accommodation, both for the Adelaide Hills and the State. The need for the proposed development is demonstrably strong from a local industry perspective.

## 2.4 Environmental, Economic and Social Impacts of the Proposed Development

Given its scale, the proposed development results in positive, neutral and negative impacts. The positive and neutral impacts of the proposed development outweigh the potential negative impacts, and with considered on-going management and mitigation the negative impacts are reduced.

**Table 2** provides a summary of the anticipated environmental, economic and social impacts of the proposed development. Each item is briefly explained with additional commentary provided in the following sections of this DR. This DR covers both the construction and ongoing operation. A suite of management plans and strategies are provided in **section 5** and **Appendices J, N, P, Q, T, U, X** and **Y**, which manage the potential negative impacts and provide procedures to avoid and mitigate.

**Table 2 - Summary of Impacts**

Impact	Environmental / Economic / Social	Positive (+) Negative (-) Neutral (N)	Explanation
Improvement to landscape quality	Environmental	+	Improved habitat for fauna, improved visual quality of site.
Adaptive reuse of a local heritage item	Environmental, Economic, Social	+	The adaptive reuse of the Perfumery will help to preserve and protect it, and the inclusion of a scent garden and orchard will establish a continued connection to its previous use as a local perfumery.  Reusing the building will have long term benefits for the community as if the building cannot be incorporated into the golf course redevelopment, it will continue to deteriorate.

Impact	Environmental / Economic / Social	Positive (+) Negative (-) Neutral (N)	Explanation
			The proposed work will not have an adverse impact on the current heritage values of the building but will rather enhance the heritage values (HIS, page 5).
Improvement to water quality	Environmental	+	Improved 'flow on effects' through creek and waterway restoration.  Existing lakes improved with planting to embankments and stormwater basin for water quality improvement.  Designated crossovers for walkers and golf buggies to reduce potential for golfers to traverse and damage waterways.
Connectivity to Heysen Trail	Environmental	+	Inclusion of a lookout deck connects Heysen Trail and provides views to the golf course and celebrates the architecture of the facility.
Vegetation removal	Environmental	N	A large proportion of the land is subject to a significant environmental benefit (SEB) to offset impacts to biodiversity arising from the development. Payment of \$439,095.19 which includes a \$22,891.21 administration fee into the NV fund is proposed to offset native vegetation removal.
Increased traffic movements to Golflinks Road	Environmental	N	Additional vehicle movements on Golflinks Road are proposed. The Traffic Impact Assessment at <b>Appendix I</b> , finds that "while it is acknowledged that there will be an increase in movements on the adjacent road network as a result of the proposal, it is considered that the traffic impacts will be within acceptable levels and not result in significant impact on other road users in the vicinity of the site".

Impact	Environmental / Economic / Social	Positive (+) Negative (-) Neutral (N)	Explanation
Increased demand for car parking given intensification of land uses.	Environmental	N	Car parking is provided in accordance with likely demand.
Increased vehicles using Old Carey Gully Road during construction.	Environmental	N	Large construction vehicles are diverted away from Golflinks Road to minimise impacts to these residents.
Positive internal site upgrades to facilitate better accessibility for service vehicles and fire-fighting vehicles.	Environmental	N	Internal roads and manoeuvring areas have been designed to accommodate the largest vehicle to frequent the site.  Internal roads have been designed to accommodate fire fighting vehicles.
Increased number of people in High Risk Bushfire Area	Environmental	N	The proponent commissioned a bushfire management plan and bushfire survival plan to safeguard patrons in the event of a bushfire.
Increased local employment during construction in the Adelaide Hills	Social, Economic	+	The proposed development will support the employment of 141 Full Time Equivalent (FTE) jobs in the Adelaide Hills SAGR on average over the three years of construction ( <b>Appendix F</b> ).
Increased employment during construction	Social, Economic	+	The proposed development will support the employment of 240 FTE jobs in the state on average, over the three years of construction. These estimates include the construction of the development and flow-on effects in the broader economy ( <b>Appendix F</b> ).
Increased employment during operation	Social, Economic	+	Statewide, the development is expected to contribute GSP of \$40.3m, household income of \$16.7m, and support the employment of 261 FTE jobs annually in the South Australian economy by the tenth year of operation. This includes the operation of the estate, associated tourism expenditure at other businesses,

Impact	Environmental / Economic / Social	Positive (+) Negative (-) Neutral (N)	Explanation
			and flow-on effects in the broader economy ( <b>Appendix F</b> ).
Positive economic contribution to the Adelaide Hills economy during construction	Economic	+	During the construction phase, the development is expected to contribute Gross Regional Product (GRP) of \$41.1m and household income of \$29.3m to the Adelaide Hills economy.
Positive economic contribution to the States economy	Economic	+	Statewide, the development is expected to contribute Gross State Product (GSP) of \$87.1m and household income of \$57.3m to the South Australian economy ( <b>Appendix F</b> ).
Positive economic contribution to the Adelaide Hills economy	Economic	+	By the tenth year of operation, the development is expected to contribute GRP of \$32.0m, household income of \$12.6m, and support the employment of 225 FTE jobs annually in the Adelaide Hills economy. This includes the operation of the estate, associated tourism expenditure at other businesses, and flow-on effects in the broader economy ( <b>Appendix F</b> ).
Medium visual impact	Environmental, Social	N	As detailed in the Architectural Design Statement ( <b>Appendix L</b> ), the visual impacts associated with the proposed development are medium. This level of visual impact is considered appropriate given the scale and context of the proposed development.
Visual impacts from the Heysen Trail	Environmental, Social	N	Particular care was taken to preserve views to Mt George and to position the built form to reduce the impact on views from the Heysen Trail. The choice of materials reflects the desire to blend the building with its surroundings. It is not uncommon that man-made structures are visible from the Heysen Trail, such as the South Eastern Freeway.

Impact	Environmental / Economic / Social	Positive (+) Negative (-) Neutral (N)	Explanation
Retention of the golf club as an important community asset	Social	+	The Stirling Golf Club is an important community asset for recreation and social interaction.
Improved meeting facilities for great social and community interaction	Social	+	The proposed development provides on-going opportunities to meet and congregate at the Golf Club which has a history of hosting local events in the Adelaide Hills in its clubrooms.
Promotion of golf in the area – a healthy pastime	Social, Economic	+	The flow on effects to the economy from having healthy and active people is positive. Further, the social benefits of exercise and recreation promotes healthy living and social interaction especially in an aging demographic.



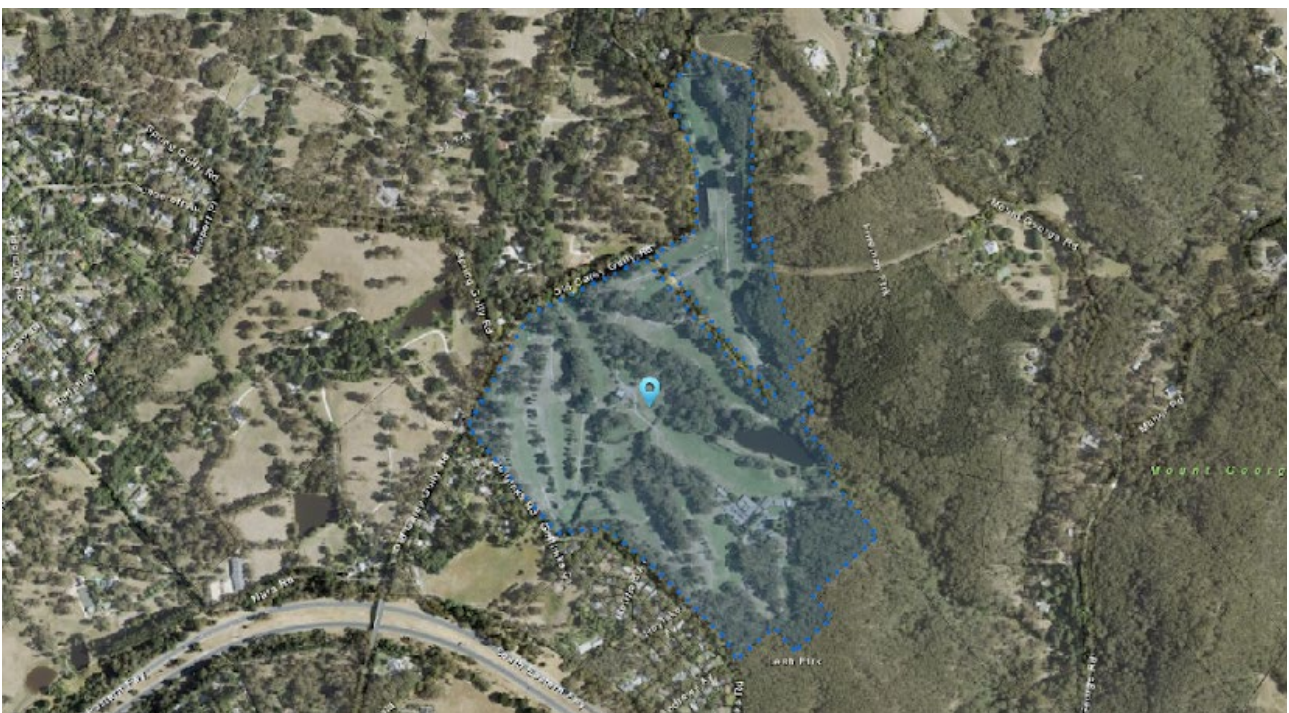
### 3. Description of the Proposed Development

#### 3.1 The Subject Land

The subject land (the land) is located at 35 Golflinks Road, Stirling, approximately 2.5 kilometres north-east of Stirling post office and approximately 250 metres north of the South Eastern Freeway.

The site is an irregular shaped parcel with frontages to Old Carey Gully Road, Rangeview Drive and Golflinks Road. The site comprises a single allotment with a combined area of approximately 39.9 hectares. It is formally described as Allotment 53 in Deposited Plan 59212 contained in Certificate of Title Volume 5891 Folio 805 (**Appendix CC**). A detail survey of the site is provided at **Appendix B**.

Image 1 - The Land



It includes an 18-hole golf course with associated members facilities, gymnasium, bars and function rooms supported by a commercial kitchen (**Image 2**). The Golf Course and Club Rooms are leased by the Stirling Golf Club. The facility also includes 5 motel-style accommodation rooms (**Image 3**). The Stirling Golf Club hosts functions and weddings (for up to 300 guests) as well as regular events.

The land contains a local heritage place described as a cottage, which was a former Scent Factory (referred to herein as the Perfumery) (**Image 4**).

The land uses occurring on the site are summarised as:

- Tourist accommodation.
- Golf course and associated club facilities (ancillary bar, gymnasium and function rooms).

Image 2 – Existing Clubhouse Buildings



Image 3 – Accommodation Units



**Image 4 – The Perfumery**



Vehicle access is provided via a primary access point on Golflinks Road (near the southern portion of the site), at which all turning movements are permitted. The site contains an easement for Davenport Road, which is an unsealed track that runs from Carey Gully Road along the Heysen Trail through the site. Maintenance access points are also provided on Carey Gully Road.

The primary parking areas are located to the east and south of the main buildings. A total of 65 parking spaces are provided in these areas. Additional informal parking is also available within the site.

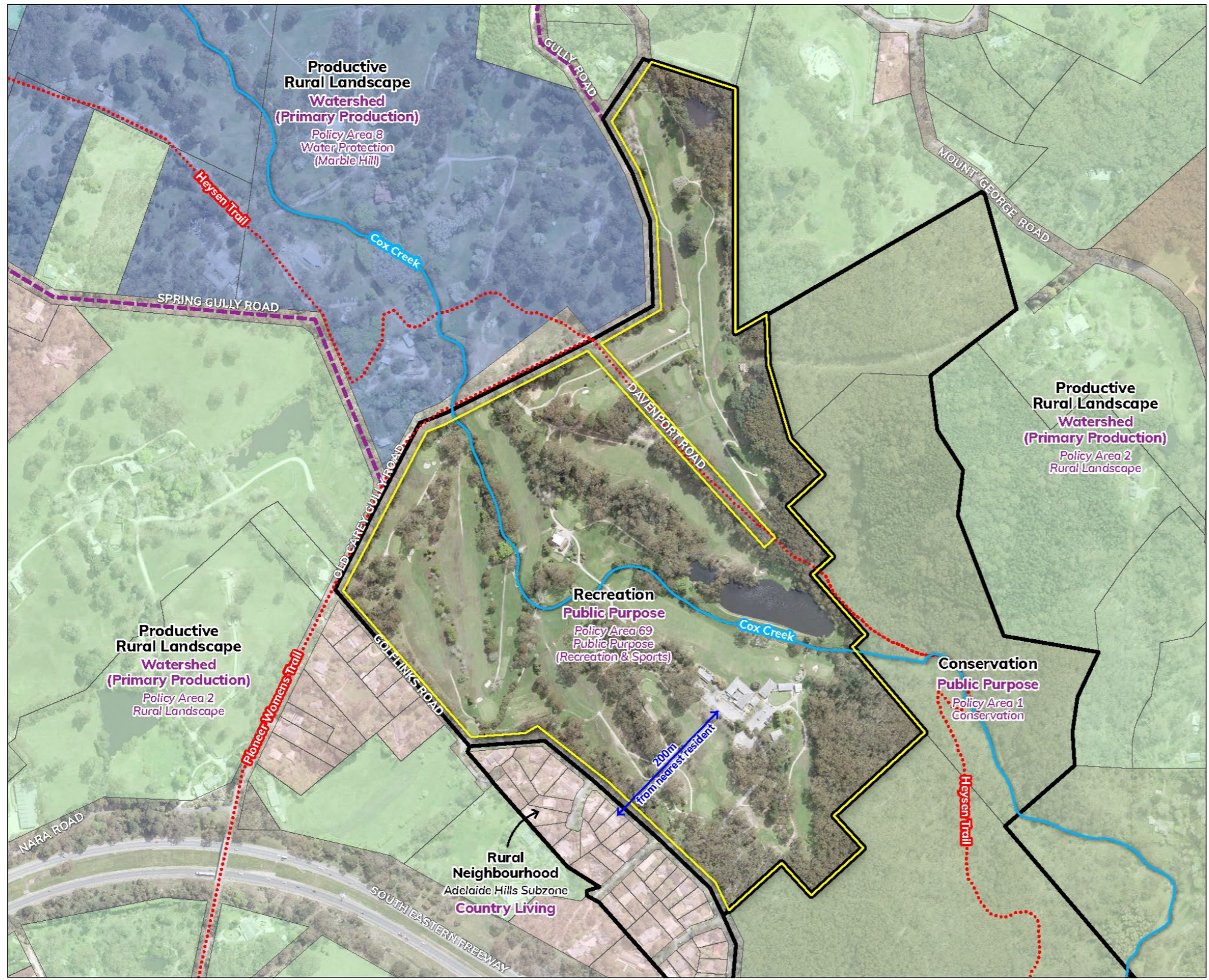
### **3.2 The Locality**

The site is bound by residential properties to the north, Mount George Conservation Park to the east, Golflinks Road to the south and Old Carey Gully Road to the west.

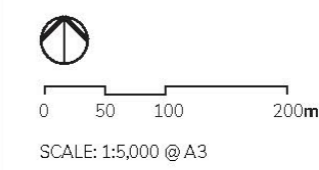
The locality is defined by the presence of Mount George Conservation Park and bisected by Cox Creek. The site is immediately east of the Scouts SA Woodhouse complex. Existing residents live adjacent to the site on Golflinks Road.

The Heysen Trail runs through north-eastern portion of the site between Hole 14 and Hole 16 of the Golf Course.

The Locality is depicted on the Locality Plan overleaf.



- Legend**
- Subject Site
  - Zone Boundary
  - Rec** Planning & Design Code Zone
  - PP** Development Act Zoning / Policy
  - Walking Trail
  - Creek
  - Cadastre
- Land Use**
- Agriculture
  - Horticulture
  - Public Institution
  - Reserve
  - Residential
  - Rural Residential



**LOCALITY**  
Mount Lofty  
Golf Course

JOB REF.	20ADL-0075
PREPARED BY.	MP
DATE	05.12.22
REVISION.	1
DATA SOURCE	MetroMap (10.10.22) data.sa.gov.au



1395-002

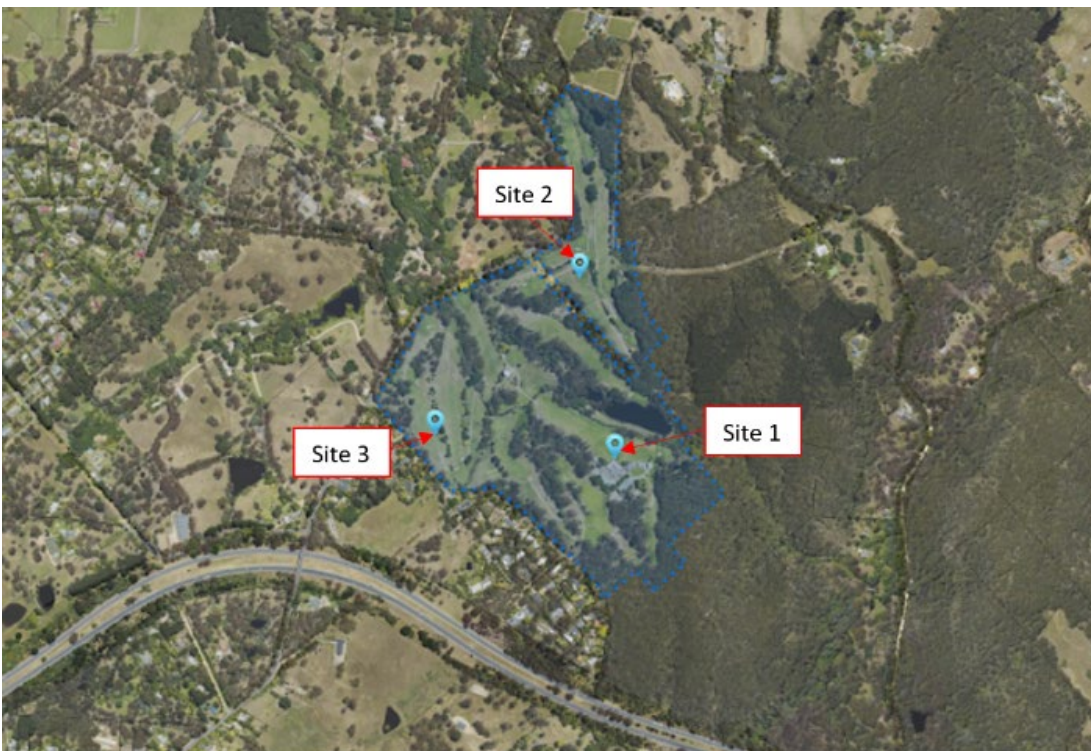
### 3.3 Site Selection and Suitability

Three potential locations were investigated as part of the initial site investigations which informed the site's location. Site selection was based on the following criteria:

- topography,
- distance to Mount George Conservation Park,
- availability and proximity to services,
- minimising visual impacts to residents on Golflinks Road,
- minimising impacts to the function of the 18-hole Golf Course,
- minimising the need for removal of trees and vegetation - through application of advice sought from the Native Vegetation Council (NVC),
- minimising cut and fill,
- minimising impacts to people and property in the event of a bushfire - through application of advice sought from the Country Fire Service (CFS).

**Image 5** details the three locations investigated to find a suitable site and **Table 3** provides a matrix which measures the suitability of each site location against the site selection criteria. The matrix ranks each of the sites against the criteria to measure suitability. For each criteria the three sites are ranked, 1, 2, or 3 - 3 being the most desirable site, 1 being the least desirable site. The highest cumulative number is the most suitable site.

**Image 5 - Site Options**



**Table 3 - Site Selection and Suitability Matrix**

Criteria	Site 1	Site 2	Site 3
Topography	3	1	2
Distance to Mount George Conservation Park	2	3	1
Availability and proximity to services	3	1	2
Minimising visual impacts to nearby residents	3	2	1
Minimising impacts to the function of the 18-hole Golf Course	3	1	2
Minimising the need for removal of trees and vegetation - through application of advice sought from the Native Vegetation Council (NVC)	1	2	3
Minimising cut and fill	3	1	2
Minimising impacts to people and property in the event of a bushfire - through application of advice sought from the Country Fire Service (CFS)	1	3	2
<b>TOTAL</b>	<b>19</b>	<b>14</b>	<b>15</b>

Based on the site selection criteria, Site 1 was found to be the most suitable site for the location of the proposed development. Site 1 performed the best given:

- It utilises the existing 'pad' where the clubrooms are located, which minimises the need for vegetation removal, minimises cut and fill and takes into account the sites unique topography.
- It can connect to existing services (with upgrades).
- Minimises the potential for impacts to views from external vantage points by locating the buildings centrally within the site and at a low point of the site. Added benefit also exists in locating buildings where the general public is already used to seeing buildings in the landscape.
- Minimises impacts to the function of the golf course through utilising the area presently occupied by the existing golf club buildings.
- Is located away from hazardous vegetation in Mount George Conservation Park, which reduces the potential impacts in the event of a bushfire.

Site 1 did not perform as well as the other two sites in terms of tree and vegetation removal and bushfire risk. To reduce the level of clearance, the proposed development was amended. Initially, 20 private Pods were proposed and this has now been reduced to 17 Pods. Utilising the existing footprint of the club rooms assisted in overcoming the site's constraints in terms of vegetation and topography. As detailed in **section 5** of this DR and **Appendix Q, Y and V**, bushfire risk has been mitigated through the proposed clearance of vegetation in the understorey adjacent the Pods. As well as siting the development away from the Mt George Conservation Park. The Bushfire Management Strategy and Bushfire Survival Plan provides guidance on both planning for bushfire events and the processes to be implemented in the event of a bushfire. Likewise, payment of \$439,095.19 which includes a \$22,891.21 administration fee into the NV fund was proposed in **Appendix Z** to offset the loss of native vegetation arising from the proposed development. Taking into account the proposed mitigation, Site 1 was chosen as the most suitable location for the development.

### 3.4 Nature of the Proposed Development

The nature of the proposed development is refurbishment of an existing golf course together with construction of a 2-5 level building to accommodate tourist accommodation and associated golf club facilities and ancillary shop and function facilities together with cut and fill, landscaping, subdivision, tree and native vegetation removal. More specifically, it includes the following:

- Construction of an integrated 2-5 level tourist accommodation and golf facilities building comprising:
  - tourist accommodation (3-5 levels):
    - 56 tourist accommodation units.
    - 15 x two bedroom serviced apartments.
    - 15 x three bedroom serviced apartments.
    - 2 penthouse serviced apartments.
    - Back of house, plant storage and maintenance areas.
    - A 537m<sup>2</sup> function room.
    - A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace.
    - 186m<sup>2</sup> sports bar.
    - A 189m<sup>2</sup> gallery and cafe.
    - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms. The wellness centre is not open to the general public.
  - Golf Course Facilities (2-5 levels):
    - Retention of 18-hole golf course with improvements.
    - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
    - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Construction of Private retreats – 'Pods'
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing Perfumery:

- Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
- Extension to the Perfumery to include a covered outdoor dining area.
- Orchard and perfumery garden plantings to reimagine the former use of the building as a “Scent Factory”.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.
  - A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
  - Designated waste storage areas.
- Cut and fill of the land (indicative estimated volumes):
  - Cut: -15,838m<sup>3</sup>
  - Fill: +3,008m<sup>3</sup>
  - Net = 12,829m<sup>3</sup>
- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way ‘A’, comprising the tourist accommodation building and pods.
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way ‘B’, comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements ‘A’ and ‘B’.
- New entry statement signage at the Golflinks Road entry to the site.

### 3.5 Site Layout Plans

The proposed development is depicted on the following drawings:

- Architectural Drawings – RArchitecture - **Appendix D**
- Landscape Architecture Drawings – Oxigen - **Appendix E**
- Architectural Renders - RArchitecture - **Appendix AA**
- Plan of Subdivision - Alexander & Symonds - **Appendix C**



An extract if each of the above is provided in the following sections, for additional detail refer to each of the relevant Appendices.

**Image 6 - Pods, Tourist Accommodation and Facilities Building Layout**

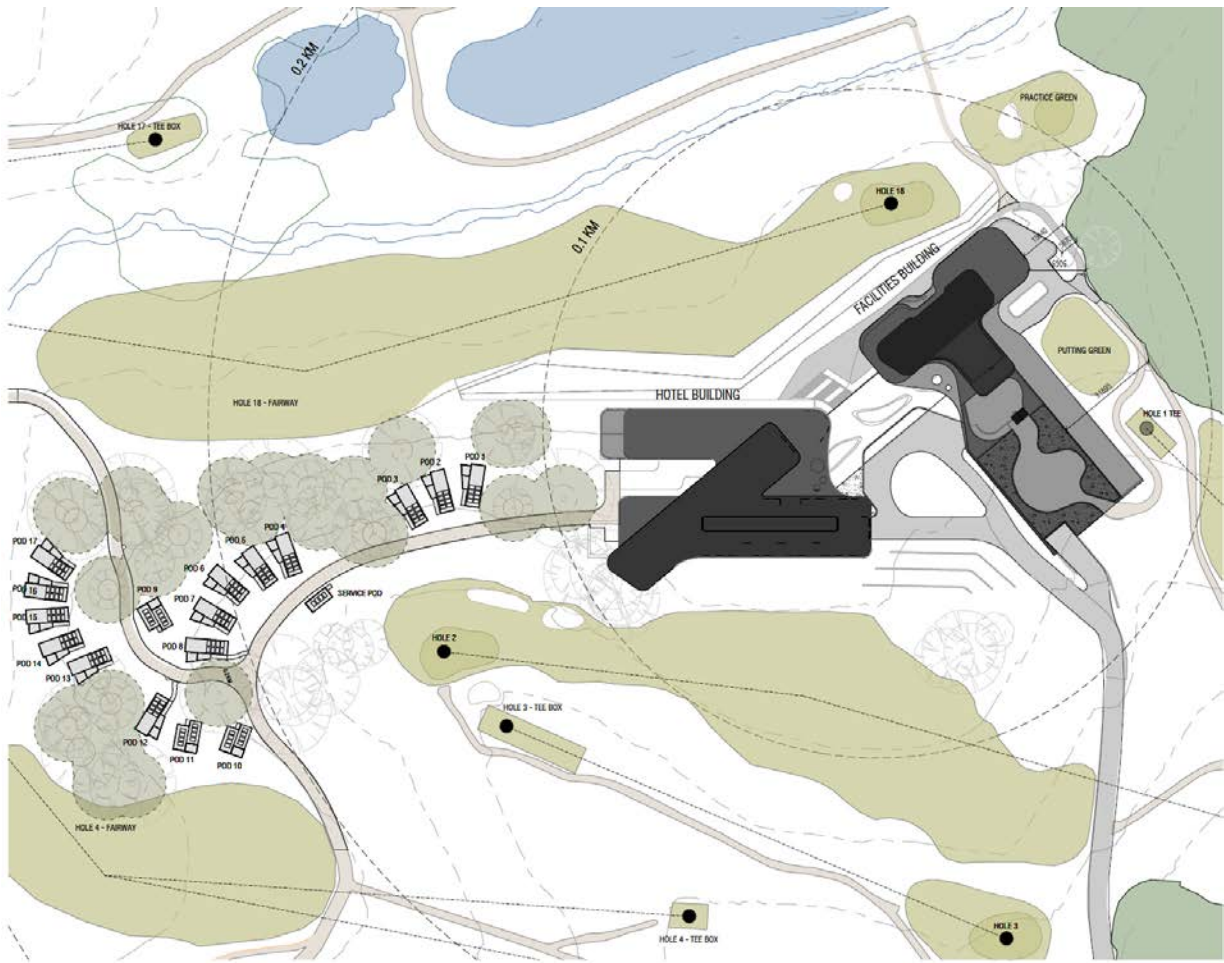


Image 7 - Landscape Site Layout



Image 8 - Architectural Renders - Arrival view (Mt George in background)



Image 9 - Architectural Renders - the Pods as viewed from the 18th hole fairway



Image 10 - Architectural Renders - view from 3rd hole of Golf Course (Mt George in background)

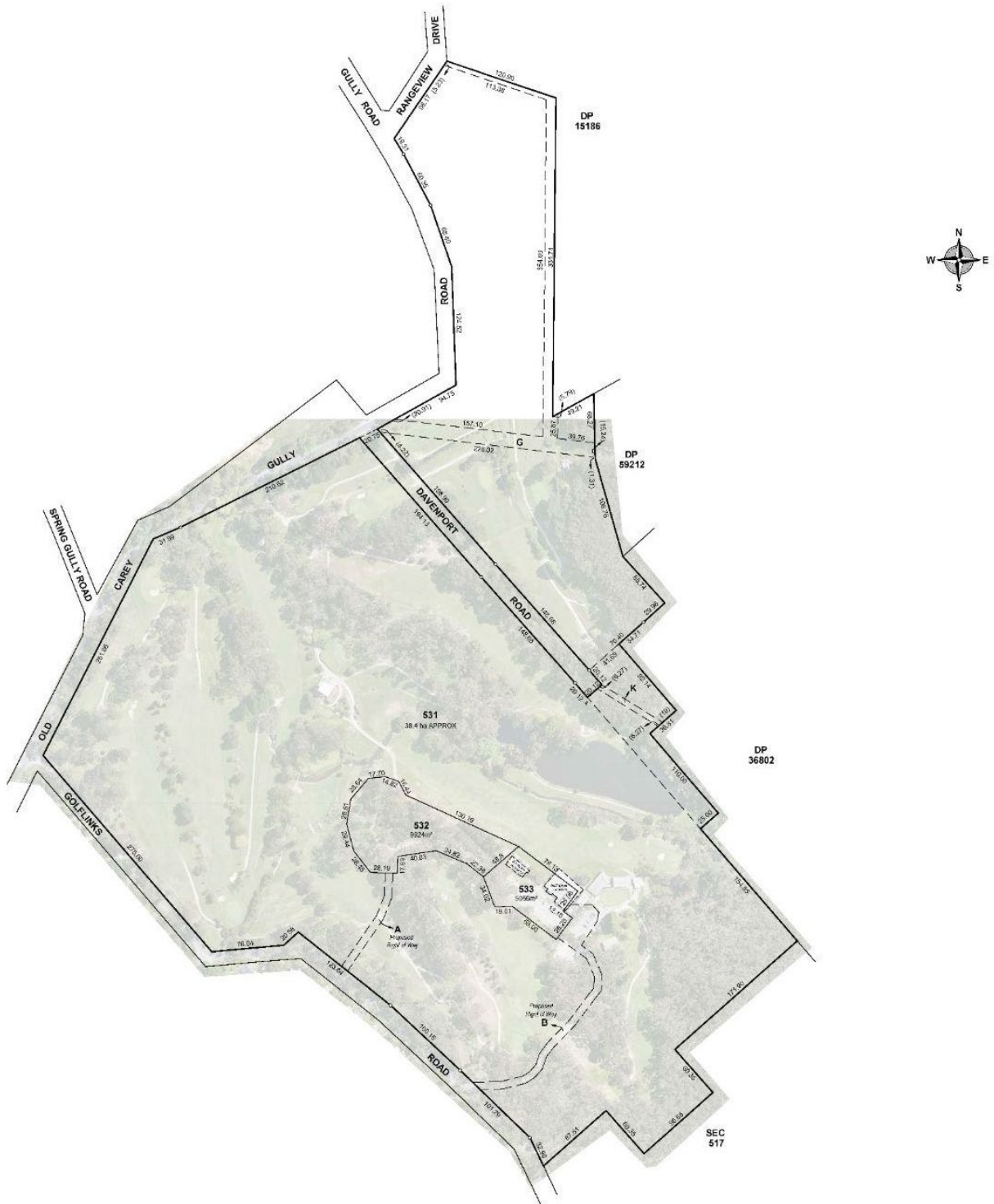


Image 11 - Architectural Renders - View towards proposed development from 18th hole fairway, Perfumery building shown right of image.

Second Image below provides imagery of the Adaptive Reuse of the Perfumery



Image 12 - Extract of Indicative Subdivision Plan



### 3.6 Sensitive Receivers

The guidelines sought that the nearest sensitive receivers and their distances from various site activities be mapped and provided. A sensitive receiver is defined as:

*“A sensitive receptor/receiver is a fixed location such as a house, building, other premises or open area where health, property or amenity are affected by emissions that increase the concentration of the emitted parameter above background levels. Sensitive environments, plants and animals may also be considered as sensitive receptors because vegetation and animals can also be affected by emissions”, (EPA, 2016, Evaluation distances for effective air quality and noise management)*

The nearest sensitive receivers are located on Golflinks Road to the east of Muirfield Avenue. These are mapped in the BESTEC Environmental Noise Assessment Report (**Appendix R**). The Locality Plan provided in an earlier section of this DR also details that the nearest sensitive receivers are in excess of 200 metres from the proposed built form.

### 3.7 Construction and Commissioning Timeframes (Including Staging)

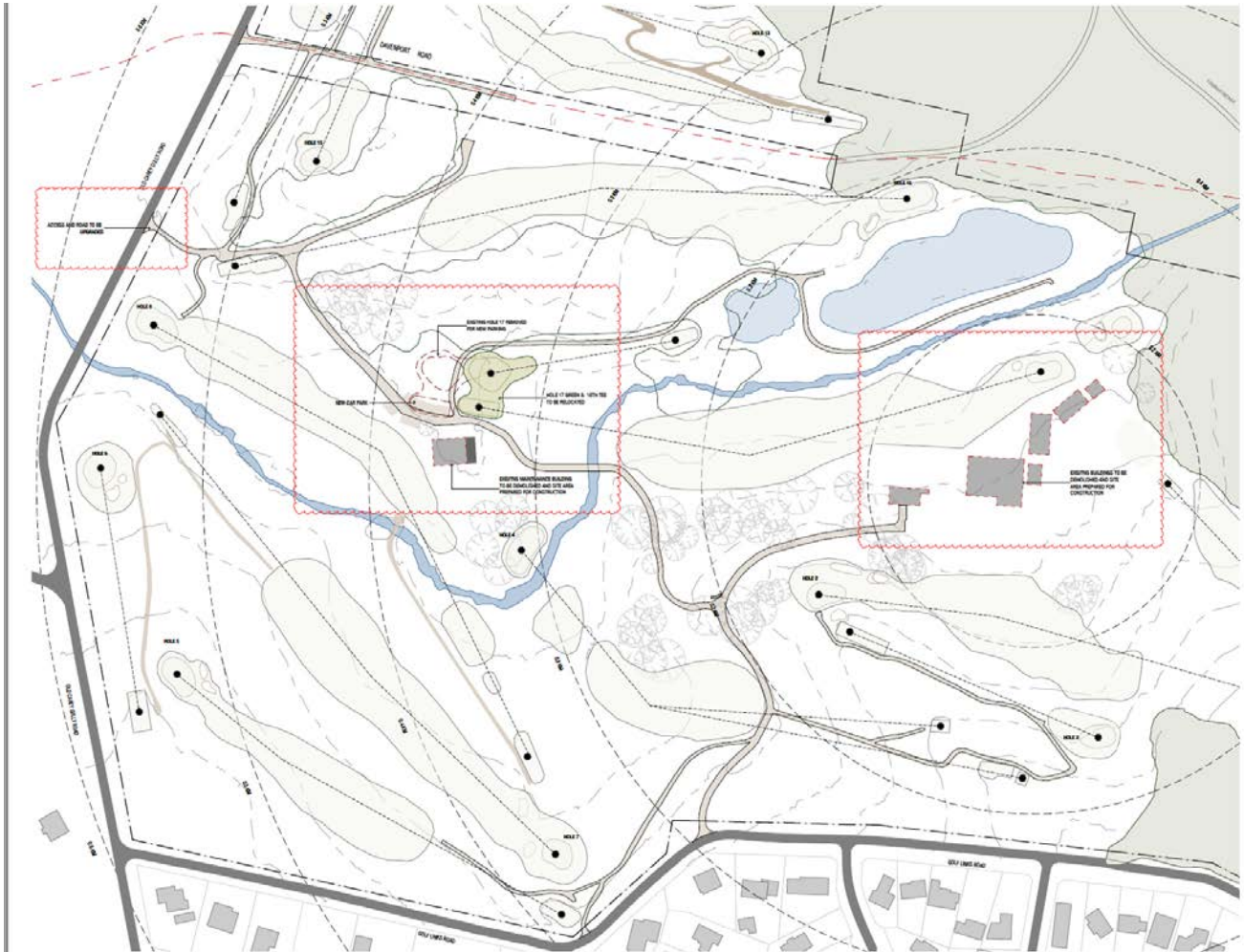
The expected date for commencement of construction is the end of 2024. The construction program is estimated to take 24 to 30 months. The expected date for operation is 2026.

The proposed development is to be constructed across three stages:

**Stage 1:**

- Upgrade access and road from old Carey Gully Road
- Provide new parking for adjacent to perfumery
- Demolition of existing golf club and accommodation.

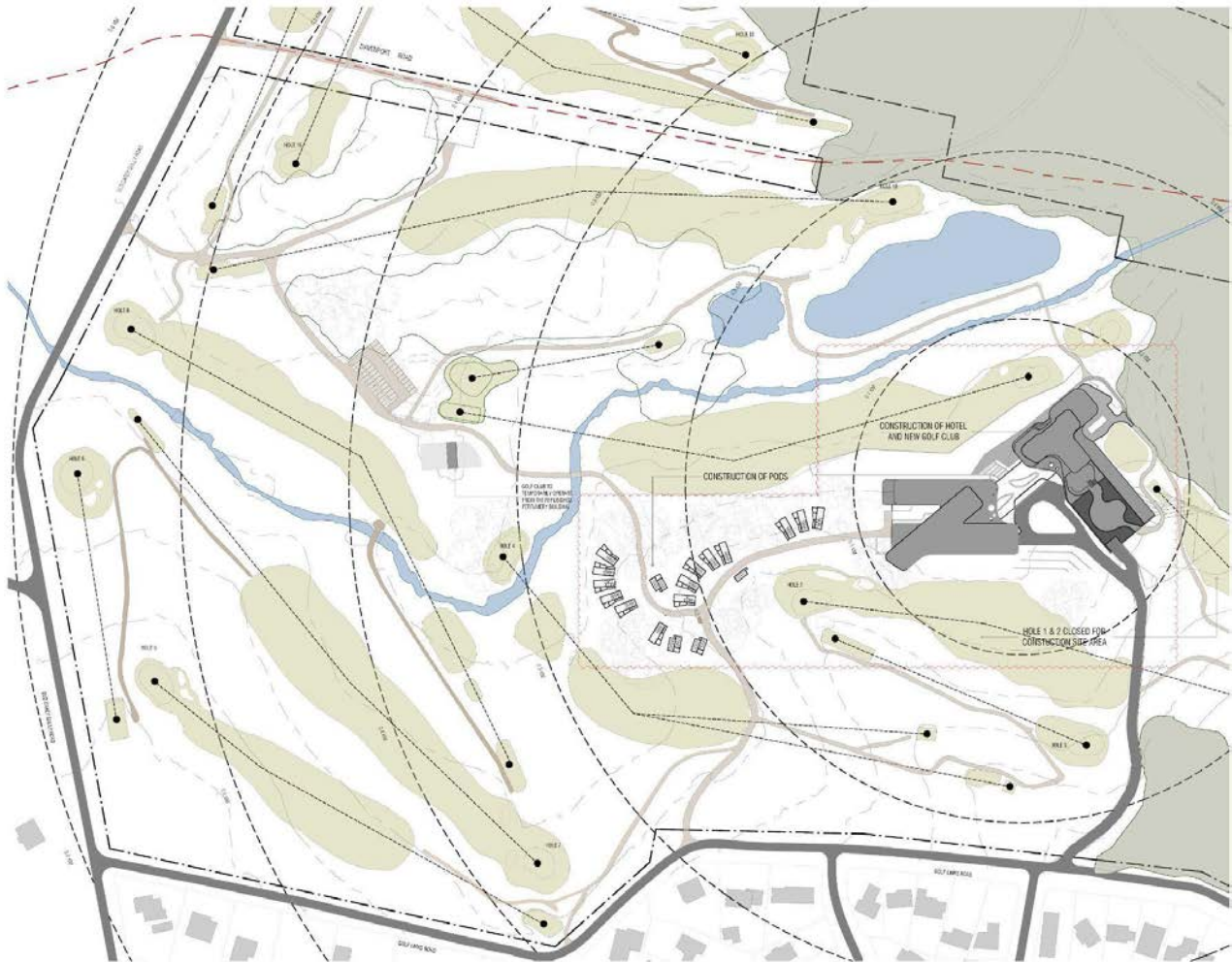
**Image 13 - Stage 1**



## Stage 2:

- Site preparation
- Construction of pods and tourist accommodation / new buildings
- Existing access to be used for construction only
- Holes 1 and 2 to be used for construction hubs / parking etc.

Image 14 - Stage 2





### Stage 3:

- Construct new function pavilion and refurbish perfumery.
- Upgrade / refurbish golf course.

Image 15 - Stage 3



A contingency plan for delays in construction is detailed in the Construction Environmental Management Plan (**Appendix T**).

## 4. Environmental, Social and Economic Assessment

This section provides an assessment of the anticipated environmental, social and economic impacts of the Proposed Development. In reading this section, reference should be had to:

- **Table 1 - Technical Appendices in Response to the Guidelines** in the Summary of this DR as it provides a direct response to each Guideline and references the supporting technical appendices; and
- **Table 2 - Summary of Impacts** - which provides a cumulative summary of the impacts of the proposed development. It also references the assessment hierarchy and colour coding established by the Guidelines which determines the importance and required level of assessment of each potential impact, as follows:

Assessment Level	Explanation of Assessment Level	Guideline Reference
Critical	Where information about the issue is lacking and the response is unclear, the issue is classed as 'critical'.	1-5
Medium	Where work is required to address the issue but the risk is likely to be manageable with additional information then the risk assessment is classed as 'medium'.	6-14
Standard	Where the issue is well known and the response is well understood then the risk assessment is classed as 'standard'	15-17

The above system has been applied in addressing each of the impacts. For each, a summary of the impact is provided with reference to the relevant technical appendix and a comment on the level of impact provided.

### 4.1 Tourism, Economic Development and Job Creation

#### Critical

An Economic Analysis of the Mount Lofty Golf Estate prepared by BDO EconSearch and Hudson Howells is provided at **Appendix F**. It summarises the positive contribution that the proposed development will have on the local Adelaide Hills South Australian Government Region (SAGR) economy and for South Australia.

During the construction phase, the development is expected to contribute Gross Regional Product (GRP) of \$41.1m and household income of \$29.3m to the Adelaide Hills economy. Additionally, the proposed development will support the employment of 141 Full Time Equivalent (FTE) jobs in the Adelaide Hills SAGR on average over the three years of construction.

Statewide, the development is expected to contribute Gross State Product (GSP) of \$87.1m and household income of \$57.3m to the South Australian economy. Additionally, the proposed development will support the employment of 240 FTE jobs in the state on average, over the three years of construction. These estimates include the construction of the development and flow-on effects in the broader economy.

By the tenth year of operation, the development is expected to contribute GRP of \$32.0m, household income of \$12.6m, and support the employment of 225 FTE jobs annually in the Adelaide Hills economy. This includes the operation of the estate, associated tourism expenditure at other businesses, and flow-on effects in the broader economy.

Statewide, the development is expected to contribute GSP of \$40.3m, household income of \$16.7m, and support the employment of 261 FTE jobs annually in the South Australian economy by the tenth year of operation. This includes the operation of the estate, associated tourism expenditure at other businesses, and flow-on effects in the broader economy.

The impacts on the local and state economy arising from this project are vast. It will result in a **positive** economic impact.

## 4.2 Design / Visual Amenity

### Critical

The Architectural Design Statement (**Appendix L**) prepared by RArchitecture provides a summary of:

- the design philosophy,
- the evolution of proposed development (including options explored and discounted) from the initial concept to the final design with reference to the Design Review Panel process which the Proponent undertook,
- site access,
- servicing strategy, including emergency access,
- building site selection,
- built form and visual impact,
- materiality,
- landscaping, including proposed development's response to the unique landscape setting and any work in the public realm,
- Environmentally Sustainable Design,
- universal/equitable access,
- adaptive reuse of the Local Heritage Place – the Perfumery.

Reference to the Architectural Design Statement (**Appendix L**) should be had to understand how the design has evolved with regard to the above. The Proponent participated in the State Government led Design Review Panel process which facilitated positive design outcomes.

A visual impact analysis is provided which considers near and distant views. The visual impact analysis finds that the cumulative visual impact of the proposed development is 'medium'. A degree of visual impact is anticipated in a development of this scale. The architectural response sought to minimise visual impacts through:

- choice of materials, the use of timber cladding, curved precast concrete and slate cladding respond to the sites natural surroundings,
- breaking up the building form into two parts to provide visual relief and provide a landscaped backdrop,
- designing with the site's topography to minimise views of the building form from external vantage points.

The approach to avoid and minimise visual impacts through design results in a medium visual impact. This is considered an appropriate level of impact because the siting, design and architecture responds to the scenic, natural and topographic character of the area. The proposed visual impacts are considered **neutral**.

### 4.3 Landscaping

#### Critical

The proposed landscape design sought to minimise the impacts of the built form through distinct landscape typologies. These relate to the new tourist accommodation and facilities buildings and nearby areas and the Perfumery Scent Garden.

No additional landscaping is proposed adjacent to the Pods as the understorey and smaller trees are proposed to be removed due to Bushfire hazard. On-going management of the area adjacent to the Pods is to be kept to managed grassland.

Particular care was also taken to preserve views to Mt George and to position the built form to reduce the impact on views from the Heysen Trail. The choice of materials reflects the desire to blend the building with its surroundings. The following extracts from the landscape design strategy detail approach to planting, site design and materiality.

FLEXIBLE OUTDOOR SEATING SPACES



LAWN TERRACES



ROOFTOP GREENING



MOUNDED FEATURE PLANTERS



UPPER LEVEL DECKS + BALCONIES



MEADOW PLANTING

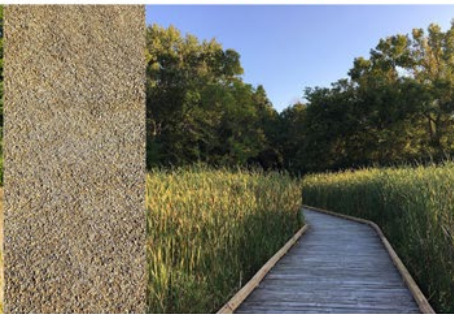


ORNAMENTAL TREES

P2 - SMALL BOARDWALK

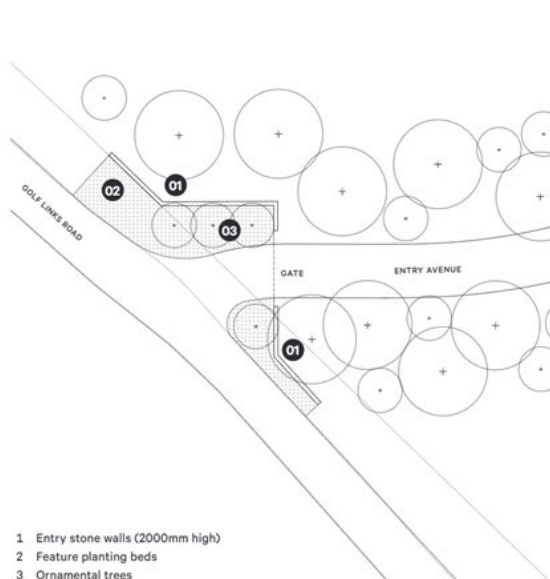


P1 - COMPACTED GRANULITIC PAVING



LOW LEVEL NATIVE GRASSES

Source: Oxigen, 2022



- 1 Entry stone walls (2000mm high)
- 2 Feature planting beds
- 3 Ornamental trees

STONE ENTRY WALL



SIGNAGE AND ACCESS GATE



TREE LINED AVENUE



RE-INSTATED UNDERSTOREY PLANTING

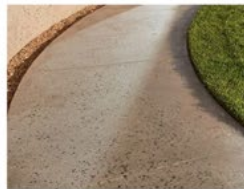
Material and elements play an important role in providing amenity and contributing to visual consistency throughout the key sites.

- Paving and hardscape elements are of enduring quality enable safe movement, are robust and low maintenance.
- Public outdoor spaces are integrated through consistent materials and detailing.
- Locally sourced materials are used where possible.
- Materials are selected for their durability and whole of life costing.



P1 + P2 Stone / Precast pavers

- High quality unit pavers
- Stepping stones (Pods)



P3 - Concrete

- Honed and gritblast non-slip insitu concrete paving
- Used for paths, plazas and thresholds



Hotmix Roads

- Sealed entry roads and carparks
- Kerbless / Flush Kerbs



Corten Steel

- Feature edging



W1 - Gabion Wall - Local Stone

- Large walls where long spans are required.



Compacted Sand / Gravel Paving

- Local compacted sand
- High quality unit pavers
- Used for pedestrianised areas (Pods)



Local Stone

- Feature paving, walls, edging, steps, terraces



Timber

- Class 1 seasoned hardwood or thermally modified timber
- Natural grey finish
- Used for decks, trims and fences

Source: Oxygen, 2022

Integration of the landscape design and architecture, aids in minimising the impact of the proposed development. It does this through softening the appearance of the built form and integrating it with its landscape context. The design achieves this through:

- Lawned terraces.
- Balcony planting.
- Balustrade planting.
- Rooftop 'green roof' sedum gardens.
- Entry and roadside planting.

A site-wide approach to restoring creeks and waterways assists in improving the site's overall ecology and appearance. Integration with the Heysen Trail also sought to showcase the proposed development. The following is proposed:

- Restoration to creek beds with revegetation along creek beds, with designated crossovers for walkers and golf buggies.
- Existing lakes improved with planting to embankments and a small lookout deck integrated along the connection to the Heysen Trail.
- Stormwater basin for water quality improvement.

The proposed stormwater detention basin, creek and lake restoration activities including planting natives in the beds, erosion control works and creek crossings are water affecting activities that require a permit under the Landscapes South Australia Act 2019 obtained from the Hills & Fleurieu Landscape Board. It is anticipated that these activities will have a **positive** environmental outcome that comply with the Hills & Fleurieu Water Affecting Activity Control Policy and Western Mt Lofty Ranges Water Allocation Plan.

## 4.4 Traffic and Access

### Critical

The proposed development results in an increase to the total number of vehicle movements and an increase in car parking demand. Site access and car parking areas have been designed to accommodate all anticipated vehicle types (including fire fighting vehicles) and car parking is provided in accordance with demand. Assessment of both construction and operation traffic has been undertaken. A comprehensive Traffic and Access Impact Statement has been prepared by Cirqa, the key findings of which have been summarised below and an assessment made against the relevant Code provisions.

### Operational Phase

Vehicle access to the site will be provided via the existing crossover on Golflinks Road. The internal driveway facilitates access to the various parking areas present on the site and the pick up/drop off area in front of the estate. The entrance has been designed to facilitate the ingress/egress of vehicles in a forward direction. The existing access on Old Carey Gully Road will be improved to facilitate vehicle access to the 'perfumery' building (previously a service vehicle entrance). Additional upgrades to Golflinks Road were recommended by the traffic consultant including, improvements to the shoulder bends to assist with the increase in vehicle movements and load. This would provide some mitigation to residents within the locality.

Performance Outcome 5.1 of the General Development Policies (Transport, Access and Parking) of the Code seeks:

- PO 5.1** **Sufficient on-site vehicle parking and specifically marked accessible car parking places are provided to meet the needs of the development or land use having regard to factors that may support a reduced on-site rate such as:**
- (a) availability of on-street car parking**
  - (b) shared use of other parking areas**
  - (c) in relation to a mixed-use development, where the hours of operation of commercial activities complement the residential use of the site, the provision of vehicle parking may be shared.**
  - (d) the adaptive reuse of a State or Local Heritage Place.**

Via an analysis of the land use, it was determined that the following spaces are required for each period:

- 187 parking spaces during the weekday evening peak.
- 196 spaces during the Saturday lunch period.
- 189 parking spaces during the weekend morning period.

The following car parking arrangement is proposed:

- 200 parking spaces provided with four spaces reserved for people with disabilities.
- Additional three spaces provided within the pick up/drop off area which can also accommodate buses.
- Provision for additional car parking adjacent to the 'perfumery' building.

The proposed number of car parking spaces will accommodate the anticipated demand generated by the development (Cirqa, 2022).

All deliveries, services vehicles and refuse collection will occur via a dedicated service bay (with adequate turn path space) within the eastern tourist accommodation building (refer pg. 8, Cirqa, 2022). This area accommodates a vehicle length of 10.4 metres, facilitating a range of service vehicles.

The pick up/drop off area will facilitate the vehicle movements for large buses and CFS vehicles up to a length of 12.5 metres (refer pg. 9, Cirqa, 2022).

Additional vehicle movements on Golflinks Road are proposed. The Traffic Impact Assessment at **Appendix I**, finds that *"while it is acknowledged that there will be an increase in movements on the adjacent road network as a result of the proposal, it is considered that the traffic impacts will be within acceptable levels and not result in significant impact on other road users in the vicinity of the site"* (Cirqa, 2022).

The traffic, car parking and access impacts associated with the operation of the development have been considered and they result in a **neutral** impact because:

- car parking can be accommodated on site,
- the largest vehicle to frequent the site can be accommodated,
- fire fighting vehicles can be accommodated; and
- whilst there is an increase in vehicle movements to the site, this will occur at a level appropriate to the classification of the external road network and should not cause unreasonable levels of impact.

## Construction Phase

It is anticipated that during the construction phase, 20 to 30 staff/trades will be on site each day. This will result in up to 30 to 60 light vehicle movements per day and will be absorbed by the movement systems. Vehicle types associated with the construction of the infrastructure (e.g demolition, earthmoving and material delivery) are anticipated to be undertaken by vehicles with a length of up to 19 metres. These vehicles will be able to enter and exit the site via the Old Carey Gully Road access to mitigate amenity impacts on the sensitive receivers along Golflinks Road. Additional measures of mitigation regarding vehicles during the construction phase is provided at **Appendix T**.



In summary of the traffic, car parking and access arrangements for the proposed development during construction and operation, the following is noted:

- Car parking is provided in accordance with likely demand, (**neutral impact**).
- Internal roads and manoeuvring areas have been designed to accommodate the largest vehicle to frequent the site (**neutral impact**).
- Construction vehicles are diverted away from Golflinks Road to minimise impacts to these residents, (**neutral impact**).
- The increased vehicle movements on the adjacent road network are considered to be “within acceptable levels and not result in significant impact on other road users in the vicinity of the site” (Cirqa, 2022) (**neutral impact**).

## 4.5 Bushfire

### Critical

The proposed development is located in a High Bushfire Risk Area under the Code and is in close proximity to hazardous vegetation including the Mount George Conservation Park. Under the Adelaide Hills Development Plan, the land was also High Bushfire Risk.

Ongoing engagement with the CFS informed the capacity and location of on-site fire water storage, the location of the Pods and the proposed removal of under-storey vegetation. The removal of vegetation was also subject to review by the Native Vegetation Council (NVC) and engagement with NVC was also undertaken to balance the requirements of both agencies.

In the initial concept design, the Pods were located adjacent to the Mt George Conservation Park. Early advice sought from the CFS suggested that this location was not suitable from a bushfire risk perspective. The Proponent took this advice and relocated the Pods. Further, the number of Pods was reduced from 20 to 17.

To reduce impact to the Pods in the event of a bushfire event. All understorey and smaller trees are proposed to be removed, together with 13 trees. The understorey will be managed grassland.

With regard to the tourist accommodation and golf club facilities building, an agreed setback distance of 35 metres and a suitable Bushfire Attack Level (BAL) of 19 was negotiated with the CFS. The setback to Mount George Conservation Park is also proposed to be managed grassland.

A BAL Assessment provided at **Appendix V** provides a technical assessment with regard to bushfire. A Bushfire Survival Plan (**Appendix Q**) and a Bushfire Management Strategy (**Appendix Y**) provide ongoing management of the proposed development with regard to bushfire.

With the design recommendations, the proposed development results in **neutral** environmental impact with regard to bushfire. The increase of patrons in a high bushfire area increases the risk of a **negative** social and economic impact arising from the proposed development. The proposed management strategies outlined in the Bushfire Survival Plan and Bushfire Management Strategy reduce this risk to an acceptable level.

## 4.6 Conservation

### Medium

The Conservation values of the Mount George Conservation Park (MGCP) are not anticipated to be impacted by the proposed development in terms of Aboriginal culture or flora and fauna. Two assessments were undertaken taking into account the requirements of the EPBC Act, These are:

- Cultural Heritage Management Plan (CHMP) (**Appendix N**).
- Ecological Fauna and Flora Assessment was undertaken by EBS Ecology (**Appendix O**).

A Cultural heritage Management Plan (CHMP) to address the impacts of the development on the cultural heritage of First Nations People. The CHMP Framework document sets out in detail how risk will be managed and the controls that will be implemented to ensure that no damage is caused to Aboriginal heritage during the construction and operational phases of the development. The CHMP will assist in conserving Aboriginal culture throughout the project's lifetime.

An Ecological Fauna and Flora Assessment was undertaken by EBS Ecology (**Appendix O**). The Assessment identified that pockets of remnant native vegetation, scattered trees and planted landscaped areas exist on the land. The Mount George Conservation Park (MGCP) is located directly adjacent to the subject land which supports a large assembly of nationally and state significant flora and fauna. No significant habitat loss or displacement was identified in the assessment. The Assessment found "vegetation that remains in the Project Area [post development] is of high habitat value as it provides a corridor for movement to better quality vegetation. Additionally, the remaining remnant scattered trees contain a significant number of hollows, likely to be utilised by less conspicuous or nocturnal species and utilised for nesting, either by birds or other fauna. With reference to the EPBC Act, nationally and state significant flora and fauna will continue to be conserved post-development.

## 4.7 Environmental Sustainability

### Medium

A Sustainability Strategy Report prepared by DSquared is provided at **Appendix H**. It provides Sustainability Strategies and Ecologically Sustainable Design (ESD) initiatives for the proposed development to reduce its impact on the environment in both construction and operation.

The proposed development is targeting a 5-star rating certification from the Green Building Council of Australia. In doing so, a high degree of validity can be prescribed to the above ESD initiatives, ensuring their implementation.

A suite of ESD initiatives have been integrated into the design - these are captured in the following extract from the Sustainability Strategy:



These initiatives align with the Proponent’s objective to:

*“prioritise to sustainable practices by improving the current natural resources at the property to create a unique hospitality experience”.*

The following passive design principles and climate-responsive techniques are integrated into the design:

- Buildings oriented toward the north which captures free heating from the winter sun with external shade elements and balconies used to provide shade protection from the summer sun, reducing the reliance on active climate control techniques.
- Facade shading elements and glazing specifications have been selected by energy performance modelling and computer simulation techniques.
- A tailored approach has been taken regarding facade glazing. Solar heat gain coefficients have been optimised for each building type to ensure a balance between summer and winter temperature regulating.
- Air leakage pressure testing will be conducted on the external facade to ensure ideal air leakage rates, significantly reducing air conditioning energy consumption.

- Installation of a green roof, facade planters and extensive landscaping will provide a passive cooling effect from water transpiration and act as a barrier.
- Completely electrified energy system with no fossil fuels or natural gas required.
- Installation of 300 solar voltaic panels on the rooftop at 330W per panel, providing 20% of the total energy requirement of the building.

Additional sustainable practices will be incorporated in the hiring of local labour and materials as well as selecting recycled materials and highly efficient water and electrical fittings.

The confluence of these actions and practices will reduce the energy consumption of proposed development by 24% (and the carbon emissions from energy use by 18%) when compared to a reference study from the National Construction Code.

The proposed development results in **positive** environmental impacts with regard to sustainability in the built form. The integrated approach to incorporating these features into the design demonstrates how the Proponent intends to prioritise sustainable practices.

## 4.8 Land Use

### Medium

The land is located in the:

- Public Purpose Zone and the Public Purpose (Recreation and Sports) Policy Area in the Adelaide Hills Development Plan (the Development Plan).
- Recreation Zone under the Code. No Sub-Zones apply to the land.

The Guidelines sought: “*The Development Act 1993 requires the DR to state the consistency of the expected effects of the proposed development: with the relevant Planning and Design Code policy....*”. The Development Act 1993 (and the Development Plan) was in force when the project was declared a Major Project. Since this time, the *Planning, Development and Infrastructure Act, 2016* (and the Code) has been enacted. A complexity exists in the application of legislation in this regard. The weight to be applied given this policy landscape is at the discretion of the Minister of Planning as the Major Development assessment process provides the most rigorous form of impact assessment which is highly interrogated.

Under the Development Plan, the tourist accommodation portion of the development would have been considered a non-complying form of development. A Non-complying form of development underwent a heightened level of assessment. Under the Code, the proposed development would be Performance Assessed and all proposed land uses are envisaged.

The provisions of the Code have been given greater weight in this assessment. Desired Outcome (DO) 1 and PO 1.1 of the Zone seek:

**DO 1: Provision of a range of accessible recreational facilities**

**PO 1.1: Development is associated with or ancillary to the primary purpose of structured, unstructured, active and / or passive recreational facilities.**

**PO 1.6: Facilities that may attract longer-term stays may include complementary activities associated with the principal recreational use of land, such as tourist accommodation.**

(underlining emphasis added)

The proposed development provides structured active recreation facilities, in the golf course and provides complementary tourist accommodation. It is consistent with land use provisions of the Zone.

The primary use of the land is for a 'golf course' which is envisaged in DPF 1.1 of the Zone. DPF 1.1 also lists the following acceptable land uses:

**(n) shop ancillary to recreation facility**

**(v) tourist accommodation ancillary to recreation facility.**

Golf courses and recreation facilities are not explicitly defined under the Code however the land has existing use rights as a golf course with ancillary accommodation and ancillary pro-shop, function and restaurant (shop) facilities. The continued use of the land for such purposes is consistent with DO 1, PO 1.1 and PO 1.6, as it principally remains a golf course with ancillary tourist accommodation offering.

The existing land uses will be intensified as part of the proposed development. To determine whether the level of intensification is appropriate, a cumulative impact assessment which takes into account the amenity of neighbouring properties was undertaken. Regard was had to visual, noise, traffic and lighting impacts. A summary of this assessment is provided below:

**Visual** - As detailed in the visual analysis provided in the Architectural Design Statement (**Appendix L**), the proposed development results in medium visual impact. This is based on an analysis of near and distant views, both internal and external to the site. The visual impact to adjacent land users arising from intensification of the existing land uses results in a **medium visual impact**. The visual impacts associated with the development have minimal impact on adjacent neighbours, with the majority of visual impact affecting users of the Heysen Trail (refer visual impact analysis, in the Architectural Design Statement - **Appendix L**).

**Traffic** - As detailed in the traffic assessment section of this DR, the proposed development will not result in adverse traffic impacts. Additional vehicle movements on Golflinks Road are proposed. The Traffic Impact Assessment at **Appendix I**, finds that "while it is acknowledged that there will be an increase in movements on the adjacent road network as a result of the proposal, it is considered that the traffic impacts will be within acceptable levels and not result in significant impact on other road users in the vicinity of the site". The traffic impacts arising from the intensification of the existing land uses results in a **neutral** impact to neighbours.

**Lighting** - The Proponent has not yet designed the lighting system - they are willing to accept a condition of consent which seeks the provision of a lighting plan and demonstrates compliance with the relevant standards in this regard. For the purposes of this assessment - it is assumed that the lighting system could operate within acceptable levels if it is designed to comply with relevant standards. The lighting impacts associated with the proposed development can be managed to result in **neutral** environmental impact.

**Noise** - A Noise Impact Assessment (NIA) has been provided in **Appendix R**. The NIA utilised a continuous noise survey over a 5-day period with the receiver placed at the boundary of the nearest sensitive receiver. The results of the survey were assessed against the noise criteria in the Planning and Design Code and the SA EPA Environment Protection (Noise) Policy 2007. The report concluded that the predicted noise levels at the nearest sensitive receiver will achieve the relevant criteria sought by the above sources as long as each speaker is limited to 90dBA at a distance of one metre, based on all four speakers used. This is a very high level of volume which would not be utilised during an event and therefore it is considered that there will be no adverse impacts on sensitive receivers as a result of speaker usage.

Additionally, the noise generated from patrons on both the terrace and inside the function hall was found to have no effect on the nearest sensitive receiver, even under worst case meteorological conditions (i.e. sound waves travelling further in lower pressure systems).

With reference to SA Planning and Design Code, nearby residential properties are located in two different land zones – Rural Neighbourhood and Productive Rural Landscape. The closest residents are located on land zoned Rural Neighbourhood. The indicative noise factors are 47dBA and 40dbA (day and night time) as per EPA requirements. The site is in the Recreation Zone where there are no indicative noise factors under EPA requirements. The NIA applied the most conservative case which assumed the same indicative noise factors as per Rural Neighbourhood. It also based the assessment on the measured noise levels at the proposed site. The nominated design criterion for continuous operational noise is achieved with this criteria applied.

Mechanical services are currently being developed and detailed recommendation will be provided once it is sufficiently developed. The NIA provides a note about the mechanical services assessment included in Page 13.

The acoustic impacts arising from the intensification of the existing land uses results in a **neutral** environmental impact to neighbours.

On review of the Code in response to land use and with reference to the impact assessment sought by Guideline 8, the proposed land uses are acceptable. The level of impact arising from the intensification of the existing land uses on the site results in:

- Medium visual impact,
- Neutral lighting impact (subject to further investigation and control to be enforced through conditions of consent),
- Neutral traffic impact,
- Neutral noise impact.

Post development, the proposed level of amenity for neighbours should not be adversely affected in terms of lighting, traffic and noise. A medium visual impact will occur, this is primarily as viewed from the Heysen Trail and not by adjacent landowners.

## 4.9 Native Vegetation

### Medium

Native vegetation is proposed to be removed to facilitate the development. The land is located in the Native Vegetation Overlay and State Significant Native Vegetation Overlay under the Code. A total of 1.758 ha of native vegetation is proposed for clearance, including:

- 0.0.261 ha of VA A1a – *Eucalyptus viminalis ssp. viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon*.
- 1.307 ha of VA A1b – *Eucalyptus viminalis ssp. viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey.
- 0.091 ha of VA A1c – *Eucalyptus viminalis ssp. viminalis* +- *Eucalyptus obliqua* over exotic understorey.

- 0.013 ha of VA A2 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over *Pultenaea daphnoides*.
- 0.144 ha of VA A13 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* +- *Acacia Melanoxylon* over exotics
- A total of 57 scattered trees are proposed for removal within the Project Area, which includes 6 *Acacia melanoxylon* (Blackwood), 23 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum) and 27 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) from poor to excellent in health.

The Level of clearance is Level 4.

The following Appendices provide a detailed assessment against the Native Vegetation Act 1991:

- Native Vegetation Data Clearance Report prepared by EBS Ecology (**Appendix Z**).
- Ecology Fauna and Flora Assessment prepared by EBS Ecology (**Appendix O**).

Additional assessment regarding significant and regulated trees proposed to be removed is provided in the Tree Impact Assessment at **Appendix G**.

To offset the loss of native vegetation a payment of \$439,095.19 , which includes a \$22,891.21 administration fee is proposed to be paid into the Native Vegetation fund.

The proposed development results in **neutral** environmental impacts with regard to native vegetation removal given this level of offset. For a full assessment of the issues reference should be had to the EBS Ecology Report referenced above.

## 4.10 Native Fauna

### Medium

A detailed fauna assessment is provided in Native Vegetation Data Clearance Report prepared by EBS Ecology (**Appendix Z**).

A total of 22 fauna species were recorded within the Project Area, 20 were birds and two were mammals. No fauna species listed under the EPBC Act were recorded within the Project Area. One fauna species listed under the NPW Act as Rare was recorded in the Project Area:

- Common Brushtail Possum (*Trichosurus vulpecula*).

This species was observed directly adjacent to the main building of the Golf Club.

One of the species recorded within the Project Area is introduced fauna:

- Common Blackbird (*Turdus merula*).

Fauna species observed during the survey are provided in Appendix 3 of **Appendix Z**.

A range of Nationally threatened fauna species were assessed as likely to occur within the Project Area. A total of 11 State listed fauna species that have records within 5 km of the Project Area were assessed as highly likely / known or likely to occur within the Project Area. Reference should be had to **Appendix Z** for detailed discussion on each of these species.

The potential impacts to flora and fauna were assessed by EBS as:

*“The Project Area is largely comprised of pockets of remnant native vegetation, scattered trees and planted (amenity) vegetation associated with the golf course. MGCP is directly adjacent to the Project Area and supports a large assemblage of both nationally and State listed flora and fauna (DEH 2006). Few patches of naturally occurring native or remnant vegetation remain in the landscape, and those that do are generally impacted at some level by weed invasion and lacking an intact understorey. Regardless, vegetation that remains in the Project Area is of high habitat value as it provides a corridor for movement to better quality vegetation. Additionally, the remaining remnant scattered trees contain a significant number of hollows, likely to be utilised by less conspicuous or nocturnal species and utilised for nesting, either by birds or other fauna”.*

EBS provided the following recommendations and considerations to protect flora and fauna on site:

- Retain high value vegetation where possible, particularly those areas assessed as having high fauna habitat value (in particular trees/vegetation with a high biodiversity score and trees with hollows) and consider Project design that avoids this constraint.
- Utilise existing disturbed areas including areas defined as exotic vegetation for Project infrastructure where possible. See Appendix 10 for a map and photographs of suggested areas and routes that EBS recommends in order to avoid impact to native vegetation.
- Ensure infrastructure is sufficiently located away from large remnant trees (i.e., a minimum of 10 metres away but preferably outside of the Tree Protection Zone (TPZ) of trees).
- Ensure that the design and construction methods minimise impacts to all vegetation, as much as possible, including impacts to the TPZ of large remnant trees.
- Vegetation clearing required for the Project outside the parameters of maintenance activities would require approval under the Native Vegetation Act 1991 (NV Act). This would require a Clearance Data Report and a Clearing Application lodged with the Native Vegetation Council. The completion of additional field work may also be required.
- If native flora species that provide suitable resting, foraging and breeding areas for some fauna species are impacted by works then a suitably qualified fauna spotter (or the likes) needs to assess the presence of fauna prior to any flora removal.
- Collate additional information to determine if a referral under the EPBC Act (i.e., undertake an EPBC Self-assessment of MNES, conduct targeted threatened species surveys), is required.
- Develop a Construction Environmental Management Plan (CEMP) for the construction phase of the project that includes detailed strategies for the management of native vegetation and fauna. This should include the management of Declared and Environmental weeds across the Project Area to prevent their spread into surrounding areas as well as Phytophthora risk.

With these recommendations in place, the proposed development results in **neutral** environmental impacts with regard to native fauna.



## 4.11 Flooding and Water Quality

### Medium

The proposed development is located within the Mount Lofty Ranges Catchment (Area 2) Overlay, which seeks to ensure that development has a neutral or beneficial effect on the water quality harvested from secondary reservoirs or diversion weir catchments. The Hazards (Flooding – Evidence –Required) Overlay seeks the management of potential flooding of infrastructure and buildings.

The Stormwater Management Plan (**Appendix U**) and Integrated Water Management Plan (**Appendix DD**) provide detail on:

- The effects on water quality and methods for managing this.
- How wastewater and effluent disposal will be managed.
- Minimising erosion to Cox Creek.
- The impacts of surface water to downstream flows and proposed mitigation methods.

Lake and dam levels will be managed through the pumping of stormwater storage ponds throughout the golf course for use as irrigation. Weirs will manage peak levels within the lake which will feed into Cox Creek when required.

Existing drainage pits and pipes will be retained and reused to minimise the construction impact. New stormwater pipework will be laid within the building footprint and collect all rainwater runoff from storm events up to the 10-year ARI level into a below ground drainage pipe. Roof runoff will be collected into downpipes and stored in a retention tank within 100-year ARI overflows connected into the below ground outlet drain.

As the proposed site is located within the Onkaparinga Catchment of the Western Mt Lofty Ranges Prescribed Water Resources Area, the stormwater detention basin constitutes a water affecting activity under the Landscape South Australia Act 2019. It is anticipated that the design of the basin complies with the requirements set out in the Western Mt Lofty Ranges Water Allocation Plan – water storage and diversion structures section specifically.

- Approximately 150m<sup>3</sup> detention storage basin with a staged flow control over the outfall to Cox's Creek to limit post-development flow rates to pre-development flow rates. Detention volume will be calculated and adjusted as necessary to ensure peak outflows do not exceed pre-development flow rates for the minor and major storm events respectively.
- Minimum 300mm freeboard from peak 1% AEP storm event basin water level, to emergency overflow weir to Cox Creek.
- Provision of 300mm of extended duration detention depth, sized to capture and treat the 3month ARI (4EY AEP) storm event for all runoff from the ground surface areas of the basin.
- Provision of 200micron stormwater filter baskets within all stormwater inlet pits within the development.
- Basin floor to be planted with effective nutrient removal native vegetation, deep filter media, transition layers and drainage layers in accordance with EPA/Water Sensitive SA best practice guidelines.
- Provision of emergency overflow to Cox creek via a rock lined weir or similar approved to mitigate erosion and protect the existing watercourse in the event of a blockage.

The stormwater management system complies with the South Australian EPA water quality reduction targets of:

- 80% retention of the typical urban annual load for Total Suspended Solids (TSS).
- 60% retention of the typical urban annual load for Total Phosphorus (TP).
- 45% retention of the typical urban annual load for Total Nitrogen (TN).
- 100% retention of the typical urban annual load for Gross Pollutants (litter).

All internal pipe specifications will be determined during the detailed design period of the development, however, minimum requirements to manage a 10% AEP storm event and use of 225 minimum diameter pipes will mitigate potential blockages and downstream flood risks. This will assist in protecting habitable buildings (refer to the stormwater concept within the FMG Stormwater Management Report (**Appendix U**)).

Overland flow paths divert surface water runoff towards the basin through naturally occurring depressions in the topography to minimise the need for excavation.

The Pod's will include individual retention/detention tanks as a self-sufficient unit. Discharge from these pipes will be managed via a main collector pipe or discrete outlets to the bushland surrounding the units, controlled by orifice and erosion protection elements. Post-development runoff will be managed with 1.5m<sup>3</sup> stormwater detention volume per Pod.

As a part of the Stormwater Management Report, a Cox Creek drain model was created to predict the impacts of the development on the watercourse. Calculations indicate that the water depth of the watercourse may approach an increase of 2.5 metres with a maximum velocity increase of 5m/s during a 1% AEP major storm event. Rock rip-rap will be placed along the banks of Cox creek to protect the banks from erosion in a 1% AEP overflow event. Undertaking erosion control work within a watercourse requires a permit under the Landscapes South Australia Act 2019 obtained from the Hills & Fleurieu landscape Board. It is anticipated that these works will comply with the requirements set out in the Hills & Fleurieu Water Affecting Activity Control Policy.

Cox Creek is at an elevation of 412m AHD when measured directly downhill from the proposed development. The proposed development will be sited on elevations between 418-420m AHD (6-8 metres above the creek). The potential 2.5 metre increase will not increase the risk of the entrance of flood waters in the proposed development.

The proposed stormwater management system designs for post development peak flow to not exceed pre-development peak flows in an equivalent storm event. This aims to protect patrons as well as minimise erosion and water quality in Cox Creek. The management of pollutants within the stormwater runoff has been considered with high importance and all EPA water quality targets are proposed to be achieved.

Comparing the existing golf course operation and the proposed development, the management of flooding and improvements to water quality, arising from the development are **positive**. The proposed development provides appropriate flood mitigation and improves the quality of water prior to diversion to Cox Creek.

## 4.12 Surface Water

### Medium

The proposed development is located in the Onkaparinga (reservoir) catchment. Cox Creek runs through the site. The proposed development has considered the potential for managing water resources through the Integrated Water Management Plan (IWMP) at **Appendix DD**. It provides the management approach to water supply, rainwater harvesting, stormwater, wastewater, and groundwater resources. The aim of the IWMP is to promote sustainable water use, minimize the impact of development on water resources, and ensure the long-term availability and quality of water resources.

The IWMP is designed to comply with best practice guidelines and requirements, namely the South Australian Environmental Protection Authority (EPA) and the SA Public Health wastewater requirements. Given the technical nature of the proposed surface water management approach the following extract of the IWMP is provided – for further detail reference should be made to the IWMP at **Appendix DD**:

*“Under the proposed development, runoff from upstream catchments will be safely routed around the east and west of the proposed building, mimicking existing conditions and protecting the development from inundation. Runoff intercepted by the roof area will be harvested for reuse as outlined within the Water Balance section of this report. Runoff captured at surface level within the hotel will be collected into a minor stormwater pit and pipe network fitted with gross pollutant intercepting baskets, or conveyed via overland flow during a major storm event, towards a stormwater basin located adjacent Cox’s Creek. Within this basin a tertiary level water quality improvement will be achieved through use of a bioretention raingarden capable of treating at least the volume of runoff generated by the 4EY ARI in accordance with the EPA and Water Sensitive SA best practice guidelines.*

*Stormwater collected into the basin will also be detained to ensure post-development peak runoff does not exceed the pre-development peak runoff figures for the minor and major storm respectively. The detention volume held within this basin during the 1% AEP storm event is estimated to be in the order of 150m<sup>3</sup>. Should further investigations determine this basin is required to be enlarged, sufficient room exists along the length of Cox’s creek to increase the basin size. The basin is likely to be nominated beyond the 1% AEP flood level, however could be designed to be adequately protected within the floodway if required.*

*All wastewater infrastructure, general waste infrastructure and equipment storage facilities will be nominated within the footprint of the proposed hotel facility, which will be at or above the minimum FFL of 419.80mAHD, and adequately protected from upstream catchments which will be safely diverted around or away from the building along existing overland flow routes.*

*The detailed stormwater management plan can be found within Appendix C where further calculations are provided.*

*A review of SARIG mapping suggests a depth to groundwater in the order of 5-10m throughout the subject site. No works are proposed which will affect groundwater, however groundwater may be encountered during construction depending on proposed footing systems”.*

The report concludes that the proposed development can be suitably designed to manage water both on site and within the surrounding catchment to mitigate negative effects on the environment. This was based on consideration to the EPA, SA Health and WSAA code requirements, along with best practices for stormwater management. The resultant impact is considered to be **neutral to positive**, given that within the

stormwater basin, there are water quality improvement mechanisms proposed. Further, that the existing infrastructure which is at the end of its useful life is proposed to be upgraded.

### 4.13 Heritage – First Nations People

#### Medium

A Cultural Heritage Management Plan (CHMP) is provided at **Appendix N** to plan for the management of sites and places of Aboriginal heritage should these be encountered during construction and on-going.

The CHMP outlines how risk will be managed and the controls that will be implemented to ensure that no damage is caused to Aboriginal heritage during the construction and operational phases of the development. The methods and procedures outlined in the CHMP are informed by the *Aboriginal Heritage Act 1988 (AH Act)*. The AH Act does not mandate a requirement for a cultural heritage survey where there is a low likelihood of disturbance of Aboriginal heritage. After a review of geotechnical survey data, flora and fauna survey and the arborist survey, it was determined that this was the case for the proposed development. Additionally, there are no Aboriginal places listed within the Australian Heritage Database within or near the subject site.

Mitigative techniques and management controls which will be implemented to avoid and minimise impact to Aboriginal cultural heritage values are as follows:

- Desktop assessment of registered and recorded sites via the Central Archive, including the Register of Aboriginal Sites and Objects, maintained by the Attorney General's Department.
- Utilise previously disturbed areas for infrastructure wherever practicable.
- Induct all staff and contractors on cultural heritage prior to any onsite construction work.
- Undertake a cultural heritage survey with native title claimants, if required.
- Develop and implement a Cultural Heritage Management Plan detailing the procedures for the identification, management and protection of Aboriginal cultural heritage sites including monitoring of ground disturbance activities in agreed locations with relevant traditional owner representatives, if required.

#### Construction Phase

During the construction phase of the proposed development, Aboriginal heritage protection and management measures include:

- Ongoing heritage inductions to make all project personnel aware of Aboriginal heritage sites and appropriate management procedures in place to avoid impact,
- Monitoring of construction works in higher sensitivity or higher risk locations by Kurna Yerta Aboriginal Corporation (KYAC) and Peramangk Peoples.
- Robust measures and procedures to address site discoveries during construction
- Where sites are identified during construction, Mount Lofty Golf Estate will aim to relocate works to mitigate impact
- If works are unable to be relocated, Mount Lofty Golf Estate will work closely with interested parties and the contractor to find a suitable solution in accordance with the requirements of the AH act.

- At the conclusion of construction Mount Lofty Golf Estate intends to undertake a compliance audit to ensure all heritage management conditions have been met and that the mitigation measures and control operated effectively.

## Operational Phase

Ongoing compliance with the AH Act in accordance with the operational heritage management system (and any CHMP) in consultation with the KYAC will be practiced.

The above measures ensure that the project will avoid disturbing or damaging potential items of Aboriginal cultural significance during both the construction and on-going operation phase, and respond appropriately and responsibly in the case of any discovery event.

The CHMP provides the means for managing sites and places of Aboriginal heritage should these be encountered during construction and on-going. With strict compliance to the CHMP, the proposed development should result in **neutral** environmental impact with regard to Aboriginal Heritage. Opening the dialogue between the Proponent and the KYAC is also intended to provide **positive** social impacts.

## 4.14 Heritage – European

### Medium

The site contains a Local Heritage Place ('the Perfumery'). The proposed development includes partial demolition, restoration, conservation, reuse and new built form elements to the Perfumery. A Heritage Impact Assessment (HIA) has been prepared (**Appendix BB**).

The Perfumery is currently used as the site maintenance building and office. It is dilapidated. The intent is to restore the existing building to its original state (or as close as possible) to a Perfumery / retail café space and construct an addition for use as a function space. Its refurbishment includes a new modern structure which sits adjacent to the Perfumery building, providing additional amenity and dining spaces. A Scent Garden adjacent the addition is also proposed. The materiality consists of glass and metal to provide a contrast and clear modern addition to the existing stone Perfumery building.

The HIA details the following with regard to European heritage impact:

- The adaptive reuse of the Perfumery will help to preserve and protect it, and the inclusion of a scent garden and orchard will establish a continued connection to its previous use as a local perfumery.
- Reusing the building will have long term benefits for the community as if the building cannot be incorporated into the golf course redevelopment, it will continue to deteriorate.
- The site of the Perfumery works are not situated on any known or potentially significant archaeological artefacts; however ground disturbance works may uncover artefacts relating to all stages of the development of the project area. This aspect is covered in the Cultural Heritage Management Plan (CHMP) at **Appendix N**. Which provides a procedure for management of uncovered archaeological items.
- The proposed work will not have an adverse impact on the current heritage values of the building but will rather enhance the heritage values (HIS, page 5).

The adaptive reuse of a local heritage item results in **positive** environmental, economic and social benefits.

## 4.15 Waste Management – Stormwater and Construction and Operational Environmental Management

### Standard

This aspect of the proposed development has been addressed through the creation of the following management plans:

- The Waste Minimisation and Management Plan - this plan identifies waste sources during the construction and operation phases and outlines principles, procedures and on-going responsibilities of managing and minimising the waste materials generated by the development.
- The Construction Environmental Management Plan - this plan identifies the environmental protection measures, systems and tools to be implemented during the construction phase of the development.
- The Operational Environmental Management Plan - this plan employs a system for hazard and risk identification training for all staff and construction personnel to ensure deliverance of mitigation measures for the proposed development on-going.

These plans are discussed in detail in the following section of this DR. Adherence to the management measures outlined in these plans is anticipated to result in **neutral** impact.

## 4.16 Effects on the Physical Environment

### Standard

The proposed development results in cut and fill on the land which will alter the land as existing. Plans detailing the extent of cut and fill are at **Appendix U**. These detail that the indicative estimated volumes of cut and fill are:

- Cut: -15,838m<sup>3</sup>
- Fill: +3,008m<sup>3</sup>
- Net = 12,829m<sup>3</sup>

The potential impacts to the natural topography of the land arising from cut and fill are:

- Alterations to surface water runoff - this is addressed in **Appendix U** the Stormwater Water Management Plan. Improvements to stormwater management and quality compared to existing are of note.
- Potential for increased sediment during construction - this is addressed in **Appendix T** the Construction Environmental Management Plan (CEMP). This item will be managed on-going during construction.
- Potential for increased erosion during construction - this is addressed in **Appendix T** the Construction Environmental Management Plan (CEMP). This item will be managed on-going during construction.
- Visual impacts resulting from changes to the landform - this is addressed in **Appendix E** through the provision of soft landscaping and the level of impact quantified in the visual analysis provided in **Appendix L**, the Architectural Design Statement. The visual impacts resulting from an altered land form are screened by the development i.e. basement car parking. The land is already altered to accommodate the golf course. Landscaping treatments and planting assist in reducing the visual impacts to the landscape.

The above impacts have been addressed in the various management plans appended to this DR. The resultant impact from this part of the proposal is considered **neutral**. The proposed development will not have a positive or negative impact on the physical environment in terms of land form.

## 4.17 Environment Food Production Area

### Standard

The site is located within the Environment Food Production Area (EFPA) where productive agricultural land is expected to be retained for such land uses and it is sought that land is not subdivided for residential purposes. The site has an existing non-agricultural land use - The Stirling Golf Course. Future division of the land would not result in additional loss of agricultural land and would not impact the EFPA. No residential land uses are proposed as part of the development. The proposed land division seeks to formalise the tourist accommodation, golf and golf course areas and provide rights of way access. This is proposed for leasing purposes so that each area can be tenanted separately.

The resultant impact from this part of the proposal is **neutral**. It will not have a positive or negative impact on the EFPA.

## 5. Avoidance, Mitigation, Management and Control of Adverse Effects

This DR is supported by a suite of environmental and operational management plans to assist in the on-going management and mitigation of any potential impacts arising from the development. The management plans provide the means to avoid environmental impact and outline processes and procedures in the event that a risk arises.

The following management plans are appended to this DR:

- Waste Management and Minimisation Plan - **Appendix J**
- Cultural Heritage Management Plan - **Appendix N**
- Hazard Management Plan - **Appendix P**
- Bushfire Survival Plan - **Appendix Q**
- Bushfire Management Strategy - **Appendix Y**
- Construction Environmental Management Plan - **Appendix T**
- Stormwater Management Plan - **Appendix U**
- Operational Environmental Management Plan - **Appendix X**

For each plan, a summary of the approach is provided below. For additional detail, reference should be had to the relevant Appendices.

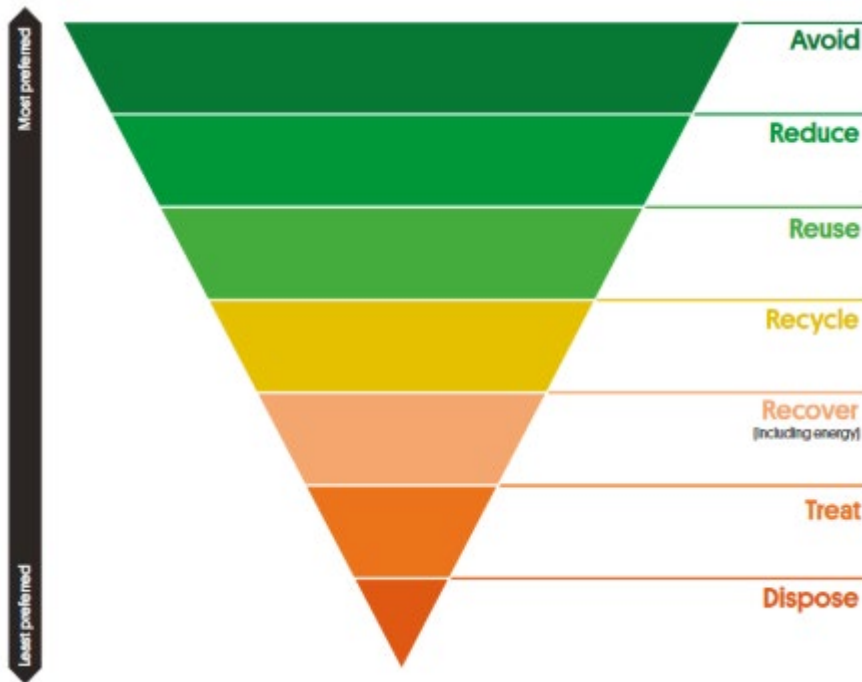
### 5.1 Waste Management and Minimisation Plan

The Waste Minimisation and Management Plan (**Appendix J**) details the proposed program for waste minimisation, mitigation and monitoring during the construction and operational phases of the project.

The Waste Minimisation and Management Plan identifies waste sources during the construction and operation phases and outlines principles, procedures and on-going responsibilities of managing and minimising the waste materials generated by the development. These are best reflected by the priority actions identified by the report which seek to:

- Avoid waste.
- Improve resource recovery.
- Increase use of recycled material and build demand and markets for recycled products.
- Better manage material flows to benefit human health and wellbeing, the environment, and the economy.
- Improve information to support innovation, guide investment and enable informed consumer decisions.





**Figure 1 - Waste Management Hierarchy**  
 (“South Australia Waste Strategy 2020-2025”, 2020)

Specifically, the head contractor and site manager will be responsible for:

- Clearly separating and defining waste materials to facilitate processing or recycling.
- Subcontractor coordination to maximise on-site reuse of waste materials.
- Regular monitoring of on-site activities to ensure every aspect of the WMMP is implemented.

During the operational phase, the building management and maintenance staff will be responsible for:

- Ensuring waste is separated and defined to facilitate appropriate treatment and transportation.
- Ensure waste areas and transfer pathways are inspected and cleaned routinely to minimise contamination and keep hygienic.
- Ensure and uphold suitable waste training for all staff.

The Waste Minimisation and Management Report will be continuously updated and adapted to ensure the efficient collection, storage and collection of waste throughout the duration of the use.

## 5.2 Cultural Heritage Management Plan

A Cultural Heritage Management Plan (CHMP) has been prepared by EBS Heritage and is provided at **Appendix N**. The report provides an assessment of the impacts of the proposed development on the cultural heritage of First Nations People. The CHMP:

- Demonstrates the commitment by Mount Lofty Golf Estate to consulting and working with the Kaurna Yerta Aboriginal Corporation (KYAC, the registered native title body corporate for the Kaurna people.)

- Outlines how the Proponent will meet its statutory obligations under the Aboriginal Heritage Act 1988 (AH Act) in relation to the management and protection of Aboriginal cultural heritage.
- Demonstrates the measures that will be implemented to manage and protect Aboriginal cultural heritage in the pre-construction, construction and operation phases of the project.
- Demonstrates the cultural heritage stop work/discovery and reporting procedures should Aboriginal heritage be identified during either the construction or operational phases of the project.

### 5.3 Hazard Management Plan - Mount Lofty Golf Estate

A Hazards Management Plan has been prepared by Mount Lofty Golf Course Estate and is provided at **Appendix P**. The purpose of the Hazards Management Plan is to establish and maintain an effective health and safety management system. The report details a health and safety program which plans for and manages hazards, safety responsibilities and emergencies. The key components of the health and safety programs comprise:

- Training and supervision
- Written work procedures
- Hazard identification systems
- Workplace inspections
- Investigations of incidents and injuries
- Keeping records and monitoring effectiveness.

The on-going health and safety operations of the Mt Lofty Golf Course Estate will be upheld using the risk management process, which is broken down into the following five steps:

- Step 1: Identify the hazards
- Step 2: Assess the risk
- Step 3: Risk priority score and identify the necessary action and response
- Step 4: Control the hazards
- Step 5: Review the process

These processes will ensure that the safety of guests and staff are prioritised as well as creating a well educated culture of hazard management which will have broader benefits within the locality as potential hazards are identified early and managed appropriately.

### 5.4 Bushfire Survival Plan

A Bushfire Survival Plan has been prepared by BSP Design provided at **Appendix Q**. The Survival Plan is underpinned by the following priorities:

- Priority 1: Protection of Life - Ensures that all people who may be in danger are forewarned and that action is taken to guarantee their safety (including evacuation), before any steps are taken to prevent the spread of fire, secure assets or to fight the fire.

- Priority 2: Prevent Spread of Fire - Once complete evacuation has occurred, trained staff will begin preventing the spread of fire in the event that the Fire Service are unable to attend and a decision has been made to stay and defend.
- Priority 3: Protect Assets - Once all safety measures have been initiated, the protection of the assets of the estate can occur.

The Survival Plan also promotes the *leave early* approach to evacuation despite the buildings within the estate being designed to withstand radiant heat and ember attack. There will be a Chief Warden at the estate at all times during the bushfire season who will coordinate the time to leave early if required.

On days of catastrophic risk, the report promotes the decision to leave at the earliest possible time in order to uphold priority 1.

Designated assembly points will be indicated on Emergency Evacuation Plans that will be displayed throughout main buildings and including within all of the remote accommodation pods.

All staff will be instructed to manage guests under the guidance and instruction of the fire wardens.

The nearest designated safe precinct is the Stirling township, with the next alternative being Mount Barker. Staff and guests will be transported through a mixture of shared and personal transportation.

Additionally, on days of catastrophic risk:

- All staff will be briefed of the predicted fire risk and are able to review the safety plan with a particular emphasis on evacuation procedures and requirements.
- All expected guests will be contacted prior to their arrival to inform them of the fire danger with alternative arrangements for their arrival to be made to suit the fire danger rate of the following three days.
- Staff will inspect all rooms and ensure that windows are fully closed and that all external doors are fully closed.
- The last resort refuge area will be equipped with bottled water supplies and towels which can be used to provide relief from the raised temperatures.
- All fire fighting equipment on site will be checked to ensure its operation and set up on standby for immediate access when required.
- All ground will be checked for potential fuel sources such as leaf litter and cleared.

## 5.5 Bushfire Management Strategy

A Bushfire Management Strategy (BMS) has been prepared by BSP Design and is provided at **Appendix Y**. The purpose of the BMS is to set guidelines regarding the processes and procedures in the preparation for bushfires, particular responses and the actions required in the recovery following any bushfire event. The BMS is intended to be a fluid document which will be reviewed on a regular basis and amended/upgraded as necessary, particularly prior to any bushfire season. The key objectives of the BMS are as follows:

- **Preparation** - which primarily involves managing fuel loads, vegetation, access tracks, staff resources and any other arrangements to ensure that in the event of a bushfire all resources and services which are required to cope with the effects of an event are efficiently mobilised and deployed.

- **Response** - Encompasses actions taken in anticipation of, during and immediately after an event to ensure that its effects are minimised and that the affected people are given immediate relief and support.
- **Recovery** - is the restoring and improving of livelihoods and health as well as economic, physical, social, cultural and environmental assets and working to avoid and reduce future disaster risk.

These objectives are achieved through the following initiatives:

- Establishment of an Emergency Planning Committee (EPC) who are responsible for the implementation of the strategy and supervising emergency procedures.
- Mitigating the bushfire risk through vegetation management (refer Appendix A of the BMS).
- Asset management and record keeping to ensure all building specifications and materiality is easily accessible and available to all staff and emergency services.
- Implementation of the Buffer Zones (p.12, BMS).

## 5.6 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) has been prepared by FMG Engineering and is provided at **Appendix T**. The purpose of the report is to identify environmental protection measures, systems and tools to be implemented during the construction phase of the development.

These initiatives are intended to mitigate and minimise adverse environmental impacts as a result of the construction activities associated with the development. They are informed by the Guidelines for Environmental Management of On-Site Remediation (SA EPA, 2019) and the Guidelines prescribed by the SPC for the preparation of this development report. The CEMP is underpinned by the following objectives:

- To employ best management practices to ensure that the construction project meets environmental legislative requirements.
- To employ best environmental management practices to ensure compliance with all planning approvals and environmental authorisations.
- To employ best environmental management practices to minimise noise and vibration impacts.
- To apply best environmental management practice to soil and water quality management.
- To minimise air pollution from construction and associated activities.
- To protect any vegetation adjacent to the construction zone.
- To avoid pollution of the environment caused by fuels, oils or chemicals stored or used on the Project.

The report provides an in-depth analysis of potential risks and the associated mitigative actions which will be employed during the construction phase to achieve the above objectives. It outlines the mandatory training which will be provided in the forms of site induction, environmental management training and 'toolbox' training. The environmental management training will include incident reporting and response procedures to assign responsibility and enforce management of environmental risk.

## 5.7 Stormwater Management Plan

A Stormwater Management Plan (SMP) has been prepared by FMG Engineering and is provided at **Appendix U**. The installation of a new detention and water quality improvement stormwater basin located adjacent to Cox's Creek will achieve the following performance requirements:

- Approximately 150m<sup>3</sup> detention storage with a staged flow control over the outfall to Cox's creek to limit post-development flow rates to pre-development flow rates. Detention volume will be calculated and adjusted as necessary to ensure peak outflows do not exceed pre-development flow rates for the minor and major storm events respectively.
- Minimum 300mm freeboard from peak 1% AEP storm event basin water level, to emergency overflow weir to Cox creek.
- Provision of 300mm of extended duration detention depth, sized to capture and treat the 3mo ARI (4EY AEP) storm event for all runoff from the ground surface areas of the basin.
- Provision of 200micron stormwater filter baskets within all stormwater inlet pits within the development
- Basin floor to be planted with effective nutrient removal native vegetation, deep filter media, transition layers and drainage layers in accordance with EPA/Water Sensitive SA best practice guidelines.
- Provision of emergency overflow to Cox creek via a rock lined weir or similar approved to mitigate erosion and protect the existing watercourse in the event of a blockage.

Additionally, all buildings have been designed so that the finished floor levels are above flood level to restrict the entrance of flood waters in the unlikely event of a flood.

The stormwater management system fully complies with the South Australian EPA water quality reduction targets of:

- 80% retention of the typical urban annual load for Total Suspended Solids (TSS),
- 60% retention of the typical urban annual load for Total Phosphorus (TP),
- 45% retention of the typical urban annual load for Total Nitrogen (TN),
- 100% retention of the typical urban annual load for Gross Pollutants (litter).

As the proposed site is located within the Onkaparinga Catchment of the Western Mt Lofty Ranges Prescribed Water Resources Area, the stormwater detention basin constitutes a water affecting activity under the Landscape South Australia Act 2019. It is anticipated that the design of the basin complies with the requirements set out in the Western Mt Lofty Ranges Water Allocation Plan – water storage and diversion structures section specifically.

## 5.8 Operational Environmental Management Plan

An Operational Environmental Management Plan has been prepared by Environmental Projects and is provided for at **Appendix X**. The OEMP employs a system for hazard and risk identification training for all staff and construction personnel to ensure deliverance of mitigation measures.

A Key Aspects, Potential Impacts and Risk Analysis matrix has been created (pg. 13, Environmental Projects, 2022) which analyses the potential impacts, receptors, risk categorisation and mitigation measures relating to the following items:

- Soil and groundwater.
- Stormwater, site erosion and sedimentation.
- Asbestos.
- Wind.
- Protection of trees and vegetation.
- Noise and vibrations.

The OEMP provides an integrated approach to the management of the proposed development during the operational phase, its purpose is to capture the management measures outlined in the suite of management plans appended to this DR. The OEMP provides the means to which the on-going performance of the environmental aspects of the proposed development and its environment can be measured, controlled and safeguarded.

## 6. Conclusion

This DR was required due to the nature of the proposed development, the need for a broader assessment and investigation. Of the 17 Guidelines, 5 were listed as requiring a critical level of assessment, 9 required a medium level of assessment and 3 a standard level of assessment. On balance, the proposed development results in neutral to positive environmental, social and economic impact.

In summary, the neutral impacts i.e. those which do not result in adverse amenity impact and/or can be managed through avoidance, mitigation and/or control, are:

- Vegetation removal.
- Increased traffic movements to Golflinks Road.
- Increased demand for car parking.
- Increased vehicles using Old Carey Gully Road during construction.
- Increased number of people in High Risk Bushfire Area.
- Visual impacts from the Heysen Trail.

The positive impacts are:

- Improvement to landscape quality.
- Adaptive reuse of a local heritage item.
- Improvement to water quality treatment compared to pre-development.
- Better connectivity to Heysen Trail.
- Internal site upgrades to facilitate better accessibility for service vehicles and fire-fighting vehicles compared to pre-development.
- Increased local employment during construction in the Adelaide Hills
- Increased employment during construction.
- Increased employment during operation.
- Minimal visual impact from Golflinks Road.
- Retention and improvement to the golf club as an important community asset which has positive social impacts.
- Improved meeting facilities for great social and community interaction which has positive social impacts.
- Promotion of golf in the area – a healthy pass-time which has social and economic benefits.
- Positive economic contribution to the Adelaide Hills economy during construction.
- Positive economic contribution to the States economy.
- Positive economic contribution to the Adelaide Hills economy.

The proposed development has demonstrable need in the Adelaide Hills. It is of high quality and design and on balance, the additional investigations sought by SPC have been addressed in this DR. The Minister for Planning can reasonably proceed this application to public exhibition.

## Bibliography

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- Cirqa, 15 September 2022, Waste Management and Minimisation Plan
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- EBS Ecology, 14 October 2022, Native Vegetation Clearance
- South Australian Tourism Commission (SATC), 2019, *South Australian Visitor Economy Sector Plan 2030*



# Appendix A

## The Guidelines

# Appendix B

Detail Survey - Alexander & Symonds

# Appendix C

## Plan of Subdivision - Alexander & Symonds

# Appendix D

## Architectural Drawings – RArchitecture

# Appendix E

## Landscape Architecture Drawings and Species List – Oxigen

# Appendix F

## Economic Analysis - Hudson Howells

# Appendix G

## Tree Impact Assessment - Arborman

# Appendix H

## Sustainability Strategy Report – Dquared



# Appendix I

## Traffic and Access Impact Statement – Cirqa

# Appendix J

## Waste Management and Minimisation Plan – Cirqa

# Appendix K

## Geotechnical Investigations - FMG

# Appendix L

## Architectural Design Statement – RArchitecture

# Appendix M

## Environmental Heritage Impact Assessment Report - EBS Ecology

# Appendix N

## Cultural Heritage Management Plan - EBS Heritage

# Appendix O

## Ecological Flora and Fauna Assessment - EBS Ecology

# Appendix P

## Hazard Management Plan - Mount Lofty Golf Estate



# Appendix Q

## Bushfire Survival Plan - BSP Design

# Appendix R

## Environmental Noise Assessment Report – BESTEC

# Appendix S

## Services Infrastructure Summary – LUCID

# Appendix T

## Construction Environmental Management Plan – FMG

# Appendix U

## Stormwater Management Plan – FMG

# Appendix V

## BAL Assessment - BSP Design

# Appendix W

## Industry Letters of Support

# Appendix X

## Operational Environmental Management Plan - Environmental Projects



# Appendix Y

## Bushfire Management Strategy - BSP Design

# Appendix Z

## Native Vegetation Clearance Data Report - EBS Ecology

# Appendix AA

## Architectural Renders – RArchitecture

# Appendix BB

## Heritage Impact Statement - EBS Ecology

# Appendix CC

## Certificate of Title

# Appendix DD

## Integrated Water Management Plan – FMG

# Appendix EE

## Perfumery Landscape Plans - Oxigen

# Appendix FF

## Perfumery Detail Survey



SHAPING  
GREAT  
COMMUNITIES



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## **Appendix 3**

*Appendix A of Development Report – Development  
Guidelines*

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# GUIDELINES

For the preparation of a

Development Report  
Mount Lofty Golf Estate

Mount Lofty Golf Estate Pty Ltd  
March 2022

State Planning Commission  
Department for Trade and Investment

[www.plan.sa.gov.au](http://www.plan.sa.gov.au)

Department for Trade and Investment  
Level 5, 50 Flinders Street  
GPO Box 1815  
Adelaide South Australia 5001

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<b>3. MAJOR DEVELOPMENT PROCESS AND ROLE OF GUIDELINES</b>	<b>5</b>
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## 1. BACKGROUND

On 17 December 2020, the then Minister for Planning and Local Government ('the Minister') declared the Mount Lofty Golf Estate to be assessed as a Major Development pursuant to Section 46 of the *Development Act 1993* (the Act).

Section 46 of the Act ensures that matters affecting the environment, the community or the economy to a significant extent, are fully examined and taken into account in the assessment of this proposal.

The State Planning Commission (SPC) is responsible for setting the level of assessment required (Environmental Impact Statement, Public Environmental Report or Development Report) and provides Guidelines for the preparation of the assessment document.

Due to the nature of proposal, the need for a broader assessment and investigation of the following is required:

- Tourist accommodation and associated land uses, including major events,
- Bushfire protection requirements,
- Native vegetation clearances requirements,
- The interface with the Mount George Conservation Park,
- The potential impacts on the Mount Lofty Ranges Watershed including water resources such as watercourses, dam, lakes, wetlands and floodplains, and associated water quality,
- The impacts on the surrounding traffic networks during construction and operation, and
- Servicing and infrastructure required for the site.

The SPC has determined, subject to consideration of section 63 of the *Development Regulations 2008* that the proposal will be subject to the processes of a **Development Report** (DR), as set out in Section 46D of the Act. A DR was considered appropriate due to the nature and scale of the issues to be investigated.

The *Development Act 1993* requires that a DR be publicly exhibited for a period of at least 15 business days and for a public meeting to be held during this period.

The SPC has now prepared Guidelines (this document) for the Mount Lofty Golf Estate and associated infrastructure based upon the significant issues relating to the proposed development. The DR should be prepared in accordance with these Guidelines and should describe what the proponent wants to do, what the environmental effects will be and how the proponent intends to manage the project.

The DR should cover both the construction and ongoing operation of the development and, where possible, should outline opportunities to incorporate best practice design and management.

For the purposes of environmental impact assessment under the *Development Act 1993*, the meaning of 'environment' is taken to include an assessment of environmental (biological and physical), social and economic effects associated with the development and how those effects can be managed.

In this context, this document forms the guidelines as set by the SPC specifically prepared for this application. The guidelines have been developed to properly define the expected impacts (extent, nature and significance) associated with the proposal in the manner suggested, the proposed mitigation strategies, and on balance whether such impacts are acceptable.

## 2. DESCRIPTION OF PROPOSAL

The proponent of the proposed development is the Mt Lofty Golf Estate Pty Ltd. The site is described as Allotment 53 in Deposited Plan 59212 (Certificate of Title: CT 5891/805). A proposed site plan is included in Appendix 1.

The proponent seeks to undertake works at the existing Stirling Golf Club incorporating the following:

- The construction of tourist accommodation in a new hotel building (3 to 5 levels), 20 private retreats (pods) and one service pod,
- New clubhouse facility and pro-shop, administration areas and change rooms,
- Retention and improvements to the 18-hole golf course,
- Conservation works and adaptive reuse of a local heritage place to accommodate a multipurpose café, retail and function space,
- Car parking for 200 spaces in two parking areas, and
- Tree removal (including native vegetation) and associated landscaping.

An emergency access would be formalised via the western entry at Golf Links Road.

The estimated minimum project cost is anticipated to be approximately \$40 million.

### 3. MAJOR DEVELOPMENT PROCESS AND ROLE OF GUIDELINES

The Major Development assessment process enables the Minister for Planning to utilise impact assessment as a strategic tool.

Impact assessment enables the holistic consideration of proposals that might otherwise be of a nature or scale that is not expected through the regular development assessment process and/or Planning and Design Code.

The major development assessment process has several steps:



These Guidelines are prepared to inform the preparation of the DR. They set out the assessment issues associated with the proposal along with their scale of risk as determined by the SPC.

A DR must be prepared by the proponent in accordance with the Guidelines and should specifically address each guideline.

Each guideline is intended to be outcome focused and may be accompanied by suggested assessment approaches. These suggestions are not exhaustive and may be just one of a wide range of methods to consider and respond to a particular guideline.

The DR should detail any expected environmental, social and economic effects of the development, and the extent to which the development is consistent with the provisions of the Planning and Design Code, the State Planning Policy and any matter prescribed by the Regulations under the Act.

Whilst not mandatory for this DR, due to it being declared under the Development Act, the DR may also address the State Planning Policies given they are now a relevant planning instrument.

The completed DR is submitted (by the proponent) to the Minister for public release and is subsequently referred to the relevant Council and government agencies for comment.

An opportunity for public comment will occur when the completed DR is released. Public exhibition is undertaken for a minimum period of 15 business days, however the Minister for Planning has the power to extend this if necessary. An advertisement will be placed in the *Advertiser*, *The Courier (Mount Barker)* and on the SA Planning Portal inviting submissions.

Copies of the submissions from the public, relevant Council and government agencies will be provided to the proponent. The proponent must then prepare a 'Response Document' to address the matters raised during the public exhibition period.

An Assessment Report is then prepared by the SPC. The Assessment Report and the Response Document will be available for inspection and purchase at a place and period, determined by the Minister.

Availability of each of these documents will be notified by advertisements in *The Advertiser*, *The Courier (Mount Barker)* and on the Plan SA Portal inviting submissions. A copy of the DR, Response Document and the Assessment Report will be provided to the relevant Council.

In deciding whether the proposal will be approved and any conditions that will apply, the Minister for Planning must have regard to:

- provisions of the appropriate Planning and Design Code
- the *Development Act 1993* and *Development Regulations 2008*
- if relevant, the Building Code of Australia
- the South Australian Planning Strategy
- the DR, Response Document and the State Planning Commission's Assessment Report
- *Landscape South Australia Act 2019* – Water Affecting Activity Control Policy and Western Mount Lofty Ranges Water Allocation plan
- if relevant, the *Environment Protection Act 1993* and any other relevant government policy and/or legislation.

The Minister can at any time indicate that the development will not be granted authorisation. This may occur if the development is inappropriate or cannot be properly managed. This is commonly referred to as an **early no**.



## 4. DEVELOPMENT REPORT (DR)

The DR will be presented in terms that are readily understood by the general reader. Technical details should be included in the appendices.

### The report will include the following:

#### Summary

The DR should include a concise summary of the matters set out in Section 46D of the *Development Act 1993* and include all aspects covered under the headings set out in the Guidelines, in order for the reader to obtain a quick but thorough understanding of the proposal and the resulting environmental impacts.

#### Introduction

The introduction to the DR should cover the following:

- background to, and objectives of, the proposed development,
- details of the proponent,
- staging and timing of the proposal, including expected dates for construction and operation,
- relevant legislative requirements and decision making processes, and
- purpose and description of the DR process.

#### Need for the Proposal

A statement of the objectives and justification for the proposal, including:

- the specific objectives that the proposal is intended to meet, including market requirements,
- expected local, regional and state benefits and costs, including those that cannot be adequately described in monetary or physical terms (e.g. effects on visual amenity), and
- a summary of environmental, economic and social arguments to support the proposal, including the consequences of not proceeding with the proposal.

#### Description of the Proposal

The description of the proposal should include the following information:

- the nature of the proposal and location,
- site selection and justification provided as to the suitability of the site,
- site layout plans (including indicative land division plan),
- a description of the existing environment (including the immediate and broader location),
- a description of the current land use activities occurring in the area,
- details of all buildings and structures associated with the proposed development and structures to be demolished,
- details of any other infrastructure requirements and availability,
- details of the construction methods to be used,
- details of the operation of the proposed development, including proposed maintenance programs,
- the relevant Planning and Design Code zones,
- identification of the nearest sensitive receivers and their distances from various site activities that have potential to cause off-site impacts,
- management arrangements for the construction and operational phases (including Environmental Management and Monitoring Plans),
- the construction and commissioning timeframes (including staging), and
- a contingency plan for delays in construction.

#### Assessment of expected environmental, social and economic effects

The assessment of effects should include all issues identified in these Guidelines and cross referenced to supporting technical references.

### **Avoidance, Mitigation, Management and Control of adverse effects**

The proponent's commitment to meet conditions proposed to avoid, mitigate, satisfactorily manage and/or control any potentially adverse impacts of the development on the physical, social or economic environment, must be clearly stated as part of the DR.

The design of the proposal should be flexible enough to incorporate changes to minimise any impacts highlighted by this evaluation or post-operation monitoring programs.

### **Consistency with Government policy**

The *Development Act 1993* requires the DR to state the consistency of the expected effects of the proposed development:

- with the relevant Planning and Design Code policy and Planning Strategy,
- with the objects of the *Environment Protection Act 1993*, the general environmental duty and relevant environment protection policies,
- water affecting activities in accordance with the *Landscape South Australia Act 2019*, and
- native vegetation clearance in accordance with the *Native Vegetation Act 1991*.

### **Plans and Forms**

- **Current Certificate(s) of Title.**
- **Context and locality plans** should illustrate and analyse the existing environment and site conditions and the relationship of the proposal to surrounding land, buildings and waters. The plan should be drawn to a large scale and be readily legible. The plan(s) should indicate:
  - any neighbouring buildings, infrastructure or facilities, including identification of all nearest sensitive receivers and their distances from proposed activities that may pose air and noise impacts, and the likely use of existing or proposed neighbouring buildings (e.g. dwellings),
  - location of any watercourse, dams, underground wells and/or any other environmentally sensitive areas,
  - location of any State or Local Heritage Places and cultural heritage areas in relation to the site,
  - separation distances from the main building complex to any existing vegetation that poses a fire hazard,
  - location of existing native vegetation, regulated or significant trees (including those on Council land that will be affected by the proposal),
  - known sites for protected, threatened or vulnerable species, including migratory species, on the site, the adjoining land,
  - existing roads and access tracks (public and private), and
  - any other information that would help to set the context for the locality.
- **Site plan(s)** (drawn at a scale of 1:1000 or 1:2000) clearly indicating all proposed buildings, structures and landscape works with individual development sites drawn at a scale of 1:500.
- **Site plan(s)** outlining the location(s) of firefighting water sources, including capacity, locations of outlets and access for fire fighting vehicles.
- **Elevations** (drawn at a scale of 1:100 or 1:200) of all sides of buildings and other structures, with levels and height dimensions provided in Australian Height Datum, existing tree canopy and landscape.
- **Cross sections** of buildings and other structures, including ground levels, floor levels, ceiling heights and maximum height in Australian Height Datum, existing tree canopy and landscape.
- **A schedule of external materials, finishes and colours**, supported by a physical materials sample board.

- Coloured high resolution **perspectives** of the proposal shown in context from various locations, including longer views from strategic approaches to the site.
- **Landscaping plan(s)**, including the incorporation of any native vegetation or significant trees on the site and/or adjoining land.
- **Electricity powerline survey plan** that shows indicative high voltage powerline easement corridor and the location of towers within easement.
- **Sequencing and staging plans** if staged Building Rules Consent is to be sought.
- Any **technical or engineering drawings** and specifications including geotechnical data.

#### Specialist Reports and Details

- A **Design Statement** outlining the design philosophy proposed the evolution of the proposal (including options explored and discounted) from the initial concept to the final design, and addressing the following matters from a design perspective:
  - Site access, circulation and way finding strategy (for the variety of public users and modes of transport),
  - Servicing strategy, including emergency access,
  - Building site selection,
  - Built form and visual impact,
  - Materiality,
  - Landscaping, including the proposal's response to the unique landscape setting and any work in the public realm,
  - Environmentally Sustainable Design,
  - Universal/equitable access, and
  - Adaptive reuse of the Local Heritage Place
- A report on **Environmentally Sustainable Design** which outlines environmentally sustainable design measures, including any water sensitive design and renewable energy initiatives proposed.
- An **Economic Impact Assessment** that describes the existing environment in which the project is set and assesses the magnitude of change to the economic environment resulting from the project.
- A **Hazard Management Plan** that considers the risks and hazards associated with all components of, and activities associated with, the proposed development. The plan is to address public and workplace safety and emergency response strategies.
- A **Bushfire Management Strategy** to include the following:
  - The provision of firefighting water supplies, pumps and firehose reels,
  - A Bushfire Survival Plan (BSP), including emergency procedures, the identification of evacuation triggers and potential reduction of operating hours or closures on days of heightened fire danger,
  - Training and practicing of emergency procedures for all staff, and
  - Measures to minimise fire risk, including landscaping and vegetation management to reduce fire risk.
- A **Fauna and Flora Assessment and Management Plan**, (including a **Native Vegetation Clearance Data Report**) prepared by an Accredited Consultant approved by the Native Vegetation Council. The assessment should undertake a survey of the vegetation and fauna (including EPBC Act Listed threatened species and communities), detail compliance with the impact mitigation hierarchy and describe how the significant environmental benefit would be achieved. A landscaping plan should include including details about vegetation clearance and maintenance around the accommodation

pods and the main building complex and any clearance required due to other structures / access arrangements (including on Council land).

- A **Transport and Access Impact Assessment** prepared by a suitably qualified traffic and access engineer. The assessment should evaluate current and proposed access arrangements including the effect on the arterial road network and car parking, as well as vehicle interface with the local road network. The impacts on the arterial and local road networks are to be considered to an extent which encompasses Stirling Township. Any assessment must include the traffic and access impact for the construction period as well as any ongoing operations and maintenance including details of the transport vehicle sizes and movements outside of normal gazetted heavy vehicles and how any impacts will be minimised and / or mitigated.
- A **Cultural Heritage Management Plan (CHMP)** prepared by an appropriately qualified heritage expert that includes an assessment of the potential impact of the proposal on First Nation peoples cultures and the wider community heritage. The CHMP must outline measures to be taken before, during and after the proposed development to manage and protect First Nation peoples cultural and the wider community heritage. The CHMP should include a cultural heritage survey identifying areas of First Nation people's significance. This survey should identify any archaeological, anthropological or historical sites, or sites of significance according to First Nation people's tradition.
- A **Heritage Impact Statement (HIS)** prepared by an appropriately qualified heritage expert, that includes an assessment of the Local Heritage Place including research to review and confirm the extent of listing, detailed description of the proposed conservation, reconstruction and new work to the Local Heritage Place (including proposed adjacent built form elements or additional services infrastructure), and the heritage impact of these works on the heritage and cultural values of the Local Heritage Place.
- A **Waste Management and Minimisation Plan** (for demolition, construction and operation) detailing the sources of waste (including spoil and removed vegetation), the location of waste management storage areas (including the separation of waste streams, such as recyclables, hard waste and e-waste) and disposal facilities located on site or within laydown areas and provide details of how these facilities will be serviced. The plan should assess the impact on the local waste management and disposal facilities. The plan should also document the decommissioning and rehabilitation strategy for the development.
- A **Soil Erosion and Drainage Management Plan** which describes the site characteristics, including the existing topography and stormwater runoff characteristics. The plan should describe the measures proposed to prevent soil erosion and contaminated runoff from leaving the site during construction (including any opportunities for retention and reuse). The Plan should describe the drainage management to prevent contamination of groundwater on site.
- A **Surface Water Management Plan**, which describes proposed activities on water resources such as watercourses, lakes, floodplains, springs, wetlands, waterholes and surface water storage structures such as the construction, modification or removal of dams or basins. The plan should detail how these activities will be carried out, materials to be used (including specifications) and machinery/tools required to carry out the works. The anticipated impacts of these activities and the measures and actions proposed to reduce or mitigate the impact on the stability and integrity of the water resources are to be addressed. These activities must meet requirements as set out in the Hills and Fleurieu Water Affecting Activity Control Policy and or Western Mount Lofty Ranges Water Allocation Plan. Information about WAA including specific examples can be found here: <https://www.landscape.sa.gov.au/hf/water/managing-water/water-affecting-activities>
- **Integrated Water Management Plan (IWMP)** that incorporates measures and actions to address (but not be limited to) the following issues:

- Site plan identifying all water related features and infrastructure for the storage, treatment and/or reuse of potable water, stormwater, wastewater and irrigation water.
  - Water balance information, including the total water needs of all components of the development.
  - Total wastewater generation from the development (based on projected wastewater volumes per day).
  - A description of how all wastewater is collected, managed and relayed/discharged to the Adelaide Hills Council CWMS connection point on Golflinks Road (including computations to demonstrate acceptable control discharge to the effluent treatment facility at Stirling and details of any upgrades to the system that may be required).
  - Predicted stormwater generation volumes and details of stormwater quality improvements, including the location and sizing of bio-retention swales and basins, anticipated quality improvements and details of any other proposed stormwater quality treatment features.
  - Contingencies to address any detrimental effects, especially on local hydrology.
- **Construction Environmental Management Plan (CEMP)** that documents proposed construction phase measures to minimise potential impacts on the environment, including hazards and risks, proposed mitigation measures and any residual risks and incorporates measures and actions to address (but not be limited to) the following matters:
    - Construction noise management (e.g. from machinery noise),
    - Air emissions (e.g. from dust),
    - Waste Management strategies detailing the collection, storage and disposal of construction waste to comply with the Environment Protection (Waste to Resources) Policy 2010,
    - Dilapidation report,
    - Construction wastewater collection and treatment to ensure that the general obligations of the Environment Protection (Water Quality) Policy 2015 and SA Public Health (Wastewater) Regulations 2013 are met,
    - Prevention of soil erosion and treatment of polluted stormwater prior to discharge from the site (including any opportunities for retention and reuse),
    - Communication and complaint resolution,
    - Emergency and evacuation procedures including a Fire Management Plan, prepared in consultation with the Country Fire Service, and
    - Monitoring program to monitor those items listed above.
  - An **Operational Environmental Management Plan (OEMP)** that describes how operations, will be managed to mitigate negative impacts to the environment, and public health and the amenity, and how any ongoing environmental management requirements will be implemented and monitored.
  - Details of **Site Services and Infrastructure** including utility services (water, gas, electricity, domestic and commercial / industrial wastewater treatment and disposal, drainage, trenches or conduits); location of ground and roof plant and equipment (fire booster; electricity transformer; air conditioning; solar panels etc.).
  - **Noise assessment** prepared by an acoustic engineer to moderate external and environmental noise disturbance and amenity impacts for future occupants of the development, but also other sensitive uses within the immediate area because of the proposed development.
  - **Social Impact Statement** that describes the characteristics and demographics of the local and regional community (including neighbouring land owners and land uses) and the impacts on affected groups of people (such as their way of life, life chances, health and culture).

#### Sources of Information

- All sources of information (e.g. reference documents, literature services, research projects, authorities consulted) should be fully referenced, and reference should be made to any

uncertainties in knowledge. Where judgements are made, or opinions given, these need to be clearly identified as such, and the basis on which these judgements or opinions are made need to be justified. The expertise of those making the judgements including the qualifications of consultants and authorities should also be provided.

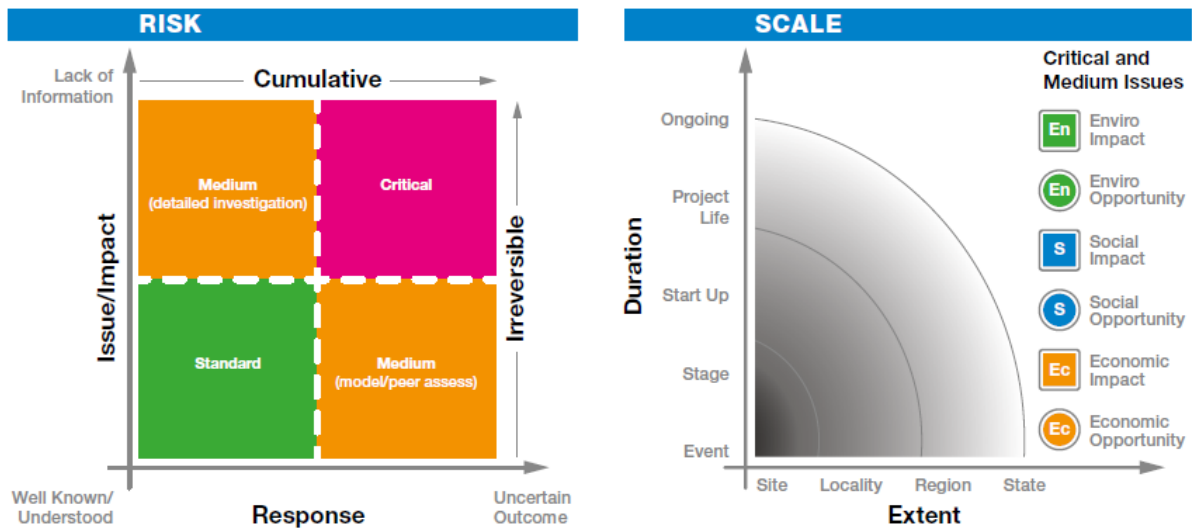
- Any technical and additional information relevant to the DR that is not included in the text should be included in appendices.

## 5. ASSESSMENT

Impact assessment is an important tool that enables the consideration of projects that might otherwise struggle to be addressed properly or fairly under the 'normal' assessment system.

In setting these Guidelines, the State Planning Commission has considered the scale of issues associated with the project and determined whether they represent issues or opportunities. The potential impacts and issues have then been organised according to the level of work and type of attention required by the proponent: either standard, medium or critical:

- Where the issue is well known and the response is well understood then the risk assessment is classed as **'standard'**
- Where work is required to address the issue but the risk is likely to be manageable with additional information then the risk assessment is classed as **'medium'**.
- Where information about the issue is lacking and the response is unclear, the issue is classed as **'critical'**.



The issues and impacts identified by the Commission as requiring standard, medium or critical level assessment are listed below. Each requirement includes a description of the issue/impact and a description of the action or investigation needed.

To assist with the assessment of the DR the proponent is requested to provide a table (as an appendix) that cross references each Guideline requirement (action or investigation needed) with the relevant section and page of the DR.

**NOTE:** The investigative requirements of the DR do not negate the need for the proponent to obtain all necessary licences, permits and/or management plans prior to undertaking any investigations or works in relation to this DR. It also does not negate the need for the proponent to comply with any legislative obligations or duty of care under the relevant legislation.

No	Issue/Impact	Description	Risk		Scale		Level of assessment
			Issue/Impact	Response	Duration	Extent	
1.	Tourism and economic development and job creation	<p>The proposal will have an impact on the local and State's economy during construction and operations and may result in immediate and long terms effects on residents, businesses and surrounding uses.</p> <p>The development will create jobs for various occupations associated with the golf course and its upkeep, tourist accommodation, functions, events and also during construction. The proponent advises that food, services and employment opportunities will be sourced locally, where possible.</p> <p>From an economic perspective the proponent has advised the total capital expenditure for the proposal is some \$35 million. In addition there will be broader economic benefits to the local Adelaide Hills community</p>	<p>The proposal has the potential to significantly boost the local and state economy through local, regional, interstate and potentially international tourism.</p> <p>The proposal will have a positive impact in terms of job creation from an ongoing perspective and during construction.</p> <p>The proposal will be ancillary to surrounding tourist accommodation.</p>	Demonstration of how the proposal is likely to have a positive economic impact on the locality and for job creation during construction and ongoing and for the locality community (spin-off from increased visitors to the region), including how it will be complementary to existing tourist accommodation offerings in close proximity	Ongoing	Locality, Regional and State	The proposal will attract local, regional, interstate and international visitors. This has the potential to boost the local economy, particularly if local produce and employment is sourced =CRITICAL
2.	Design / Visual amenity	The proposed development is located in the Mt Lofty Ranges and requires a bespoke approach to the siting, design and architecture in response to the scenic value and natural character of the area.	<p>The need for a high quality design that is complementary to the locality and maximising views to and from the buildings is well understood.</p> <p>The contextual setting in a peri-urban landscape is well understood.</p> <p>Further consideration and details will be required on aspects of the architectural response and impacts on surrounding sensitive land uses.</p>	<p>The proponent has engaged in the Design Review process and the design is well progressed. Further design resolution is required as the development progresses.</p> <p>In addition to the elevations and site plans the documentation should include an analysis of the visual impact (near and distant views).</p> <p>In principle support is given for robust and genuine materials – the description of the final selection of materials and finishes will be required in the report.</p>	Ongoing	Locality and Regional	<p>The issue is well understood but the response requires further design resolution with the need for further assessment on the bespoke requirements.</p> <p>The extent of the impacts beyond the subject site requires assessment. = CRITICAL</p>
3.	Landscaping	The proposal is for a high quality hospitality and recreation focused development that will celebrate and enhance the landscape setting. This	Integration with the landscape into the built form to minimise the impact of the architectural response to the land.	Continued collaboration with the local landscape architect is required to ensure the landscape and natural environment informs all aspects of	Ongoing	Locality and Regional	The response requires further design resolution with the need for further assessment on the



No	Issue/Impact	Risk			Scale		Level of assessment
		Description	Issue/Impact	Response	Duration	Extent	
		development presents a significant opportunity due to its location and unique landscape setting and has the potential to become a leading precedent for developments of this kind.	Connectivity within and beyond the site should be explored, including connections with existing walking trails.	the architectural response to minimise the impact of an architectural response to the land.			integration of the development into the landscape. = <b>CRITICAL</b>
4.	Traffic and access	<p>The proposal significantly increases vehicle movements to the site, with the increase in visitors and employees and service vehicles. The proposal includes a 200 space car park.</p> <p>The proposal also includes a function facility and the occasional large events which will increase demand for vehicular access.</p> <p>The overall traffic to the site will include different modes of transport – including cars, share vehicles, coaches, bicycles and the like.</p> <p>The proposal also involves the transportation of infrastructure and construction materials to site.</p>	<p>The site is located near residential properties with access from a local road to the golf course, which also provides access for residents. These residents may be impacted from the increase in traffic movement as a result of the development – this includes normal operation of the golf course, functions and special events.</p> <p>Potential issues with the movement strategy have been identified with the potential for conflicts between back of house and front of house functions.</p> <p>Traffic may introduce impacts to the arterial and local road network, including the delivery of materials and infrastructure.</p> <p>There are likely to be traffic impacts during construction.</p>	<p>A detailed traffic assessment is required for the immediate locality and the wider area. Traffic management strategies will be required to be put in place. This includes everyday operation of the Golf course, functions and special events. The conflicts with the movement strategy between users should be further explored and be addressed in the design strategy.</p> <p>A bushfire management strategy will also be required, in the case of an emergency.</p>	Ongoing and during construction	Locality and Regional	<p>The proposal requires ongoing access for visitors and employees to the site and also for the transportation of infrastructure and construction materials and ongoing access for materials and workforce attendance.</p> <p>The site is located within a high Bushfire area and traffic management during emergencies is required. = <b>CRITICAL</b></p>
5.	Bushfire	The proposed development is located within a High Bushfire Risk area and in close proximity to hazardous vegetation, including Mount George Conservation Park.	The CFS needs to undertake a Bushfire Attack Level (BAL) assessment of the proposed development. The main hotel complex and the tourist accommodation pods are at high risk of being impacted by bushfires unless mitigation strategies, including siting away from hazardous vegetation and landscaping and vegetation clearance to reduce bushfire risk are introduced.	The current documents provide limited detail of risk assessment and mitigation strategies. Suitable separation distances are needed from the forest vegetation east, south east and south of the main hotel complex to achieve BAL 29, BAL 19 or BAL 12.5. A change to the siting of the building and/or vegetation clearance may be needed to achieve a minimum requirement of BAL 29 (BAL 12.5 is the preferred option). Plans clearly need to outline these separation distances and how they will be achieved.	Ongoing	Locality and Regional	The issue is well understood and advice provided by the SA CFS will need to be addressed to lower the risk to the development. Ongoing and final assessment of bushfire hazards and mitigation strategies is required. = <b>CRITICAL</b>

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No	Issue/Impact	Description	Risk		Scale		Level of assessment
			Issue/Impact	Response	Duration	Extent	
				The current landscaping plan does not address vegetation clearance and landscaping requirements to lower the bushfire risk for the accommodation pods.			
6.	Conservation	To the east of the proposal is the Mount George Conservation Park, the traditional lands of the Peramangk Peoples.	Conservation values of the Park are to be maintained and native fauna accessing the golf course to be protected.  Aboriginal culture is to be respected.	Details will be required of any impacts on the conservation values of the area, including the introduction of exotic plant or animal species.	Ongoing	Locality, Regional, State	There is a potential impact on the Conservation Park and habitat for native fauna.  A final report is required identifying potential impacts against the EPBC for consideration. There is a need for further assessment. <b>= MEDIUM</b>
7.	Environmental Sustainability	The proposed development is located in a highly valued rural landscape where environmental sustainability is important	The need for a high level of environmental sustainability to showcase ESD initiatives in a natural setting.	A variety of ESD initiatives should be implemented into the design. The proponent should showcase the project's sustainability ambitions in a bold and distinctive manner.	Ongoing	Locality, Regional and State	The issue is well understood but the response requires further resolution and consideration of ESD initiatives. <b>= MEDIUM</b>
8.	Land Use	The proposal will have an impact on surrounding land owners and uses, in the immediate and long term due to the intensification of the land use and introduction of tourist accommodation.	The proposal introduces land uses which are compatible with the Planning and Design Code provisions	The issues are well understood and need to be outlined in the report – including visual amenity, noise, traffic, and lighting.	Ongoing	Locality and Regional	The report should outline the impacts of the intensification of the land use on the land. <b>=MEDIUM</b>
9.	Native Vegetation	The removal of native vegetation is proposed (although intended to be kept to a minimum), including possibly threatened species and ecological communities.	There are potentially significant impacts on native vegetation, including threatened species and ecological communities through the clearance of vegetation and habitat and disturbance and edge effects. The interaction of the development in relation to the Native Vegetation Heritage Agreement is required to be detailed.	A detailed description is required of the quantity and condition of native vegetation proposed to be cleared, the effect on habitat and conservation values (including any changes to the Native Vegetation Heritage Agreement).	During construction	Locality, Regional and State and potentially National	The receiving natural environment is potentially negatively impacted by the development. Need for further assessment on the location, extent, condition and impact on native vegetation and habitat (especially threatened species and ecological communities). Need for investigation of offset opportunities. <b>= MEDIUM</b>
10.	Native Fauna	The site is located in a peri-urban area and adjacent the Mt George Conservation Park. The proposal involves significant construction and also clearance of native	The proposal involves construction of new buildings and clearance of native vegetation. Particularly given its peri-urban location and being adjacent a Conservation Park there is the potential	An analysis of the impacts on native Fauna is required, including under the EPBC Act.	During construction and ongoing	Local, Regional and State and potentially National	The receiving natural environment is potentially negatively impacted by the development. Need for further assessment

No	Issue/Impact	Description	Risk		Scale		Level of assessment
			Issue/Impact	Response	Duration	Extent	
		vegetation which has the potential to impact on native fauna and habitat.	to impact on native fauna and habitat and potentially threatened species, including Chestnut-rumped Heathwren, White-throated Needletail, South Australian Bassian Thrush, Southern Brown Bandicoot.  Greater visitation levels to the site would increase human disturbance to local native fauna.				= <b>MEDIUM</b>
11.	Flooding and Water Quality	The proposed development is located within the Mount Lofty Ranges Catchment (Area 2) Overlay, which seeks to ensure that development has a neutral or beneficial effect on the water quality harvested from secondary reservoirs or diversion weir catchments. The Hazards (Flooding – Evidence –Required) Overlay seeks the management of potential flooding of infrastructure and buildings.	The issues are well understood. The site is located in close proximity to a watercourse and high flood prone area. The proposal includes construction of new habitable buildings and infrastructure which could be impacted during times of flooding. The design, location and siting of buildings will need to take this into account as well as any mitigation measures required.	The current plan does not provide a detailed description of the various effects on water quality and methods for managing this.  Demonstration of how stormwater and wastewater/effluent will be managed will be required.  Details will be required to address the land slope (not exceeding 20%), rainwater tanks of 1000L and swales that divert clean stormwater away from areas where it could be contaminated.  Further investigations are required to understand the stability, erosion levels of the Cox Creek waterway running through the site and appropriate erosion control measures.	During construction and ongoing.	Locality, Regional and State	The receiving environment is potentially negatively impacted by the development. Need for further assessment and offset opportunities.  = <b>MEDIUM</b>
12.	Surface water	The proposed development is located within the Onkaparinga (reservoir) catchment.  Cox creek (stream order 4) runs through the development area. Creek restoration and crossing work has been identified.  There are two off-stream surface water sutures on site. There are policies and principles related to capture, extraction	There is potential for impacts on the integrity and geomorphology of the watercourse and surface water storage structures (i.e. dam or lake) and on downstream flows from both an ecological or downstream community perspective.	The current plan does not provide detailed information to enable an assessment as to whether any of these adverse outcomes are likely to result from the development. Detailed information must include the following: how these activities will be carried out, materials to be used (including specifications) and machinery/tools required to carry out the works. The anticipated	During construction and ongoing.	Locality and Regional	There is potential impacts on receiving water resources. Proposed development needs to meet the requirements set out in the Hills and Fleurieu Water Affecting Activity Control Policy and Western Mount Lofty Ranges Water Allocation plan. There is a need for further assessment.  = <b>MEDIUM</b>

No	Issue/Impact	Description	Risk		Scale		Level of assessment
			Issue/Impact	Response	Duration	Extent	
		and diversion of surface water resources, particular those catchments upstream from reservoirs.		impacts of these activities and the measures and actions proposed to reduce or mitigate the impact on the stability and integrity of the water resources must be addressed.			
13.	Heritage – First Nations people	The proposed development has the potential to impact on sites and places of Indigenous heritage through disturbance during construction.	The proposed development may have impacts heritage sites, objects and remains of the First nation people.	A detailed description on existing First nation people’s heritage or management of such heritage matters that may arise during the construction phase.	Construction	Locality and State, Regional	Investigations are required to be undertaken and more information to be provided. = <b>MEDIUM</b>
14.	Heritage - European	The site contains a Local Heritage Place and proposes partial demolition, restoration, conservation, reuse and new built form elements adjacent the Local Heritage Place	The proposal will have a material impact on a Local Heritage Place.	The proponent is aware of the issue and requirements. A Heritage Impact Statement will be required on the works affecting the heritage place – and associated plans and documentation (prior to any approval for this component of works).	Construction and operation	Locality	A Heritage Impact Statement and plans, elevations and materials schedule will be required. = <b>MEDIUM</b>
15.	Waste Management – Stormwater and Construction and Operational Environmental Management	The proposed development would require a range of impacts to be minimised, mitigated and monitored through an environmental management plan framework across the construction and operational phases.	The potential impacts would need to be adequately addressed to mitigate adverse impacts.	The current document provides limited information on the proposed construction and operational management techniques and measures.	During construction and ongoing.	Locality and Regional	More information is required. = <b>STANDARD</b>
16.	Effects on the physical Environment	The site is located in a sensitive area, with a sloping topography. The proposal is likely to result in exaction and fill on the land which will have an impact on the natural landform.	The potential impacts would need to be adequately detailed and addressed to mitigate adverse impacts on the natural landform.	A description of any works which will affect the natural topography of the land and mitigation measures.	Construction and ongoing	Locality and Regional	Details are to be provided in the report. = <b>STANDARD</b>
17.	Environment Food Production Area (EFPA)	The Site is located within the EFPA where productive agricultural land is expected to be retained for such land uses and the land cannot be subdivided for residential purposes.	The site has an existing non-agricultural land use. Land division for residential purposes will not be allowed.	The intention of any further subdivisions should be identified in the report.	Ongoing	Locality, Regional and State	Details are to be provided in the report. = <b>STANDARD</b>

## State Assessment Requirements

### CRITICAL ASSESSMENT

#### 1. Tourism and Economic Development / Employment and Job Creation

**Guideline 1:** The proposal will result in significant job creation and has the potential to be an economic stimulus for the area. The proposal will have an impact on the local and State's economy during construction and operations and may result in immediate and long terms effects on residents, businesses and surrounding uses.

- 1.1** *Identify any potential economic effects on tourism, recreation, and any secondary economic effects, including the potential to attract value add development and commercial ventures. Describe the positive and negative effects of this, including the current situation.*
- 1.2** *Describe potential employment opportunities and the expected impacts on the local workforce during construction and operational stages. In particular the proposal's anticipated effect on State and local investment and the region as a whole, employment generation and flow-on impacts on local business and also effects on accommodation supply and demand.*
- 1.3** *Describe how the proposal aligns with the State tourism organisation (SATC) to ensure that positive outcomes are being delivered.*

#### 2 Design / Visual Amenity

**Guideline 2:** The proposal is for tourist accommodation, functions and recreation focussed land uses with high visual amenity and in the Mt Lofty Ranges, in a rural landscaped setting adjacent the Mount George Conservation Park. Any development on the site requires a bespoke approach to the siting, design and architecture in response to the scenic value and natural character of the area.

- 2.1** *Evaluate the proposal against the Office for Design and Architecture SA's Principles of Good Design, including input from the Government Architect through the State Design Review process. Demonstrate how the development responds to the six principles: 'Context, Inclusive, Durable, Value, Performance and Sustainable.'*
- 2.2** *Demonstrate that the development provides a high quality design that complements the natural landscaped setting and surrounding locality.*
- 2.3** *Describe the proximity of the proposed structures the nearest dwellings and describe any potential impacts of the proposal on quality of lifestyle and how the visual landscape and amenity will be altered by the development, for residents and visitors, for both near and distant views.*
- 2.4** *Describe the effects of the proposal on the visual amenity and landscape quality for residents, visitors and tourists and views from nearby roads. Refer to construction, operation, maintenance aspects of the proposal.*
- 2.5** *Demonstrate that the development will result in a high quality arrival experience in relation to movement and legibility, materiality, seamless integration of landscape and architecture, built form massing, architectural expression and extent of car parking.*
- 2.6** *Identify the strategies undertaken to reduce the built form massing to ensure views to the surrounding tree canopy from key pedestrian viewpoints are maintained.*
- 2.7** *Buildings should be designed and sited to manage visual impacts. Provide visualisations that demonstrate the approach to the development from the elevated position of the main Golf links*

*Road roadway, and from the Heysen Trail and Cox Creek dam to demonstrate how the development sits within the landscape and the effective integration of landscape and architecture.*

- 2.8** *Provide a detailed schedule of external materials, finishes and colours, supported by a physical materials sample board to demonstrate the commitment to materials that are robust and genuine.*
- 2.9** *Demonstrate the guest movement strategy within the site, including access for People with Restricted Mobility.*
- 2.10** *Demonstrate the fire and life safety and egress strategy for each of the building elements.*
- 2.11** *Describe any community consultation processes conducted by the proponent for the proposal and indicate community attitudes towards the proposal, where identified.*

### 3. Landscaping

**Guideline 3:** The proposal is for a high quality hospitality and recreation focused development that will celebrate and enhance the landscape setting and its high quality integration with the built form is important. This development presents a significant opportunity due to its location and unique landscape setting and has the potential to become a leading precedent for developments of this kind.

- 3.1** *Describe the nature and condition of the existing physical environment in the proposal's environs, including reference to geology, geomorphology, soils, hydrology and atmosphere.*
- 3.2** *Provide a detailed landscaping plan that includes surface and edge treatments, seating and platform elements, lighting, tree and planting selections and size, wayfinding, retaining walls, and proposed restoration works to Cox Creek.*
- 3.3** *Provide details of the interfaces and demonstrate how the landscape integrates and merges into the built form to minimise the impact of the architectural response to the land.*
- 3.4** *Outline mitigation measures and their likely effectiveness in minimising or avoiding disturbance to the physical environment (including surface and underground waters) during construction and maintenance.*

### 4. Traffic and Access

**Guideline 4:** The proposal incorporates a variety of land uses including an upgrade to the existing 18-hole recreational golf course and construction of new tourist accommodation, restaurant, function facility and special events, which will significantly increase vehicle movements to the site. The proposal includes a 200 space car park and will also have a number of service vehicles accessing the site. Emergency service vehicles will require safe and convenient access to the site, especially taking into consideration CFS vehicles, as this is a high bushfire risk area.

- 4.1** *Describe the existing transport and access arrangements to and around the site, including access from the arterial and local road network, private roads and gated areas. Detail the existing and proposed road surface treatments and traffic control devices (line marking etc) and detail any proposed road upgrades / new roads and egress points.*
- 4.2** *Identify all vehicle types required to utilise the existing and any proposed new access routes, specifically the heavy vehicles anticipated. Identify any road surface upgrades required as a result of the development and any heavy vehicle movements (including over-size/over-mass) that require approval through the National Heavy Vehicle Regulator.*

- 4.3 *Provide details of the site-wide movement strategy in relation to servicing, operations, traffic, legibility of front and back of house areas, with the view to providing discrete servicing and a seamless and welcoming guest experience.*
- 4.4 *Provide confirmation of waste storage locations and transfer pathways with consideration given to amenity impacts – ie location of bin rooms relative to guest arrival spaces.*
- 4.5 *Provide confirmation of the adequacy of Back of House facilities informed by the hotel operator/consultant and the technical and operational aspects of the development.*
- 4.6 *Undertake a Transport Assessment to determine transport impacts (including traffic impacts on the local and arterial road network) and measures to manage and / or mitigate the impacts during the construction and operational phases. The impacts on the arterial and local road networks are to be considered to an extent which encompasses Stirling Township.*
- 4.7 *Identify any potential effects of construction traffic including noise and dust and associated mitigation measures.*
- 4.8 *Demonstrate emergency service vehicle access to the site and manoeuvrability.*

**Bushfire Hazard**

**Guideline 5:** The site is located within a high bushfire area and development is to be sited and designed to minimise the threat and impact of bushfires on life and property. Buildings and structures should be located away from areas that pose an unacceptable bushfire risk as a result of vegetation cover and type, and terrain.

- 5.1 *Evaluate and identify any bushfire risks on the site, in particular how risks from bushfire will be minimised with regards to the potential for uncontrolled bushfire events, high levels and exposure to ember attack, impact from burning debris, radiant heat, likelihood and direct exposure to flames from a fire front.*
- 5.2 *Provide an outline of the bushfire management strategy and details of the access arrangements for emergency service vehicles (to achieve SA CFS requirements), including road construction for fire-fighting vehicles/ turning options, location of firefighting water and outlets, (including any bushfire protection systems comprising firefighting equipment, all-weather hardstands, firehose reels and pumps). The bushfire strategy should also include the development of a bushfire survival plan, including triggers for evacuation and/or closure or reduction of business hours and the transportation of guests and staff.*
- 5.3 *Explain how the buildings and structures will be designed, configured, sited and the use of materials in order to reduce the impact of bushfire (i.e. buildings should reduce the potential for trapping burning debris against or underneath the building or structure, or between the ground and building floor level in the case of buildings on stilts and located on flatter sites and away from vegetated areas that pose an unacceptable bushfire risk).*
- 5.4 *Address vegetation clearance and landscaping needed to mitigate the bushfire risk, particularly around the tourist accommodation pods and to the east, south-east of the main hotel complex.*

## MEDIUM ASSESSMENT

### Conservation

**Guideline 6:** The proposal is in an area which has high conservation value being adjacent the Mount George Conservation Park, the traditional lands of the Peramangk Peoples.

- 6.1** *Identify the potential effects and measures to avoid and or mitigate the proposal on the local, regional, state or national conservation status of individual species and vegetation communities during both construction and maintenance (including species listed in the SA National Parks and Wildlife Act 1972 and the Commonwealth Environment Protection Biodiversity Conservation Act 1999).*
- 6.2** *Identify the potential effects and measures to avoid and or mitigate the proposal on the local, regional, state or national conservation status of sites, objects and areas of significance to First Nations people during both construction and operation.*
- 6.3** *Describe the volume and source of cut and fill required for all proposed built form and associated works, including access tracks, permanent and temporary structures, and the effect on the natural topography of the site.*
- 6.4** *Identify any exotic plant or animal species that may have a risk of spreading and mitigation measures.*

### Environmental Sustainability

**Guideline 7:** The proposed development comprises built form in a highly valued landscaped rural setting. Environmentally Sustainable Design (ESD) measures, consistent with the Planning and Design Code should be achieved - to maximise natural sunlight access and ventilation, maximise passive environmental performance and minimise energy consumption and reliance on mechanical cooling and heating. Tourism development comprising multiple accommodation is expected to be clustered to minimise environmental and contextual impact.

- 7.1** *Provide details of the Environmentally Sustainable Design (ESD) techniques proposed for the development including holistic solutions to building performance and services. Demonstrate if and how the development achieves the following:*
  - 7.1.1** *incorporates integrated passive design principles and climate-responsive techniques and features such as building and window orientation, use of eaves, verandahs and shading structures, water harvesting, at ground landscaping, green walls, green roofs and photovoltaic cells.*
  - 7.1.2** *is sited and designed to maximise passive environmental performance and minimise energy consumption and reliance on mechanical systems, such as heating and cooling.*
  - 7.1.3** *is sited, oriented and designed to maximise natural sunlight access and ventilation to main activity areas, habitable rooms, common areas and open space.*
- 7.2** *Provide details on the roofscapes including external materials selection, facade systems and green infrastructure in collaboration with landscape, structural and sustainability consultants to ensure delivery of the design intent*



## Land use

**Guideline 8:** The proposal will have an impact on surrounding land owners and uses, in the immediate and long term due to the intensification of the land use and introduction of tourist accommodation. The land use and interface issues will require consideration, such as visual amenity, traffic, noise.

- 8.1** *Identify the existing land uses of the subject site and surrounds.*
- 8.2** *Describe the new land uses proposed for the subject site, including the general break down of floor areas.*
- 8.3** *Evaluate the compatibility of the land use with the Planning and Design Code provisions. This includes the recreation zone, relevant overlays and general provisions.*
- 8.4** *Identify the level of interference to landowners, land uses and activities in the immediate and surrounding environs and outline any mitigation measures to alleviate or avoid impacts on land owners and land uses. This includes traffic, noise, light spill, hours, likely hours of operation for functions and special events/live music, odours and any other interface issues.*
- 8.5** *Describe the implications, if any, of securing any easements.*

## Native Vegetation

**Guideline 9:** The proposed development is located on land which currently holds significant stands of native vegetation, some requiring removal to facilitate the proposed construction. Development should avoid delicate or environmentally sensitive areas, including areas of native vegetation. Wherever possible areas of native vegetation are to be protected, retained and restored in order to sustain biodiversity, threatened species and vegetation communities, fauna habitat, ecosystem services, carbon storage and amenity values.

- 9.1** *Describe the location, condition and significance of native vegetation on the subject site, including individual species and communities. Include reference to areas that have Heritage Agreements under the Native Vegetation Act 1991 and any proposed alterations to or implications for the Heritage Agreement.*
- 9.2** *Identify any threatened plant species listed under the EPBC Act, such as Osborn's Eyebright (*Euphrasia collina* sbsp. *Osbornii*), Clover Glycine, Plum Leek-orchid).*
- 9.3** *Describe the location, condition and significance of native vegetation species and communities that may need to be cleared or disturbed during both the construction and operation phases. This should include clearing for all buildings, structures, exclusion zones and access arrangements.*
- 9.4** *Identify significant wildlife habitat and movement corridors.*
- 9.5** *Describe the potential impacts on native vegetation fragmentation and the ability of communities or individual species to recover, regenerate or be rehabilitated during all phases of development.*
- 9.6** *Identify the habitat value of native vegetation and the potential for habitat fragmentation during both construction and maintenance (and decommissioning). Include a description of the effects of any fragmentation that may occur over the life of the project.*
- 9.7** *Outline measures to mitigate effects on native vegetation by addressing the mitigation hierarchy, including any compensatory activities in already degraded areas and use of existing easements. Make reference to guidelines produced by the Native Vegetation Council and*

*outline the effectiveness of any mitigation measures adopted during both construction and maintenance.*

#### **Native Fauna**

**Guideline 10:** The site is located in a peri-urban area, adjacent the Mt George Conservation Park. The proposal involves significant construction and also clearance of native vegetation which has the potential to impact on native fauna and habitat. Greater visitation levels to the site would increase human disturbance to local native fauna.

- 10.1** *Identify significant wildlife habitat and movement corridors including a description of the location, extent, condition and significance of native fauna populations, including individual species and communities in the proposal's environs and any threatened species, such as chestnut-rumped Heathwren, White-throated Needletail, South Australian Bassian Thrush, Southern Brown Bandicoot.*
- 10.2** *Identify the effect of the loss of habitat for fauna.*
- 10.3** *Outline measures to mitigate the effects on native fauna, including any compensatory activities in already degraded areas and use of existing easements.*

#### **Flooding and Water Quality**

**Guideline 11:** The proposed development is located within the Mount Lofty Ranges Catchment (Area 2) Overlay which seeks a neutral or beneficial effect on the water quality harvested from secondary reservoirs or diversion weir catchments. It is also located in the Hazards (Flooding) Overlay where development should adopt a precautionary approach to mitigate potential impacts on people, property, infrastructure and the environment from potential flood risk through the appropriate siting and design of development.

- 11.1** *Identify any risks and implications of causing or exacerbating land degradation, especially soil erosion.*
- 11.2** *Identify the potential for pollution (including, but not limited to, sedimentation) of wetlands, watercourses, drainage channels and groundwater (especially at crossing points during construction), including the implications of this pollution and how these impacts will be minimised.*
- 11.3** *Describe potential changes to hydrology (e.g. drainage patterns or groundwater characteristics), including the implications of these changes and identify major and minor flows.*
- 11.4** *Identify the potential impacts on people, property, infrastructure and the environment from potential flood risk.*
- 11.5** *Provide details of how wastewater will be managed to demonstrate that potential adverse impacts on water quality within secondary reservoir and weir catchment areas are minimised and surface and groundwater is protected from wastewater discharge pollution.*
- 11.6** *Provide detail of any change to the watercourse and its bed, banks, wetlands and floodplains and any works that will interfere with existing hydrology.*
- 11.7** *Provide details of how stormwater will be managed during operation and the incorporation of Water Sensitive Urban Design (WSUD) principles. The above matters should be addressed in stormwater management plans.*

### Surface Water

**Guideline 12:** *Part 8 of the Landscape South Australia Act 2019 (LSA Act) defines provisions for the conservation, management or protection of water resources. The Hills and Fleurieu Landscape Board specifically manage surface water resources, including activities in and around watercourses, lakes and dams. The Hills and Fleurieu Water Affecting Activities Control Policy and the relevant Water Allocation Plans set out the principles for managing WAA. The subject site is located within the Onkaparinga catchment. The development has the potential to impact water resources identified on site.*

- 12.1** *Provide detail of any proposed water affecting activities including: description of the proposed activity, materials to be used (and specifications); how the works will be undertaken and machinery/tools to be used to complete the work, construction specifications and stormwater design plans for underground pipe systems and detention and retention systems.*
- 12.2** *Provide details on identified environmental risks during and after construction and provide measures and actions to minimise and or mitigate the identified risks.*

### Heritage – First Nations People

**Guideline 13:** The proposed development has the potential to impact on sites / locations of First Nation people through disturbance during construction.

- 13.1** *Identify any effects sites of archaeological or anthropological significance for First Nation people (including but not limited to those listed in the Register of the National Estate and the SA Register of Aboriginal Sites and Objects). Indicate any consultation with local Aboriginal organisations that have an in interest in the area.*
- 13.2** *Outline measures adopted to avoid or minimise impacts on sites of archaeological or anthropological significance for First Nations people.*

### Heritage – European

**Guideline 14:** The proposed development has the potential to impact on sites / locations of European heritage through disturbance during construction. The site contains a Local Heritage Place which is proposed for adaptive reuse.

- 14.1** *Identify any effects on post European settlement sites of archaeological or anthropological significance (especially but not limited to those listed in the Register of the National Estate, State Heritage Register or Interim List for the State Register and lists of places of local heritage value).*
- 14.2** *Identify any works affecting the Local Heritage Place on the site and any merits associated with the works (i.e. how the development maintains the heritage and cultural values of the Local Heritage Place through conservation, ongoing use and adaptive reuse).*
- 14.3** *Provide details of proposed conservation, reconstruction and new work to the Local Heritage Place (including proposed adjacent built form elements or additional services infrastructure), and demonstrate how the works, materials and colours are either consistent with or complement the heritage values of the Local Heritage Place.*

## STANDARD ASSESSMENT

**Waste Management –/ Construction Environment Management Plan**

**Guideline 15:** The proposed development would require a range of impacts to be minimised, mitigated and monitored through an environmental management plan framework across the construction and operational phases.

- 15.1** *Document the development's construction techniques, methodology, including site preparation works, activities, timeframes and staging (if proposed). Detail the proposed management arrangements to mitigate the negative environmental, public health and amenity impacts and subsequent implementation of these procedures.*
- 15.2** *Outline the timing of construction and the time of year it is likely to occur.*
- 15.3** *Identify the location, extent and details of all infrastructure and site services required on site to support the development including, but not limited, to solar arrays, water tanks, chemical storage, and generators. Detail all utilities to be provided or connecting, including water, gas, electricity, wastewater treatment and disposal, drainage, trenches or conduits.*
- 15.4** *Prepare a waste management and minimisation plan which documents all waste streams during construction and operation, identifies the location of waste storage areas and disposal facilities. Identify the opportunities for recycling and reuse of equipment and componentry.*

**Effects on Physical Environment**

**Guideline 16:** The site is located in a sensitive area, with a sloping topography and the proposal is likely to result in works that affect the natural landform – including excavation and fill on the land and form.

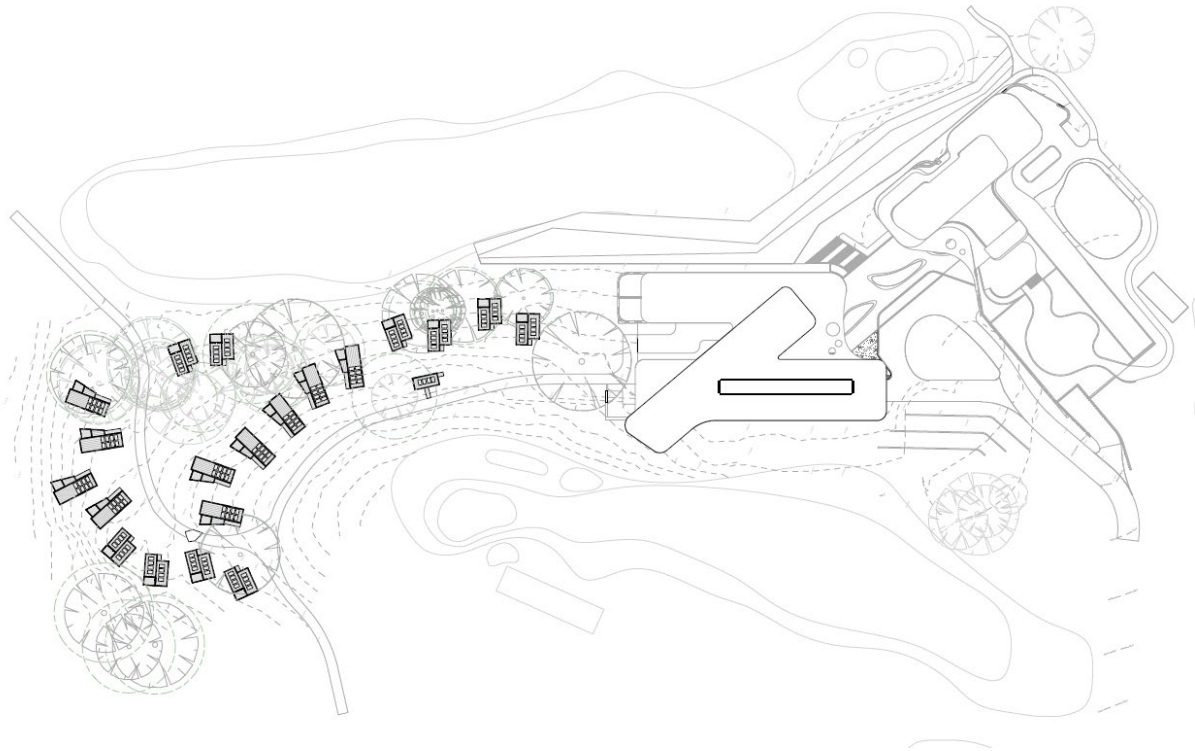
- 16.1** *Provide details on the proposed works that are likely to impact the natural landform – details of excavation and fill, and the associated impacts (during construction and operation) and mitigation impacts.*

**Environment Food Production Area (EFPA)**

**Guideline 17:** The site is within the EFPA where productive agricultural land is expected to be retained for such land uses and the land cannot be subdivided for residential purposes.

- 17.1** *Provide details of any future land divisions likely to be proposed on the site – given that valuable rural, landscape, environmental and food production areas are to be protected from urban encroachment and no residential land division is permitted.*

APPENDIX 1 – SITE PLAN



## APPENDIX 1 – USEFUL DOCUMENTS

### Legislation

- *Planning Development and Infrastructure Act, 2016*
- *Planning, Development and Infrastructure (General) Regulations 2017*
- *Development Act 1993*
- *Development Regulations 2008*
- *Environment Protection Act 1993*
- *Native Vegetation Act 1991*
- *Landscape South Australia Act 2019*
- *Native Title Act 1994*
- *Aboriginal Heritage Act 1988*
- *Heritage Places Act 1993*
- *National Parks and Wildlife Act 1972*
- *National Parks and Wildlife (Protected Animals - Marine Mammals) Regulations 2010*
- *SA Public Health (Wastewater) Regulations 2013*

### Strategy & Policy

- Planning and Design Code
- State Planning Policies, 2019
- *Environment Protection (Noise) Policy 2007*
- *Environment Protection (Water Quality) Policy 2015*
- *Environment Protection (Air Quality) Policy 2016*
- Hills and Fleurieu Water Affecting Activity Control Policy 2021
- Western Mount Lofty Ranges Water Allocation Plan 2013
- South Australia's Waste Strategy 2020 – 2025, Green Industries SA
- Building Code of Australia

### Guidelines

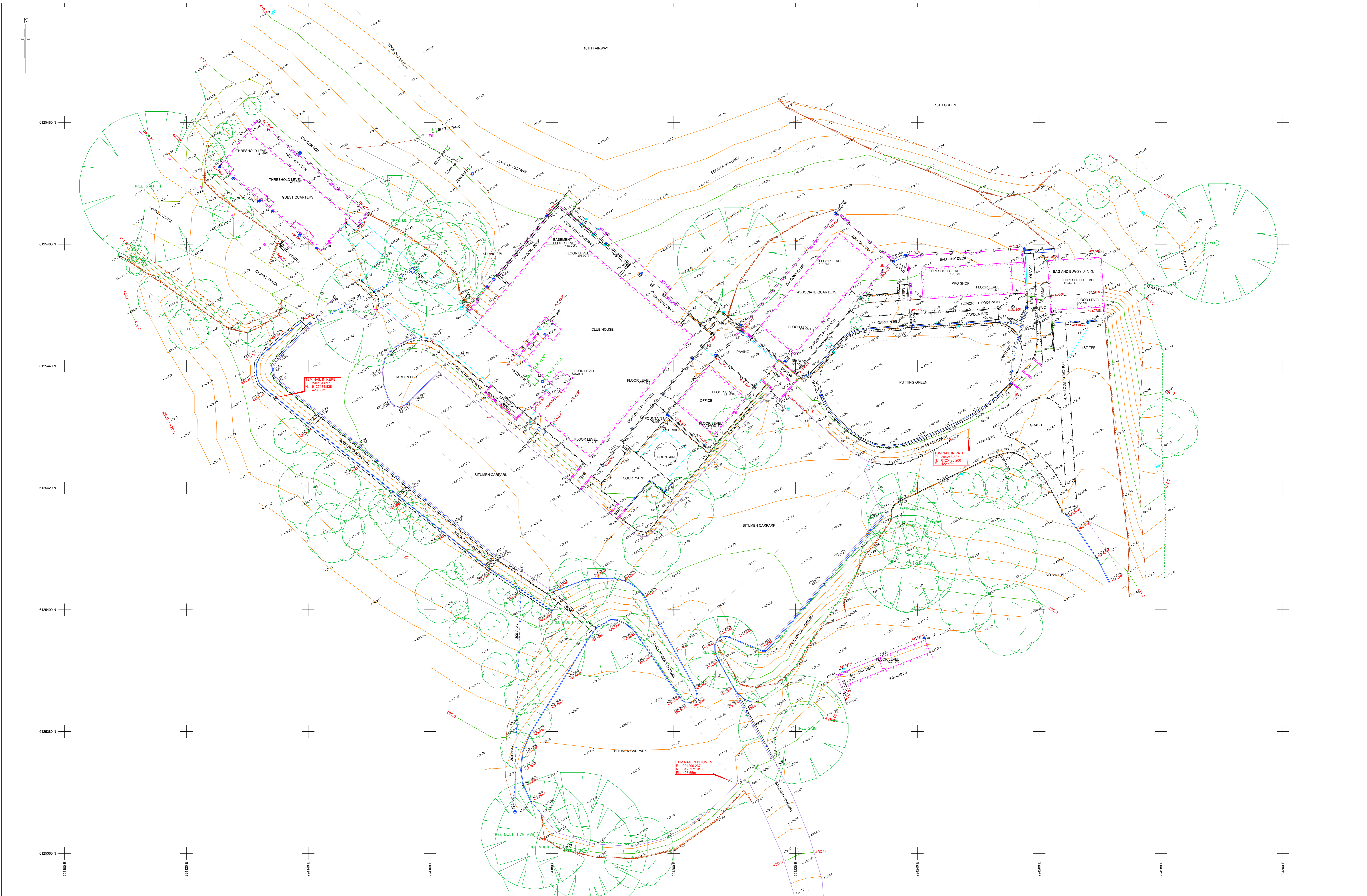
- Guide for applications to clear native vegetation, 2020
- EPA Construction environmental management plans guidelines, 2021
- Office for Design and Architecture SA's (ODASA) Principles of Good Design

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## **Appendix 4**

*Appendix B of Development Report – Detail survey*

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REV	DATE	DESCRIPTION	CALC	FILED
0	22.04.2020	INITIAL RELEASE	JTH	JTH
ADDITIONS, AMENDMENTS AND APPROVALS				

**LEGEND**

<ul style="list-style-type: none"> <li>47.015 TOP MARK</li> <li>47.016 WATER TABLE</li> <li>47.017 FLOOR LEVEL</li> <li>47.018 INVERT LEVEL</li> <li>47.019 TAP</li> <li>47.020 WATER METER</li> <li>47.021 SPRINKLER / IRROG VALVE</li> <li>47.022 PROPANET</li> <li>47.023 DOMESTIC OUTLET</li> <li>47.024 DOWNPIPE</li> <li>47.025 DOMESTIC BLEND</li> <li>47.026 HYDRO-PNEUMATIC TANK</li> <li>47.027 REP / GRATING</li> <li>47.028 GUTTER LEVEL</li> <li>47.029 UNDERSIDE EAVE LEVEL</li> <li>47.030 OVERSIDE EAVE LEVEL</li> <li>47.031 TRAFFIC LIGHT</li> <li>47.032 SIGNPOST SIGN</li> <li>47.033 LITTER BIN</li> <li>47.034 MAIL BOX / SIGNAL BOX</li> <li>47.035 TELEPHONE MACHINE</li> <li>47.036 ROAD ELEC SERVICE</li> <li>47.037 WATER METER / FIP</li> <li>47.038 TRANSDUCER SERVICE</li> <li>47.039 REP / GRATING</li> <li>47.040 GUTTER LEVEL</li> <li>47.041 UNDERSIDE EAVE LEVEL</li> <li>47.042 OVERSIDE EAVE LEVEL</li> <li>47.043 TRAFFIC LIGHT</li> <li>47.044 SIGNPOST SIGN</li> <li>47.045 LITTER BIN</li> <li>47.046 MAIL BOX / SIGNAL BOX</li> <li>47.047 TELEPHONE MACHINE</li> <li>47.048 ROAD ELEC SERVICE</li> <li>47.049 WATER METER / FIP</li> <li>47.050 TRANSDUCER SERVICE</li> <li>47.051 REP / GRATING</li> </ul>	<ul style="list-style-type: none"> <li>47.052 POWER LIGHT POLE</li> <li>47.053 CABLE MARKER</li> <li>47.054 STAKE</li> <li>47.055 POST / SIGNPOST</li> <li>47.056 WATER METER / FIP</li> <li>47.057 TRANSDUCER SERVICE</li> <li>47.058 SEWER VENT</li> <li>47.059 ELEC OVERHEAD</li> <li>47.060 GATE</li> </ul>	<ul style="list-style-type: none"> <li>47.061 SURVEY MARKS</li> <li>47.062 BENCHMARK</li> <li>47.063 CABLE MARKER</li> <li>47.064 STAKE</li> <li>47.065 POST / SIGNPOST</li> <li>47.066 WATER METER / FIP</li> <li>47.067 TRANSDUCER SERVICE</li> <li>47.068 SEWER VENT</li> <li>47.069 ELEC OVERHEAD</li> <li>47.070 GATE</li> </ul>	<ul style="list-style-type: none"> <li>47.071 EDGE OF ROSETT</li> <li>47.072 POLE SIGN-HAND</li> <li>47.073 TREE 1-4M</li> <li>47.074 POWER (REGULATED) / UNREGULATED</li> <li>47.075 CABLE MARKER</li> <li>47.076 STAKE</li> <li>47.077 POST / SIGNPOST</li> <li>47.078 WATER METER / FIP</li> <li>47.079 TRANSDUCER SERVICE</li> <li>47.080 SEWER VENT</li> <li>47.081 ELEC OVERHEAD</li> <li>47.082 GATE</li> </ul>	<ul style="list-style-type: none"> <li>47.083 BOTTOM OF BANK</li> <li>47.084 TOP OF BANK</li> <li>47.085 CHANGE OF GRADE</li> <li>47.086 DRAIN</li> <li>47.087 RESERVE PIPE LUG</li> <li>47.088 TEL CORMER LUG</li> <li>47.089 WATER PIPE LUG</li> <li>47.090 BUILDING</li> <li>47.091 WALL</li> <li>47.092 CONCRETE</li> <li>47.093 ASPHALT</li> <li>47.094 BITUMEN</li> <li>47.095 GATE</li> </ul>	<p><b>COORDINATE SYSTEM</b></p> <p>VERTICAL: AHD          HORIZONTAL: GROUND PLANE ORIENTED          TO IGA 2020 ZONE 54          SCALE: HORIZONTAL (CSF = 1.00004942)</p> <p><b>ADOPTED STATION &amp; AUTHORITY</b></p> <p>PSM 6628/2372 RL: 498.939 SDB          PSM 6628/2370 E: 293981.268 SDB          PSM 6628/2371 N: 6125168.965 SDB          SDB Director S4 Government survey data base values / (Dated: 08/03/2020)</p>	<p>© ALEXANDER &amp; SYMONDS PTY. LTD.</p> <p>1:200 ORIGINAL SHEET SIZE A3</p> <p>CONTOUR INTERVAL: 0.5m min, 2.0m MAJ</p> <p>SURVEY: JTH APRIL 2020</p> <p>DRAWN: JTH 22.04.2020</p> <p>CHECKED: MRE 22.04.2020</p>
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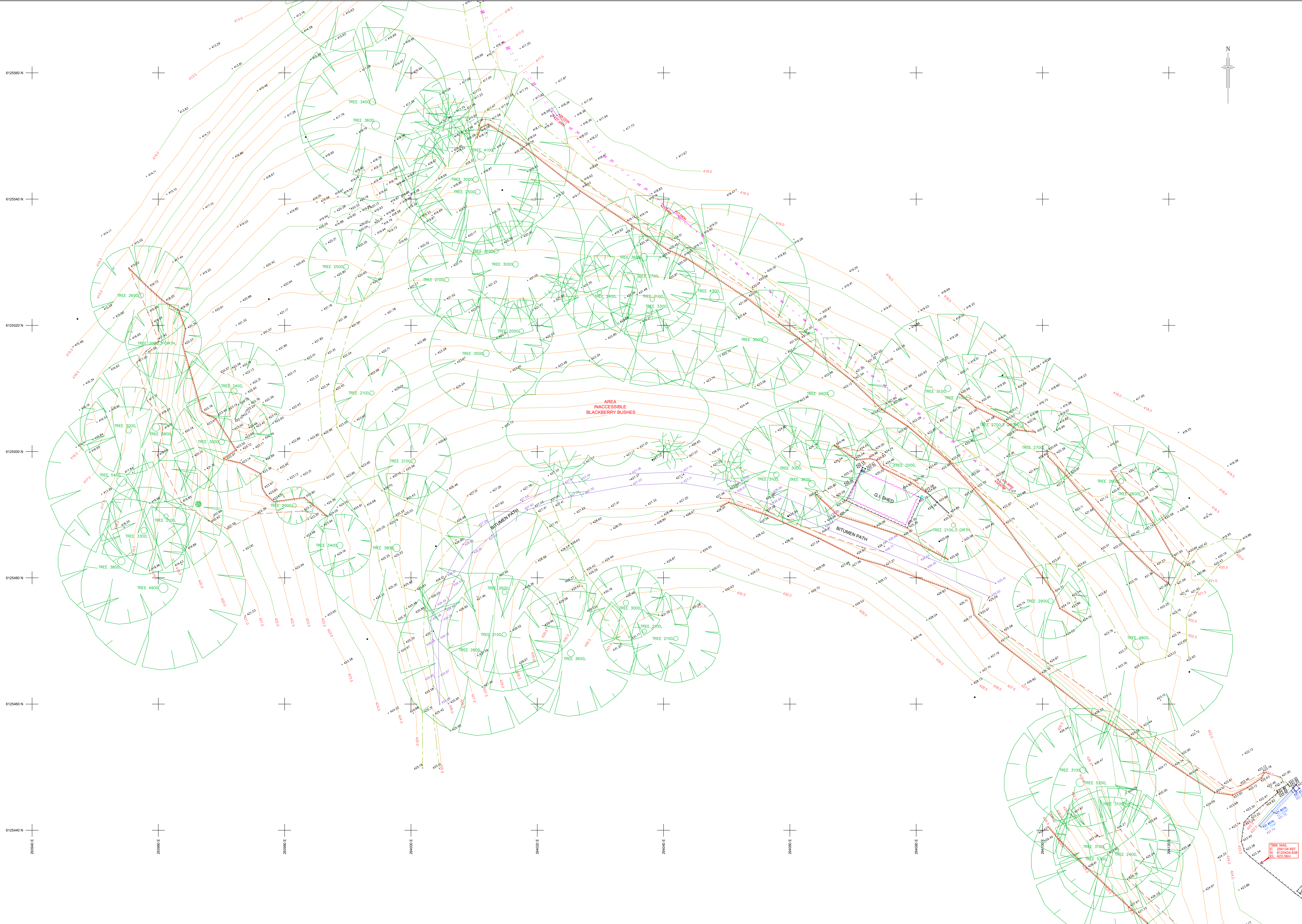
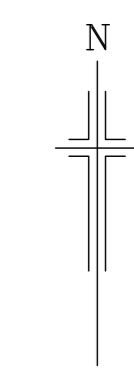
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 + Construction + Mining +  
 + Spatial Information Management +

**Alexander Symonds**  
 Surveying  
 Consultants

**DETAIL AND LEVEL SURVEY**  
**STIRLING GOLF CLUB**  
**STIRLING**

DRAWING No: A036720 DETAIL SHEET 1 OF 1 REVISION: 0





Aerial photography supplied by NearMap, date \_\_\_\_\_

REV	DATE	DESCRIPTION	CALC	FIELD
ADDITIONS, AMENDMENTS AND APPROVALS				

LEGEND	
<ul style="list-style-type: none"> <li>41.00m TOP KERN</li> <li>41.00m WATER TABLE</li> <li>40.00m FLOOR LEVEL</li> <li>41.00m INSET LEVEL</li> <li>41.00m TAP</li> <li>41.00m WATER METER</li> <li>41.00m SPRINKLER / IRIG VALVE</li> <li>41.00m HYDRANT</li> <li>41.00m DOMESTIC OUTLET</li> <li>41.00m DOWNPIPE</li> <li>41.00m DOMESTIC SEWER</li> <li>41.00m WINDMILLER VEHICLE</li> <li>41.00m REP / GRATING</li> </ul>	<ul style="list-style-type: none"> <li>PSM / CSM / PEG / TRM</li> <li>TRAFFIC LIGHT</li> <li>ROAD SIGN</li> <li>LETTER SIGN</li> <li>MAIL BOX / SIGNAL BOX</li> <li>POST / FREELAND</li> <li>WATER BY / FIRE</li> <li>ELECT. / GAS METER</li> <li>GAS SERVICE</li> <li>POWER LIGHT POLE</li> <li>CABLE MARKER</li> <li>TYRE / WOODEN POLE</li> <li>WATER METER / HD / SP</li> <li>UNKNOWN POINT / SERVICE</li> </ul>

COORDINATE SYSTEM	
VERTICAL:	AHD
HORIZONTAL:	GROUND PLANE ORIENTED
TO MGA 2020 ZONE 54	
SCALE: GROUND (CSF = 1.00004942)	

ADOPTED STATION & AUTHORITY	
PSM 6628/2370	RL 462.33 SDB
PSM 6628/2370	E 293981.268 SDB
PSM 6628/2370	N 6125168.965 SDB
SDB denotes SA Government survey data base	

ALEXANDER & SYMONDS PTY. LTD.	
1:200	ORIGINAL SHEET SIZE A4
CONTOUR INTERVAL: MIN 0.5m MAJ 2.0m	
SURVEY: DJH	02.06.2021
DRAWN: DJH	09.06.2021
CHECKED: SJC	14.06.2021

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### DETAIL & LEVEL SURVEY STIRLING GOLF CLUB STIRLING

DRAWING No. 21A1821-Detail(0)\_MGA20P

SHEET 1 OF 1

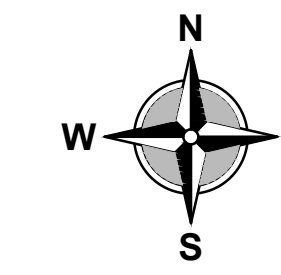
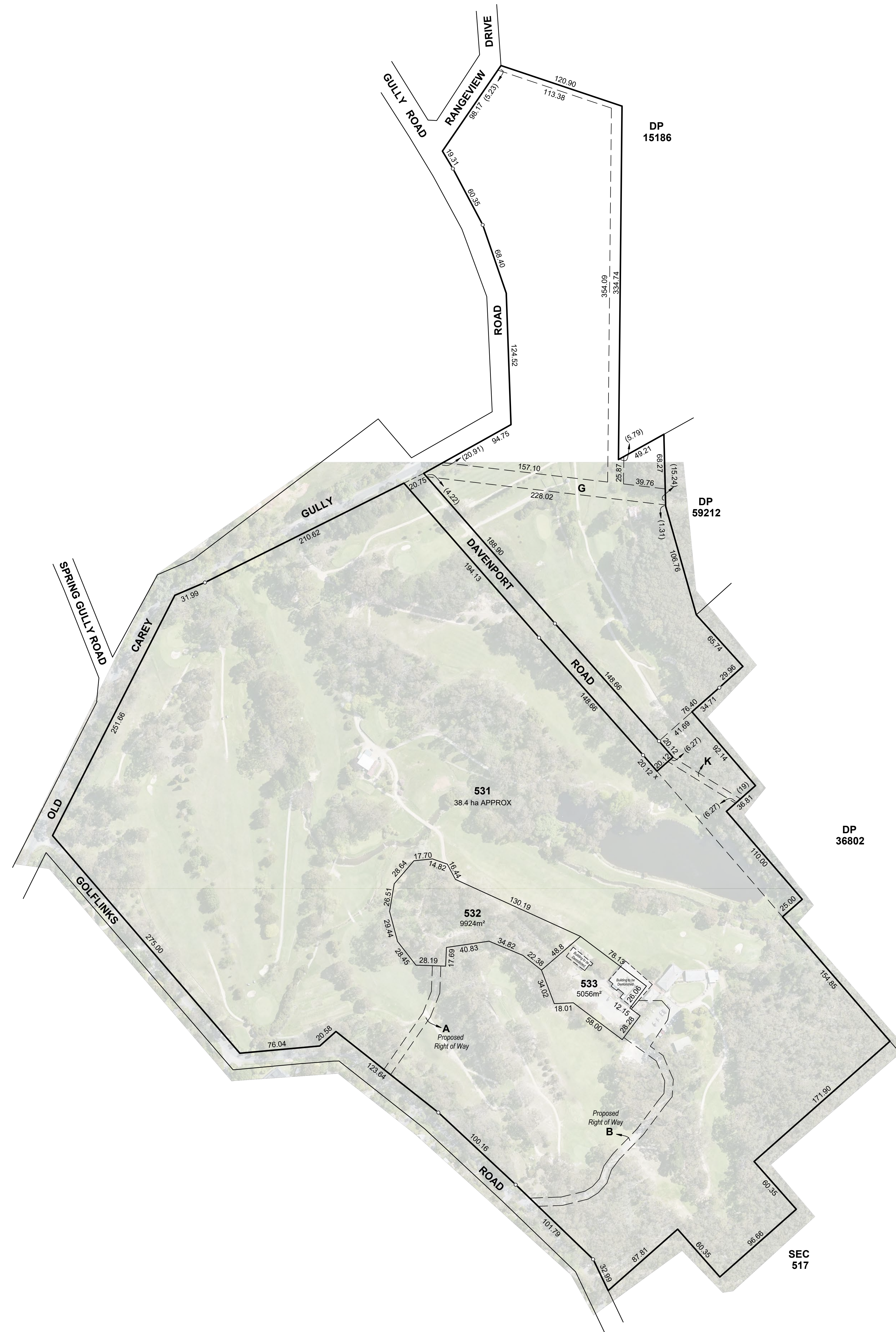
REVISION 0

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## **Appendix 5**

*Appendix C of Development Report – Plan of  
Division*

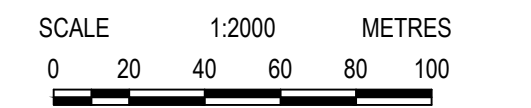
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Plan SA -----  
 Development No. / /  
 Adelaide Hills Council

Proposed Plan of Division  
 Allotment 53 in DP 59212  
 Hundred of Onkaparinga  
 in the area named  
**STIRLING**

CT 5891/805



No. of proposed allotments 3

Buildings to be demolished.

Portion of Allotment 531 marked A is to be subject to a Right of Way in favour of Allotment 532.

Portion of Allotment 531 marked B is to be subject to a Right of Way in favour of Allotment 533.

Portion of Allotment 531 marked G is subject to an easement to Distribution Lessor Corporation (Subject to Lease 8890000) (T 2520855)

Portion of Allotment 531 marked K is subject to a Free and Unrestricted Right of Way

Refer to CT for easement details.

Dimensions and areas are subject to survey.

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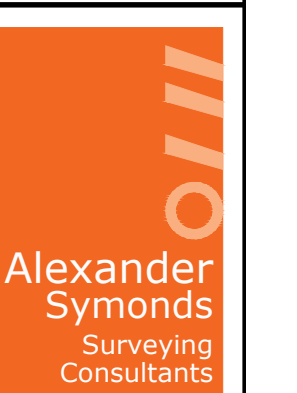
**Glenn Ian Hordacre**  
 LICENSED SURVEYOR

REF: 21A1821	STIRLING GOLF CLUB
DWG NO.: 21A1821PROP(B)	
REVISION: B	
RHF: 20.09.2022	

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 + Construction + Mining +  
 + Spatial Information Management +

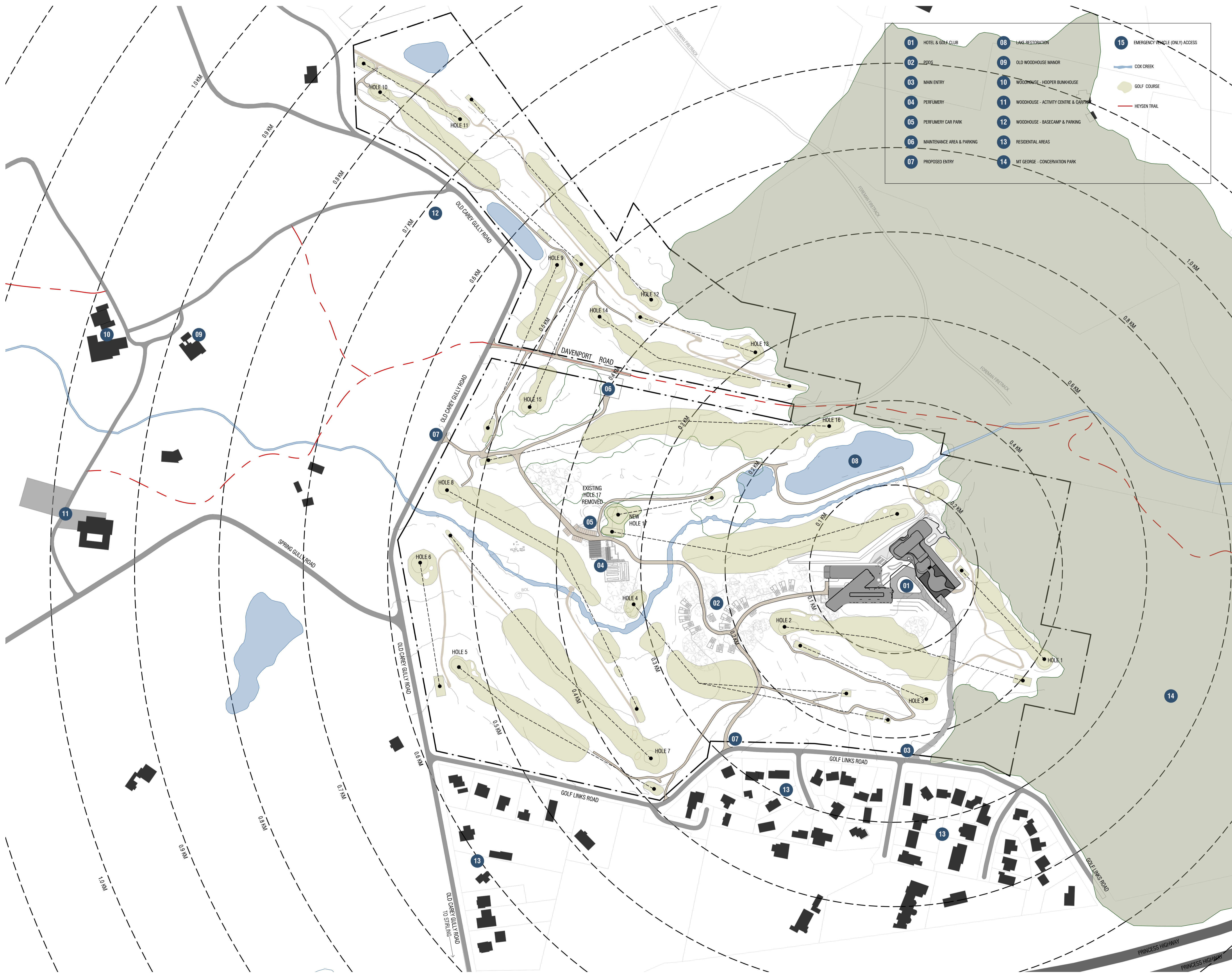


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## **Appendix 6**

*Appendix D of Development Report – Architectural Drawings*

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- 01 HOTEL & GOLF CLUB
- 02 POOLS
- 03 MAIN ENTRY
- 04 PERFUMERY
- 05 PERFUMERY CAR PARK
- 06 MAINTENANCE AREA & PARKING
- 07 PROPOSED ENTRY
- 08 LAKE RESTORATION
- 09 OLD WOODHOUSE MANOR
- 10 WOODHOUSE - HOOPER BUNKHOUSE
- 11 WOODHOUSE - ACTIVITY CENTRE & GARAGE
- 12 WOODHOUSE - BASECAMP & PARKING
- 13 RESIDENTIAL AREAS
- 14 MT GEORGE - CONSERVATION PARK
- 15 EMERGENCY VEHICLE (ONLY) ACCESS

No.	Description	Date
A	DA - FURTHER INFORMATION DRAFT	08.09.22
B	DA - FURTHER INFORMATION SUBMISSION	29.11.22
C	DA - FURTHER INFORMATION SUBMISSION	30.03.23

The drawings are to be viewed with regard to the scale at which the document has been issued and for the specific purpose of the issue. The information contained within is considered to be correct at the time of documentation. As an uncontrolled document, R ARCHITECTURE accepts no responsibility for alterations by persons other than R ARCHITECTURE. By accepting and utilizing any drawings or other data or any form of electronic media generated and provided by R ARCHITECTURE, the Client agrees not to use these drawings and data, in whole or in part, for any purpose or project other than the project which is the subject of this agreement. The Client agrees to waive all claims against R ARCHITECTURE resulting in any way or from any unauthorised changes or reuse of the drawings and data for any other project by anyone other than R ARCHITECTURE. In addition, the Client agrees, to the fullest extent permitted by the law, to indemnify and hold R ARCHITECTURE harmless from any damage, liability, or cost, including costs of defence, arising from any charges made by anyone other than R ARCHITECTURE or from any reuse of the drawings and data without prior written consent of R ARCHITECTURE. By accepting and utilizing any drawings or other data on any form of electronic media generated and provided by R ARCHITECTURE, the Client agrees that all such drawings and data are instruments of service of R ARCHITECTURE, who shall be deemed the author of the drawings and data and shall retain all common law, statutory law and other rights, including copyrights and intellectual property.

**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

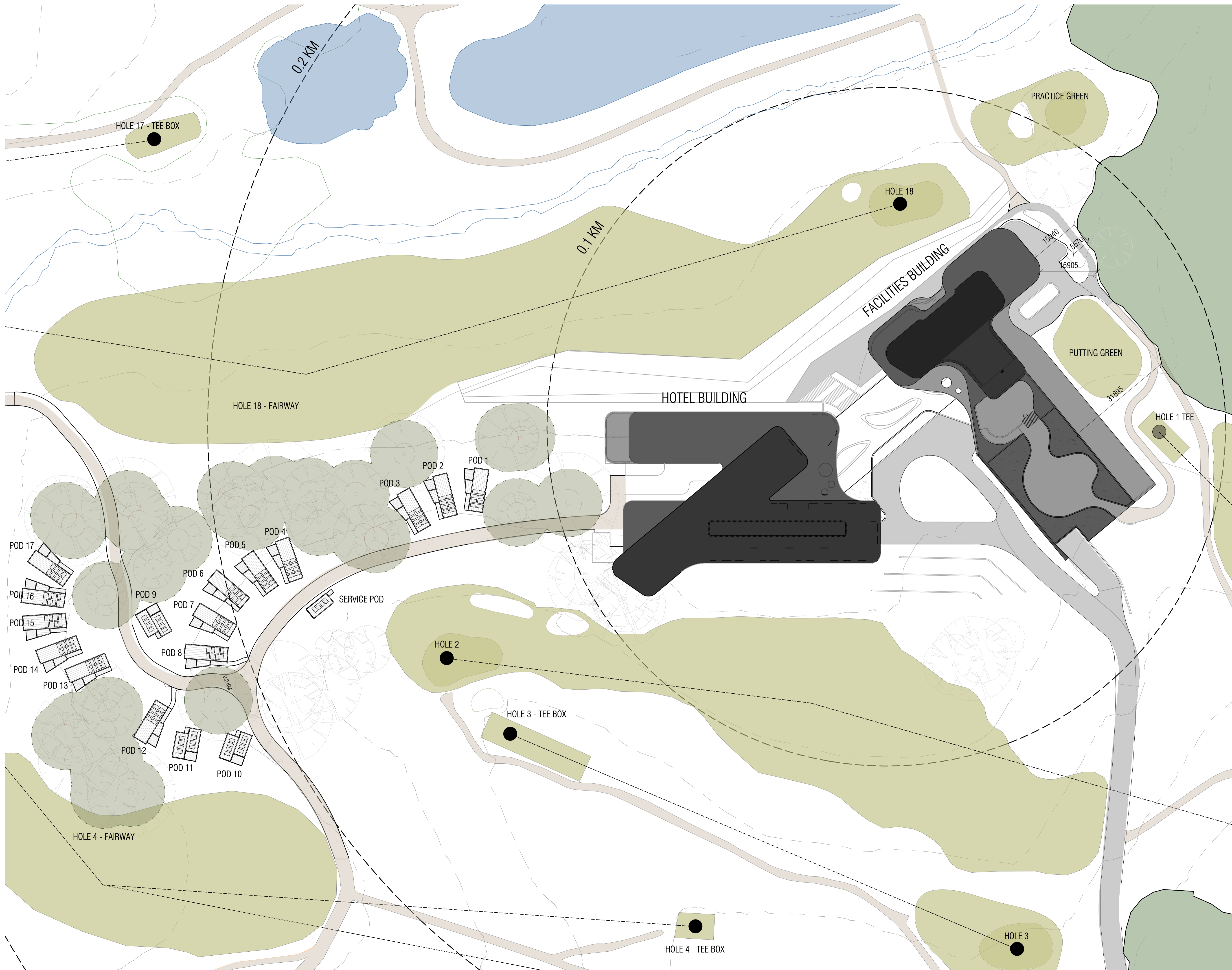
Scale@A1  
Scale@A3

Date: 30.03.23

**SHEET NAME**  
SITE MASTERPLAN / CONTEXT PLAN

SHEET NO. REVISION:  
TP00 C

**"PRELIMINARY NOT FOR CONSTRUCTION"**



HOTEL DEVELOPMENT SUMMARY	
35 GOLF LINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
<b>TOTAL</b>	<b>88 UNITS</b>
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES
<b>AREA SUMMARY</b>	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV. - LG	1039 m <sup>2</sup>
BACK OF HOUSE / SERV. - LEVEL 1	233 m <sup>2</sup>
GROUND FLOOR - F&B	323 m <sup>2</sup>
GROUND FLOOR - GOLF	429 m <sup>2</sup>
LEVEL 1	1393 m <sup>2</sup>
LEVEL 2	570 m <sup>2</sup>
LEVEL 3	447 m <sup>2</sup>
LOWER GROUND	937 m <sup>2</sup>
SERVICES CORE-L3	54 m <sup>2</sup>
	5426 m <sup>2</sup>
<b>FACILITIES CARPARK</b>	
FIRST FLOOR CARPARK	1461 m <sup>2</sup>
GROUND FLOOR CARPARK	1886 m <sup>2</sup>
LOADING BAY	67 m <sup>2</sup>
	3413 m <sup>2</sup>
<b>HOTEL</b>	
GROUND FLOOR	1095 m <sup>2</sup>
LEVEL 1	2334 m <sup>2</sup>
LEVEL 2	1659 m <sup>2</sup>
LEVEL 3	1921 m <sup>2</sup>
LOWER GROUND	1149 m <sup>2</sup>
	8157 m <sup>2</sup>
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1332 m <sup>2</sup>
LOWER GROUND CARPARK	1515 m <sup>2</sup>
	2867 m <sup>2</sup>
Grand total:	19 19864 m <sup>2</sup>

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

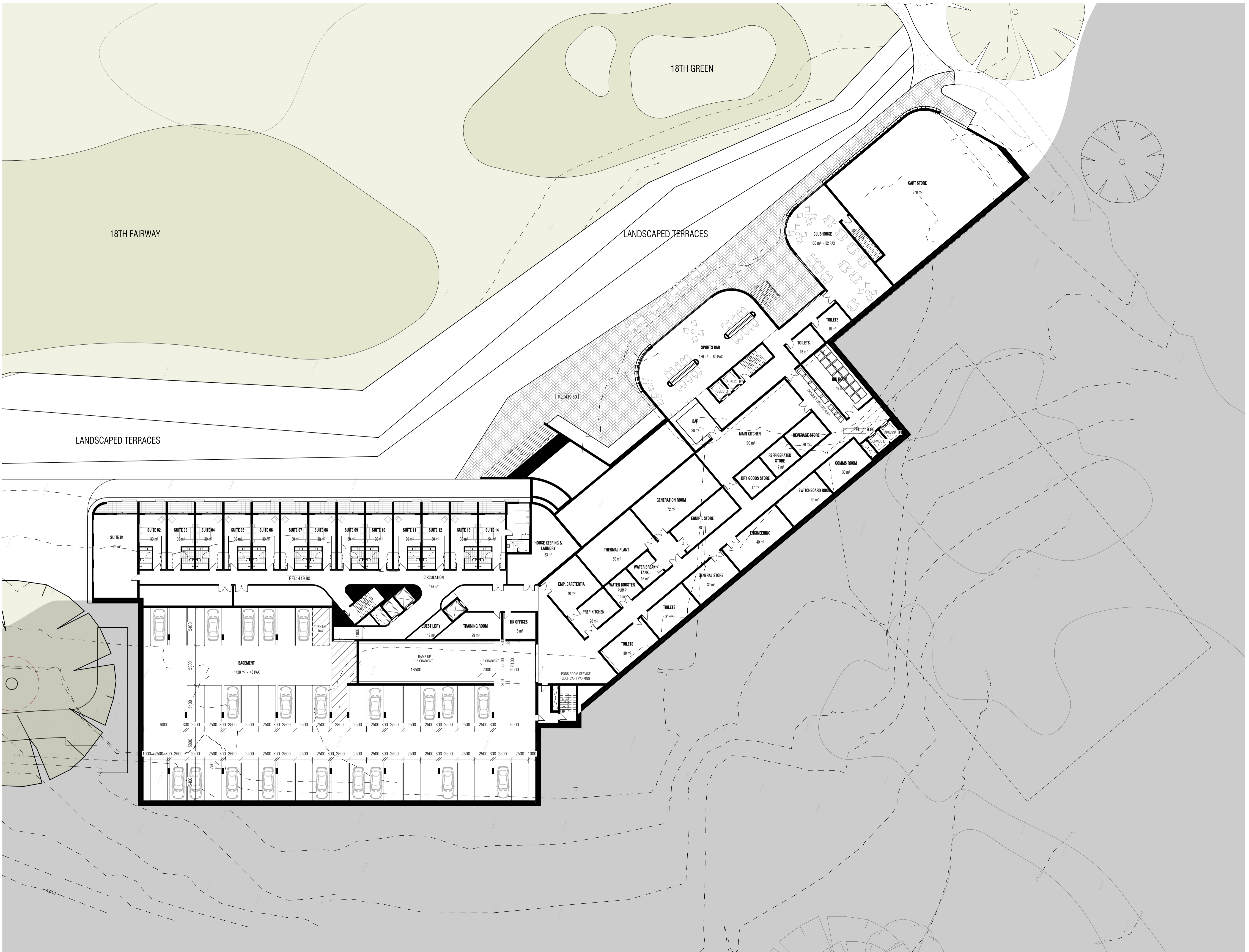
Scale@A1  
Scale@A3  
Date: 30.03.23

**SHEET NAME**  
HOTEL MASTERPLAN

**SHEET NO.** TP01 **REVISION:** E

**\*PRELIMINARY NOT FOR CONSTRUCTION\***

architectural | interior design | urban design | landscape  
ph: 8822 8225 | e: info@rarchitect.com.au



HOTEL DEVELOPMENT SUMMARY	
35 GOLFLINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
TOTAL	88 UNITS
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV - LG	1039 m <sup>2</sup>
BACK OF HOUSE / SERV - LEVEL 1	233 m <sup>2</sup>
GROUND FLOOR - F&B	323 m <sup>2</sup>
GROUND FLOOR - GOLF	429 m <sup>2</sup>
LEVEL 1	1393 m <sup>2</sup>
LEVEL 2	570 m <sup>2</sup>
LEVEL 3	447 m <sup>2</sup>
LOWER GROUND	937 m <sup>2</sup>
SERVICES CORE-L3	54 m <sup>2</sup>
FACILITIES CARPARK	5426 m <sup>2</sup>
FIRST FLOOR CARPARK	1461 m <sup>2</sup>
GROUND FLOOR CARPARK	1886 m <sup>2</sup>
LOADING BAY	67 m <sup>2</sup>
HOTEL	3413 m <sup>2</sup>
<b>HOTEL</b>	
GROUND FLOOR	1095 m <sup>2</sup>
LEVEL 1	2334 m <sup>2</sup>
LEVEL 2	1659 m <sup>2</sup>
LEVEL 3	1921 m <sup>2</sup>
LOWER GROUND	1149 m <sup>2</sup>
HOTEL CARPARK	8157 m <sup>2</sup>
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1332 m <sup>2</sup>
LOWER GROUND CARPARK	1515 m <sup>2</sup>
Grand total: 19	2867 m <sup>2</sup>
	19864 m <sup>2</sup>

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
**MOUNT LOFT GOLF ESTATE**

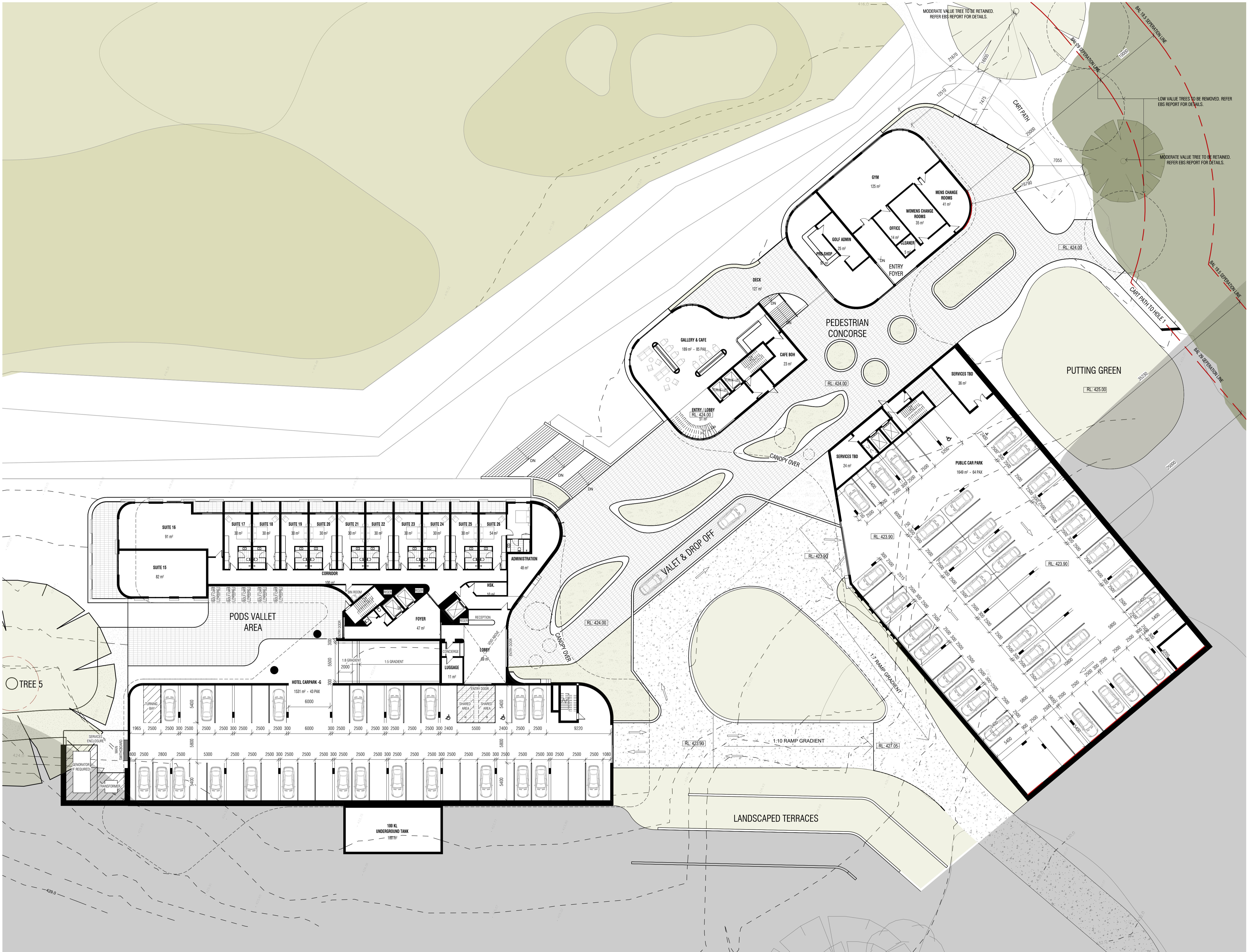
**ADDRESS**  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1  
 Scale@A3  
 Date: 30.03.23

**SHEET NAME**  
**LOWER GROUND FLOOR PLAN**

SHEET NO.      REVISION:  
**TP02**      E

**\*PRELIMINARY NOT FOR CONSTRUCTION\***



HOTEL DEVELOPMENT SUMMARY	
35 GOLF LINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
TOTAL	88 UNITS
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES
<b>AREA SUMMARY</b>	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV - LG	1039 m <sup>2</sup>
BACK OF HOUSE / SERV - LIV 1	233 m <sup>2</sup>
GROUND FLOOR - F&B	323 m <sup>2</sup>
GROUND FLOOR - GOLF	429 m <sup>2</sup>
LEVEL 1	1393 m <sup>2</sup>
LEVEL 2	570 m <sup>2</sup>
LEVEL 3	447 m <sup>2</sup>
LOWER GROUND	937 m <sup>2</sup>
SERVICES CORE-L3	54 m <sup>2</sup>
FACILITIES CARPARK	5426 m <sup>2</sup>
FIRST FLOOR CARPARK	1461 m <sup>2</sup>
GROUND FLOOR CARPARK	1886 m <sup>2</sup>
LOADING BAY	67 m <sup>2</sup>
TOTAL	3413 m <sup>2</sup>
<b>HOTEL</b>	
GROUND FLOOR	1095 m <sup>2</sup>
LEVEL 1	2334 m <sup>2</sup>
LEVEL 2	1659 m <sup>2</sup>
LEVEL 3	1921 m <sup>2</sup>
LOWER GROUND	1149 m <sup>2</sup>
TOTAL	8157 m <sup>2</sup>
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1352 m <sup>2</sup>
LOWER GROUND CARPARK	1515 m <sup>2</sup>
TOTAL	2867 m <sup>2</sup>
Grand total:	19 19864 m <sup>2</sup>

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

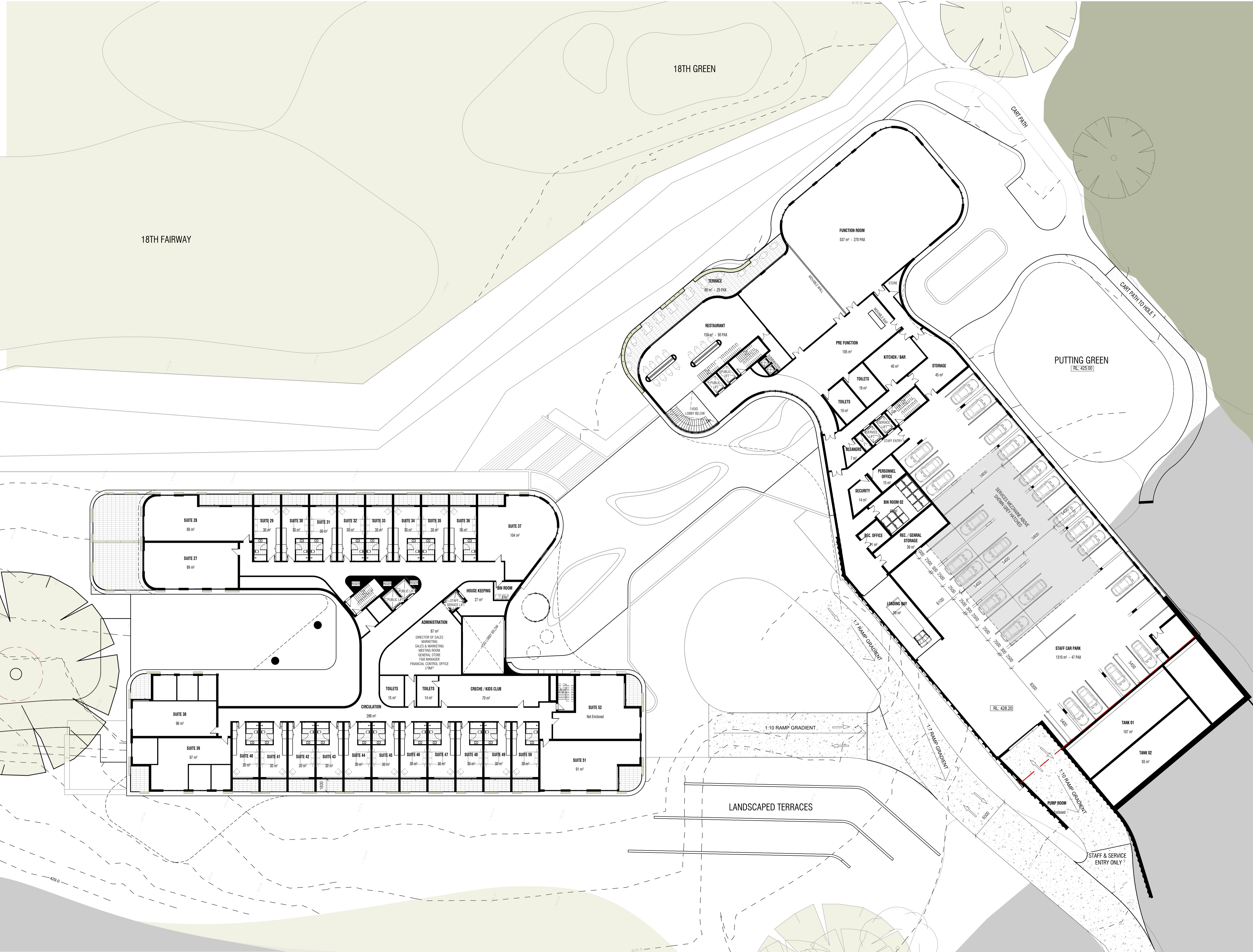
Scale@A1  
Scale@A3  
Date: 30.03.23

**SHEET NAME**  
GROUND FLOOR PLAN

SHEET NO. REVISION:  
TP03 E

**"PRELIMINARY NOT FOR CONSTRUCTION"**





HOTEL DEVELOPMENT SUMMARY	
85 GOLFLINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
<b>TOTAL</b>	<b>88 UNITS</b>
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV - LG	1039 m <sup>2</sup>
BACK OF HOUSE / SERV - LEVEL 1	233 m <sup>2</sup>
GROUND FLOOR - F&B	325 m <sup>2</sup>
GROUND FLOOR - GOLF	429 m <sup>2</sup>
LEVEL 1	1393 m <sup>2</sup>
LEVEL 2	570 m <sup>2</sup>
LEVEL 3	447 m <sup>2</sup>
LOWER GROUND	937 m <sup>2</sup>
SERVICES CORE-L3	54 m <sup>2</sup>
<b>FACILITIES CARPARK</b>	<b>5426 m<sup>2</sup></b>
FIRST FLOOR CARPARK	1461 m <sup>2</sup>
GROUND FLOOR CARPARK	1886 m <sup>2</sup>
LOADING BAY	67 m <sup>2</sup>
<b>TOTAL</b>	<b>3413 m<sup>2</sup></b>
<b>HOTEL</b>	
GROUND FLOOR	1095 m <sup>2</sup>
LEVEL 1	2334 m <sup>2</sup>
LEVEL 2	1659 m <sup>2</sup>
LEVEL 3	1921 m <sup>2</sup>
LOWER GROUND	1149 m <sup>2</sup>
<b>TOTAL</b>	<b>8157 m<sup>2</sup></b>
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1352 m <sup>2</sup>
LOWER GROUND CARPARK	1515 m <sup>2</sup>
<b>TOTAL</b>	<b>2867 m<sup>2</sup></b>
<b>Grand total:</b>	<b>19</b>

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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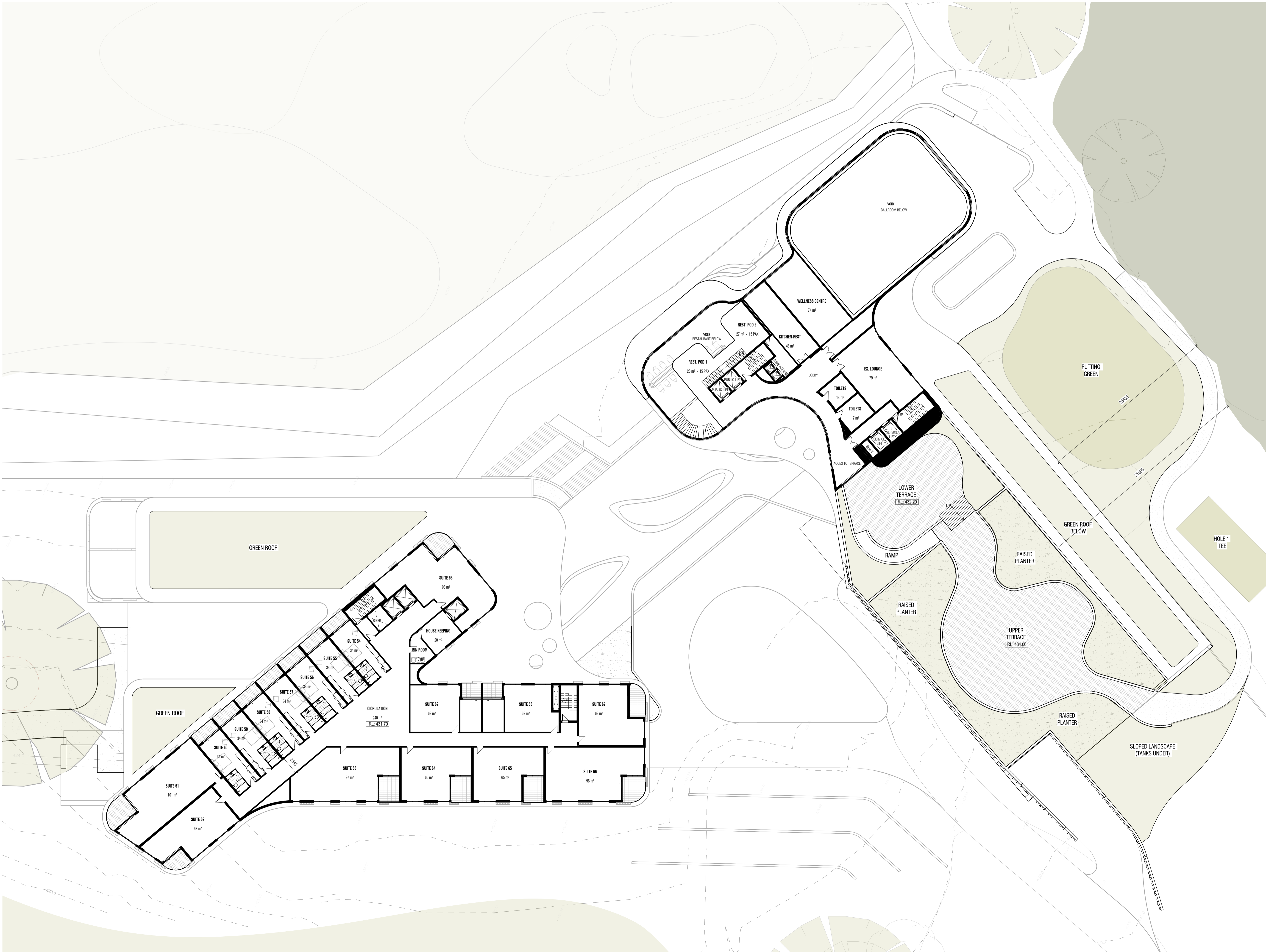
**PROJECT**  
**MOUNT LOFT GOLF ESTATE**  
 ADDRESS  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1  
 Scale@A3  
 Date: 30.03.23

SHEET NAME  
**LEVEL 1 PLAN**

SHEET NO. **TP04** REVISION: **E**

**\*PRELIMINARY NOT FOR CONSTRUCTION\***



HOTEL DEVELOPMENT SUMMARY	
85 GOLFLINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
TOTAL	88 UNITS
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFORMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV - LG	1039 m <sup>2</sup>
BACK OF HOUSE / SERV - LEVEL 1	233 m <sup>2</sup>
GROUND FLOOR - F&B	323 m <sup>2</sup>
GROUND FLOOR - GOLF	429 m <sup>2</sup>
LEVEL 1	1393 m <sup>2</sup>
LEVEL 2	570 m <sup>2</sup>
LEVEL 3	447 m <sup>2</sup>
LOWER GROUND	937 m <sup>2</sup>
SERVICES CORE-L3	54 m <sup>2</sup>
FACILITIES CARPARK	5426 m <sup>2</sup>
FIRST FLOOR CARPARK	1461 m <sup>2</sup>
GROUND FLOOR CARPARK	1886 m <sup>2</sup>
LOADING BAY	67 m <sup>2</sup>
TOTAL	3413 m <sup>2</sup>
<b>HOTEL</b>	
GROUND FLOOR	1095 m <sup>2</sup>
LEVEL 1	2334 m <sup>2</sup>
LEVEL 2	1639 m <sup>2</sup>
LEVEL 3	1921 m <sup>2</sup>
LOWER GROUND	1149 m <sup>2</sup>
TOTAL	8157 m <sup>2</sup>
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1332 m <sup>2</sup>
LOWER GROUND CARPARK	1515 m <sup>2</sup>
TOTAL	2867 m <sup>2</sup>
Grand total: 19	19864 m <sup>2</sup>

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
**MOUNT LOFT GOLF ESTATE**

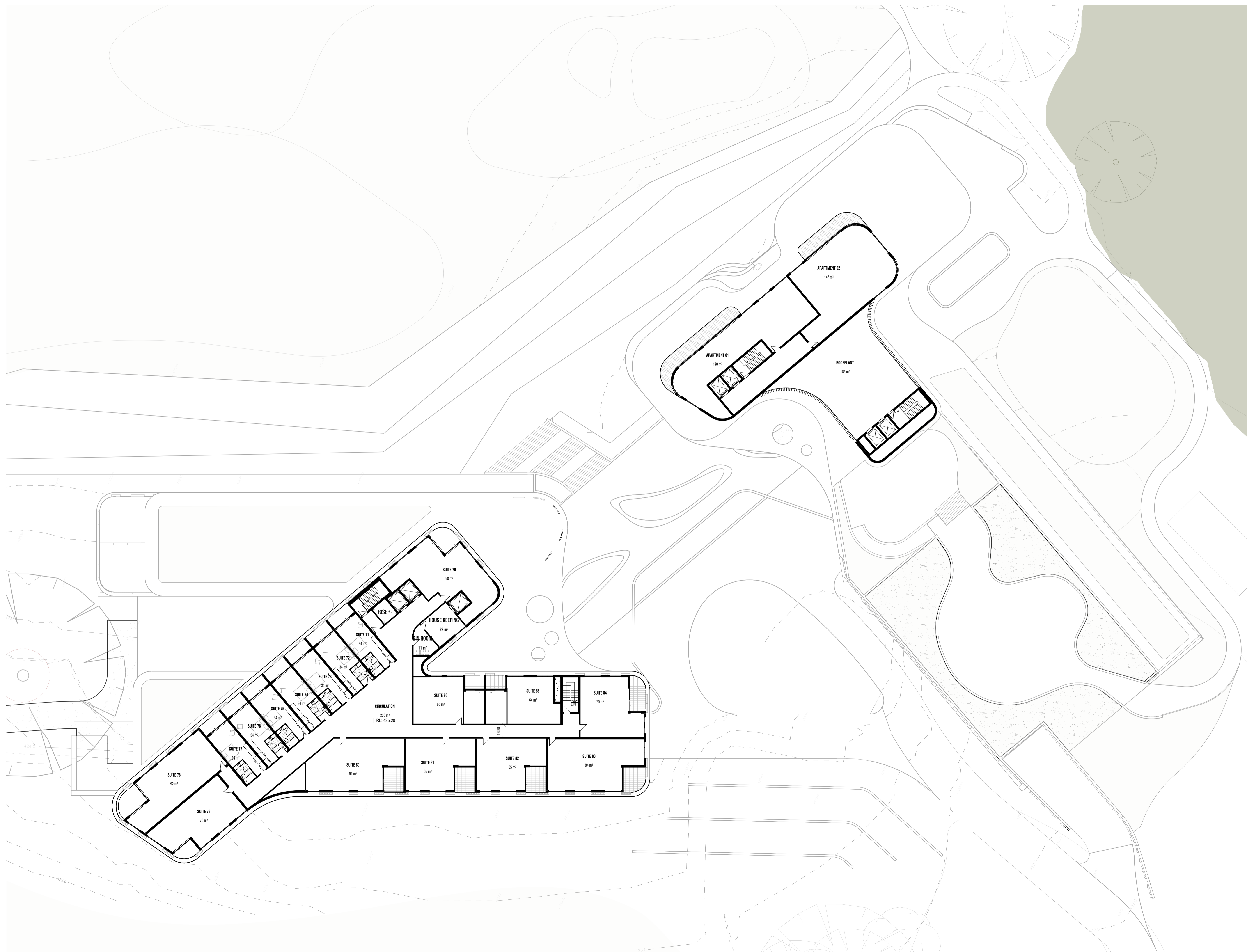
**ADDRESS**  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1  
 Scale@A3  
 Date: 30.03.23

**SHEET NAME**  
**LEVEL 2 PLAN**

SHEET NO.      REVISION:  
 TP05      E

\*PRELIMINARY NOT FOR CONSTRUCTION\*



HOTEL DEVELOPMENT SUMMARY	
85 GOLFLINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
TOTAL	88 UNITS
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV. - LG	1039 m²
BACK OF HOUSE / SERV. - LEVEL 1	233 m²
GROUND FLOOR - F&B	323 m²
GROUND FLOOR - GOLF	429 m²
LEVEL 1	1393 m²
LEVEL 2	570 m²
LEVEL 3	447 m²
LOWER GROUND	937 m²
SERVICES CORE-L3	54 m²
	5426 m²
<b>FACILITIES CARPARK</b>	
FIRST FLOOR CARPARK	1461 m²
GROUND FLOOR CARPARK	1886 m²
LOADING BAY	67 m²
	3413 m²
<b>HOTEL</b>	
GROUND FLOOR	1095 m²
LEVEL 1	2334 m²
LEVEL 2	1659 m²
LEVEL 3	1921 m²
LOWER GROUND	1149 m²
	8157 m²
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1352 m²
LOWER GROUND CARPARK	1515 m²
	2867 m²
Grand total: 19	19864 m²

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
**MOUNT LOFT GOLF ESTATE**

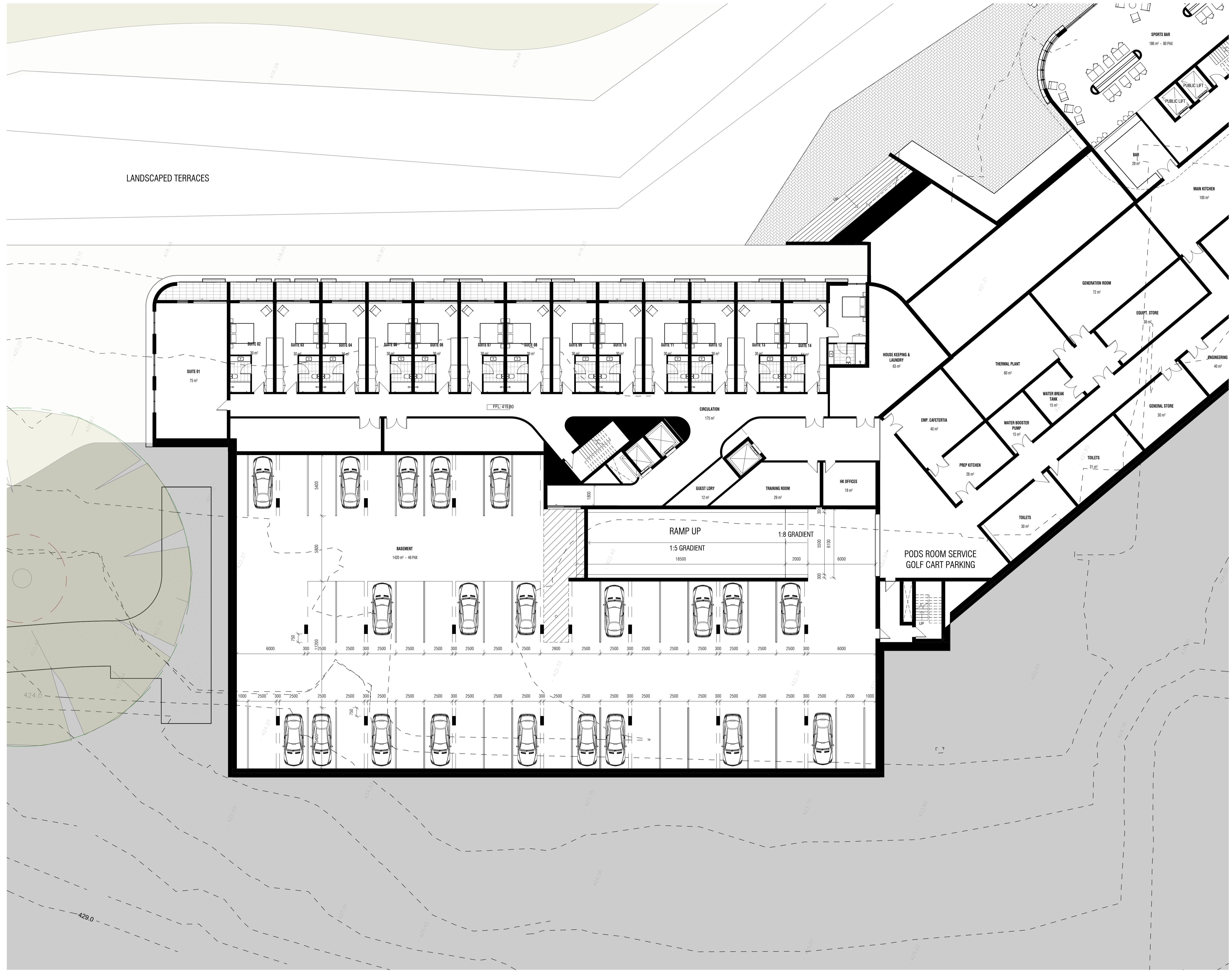
**ADDRESS**  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1  
 Scale@A3  
 Date: 30.03.23

**SHEET NAME**  
**LEVEL 3 PLAN**

SHEET NO. REVISION:  
 TP06 E

LANDSCAPED TERRACES



HOTEL DEVELOPMENT SUMMARY	
35 GOLFLINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
HOTEL	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
TOTAL	88 UNITS
PODS	
TOTAL	17 UNITS - 1 BEDROOM
PARKING	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
FACILITIES	
BACK OF HOUSE / SERV - LG	1039 m <sup>2</sup>
BACK OF HOUSE / SERV - LEVEL 1	233 m <sup>2</sup>
GROUND FLOOR - F&B	323 m <sup>2</sup>
GROUND FLOOR - GOLF	429 m <sup>2</sup>
LEVEL 1	1393 m <sup>2</sup>
LEVEL 2	570 m <sup>2</sup>
LEVEL 3	447 m <sup>2</sup>
LOWER GROUND	937 m <sup>2</sup>
SERVICES CORE-L3	54 m <sup>2</sup>
	5426 m <sup>2</sup>
FACILITIES CARPARK	
FIRST FLOOR CARPARK	1461 m <sup>2</sup>
GROUND FLOOR CARPARK	1886 m <sup>2</sup>
LOADING BAY	67 m <sup>2</sup>
	3413 m <sup>2</sup>
HOTEL	
GROUND FLOOR	1095 m <sup>2</sup>
LEVEL 1	2334 m <sup>2</sup>
LEVEL 2	1639 m <sup>2</sup>
LEVEL 3	1921 m <sup>2</sup>
LOWER GROUND	1149 m <sup>2</sup>
	8157 m <sup>2</sup>
HOTEL CARPARK	
HOTEL CARPARK	1332 m <sup>2</sup>
LOWER GROUND CARPARK	1515 m <sup>2</sup>
	2867 m <sup>2</sup>
Grand total:	19 19864 m <sup>2</sup>

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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PROJECT  
MOUNT LOFT GOLF ESTATE

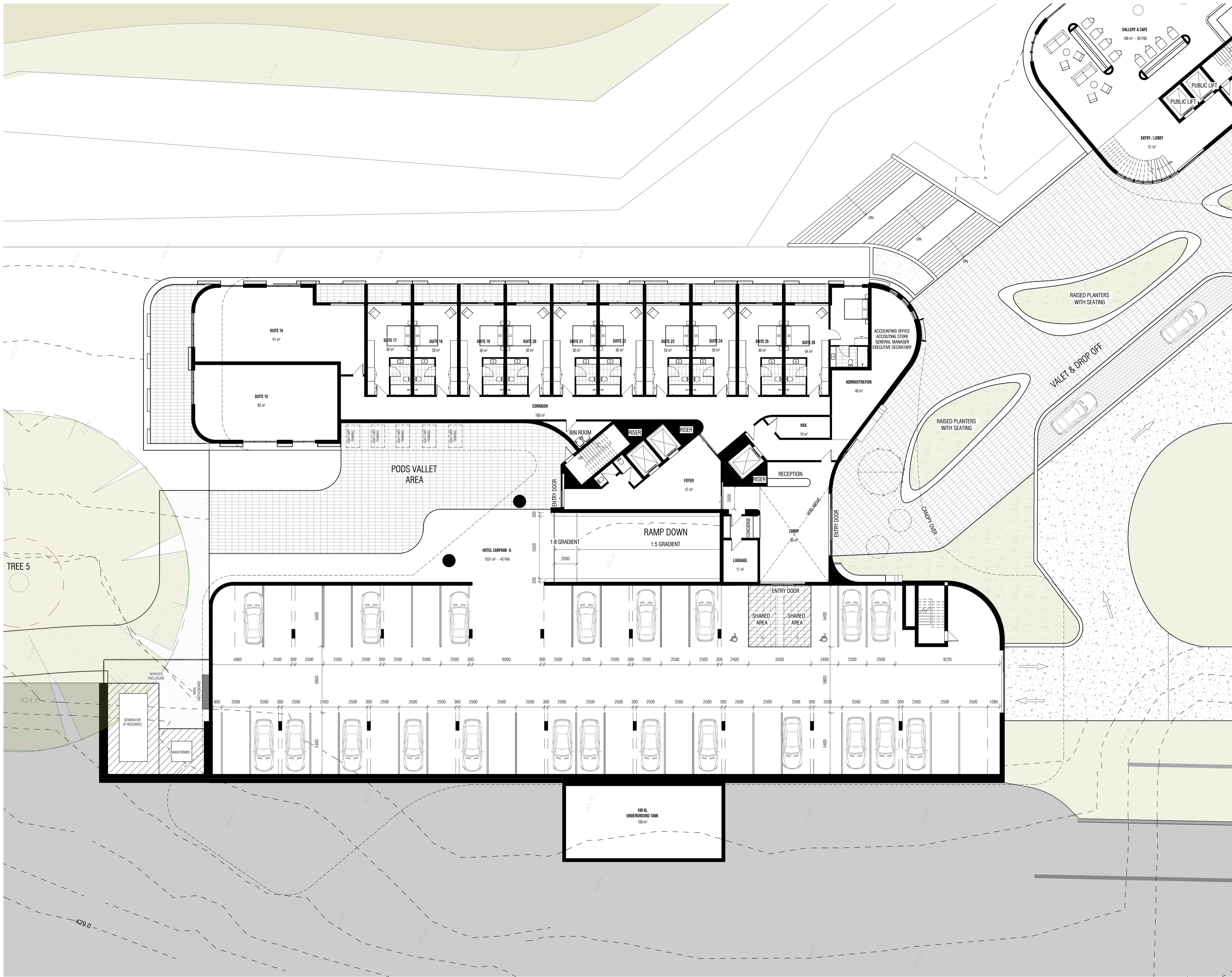
ADDRESS  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1  
Scale@A3

Date: 30.03.23

SHEET NAME  
HOTEL\_LOWER GROUND FLOOR PLAN

SHEET NO. TP07 REVISION: E



**HOTEL DEVELOPMENT SUMMARY**  
35 GOLF LINKS RD, STIRLING, SA.

DEVELOPMENT SITE AREA	
HOTEL	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
<b>TOTAL</b>	<b>88 UNITS</b>
PODS	
<b>TOTAL</b>	<b>17 UNITS - 1 BEDROOM</b>
PARKING	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES
AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV - LG	1039 m <sup>2</sup>
BACK OF HOUSE / SERV - LEVEL 1	233 m <sup>2</sup>
GROUND FLOOR - F&B	323 m <sup>2</sup>
GROUND FLOOR - GOLF	429 m <sup>2</sup>
LEVEL 1	1393 m <sup>2</sup>
LEVEL 2	570 m <sup>2</sup>
LEVEL 3	447 m <sup>2</sup>
LOWER GROUND	937 m <sup>2</sup>
SERVICES CORE-L3	54 m <sup>2</sup>
<b>FACILITIES CARPARK</b>	<b>5426 m<sup>2</sup></b>
FIRST FLOOR CARPARK	1461 m <sup>2</sup>
GROUD FLOOR CARPARK	1886 m <sup>2</sup>
LOADING BAY	67 m <sup>2</sup>
<b>HOTEL</b>	<b>3413 m<sup>2</sup></b>
GROUND FLOOR	1095 m <sup>2</sup>
LEVEL 1	2334 m <sup>2</sup>
LEVEL 2	1639 m <sup>2</sup>
LEVEL 3	1921 m <sup>2</sup>
LOWER GROUND	1149 m <sup>2</sup>
<b>HOTEL CARPARK</b>	<b>8157 m<sup>2</sup></b>
HOTEL CARPARK	1332 m <sup>2</sup>
LOWER GROUND CARPARK	1515 m <sup>2</sup>
<b>Grand total:</b>	<b>19 19864 m<sup>2</sup></b>

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFT GOLF ESTATE

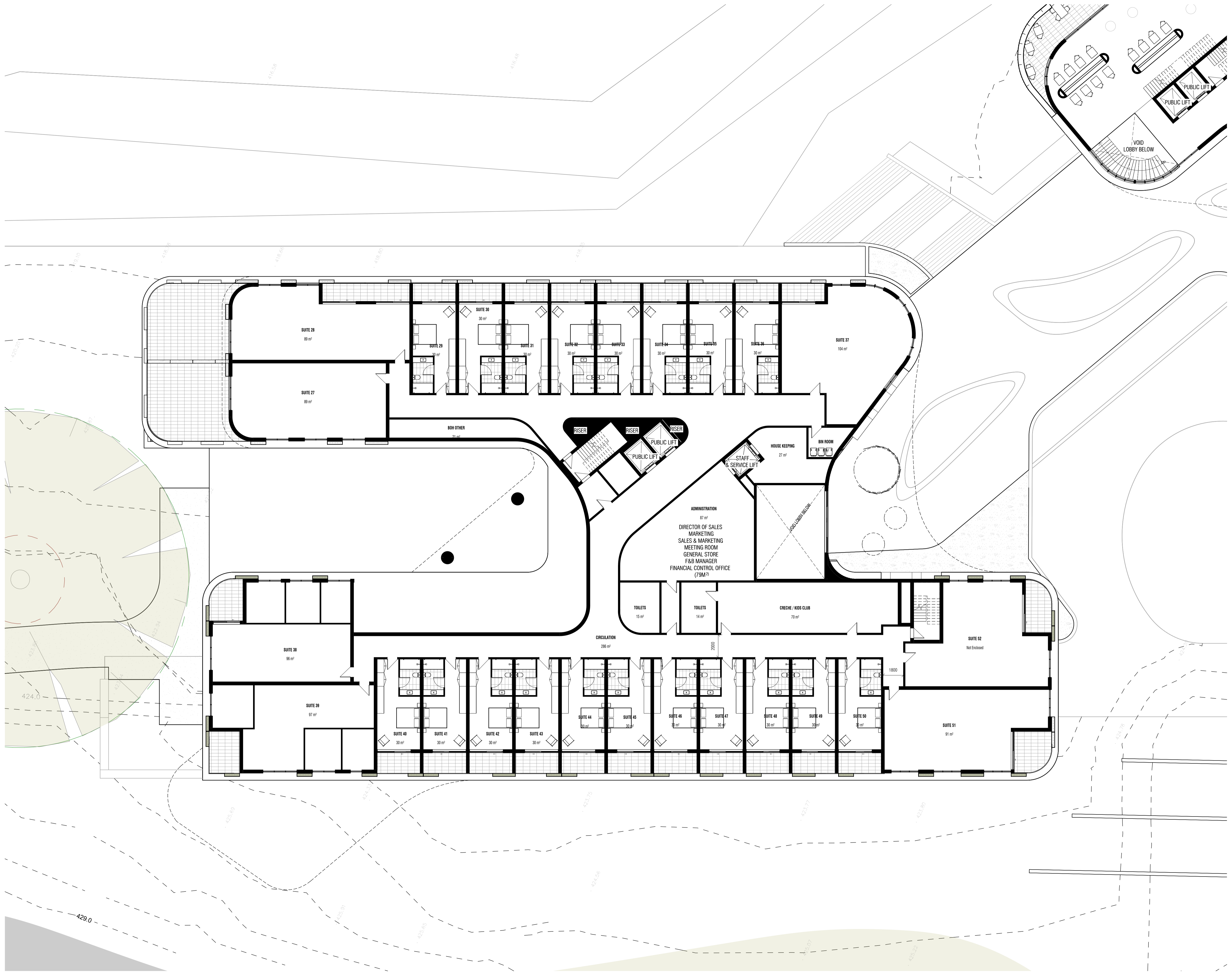
**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1  
Scale@A3  
Date: 30.03.23

**SHEET NAME**  
HOTEL\_GROUND FLOOR PLAN

**SHEET NO.** TP08 **REVISION:** E

**\*PRELIMINARY NOT FOR CONSTRUCTION\***



HOTEL DEVELOPMENT SUMMARY	
35 GOLFLINKS RD, STIRLING, SA.	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
TOTAL	88 UNITS
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV - LG	1039 m²
BACK OF HOUSE / SERV - LEVEL 1	233 m²
GROUND FLOOR - F&B	323 m²
GROUND FLOOR - GOLF	429 m²
LEVEL 1	1393 m²
LEVEL 2	570 m²
LEVEL 3	447 m²
LOWER GROUND	957 m²
SERVICES CORE-L3	54 m²
FACILITIES CARPARK	5426 m²
FIRST FLOOR CARPARK	1461 m²
GROUND FLOOR CARPARK	1886 m²
LOADING BAY	67 m²
TOTAL	3413 m²
<b>HOTEL</b>	
GROUND FLOOR	1095 m²
LEVEL 1	2334 m²
LEVEL 2	1639 m²
LEVEL 3	1921 m²
LOWER GROUND	1149 m²
TOTAL	8157 m²
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1332 m²
LOWER GROUND CARPARK	1515 m²
TOTAL	2867 m²
Grand total: 19	19864 m²

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
**MOUNT LOFT GOLF ESTATE**

**ADDRESS**  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1  
 Scale@A3  
 Date: 30.03.23

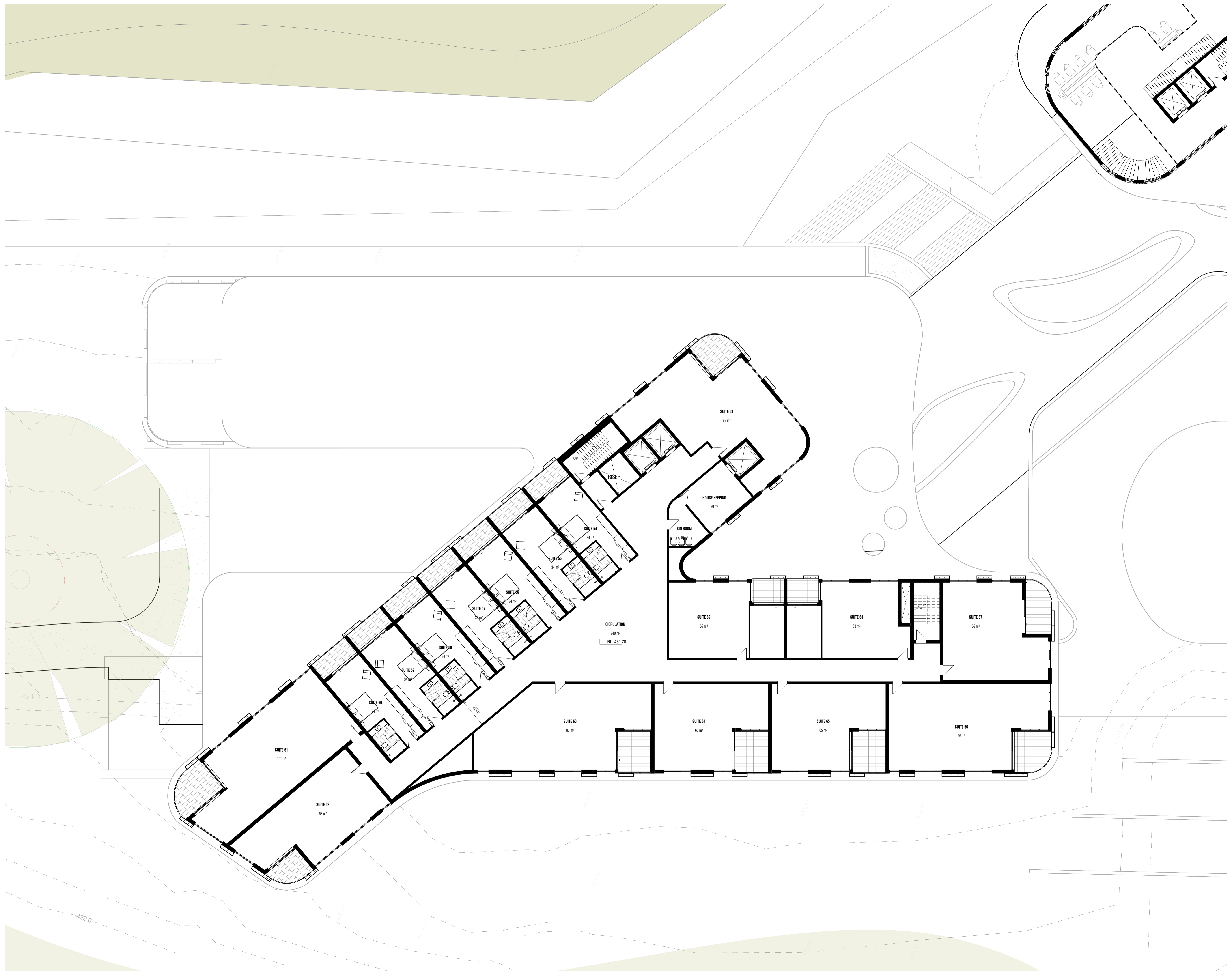
**SHEET NAME**  
**HOTEL\_LEVEL 1 PLAN**

**SHEET NO.** \_\_\_\_\_ **REVISION:** \_\_\_\_\_

**TP09**

**\*PRELIMINARY NOT FOR CONSTRUCTION\***

**R ARCHITECTURE**  
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HOTEL DEVELOPMENT SUMMARY	
35 GOLF LINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
<b>TOTAL</b>	<b>88 UNITS</b>
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV - LG	1039 m <sup>2</sup>
BACK OF HOUSE / SERV - LEVEL 1	233 m <sup>2</sup>
GROUND FLOOR - F&B	323 m <sup>2</sup>
GROUND FLOOR - GOLF	429 m <sup>2</sup>
LEVEL 1	1393 m <sup>2</sup>
LEVEL 2	570 m <sup>2</sup>
LEVEL 3	447 m <sup>2</sup>
LOWER GROUND	957 m <sup>2</sup>
SERVICES CORE-L3	54 m <sup>2</sup>
	5426 m <sup>2</sup>
<b>FACILITIES CARPARK</b>	
FIRST FLOOR CARPARK	1461 m <sup>2</sup>
GROUND FLOOR CARPARK	1886 m <sup>2</sup>
LOADING BAY	67 m <sup>2</sup>
	3413 m <sup>2</sup>
<b>HOTEL</b>	
GROUND FLOOR	1095 m <sup>2</sup>
LEVEL 1	2334 m <sup>2</sup>
LEVEL 2	1659 m <sup>2</sup>
LEVEL 3	1921 m <sup>2</sup>
LOWER GROUND	1149 m <sup>2</sup>
	8157 m <sup>2</sup>
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1352 m <sup>2</sup>
LOWER GROUND CARPARK	1515 m <sup>2</sup>
	2867 m <sup>2</sup>
Grand total: 19	19864 m <sup>2</sup>

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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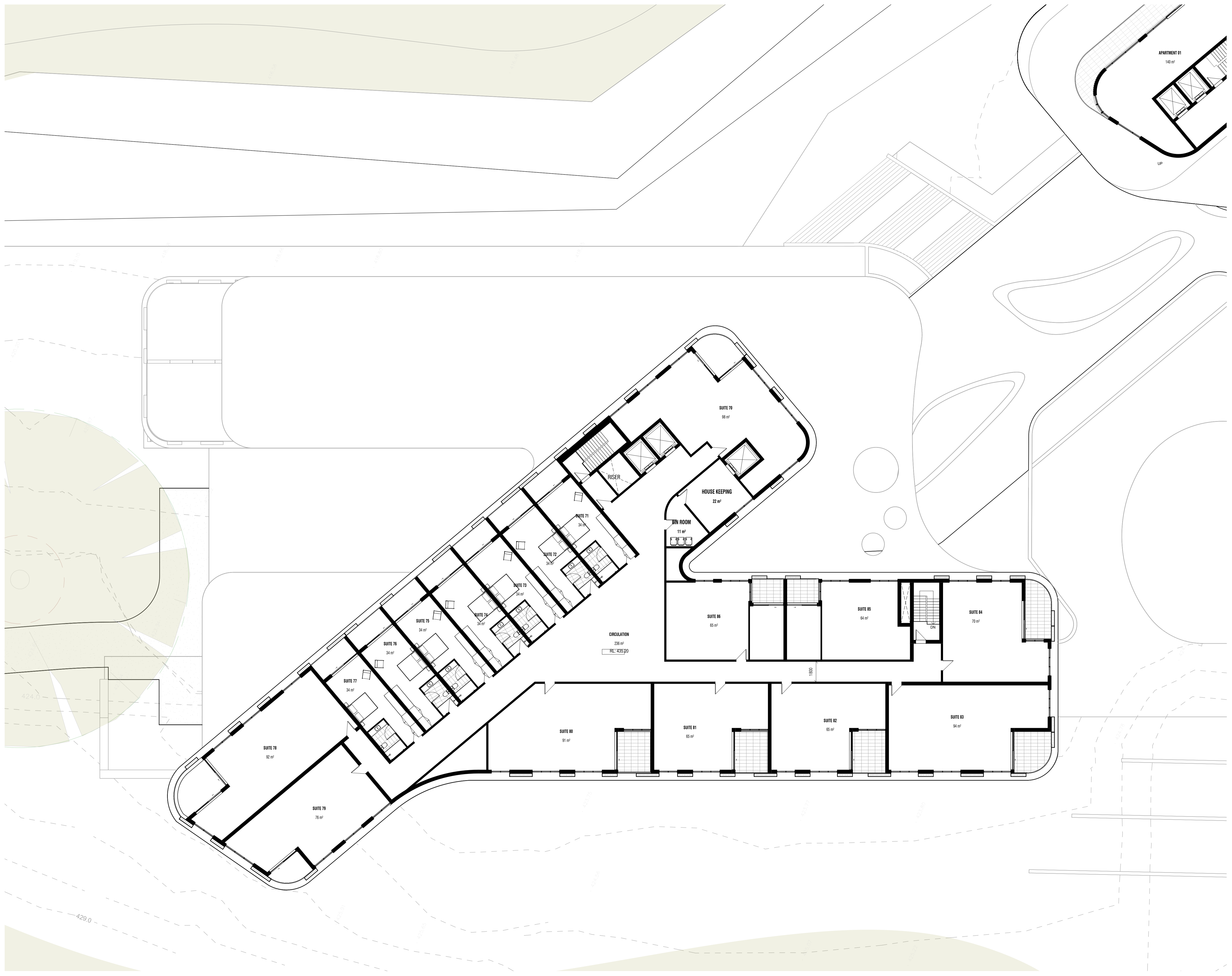
**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1  
Scale@A3  
Date: 30.03.23

**SHEET NAME**  
HOTEL\_LEVEL 2 PLAN

**SHEET NO.** TP10 **REVISION:** E



HOTEL DEVELOPMENT SUMMARY	
35 GOLFLINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
<b>TOTAL</b>	<b>88 UNITS</b>
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV. - LG	1039 m²
BACK OF HOUSE / SERV. - LEVEL 1	233 m²
GROUND FLOOR - F&B	323 m²
GROUND FLOOR - GOLF	429 m²
LEVEL 1	1393 m²
LEVEL 2	570 m²
LEVEL 3	447 m²
LOWER GROUND	937 m²
SERVICES CORE-L3	54 m²
	5426 m²
<b>FACILITIES CARPARK</b>	
FIRST FLOOR CARPARK	1461 m²
GROUND FLOOR CARPARK	1886 m²
LOADING BAY	67 m²
	3413 m²
<b>HOTEL</b>	
GROUND FLOOR	1095 m²
LEVEL 1	2334 m²
LEVEL 2	1659 m²
LEVEL 3	1921 m²
LOWER GROUND	1149 m²
	8157 m²
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1352 m²
LOWER GROUND CARPARK	1515 m²
	2867 m²
Grand total: 19	19864 m²

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1  
Scale@A3

Date: 30.03.23

**SHEET NAME**  
HOTEL\_LEVEL 3 PLAN

SHEET NO. TP11 REVISION: E





### HOTEL DEVELOPMENT SUMMARY

85 GOLFLINKS RD, STIRLING, SA.

HOTEL	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
<b>TOTAL</b>	<b>88 UNITS</b>
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

### AREA SUMMARY

AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV. - LG	1039 m²
BACK OF HOUSE / SERV. - LEVEL 1	233 m²
GROUND FLOOR - F&B	323 m²
GROUND FLOOR - GOLF	429 m²
LEVEL 1	1393 m²
LEVEL 2	570 m²
LEVEL 3	447 m²
LOWER GROUND	937 m²
SERVICES CORE-L3	54 m²
	<b>5426 m²</b>
<b>FACILITIES CARPARK</b>	
FIRST FLOOR CARPARK	1461 m²
GROUND FLOOR CARPARK	1886 m²
LOADING BAY	67 m²
	<b>3413 m²</b>
<b>HOTEL</b>	
GROUND FLOOR	1095 m²
LEVEL 1	2334 m²
LEVEL 2	1639 m²
LEVEL 3	1921 m²
LOWER GROUND	1149 m²
	<b>8157 m²</b>
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1332 m²
LOWER GROUND CARPARK	1515 m²
	<b>2867 m²</b>
<b>Grand total:</b>	<b>19 1864 m²</b>

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
**MOUNT LOFT GOLF ESTATE**

**ADDRESS**  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

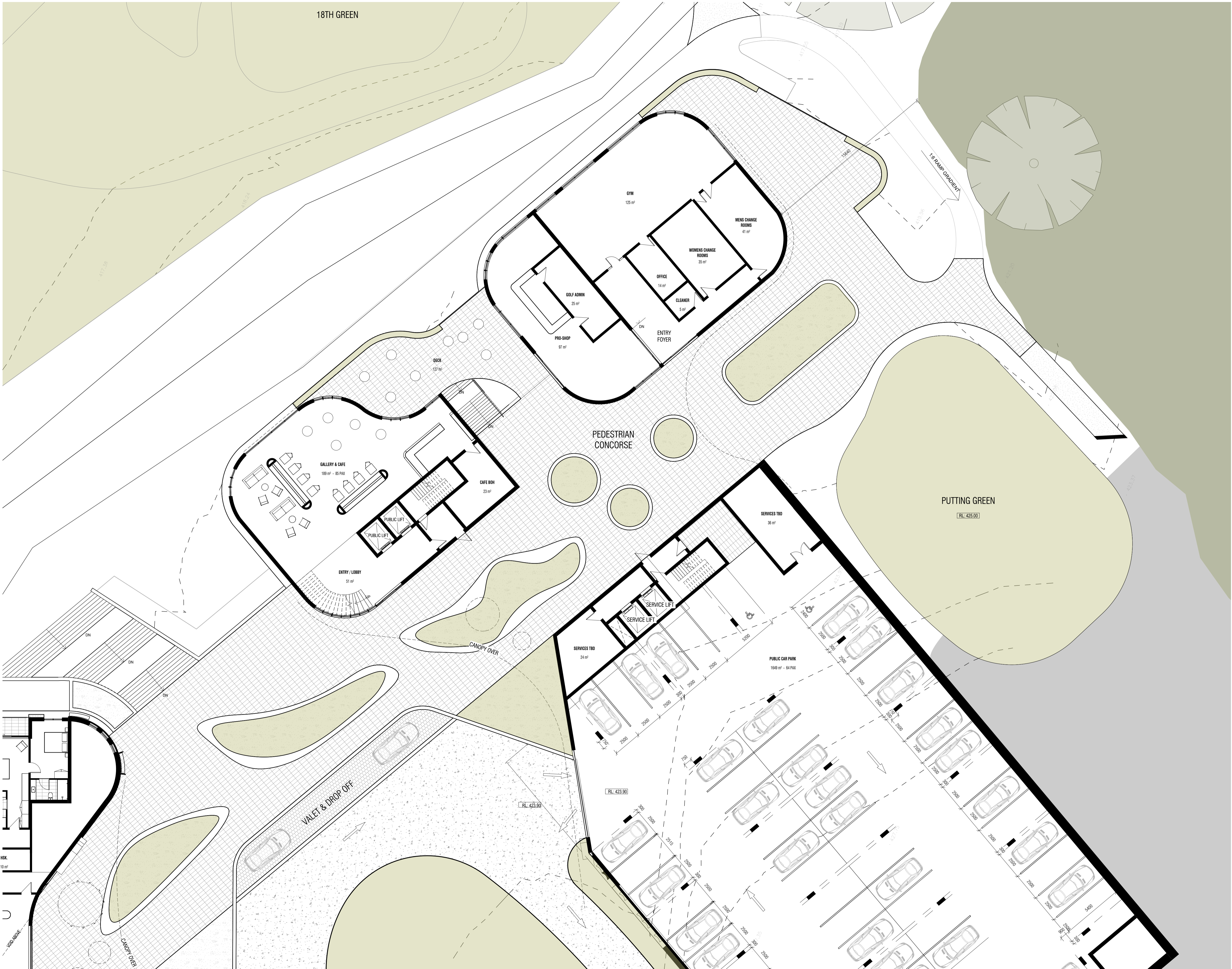
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 Scale@A3 1:150  
 Date: 30.03.23

**SHEET NAME**  
**FACILITIES LOWER GROUND FLOOR**

SHEET NO. **TP12** REVISION: **E**

**\*PRELIMINARY NOT FOR CONSTRUCTION\***





### HOTEL DEVELOPMENT SUMMARY

85 GOLFLINKS RD, STIRLING, SA

DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
TOTAL	88 UNITS
<b>PODS</b>	
TOTAL	17 UNITS - 1 BEDROOM
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

### AREA SUMMARY

AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV - LG	1039 m²
BACK OF HOUSE / SERV - LVL 1	233 m²
GROUND FLOOR - F&B	323 m²
GROUND FLOOR - GOLF	429 m²
LEVEL 1	1393 m²
LEVEL 2	570 m²
LEVEL 3	447 m²
LOWER GROUND	937 m²
SERVICES CORE-L3	54 m²
<b>FACILITIES CARPARK</b>	
FIRST FLOOR CARPARK	1461 m²
GROUND FLOOR CARPARK	1886 m²
LOADING BAY	67 m²
<b>HOTEL</b>	
GROUND FLOOR	1095 m²
LEVEL 1	2334 m²
LEVEL 2	1639 m²
LEVEL 3	1921 m²
LOWER GROUND	1149 m²
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1332 m²
LOWER GROUND CARPARK	1515 m²
	2867 m²
Grand total: 19	19864 m²

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

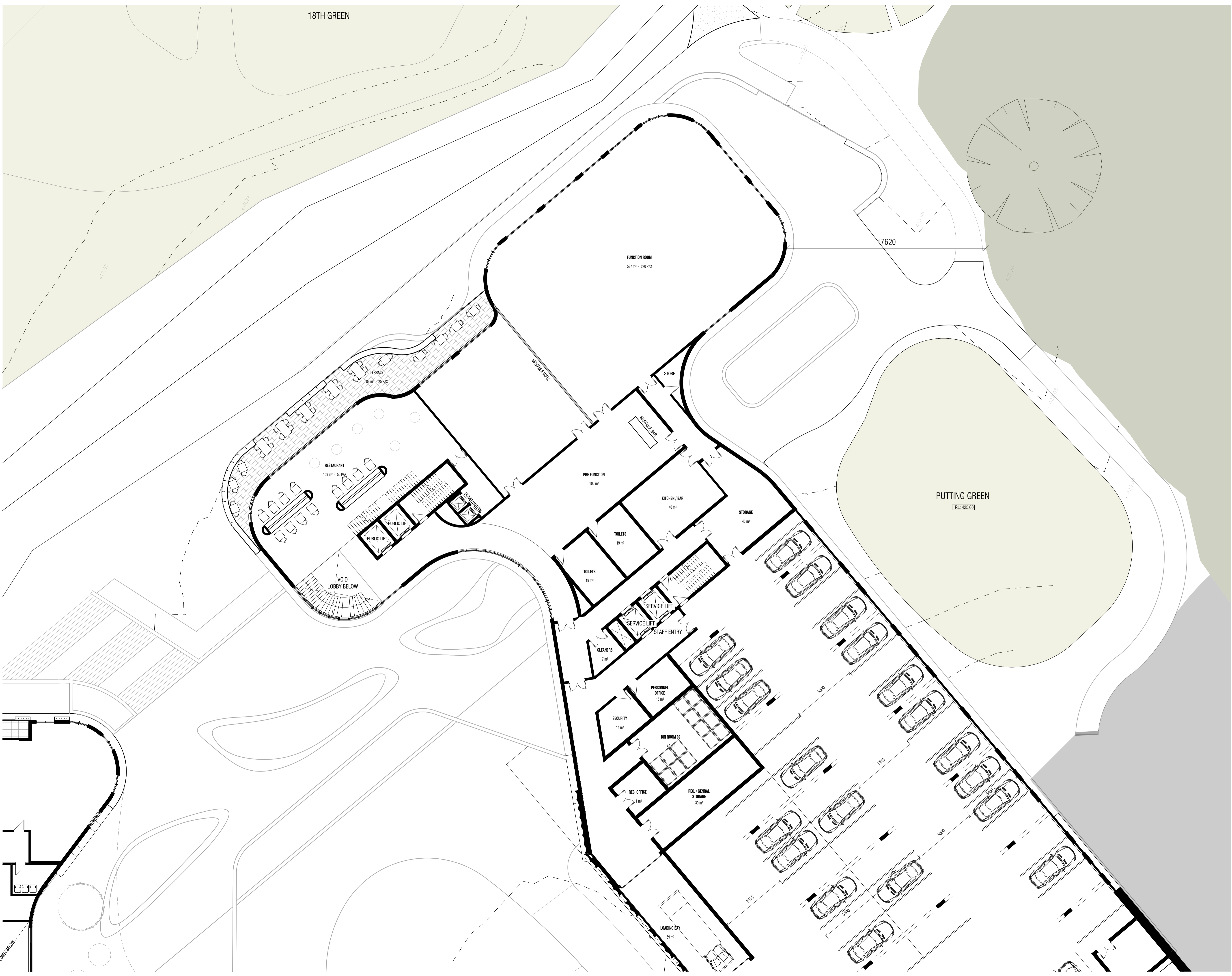
Scale@A1  
Scale@A3  
Date: 30.03.23

**SHEET NAME**  
FACILITIES - GROUND FLOOR PLAN

**SHEET NO.** TP13 **REVISION:** E

**\*PRELIMINARY NOT FOR CONSTRUCTION\***

R ARCHITECTURE  
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ph: 8822 8225 | e: info@rarchitect.com.au



HOTEL DEVELOPMENT SUMMARY	
35 GOLF LINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
<b>TOTAL</b>	<b>88 UNITS</b>
<b>PODS</b>	
<b>TOTAL</b>	<b>17 UNITS - 1 BEDROOM</b>
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV - LG	1039 m <sup>2</sup>
BACK OF HOUSE / SERV - LEVEL 1	233 m <sup>2</sup>
GROUND FLOOR - F&B	323 m <sup>2</sup>
GROUND FLOOR - GOLF	429 m <sup>2</sup>
LEVEL 1	1393 m <sup>2</sup>
LEVEL 2	570 m <sup>2</sup>
LEVEL 3	447 m <sup>2</sup>
LOWER GROUND	937 m <sup>2</sup>
SERVICES CORE-L3	54 m <sup>2</sup>
	5426 m <sup>2</sup>
<b>FACILITIES CARPARK</b>	
FIRST FLOOR CARPARK	1461 m <sup>2</sup>
GROUND FLOOR CARPARK	1886 m <sup>2</sup>
LOADING BAY	67 m <sup>2</sup>
	3413 m <sup>2</sup>
<b>HOTEL</b>	
GROUND FLOOR	1095 m <sup>2</sup>
LEVEL 1	2334 m <sup>2</sup>
LEVEL 2	1639 m <sup>2</sup>
LEVEL 3	1921 m <sup>2</sup>
LOWER GROUND	1149 m <sup>2</sup>
	8157 m <sup>2</sup>
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1332 m <sup>2</sup>
LOWER GROUND CARPARK	1515 m <sup>2</sup>
	2867 m <sup>2</sup>
<b>Grand total:</b>	<b>19 19864 m<sup>2</sup></b>

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

The drawings are to be viewed with regard to the scale at which the document has been issued and for the specific purpose of the issue. The information contained within is considered to be correct at the time of documentation. As an uncontrolled document, R ARCHITECTURE accepts no responsibility for alterations by persons other than the project which is the subject of this agreement. The Client agrees to waive all claims against R ARCHITECTURE resulting in any way or from any unauthorised changes or reuse of the drawings and data for any other project by anyone other than R ARCHITECTURE. In addition, the Client agrees, to the fullest extent permitted by the law, to indemnify and hold R ARCHITECTURE harmless from any damage, liability, or cost, including costs of defence, arising from any changes made by anyone other than R ARCHITECTURE or from any reuse of the drawings and data without prior written consent of R ARCHITECTURE. By accepting and utilizing any drawings or other data on any form of electronic media generated and provided by R ARCHITECTURE, the Client agrees that all such drawings and data are instruments of service of R ARCHITECTURE, who shall be deemed the author of the drawings and data and shall retain all common law, statutory law and other rights, including copyrights and intellectual property.

**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

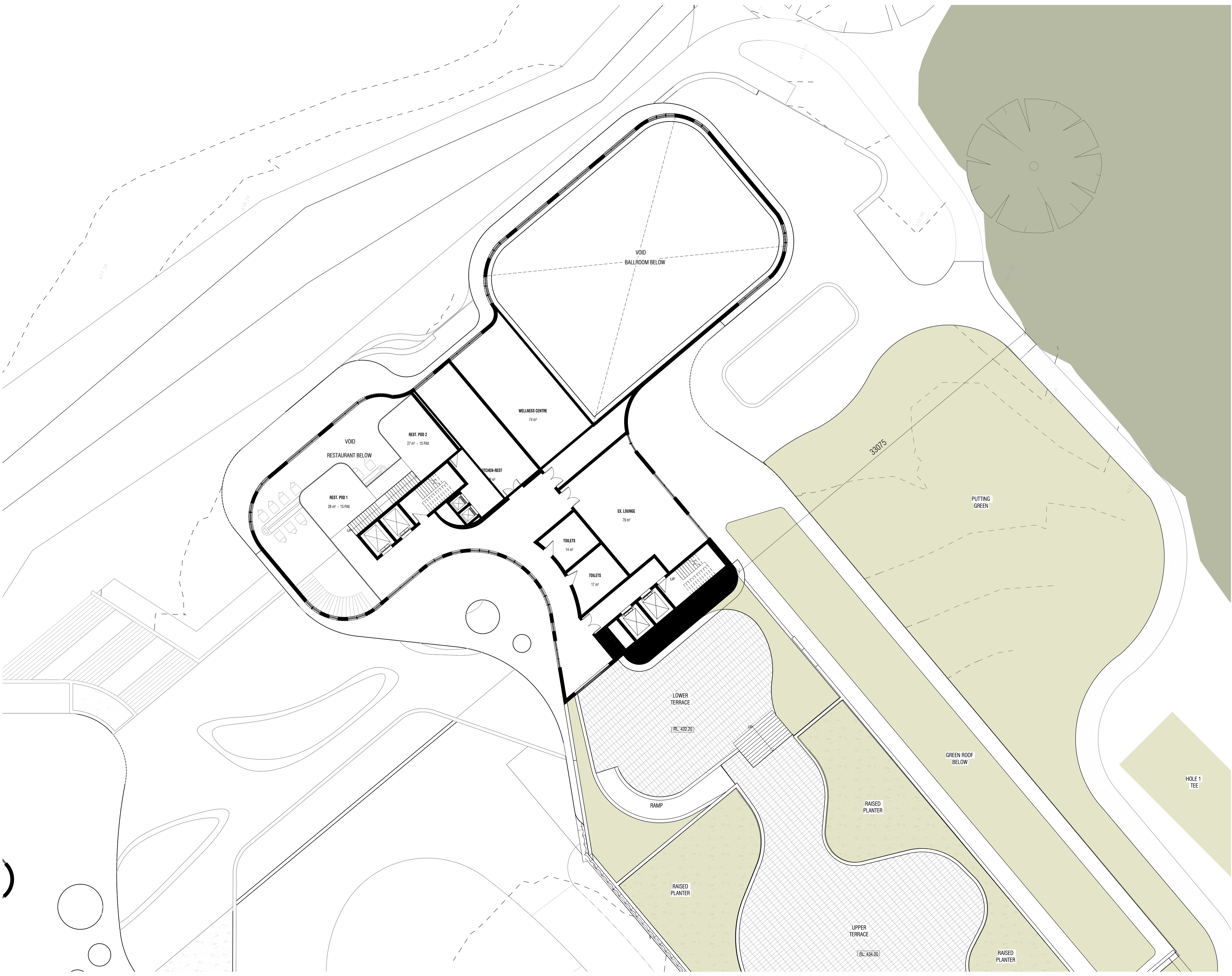
Scale@A1  
Scale@A3  
Date: 30.03.23

**SHEET NAME**  
FACILITIES LEVEL 1 PLAN

**SHEET NO.** TP14 **REVISION:** E

**\*PRELIMINARY NOT FOR CONSTRUCTION\***





HOTEL DEVELOPMENT SUMMARY	
85 GOLFLINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
<b>TOTAL</b>	<b>88 UNITS</b>
<b>PODS</b>	
<b>TOTAL</b>	<b>17 UNITS - 1 BEDROOM</b>
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV - LG	1039 m²
BACK OF HOUSE / SERV - LVL 1	233 m²
GROUND FLOOR - F&B	323 m²
GROUND FLOOR- GOLF	429 m²
LEVEL 1	1393 m²
LEVEL 2	570 m²
LEVEL 3	447 m²
LOWER GROUND	937 m²
SERVICES CORE-L3	54 m²
<b>FACILITIES CARPARK</b>	<b>5426 m²</b>
FIRST FLOOR CARPARK	1461 m²
GROUD FLOOR CARPARK	1886 m²
LOADING BAY	67 m²
<b>HOTEL</b>	<b>3413 m²</b>
GROUND FLOOR	1095 m²
LEVEL 1	2334 m²
LEVEL 2	1639 m²
LEVEL 3	1921 m²
LOWER GROUND	1149 m²
<b>HOTEL CARPARK</b>	<b>8157 m²</b>
HOTEL CARPARK	1332 m²
LOWER GROUND CARPARK	1515 m²
	2867 m²
Grand total: 19	19864 m²

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA- FURTHER INFORMATION SUBMISSION	30.03.23

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PROJECT  
**MOUNT LOFT GOLF ESTATE**

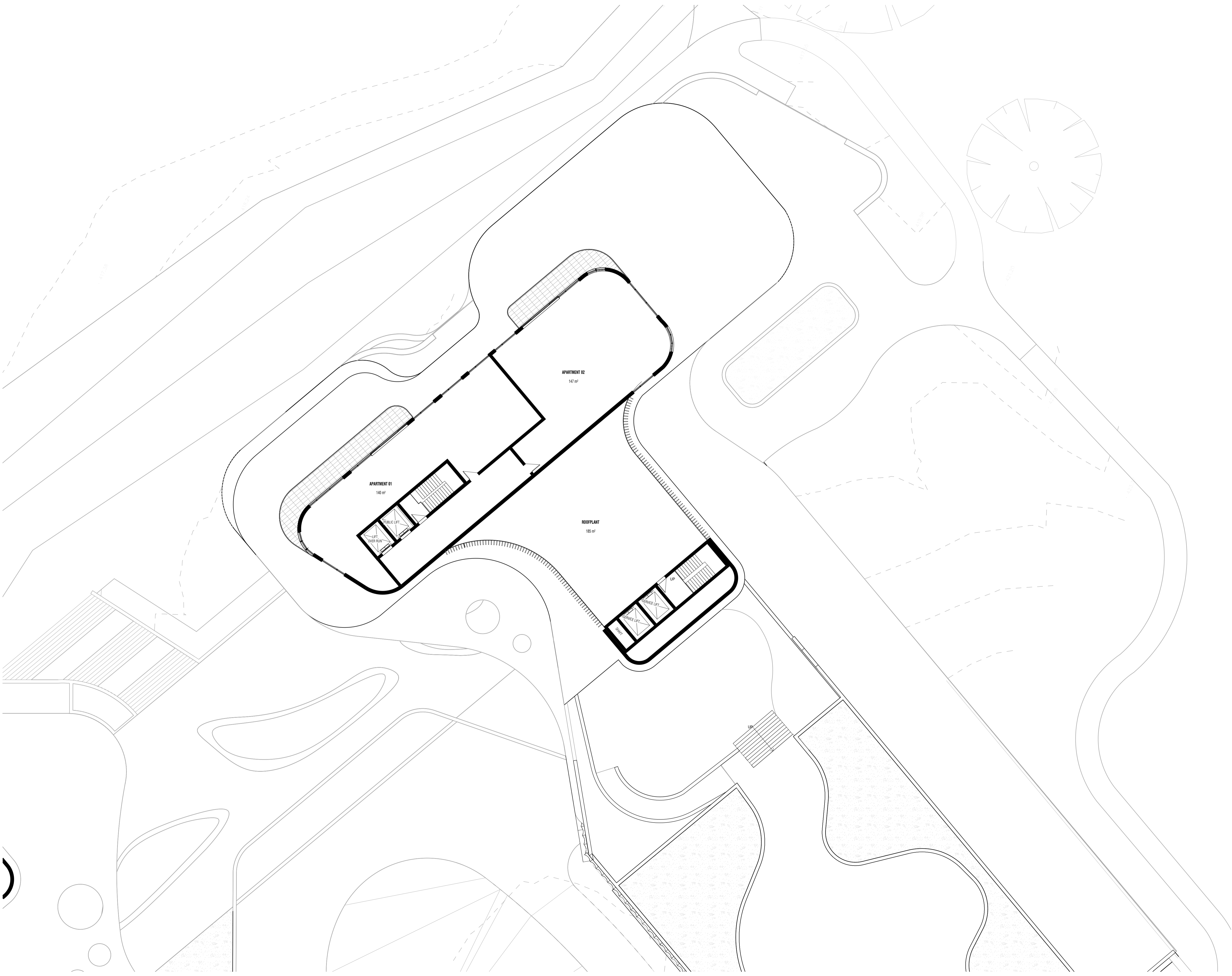
ADDRESS  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1  
 Scale@A3  
 Date: 30.03.23

SHEET NAME  
**FACILITIES\_SECOND FLOOR PLAN**

SHEET NO. TP15 REVISION: E

**\*PRELIMINARY NOT FOR CONSTRUCTION\***



HOTEL DEVELOPMENT SUMMARY	
85 GOLFLINKS RD, STIRLING, SA.	
DEVELOPMENT SITE AREA	
<b>HOTEL</b>	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
<b>TOTAL</b>	<b>88 UNITS</b>
<b>PODS</b>	
<b>TOTAL</b>	<b>17 UNITS - 1 BEDROOM</b>
<b>PARKING</b>	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

AREA SUMMARY	
AREA TYPE	AREA
<b>FACILITIES</b>	
BACK OF HOUSE / SERV. - LG	1039 m²
BACK OF HOUSE / SERV. - LEVEL 1	233 m²
GROUND FLOOR - F&B	323 m²
GROUND FLOOR - GOLF	429 m²
LEVEL 1	1393 m²
LEVEL 2	570 m²
LEVEL 3	447 m²
LOWER GROUND	957 m²
SERVICES CORE - L3	54 m²
	5426 m²
<b>FACILITIES CARPARK</b>	
FIRST FLOOR CARPARK	1461 m²
GROUND FLOOR CARPARK	1886 m²
LOADING BAY	67 m²
	3413 m²
<b>HOTEL</b>	
GROUND FLOOR	1095 m²
LEVEL 1	2334 m²
LEVEL 2	1659 m²
LEVEL 3	1921 m²
LOWER GROUND	1149 m²
	8157 m²
<b>HOTEL CARPARK</b>	
HOTEL CARPARK	1352 m²
LOWER GROUND CARPARK	1515 m²
	2867 m²
Grand total: 19	19864 m²

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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PROJECT  
**MOUNT LOFT GOLF ESTATE**

ADDRESS  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1  
Scale@A3  
Date: 30.03.23

SHEET NAME  
**FACILITIES THIRD FLOOR PLAN**

SHEET NO. REVISION:  
**TP16 E**

**\*PRELIMINARY NOT FOR CONSTRUCTION\***





ALL UNDERGROWTH TO BE CLEARED. ANY PROPOSED VEGETATION TO BE MAX 100MM OR APPROVED SPECIES AS PER CFS AND BUSH FIRE MANAGEMENT REQUIREMENTS. REFER LANDSCAPE PLAN FOR DETAILS.

ALL TREES LISTED AS (D) ARE CLASSIFIED AS DEAD. ALL DEAD TREES TO BE REMOVED. REFER ARBORIST REPORT FOR DETAILS.

ALL UNDERGROWTH TO BE CLEARED. ANY PROPOSED VEGETATION TO BE MAX 100MM OR APPROVED SPECIES AS PER CFS AND BUSH FIRE MANAGEMENT REQUIREMENTS. REFER LANDSCAPE PLAN FOR DETAILS.

HOTEL DEVELOPMENT SUMMARY	
35 GOLFLINKS RD, STIRLING, SA	
DEVELOPMENT SITE AREA	
HOTEL	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
<b>TOTAL</b>	<b>88 UNITS</b>
PODS	
<b>TOTAL</b>	<b>17 UNITS - 1 BEDROOM</b>
PARKING	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	20 SPACES

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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PROJECT  
MOUNT LOFT GOLF ESTATE

ADDRESS  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1  
Scale@A3

Date: 30.03.23

SHEET NAME  
PODS MASTERPLAN

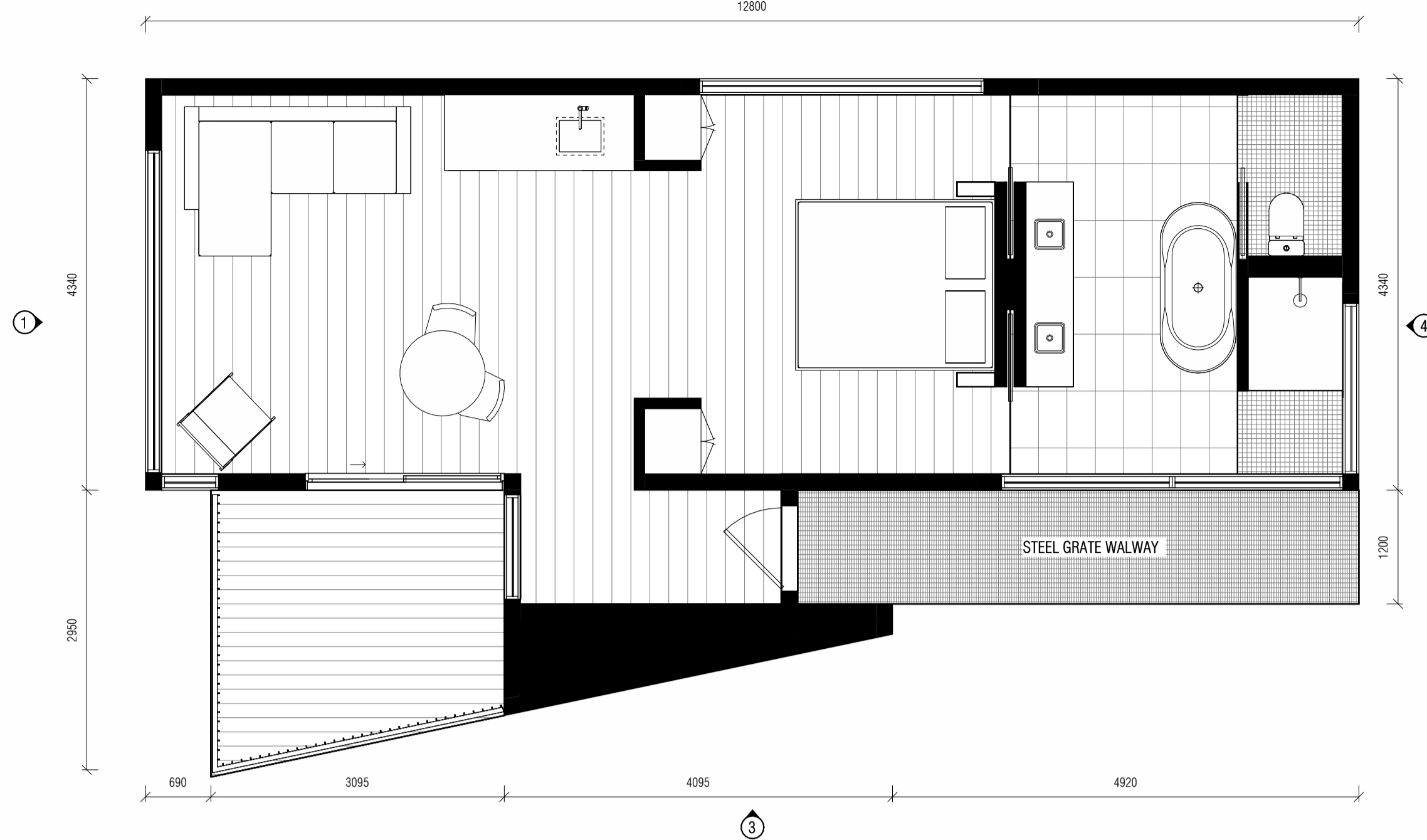
SHEET NO. TP17

REVISION: E

\*PRELIMINARY NOT FOR CONSTRUCTION\*



POD PLAN- TYPE A\_ 1:50



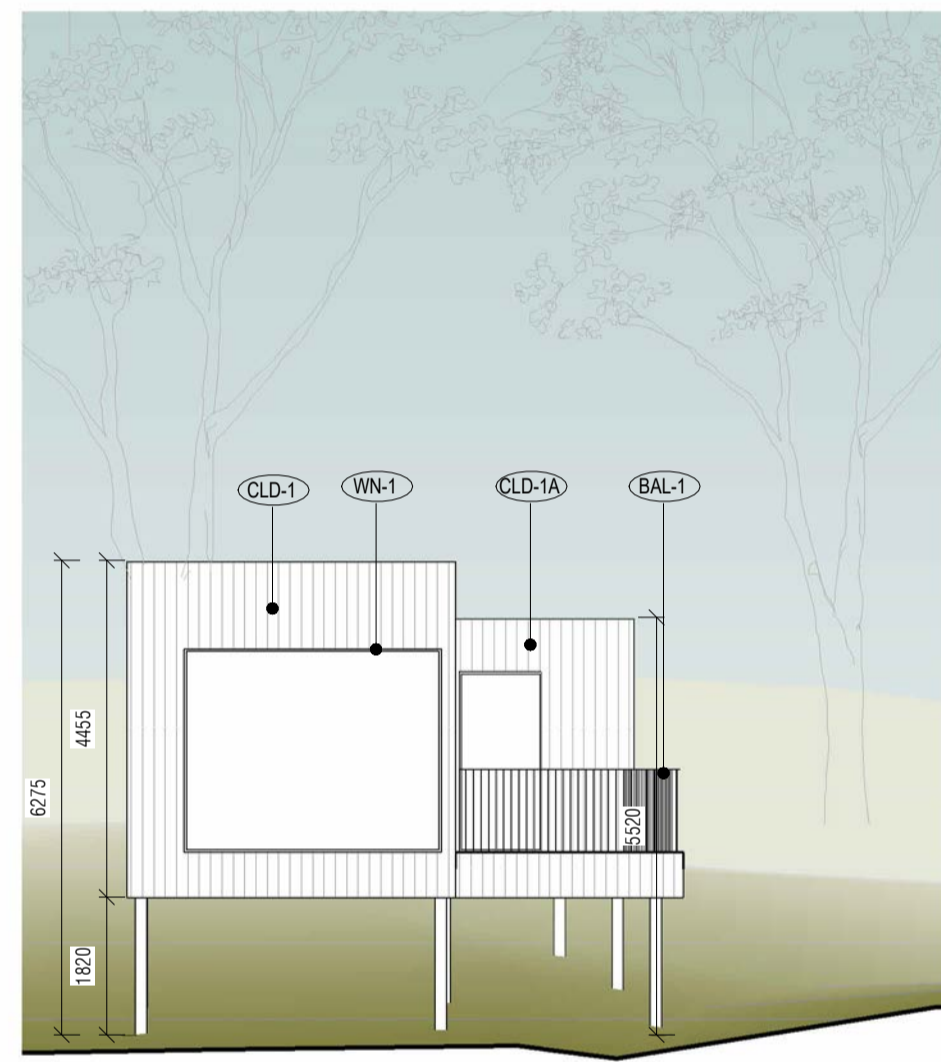
POD PLAN- TYPE B\_ 1:50



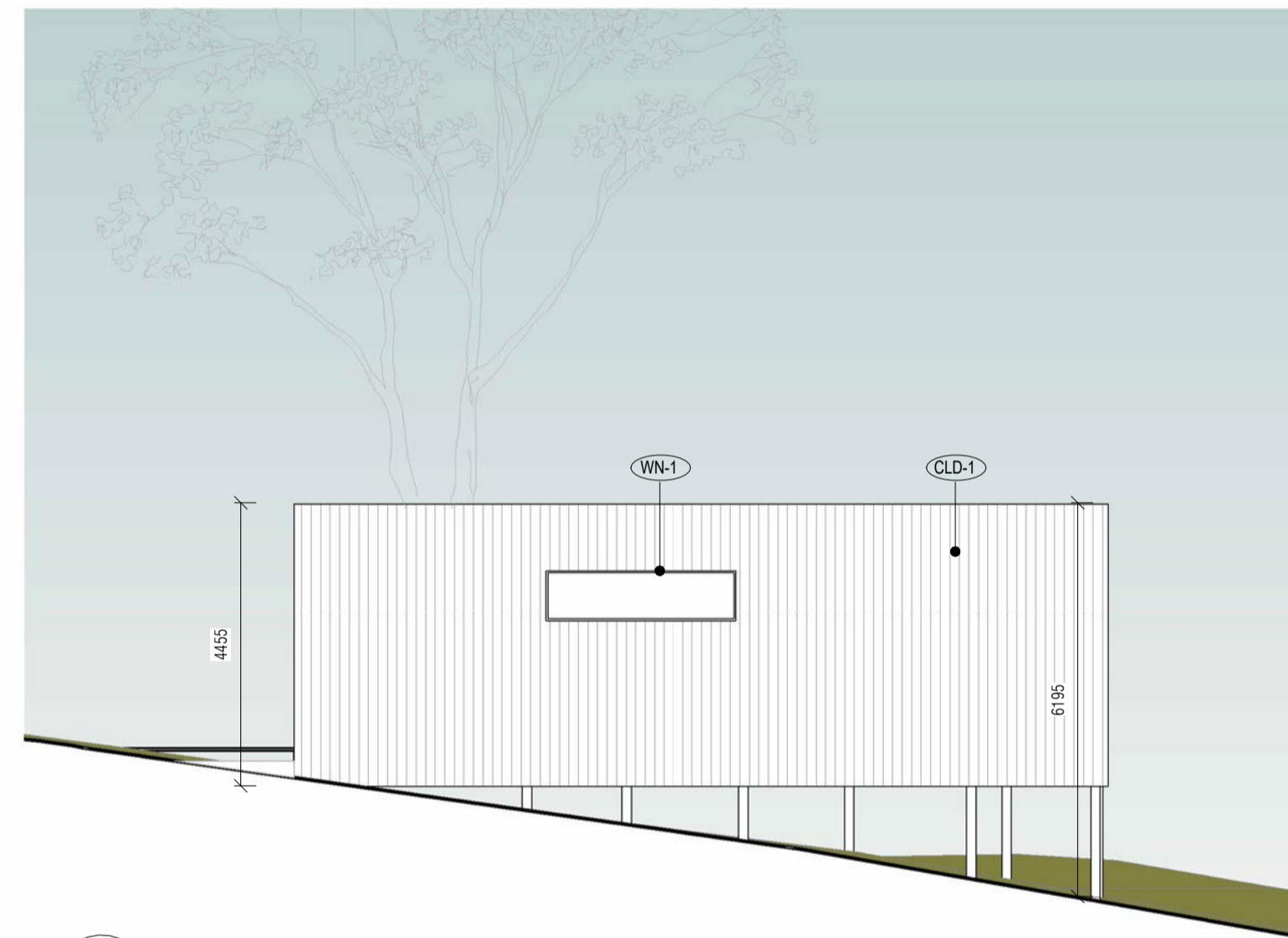
CLD-1\_ TIMBER SHIPLAP CLADDING



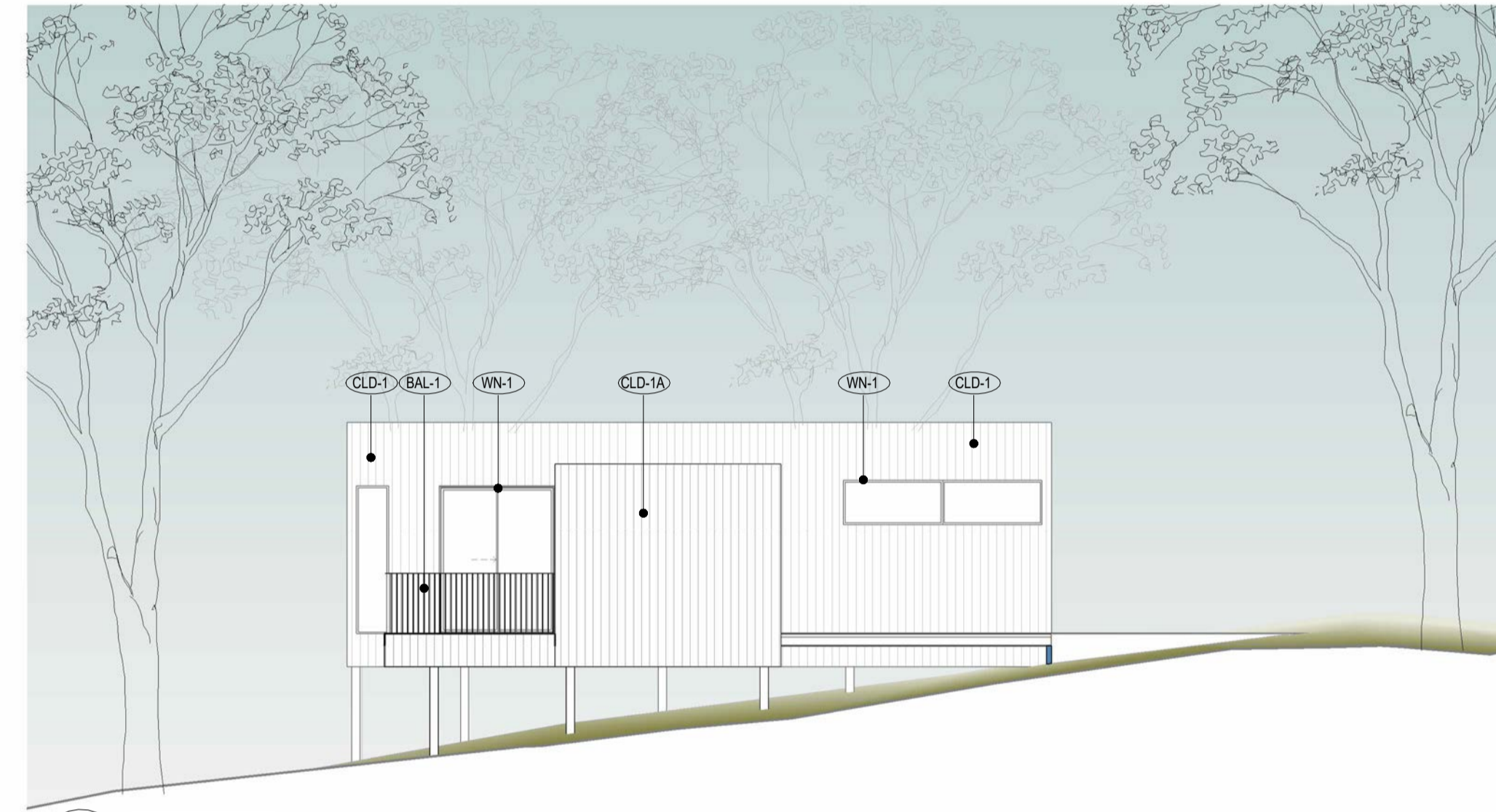
CLD-1A\_ CHARED TIMBER SHIPLAP CLADDING



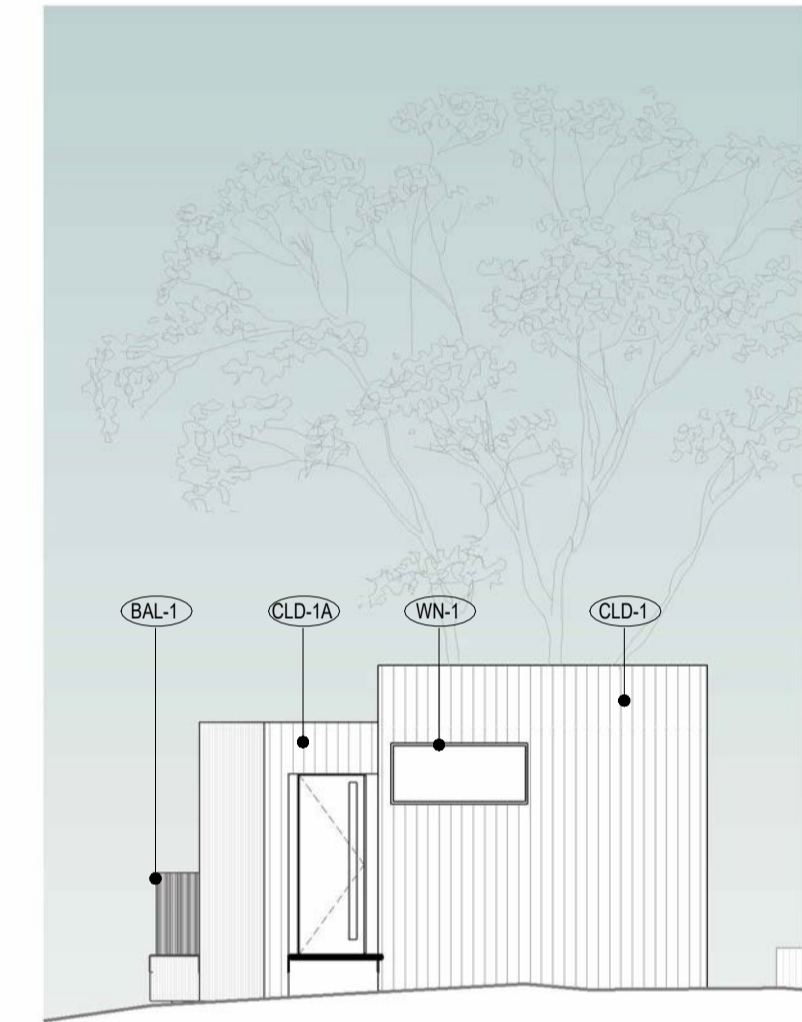
1 Elevation 1  
SCALE 1:100



2 Elevation 2  
SCALE 1:100



3 Elevation  
SCALE 1:100



4 Elevation 4  
SCALE 1:100



5 PODS Section  
SCALE 1:200

No.	Description	Date
A	DA- FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1 AS  
Scale@A3 INDICATED  
Date: 30.03.23

**SHEET NAME**  
PODS TYPICAL PLANS & ELEVATIONS

**SHEET NO.** TP18 **REVISION:** A

"PRELIMINARY NOT FOR CONSTRUCTION"





**FINISHES LEGEND**

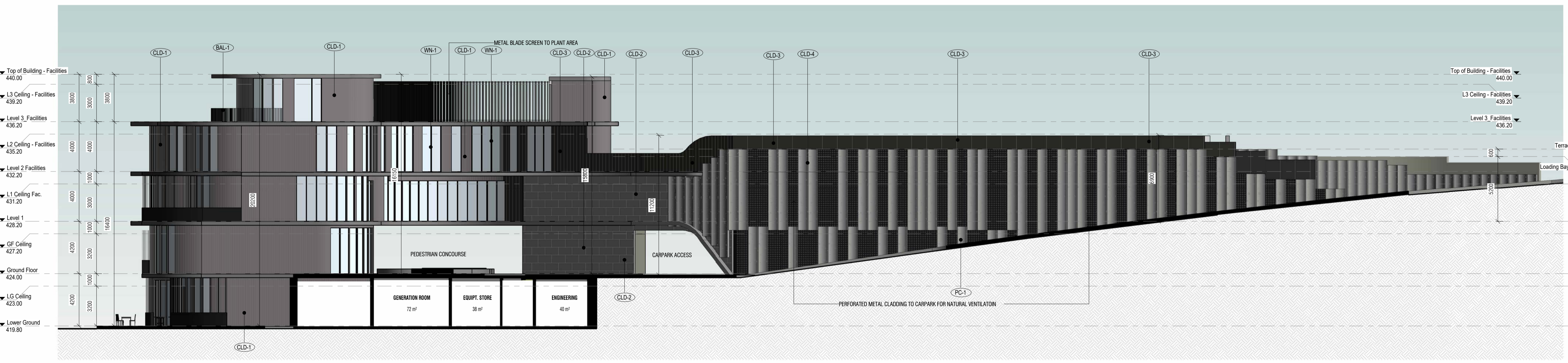
- CON-1 INSITU CONCRETE FINISH
- PC-1 CURVED PRECAST PANELS
- PC-2 PRECAST PANELS
- CLD-1 TIMBER CLADDING
- CLD-2 NATURAL SLATE CLADDING
- CLD-3 METAL PANALISED CLADDING
- CLD-4 PERFORATED METAL CLADDING
- WN-1 POWDERCOATED ALUMINIUM WINDOWS
- PL-1 PREFABRICATED METAL PLANTER WITH TRELIS
- BAL-1 METAL BLADE BALUSTRADE

**MATERIALS & FINISHED SCHEDULE**

<b>WALLS</b>	CON-1: INSITU CONCRETE SLAB EDGE AND WALLS COLOUR: NATURAL CONCRETE PC-1: CURVED PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE PC-2: PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE CLD-1: TIMBER CLADDING - MORTLOCK TRENDPLANK SHIPLAP CLADDING SPECIES: PACIFIC TEAK - BAL-19 COMPLIANT (OR EQUIVALENT) CLEAR OILED FINISH TO WEATHER CLD-2: SLATE SHINGLE CLADDING COLOUR: NATURAL FINISH CLD-3: PANELISED METAL CLADDING. 300MM INTERLOCKING PROFILE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT) CLD-4: PERFORATED METAL CLADDING. COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
<b>RAISED PLANTERS</b>	PL-1: PREFABRICATED ALUMINIUM PLANTER WITH WIRE TRELIS COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
<b>BALUSTRADE</b>	BAL-1: STEEL BLADE BALUSTRADE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
<b>WINDOWS</b>	POWDERCOAT ALUMINIUM FRAME WINDOWS WITH GLAZING. COLOUR: BLACK (OR SIMILAR)
<b>DOORS</b>	CARPARK DOORS. PERFORATED METAL SECTIONAL GARAGE DOORS COLOUR: COLORBOND NIGHT SKY- BLACK (OR SIMILAR)

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA- FURTHER INFORMATION SUBMISSION	30.03.23

**1 FACILITIES NORTH ELEVATION**  
SCALE 1:150



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**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

**Scale@A1**  
Scale@A3

**Date:** 30.03.23

**SHEET NAME**  
ELEVATIONS\_FACTILITIES

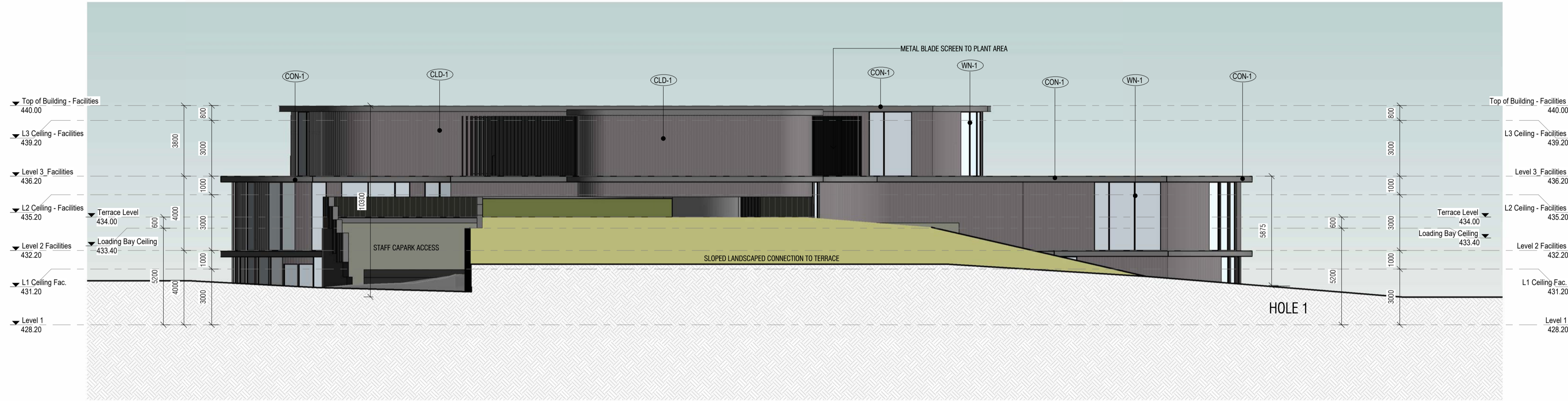
SHEET NO.	REVISION:
	E

**TP19.1**

\*PRELIMINARY NOT FOR CONSTRUCTION\*

**2 FACILITIES WEST ELEVATION**  
SCALE 1:175





1 FACILITIES SOUTH ELEVATION  
SCALE 1:150

- ### FINISHES LEGEND
- CON-1 INSITU CONCRETE FINISH
  - PC-1 CURVED PRECAST PANELS
  - PC-2 PRECAST PANELS
  - CLD-1 TIMBER CLADDING
  - CLD-2 NATURAL SLATE CLADDING
  - CLD-3 METAL PANELISED CLADDING
  - CLD-4 PERFORATED METAL CLADDING
  - WN-1 POWDERCOATED ALUMINIUM WINDOWS
  - PL-1 PREFABRICATED METAL PLANTER WITH TRELIS
  - BAL-1 METAL BLADE BALUSTRADE

### MATERIALS & FINISHED SCHEDULE

WALLS	CON-1: INSITU CONCRETE SLAB EDGE AND WALLS COLOUR: NATURAL CONCRETE  PC-1: CURVED PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE  PC-2: PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE  CLD-1: TIMBER CLADDING - MORTLOCK TRENDPLANK SHIPLAP CLADDING SPECIES: PACIFIC TEAK - BAL-19 COMPLIANT (OR EQUIVALENT) CLEAR OILED FINISH TO WEATHER  CLD-2: SLATE SHINGLE CLADDING COLOUR: NATURAL FINISH  CLD-3: PANELISED METAL CLADDING, 300MM INTERLOCKING PROFILE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)  CLD-4: PERFORATED METAL CLADDING COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
RAISED PLANTERS	PL-1: PREFABRICATED ALUMINIUM PLANTER WITH WIRE TRELIS COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
BALUSTRADE	BAL-1: STEEL BLADE BALUSTRADE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
WINDOWS	WN-1: POWDERCOATED ALUMINIUM FRAME WINDOWS WITH GLAZING. COLOUR: BLACK (OR SIMILAR)
DOORS	CARPARK DOORS: PERFORATED METAL SECTIONAL GARAGE DOORS COLOUR: COLORBOND NIGHT SKY - BLACK (OR SIMILAR)

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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2 FACILITIES EAST ELEVATION  
SCALE 1:175

PROJECT  
**MOUNT LOFT GOLF ESTATE**

ADDRESS  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1  
Scale@A3  
Date: 30.03.23

SHEET NAME  
ELEVATION FACILITIES

SHEET NO. REVISION:  
TP19.2 E

\*PRELIMINARY NOT FOR CONSTRUCTION\*

**FINISHES LEGEND**

- CON-1** INSITU CONCRETE FINISH
- PC-1** CURVED PRECAST PANELS
- PC-2** PRECAST PANELS
- CLD-1** TIMBER CLADDING
- CLD-2** NATURAL SLATE CLADDING
- CLD-3** METAL PANELISED CLADDING
- CLD-4** PERFORATED METAL CLADDING
- WN-1** POWDERCOATED ALUMINIUM WINDOWS
- PL-1** PREFABRICATED METAL PLANTER WITH TRELIS
- BAL-1** METAL BLADE BALUSTRADE

**MATERIALS & FINISHED SCHEDULE**

Category	Material / Finish
WALLS	CON-1: INSITU CONCRETE SLAB EDGE AND WALLS COLOUR: NATURAL CONCRETE
	PC-1: CURVED PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE
	PC-2: PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE
RAISED PLANTERS	CLD-1: TIMBER CLADDING - MORTLOCK TRENDPLANK SHIPLAP CLADDING SPECIES: PACIFIC TEAK - BAL-19 COMPLIANT (OR EQUIVALENT) CLEAR OILED FINISH TO WEATHER
	CLD-2: SLATE SHINGLE CLADDING COLOUR: NATURAL FINISH
	CLD-3: PANELISED METAL CLADDING. 300MM INTERLOCKING PROFILE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
	CLD-4: PERFORATED METAL CLADDING. COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
BALUSTRADE	PL-1: PREFABRICATED ALUMINIUM PLANTER WITH WIRE TRELIS COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
	BAL-1: STEEL BLADE BALUSTRADE COLOUR: BLACK (OR SIMILAR)
WINDOWS	WN-1: POWDERCOAT ALUMINIUM FRAME WINDOWS WITH GLAZING. COLOUR: BLACK (OR SIMILAR)
	DOORS: CARPARK DOORS: PERFORATED METAL SECTIONAL GARAGE DOORS COLOUR: COLORBOND NIGHT SKY - BLACK (OR SIMILAR)



**1 HOTEL WEST ELEVATION**  
SCALE 1:150



**2 HOTEL NORTH ELEVATION**  
SCALE 1:150

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale: A1  
Scale: A3

Date: 30.03.23

**SHEET NAME**  
ELEVATION\_HOTEL

**SHEET NO.** TP19.3 **REVISION:** E

**\*PRELIMINARY NOT FOR CONSTRUCTION\***



**FINISHES LEGEND**

- CON-1 INSITU CONCRETE FINISH
- PC-1 CURVED PRECAST PANELS
- PC-2 PRECAST PANELS
- CLD-1 TIMBER CLADDING
- CLD-2 NATURAL SLATE CLADDING
- CLD-3 METAL PANALISED CLADDING
- CLD-4 PERFORATED METAL CLADDING
- WN-1 POWDERCOATED ALUMINIUM WINDOWS
- PL-1 PREFABRICATED METAL PLANTER WITH TRELIS
- BAL-1 METAL BLADE BALUSTRADE

**MATERIALS & FINISHED SCHEDULE**

WALLS	CON-1: INSITU CONCRETE SLAB EDGE AND WALLS COLOUR: NATURAL CONCRETE
	PC-1: CURVED PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE
RAISED PLANTERS	PC-2: PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE
	CLD-1: TIMBER CLADDING - MORTLOCK TRENDPLANK SHIP LAPPING SPECIES: PACIFIC TEAK - BAL-19 COMPLIANT (OR EQUIVALENT) CLEAR OILED FINISH TO WEATHER
	CLD-2: SLATE SHINGLE CLADDING. COLOUR: NATURAL FINISH
	CLD-3: PANALISED METAL CLADDING. 300MM INTERLOCKING PROFILE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
BALUSTRADE	CLD-4: PERFORATED METAL CLADDING. COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
	PL-1: PREFABRICATED ALUMINIUM PLANTER WITH WIRE TRELIS COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
WINDOWS	BAL-1: STEEL BLADE BALUSTRADE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
	WN-1: POWDERCOATED ALUMINIUM FRAME WINDOWS WITH GLAZING. COLOUR: BLACK (OR SIMILAR)
DOORS	CARPARK DOORS: PERFORATED METAL SECTIONAL GARAGE DOORS COLOUR: COLORBOND NIGHT SKY (BLACK OR SIMILAR)

**1 HOTEL EAST ELEVATION**  
SCALE 1:150

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23



**2 HOTEL SOUTH ELEVATION**  
SCALE 1:150

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PROJECT  
**MOUNT LOFT GOLF ESTATE**

ADDRESS  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1  
Scale@A3  
Date: 30.03.23

SHEET NAME  
**ELEVATION HOTEL**

SHEET NO. REVISION:

**TP19.4** E

**\*PRELIMINARY NOT FOR CONSTRUCTION\***



### 1 Section A Facilities

SCALE 1:500



### 2 Section B Entry

SCALE 1:500



### 3 Section Long Section Hotel

SCALE 1:500

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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PROJECT  
MOUNT LOFT GOLF ESTATE

ADDRESS  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1  
Scale@A3  
Date: 30.03.23

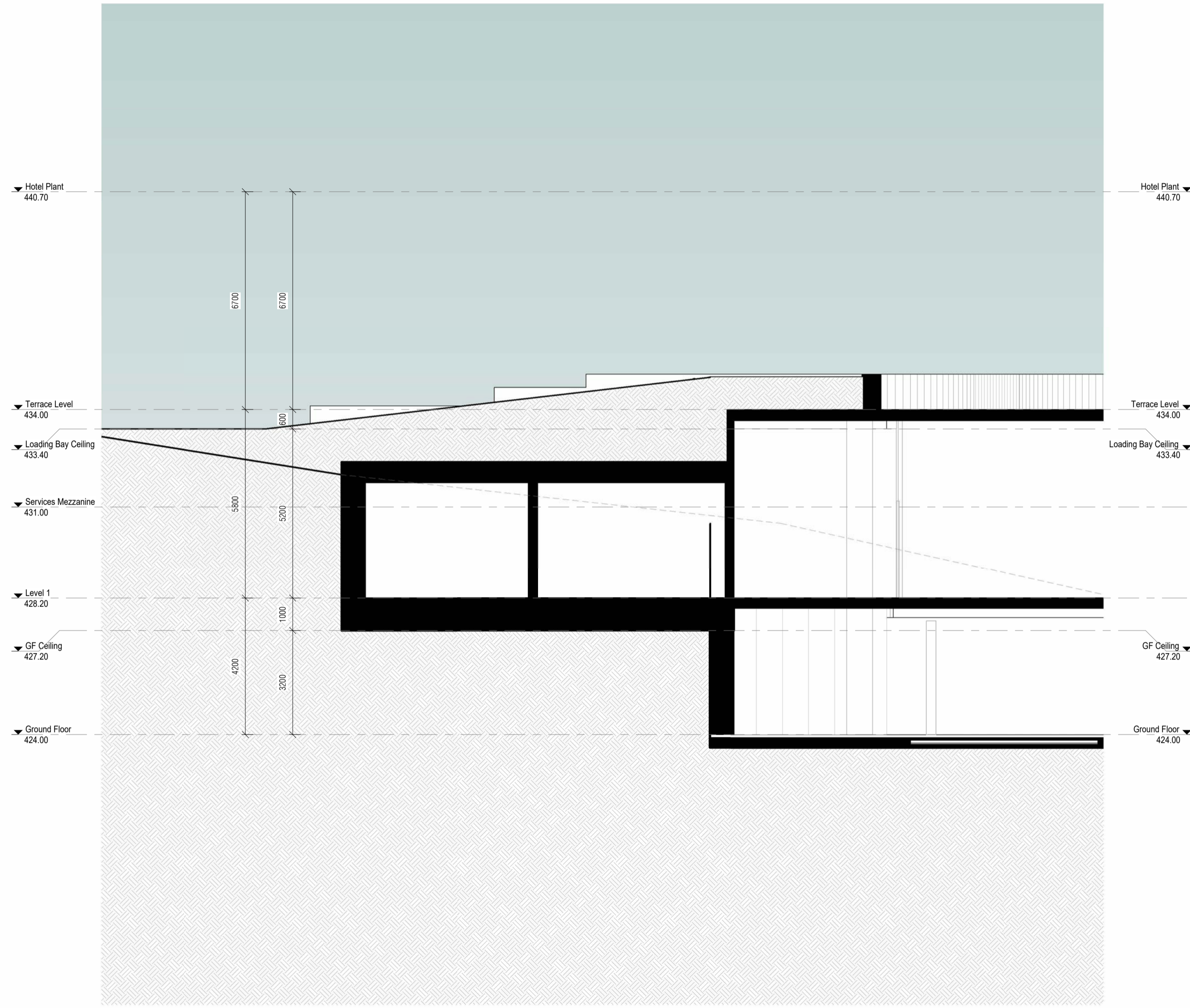
SHEET NAME  
SECTIONS

SHEET NO.                  REVISION:  
E

TP20.1

\*PRELIMINARY NOT FOR CONSTRUCTION\*





**1 Section A Facilities -Callout 1**  
 TP20.1 SCALE 1 : 100



**2 Section A Facilities -Callout 2**  
 TP20.1 SCALE 1 : 100

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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PROJECT  
**MOUNT LOFT GOLF ESTATE**

ADDRESS  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1 1:100  
 Scale@A3 1:200  
 Date: 30.03.23

SHEET NAME  
**SECTIONS**

SHEET NO. TP20.2 REVISION: E

**\*PRELIMINARY NOT FOR CONSTRUCTION\***





No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21
C	DA - FURTHER INFORMATION, DRAFT	08.09.22
D	DA - FURTHER INFORMATION SUBMISSION	29.11.22
E	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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PROJECT  
**MOUNT LOFT GOLF ESTATE**

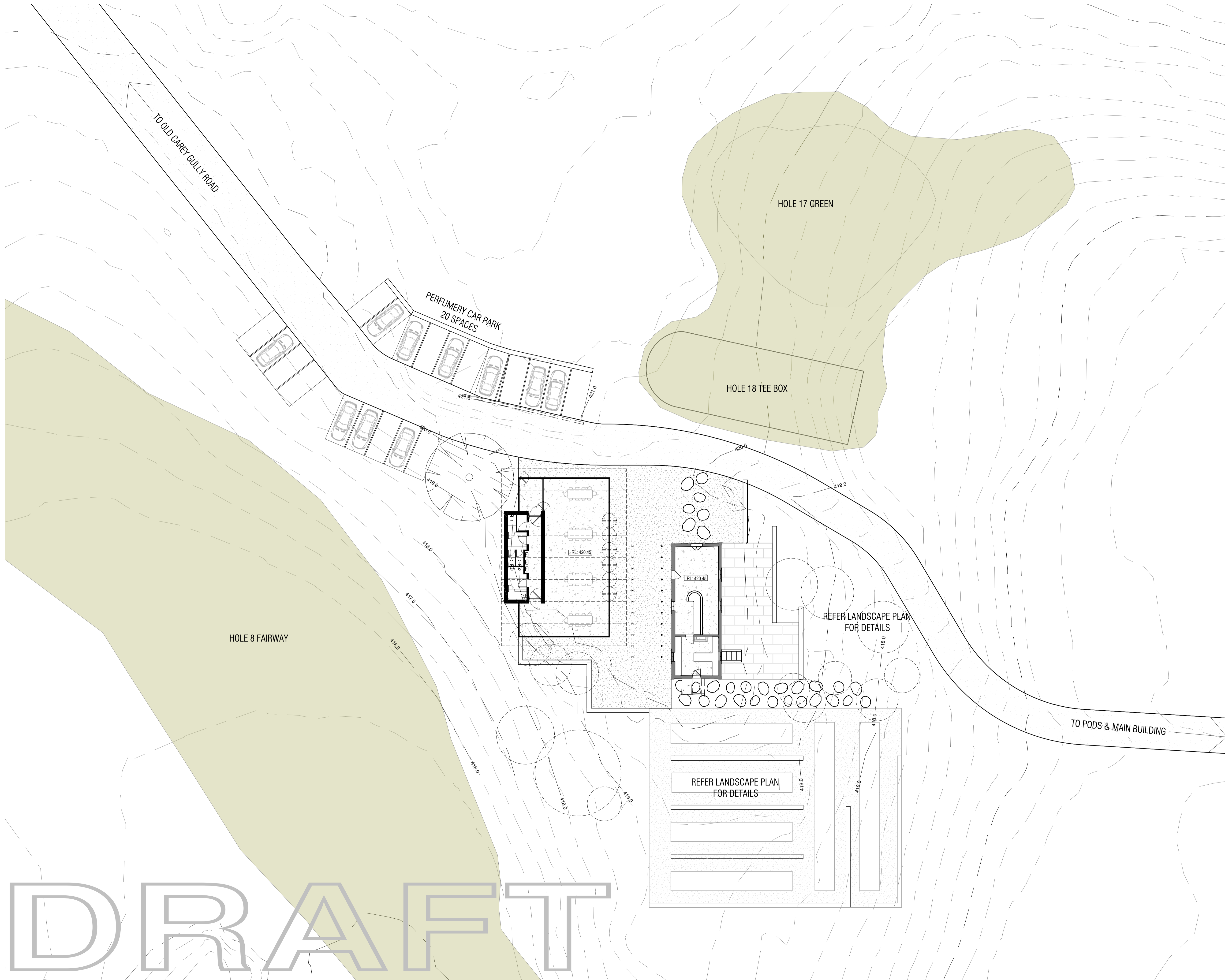
ADDRESS  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1 1:100  
 Scale@A3 1:200  
 Date: 30.03.23

SHEET NAME  
**SECTIONS**

SHEET NO. REVISION:  
**TP20.3 E**

**\*PRELIMINARY NOT FOR CONSTRUCTION\***



DRAFT

No.	Description	Date
A	PERFUMERY PRELIMINARY CONCEPT	22.02.23
B	DA- FURTHER INFORMATION SUBMISSION	30.03.23

The drawings are to be viewed with regard to the scale at which the document has been issued and for the specific purpose of the issue. The information contained within is considered to be correct at the time of documentation. As an uncontrolled document, R ARCHITECTURE accepts no responsibility for alterations by persons other than those issued. By accepting and utilizing any drawings or other data or any form of electronic media generated and provided by R ARCHITECTURE the Client agrees not to use these drawings and data, in whole or in part, for any purpose or project other than the project which is the subject of this agreement. The Client agrees to waive all claims against R ARCHITECTURE resulting in any way or from any unauthorised changes or reuse of the drawings and data for any other project by anyone other than R ARCHITECTURE. In addition, the Client agrees, to the fullest extent permitted by the law, to indemnify and hold R ARCHITECTURE harmless from any damage, liability, or cost, including costs of defence, arising from any changes made by anyone other than R ARCHITECTURE or from any reuse of the drawings and data without prior written consent of R ARCHITECTURE. By accepting and utilizing any drawings or other data on any form of electronic media generated and provided by R ARCHITECTURE, the Client agrees that all such drawings and data are instruments of service of R ARCHITECTURE, who shall be deemed the author of the drawings and data and shall retain all common law, statutory law and other rights, including copyrights and Intellectual property.

**PROJECT**  
MOUNT LOFTY GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

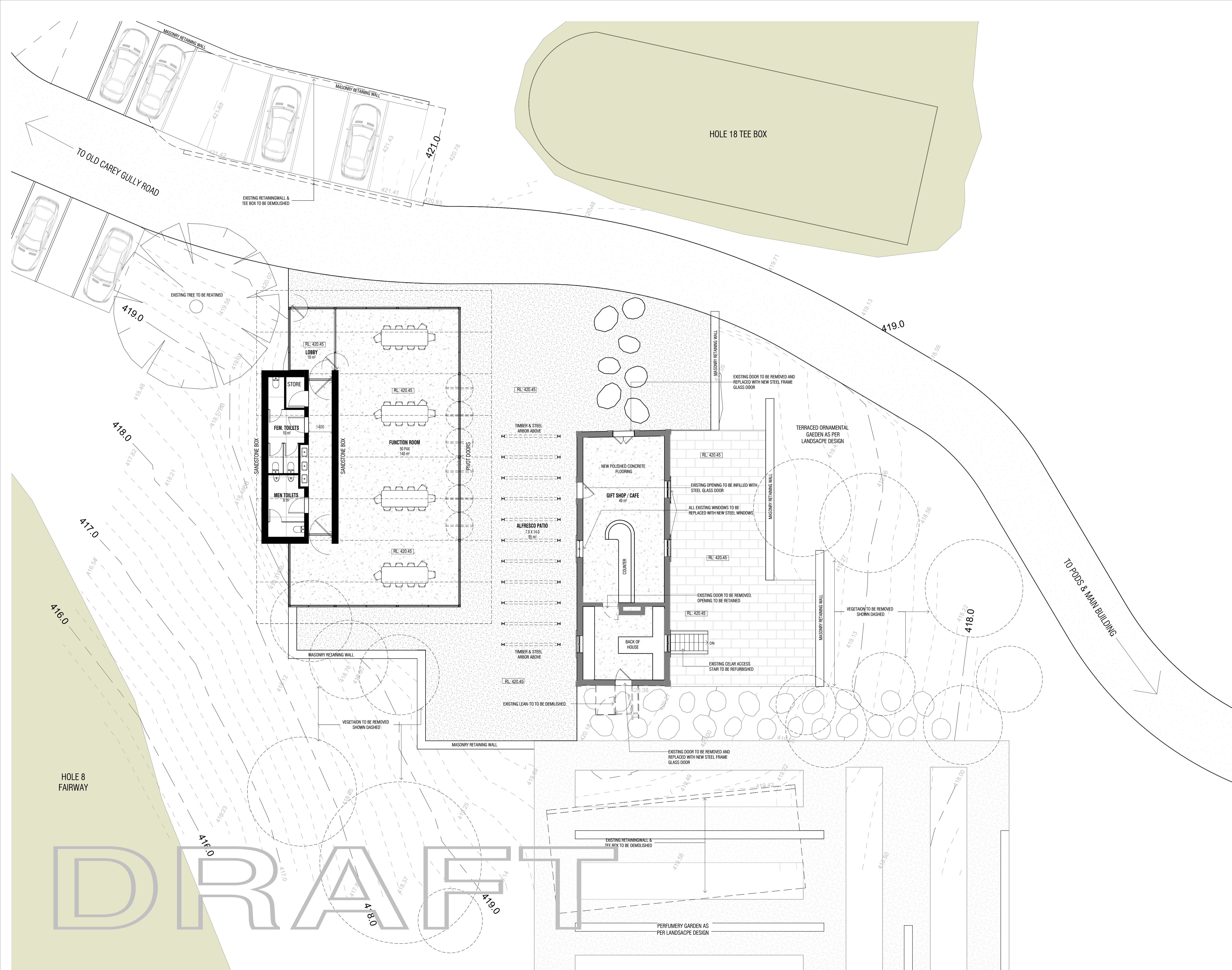
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Date: 30.03.23

**SHEET NAME**  
PERFUMERY - SITE PLAN

SHEET NO. TP21.0 REVISION: B

\*PRELIMINARY NOT FOR CONSTRUCTION\*





No.	Description	Date
A	PERFUMERY PRELIMINARY CONCEPT	22.02.23
B	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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PROJECT  
MOUNT LOFTY GOLF ESTATE

ADDRESS  
35 GOLF LINKS ROAD, STIRLING SA 5152

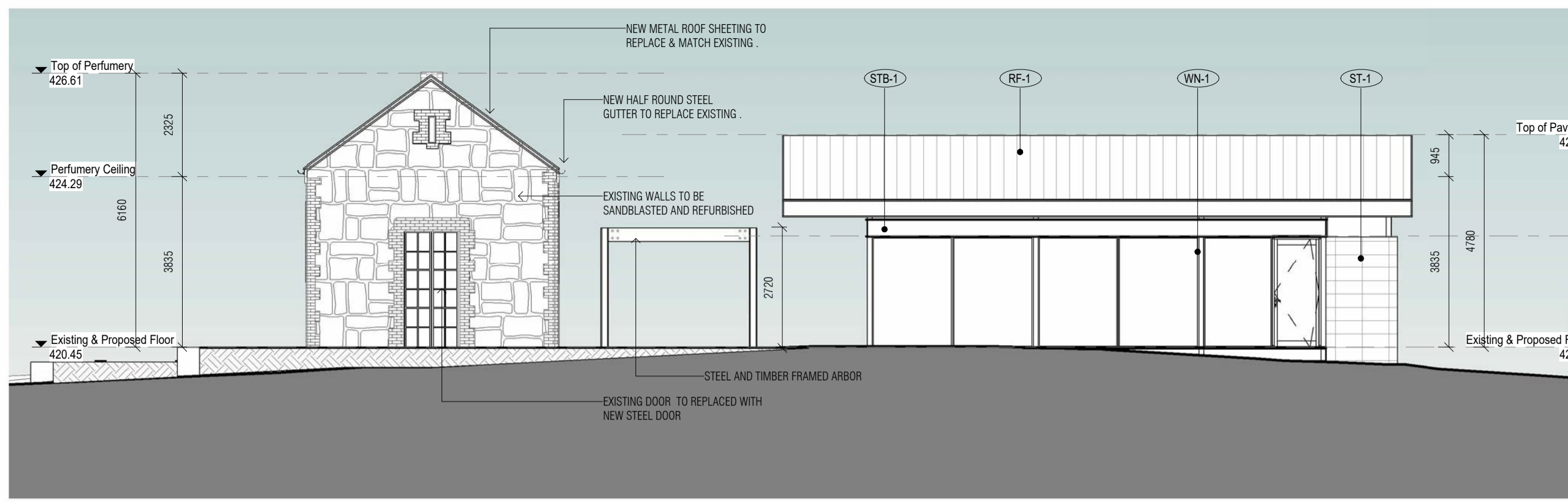
Scale@A1 1:100  
Scale@A3 1:200  
Date: 30.03.23

SHEET NAME  
PERFUMERY - GROUND FLOOR PLAN

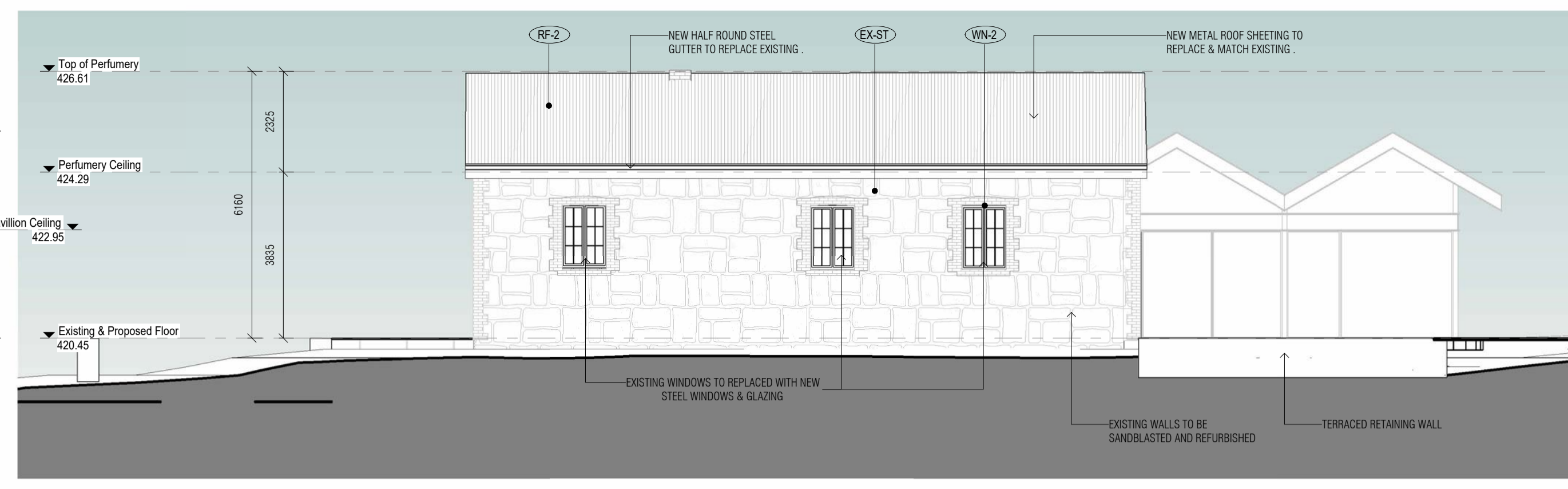
SHEET NO. REVISION:  
TP21.1 B

\*PRELIMINARY NOT FOR CONSTRUCTION\*

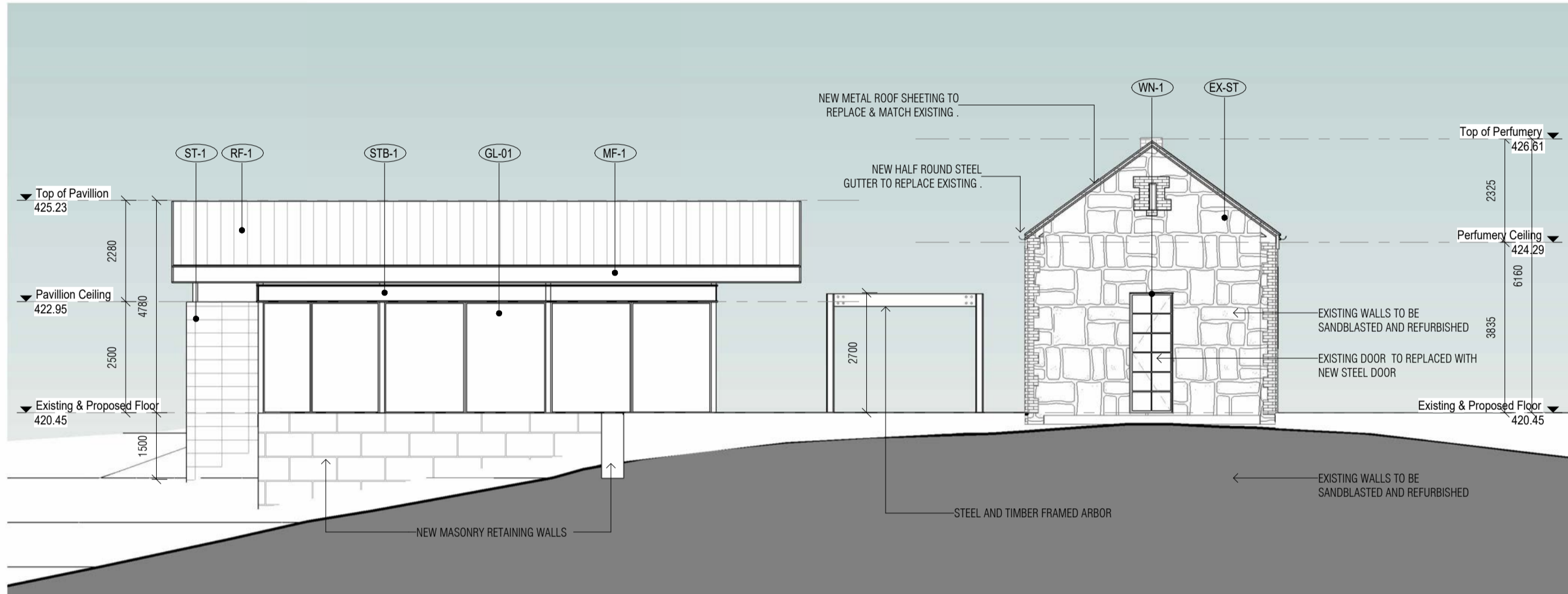




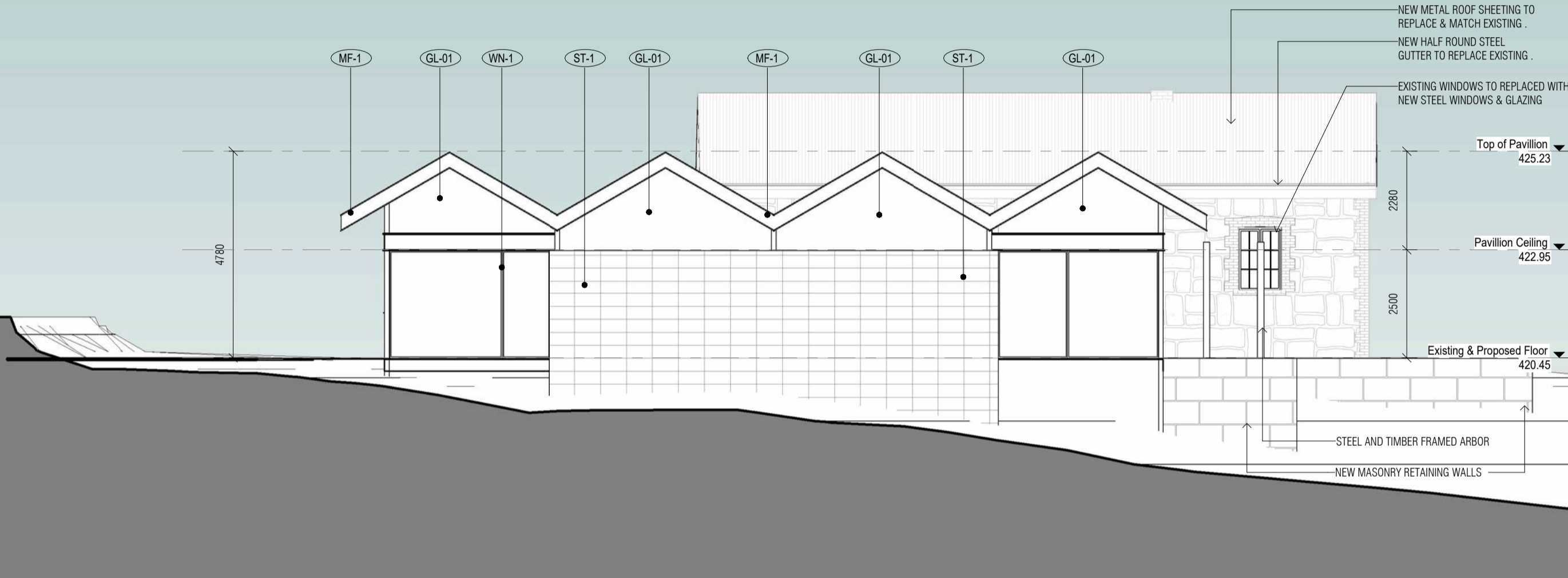
1 North Elevation  
SCALE 1:100



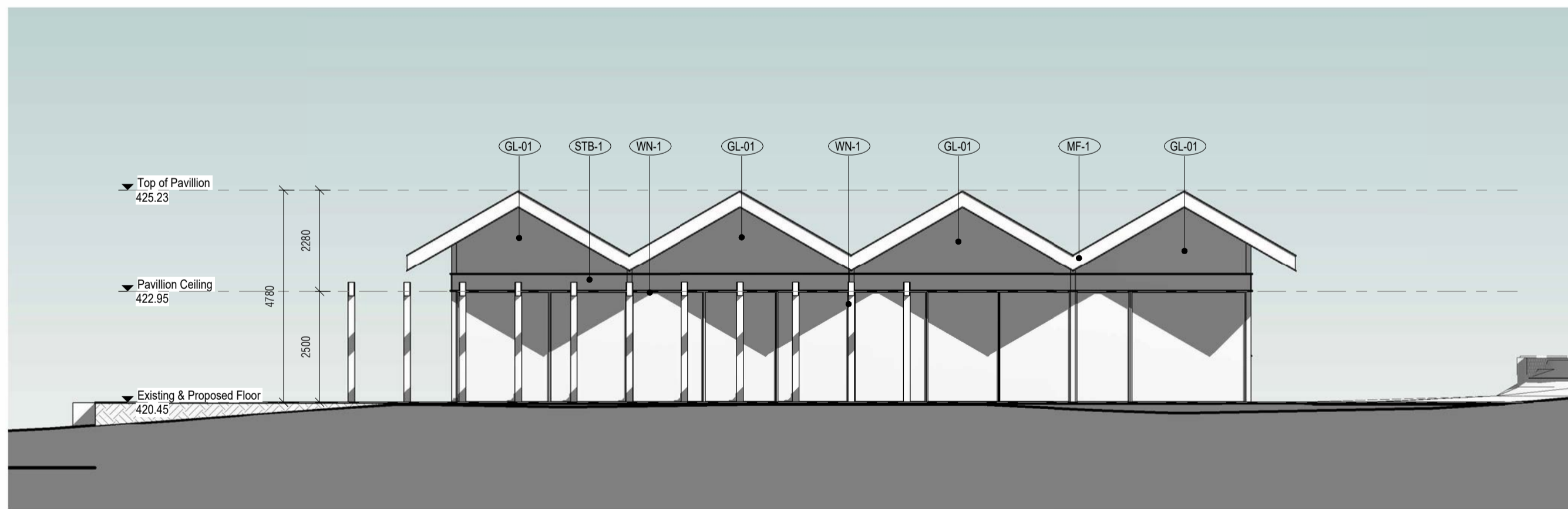
2 East Elevation  
SCALE 1:100



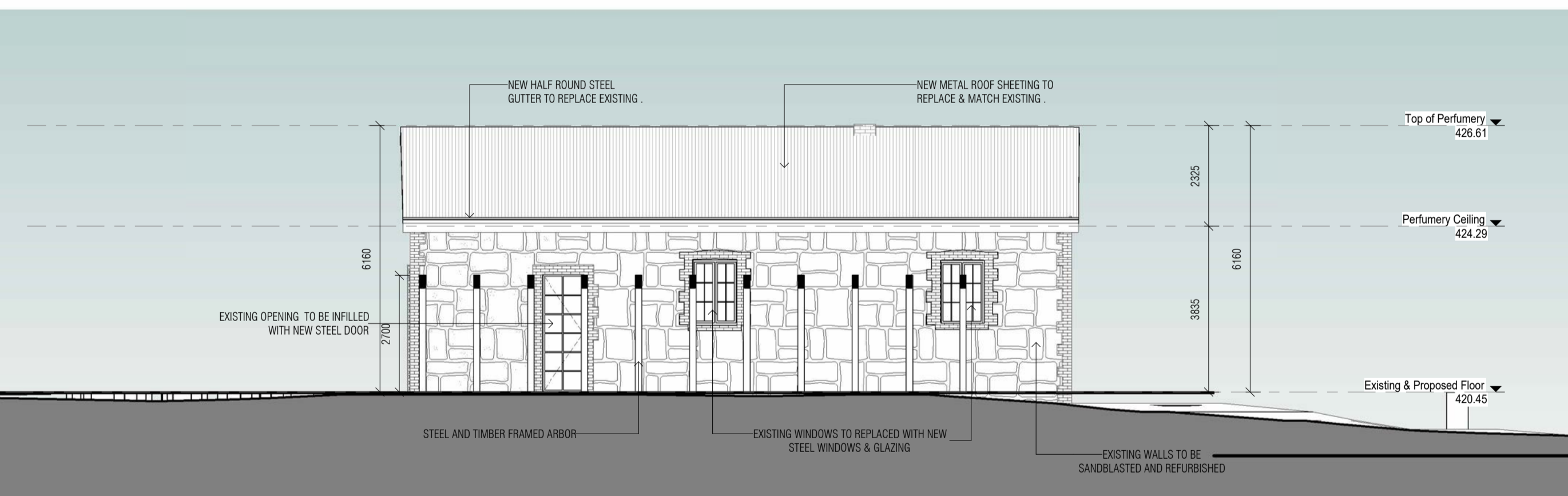
3 South Elevation  
SCALE 1:100



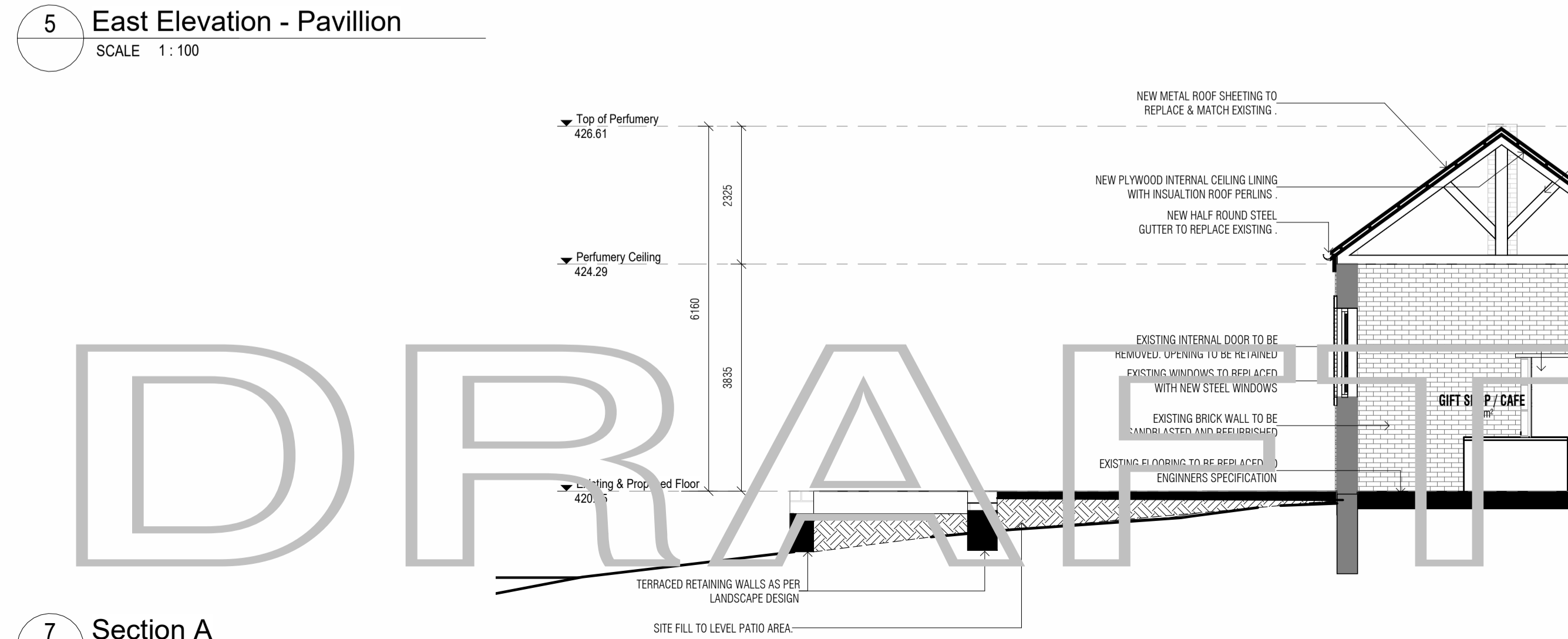
4 West Elevation  
SCALE 1:100



5 East Elevation - Pavillion  
SCALE 1:100



6 West Elevation - Perfumery  
SCALE 1:100



7 Section A  
SCALE 1:75

FINISHES LEGEND

- ST-1 STONE CLADDING
- EX-ST EXISTING REFINISHED STONE
- RF-1 NEW STANDING SEAM ROOF
- RF-2 NEW - REFINISHED ROOF - TO MATCH EXISTING
- MF-1 METAL ROOF FACIA
- STB-1 POWDERCOATED STEEL BEAM
- WN-1 POWDERCOATED ALUMINIUM WINDOWS
- WN-2 POWDERCOATED STEEL WINDOWS
- GL-1 FRAMLESS GLASS INFIL

No.	Description	Date
A	PERFUMERY - PRELIMINARY CONCEPT	22.02.23
B	DA- FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFTY GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1 1:100  
Scale@A3 1:200  
Date: 30.03.23

**SHEET NAME**  
PERFUMERY - ELEVATIONS

**SHEET NO.** TP21.2 **REVISION:** B

\*PRELIMINARY NOT FOR CONSTRUCTION\*

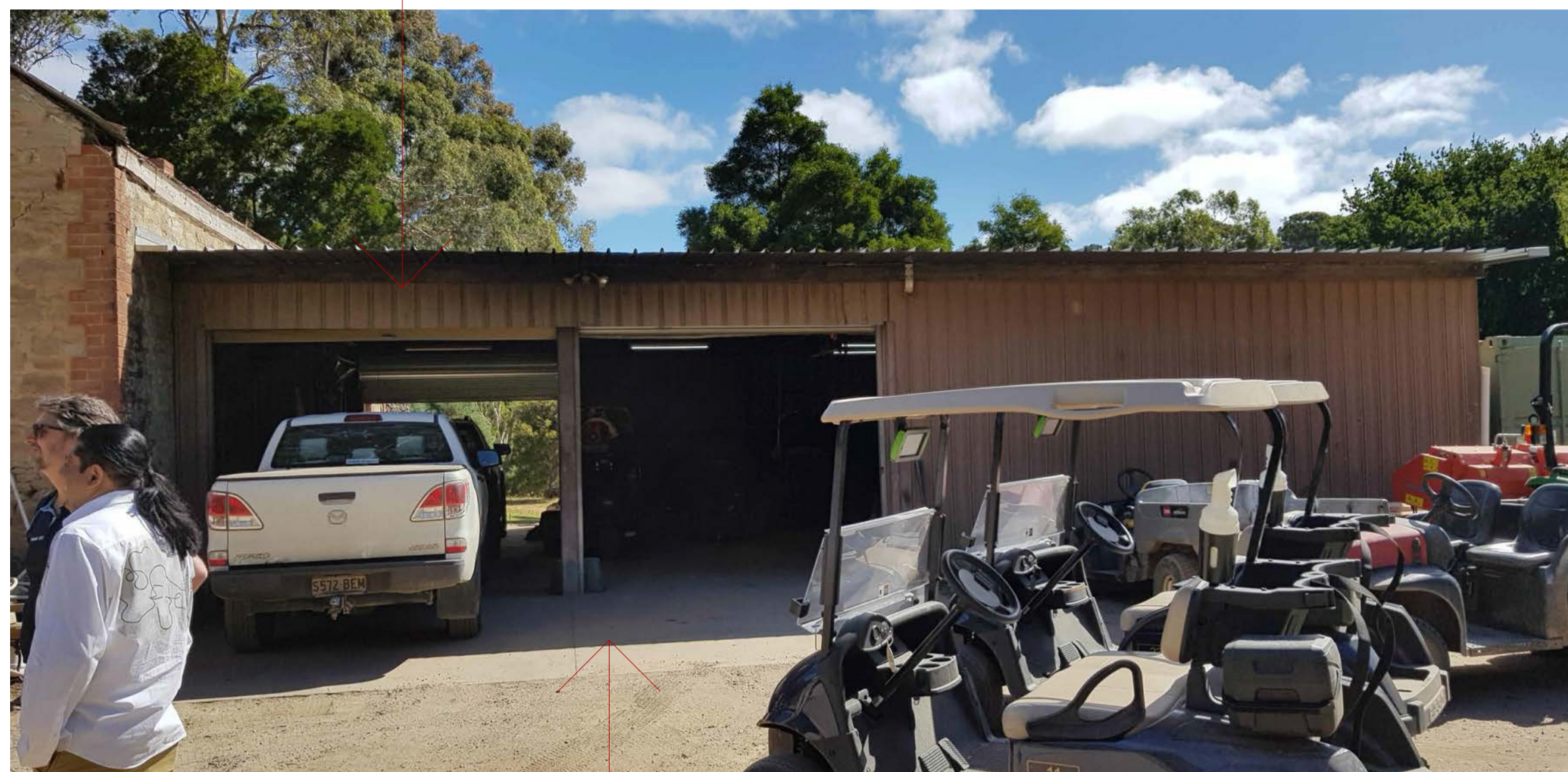
**R ARCHITECTURE**  
architect | interior design | urban design | landscape  
ph 8822 8225 | info@rarchitect.com.au

REAR LEAN-TO TO BE DEMOLISHED

NEW ROOF & GUTTERING TO MATCH EXISTING

EXISTING ADDITIONAL SHED TO BE DEMOLISHED

EXISTING BUILDING TO BE RETAINED & REFURBISHED



EXISTING BUILDING TO BE RETAINED & REFURBISHED

EXISTING CONCRETE SLAB TO BE REMOVED

EXISTING WINDOWS TO BE REPLACED WITH NEW STEEL WINSOWS



EXISTING ORGEGAN PINE TIMBER TRUSS TO BE RETAINED. ENGINEER TO PROVIDE FURTHER INSPECTION AND CONFIRMATION. PLY LINING TO UNDER SIDE OF TRUSSES WITH INSULATION. NEW WINDOWS STEEL PROVICED TO EXISTING OPENINGS.

EXISTING OPENING TO BE INFILLED WITH STEEL FRAME DOOR.

EXISTING DOOR TO BE REMOVED & OPEING TO BE RETAINED FOR BACK OF HOUSE ACCESS.

INTERIOR WALLS TO BE SAND BLASTED TO EXPOSE BRICK & STONE

EXISTING CONCRETE SLAB TO BE PROVIDED WITH NEW POLISHED CONCRETE TOPPING ON EXISTING SLAB TO ENGINEERS SPEC.

EXISTING CONCRETE SLAB TO SHED AREA TO BE REMOVED

NEW EXPOSED TIMBER TRUSS TO BE PROVIDED. INTERNAL TIMBER LINING TO UNDER SIDE OF TRUSSES WITH INSULATION.



No.	Description	Date
A DA	FURTHER INFORMATION SUBMISSION	30.03.23

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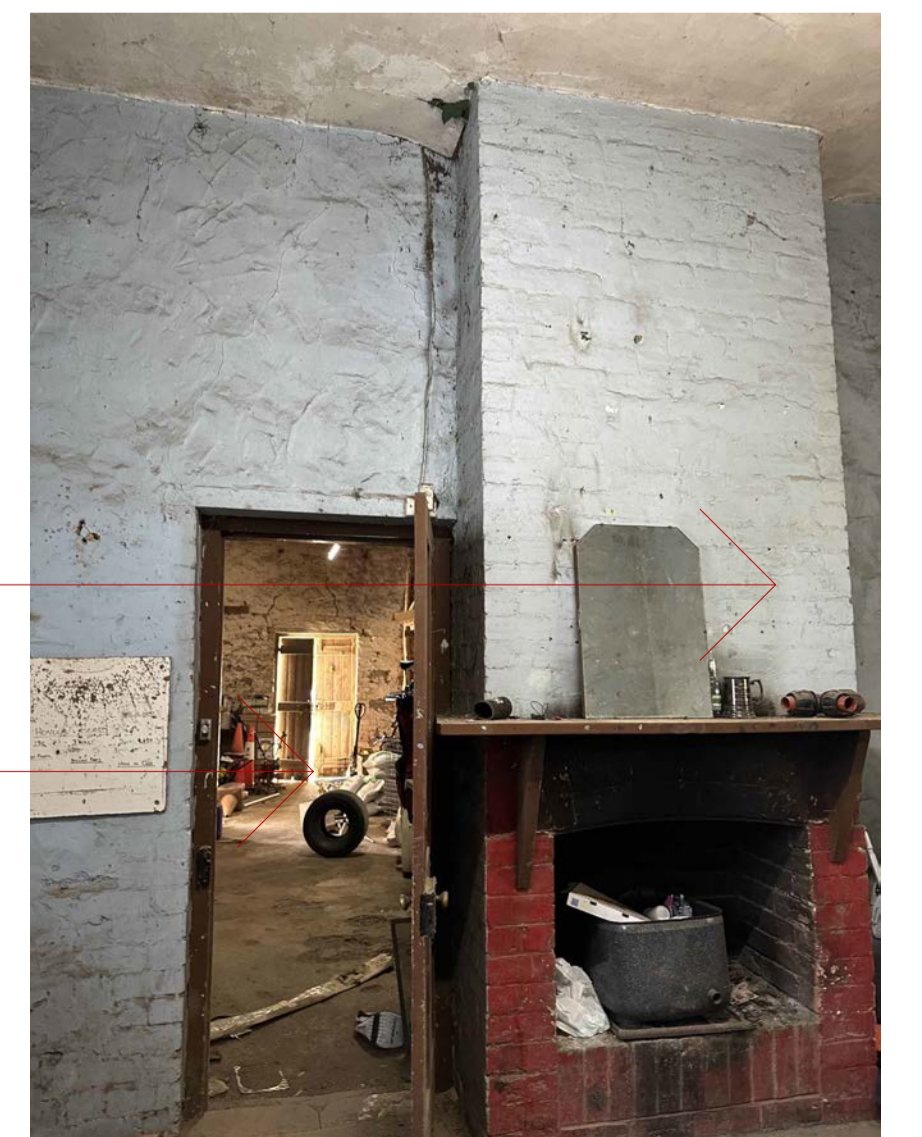
NEW STEEL ENTRY DOOR TO REPLACE EXISTING

CEILING TO BE REMOVED. RAKED CEILING & NEW TRUSSES TO BE EXPOSED.

INTERIOR WALLS TO BE SAND BLASTED TO EXPOSE BRICK & STONE

EXISTING DOOR TO BE REMOVED & OPEING TO BE RETAINED FOR BACK OF HOUSE ACCESS.

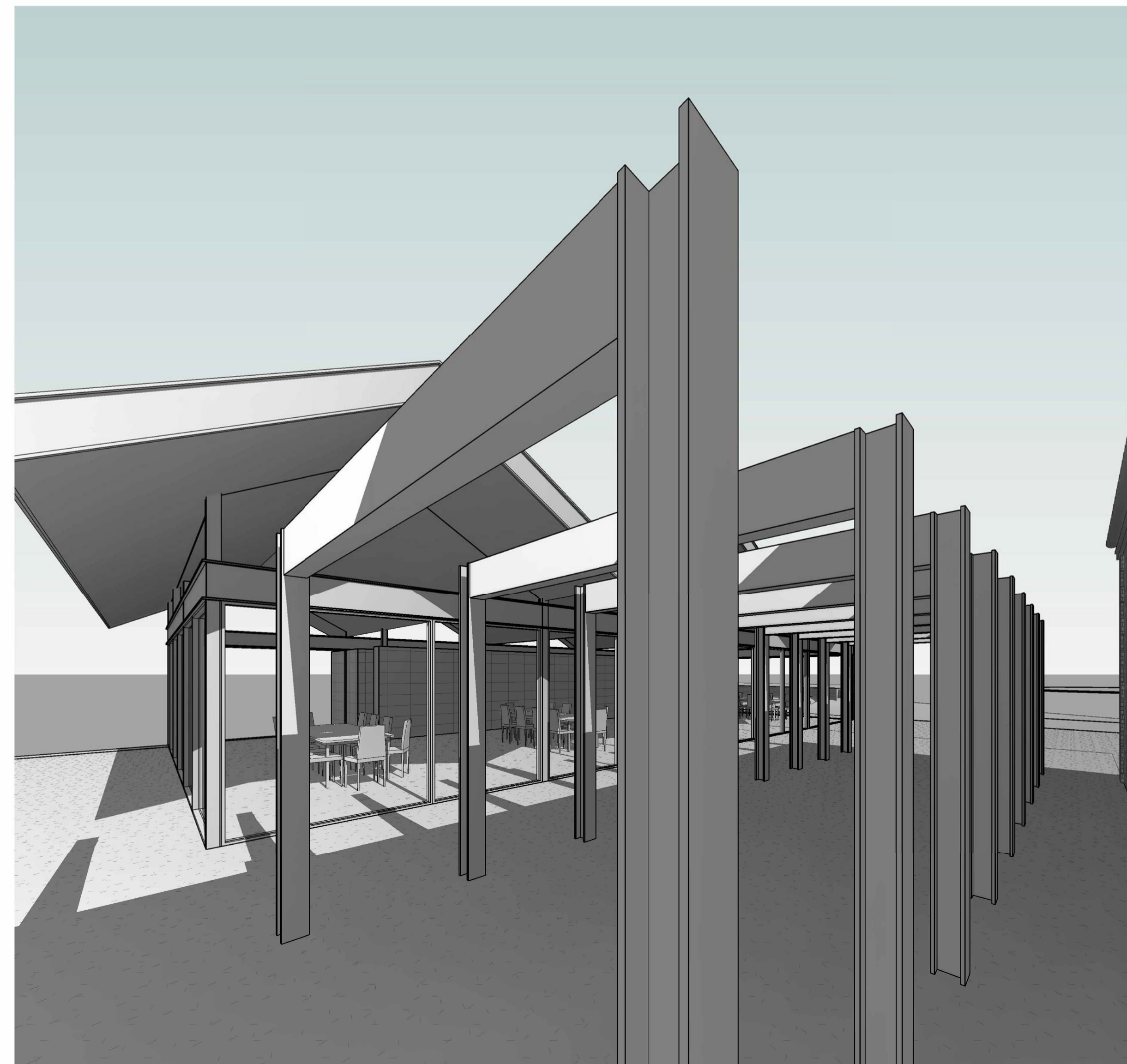
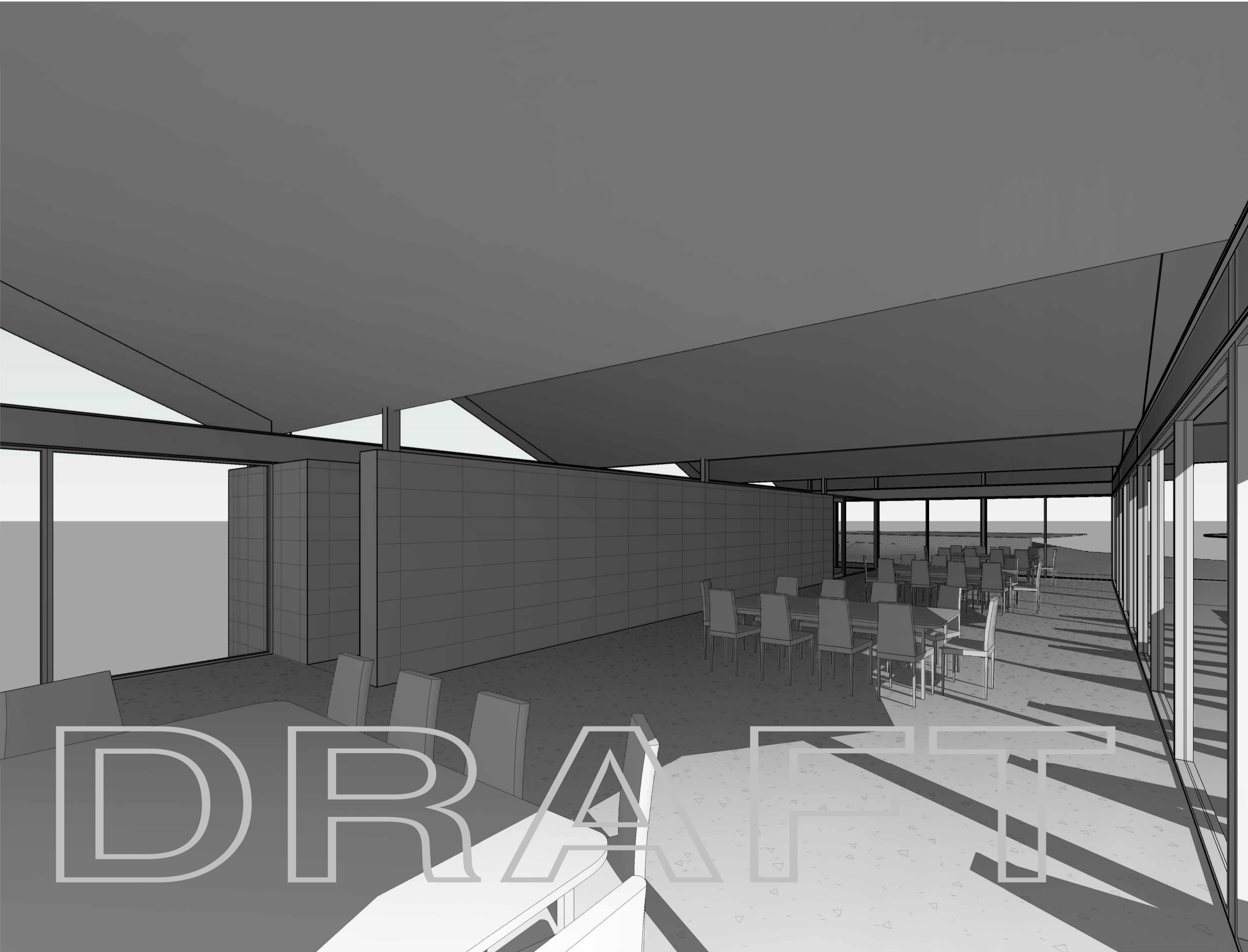
NEW CONCRETE FLOOR TO INTERIOR



PROJECT	MOUNT LOFTY GOLF ESTATE		
ADDRESS	35 GOLF LINKS ROAD, STIRLING SA 5152		
Scale@A1	1:100	REVISION:	
Scale@A3	1:200		
Date:	30.03.23		
SHEET NAME	PURFUMERY - EXISTING CONDITIONS & PROPOSED CHANGES		
SHEET NO.	TP21.3	REVISION:	A
*PRELIMINARY NOT FOR CONSTRUCTION*			







No.	Description	Date
A	PERFUMERY - PRELIMINARY CONCEPT	22.02.23
B	DA- FURTHER INFORMATION SUBMISSION	30.03.23

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PROJECT  
**MOUNT LOFTY GOLF ESTATE**

ADDRESS  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

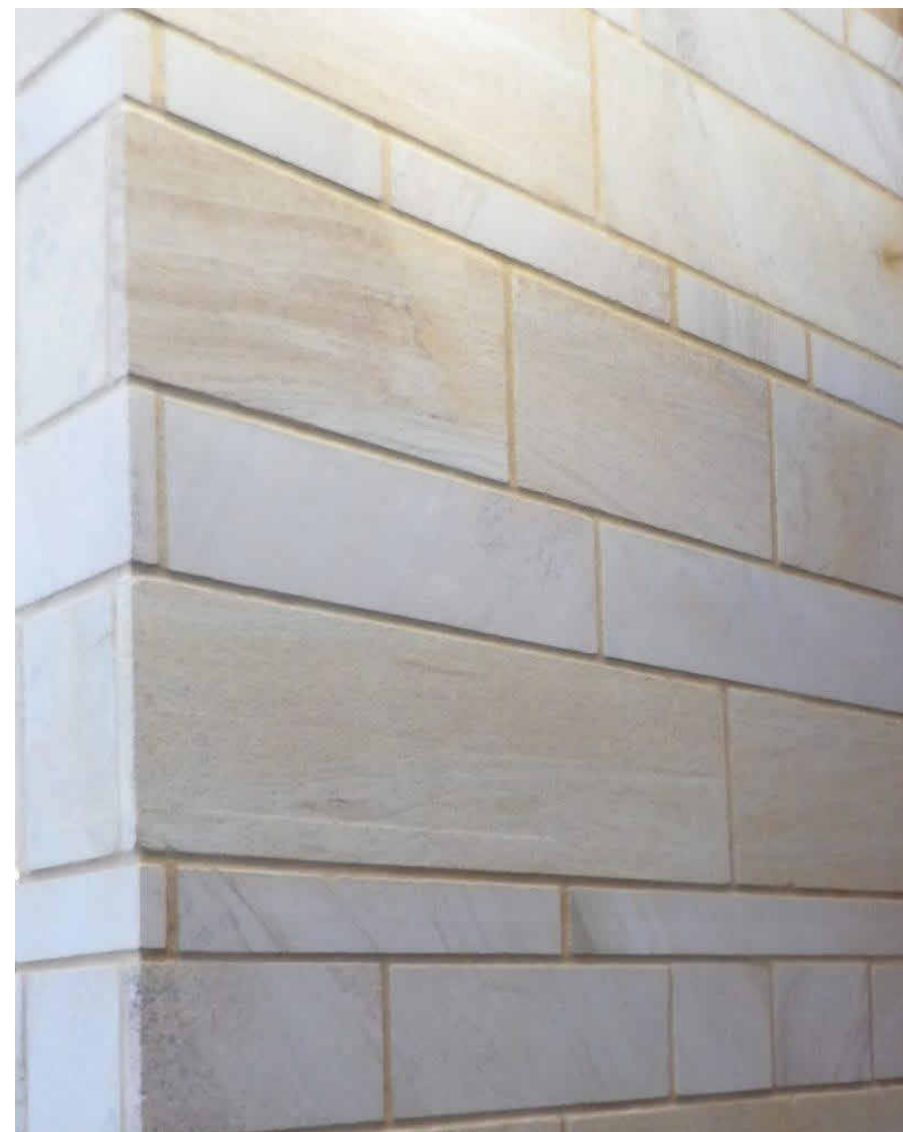
Scale@A1  
 Scale@A3  
 Date: 30.03.23

SHEET NAME  
**PERFUMERY - 3D VIEWS**

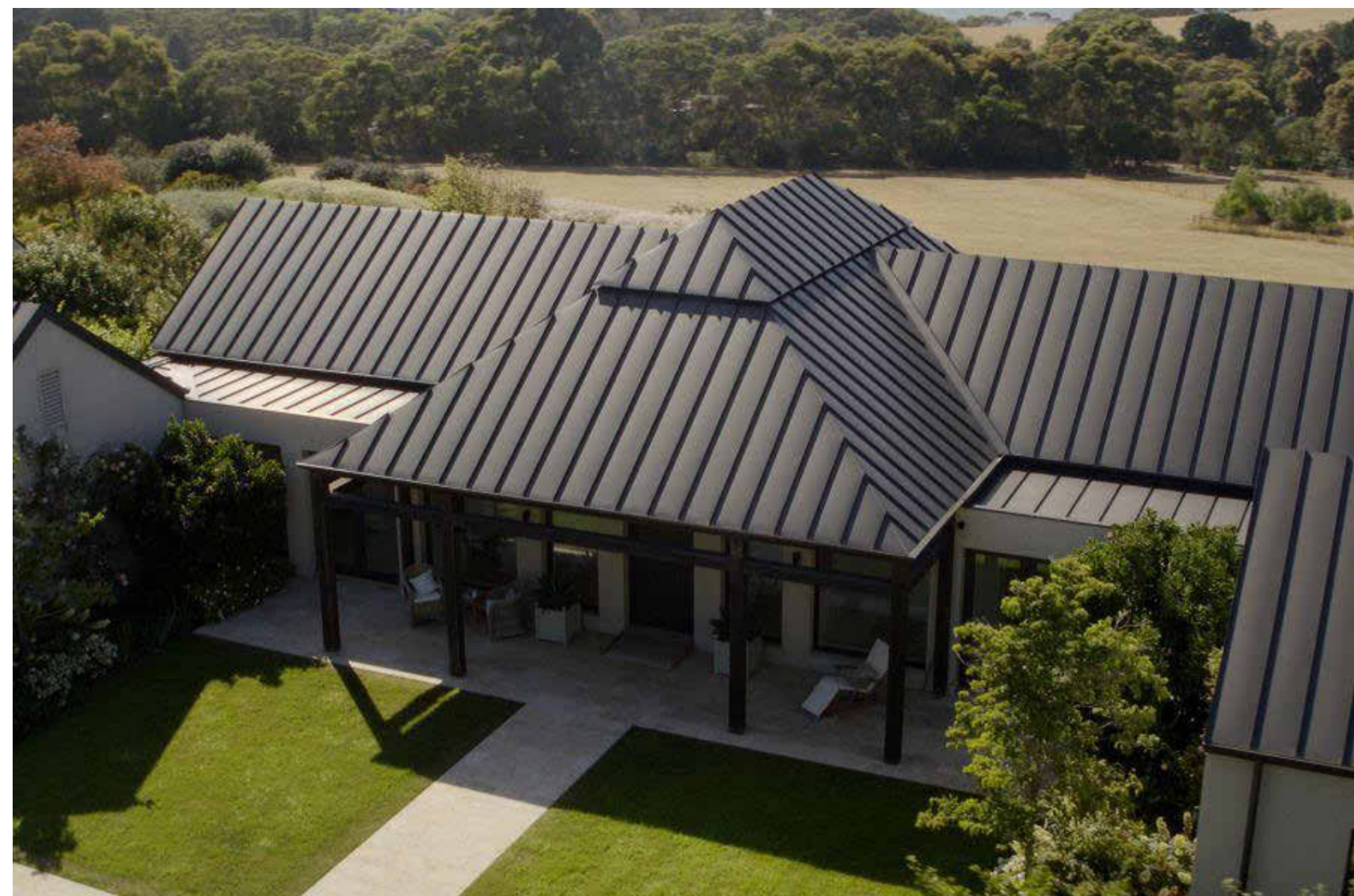
SHEET NO. REVISION:  
**TP21.4.2<sup>B</sup>**

**\*PRELIMINARY NOT FOR CONSTRUCTION\***

## MATERIAL IMAGES



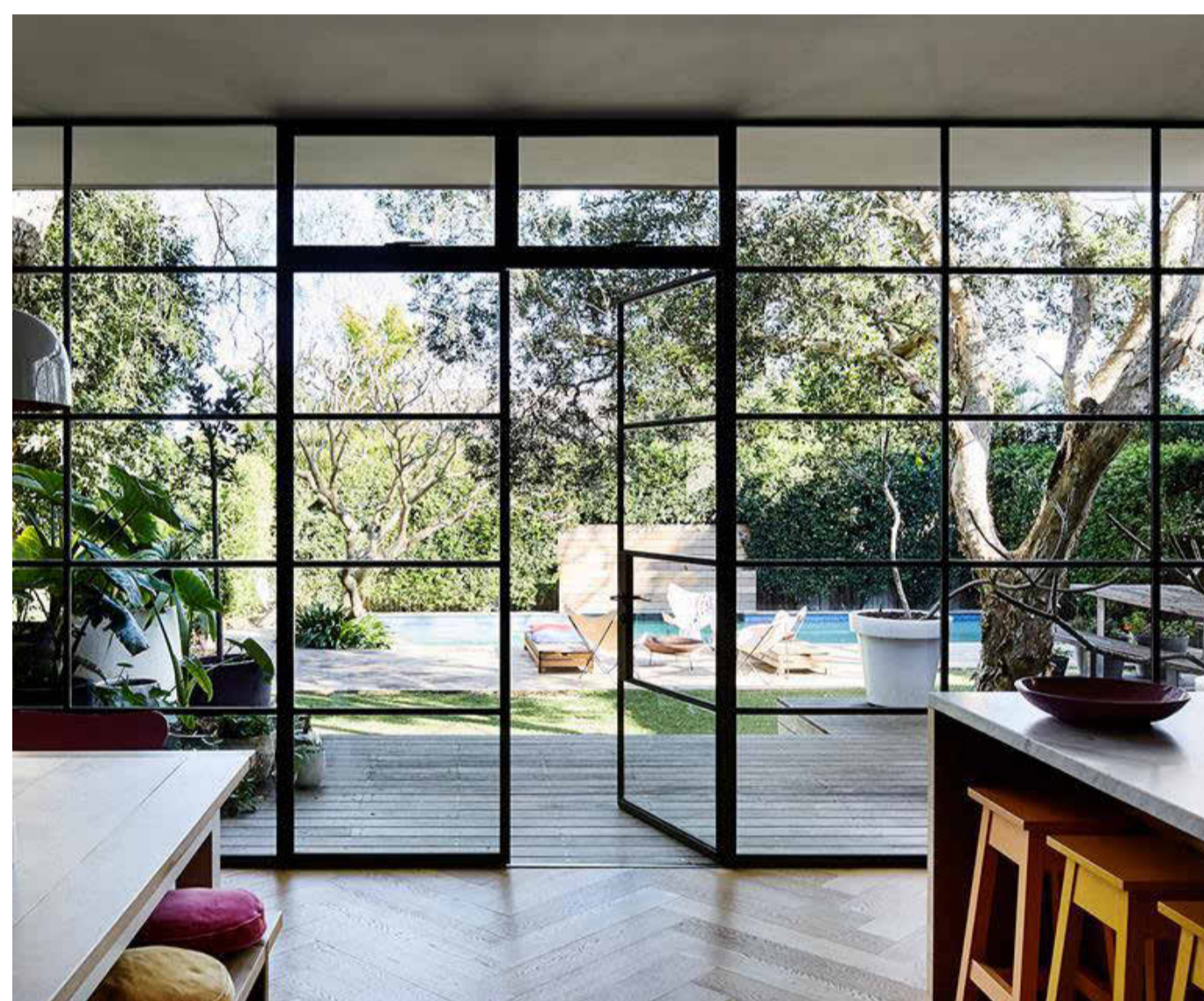
ST-1:  
SMOOTH CUT BASKET RANGE SANDSTONE



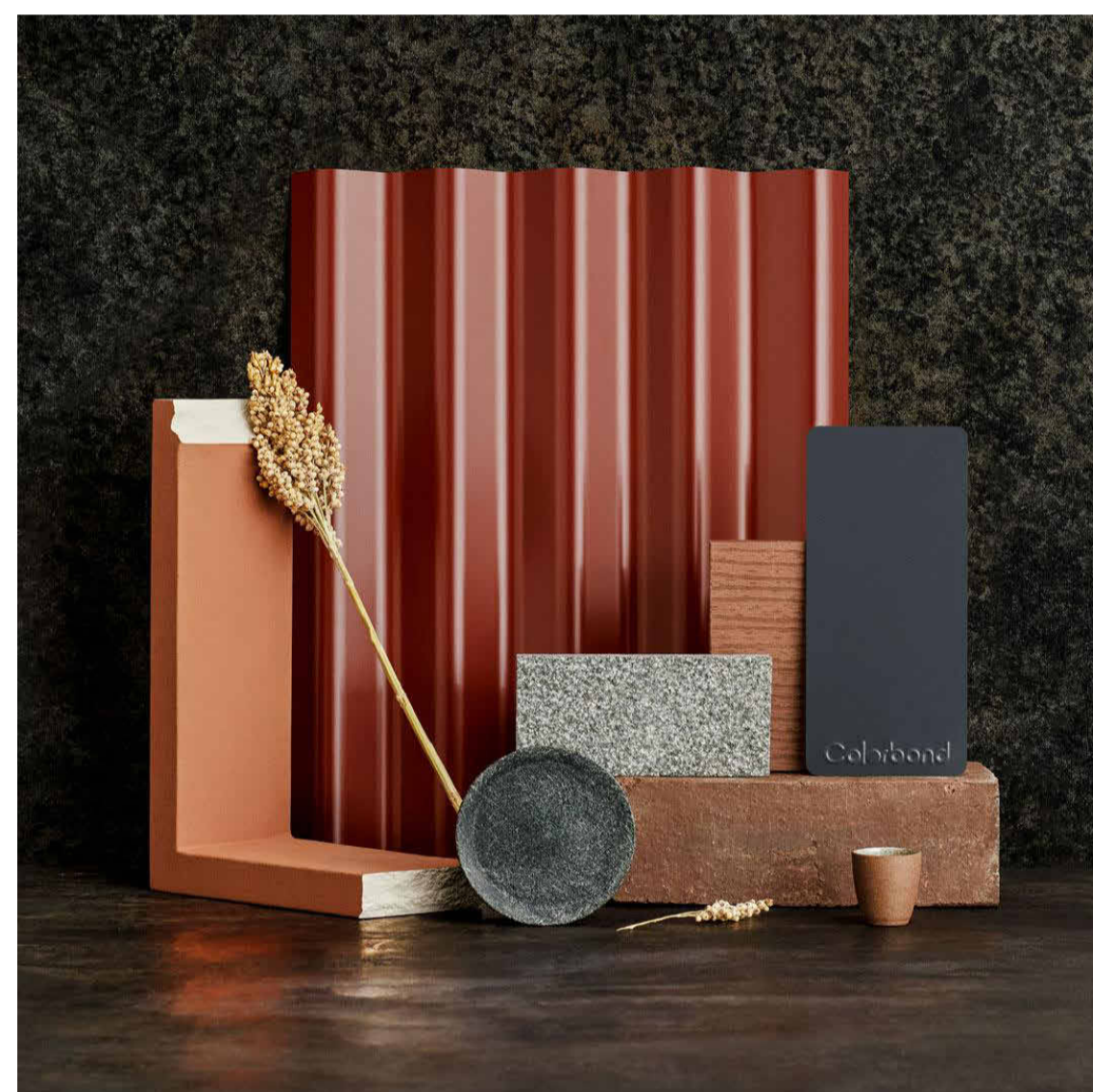
RF-1:  
STANDINGSEAM METAL ROOF SHEETING - BLACK



STB-1 & GL-1:  
EXPOSED STEEL BEAM & FIXED FRAMELESS GLASS

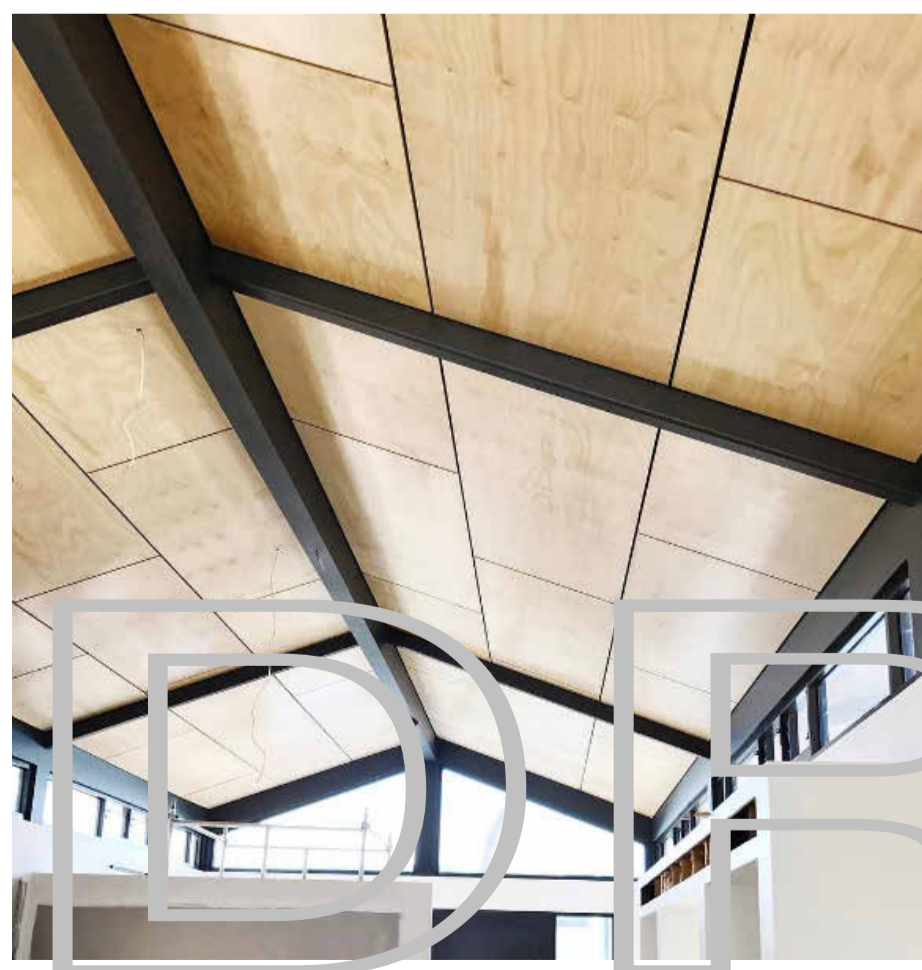


WIN-1 & 2:  
POWDERCOAT METAL WINDOWS - BLACK



RF-2:  
METAL ROOF SHEETING & GUTTERS - TO MATCH EXISTING  
(COLORBOND MANOR RED OR SIMILAR)

## INTERIOR CONCEPT IMAGES



TIMBER CEILING LINING TO PERFUMERY



CUSTOM FREESTANDING DISPLAYS



CUSTOM FREESTANDING DISPLAYS & COUNTERS

### FINISHES LEGEND

ST-1	STONE CLADDING
EX-ST	EXISTING REFINISHED STONE
RF-1	NEW STANDING SEAM ROOF
RF-2	NEW - REFINISHED ROOF - TO MATCH EXISTING
MF-1	METAL ROOF FACIA
STB-1	POWDERCOATED STEEL BEAM
WN-1	POWDERCOATED ALUMINIUM WINDOWS
WN-2	POWDERCOATED STEEL WINDOWS
GL-1	FRAMELESS GLASS INFIL

No.	Description	Date
A	PERFLUMERY PRELIMINARY CONCEPT	22.02.23
B	DA- FURTHER INFORMATION SUBMISSION	30.03.23

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### PROJECT

**MOUNT LOFTY GOLF ESTATE**

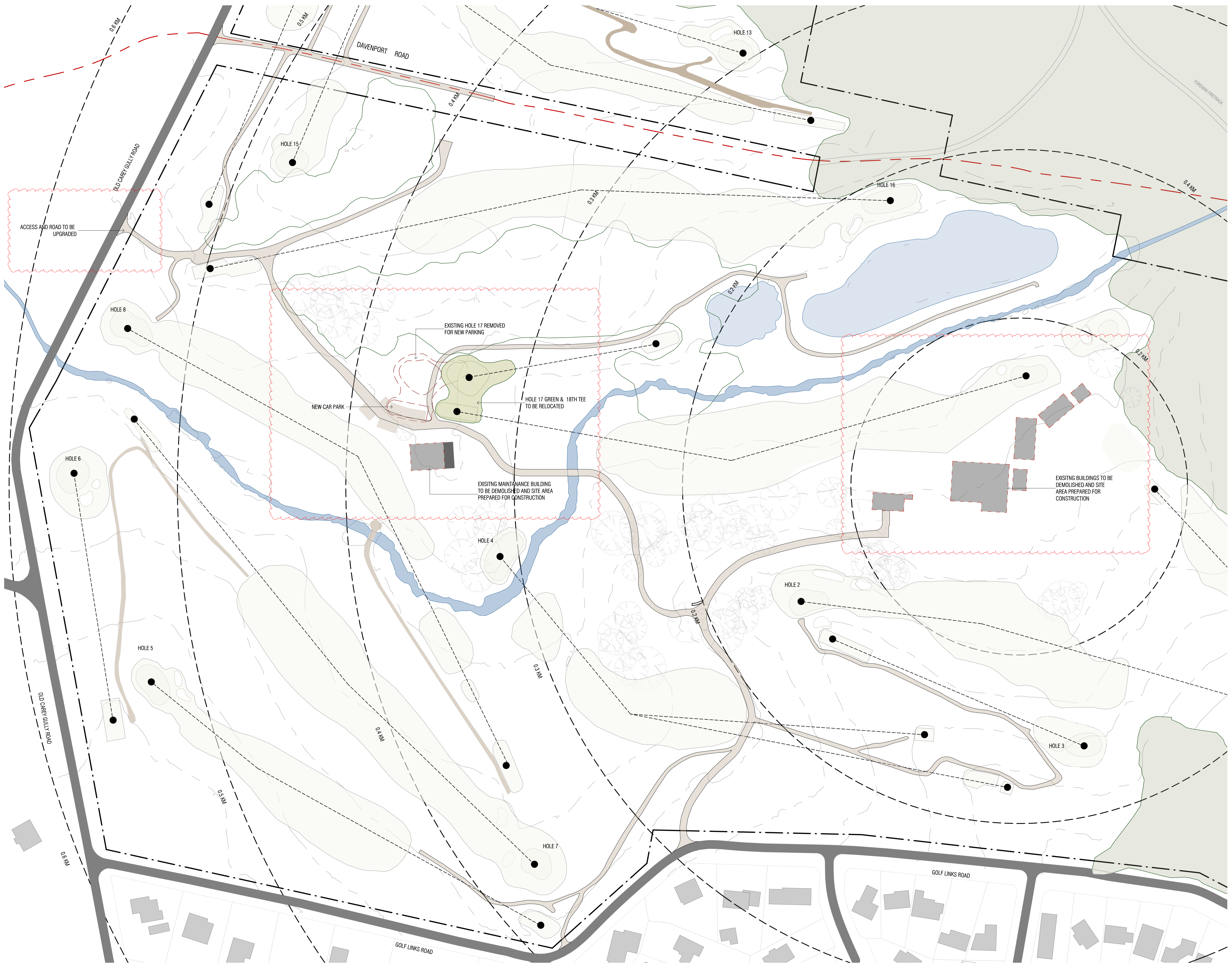
ADDRESS  
**35 GOLF LINKS ROAD, STIRLING SA 5152**

Scale@A1  
Scale@A3  
Date: 30.03.23

SHEET NAME  
**PERFLUMERY - MATERIALS & PRECEDENTS**

SHEET NO. REVISION:  
**TP21.5 B**

\*PRELIMINARY NOT FOR CONSTRUCTION\*



**STAGE 01:**

- UPGRADE ACCESS AND ROAD FROM OLD CAREY GULLY ROAD
- PROVIDE NEW PARKING FOR ADJACENT TO PERFUMERY
- DEMOLITION OF EXISTING GOLF CLUB AND ACCOMMODATION.

No.	Description	Date
A	DA - FURTHER INFORMATION DRAFT	08.09.22
B	DA - FURTHER INFORMATION SUBMISSION	29.11.22
C	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

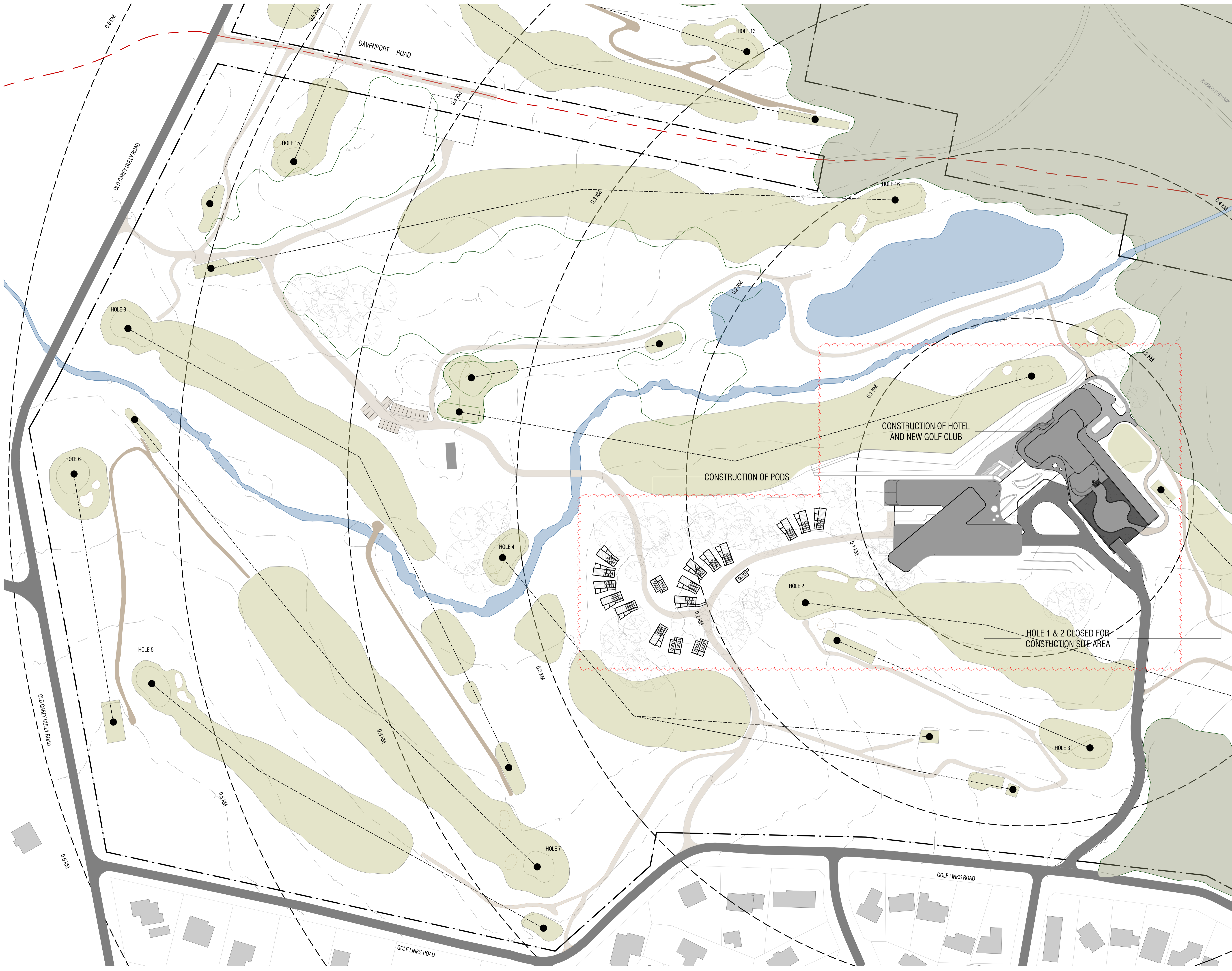
Scale@A1  
Scale@A3  
Date: 30.03.23

**SHEET NAME**  
STAGING PLANS

**SHEET NO.** TP22.1 **REVISION:** C

**\*PRELIMINARY NOT FOR CONSTRUCTION\***





**STAGE 02:**

- SITE PREPARATION
- CONSTRUCTION OF PODS AND HOTEL / NEW BUILDINGS
- EXISTING ACCESS TO BE USED FOR CONSTRUCTION ONLY
- HOLES 1 AND 2 TO BE USED FOR CONSTRUCTION HUBS / PARKING ETC.

No.	Description	Date
A	DA - FURTHER INFORMATION DRAFT	08.09.22
B	DA - FURTHER INFORMATION SUBMISSION	29.11.22
C	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1  
Scale@A3  
Date: 30.03.23

**SHEET NAME**  
STAGING PLANS

**SHEET NO.** TP22.2      **REVISION:** C





**STAGE 03:**

- CONSTRUCT NEW FUNCTION PAVILION & REFURBISH PERFUMERY.
- UPGRADE / REFURBISH GOLF COURSE

No.	Description	Date
A	DA - FURTHER INFORMATION DRAFT	08/09/22
B	DA - FURTHER INFORMATION SUBMISSION	29/11/22
C	DA - FURTHER INFORMATION SUBMISSION	30/03/23

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**PROJECT**  
**PROJECT NAME**  
**PROJECT ADDRESS**

35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1  
 Scale@A3  
 Date: 30/03/23

**SHEET NAME**

STAGING PLANS

SHEET NO. **TP22.3** REVISION: C

\*PRELIMINARY NOT FOR CONSTRUCTION\*



**FINISHES LEGEND**

- CON-1** INSITU CONCRETE FINISH
- PC-1** CURVED PRECAST PANELS
- PC-2** PRECAST PANELS
- CLD-1** TIMBER CLADDING
- CLD-2** NATURAL SLATE CLADDING
- CLD-3** METAL PANALISED CLADDING
- CLD-4** PERFORATED METAL CLADDING
- WN-1** POWDERCOATED ALUMINIUM WINDOWS
- PL-1** PREFABRICATED METAL PLANTER WITH TRELIS
- BAL-1** METAL BLADE BALUSTRADE

**MATERIALS & FINISHED SCHEDULE**

WALLS	CON-1: INSITU CONCRETE SLAB EDGE AND WALLS COLOUR: NATURAL CONCRETE
	PC-1: CURVED PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE
	PC-2: PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE
	CLD-1: TIMBER CLADDING - MORTLOCK TRENDPLANK SHIPLAP CLADDING SPECIES: PACIFIC TEAK - BAL-19 COMPLIANT (OR EQUIVALENT) CLEAR OILED FINISH TO WEATHER
RAISED PLANTERS	CLD-2: SLATE SHINGLE CLADDING COLOUR: NATURAL FINISH
	CLD-3: PANALISED METAL CLADDING, 300MM INTERLOCKING PROFILE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
	CLD-4: PERFORATED METAL CLADDING COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
	PL-1: PREFABRICATED ALUMINIUM PLANTER WITH WIRE TRELIS COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
BALUSTRADE	BAL-1: STEEL BLADE BALUSTRADE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)
WINDOWS	WN-1: POWDERCOAT ALUMINIUM FRAME WINDOWS WITH GLAZING COLOUR: BLACK (OR SIMILAR)
DOORS	CARPARK DOORS: PERFORATED METAL SECTIONAL GARAGE DOORS COLOUR: COLORBOND NIGHT SKY - BLACK (OR SIMILAR)

No.	Description	Date
A	DA - FURTHER INFORMATION DRAFT	08.09.22
B	DA - FURTHER INFORMATION SUBMISSION	29.11.22
C	DA - FURTHER INFORMATION SUBMISSION	30.03.23

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**PROJECT**  
MOUNT LOFT GOLF ESTATE

**ADDRESS**  
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1  
Scale@A3  
Date: 30.03.23

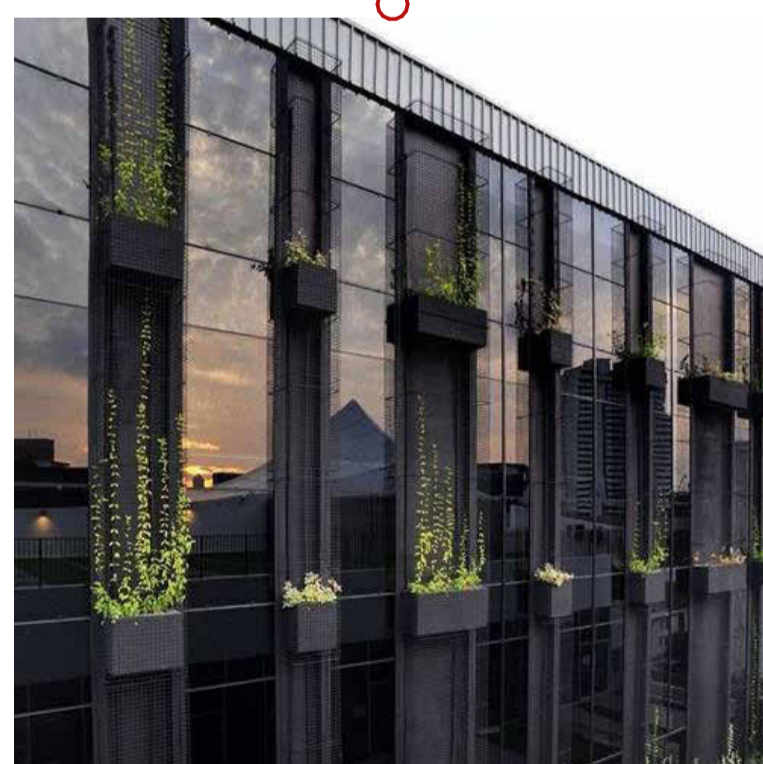
**SHEET NAME**  
MATERIALS PALLET

SHEET NO. REVISION:  
TP23 C

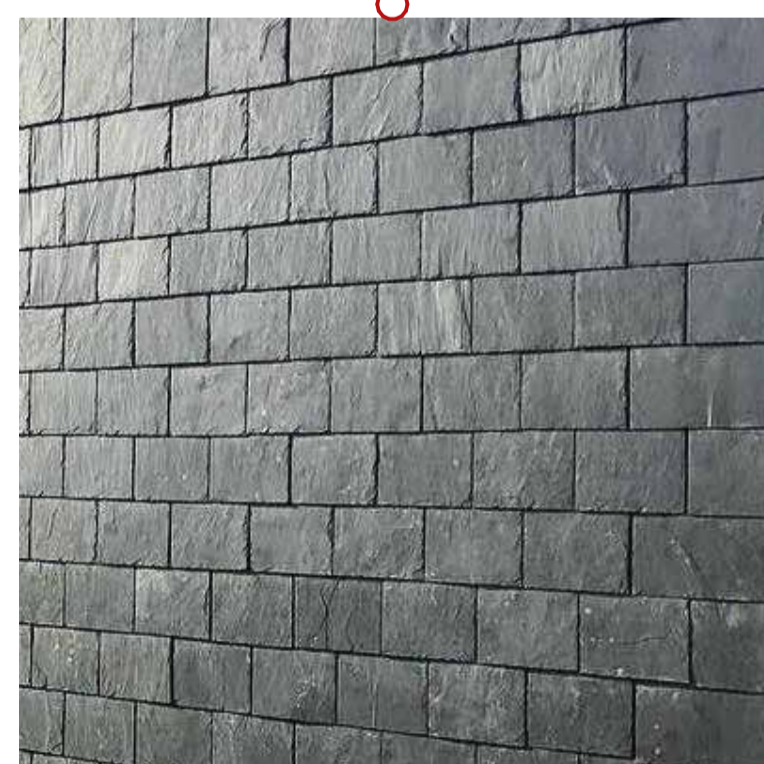
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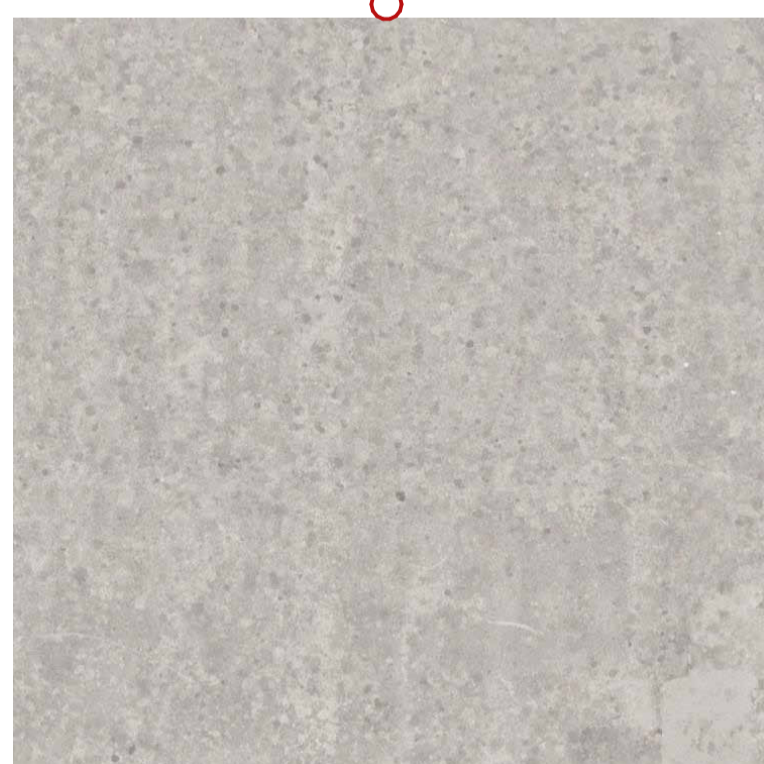
CLD-1



PL-1



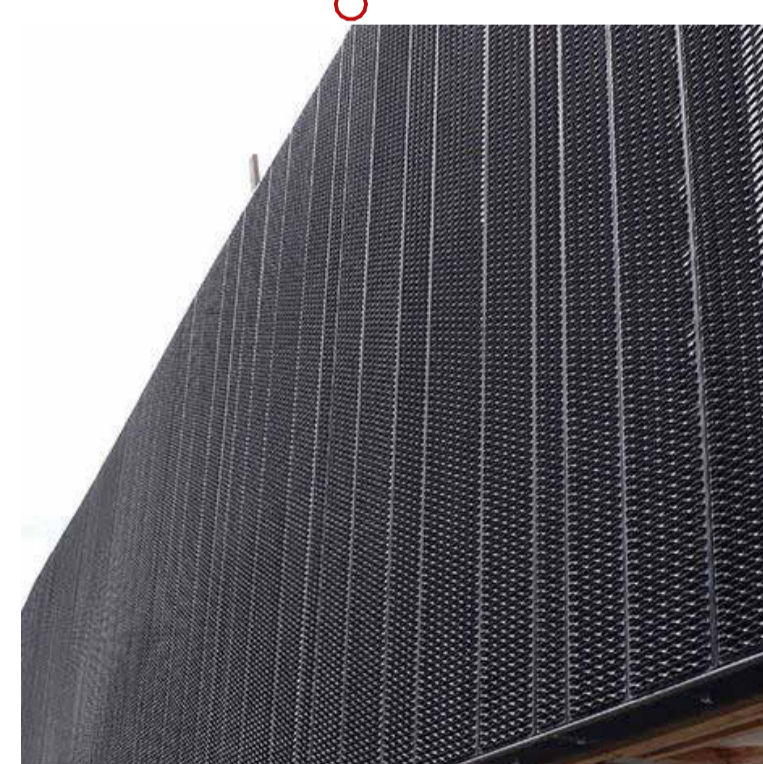
CLD-2



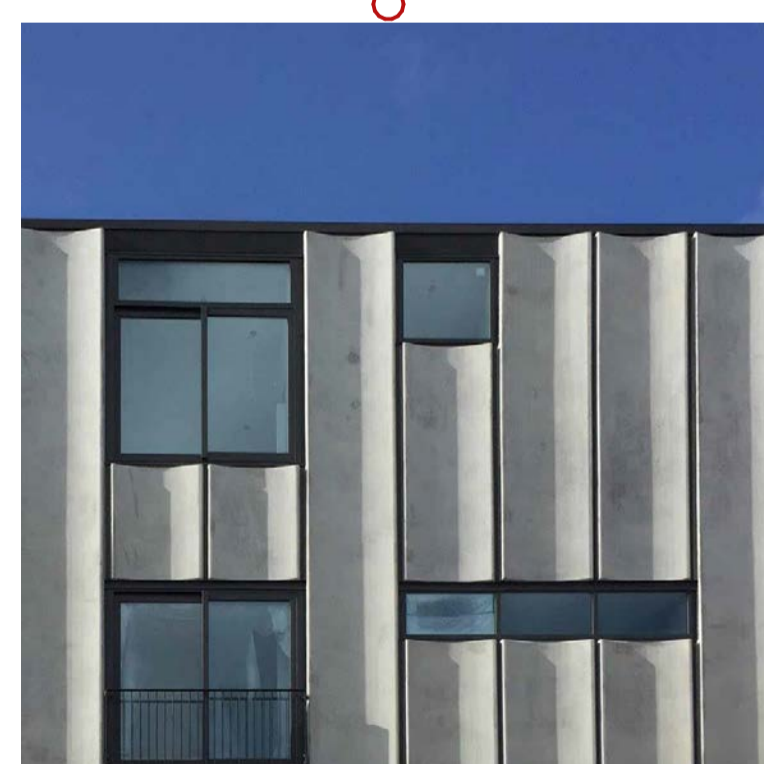
PC-1



CLD-3



CLD-4



CON-1

---

## **Appendix 7**

*Appendix E of Development Report – Landscape Plan*

---

Date —  
05 APRIL 2023

# MT LOFTY GOLF RESORT

## DEVELOPMENT APPLICATION

oxigen

● ADELAIDE CBD



**MT LOFTY GOLF RESORT**  
30 min from the CBD

● Crafers

● Stirling

SOUTH EASTERN EXPRESSWAY



# CHARACTER



The landscape design focuses on re-establishing the site's tree canopy and increasing the site's green credentials through the application of distinct landscape typologies.

Blackberries, gorse and other weed species are removed. The new native planting comprises species native to the Adelaide Hills region with an emphasis on wattles, bottlebrush and correa comprising yellow and red winter and early summer flowerings.

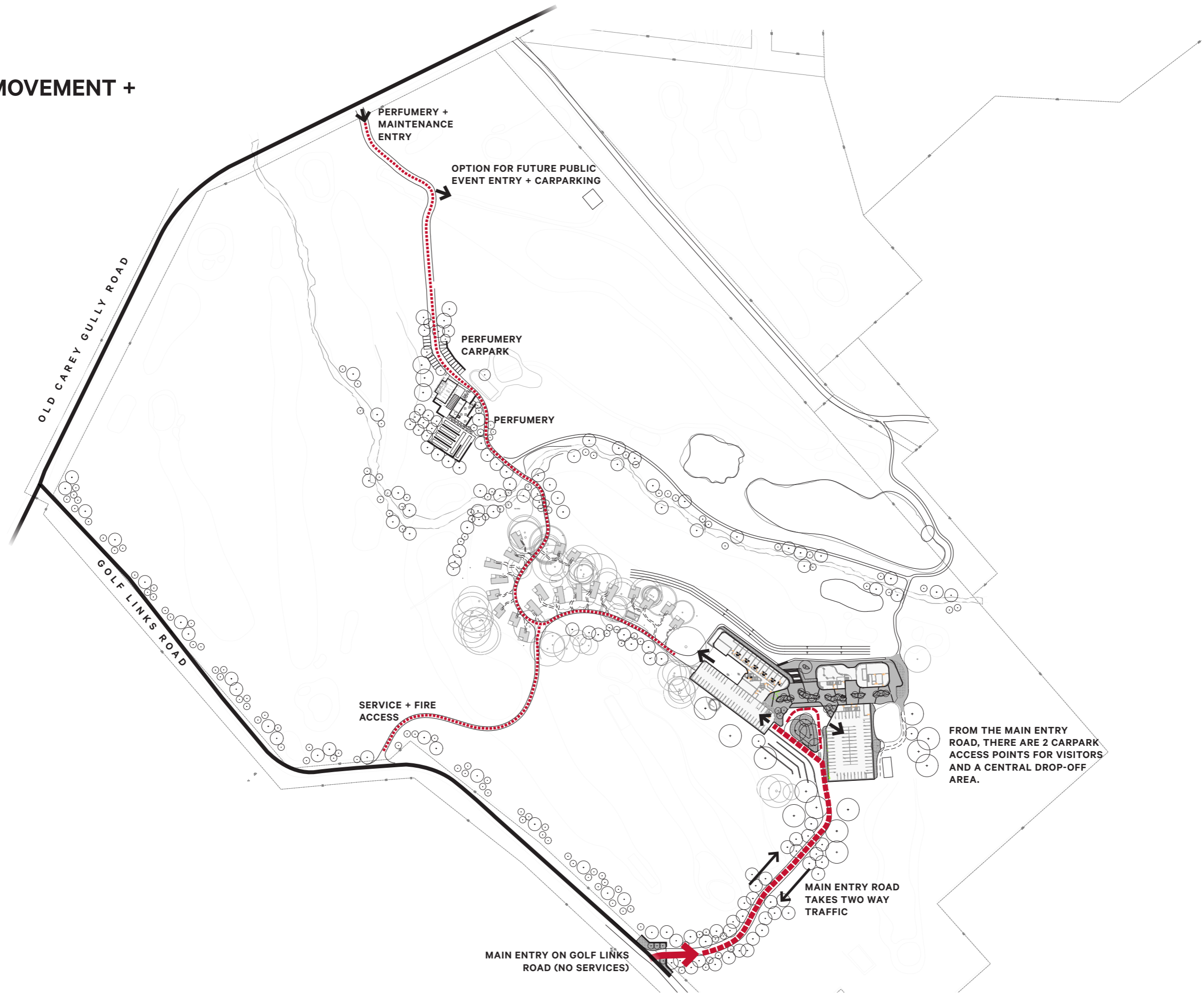
Whenever possible, the existing forest of Manna Gum and Stringybark are retained. Particular care is taken to preserve views to Mt George and to position the new built form so that it has minimal impact on views from the Heysen Trail.

# SITEWIDE

- 1 Main entry roadway
- 2 New Building
- 3 Pods
- 4 Perfumery
- 5 Heysen Trail
- 6 Boundary restoration
- 7 Creek restoration
- 8 Lake restoration
- 9 Perfumery carpark
- 10 Maintenance shed
- 11 Dam

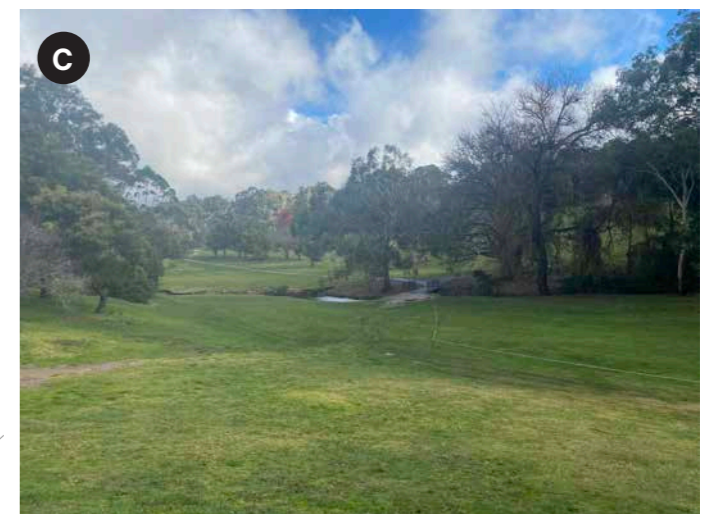
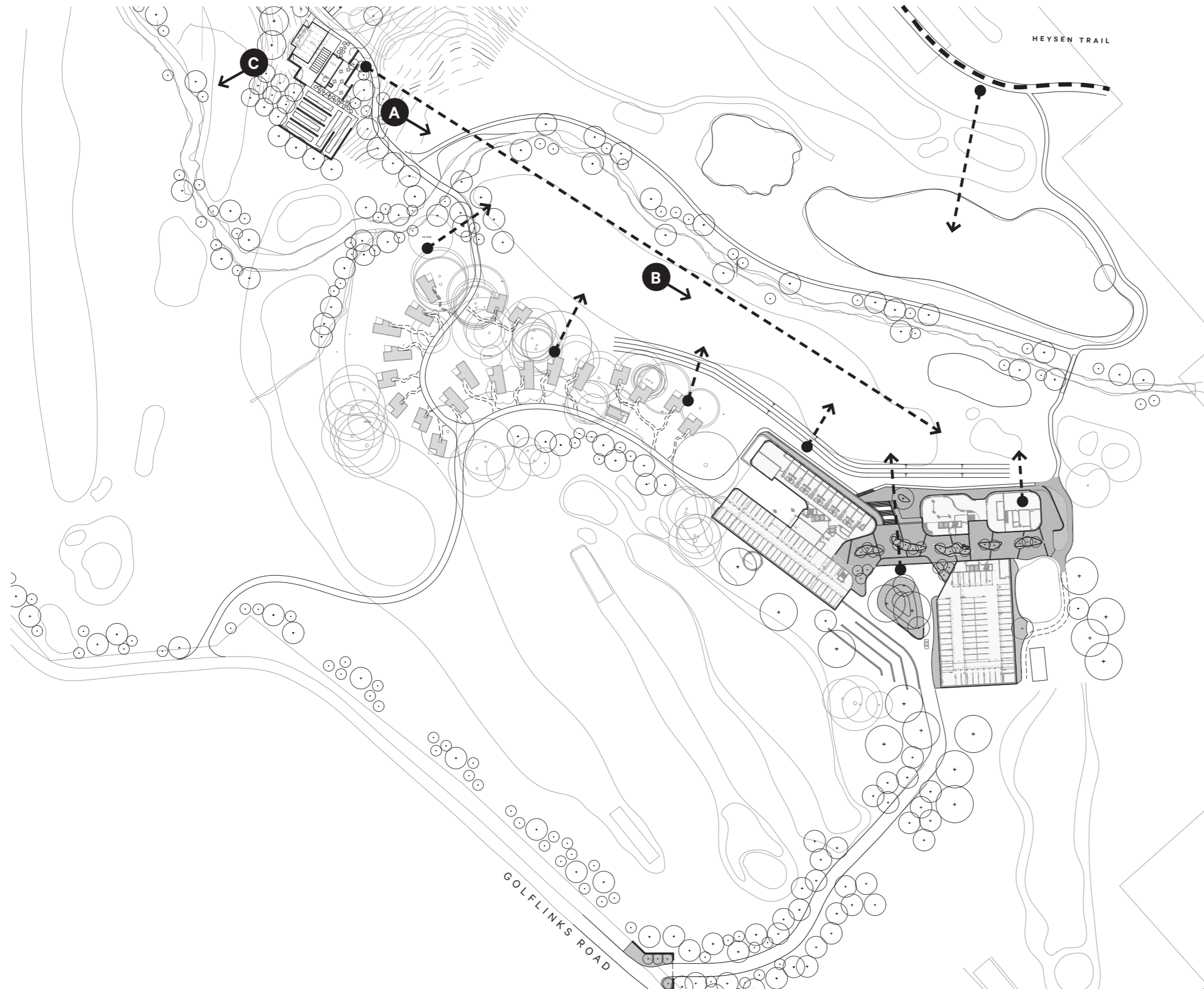


# SITE VEHICLE MOVEMENT + ENTRIES





# SITE KEY VIEWS







SITE  
**MAIN BUILDING  
 LOWER GROUND**



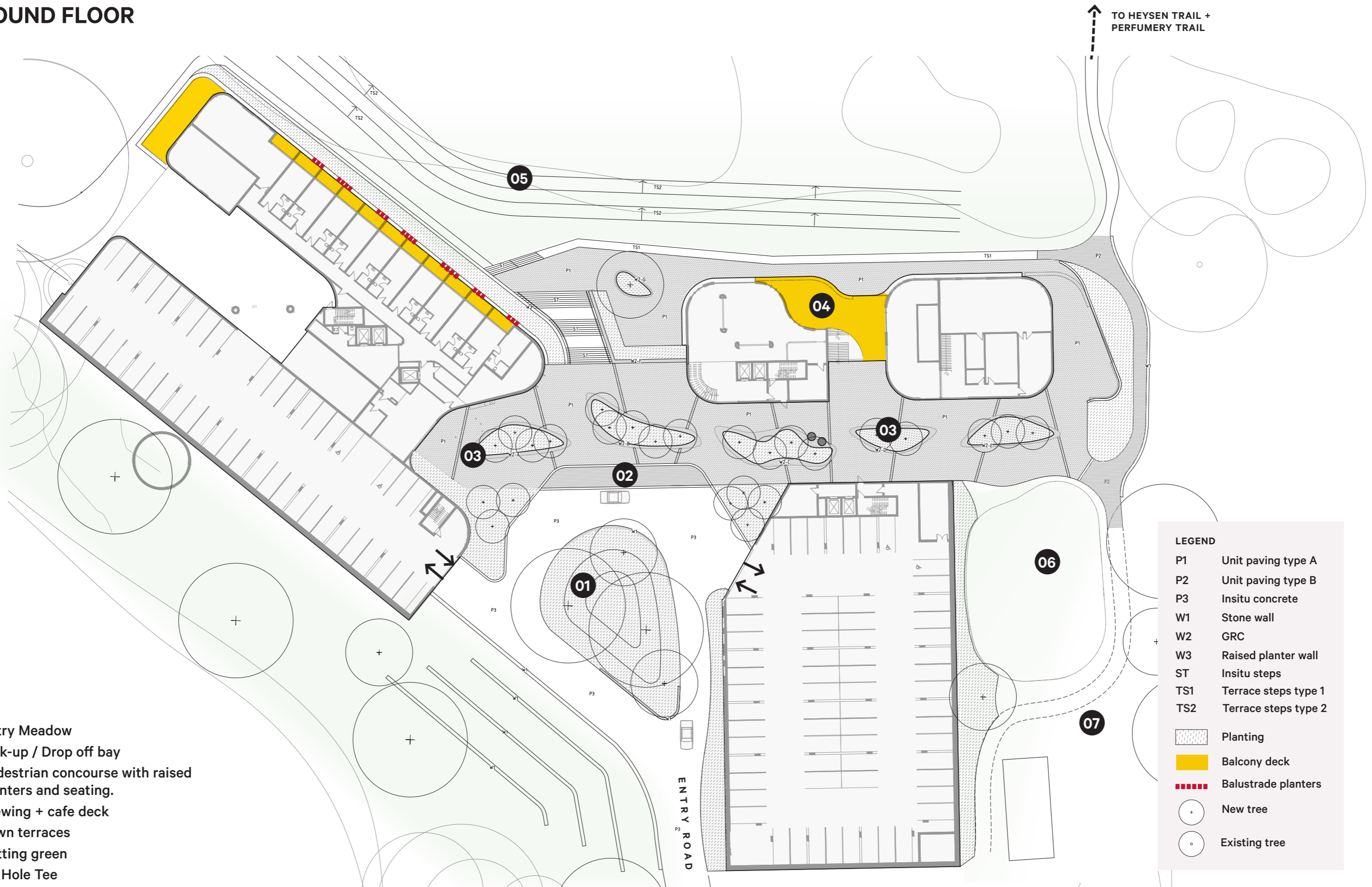
**KEY ELEMENTS**

- 1 Lawn terraces
- 2 Stairway to upper-ground floor
- 3 Sports bar spill-out space
- 4 Access path to upper ground floor.

**LEGEND**

-  Planting
-  Balcony deck
-  Balustrade planters
-  Feature tree

SITE  
**MAIN BUILDING  
 GROUND FLOOR**



- 1 Entry Meadow
- 2 Pick-up / Drop off bay
- 3 Pedestrian concourse with raised planters and seating.
- 4 Viewing + cafe deck
- 5 Lawn terraces
- 6 Putting green
- 7 1st Hole Tee

**LEGEND**

P1	Unit paving type A
P2	Unit paving type B
P3	Insitu concrete
W1	Stone wall
W2	GRC
W3	Raised planter wall
ST	Insitu steps
TS1	Terrace steps type 1
TS2	Terrace steps type 2
	Planting
	Balcony deck
	Balustrade planters
	New tree
	Existing tree

# SITE MATERIALS

Material and elements play an important role in providing amenity and contributing to visual consistency throughout the key sites.

- Paving and hardscape elements are of enduring quality enable safe movement, are robust and low maintenance.
- Public outdoor spaces are integrated through consistent materials and detailing.
- Locally sourced materials are used where possible.
- Materials are selected for their durability and whole of life costing.



## P1 + P2 Stone / Precast pavers

- High quality unit pavers
- Stepping stones (Pods)



## P3 - Concrete

- Honed and gritblast non-slip insitu concrete paving
- Used for paths, plazas and thresholds



## Hotmix Roads

- Sealed entry roads and carparks
- Kerbless / Flush Kerbs



## Corten Steel

- Feature edging



## W1 - Gabion Wall - Local Stone

- Large walls where long spans are required.



## Compacted Sand / Gravel Paving

- Local compacted sand
- High quality unit pavers
- Used for pedestrianised areas (Pods)



## Local Stone

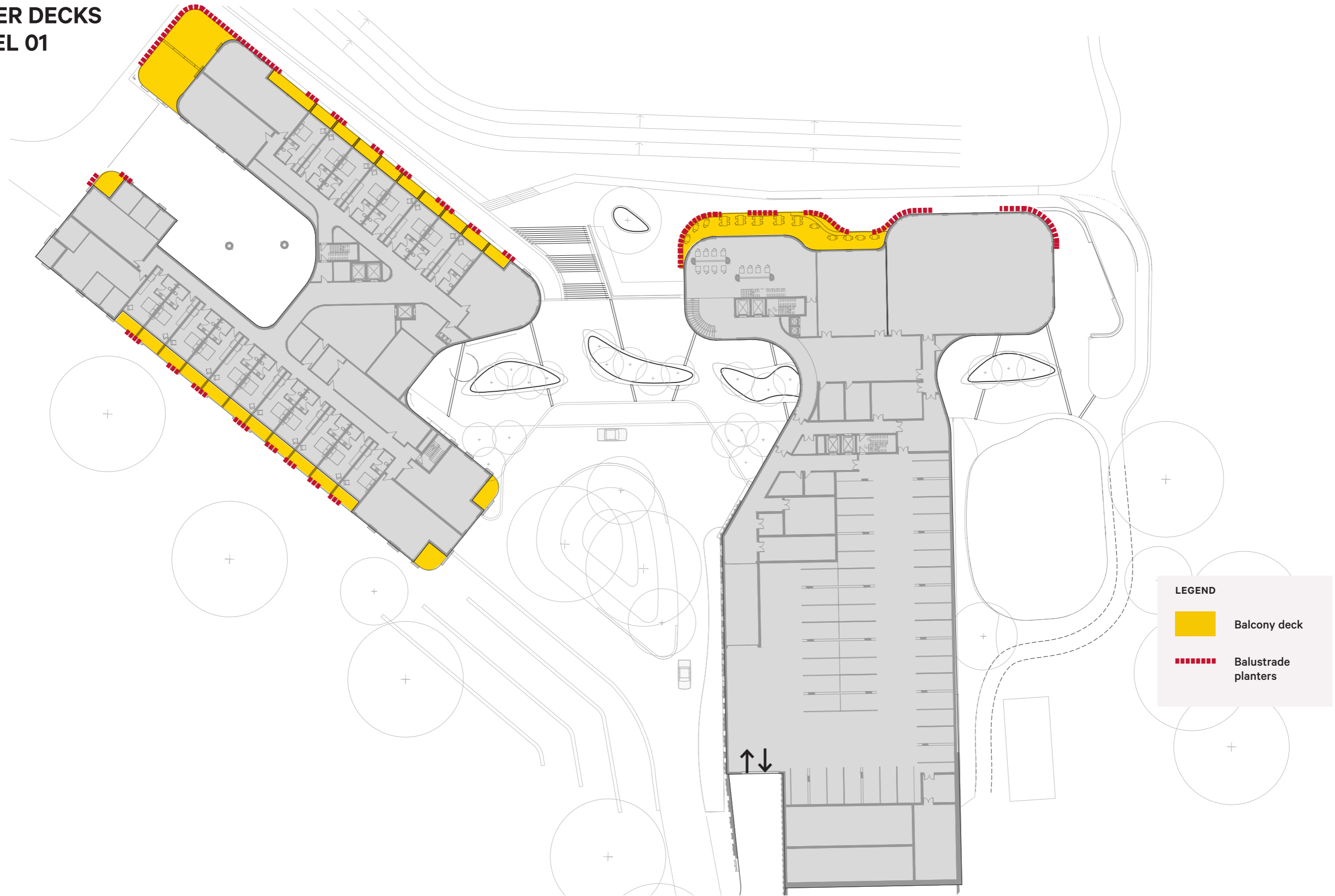
- Feature paving, walls, edging, steps, terraces



## Timber

- Class 1 seasoned hardwood or thermally modified timber
- Natural grey finish
- Used for decks, trims and fences

SITE  
MAIN BUILDING  
UPPER DECKS  
LEVEL 01







SITE  
**MAIN BUILDING  
 UPPER DECKS  
 LEVEL 02**



- KEY ELEMENTS**
- 1 Rooftop terrace
  - 2 Rooftop sedum gardens
  - 3 Sloped landscape embankment with connection to lower level (Hole 01 tee-off)

**LEGEND**

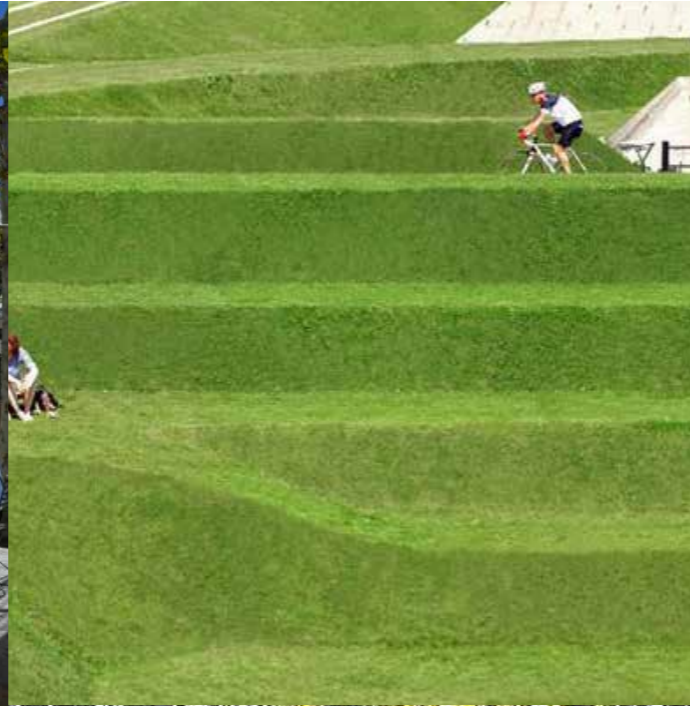
-  Planting
-  Balcony deck
-  Balustrade planters
-  Rooftop sedum garden

SITE  
MAIN BUILDING

FLEXIBLE OUTDOOR SEATING SPACES



LAWN TERRACES



ROOFTOP GREENING



MOUNDED FEATURE PLANTERS

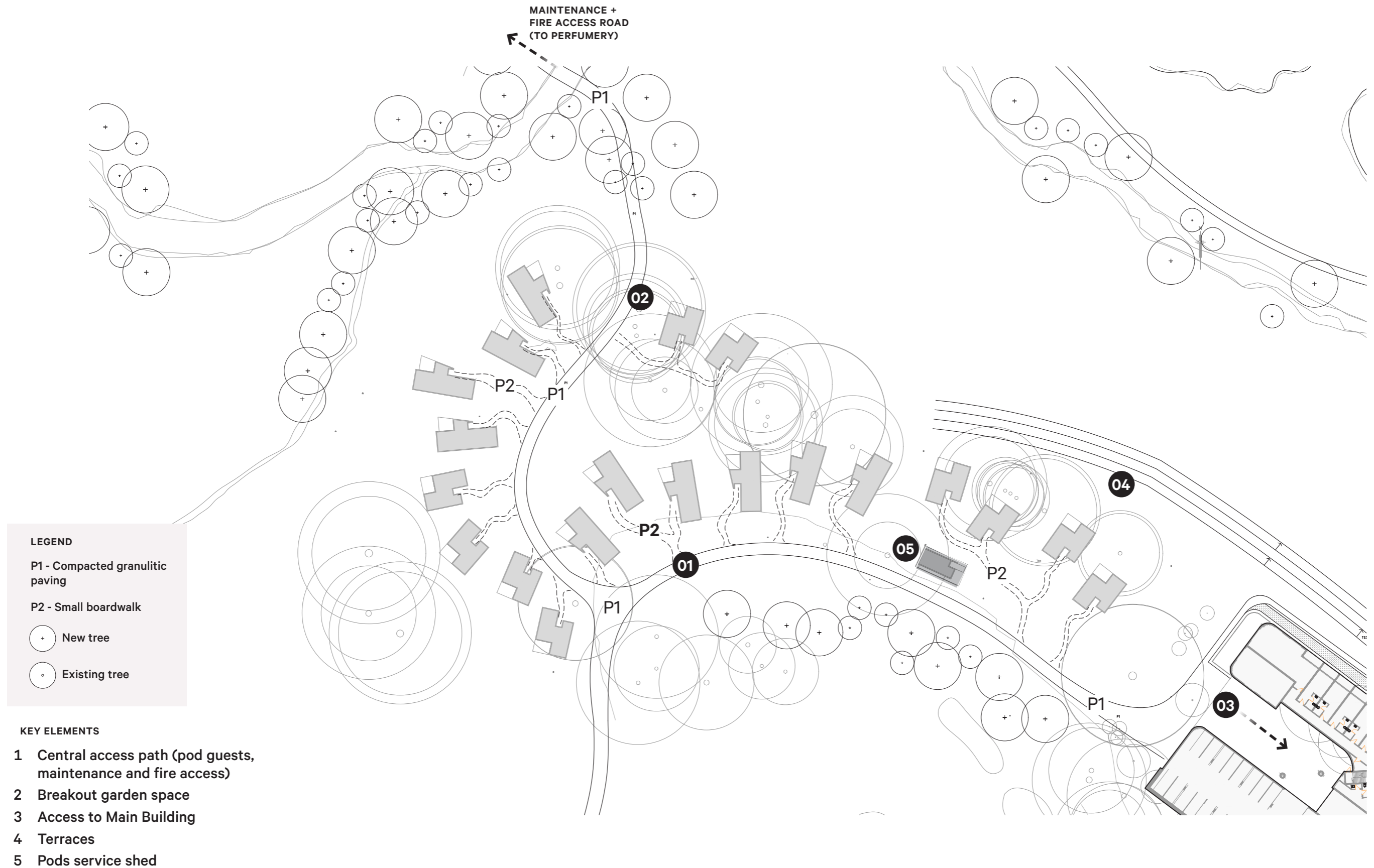


UPPER LEVEL DECKS + BALCONIES

MEADOW PLANTING

ORNAMENTAL TREES

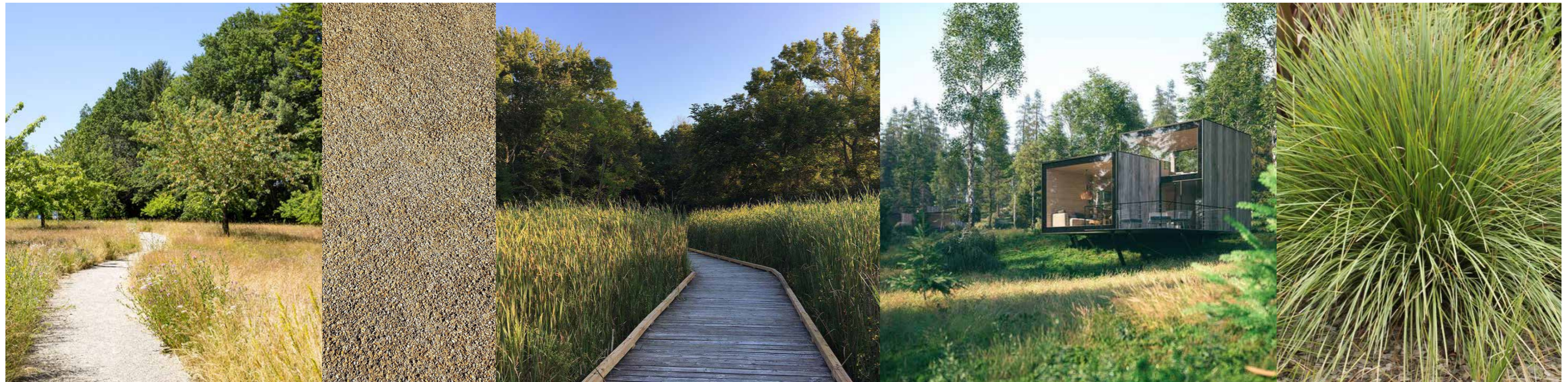
# SITE PODS





SITE  
PODS

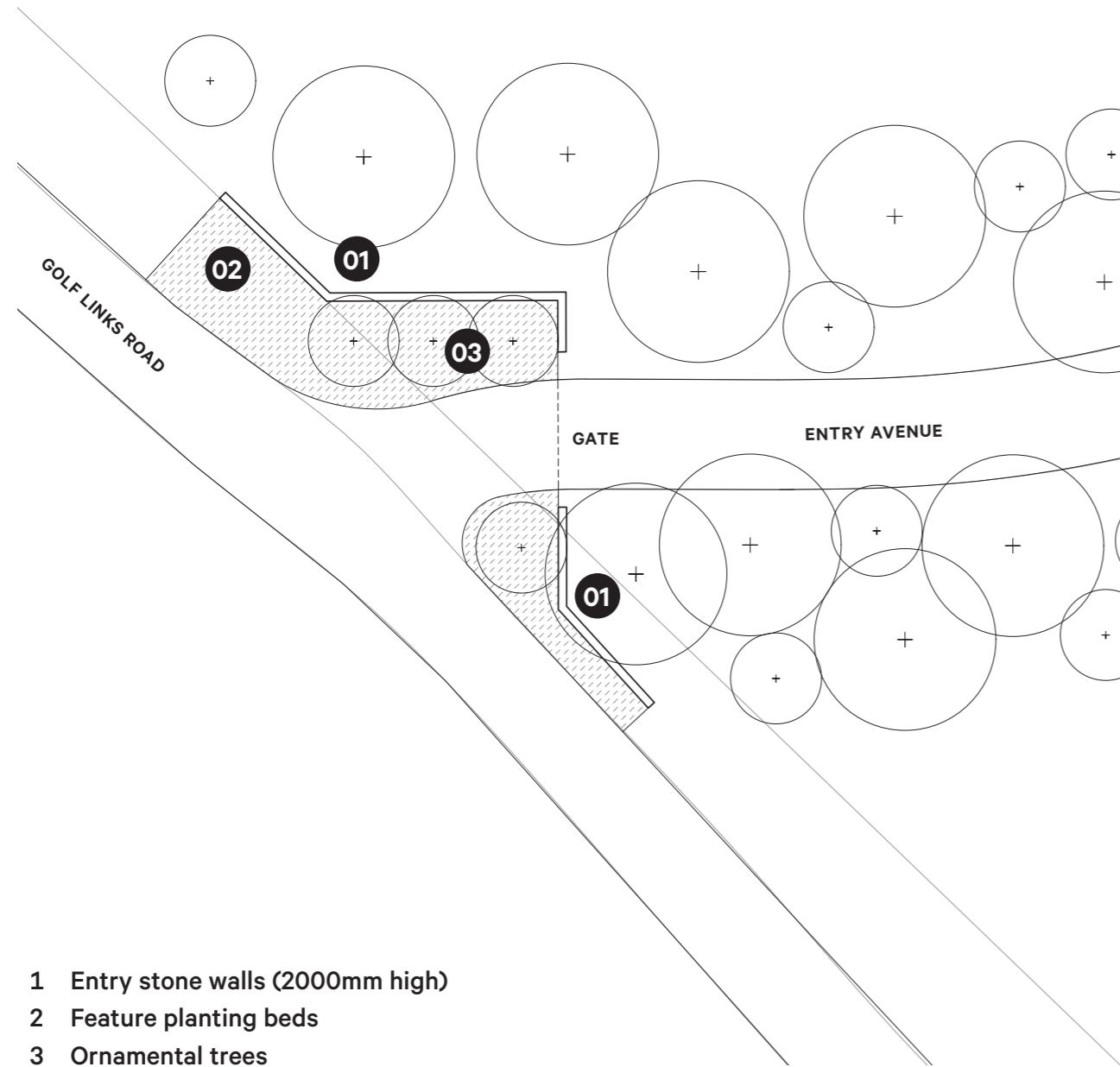
P2 - SMALL BOARDWALK



P1 - COMPACTED GRANULITIC PAVING

LOW LEVEL NATIVE GRASSES

SITE  
MAIN ENTRY



- 1 Entry stone walls (2000mm high)
- 2 Feature planting beds
- 3 Ornamental trees

STONE ENTRY WALL



SIGNAGE AND ACCESS GATE



TREE LINED AVENUE



RE-INSTATED UNDERSTOREY PLANTING

# SITE EXISTING BUILT FORM

- 1 Outdoor dining space with extension to existing building.
- 2 Perfumery gardens
- 3 Tree orchard
- 4 Arbour

## PRECEDENTS



SITE  
EXISTING BUILT FORM

EXISTING



**SITE**  
**BRIDGE CROSSINGS +**  
**WATERWAYS**

- 1 Restoration to creek beds with revegetation along creek beds, with designated cross-overs for walkers and golf buggies.
- 2 Existing lakes improved with planting to embankments and small lookout deck integrated along connection to the Heysen Trail.
- 3 Stormwater basin for water quality improvement



VIEW A



VIEW B



SITE  
**BRIDGE CROSSINGS +  
WATERWAYS**

EXISTING



# SITE PLANT + TREE PALETTE

## SPECIES LOCAL TO ADELAIDE HILLS

- Eucalyptus viminalis (Manna Gum)
- Eucalyptus obliqua (Stringybark)
- Eucalyptus oblonga
- Acacia acinacea
- Acacia myrtifolia
- Acacia pycnantha
- Acacia retinoides
- Allocasuarina muelleriana
- Austrostipa nodosa
- Backhousia citriodora
- Billardiera cymosa
- Bulbine bulbosa

- Bursaria spinosa
- Callistemon rugulosus
- Callistemon sieberi
- Clematis decipiens
- Convolvulus angustissimus ssp. Angustissimus
- Cyperus vainatus
- Dianells longifolia var. grandis
- Doconaea viscosa ssp. Spathulata
- Eurcalyptus fasciculosa
- Eurcalyptus obliqua
- Eucalyptus viminalis
- Gahnia sieberiana

- Goodenia geniculata
- Grevillea lavandulacea
- Hardenbergia violacea
- Helichrysum scorpioides
- Juncus kraussii
- Kendnedia prostrata
- Kunzea pomifera
- Lomandra densiflora
- Scaevola albida
- Olearia ramulosa
- Xanthorrhoea semiplana

## FEATURE TREES

- Araucaria bidwillii
- Araucaria cunninghamii
- Betula nigra
- Lagerstroemia natchez
- Liquidamber styraciflua
- Quercus robur
- Quercus coccinea
- Wollemia nobilis



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[oxigen.net.au](http://oxigen.net.au)



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## **Appendix 8**

*Appendix F of Development Report – Economic analysis*

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ECONOMIC ANALYSIS OF THE  
MOUNT LOFTY GOLF ESTATE  
DEVELOPMENT

A Report for Hudson Howells on  
behalf of Trice

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Prepared by

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## ABBREVIATIONS

fte	full time equivalent
GRP	gross regional product
GSP	gross state product
I-O	Input Output
RISE	Regional Industry Structure and Employment
SAGR	South Australian Government Region
SATC	South Australian Tourism Commission
SPC	State Planning Commission
TRA	Tourism Research Australia



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## EXECUTIVE SUMMARY

In December 2020, the then Minister for Planning and Local Government declared the Mount Lofty Golf Estate to be assessed as a Major Development pursuant to Section 46 of the Development Act 1993. Due to the nature of proposal, the State Planning Commission (SPC) determined the need for a broader assessment. The SPC determined that the proposal will be subject to the processes of a development report. The guidelines of the development report include the requirement for an Economic Impact Assessment that describes the existing environment in which the project is set and assesses the magnitude of change to the economic environment resulting from the project (State Planning Commission, 2022). BDO EconSearch were contracted to complete the economic impact assessment component of the development report.

The Stirling Golf Club was founded by five members of the Royal Adelaide Golf Club in 1925 and was originally named Mount Lofty Golf Estate. The project vision is to revitalise the club and upgrade the property to a world class resort whilst bringing back the original name, preserving its cultural and historic importance for the future. The Mount Lofty Golf Estate development is proposed to cost a total of \$86 million over a three year period. It will include the development of a hotel with suites, serviced apartments, a function room, restaurant sports bar, gallery and café, and wellness centre with a gym and spa treatment rooms. In addition to the hotel, the proposed development includes private retreats/pods, refurbishment and extension of the perfumery, improvements to the 18-hole golf course, refurbished function facilities and clubhouse, new pro-shop including a gym and change rooms, and 200 car parking spaces.

### Method of Analysis

This report presents the results of an economic impact analysis of the proposed development. Extended input-output (I-O) analysis was employed for estimation of regional economic impacts.

The regional and state level economic impacts were estimated using an extension of the conventional input-output method. Over the past decade BDO EconSearch has developed an extended I-O model known as the RISE model (Regional Industry Structure and Employment). I-O models are widely used to assess the economic contribution of existing levels of economic activity and the economic impacts of shocks. The indicators used in impact analysis typically include employment, contribution to gross regional product (GRP)/gross state product (GSP) and household income which are used in this report. RISE models for the Adelaide Hills South Australian Government Region (SAGR) and South Australia were used for the assessment of regional and state impacts.

The impact analysis investigated the economic impact to the Adelaide Hills SAGR and the state as a whole resulting from the construction and operation of the estate.

### *Construction phase*

The total contribution to GRP/GSP, employment and household income in the Adelaide Hills SAGR and South Australia as a result of construction is summarised in Table ES-1.

Over the three year period of construction, the development is expected to contribute GRP of \$41.1m and household income of \$29.3m to the Adelaide Hills economy. Additionally, the proposed development will support the employment of 141 fte jobs in the Adelaide Hills SAGR on average over the three years of construction. These estimates include the construction of the development and flow-on effects in the broader economy.

Statewide, the development is expected to contribute GSP of \$87.1m and household income of \$57.3m to the South Australian economy. Additionally, the proposed development will support the employment of 240 fte jobs in the state on average over the three years of construction. These estimates include the construction of the development and flow-on effects in the broader economy.

Table ES-1 Summary contribution of the construction phase to Adelaide Hills SAGR and South Australia

	Adelaide Hills SAGR	South Australia
Expenditure (\$m)	50.0	79.6
GRP/GSP (\$m)		
Direct	23.2	34.6
Flow-on	17.9	52.4
<i>Total GRP Impact</i>	41.1	87.1
Employment (fte) <sup>a</sup>		
Direct	82	104
Flow-on	59	136
<i>Total Employment Impact</i>	141	240
Household Income (\$m)		
Direct	17.8	25.5
Flow-on	11.5	31.8
<i>Total Household Income Impact</i>	29.3	57.3

<sup>a</sup> GRP and household income impacts are a total over the three-year construction period and employment impacts are an average over the same period.

Source: BDO EconSearch analysis

### Operating phase

The total contribution to GRP/GSP, employment and household income in the Adelaide Hills SAGR and South Australia as a result of the operation of the estate is summarised in Table ES-2. The operating phase includes the operation of the Mount Lofty Golf Estate and associated tourism expenditure. Results have been presented for years 1, 5 and 10.

By the tenth year of operation, the development is expected to contribute GRP of \$32.0m, household income of \$12.6m, and support the employment of 225 fte jobs annually in the Adelaide Hills economy. This includes the operation of the estate, associated tourism expenditure at other businesses, and flow-on effects in the broader economy.

Statewide, the development is expected to contribute GSP of \$40.3m, household income of \$16.7m, and support the employment of 261 fte jobs annually in the South Australian economy by the tenth year of operation. This includes the operation of the estate, associated tourism expenditure at other businesses, and flow-on effects in the broader economy.



Table ES-2 Summary contribution of the operating phase to Adelaide Hills SAGR and South Australia

	Year 1 2025/26	Year 5 2029/30	Year 10 2034/35
<b>Adelaide Hills</b>			
<b>GRP (\$m)</b>			
Direct	11.6	20.5	22.9
Total	17.6	29.1	32.0
<b>Employment (fte)</b>			
Direct	125	139	139
Total	181	219	225
<b>Household Income (\$m)</b>			
Direct	5.9	6.7	6.8
Total	9.6	12.0	12.6
<b>South Australia</b>			
<b>GSP (\$m)</b>			
Direct	11.7	20.7	23.1
Total	23.1	36.7	40.3
<b>Employment (fte)</b>			
Direct	125	139	139
Total	207	254	261
<b>Household Income (\$m)</b>			
Direct	5.9	6.7	6.8
Total	12.4	15.8	16.7

Source: BDO EconSearch analysis

## 1. INTRODUCTION

In December 2020, the then Minister for Planning and Local Government declared the Mount Lofty Golf Estate to be assessed as a Major Development pursuant to Section 46 of the Development Act 1993. Due to the nature of proposal, the State Planning Commission (SPC) determined the need for a broader assessment. The SPC determined that the proposal will be subject to the processes of a development report. The guidelines of the development report include the requirement for an Economic Impact Assessment that describes the existing environment in which the project is set and assesses the magnitude of change to the economic environment resulting from the project (State Planning Commission, 2022). BDO EconSearch were contracted to complete the economic impact assessment component of the development report.

The Stirling Golf Club was founded by five members of the Royal Adelaide Golf Club in 1925 and was originally named Mount Lofty Golf Estate. The project vision is to revitalise the club and upgrade the property to a world class resort whilst bringing back the original name preserving its cultural and historic importance for the future. The Mount Lofty Golf Estate development is proposed to cost a total of \$86 million over a three year period. It will include a hotel with:

- 56 hotel suites
- 15 x two bedroom serviced apartments
- 15 x three bedroom serviced apartments
- 2 penthouse serviced apartments
- Back of house, plant storage and maintenance areas
- A 537m<sup>2</sup> function room
- A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace
- 186m<sup>2</sup> sports bar
- A 189m<sup>2</sup> gallery and cafe
- A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.

In addition to the hotel, the proposed development includes:

- 20 x one bedroom unit Private Retreats/Pods
- 1 back of house Pod
- Refurbishment and extension of the perfumery
- Improvements to the 18-hole golf course
- Refurbished function facilities, cart storage and clubhouse in new building
- New pro-shop, administration areas, gym and change rooms
- A total of 200 car parking spaces in two car parking areas.

Following the completion of the project, it is anticipated that the Mount Lofty Golf Estate will become a recognised destination which will showcase the best that the Adelaide Hills has to offer. The goal is for the resort to become an important and **integrated part of the region's tourist offerings and to contribute significantly to the region achieving its tourism goals and awards.**

The South Australian Regional Visitor Strategy for Adelaide Hills in 2025, developed by the South Australian Tourism Commission (SATC), outlines the tourism priorities for the Adelaide Hills region. Overall, the region aims to convert more visitors to stay overnight, encourage day trippers to linger longer, spend more and grow repeat visitation (SATC, 2021). The development of the Mount Lofty Golf Estate will create additional accommodation within the region which will encourage and facilitate more overnight visitors. Additionally,

the redevelopment of the golf course will encourage day trippers to stay longer in the region to play golf, spend more, and visit more frequently.

The strategy also specified the regions priority to support the development of experiences that reflect the Adelaide Hills Interpretation Plan themes of food and beverage, towns and villages (including twilight activities), art, heritage and culture (including Aboriginal), nature and lifestyle (including soft adventure, wellness, hiking, cycling and horse riding) (SATC, 2021). The Mount Lofty Golf Estate will include the redevelopment of the Stirling Golf Course, which will improve the nature and lifestyle offering with the region.

This report presents the results of an economic impact analysis of the proposed development. Extended input-output (I-O) analysis was employed for estimation of regional economic impacts.

The remainder of this report is structured as follows:

Section 2        methods of analysis and data

Section 3        economic impact analysis results.

## 2. METHOD OF ANALYSIS AND DATA

The economic impact analysis uses an extension of the conventional input-output method. Over the past decade BDO EconSearch has developed an extended input-output model known as the RISE model (Regional Industry Structure & Employment). The RISE model provides a comprehensive economic framework that is extremely useful in the resource planning process, particularly for regional economic impact applications.

The indicators used in impact analysis typically include employment, gross regional product and household income which are used in this report.

### 2.1. Economic activity

*Economic activity indicators:* the focus of this report is the generation of economic activity resulting from the development. The key economic activity indicators considered in the analysis are employment, gross regional product (GRP)/gross state product (GSP) and household income.

*Economic impact:* changes in economic activity are referred to as economic impacts. Generally, changes in *economic activity indicators* result from some stimulus or external shock imposed. In this analysis the concept of economic impact includes the increase in economic contribution from the construction and operation of the development, i.e. the contribution the development makes to the economy. This economic impact is measured in terms of the economic activity indicators referred to above.

### 2.2. Indicators of economic activity defined

*Employment units:* Employment numbers are usually reported in either full time equivalent (fte) units or total job units defined as follows:

- *fte:* is a way to measure a worker's involvement in a project or industry activity. An fte of 1.0 means that the person is equivalent to a full-time worker, while an fte of 0.5 signals that the worker is only half-time. Typically, different scales are used to calibrate this number, depending on the type of industry and scope of the analysis but the basic calculation is the total hours worked divided by average annual hours worked in full-time jobs.
- *Jobs:* is used to refer to the number of workers employed in an industry or on a project at any point in time. It typically refers to either:
  - the *maximum* number of workers required at any point over the analytical period or the duration of the project; or
  - the *average* number of workers required over the analytical period/duration of the project. This can be calculated on a daily, weekly, monthly or annual basis.

In this report employment has been reported in terms of fte units on a per annum basis.

*Gross regional product (GRP)/Gross state product (GSP):* is a measure of the contribution of an activity to the economy. GRP/GSP is measured as value of gross output (business revenue) less the cost of goods and services (including imports) used in producing the output. In other words, it can be measured as the sum of household income, gross operating surplus and gross mixed income net of payments to owner managers and taxes less subsidies on products and production. It represents payments to the primary inputs of production (labour, capital and land). Using GRP/GSP as a measure of economic impact avoids the problem of double counting that may arise from using value of output for this purpose. *GRP/GSP are regional and state level equivalents of gross domestic product.*

*Household income*: is a component of Gross State Product (GSP) and Gross Regional Product (GRP) and is a measure of wages and salaries, drawings by owner operators and other payments to labour including overtime payments and income tax, but excluding payroll tax.

### 2.3. Categories of economic activity

A useful way to think about economic activity and economic impact (as measured by employment, GRP, household income, **etc.**) is using the concept of a ‘supply chain’. The supply chain, in the context of an infrastructure project, includes the planning and management of all activities involved in sourcing and procurement, conversion of materials, and all the logistics management activities. It also includes coordination and collaboration with suppliers, intermediaries and third-party service providers.

Broadly speaking there are four categories of employment, GRP and household income along the infrastructure supply chain.

1. *Direct employment, GRP and household income* - this is employment, GRP and household income in those firms, businesses and organisations that are directly engaged in providing goods and services to the development.
2. *First round employment, GRP and household income* - refers to employment, GRP and household income **in firms that supply inputs and services to the ‘direct employment’ businesses, i.e. those categorised under #1 above.**
3. *Industrial-support employment, GRP and household income* - is the term applied to 'second and subsequent round' effects as successive waves of output increases occur in the economy to provide industrial support, as a response to the original expenditure. This category excludes any employment, GRP and household income associated with increased household consumption.
4. *Consumption-induced employment, GRP and household income* - is the term applied to as those effects induced by increased household income associated with the original expenditure. The expenditure of household income associated with all three categories of employment, GRP and household income (direct, first round and industrial-support) will generate economic activity that will in itself generate jobs, GRP and household income.

*Flow-on (or indirect) economic impact* is the sum of categories 2, 3 and 4. In this analysis *direct* and *flow-on* employment, GRP and household income generated by the supply chain have been reported.

For this project these categories of economic impact will apply to the construction and operation of the development and to the increase in expenditures made by visitors to the region.

### 2.4. Economic impact modelling

Over the past decade BDO EconSearch has developed an extended input-output (I-O) model known as the RISE model (Regional Industry Structure & Employment). BDO EconSearch updates the RISE model annually for use by the Department of the Premier and Cabinet, Government of South Australia (EconSearch 2020). RISE models based on the 2019/20 financial year of the Adelaide Hills SAGR and state of South Australia were used to make regional and state economic estimates.

Input-output models are widely used to assess the economic contribution of existing levels of economic activity and the economic impacts of shocks. The models are based upon I-O tables that describe the interdependencies between industries within the regional economy and with the economy outside of the region. This makes the comprehensive economic framework provided by the RISE model extremely useful for disentangling the direct and flow-on effects of activity in a regional economy.

The I-O method used in the RISE model has been extended to incorporate population and unemployment changes. Modelling population change allows for the estimation of impacts on population driven sectors, such as government administration, health, defence and education. Modelling unemployment change allows estimation of an offsetting effect on consumption-induced flow-on impacts as some new employees may have previously claimed unemployment benefits in the region and some may be new to the region. These extensions improve the reliability of RISE model estimates compared to conventional I-O models.

## 2.5. Data and assumptions

### 2.5.1. Construction costs

Total construction costs are expected to total \$85.8m across 3 years with \$1.8m in 2022/23, \$46.7m in 2023/24 and \$37.3m in 2024/25 (Trice, pers. comm.). A summary of the itemised costs over the construction period are summarised in Table 2-1.

Table 2-1 Itemised construction cost assumptions for years 2022/23, 2023/24 and 2024/25

Element	2022/23 Year 1 (\$)	2023/24 Year 2 (\$)	2024/25 Year 3 (\$)	Total (\$)
Demolition		109,792	87,833	197,625
Primary Construction	1,500,000	32,273,333	25,818,667	59,592,000
Pod Accommodation		2,277,778	1,822,222	4,100,000
Furniture, Fittings and Equipment for Accommodation		1,200,000	960,000	2,160,000
Information & Communications Technology	250,000			250,000
Artwork		27,778	22,222	50,000
Headworks - Upgrades to Entrance Roads		555,556	444,444	1,000,000
Refurbishment on Perfumery + Outdoor		277,778	222,222	500,000
Civil Works upgrade to fire tracks		277,778	222,222	500,000
SA Power Networks Augmentation + Generator		222,222	177,778	400,000
Marketing, Branding + Campaigning		41,667	33,333	75,000
Contingency All Up		3,823,590	3,058,872	6,882,463
Escalation to End of 2022		2,271,213	1,816,970	4,088,183
Escalation to Completion		3,324,803	2,659,842	5,984,645
<b>Total</b>	<b>1,750,000</b>	<b>46,683,286</b>	<b>37,346,629</b>	<b>85,779,915</b>

Source: Trice, pers. comm.

### 2.5.2. Operational characteristics

A 10 year timeline of total revenue and operating costs once construction is complete is estimated below. Table 2-2 summarises these values at year 1, 5 and 10.

Table 2-2 Revenue and operating cost assumptions for year 1, 5 and 10

	Year 1 of operation (\$) 2025/26	Year 5 of operation (\$) 2028/29	Year 10 of operation (\$) 2033/34
Revenue	15,356,048	27,445,432	31,115,073
<b>Sales Expenses</b>			
Food and Beverage Division	1,748,002	3,333,941	3,793,087
Spa Division	46,623	80,695	92,255
Conference	254,333	602,727	649,250
Minor Operating Department	971,484	1,652,584	1,817,377
<i>Total Sales Expenses</i>	<i>3,020,442</i>	<i>5,669,948</i>	<i>6,351,969</i>
<b>Payroll Expenses</b>			
<i>Total Payroll Expenses</i>	<i>4,278,476</i>	<i>4,431,792</i>	<i>4,431,792</i>
<b>Other Operating Expenses</b>			
Room Division	1,731,355	2,745,172	3,158,618
Food and Beverage Division	462,870	824,927	936,080
Spa Division	41,628	90,668	103,657
Diving & Water sport	120,665	214,329	232,584
Minor Operating Department	126,845	165,800	182,913
Administration & General	436,881	505,791	567,059
Human Resources	150,000	182,326	201,303
Sales & Marketing	300,000	324,730	358,528
Property Operation Maintenance and Energy Costs	251,765	231,617	256,554
Energy	281,648	428,612	486,237
Insurance	45,000	48,948	55,380
<i>Total Other Operating Expenses</i>	<i>3,948,656</i>	<i>5,762,920</i>	<i>6,538,913</i>
<b>Total expenses</b>	<b>11,247,574</b>	<b>15,864,660</b>	<b>17,322,673</b>

Source: Ron Meerwald, pers. comm.

A 10 year timeline of the breakdown of employment required to operate the estate once construction is complete is estimated below. Table 2-3 summarises these values at year 1, 5 and 10.

Table 2-3 Employment assumptions for year 1, 5 and 10

Position Staff Number (FTEs)	Year 1 of operation 2025/26	Year 5 of operation 2028/29	Year 10 of operation 2033/34
General Manager	1	1	1
Assistant General Managers	2	2	2
Housekeeping Staff (Guest Service Grade 1)	36	40	40
Reception (Guest Service Grade 4)	8	8	8
Golf Club Staff	15	15	15
Food and Beverage (Grade 1)	12	12	12
Food and Beverage Manager	2	2	2
Chefs	1	1	1
Cook (Grade 2)	4	4	4
Cook (Grade 4)	2	2	2
Gardening Staff and Ranger	10	10	10
Administration Staff	4	4	4
<b>Total FTE</b>	<b>97</b>	<b>101</b>	<b>101</b>

Source: URPS 2021



### 2.5.3. Tourism

The expected increase in visitation to the region after the project is complete was estimated using the total number of bed nights made available by the estate. It is assumed that 106 accommodation units will be functional for 2025/26 (Ron Meerwald, pers. comm.).

Table 2-4 summarises the assumptions used to estimate the increased tourism to the region as a result of the newly developed accommodation units. Total nights and expenditure per visitor was estimated based on the Adelaide Hills SAGR tourist expenditure profile (TRA 2019).

Table 2-4 Visitation assumptions for developed accommodation units, 2025/26, 2028/29 and 2033/34

	Year 1 of operation 2025/26	Year 5 of operation 2028/29	Year 10 of operation 2033/34
<b>Built Units</b>			
One Bedroom Suite	40	40	40
Two Bedroom Suite	26	26	26
Three Bedroom Suite	20	20	20
Chalets	20	20	20
<b>Guests per rooms</b>			
One Bedroom Suite	1.2	1.2	1.2
Two Bedroom Suite	3	3	3
Three Bedroom Suite	5	5	5
Chalets	4	4	4
<b>Overall Occupancy</b>			
One Bedroom Suite	50%	73%	76%
Two Bedroom Suite	50%	73%	76%
Three Bedroom Suite	45%	67%	69%
Chalets	45%	67%	69%
<b>Additional nights</b>			
One Bedroom Suite	8,760	12,826	13,281
Two Bedroom Suite	14,235	20,841	21,581
Three Bedroom Suite	16,425	24,291	25,153
Chalets	13,140	19,433	20,122
<i>Total</i>	<i>52,560</i>	<i>77,390</i>	<i>80,136</i>
Additional domestic nights	41,197	60,659	62,812
Additional domestic visitors	14,933	21,988	22,768
Additional international nights	11,363	16,731	17,324
Additional international visitors	668	983	1,018

Source: Ron Meerwald, pers. comm.

After the completion of the development, the Developer expects an additional 17,000 rounds of golf will be played at the Mount Lofty Golf Estate in addition to the current activity on the site (URPS, 2021). Due to the improvements to the golf course research indicates that 25 per cent of the additional 17,000 rounds of golf will be played by visitors who are not in-house guests (URPS). As a consequence, this will bring additional visitors to the region.

Table 2-5 summarises the assumptions used to estimate the increased expenditure to the region as a result of the increased rounds of golf played. It is assumed that the number of additional visitors to the region will be the same from 2025/26 onwards. Note these domestic day trip visitors are in addition to the visitors who are expected to stay at the hotel (Table 2-4).

Table 2-5 Visitation assumptions for additional rounds of golf, 2025/26 onwards

	2025/26 onwards
Additional rounds of golf	17,000
Rounds of golf played by visitors who are not in house guests	25%
<i>Day trip visitors proportion</i>	10%
<i>Overnight visitors proportion (not in house guests)</i>	15%
Additional overnight visitors (not in house guests)	2,550
<i>Domestic</i>	2,441
<i>International</i>	109
Additional domestic day trip visitors	1,700

Source: URPS 2021

The expenditures by the additional visitors resulting from the development generates additional activity (revenue and expenditures) by local businesses providing goods and services to the visitors. These costs include expenditures on intermediate goods and services (e.g. food, electricity, accountancy services, etc.) and on wages. A RISE model of the Adelaide Hills SAGR was used to estimate these visitation costs within the region, based on the expected tourist expenditure profile (TRA 2019).

#### 2.5.4. Timeline

The timeline for this project includes a construction phase and an operation phase. The construction phase is over the course of three years, 2022/23 to 2024/25. The operation phase is the ten years following construction completion, 2025/26 to 2034/35.

#### 2.5.5. Modelling

In addition to the assumptions embodied in the input-output model itself, it was necessary to make a number of other general assumptions in estimating the economic impacts:

- The impacts were measured using a model that represents the structure of the regional economy for the year in which the most recent data are available (2019/20). However, over time there are likely to be improvements in primary factor productivity in these economies. To allow for the improvements an across-the-board (all sectors) labour productivity improvement rate of 0.5 per cent per annum for subsequent years of the construction and operation phases have been incorporated into the modelling.
- When new jobs are created, it should be determined where the people come from to fill those jobs. In some cases, the jobs will be taken by previously unemployed locals or by someone who is currently employed locally but whose own job is taken by a previously unemployed local. In both cases the impact of the newly created job and associated income is partially offset by the fact that someone who was previously receiving unemployment benefits for example is no longer doing so. To calculate this effect requires estimates of the parameter  $\rho$ , the proportion of new jobs that are likely to be filled by previously unemployed locals. For the construction and operating phases, it was estimated to be 0.6 for the Adelaide Hills SAGR and 0.9 for South Australia.

## 3. ECONOMIC IMPACT RESULTS

### 3.1. Construction Phase

The capital cost estimates for the development are detailed in Section 2.5.1. The development will involve a total capital investment of \$86 million (Trice, pers. comm.). The economic impact of the development will be determined by the extent of local labour and raw materials used and the level of expenditures associated with the specialised contractors and equipment that will occur in the region.

#### Gross regional product (GRP)/Gross state product (GSP)

GRP/GSP is a measure of the net contribution of an activity or industry to the regional economy. It represents payments to the primary inputs of production (labour, capital and land) and is a regional level equivalent of gross domestic product. Estimates for the 3-year construction period are provided in Table 3-1 for the Adelaide Hills SAGR and in Table 3-2 for South Australia.

The total contribution to GRP/GSP as a result of construction expenditure is expected to be:

- Adelaide Hills SAGR: \$41.1m, including \$23.2m directly and \$17.9m in flow-on impacts
- South Australia: \$87.1m, including \$34.6m directly and \$52.4m in flow-on impacts.

#### Employment (fte)

Employment is a key indicator of both regional economic activity and the welfare of regional households.

The estimates presented in Table 3-1 and Table 3-2 show that the employment effect is expected to be on average over the three-year period:

- Adelaide Hills SAGR: 141 fte jobs, including 82 fte jobs directly and 59 flow-on fte jobs
- South Australia: 240 fte jobs, including 104 fte jobs directly and 136 flow-on fte jobs.

#### Household Income

Household income is a component of Gross State Product (GSP) and Gross Regional Product (GRP) and is a measure of wages and salaries other payments to labour.

The estimates presented in Table 3-1 and Table 3-2 show that the total contribution to household income is expected to be on average over the three-year period:

- Adelaide Hills SAGR: \$29.3m, including \$17.8m directly and \$11.5m in flow-on impacts
- South Australia: \$57.3m, including \$25.5m directly and \$31.8m in flow-on impacts.

Table 3-1 Economic impact of the Mount Lofty Golf Estate Development on the Adelaide Hills SAGR region, construction phase, 2022/23 to 2024/25

	2022/23	2023/24	2024/25	Total <sup>a</sup>
Expenditure in Adelaide Hills (\$m)	0.9	27.3	21.8	50.0
GRP (\$m)				
Direct	0.4	12.6	10.1	23.2
Flow-on	0.3	9.8	7.8	17.9
<i>Total GRP Impact</i>	<i>0.7</i>	<i>22.4</i>	<i>17.9</i>	<i>41.1</i>
Employment (fte)				
Direct	4	135	107	82
Flow-on	3	97	77	59
<i>Total Employment Impact</i>	<i>8</i>	<i>231</i>	<i>184</i>	<i>141</i>
Household Income (\$m)				
Direct	0.3	9.7	7.8	17.8
Flow-on	0.2	6.3	5.0	11.5
<i>Total Household Income Impact</i>	<i>0.5</i>	<i>16.0</i>	<i>12.8</i>	<i>29.3</i>

<sup>a</sup> GRP and household income impacts are a total over the three-year construction period and employment impacts are an average over the same period.

Source: BDO EconSearch analysis.

Table 3-2 Economic impact of the Mount Lofty Golf Estate Development on South Australia, construction phase, 2022/23 to 2024/25

	2022/23	2023/24	2024/25	Total <sup>a</sup>
Expenditure in SA (\$m)	1.7	43.3	34.6	79.6
GSP (\$m)				
Direct	0.8	18.8	15.1	34.6
Flow-on	1.1	28.5	22.8	52.4
<i>Total GRP Impact</i>	<i>1.9</i>	<i>47.3</i>	<i>37.9</i>	<i>87.1</i>
Employment (fte)				
Direct	7	170	135	104
Flow-on	9	222	177	136
<i>Total Employment Impact</i>	<i>16</i>	<i>393</i>	<i>313</i>	<i>240</i>
Household Income (\$m)				
Direct	0.6	13.8	11.1	25.5
Flow-on	0.7	17.3	13.8	31.8
<i>Total Household Income Impact</i>	<i>1.3</i>	<i>31.1</i>	<i>24.9</i>	<i>57.3</i>

<sup>a</sup> GRP and household income impacts are a total over the three-year construction period and employment impacts are an average over the same period.

Source: BDO EconSearch analysis.

### 3.2. Operating Phase

The second component of the economic impact estimates relates to the operational phase of the proposed development. There are two elements related to the operating phase, the operation of the estate and the additional visitor expenditure attributed to the project. The operational costs for the development are detailed in Section 2.5.2, and the tourism assumptions are detailed in Section 2.5.3.

#### 3.2.1. Operation

The economic impact of operating the development is presented for the Adelaide Hills SAGR and South Australia for operation years 1, 5 and 10 in Table 3-3 to Table 3-4.

Table 3-3 Economic impact of the Mount Lofty Golf Estate Development on the Adelaide Hills SAGR region, operation, 2025/26, 2029/30 and 2034/35

	Year 1 2025/26	Year 5 2029/30	Year 10 2034/35
GRP (\$m)			
Direct	8.5	16.3	18.5
Flow-on	4.9	7.0	7.6
<i>Total GRP Impact</i>	<i>13.4</i>	<i>23.2</i>	<i>26.2</i>
Employment (fte)			
Direct	97	101	101
Flow-on	45	66	71
<i>Total Employment Impact</i>	<i>142</i>	<i>167</i>	<i>172</i>
Household Income (\$m)			
Direct	4.3	4.4	4.4
Flow-on	3.0	4.4	4.8
<i>Total Household Income Impact</i>	<i>7.2</i>	<i>8.8</i>	<i>9.2</i>

Source: BDO EconSearch analysis

Table 3-4 Economic impact of the Mount Lofty Golf Estate Development on South Australia, operation, 2025/26, 2029/30 and 2034/35

	Year 1 2025/26	Year 5 2029/30	Year 10 2034/35
GSP (\$m)			
Direct	8.7	16.5	18.7
Flow-on	8.7	12.3	13.4
<i>Total GRP Impact</i>	<i>17.4</i>	<i>28.8</i>	<i>32.2</i>
Employment (fte)			
Direct	97	101	101
Flow-on	65	91	97
<i>Total Employment Impact</i>	<i>162</i>	<i>192</i>	<i>198</i>
Household Income (\$m)			
Direct	4.3	4.4	4.4
Flow-on	5.0	7.1	7.8
<i>Total Household Income Impact</i>	<i>9.3</i>	<i>11.5</i>	<i>12.2</i>

Source: BDO EconSearch analysis

### 3.2.2. Tourism

The economic impact of additional tourism is presented for the Adelaide Hills SAGR and South Australia for operation years 1, 5 and 10 in Table 3-5 and Table 3-6.

Table 3-5 Economic impact of the Mount Lofty Golf Estate Development on the Adelaide Hills SAGR region, tourism, 2025/26, 2029/30 and 2034/35

	Year 1 2025/26	Year 5 2029/30	Year 10 2034/35
GRP (\$m)			
Direct	3.1	4.2	4.4
Flow-on	1.2	1.6	1.7
<i>Total GRP Impact</i>	<i>4.2</i>	<i>5.9</i>	<i>6.1</i>
Employment (fte)			
Direct	28	38	38
Flow-on	10	14	14
<i>Total Employment Impact</i>	<i>38</i>	<i>52</i>	<i>53</i>
Household Income (\$m)			
Direct	1.6	2.3	2.3
Flow-on	0.7	1.0	1.0
<i>Total Household Income Impact</i>	<i>2.3</i>	<i>3.2</i>	<i>3.3</i>

Source: BDO EconSearch analysis

Table 3-6 Economic impact of the Mount Lofty Golf Estate Development on South Australia, tourism, 2025/26, 2029/30 and 2034/35

	Year 1 2025/26	Year 5 2029/30	Year 10 2034/35
GSP (\$m)			
Direct	3.1	4.2	4.4
Flow-on	2.6	3.7	3.8
<i>Total GRP Impact</i>	5.7	7.9	8.2
Employment (fte)			
Direct	28	38	38
Flow-on	18	24	24
<i>Total Employment Impact</i>	46	62	63
Household Income (\$m)			
Direct	1.6	2.3	2.3
Flow-on	1.5	2.0	2.1
<i>Total Household Income Impact</i>	3.1	4.3	4.4

Source: BDO EconSearch analysis

### 3.2.3. Total Operational Phase

The combined contribution to GRP/GSP, employment and household income as a result of the operation of the development and tourism increase of the development to each region is summarised in Table 3-7. Results have been presented for years 1, 5 and 10.

By the tenth year of operation, the development is expected to support GRP of \$32.0m, employment of 225 fte jobs and \$12.6m of household income in the Adelaide Hills economy, including operation of the estate, associated tourism expenditure at other businesses, and flow-on effects in the broader economy.

Statewide, the development is expected to contribute GSP of \$40.3m, household income of \$16.7m, and support the employment of 261 fte jobs annually in the South Australian economy by the tenth year of operation. This includes the operation of the estate, associated tourism expenditure at other businesses, and flow-on effects in the broader economy.



Table 3-7 Summary contribution of the operating phase to the Adelaide Hills SAGR and South Australia

	Year 1 2025/26	Year 5 2029/30	Year 10 2034/35
<b>Adelaide Hills</b>			
<b>GRP (\$m)</b>			
Direct	11.6	20.5	22.9
Total	17.6	29.1	32.0
<b>Employment (fte)</b>			
Direct	125	139	139
Total	181	219	225
<b>Household Income (\$m)</b>			
Direct	5.9	6.7	6.8
Total	9.6	12.0	12.6
<b>South Australia</b>			
<b>GSP (\$m)</b>			
Direct	11.7	20.7	23.1
Total	23.1	36.7	40.3
<b>Employment (fte)</b>			
Direct	125	139	139
Total	207	254	261
<b>Household Income (\$m)</b>			
Direct	5.9	6.7	6.8
Total	12.4	15.8	16.7

Source: BDO EconSearch analysis

### 3.3. Analysis of potential secondary economic effects

As outlined in Section 3.2, once the development is complete, the operational phase of the project will have a significant secondary impact on the local and state economy. Secondary economic activity is measured by flow-on impacts, Section 2.3 outlines the definition and breakdown of flow-on economic activity. The industries with flow-on impacts in GRP/GSP and employment have increased demand in the market. These industries therefore have increased opportunity for further investment, and the potential to attract value add development and commercial ventures.

The industries most impacted by the operational phase of the development in the Adelaide Hills SAGR region are the retail trade, administration and support services, wholesale trade, professional scientific and technical services, and rental hiring and real estate. These industries have the highest flow-on economic activity and therefore have the most significantly increased opportunities for investment as a result of the development. The five industries with the highest associated flow-on economic activity within the Adelaide Hills SAGR are summarised in Table 3-8. These sectors are ranked by the GRP contribution of the flow-on economic activity from year 10 of operation.

Table 3-8 Flow-on economic contribution of the top five sectors in year 10 of operation (2034/35) in the Adelaide Hills SAGR, ranked by GRP

	Operational Phase Year 10 (2034/35)	
	Flow-on GRP (\$m)	Flow-on Employment (fte)
Retail Trade	1.04	12
Admin & Support Services	0.72	15
Wholesale Trade	0.59	4
Professional, Scientific & Technical Services	0.51	7
Rental Hiring & Real Estate	0.45	2

Source: BDO EconSearch analysis

The industries most impacted by the operational phase of the development in South Australia are retail trade, professional scientific and technical services, wholesale trade, administration and support services, and finance. These industries have the highest flow-on economic activity and therefore have the most significantly increased opportunities for investment as a result of the development. The five industries with the highest associated flow-on economic activity in South Australia are summarised in Table 3-8. These sectors are ranked by the GSP contribution of the flow-on economic activity from year 10 of operation.

Table 3-9 Flow-on economic contribution of the top five sectors in year 10 of operation (2034/35) in South Australia, ranked by GSP

	Operational Phase Year 10 (2034/35)	
	Flow-on GSP (\$m)	Flow-on Employment (fte)
Retail Trade	1.51	17
Professional, Scientific & Technical Services	1.06	9
Wholesale Trade	1.02	7
Admin & Support Services	1.02	16
Finance	0.90	2

Source: BDO EconSearch analysis

## REFERENCES


- BDO EconSearch 2020, *Input-Output Tables for South Australia and its Regions 2017/18 Update: Technical Report*, report prepared for Department of the Premier and Cabinet, February.
- State Planning Commission 2022, *Guidelines for the preparation of a Development Report - Mount Lofty Golf Estate*, March.
- South Australian Tourism Commission (SATC) 2021, *South Australian Regional Visitor Strategy 2025 - Adelaide Hills*, February.
- Tourism Research Australia (TRA) 2021, *Regional Tourism Profiles 2019/20*, Canberra.
- URPS 2021, *Mt Lofty Golf Estate - Major Project Development Application*, December.

### Disclaimer

The assignment is a consulting engagement as outlined in the ‘**Framework for Assurance Engagements**’, issued by the Auditing and Assurances Standards Board, Section 17. Consulting engagements employ an **assurance practitioner’s technical skills, education, observations, experiences and knowledge of the consulting process**. The consulting process is an analytical process that typically involves some combination of activities relating to: objective-setting, fact-finding, definition of problems or opportunities, evaluation of alternatives, development of recommendations including actions, communication of results, and sometimes implementation and follow-up.

The nature and scope of work has been determined by agreement between BDO and the Client. This consulting engagement does not meet the definition of an assurance engagement as defined in the ‘**Framework for Assurance Engagements**’, issued by the Auditing and Assurances Standards Board, Section 10.

Except as otherwise noted in this report, we have not performed any testing on the information provided to confirm its completeness and accuracy. Accordingly, we do not express such an audit opinion and readers of the report should draw their own conclusions from the results of the review, based on the scope, agreed-upon procedures carried out and findings.



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## **Appendix 9**

*Appendix G of Development Report – Tree impact assessment*

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# Arboricultural Impact Assessment and Development Impact Report

Site: Stirling Golf Club, 35 Golflinks Road, Stirling

Date: Tuesday, 6 December 2022

ATS6360-035GoIRdDIR R1

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Appendix E - Tree Protection Zone Guidelines

Report Reference Number: ATS6360-035GoIRdDIR R1

Report prepared for  
Sonia Mercorella, Trice - Project and Development Managers

Author  
Marcus Lodge, Senior Consulting Arborist, Arborman Tree Solutions Pty Ltd

## Executive Summary

Arborman Tree Solutions has assessed the trees in the area of and potentially impacted by the proposed accommodation pods at Stirling Golf Club, 35 Golflinks Road, Stirling. The assessment has identified the potential impacts to the trees from the proposed development and supporting infrastructure and recommended mitigation strategies where appropriate. The proposal involves the construction of a multi-level hotel, specialised pod style private retreatments, adaptive reuse of the existing perfumery, a new Golf Course Facilities Building, additional car parking, access, and waste management facilities. This assessment provides recommendations in accordance with Australian Standard AS4970-2009 *Protection of trees on development sites* (AS4970-2009).

The assessment considered forty seven trees which are identified as a mix of two indigenous species and one specimen of an exotic species. These trees, with the exception of Tree 101, are naturally occurring indigenous vegetation, Tree 101 is an exotic species that appears to have been planted as part of the landscaping of the area.

The majority of trees are considered to be in good (12) or fair (16) overall condition and have extended useful life expectancies. However, there are also nineteen trees displaying poor overall condition as evidenced by reduced health (15) and/or structural (7) attributes; these trees are potentially not suitable for long-term retention in this type of development.

The assessment has identified the forty six of the trees as naturally occurring indigenous vegetation in an area subject to regulation under the *Native Vegetation Act 1991* and their management is therefore controlled under this Act. A number of these trees also have a trunk circumference greater than two metres however they are exempt from control under the *PDI Act* as per Regulation 3F Sub Regulation (4)(d) as they are controlled under the *Native Vegetation Act 1991* and cannot be removed without consent from the *Native Vegetation Council*.

The remaining tree, Tree 101, is exempt from control under both the *Native Vegetation Act 1991* and the *Planning, Development and infrastructure Act 2016* due to being an exotic and exempt species, respectively.

The Arboricultural Impact Assessment has identified that seventeen trees in the area of the proposed development are likely to be negatively impacted by the proposed works and require removal. As fourteen of these trees have a Moderate or Low Retention Rating and do not display attributes that indicate they should be protected their removal to accommodate expected development is reasonable. However, three trees, Trees 43, 45 and 48 have a High Retention Rating and display attributes that indicate they should be protected, redesign has been considered to prevent substantial damage to these three trees however due to the constraints of the site and the bushfire mitigation requirements it is not possible to retain them.

Additionally, there are thirty trees that are unlikely to be negatively impacted by the planned works. The encroachment is less than 10% of the TPZ area, within an existing encroachment and/or low impact construction methodologies have been incorporated into the design; it is therefore unlikely that the proposed works will impact on the viability of this tree.

**Note:** *the tree numbers in this report have been aligned with the numbering system used in the EBS Scattered Tree Assessment and therefore they differ from the original Preliminary Tree Assessment tree numbering system. However the EBS assessment did not consider the tree Arborman originally numbered Tree 1 and the EBS Tree 6 includes two trees from the Arborman PTA, Trees 2 and 3; to accommodate this Tree 1 is now Tree 101 and the two Tree 6's are identified as Trees 602 and 603.*



## Brief

Arborman Tree Solutions was engaged by Trice - Project and Development Managers to undertake an Arboricultural Impact Assessment and provide a Development Impact Report for the identified trees at Stirling Golf Club, 35 Golflinks Road, Stirling. The purpose of the Arboricultural Impact Assessment and Development Impact Report is to identify potential impacts the proposed development will have on the trees and provide mitigation strategies to minimise the impact where appropriate.

The proposed development includes the construction of a multi-level hotel, specialised pod style private retreatments, adaptive reuse of the existing perfumery, a new Golf Course Facilities Building, additional car parking, access, and waste management facilities. This assessment will determine the potential impacts the proposal may have on the trees within the site and recommend impact mitigation strategies in accordance with Australian Standard AS4970-2009 *Protection of trees on development sites* (AS4970-2009) for trees to be retained.

In accordance with section 2.2 of the AS4970-2009 the following information is provided:

- Assessment of the general condition and structure of the subject trees.
- Identification of the legislative status of trees on site as defined in the *Planning, Development and Infrastructure Act 2016 (PDI Act 2016)* and the *Native Vegetation Act 1991*.
- Identify and define the Tree Protection Zone and Structural Root Zone for each tree.
- Identify potential impacts the development may have on tree health and/or stability.
- Recommend impact mitigation strategies in accordance with AS4970-2009 for trees to be retained.
- Provide information in relation to the management of trees.

## Documents and Information Provided

The following information was provided for the preparation of this assessment

- Email instruction on Scope of Works
- Design Drawings
- Preliminary Tree Assessment ATS6360-035GolRdPTA
- Extracts from the EBS Scattered Tree Assessment

**Note:** *the tree numbers in this report have been aligned with the numbering system used in the EBS Scattered Tree Assessment and therefore they differ from the original Preliminary Tree Assessment tree numbering system. However the EBS assessment did not consider the tree Arborman originally numbered Tree 1 and the EBS Tree 6 includes two trees from the Arborman PTA, Trees 2 and 3; to accommodate this Tree 1 is now Tree 101 and the two Tree 6's are identified as Trees 602 and 603.*

## Site Location

The trees are located in the identified area to the northwest of the carpark, Clubhouse and associated buildings.



Figure 1: Site location – Stirling Golf Club, 35 Golflinks Road, Stirling

## Methodology

The proposed design was reviewed in association with the information supplied in the in the Preliminary Tree Assessment, ATS6360-035GolRdPTA, and in the Design Drawings and CAD files as provided by Trice - Project and Development Managers.

The potential impact of the proposed works on tree condition is considered in accordance with the guidelines in AS4970-2009 *Protection of trees on development sites* (AS4970-2009). When determining potential impacts of an encroachment into a Tree Protection Zone (TPZ), the following should be considered as outlined in AS4970-2009 section 3.3.4 *TPZ encroachment considerations*.: -

- a) Location of roots and root development.
- b) The potential loss of root mass from the encroachment.
- c) Tree species and tolerance to root disturbance.
- d) Age, vigour and size of the tree.
- e) Lean and stability of the tree.
- f) Soil characteristics and volume, topography, and drainage.
- g) The presence of existing or past structures or obstacles affecting root growth.
- h) Design factors.

The impacts on a tree can be varied and are not necessarily consistent with or directly correlated to a particular level of encroachment, to assist in providing consistency the levels of impact have been classified into the following categories: -

- No Impact - no encroachment into the TPZ has been identified.
- Low <10% - the identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.
- Low >10% - the identified encroachment is greater than 10% of the TPZ area however there are factors that indicate the proposed development will not negatively impact tree viability.
- High >10% - the identified encroachment is greater than 10% of the TPZ area and factors are present that indicate the proposed development will negatively impact tree viability. The impact is likely to lead to the long-term decline of the tree however it is unlikely to impact on its short-term stability.
- Conflicted - the identified encroachment is greater than 10% of the TPZ area and in most cases will also impact the SRZ and/or the trunk. There are factors present that indicate the proposed development will negatively impact tree viability to the point where its removal is required as part of the development.

Trees with calculated encroachments greater than 10% and with an Impact identified as 'Low' have features or considerations identified in clauses in AS4970-2009 3.3.4 *TPZ encroachment considerations* which indicate these trees will be sustainable.

Trees with calculated encroachments greater than 10% and with an Impact identified as 'High' do not have any features or considerations identified in clauses in AS4970-2009 3.3.4 and therefore alternative design solutions, additional root investigations and/or tree sensitive construction measures are required if the tree is to be retained. Where alternative protection methodologies are not available tree removal may be required to accommodate the development.

Trees with an Impact identified as 'Conflicted' are impacted over the majority of their root zone and/or over the SRZ or on the trunk, additional root investigations or tree sensitive construction measures are not available, and the only option is alternative designs or tree removal.

Regulatory Status, Tree Protection Zones and Development Impacts are shown in Appendix B.

## Assessment

Arborman Tree Solutions was engaged by Trice - Project and Development Managers to undertake an Arboricultural Impact Assessment and provide a Development Impact Report for the trees in the area of and potentially impacted by the proposed accommodation pods at Stirling Golf Club, 35 Golflinks Road, Stirling. The purpose of the Arboricultural Impact Assessment and Development Impact Report is to identify potential impacts the proposed development will have on the trees and provide mitigation strategies to minimise impact where appropriate. The proposal involves the construction of a multi-level hotel, specialised pod style private retreatments, adaptive reuse of the existing perfumery, a new Golf Course Facilities Building, additional car parking, access, and waste management facilities. This assessment provides recommendations in accordance with Australian Standard AS4970-2009 *Protection of trees on development sites* (AS4970-2009).

**Note:** *the tree numbers in this report have been aligned with the numbering system used in the EBS Scattered Tree Assessment and therefore they differ from the original Preliminary Tree Assessment tree numbering system. However the EBS assessment did not consider the tree Arborman originally numbered Tree 1 and the EBS Tree 6 includes two trees from the Arborman PTA, Trees 2 and 3; to accommodate this Tree 1 is now Tree 101 and the two Tree 6's are identified as Trees 602 and 603.*

### Tree Assessment

The assessment considered forty seven trees which are identified as a mix of two indigenous species and one specimen of an exotic species as shown in Table 1 below. These trees, with the exception of Tree 101, are naturally occurring indigenous vegetation, Tree 101 is an exotic species that appears to have been planted as part of the landscaping of the area.

Table 1 – Tree Identification

Botanic Name	Common Name	Number of Trees	Origin	Tree Numbers
<i>Eucalyptus obliqua</i>	Messmate Stringy-bark	16	Indigenous	7, 10, 15, 21, 22, 26, 38, 43, 46, 48, 50, 52, 55-57 and 59
<i>Eucalyptus viminalis ssp. viminalis</i>	Manna Gum	30	Indigenous	9, 12-14, 19, 24, 25, 28-37, 39-42, 45, 47, 53, 54, 58, 60, 61, 602 and 603
<i>Robinia pseudoacacia</i>	Black Locust	1	Exotic	101

The majority of trees are considered to be in good (12) or fair (16) overall condition and have extended useful life expectancies. However, there are also nineteen trees displaying poor overall condition as evidenced by reduced health (15) and/or structural (7) attributes; these trees are potentially not suitable for long-term retention in this type of development.

Table 2 – Tree Condition

Condition	Number of Trees	Tree Numbers
Good	12	7, 9, 24, 37, 42, 45, 48, 53, 54, 56, 60 and 603
Fair	16	13, 19, 25, 28, 35, 36, 39, 40, 43, 46, 47, 52, 55, 58, 59 and 602
Poor	19	10, 12, 14, 15, 21, 22, 26, 29-34, 38, 41, 50, 57, 61 and 101

Findings on individual tree health and condition are presented in Appendix B - Tree Assessment Findings.

### **Legislative Assessment**

The assessment has identified the forty six of the trees as naturally occurring indigenous vegetation in an area subject to regulation under the *Native Vegetation Act 1991* and their management is therefore controlled under this Act. A number of these trees also have a trunk circumference greater than two metres however they are exempt from control under the *PDI Act* as per Regulation 3F Sub Regulation (4)(d) as they are controlled under the *Native Vegetation Act 1991* and cannot be removed without consent from the *Native Vegetation Council*.

Table 3 - Legislative Status

Legislative Status	Number of Trees	Tree Numbers
Exempt	1	101
Controlled	46	7, 9, 10, 12-15, 19, 21, 22, 24-26, 28-43, 45-48, 50, 52-61, 602 and 603

The remaining tree, Tree 101, is exempt from control under both the *Native Vegetation Act 1991* and the *Planning, Development and Infrastructure Act 2016* due to being an exotic and exempt species, respectively.

### **Retention Assessment**

Trees that provide important environmental and/or aesthetic contribution to the area, are in good condition scored a High Retention Rating and conservation of these trees is encouraged. Trees that score a Moderate Retention Rating provide a level of environmental and/or aesthetic benefit however not to an important level; these trees should be retained if they can be adequately protected. Trees identified as not suitable for retention or attained a Low Tree Retention Rating, displayed one or a number of the following attributes:

- a) provide limited environmental/aesthetic benefit,
- b) short lived species,
- c) represent a material risk to persons or property,
- d) identified as causing or threatening to cause substantial damage to a structure of value,
- e) limited Useful Life Expectancy.
- f) young and easily replaced.

There are twenty-seven trees that are considered to be suitable for retention as they achieved a High or Moderate Retention Rating. The fourteen trees that scored a High rating, display one or more aesthetic and/or environmental criteria that warrant their retention as important trees. However, the thirteen trees that scored a Moderate rating, whilst providing a level aesthetic and/or environmental benefit they do not do so to a level that identifies them as important trees; they are however worthy of consideration for retention if they can be adequately protected in an otherwise reasonable and expected development.

The remaining trees achieve a Low Retention Rating indicating they should not form a constraint to an otherwise reasonable and expected development.

Table 4 Retention Rating

Retention Rating	Number of Trees	Tree Numbers
High	14	9, 19, 24, 25, 28, 37, 42, 43, 45-48, 53 and 58
Moderate	13	13, 36, 38-40, 52, 54-56, 59, 60, 602 and 603
Low	20	7, 10, 12, 14, 15, 21, 22, 26, 29-35, 41, 50, 57, 61 and 101

## Encroachment and Impact Assessment

Within AS4970-2009 relevant information is provided to assist with determining the impact on trees when developing in close proximity to them. Any tree that requires protection should be retained whilst remaining viable during and post development. Further guidance on how to suitably manage any proposed or encountered encroachments is identified in AS4970-2009. When assessing potential impacts, a Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) are the principle means of protecting a tree and are provided in accordance with AS4970-2009 section 1.4.5 and 3.2. This standard has been applied to ensure trees identified for retention remain viable and the redevelopment is achievable.

There is no encroachment into the TPZ of ten trees and therefore there is not expected to be any impact on the long-term viability of these trees as a result of the proposed development. The encroachment for the eleven trees is less than 10% of the TPZ area and does not impact the SRZ, this type of encroachment is recognised as 'Minor' as defined in AS4970-2009 (See Appendix C - Mapping). This level of encroachment results in No or Low Impact and additional root investigations are not required, warranted and have not been recommended in this instance.

The encroachment for nine is greater than 10% of the total TPZ area and is therefore classified as a 'Major Encroachment' as defined in AS4970-2009. AS4970-2009 also identifies relevant factors that should be considered when determining the 'impact' of encroachments such as this; these considerations are listed under section 3.3.4 *TPZ encroachment considerations*. When considering these factors, the proposed encroachment is unlikely to result in tree damaging activity that will result in the decline, death or failure of the trees and is therefore considered to be a Low Impact.

The following discusses the relevant factors of AS4970-2009 section 3.3.4 *TPZ encroachment considerations* for this tree OR these trees OR this tree group: -

- 3.3.4 (g), *The presence of existing or past structures or obstacles affecting root growth.*  
The existing path/road encroachment into the TPZ of the trees along the path has been in place or used for a number of years and the trees have adapted to this. The replacement of the existing encroachment with the proposed encroachment is therefore unlikely to impact the long-term viability of these trees
- 3.3.4 (h), *Design factors.*  
The accommodation pods are to be placed on piers and as such there is limited excavation required and the area of excavation is substantially less than the actual area of the pod. Additionally the path/road has been redesigned to minimise any new encroachment into the TPZ of the affected trees.

The encroachment for Trees 12, 21, 22 and 33 is greater than 20% and will cause tree damaging activity that will result in the decline, death or failure of these trees. The encroachment impacts the SRZ and/or the trunk and as such they will be destabilised by the proposed work and they are therefore considered to be Conflicted by the proposed development. Additionally, there are thirteen trees that have been identified for removal as part of the bushfire mitigation requirements for this project, these trees are also considered to Conflicted by the proposed development.

Table 5 Development Impact

Impact	Number of Trees	Tree Numbers
Conflicted	17	7, 12, 21, 22, 26, 31-33, 43, 45, 46, 48, 55, 57, 101, 602 and 603
Low	20	9, 10, 13-15, 19, 24, 30, 34-40, 47, 50, 53, 54 and 61
No Impact	10	25, 28, 29, 41, 42, 52, 56 and 58-60

The three highlighted trees have a High Retention Rating, however their removal is required as part of the bushfire mitigation requirements.

## Conclusion

The Arboricultural Impact Assessment has identified that seventeen trees in the area of the proposed development are likely to be negatively impacted by the proposed works and require removal. As fourteen of these trees have a Moderate or Low Retention Rating and do not display attributes that indicate they should be protected their removal to accommodate expected development is reasonable. However, three trees, Trees 43, 45 and 48 have a High Retention Rating and display attributes that indicate they should be protected, redesign has been considered to prevent substantial damage to these three trees however due to the constraints of the site and the bushfire mitigation requirements it is not possible to retain them.

Additionally, there are thirty trees that are unlikely to be negatively impacted by the planned works. The encroachment is less than 10% of the TPZ area, within an existing encroachment and/or low impact construction methodologies have been incorporated into the design; it is therefore unlikely that the proposed works will impact on the viability of this tree.

## Recommendation

Whilst the viability of the trees to be retained is unlikely to be impacted by the proposed works there is potential for incidental damage and as such Tree Protection is recommended as part of this construction.

The following is recommended as a minimum: -

1. Ensure all work requirements/activities in the vicinity of these trees are discussed and designed in consultation with the Project Arborist. i.e.: no machinery operation in the vicinity of the trees without a Tree Protection Plan.
2. A Tree Protection Zone fence is to be erected to ensure access to the root zone is restricted. The fence is to be installed prior to the commencement of all other site works including demolition.
3. If machinery access is required within the TPZ ground protection is to be installed in consultation with the Project Arborist to ensure tree roots are not damaged.

These recommendations have been provided to ensure the balance between development and arboricultural management have been addressed and considered. If the recommendations are followed and adhered to the subject trees will not be negatively impacted by this proposal.

Thank you for the opportunity to provide this report. Should you have any questions or require further information, please contact me and I will be happy to be of assistance.

Yours sincerely,



**MARCUS LODGE**

**Senior Consulting Arborist**

**Institute of Australian Consulting Arboriculturists – Accredited Consultant**

**Australian Arborist License AL11**

**Diploma in Arboriculture**

**International Society of Arboriculture – Tree Risk Assessment**

**VALID Tree Risk Assessment (VALID) – 2018 and 2021**

**Native Vegetation Council Trained Arborist 2019**



## Definitions

<b>Circumference:</b>	trunk circumference measured at one metre above ground level. This measurement is used to determine the status of the tree in relation to the <i>Planning, Development and Infrastructure Act 2016 (PDI Act 2016)</i> .
<b>Diameter at Breast Height:</b>	trunk diameter measured at 1.4 metres above ground level used to determine the Tree Protection Zone as described in Australian Standard AS4970-2009 <i>Protection of trees on development sites</i> .
<b>Diameter at Root Buttress:</b>	trunk diameter measured just above the root buttress as described in Australian Standard AS4970-2009 <i>Protection of trees on development sites</i> and is used to determine the Structural Root Zone.
<b>Tree Damaging Activity</b>	Tree damaging activity includes those activities described within the <i>Planning, Development and Infrastructure Act 2016 (PDI Act 2016)</i> , such as removal, killing, lopping, ringbarking or topping or any other substantial damage such as mechanical or chemical damage, filling or cutting of soil within the TPZ. Can also include forms of pruning above and below the ground.
<b>Tree Protection Zone:</b>	area of root zone that should be protected to prevent substantial damage to the tree's health.
<b>Structural Root Zone:</b>	calculated area within the tree's root zone that is considered essential to maintain tree stability.
<b>Project Arborist</b>	a person with the responsibility for conducting a tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The Project Arborist must be competent in arboriculture, having acquired through training, minimum Australian Qualification Framework (AQTF) Level 5, Diploma of Horticulture (Arboriculture) and/or equivalent experience, the knowledge and skills enabling that person to perform the tasks required by this standard.
<b>Encroachment:</b>	the area of a Tree Protection Zone that is within the proposed development area.
<b>Impact:</b>	the effect on tree health, structure and/or viability as a result of required works associated with the proposed development within the TPZ or the vicinity of the tree(s).

## References

Australian Standard AS4970–2009 *Protection of trees on development sites*: Standards Australia.

Matheny N. Clark J. 1998: *Trees and Development a Technical Guide to Preservation of Trees During Land Development*. International Society of Arboriculture, Champaign, Illinois, USA.



## Appendix A - Tree Assessment Methodology

## Tree Assessment Form (TAF©)

Record	Description
<b>Tree</b>	In botanical science, a tree is a perennial plant which consists of one or multiple trunks which supports branches and leaves. Trees are generally taller than 5 metres and will live for more than ten seasons, with some species living for hundreds or thousands of seasons.
<b>Genus and Species</b>	Botanical taxonomy of trees uses the binominal system of a genus and species, often there are subspecies and subgenus as well as cultivars. When identifying tree species, identification techniques such as assessing the tree's form, flower, stem, fruit and location are used. Identifying the right species is critical in assessing the tree's legalisation and environmental benefit. All efforts are made to correctly identify each tree to species level, where possible. Genus is the broader group to which the tree belongs e.g. <i>Eucalyptus</i> , <i>Fraxinus</i> and <i>Melaleuca</i> . Species identifies the specific tree within the genus e.g. <i>Eucalyptus camaldulensis</i> , <i>Fraxinus griffithi</i> or <i>Melaleuca styphelioides</i> . Trees will also be assigned the most commonly used Common Name. Common Names are not generally used for identification due to their nonspecific use, i.e. <i>Melia azedarach</i> is commonly known as White Cedar in South Australia but is also called Chinaberry Tree, Pride of India, Bead-tree, Cape Lilac, Syringa Berrytree, Persian Lilac, and Indian Lilac; equally similar common names can refer to trees from completely different Genus e.g. Swamp Oak, Tasmanian Oak and English Oak are from the <i>Casuarina</i> , <i>Eucalyptus</i> and <i>Quercus</i> genus's respectively.
<b>Height</b>	Tree height is estimated by the arborist at the time of assessment. Tree height is observed and recorded in the following ranges; <5m, 5-10m, 10-15m and >20m.
<b>Spread</b>	Tree crown spread is estimated by the arborist at the time of assessment and recorded in the following ranges <5m, 5-10m, 10-15m, 15-20m, >20m.
<b>Health</b>	Tree health is assessed using the Arborman Tree Solutions - Tree Health Assessment Method that is based on international best practice.
<b>Structure</b>	Tree structure is assessed using Arborman Tree Solutions - Tree Structure Assessment Method that is based on international best practice.
<b>Tree Risk Assessment</b>	Tree Risk is assessed using Tree Risk Assessment methodology. The person conducting the assessment has been trained in the International Society of Arboriculture Tree Risk Assessment Qualification (TRAQ), Quantified Tree Risk Assessment (QTRA) and/or VALID Tree Risk Assessment (VALID). Refer to the Methodology within the report for additional information.
<b>Legislative Status</b>	Legislation status is identified through the interpretation of the <i>Development Act 1993</i> , the <i>Natural Resource Management Act 2004</i> , the <i>Native Vegetation Act 1991</i> and/or any other legislation that may apply.
<b>Mitigation</b>	Measures to reduce tree risk, improve tree condition, remove structural flaws, manage other conditions as appropriate may be recommended in the form of pruning and is listed in the Tree Assessment Findings (Appendix B). Tree pruning is recommended in accordance with AS4373-2007 <i>Pruning amenity trees</i> where practicable. Where measures to mitigate risk is not possible and the risk is unacceptable, then tree removal or further investigation is recommended.

## Useful Life Expectancy (ULE)

ULE Rating	Definition
Surpassed	The tree has surpassed its Useful Life Expectancy. Trees that achieve a surpassed ULE may do so due to poor health, structure or form. Additionally, trees that are poorly located such as under high voltage powerlines or too close to structures may also achieve a surpassed ULE. Trees that achieve this status will be recommended for removal as there are no reasonable options to retain them.
<10 years	The tree displays either or both Poor Health and/or Structure and is considered to have a short Useful Life Expectancy of less than ten years. Some short-lived species such as <i>Acacia sp.</i> may naturally achieve a short ULE.
>10 years	The tree displays Fair Health or Structure and Good Health or Structure and is considered to have a Useful Life Expectancy of ten years or more. Trees identified as having a ULE of >10, will require mitigation such as pruning, stem injections or soil amelioration to increase their ULE.
>20 years	The tree displays Good Health and Structure and is considered to have an extended Useful Life Expectancy of more than twenty years.

## Maturity (Age)

Age Class	Definition
Senescent	The tree has surpassed its optimum growing period and is declining and/or reducing in size. May be considered as a veteran in relation to its ongoing management. Tree will have generally reached greater than 80% of its expected life expectancy.
Mature	A mature tree is one that has reached its expected overall size, although the tree's trunk is still expected to continue growing. Tree maturity is also assessed based on species; as some trees are much longer lived than others. Tree will have generally reached 20-80% of its expected life expectancy.
Semi Mature	A tree which has established but has not yet reached maturity. Normally tree establishment practices such as watering will have ceased. Tree will generally not have reached 20% of its expected life expectancy.
Juvenile	A newly planted tree or one which is not yet established in the landscape. Tree establishment practices such as regular watering will still be in place. Tree will generally be a newly planted specimen up to five years old; this may be species dependant.

## Tree Health Assessment (THA©)

Category	Description
Good	Tree displays normal vigour, uniform leaf colour, no or minor dieback (<5%), crown density (>90%). When a tree is deciduous, healthy axillary buds and typical internode length is used to determine its health. A tree with good health would show no sign of disease and no or minor pest infestation was identified. The tree has little to no pest and/or disease infestation.
Fair	Tree displays reduced vigour abnormal leaf colour, a moderate level of dieback (<15%), crown density (>70%) and in deciduous trees, reduced axillary buds and internode length. Minor pest and/or disease infestation potentially impacting on tree health. Trees with fair health have the potential to recover with reasonable remedial treatments.
Poor	Tree displays an advanced state of decline with low or no vigour, chlorotic or dull leaf colour, with high crown dieback (>15%), low crown density (<70%) and/or in deciduous trees, few or small axillary buds and shortened internode length. Pest and or disease infestation is evident and/or widespread. Trees with poor health are highly unlikely to recover with any remedial treatments; these trees have declined beyond the point of reversal.
Dead	The tree has died and has no opportunity for recovery.

## Tree Structural Assessment (TSA©)

Category	Description
Good	Little to no branch failure observed within the crown, well-formed unions, no included bark, good branch and trunk taper present, root buttressing and root plate are typical. Trees that are identified as having good health display expected condition for their age, species and location.
Fair	The tree may display one or more of the following a history of minor branch failure, included bark unions may be present however, are stable at this time, acceptable branch and trunk taper present, root buttressing and root plate are typical. Trees with fair structure will generally require reasonable remediation methods to ensure the tree's structure remains viable.
Poor	History of significant branch failure observed in the crown, poorly formed unions, unstable included bark unions present, branch and/or trunk taper is abnormal, root buttressing and/or root plate are atypical.
Failed	The structure of the tree has or is in the process of collapsing.

## Tree Form Assessment (TFA©)

Category	Description
Good	Form is typical of the species and has not been altered by structures, the environment or other trees.
Fair	The form has minor impacts from structures, the environment or adjacent trees which has altered its shape. There may be slight phototropic response noted or moderate pruning which has altered the tree's form.
Poor	The tree's form has been substantially impacted by structures, the environment, pruning or other trees. Phototropic response is evident and unlikely to be corrected.
Atypical	Tree form is highly irregular due to structures or other trees impacting its ability to correctly mature. Extreme phototropic response is evident; or the tree has had a substantially failure resulting in its poor condition, or extensive pruning has altered the tree's form irreversibly.

## Priority

Category	Description
Low	Identified works within this priority should be carried out within 12 months.
Medium	Identified works within this priority should be carried out within 6 months.
High	Identified works within this priority should be carried out within 3 months.
Urgent	Identified works within this priority should be carried out immediately. Works within this priority rating will be brought to attention of the responsible person at the time of assessment.

## Tree Retention Rating (TRR)

The Tree Retention Rating is based on a number of factors that are identified as part of the standard tree assessment criteria including Condition, Size, Environmental, Amenity and Special Values. These factors are combined in a number of matrices to provide a Preliminary Tree Retention Rating and a Tree Retention Rating Modifier which combine to provide a Tree Retention Rating that is measurable, consistent and repeatable.

### Preliminary Tree Retention Rating

The Preliminary Tree Retention Rating is conducted assessing Tree Health and Structure to give an overall Condition Rating and Height and Spread to give an overall Size Rating. The following matrices identify how these are derived.

Condition Matrix				
Structure	Health			
	Good	Fair	Poor	Dead
Good	C1	C2	C3	C4
Fair	C2	C2	C3	C4
Poor	C3	C3	C4	C4
Failed	C4	C4	C4	C4

Size Matrix					
Spread	Height				
	>20	15-20	10-15	5-10	<5
>20	S1	S1	S1	S2	S3
15-20	S1	S1	S2	S3	S3
10-15	S1	S2	S2	S3	S4
5-10	S2	S3	S3	S4	S5
<5	S3	S3	S4	S5	S5

The results from the Condition and Size Matrices are then placed in the Preliminary Tree Retention Rating Matrix.

Preliminary Tree Retention Rating				
Size	Condition			
	C1	C2	C3	C4
S1	High	Moderate	Low	Low
S2	Moderate	Moderate	Low	Low
S3	Moderate	Moderate	Low	Low
S4	Moderate	Moderate	Low	Low
S5	Low	Low	Low	Low

The Preliminary Tree Retention Rating gives a base rating for all trees regardless of other environmental and/or amenity factors and any Special Value considerations. The Preliminary Tree Retention Rating can only be modified if these factors are considered to be of high or low enough importance to warrant increasing or, in a few cases, lowering the original rating.

## Tree Retention Rating Modifier

The Preliminary Tree Retention Rating is then qualified against the recognised Environmental and Amenity benefits that trees present to the community thereby providing a quantitative measure to determine the overall Tree Retention Rating. Data is collected in relation to Environmental and Amenity attributes which are compared through a set of matrices to produce a Tree Retention Rating Modifier.

Environmental Matrix				
Origin	Habitat			
	Active	Inactive	Potential	No Habitat
Indigenous	E1	E1	E2	E3
Native	E1	E2	E3	E3
Exotic	E2	E3	E3	E4
Weed	E3	E3	E4	E4

Amenity Matrix				
Character	Aesthetics			
	High	Moderate	Low	None
Important	P1	P1	P2	P3
Moderate	P1	P2	P3	P3
Low	P2	P3	P3	P4
None	P3	P3	P4	P4

Tree Retention Rating Modifier				
Amenity	Environment			
	E1	E2	E3	E4
P1	High	High	Moderate	Moderate
P2	High	Moderate	Moderate	Moderate
P3	Moderate	Moderate	Moderate	Moderate
P4	Moderate	Moderate	Moderate	Low

## Tree Retention Rating

The results of the Preliminary Tree Retention Rating and the Tree Retention Rating Modifier matrices are combined in a final matrix to give the actual Tree Retention Rating.

Tree Retention Rating Matrix			
Tree Retention Rating Modifier	Preliminary Tree Retention Rating		
	High	Moderate	Low
High	Important	High	Moderate
Moderate	High	Moderate	Low
Low	Moderate	Low	Low

## **Special Value Trees**

There are potentially trees that have Special Value for reasons outside of normal Arboricultural assessment protocols and therefore would not have been considered in the assessment to this point; to allow for this a Special Value characteristic that can override the Tree Retention Rating can be selected. Special Value characteristics that could override the Tree Retention Rating would include factors such as the following:

### *Cultural Values*

Memorial Trees, Avenue of Honour Trees, Aboriginal Heritage Trees, Trees planted by Dignitaries and various other potential categories.

### *Environmental Values*

Rare or Endangered species, Remnant Vegetation, Important Habitat for rare or endangered wildlife, substantial habitat value in an important biodiversity area and various other potential categories.

Where a tree achieves one or more Special Value characteristics the Tree Retention Rating will automatically be overridden and assigned the value of Important.

## **Tree Retention Rating Definitions**

- Important** These trees are considered to be important and will in almost all instances be required to be retained within any future development/redevelopment. It is highly unlikely that trees that achieve this rating would be approved for removal or any other tree damaging activity. Protection of these trees should as a minimum be consistent with Australian Standard AS4970-2009 *Protection of trees on development sites* however given the level of importance additional considerations may be required.
- High** These trees are considered to be important and will in most instances be required to be retained within any future development/redevelopment. It is unlikely that trees that achieve this rating would be approved for removal or any other tree damaging activity. Protection of these trees should be consistent with Australian Standard AS4970-2009 *Protection of trees on development sites*.
- Moderate** These trees are considered to be suitable for retention however they achieve less positive attributes than the trees rated as Important or High and as such their removal or other tree damaging activity is more likely to be considered to be acceptable in an otherwise reasonable and expected development. The design process should where possible look to retain trees with a Moderate Retention Rating. Protection of these trees, where they are identified to be retained, should be consistent with Australian Standard AS4970-2009 *Protection of trees on development sites*.
- Low** These trees are not considered to be suitable for retention in any future development/redevelopment; trees in this category do not warrant special works or design modifications to allow for their retention. Trees in this category are likely to be approved for removal and/or other tree damaging activity in an otherwise reasonable and expected development. Protection of these trees, where they are identified to be retained, should be consistent with Australian Standard AS4970-2009 *Protection of trees on development sites*.

## Development Impact Assessment

Potential development impacts were determined in accordance with Australian Standard 4970-2009 *Protection of trees on development sites*. The identification of the impact of development considers a number of factors including the following:

- a. The extent of encroachment into a tree's Tree Protection Zone by the proposed development as a percentage of the area.
- b. Results of any non-destructive exploratory investigations that may have occurred to determine root activity.
- c. Any required pruning that may be needed to accommodate the proposed development.
- d. Tree species and tolerance to root disturbance.
- e. Age, vigour and size of the tree.
- f. Lean and stability of the tree.
- g. Soil characteristics and volume, topography and drainage.
- h. The presence of existing or past structures or obstacles potentially affecting root growth.
- i. Design factors incorporated into the proposed development to minimise impact.

The impacts on a tree can be varied and are not necessarily consistent with or directly correlated to a particular level of encroachment, to assist in providing consistency the levels of impact have been classified into the following categories: -

- No Impact - no encroachment into the TPZ has been identified.
- Low <10% - the identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.
- Low >10% - the identified encroachment is greater than 10% of the TPZ area however there are factors that indicate the proposed development will not negatively impact tree viability.
- High >10% - the identified encroachment is greater than 10% of the TPZ area and factors are present that indicate the proposed development will negatively impact tree viability. The impact is likely to lead to the long-term decline of the tree however it is unlikely to impact on its short-term stability.
- Conflicted - the identified encroachment is greater than 10% of the TPZ area and in most cases will also impact the SRZ and/or the trunk. There are factors present that indicate the proposed development will negatively impact tree viability to the point where its removal is required as part of the development.

Trees with calculated encroachments greater than 10% and with an Impact identified as 'Low' have features or considerations identified in clauses in AS4970-2009 3.3.4 *TPZ encroachment considerations* which indicate these trees should be sustainable.

Trees with calculated encroachments greater than 10% and with an Impact identified as 'High' do not have any features or considerations identified in clauses in AS4970-2009 3.3.4 and therefore alternative design solutions, additional root investigations and/or tree sensitive construction measures are required if the tree is to be retained. Where alternative protection methodologies are not available tree removal may be required to accommodate the development.

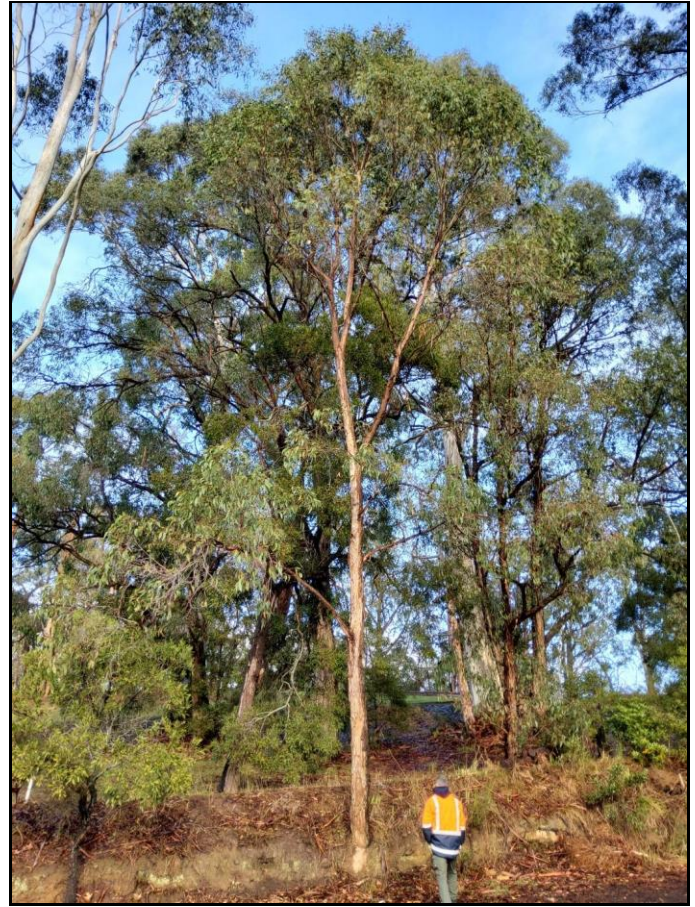
Trees with an Impact identified as 'Conflicted' are impacted over the majority of their root zone and/or over the SRZ or on the trunk, additional root investigations or tree sensitive construction measures are not available and the only option is alternative designs or tree removal.



## Appendix B - Tree Assessment Findings

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	5-10 metres
Spread:	5-10 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	4.20 metres
Structural Root Zone:	2.20 metres



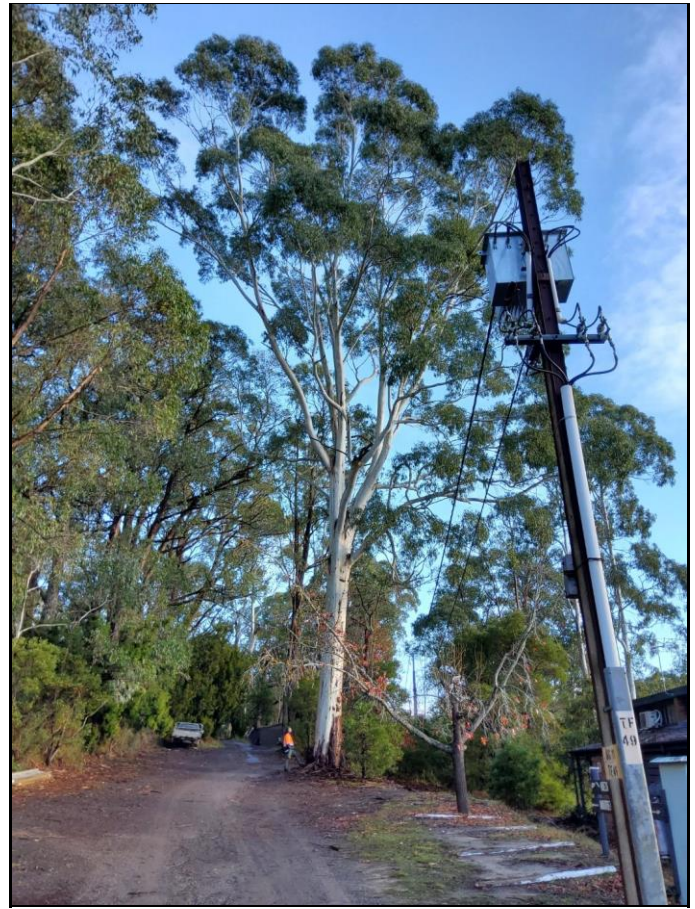
### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. However, this tree does not achieve a regulated trunk circumference and therefore is not regulated by the Planning, Development and Infrastructure Act 2016.	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Conflicted</b>
The identified encroachment is greater than 10% of the TPZ area and will also impact the SRZ and/or the trunk. On that basis the proposed development will negatively impact tree viability to the point where its removal is required.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	<5 metres
<b>Health:</b>	Good
<b>Structure:</b>	Good
<b>Form:</b>	Good
<b>Trunk Circumference:</b>	>3 metres
<b>Useful Life Expectancy:</b>	>20 years
<b>Tree Protection Zone:</b>	15.00 metres
<b>Structural Root Zone:</b>	3.93 metres



### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment. This tree has a moderate history of small diameter branch failure.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	High
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	Low
The identified encroachment is greater than 10% of the Tree Protection Zone area however the proposed development incorporates features that minimise the impact on the tree.	
<b>Action</b>	Specialised Construction
This tree is impacted by the road/path and low impact construction methods are required to minimise the impact on the tree.	

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	>20 metres
Spread:	5-10 metres
Health:	Poor
Structure:	Fair
Form:	Fair
Trunk Circumference:	>3 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	8.23 metres
Structural Root Zone:	2.94 metres



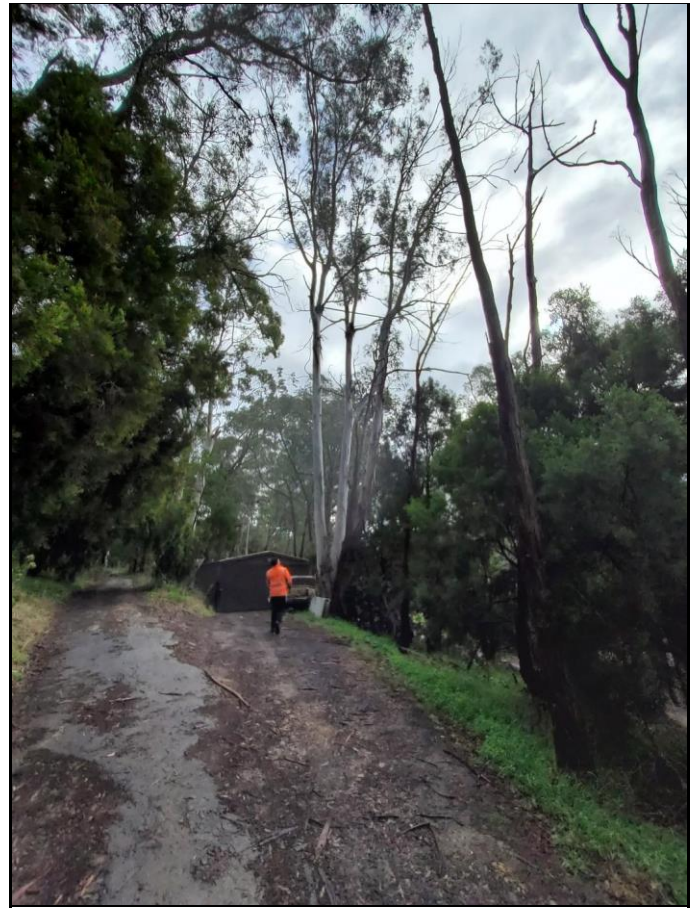
### Observations

This tree is in poor overall condition as evidenced by the substantial volume of deadwood and the presence of stable included bark in the primary structure.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Low</b>
The identified encroachment is greater than 10% of the Tree Protection Zone area however the proposed development incorporates features that minimise the impact on the tree.	
<b>Action</b>	<b>Specialised Construction</b>
This tree is impacted by the road/path and low impact construction methods are required to minimise the impact on the tree. It should be noted however that this tree is in poor condition and is not suitable for long term retention in this type of development.	

## Manna Gum

Inspected:	9 June 2021
Height:	15-20 metres
Spread:	15-20 metres
Health:	Poor
Structure:	Fair
Form:	Fair
Trunk Circumference:	>3 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	11.51 metres
Structural Root Zone:	3.39 metres



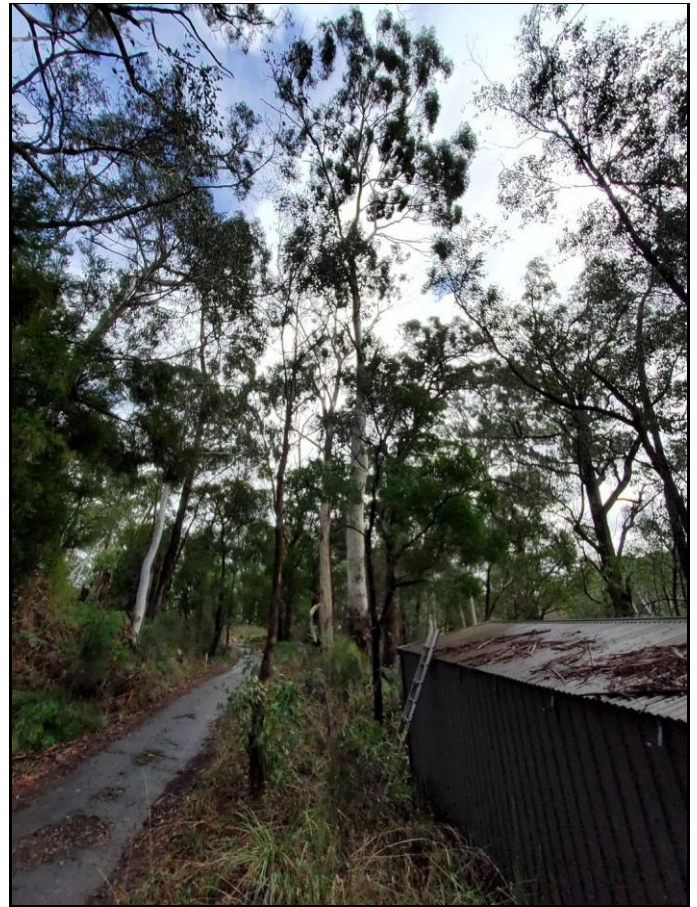
### Observations

This tree is considered to be in poor overall condition due to the considerably reduced foliage density, with high levels of dieback and deadwood throughout the crown. There are a number of relatively poorly installed cables in the mid-crown of this tree between the codominant stems, these are restricting sap flow and may be a factor in the reduced crown condition.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Conflicted</b>
The identified encroachment is greater than 10% of the TPZ area and will also impact the SRZ and/or the trunk. On that basis the proposed development will negatively impact tree viability to the point where its removal is required.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	15-20 metres
<b>Health:</b>	Good
<b>Structure:</b>	Fair
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>3 metres
<b>Useful Life Expectancy:</b>	>10 years
<b>Tree Protection Zone:</b>	12.84 metres
<b>Structural Root Zone:</b>	3.55 metres



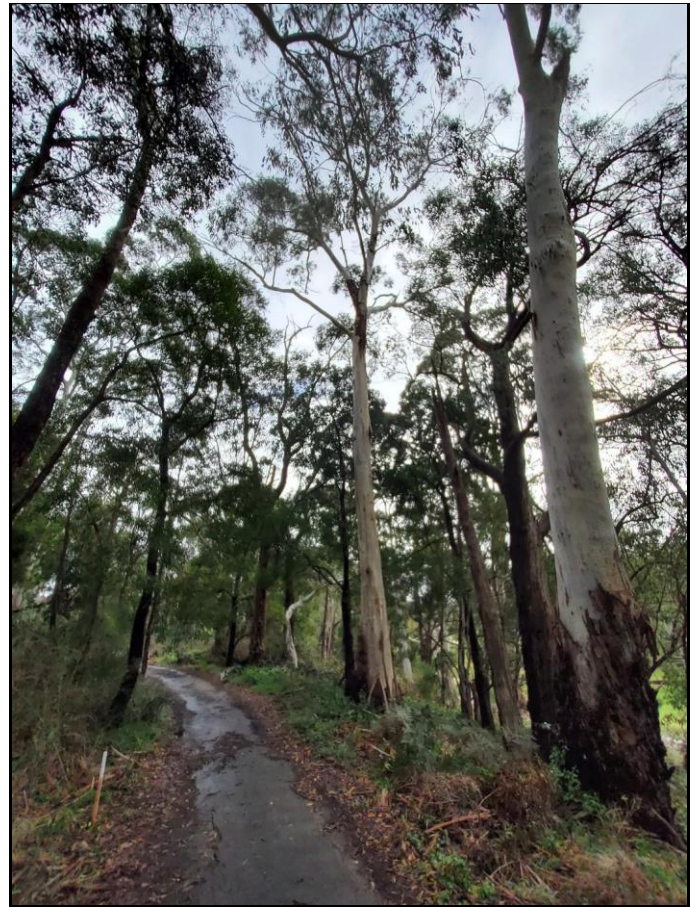
### Observations

This tree is considered to be in fair overall condition as evidenced by the moderate volume of deadwood and history of branch failure throughout the crown. This tree has a moderate trunk lean however this is natural and not considered to be affecting the overall structural rating.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	Moderate
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	Low
The identified encroachment is greater than 10% of the Tree Protection Zone area however the proposed development incorporates features that minimise the impact on the tree.	
<b>Action</b>	Specialised Construction
This tree is impacted by the road/path and low impact construction methods are required to minimise the impact on the tree.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	15-20 metres
<b>Spread:</b>	15-20 metres
<b>Health:</b>	Poor
<b>Structure:</b>	Poor
<b>Form:</b>	Poor
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	Surpassed
<b>Tree Protection Zone:</b>	9.96 metres
<b>Structural Root Zone:</b>	3.18 metres



### Observations

This tree is in poor overall condition as evidenced by the substantial levels of deadwood, branch failure and decay throughout the tree. There is a significant level of decay in the primary trunk union.

<b>Legislative Status</b>	Controlled
<p>This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).</p>	
<b>Retention Rating</b>	Low
<p>This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.</p>	
<b>Development Impact</b>	Low
<p>The identified encroachment is greater than 10% of the Tree Protection Zone area however the proposed development incorporates features that minimise the impact on the tree.</p>	
<b>Action</b>	Specialised Construction
<p>This tree is impacted by the road/path and low impact construction methods are required to minimise the impact on the tree. It should be noted however that this tree is in poor condition and is not suitable for long term retention in this type of development.</p>	

## Messmate Stringy-bark

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	15-20 metres
<b>Health:</b>	Poor
<b>Structure:</b>	Fair
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	10.92 metres
<b>Structural Root Zone:</b>	3.31 metres



### Observations

This tree is considered to be in poor overall condition as evidenced by the substantial volume of deadwood throughout the crown and moderate level of branch failure and epicormic growth.

<b>Legislative Status</b>	Controlled
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This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).

<b>Retention Rating</b>	Low
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This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.

<b>Development Impact</b>	Low
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The identified encroachment is greater than 10% of the Tree Protection Zone area however the proposed development incorporates features that minimise the impact on the tree.

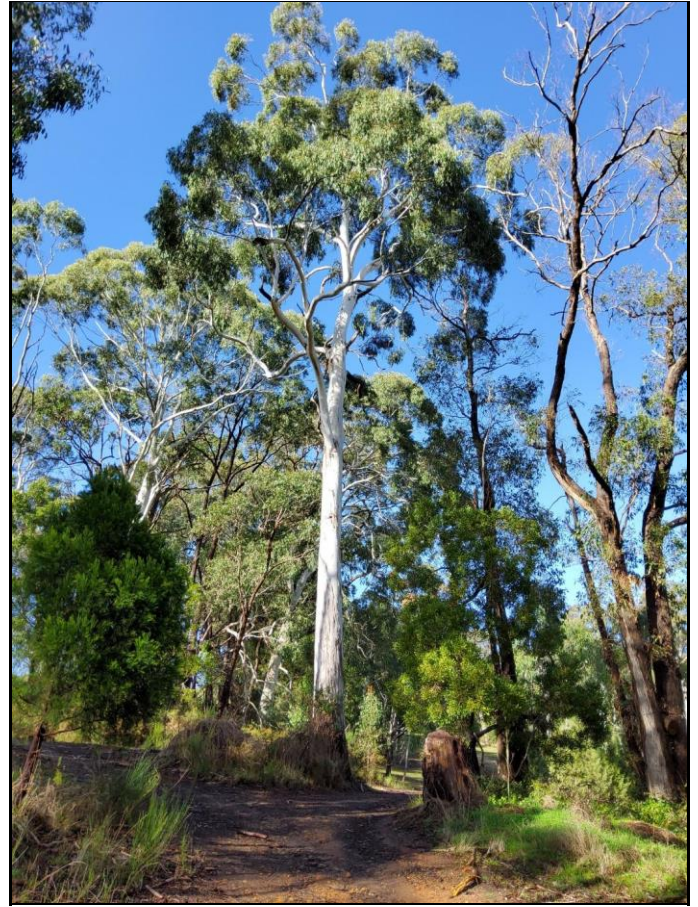
<b>Action</b>	Specialised Construction
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Low impact construction methods have been recommended and incorporated into the design to minimise any impact on the tree.



## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	>20 metres
<b>Health:</b>	Fair
<b>Structure:</b>	Fair
<b>Form:</b>	Good
<b>Trunk Circumference:</b>	>3 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	12.12 metres
<b>Structural Root Zone:</b>	3.46 metres



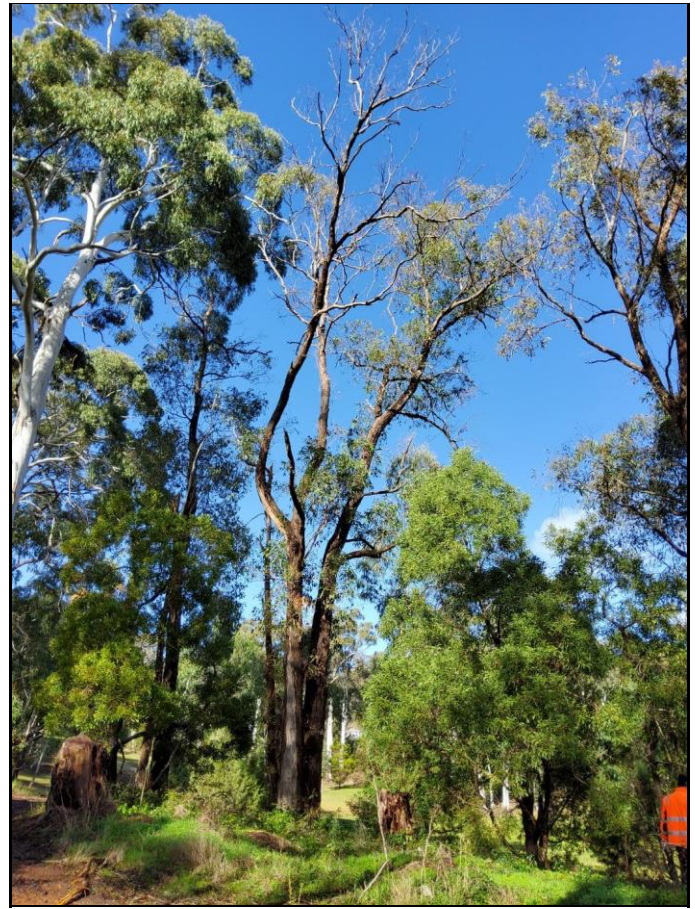
### Observations

This tree is considered to be in fair condition due to the moderate quantity of deadwood in the crown and slightly reduced overall structural rating.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	High
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	Low
The identified encroachment is greater than 10% of the Tree Protection Zone area however the proposed development incorporates features that minimise the impact on the tree.	
<b>Action</b>	Specialised Construction
This tree is impacted by the road/path and low impact construction methods are required to minimise the impact on the tree.	

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	>20 metres
Spread:	10-15 metres
Health:	Poor
Structure:	Fair
Form:	Poor
Trunk Circumference:	>3 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	12.96 metres
Structural Root Zone:	3.56 metres



### Observations

This tree is considered to be in poor overall condition as evidenced by the substantial level of dieback of the upper crown, the presence of poor quality branch unions and the moderate history of branch failure.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Conflicted</b>
The location of this tree is such that it requires removal as part of the bushfire mitigation for this project.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Messmate Stringy-bark

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	10-15 metres
<b>Spread:</b>	5-10 metres
<b>Health:</b>	Poor
<b>Structure:</b>	Good
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	3.60 metres
<b>Structural Root Zone:</b>	2.08 metres



### Observations

This tree is considered to be in poor overall condition due to the level of dieback in the upper crown.

<b>Legislative Status</b>	Controlled
<p>This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).</p>	
<b>Retention Rating</b>	Low
<p>This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.</p>	
<b>Development Impact</b>	Conflicted
<p>The identified encroachment is greater than 10% of the TPZ area and will also impact the SRZ and/or the trunk. On that basis the proposed development will negatively impact tree viability to the point where its removal is required.</p>	
<b>Action</b>	Removal Required
<p>Tree removal is required to facilitate the proposed development.</p>	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	>20 metres
<b>Health:</b>	Good
<b>Structure:</b>	Good
<b>Form:</b>	Good
<b>Trunk Circumference:</b>	>3 metres
<b>Useful Life Expectancy:</b>	>20 years
<b>Tree Protection Zone:</b>	15.00 metres
<b>Structural Root Zone:</b>	4.21 metres



### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	High
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	Low
The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.	
<b>Action</b>	Protect Root Zone
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009.	

## Manna Gum

Inspected:	9 June 2021
Height:	>20 metres
Spread:	15-20 metres
Health:	Fair
Structure:	Fair
Form:	Fair
Trunk Circumference:	>3 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	14.04 metres
Structural Root Zone:	3.68 metres



### Observations

This tree is considered to be in fair overall condition due to the moderate level of deadwood in the crown and the modest level of decay in the trunk and/or branches.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>High</b>
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	<b>No Impact</b>
No encroachment into the Tree Protection Zone area has been identified.	
<b>Action</b>	<b>Protect Root Zone</b>
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009.	

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	15-20 metres
Spread:	10-15 metres
Health:	Poor
Structure:	Fair
Form:	Fair
Trunk Circumference:	>3 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	11.52 metres
Structural Root Zone:	3.39 metres



### Observations

This tree is considered to be in poor overall condition as evidenced by the substantial volume of deadwood and moderate level of epicormic growth throughout the crown.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Conflicted</b>
The location of this tree is such that it requires removal as part of the bushfire mitigation for this project.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Manna Gum

Inspected:	9 June 2021
Height:	>20 metres
Spread:	>20 metres
Health:	Good
Structure:	Fair
Form:	Fair
Trunk Circumference:	>3 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	15.00 metres
Structural Root Zone:	4.21 metres



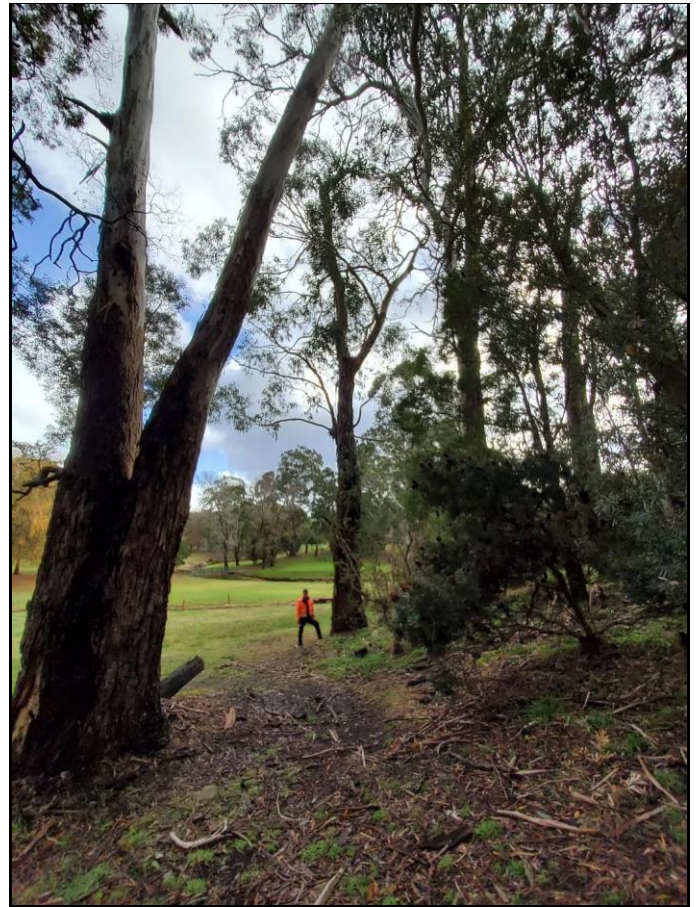
### Observations

This tree is considered to be in fair overall condition due to its reduced structural rating associated with the moderate level of branch failure and the modest level of decay in the trunk and/or branches. This tree also has a moderate trunk lean that whilst not significant structurally is worthy of noting.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>High</b>
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	<b>No Impact</b>
No encroachment into the Tree Protection Zone area has been identified.	
<b>Action</b>	<b>Protect Root Zone</b>
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	>20 metres
<b>Health:</b>	Poor
<b>Structure:</b>	Fair
<b>Form:</b>	Poor
<b>Trunk Circumference:</b>	>3 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	11.52 metres
<b>Structural Root Zone:</b>	3.39 metres



### Observations

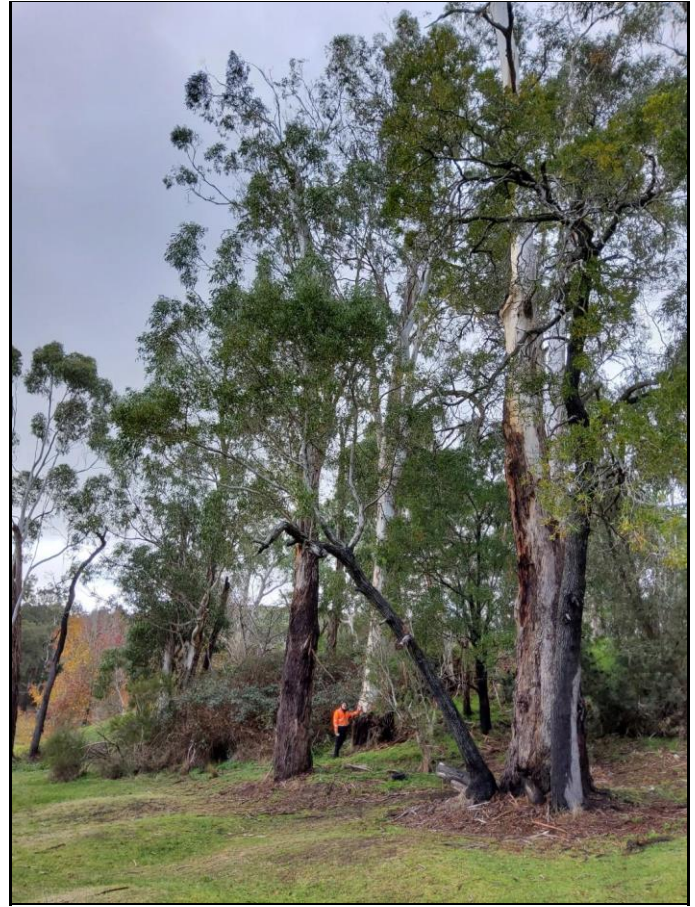
This tree is in poor overall condition as evidenced by the substantial volume of deadwood and dieback and the significantly reduced foliage density. Additionally, this tree has a moderate history of branch failure and an increased level of epicormic growth.

<b>Legislative Status</b>	Controlled
<p>This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).</p>	
<b>Retention Rating</b>	Low
<p>This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.</p>	
<b>Development Impact</b>	No Impact
<p>No encroachment into the Tree Protection Zone area has been identified.</p>	
<b>Action</b>	Protect Root Zone
<p>Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009. It should be noted however that this tree is in poor condition and is not suitable for long term retention in this type of development.</p>	



## Manna Gum

Inspected:	9 June 2021
Height:	>20 metres
Spread:	>20 metres
Health:	Poor
Structure:	Fair
Form:	Good
Trunk Circumference:	>3 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	12.72 metres
Structural Root Zone:	3.53 metres



### Observations

This tree is poor overall condition as evidenced by the high level of deadwood and dieback and the moderate levels of decay and epicormic growth.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Low</b>
The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.	
<b>Action</b>	<b>Protect Root Zone</b>
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009. It should be noted however that this tree is in poor condition and is not suitable for long term retention in this type of development.	

## Manna Gum

Inspected:	9 June 2021
Height:	>20 metres
Spread:	15-20 metres
Health:	Poor
Structure:	Poor
Form:	Poor
Trunk Circumference:	>3 metres
Useful Life Expectancy:	Surpassed
Tree Protection Zone:	9.46 metres
Structural Root Zone:	3.12 metres



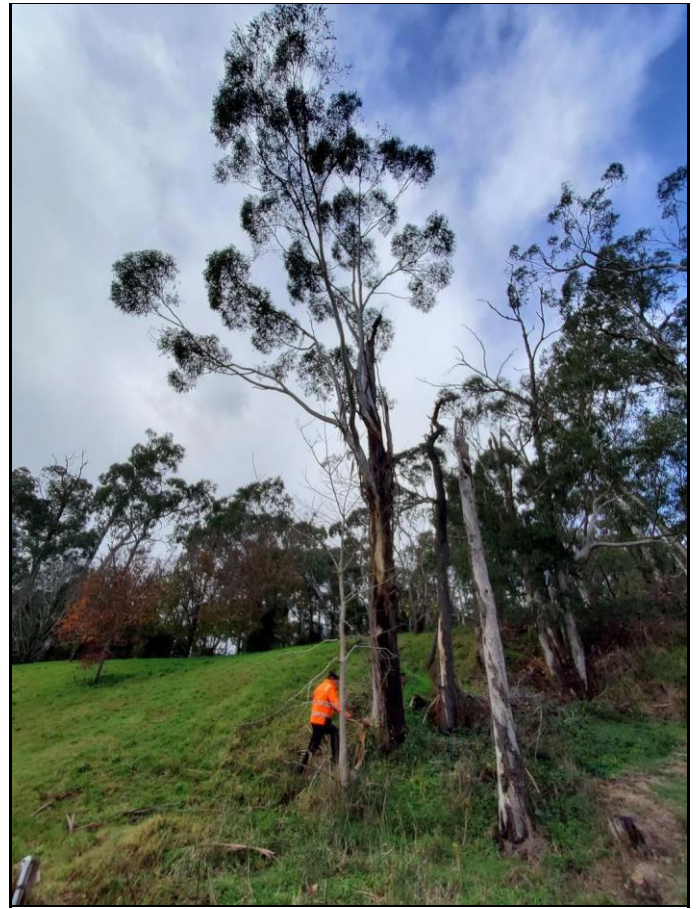
### Observations

This tree is considered to be in poor overall condition as evidenced by the elevated level of deadwood and dieback throughout the crown and the substantial history of branch failure and associated decay.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Conflicted</b>
The location of this tree is such that it requires removal as part of the bushfire mitigation for this project.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Manna Gum

Inspected:	9 June 2021
Height:	10-15 metres
Spread:	15-20 metres
Health:	Good
Structure:	Poor
Form:	Poor
Trunk Circumference:	>2 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	8.52 metres
Structural Root Zone:	2.98 metres



### Observations

This tree is considered to be in poor overall condition due to the substantial history of branch failure and the moderate volume of deadwood.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Conflicted</b>
The location of this tree is such that it requires removal as part of the bushfire mitigation for this project.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	15-20 metres
<b>Health:</b>	Poor
<b>Structure:</b>	Poor
<b>Form:</b>	Poor
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	Surpassed
<b>Tree Protection Zone:</b>	10.44 metres
<b>Structural Root Zone:</b>	3.25 metres



### Observations

This tree is considered to be in poor overall condition due to the substantial volume of deadwood and the significant level of decay in the trunk. This tree also has a moderate trunk lean that is significant structurally due to the level of decay in the trunk.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Conflicted</b>
The identified encroachment is greater than 10% of the TPZ area and will also impact the SRZ and/or the trunk. On that basis the proposed development will negatively impact tree viability to the point where its removal is required.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to support the proposed development. It should be noted that this tree is in poor condition and is not suitable for long term retention regardless of the development impact.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	15-20 metres
<b>Health:</b>	Poor
<b>Structure:</b>	Fair
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	10.44 metres
<b>Structural Root Zone:</b>	3.25 metres



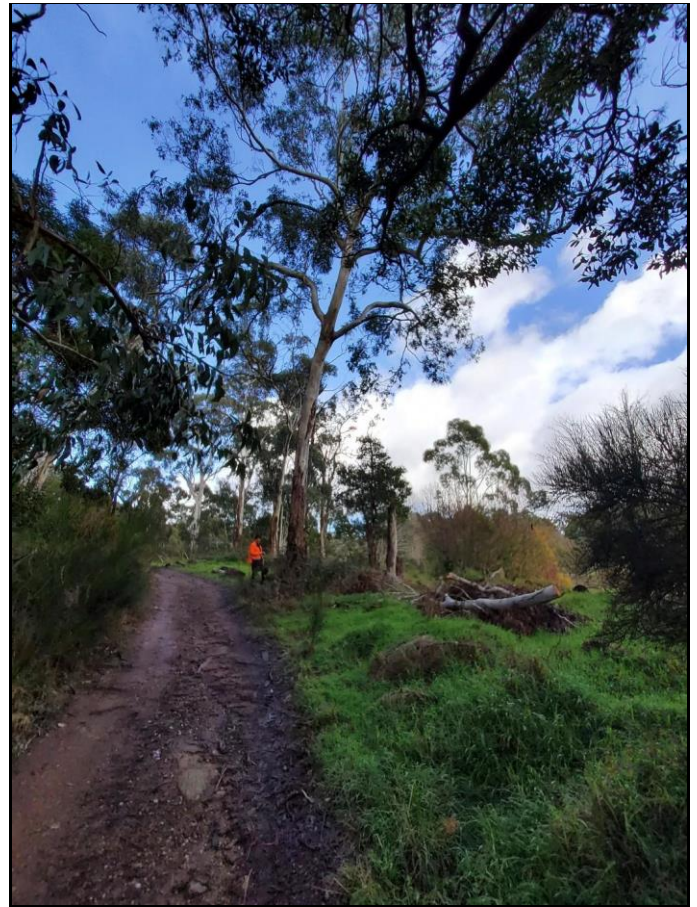
### Observations

This tree is considered to be in poor overall condition as evidenced by the high level of deadwood and the substantially reduced foliage density throughout the crown. This tree also displays a moderate level of decay, epicormic growth and branch failure.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	Low
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	Low
The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.	
<b>Action</b>	Protect Root Zone
Protect the root zone and crown in accordance with the recommendations and principles of AS4970-2009 Protection of trees on development sites to ensure it is adequately protected.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	15-20 metres
<b>Spread:</b>	15-20 metres
<b>Health:</b>	Fair
<b>Structure:</b>	Fair
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	9.00 metres
<b>Structural Root Zone:</b>	3.04 metres



### Observations

This tree is considered to be in fair overall condition as evidenced by the moderate volume of deadwood and history of branch failure throughout the crown.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	Low
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	Low
The identified encroachment is greater than 10% of the Tree Protection Zone area however the proposed development incorporates features that minimise the impact on the tree.	
<b>Action</b>	Specialised Construction
This tree is impacted by one or more pad footings and low impact construction methods are required to minimise the impact on the tree.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	>20 metres
<b>Health:</b>	Fair
<b>Structure:</b>	Fair
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>3 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	12.48 metres
<b>Structural Root Zone:</b>	3.50 metres



### Observations

This tree is considered to be in fair overall condition as evidenced by the moderate levels of deadwood and epicormic growth throughout the crown.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	Moderate
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	Low
The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.	
<b>Action</b>	Specialised Construction
Low impact construction methods have been recommended and incorporated into the design to minimise any impact on the tree.	

## Manna Gum

Inspected:	9 June 2021
Height:	>20 metres
Spread:	>20 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	>3 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	13.08 metres
Structural Root Zone:	3.57 metres



### Observations

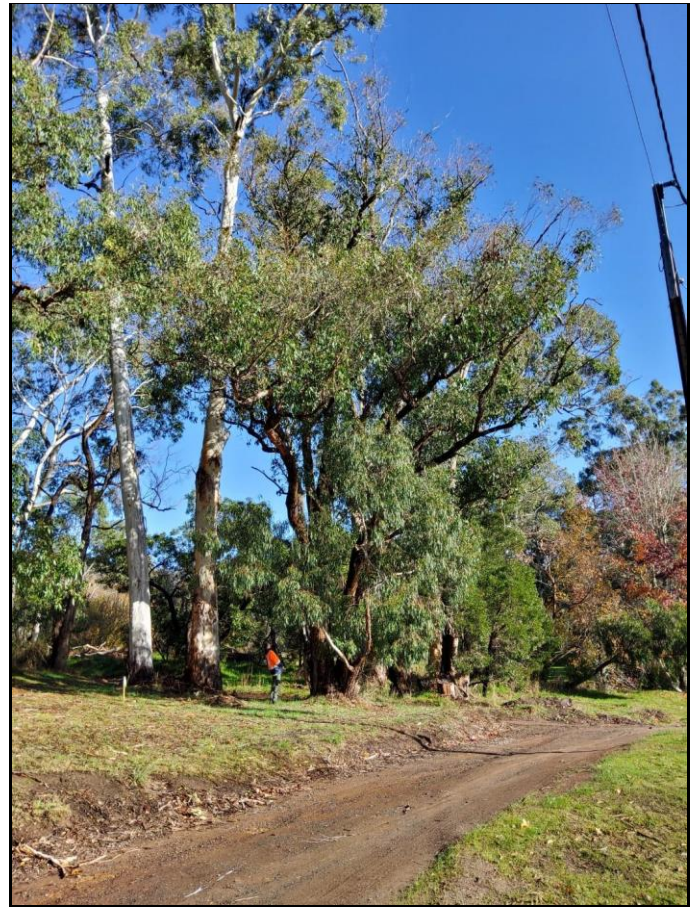
The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>High</b>
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	<b>Low</b>
The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.	
<b>Action</b>	<b>Specialised Construction</b>
Low impact construction methods have been recommended and incorporated into the design to minimise any impact on the tree.	



## Messmate Stringy-bark

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	>20 metres
<b>Health:</b>	Poor
<b>Structure:</b>	Fair
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>3 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	13.19 metres
<b>Structural Root Zone:</b>	3.59 metres



### Observations

This tree considered to be in poor overall condition as evidenced by the substantial reduction in foliage density, the increased level of dieback and the presence of a partially included union in the primary structure.

<b>Legislative Status</b>	Controlled
<p>This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).</p>	
<b>Retention Rating</b>	Moderate
<p>This tree has a Moderate Retention Rating and could be considered for retention in any future development.</p>	
<b>Development Impact</b>	Low
<p>The identified encroachment is greater than 10% of the Tree Protection Zone area however the proposed development incorporates features that minimise the impact on the tree.</p>	
<b>Action</b>	Specialised Construction
<p>This tree is impacted by the road/path and low impact construction methods are required to minimise the impact on the tree.</p>	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	5-10 metres
<b>Health:</b>	Good
<b>Structure:</b>	Fair
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	>10 years
<b>Tree Protection Zone:</b>	11.04 metres
<b>Structural Root Zone:</b>	3.32 metres



### Observations

This tree is considered to be in fair condition as indicated by the reduced overall structural rating. This tree also has a moderate trunk lean that whilst not significant structurally is worthy of noting.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	Moderate
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	Low
The identified encroachment is greater than 10% of the Tree Protection Zone area however the proposed development incorporates features that minimise the impact on the tree.	
<b>Action</b>	Specialised Construction
This tree is impacted by the road/path and low impact construction methods are required to minimise the impact on the tree.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	10-15 metres
<b>Health:</b>	Fair
<b>Structure:</b>	Fair
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	9.36 metres
<b>Structural Root Zone:</b>	3.11 metres



### Observations

This tree is considered to be in fair overall condition as evidenced by the moderate volume of deadwood and history of branch failure throughout the crown. This tree also has a moderate trunk lean that whilst not significant structurally is worthy of noting.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Moderate</b>
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	<b>Low</b>
The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.	
<b>Action</b>	<b>Specialised Construction</b>
This tree is impacted by the road/path and low impact construction methods are required to minimise the impact on the tree.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	10-15 metres
<b>Health:</b>	Good
<b>Structure:</b>	Poor
<b>Form:</b>	Poor
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	9.48 metres
<b>Structural Root Zone:</b>	3.12 metres



### Observations

This tree is considered to be in poor overall condition due to its poor structure rating. This tree has a significant history of small diameter branch failure and a moderate level of decay in the trunk.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	Low
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	No Impact
No encroachment into the Tree Protection Zone area has been identified.	
<b>Action</b>	Protect Root Zone
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009. It should be noted however that this tree is in poor condition and is not suitable for long term retention in this type of development.	

## Manna Gum

Inspected:	9 June 2021
Height:	15-20 metres
Spread:	10-15 metres
Health:	Good
Structure:	Good
Form:	Fair
Trunk Circumference:	>2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	8.28 metres
Structural Root Zone:	2.95 metres



### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	High
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	No Impact
No encroachment into the Tree Protection Zone area has been identified.	
<b>Action</b>	Protect Root Zone
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009.	

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	>20 metres
Spread:	<5 metres
Health:	Good
Structure:	Fair
Form:	Fair
Trunk Circumference:	>3 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	11.74 metres
Structural Root Zone:	3.42 metres



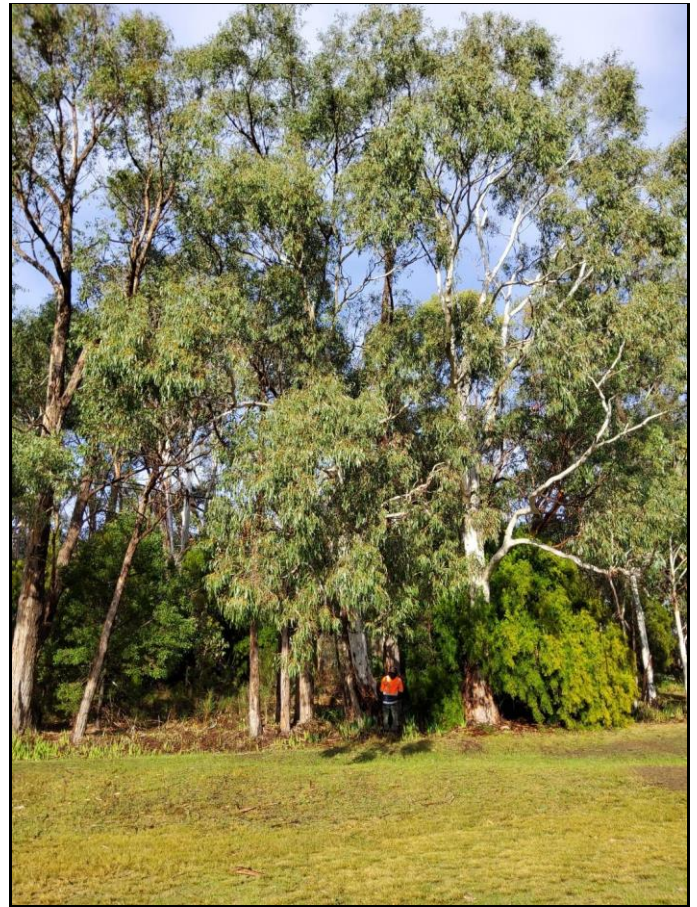
### Observations

This tree is considered to be in fair condition as indicated by the reduced overall structural rating. This tree has a moderate level of decay in the trunk.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>High</b>
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	<b>Conflicted</b>
The location of this tree is such that it requires removal as part of the bushfire mitigation for this project.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	5-10 metres
<b>Spread:</b>	5-10 metres
<b>Health:</b>	Good
<b>Structure:</b>	Good
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	<2 metres
<b>Useful Life Expectancy:</b>	>20 years
<b>Tree Protection Zone:</b>	6.24 metres
<b>Structural Root Zone:</b>	2.61 metres



### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. However, this tree does not achieve a regulated trunk circumference and therefore is not regulated by the Planning, Development and Infrastructure Act 2016.	
<b>Retention Rating</b>	<b>High</b>
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	<b>Conflicted</b>
The location of this tree is such that it requires removal as part of the bushfire mitigation for this project.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	10-15 metres
Spread:	5-10 metres
Health:	Fair
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	6.12 metres
Structural Root Zone:	2.59 metres



### Observations

This tree is considered to be in fair overall condition due to its moderately reduced health rating.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. However, this tree does not achieve a regulated trunk circumference and therefore is not regulated by the Planning, Development and Infrastructure Act 2016.	
<b>Retention Rating</b>	<b>High</b>
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	<b>Conflicted</b>
The location of this tree is such that it requires removal as part of the bushfire mitigation for this project.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	



## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	15-20 metres
<b>Health:</b>	Fair
<b>Structure:</b>	Good
<b>Form:</b>	Good
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	>10 years
<b>Tree Protection Zone:</b>	9.84 metres
<b>Structural Root Zone:</b>	3.17 metres



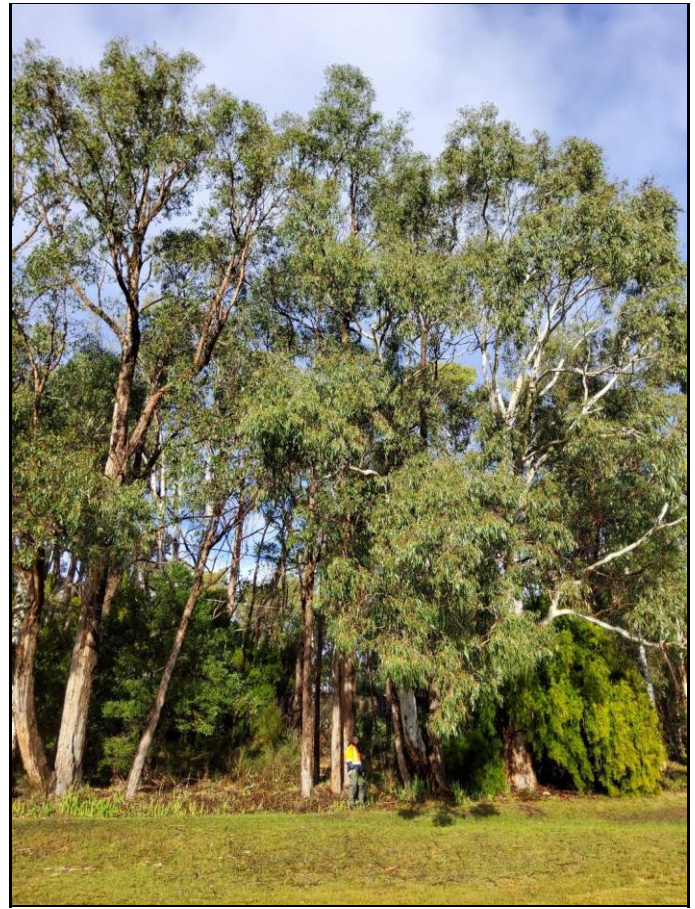
### Observations

This tree is considered to be in fair overall condition due to its moderately reduced health rating.

<b>Legislative Status</b>	Controlled
<p>This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).</p>	
<b>Retention Rating</b>	High
<p>This tree has a High Retention Rating and should be protected in any future development.</p>	
<b>Development Impact</b>	Low
<p>The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.</p>	
<b>Action</b>	Protect Root Zone
<p>Protect the root zone and crown in accordance with the recommendations and principles of AS4970-2009 Protection of trees on development sites to ensure it is adequately protected.</p>	

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	15-20 metres
Spread:	10-15 metres
Health:	Good
Structure:	Good
Form:	Fair
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	6.24 metres
Structural Root Zone:	2.61 metres



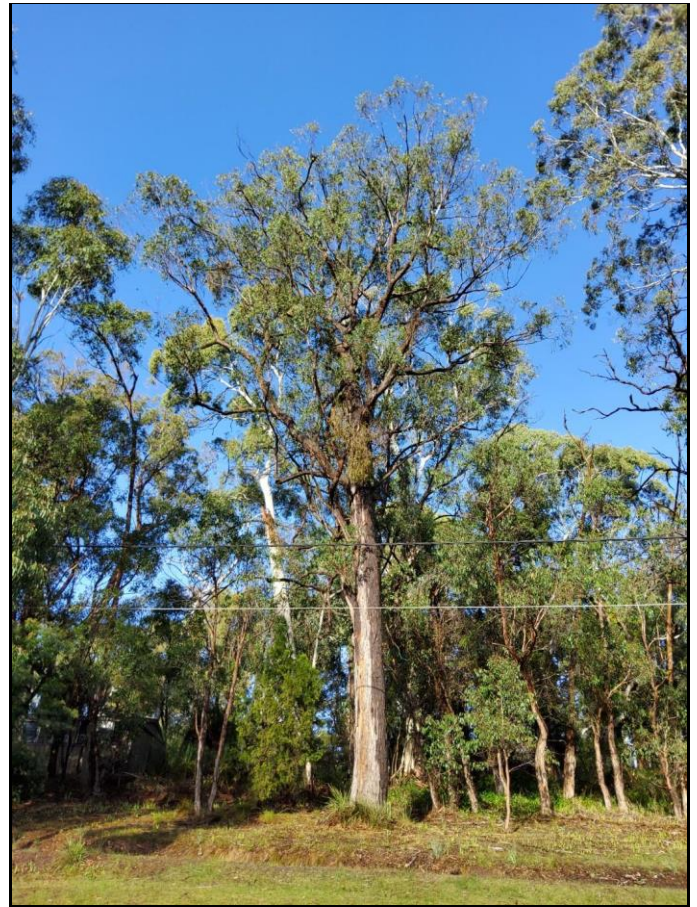
### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. However, this tree does not achieve a regulated trunk circumference and therefore is not regulated by the Planning, Development and Infrastructure Act 2016.	
<b>Retention Rating</b>	<b>High</b>
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	<b>Conflicted</b>
The location of this tree is such that it requires removal as part of the bushfire mitigation for this project.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	>20 metres
Spread:	15-20 metres
Health:	Poor
Structure:	Good
Form:	Good
Trunk Circumference:	>3 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	11.88 metres
Structural Root Zone:	3.43 metres



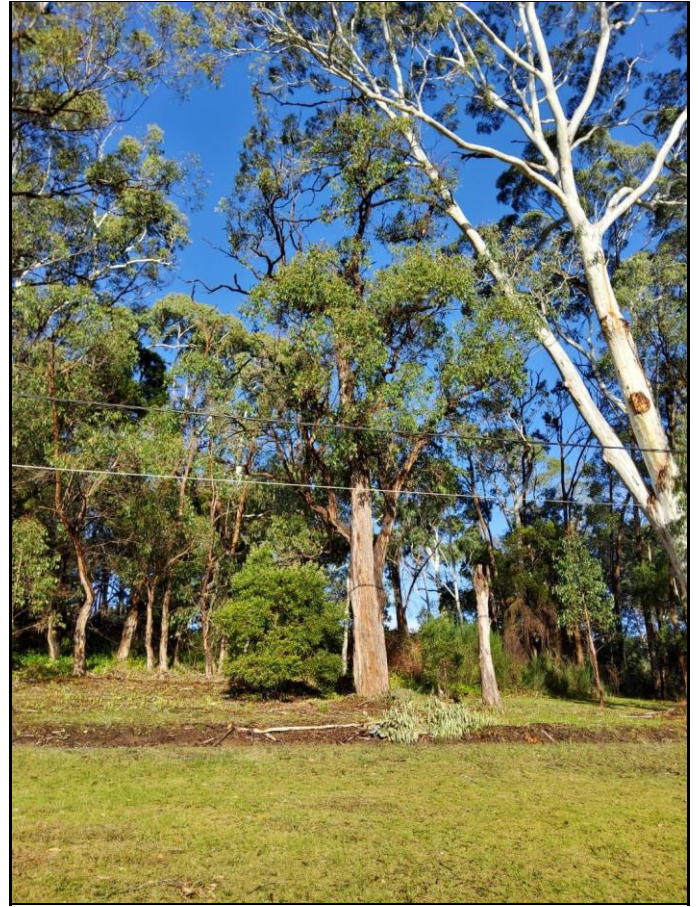
### Observations

This tree is considered to be in poor overall condition due to a reduced health rating including dieback and deadwood throughout the crown.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Low</b>
The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.	
<b>Action</b>	<b>Protect Root Zone</b>
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009. It should be noted however that this tree is in poor condition and is not suitable for long term retention in this type of development.	

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	10-15 metres
Spread:	15-20 metres
Health:	Fair
Structure:	Fair
Form:	Good
Trunk Circumference:	>2 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	10.68 metres
Structural Root Zone:	3.28 metres



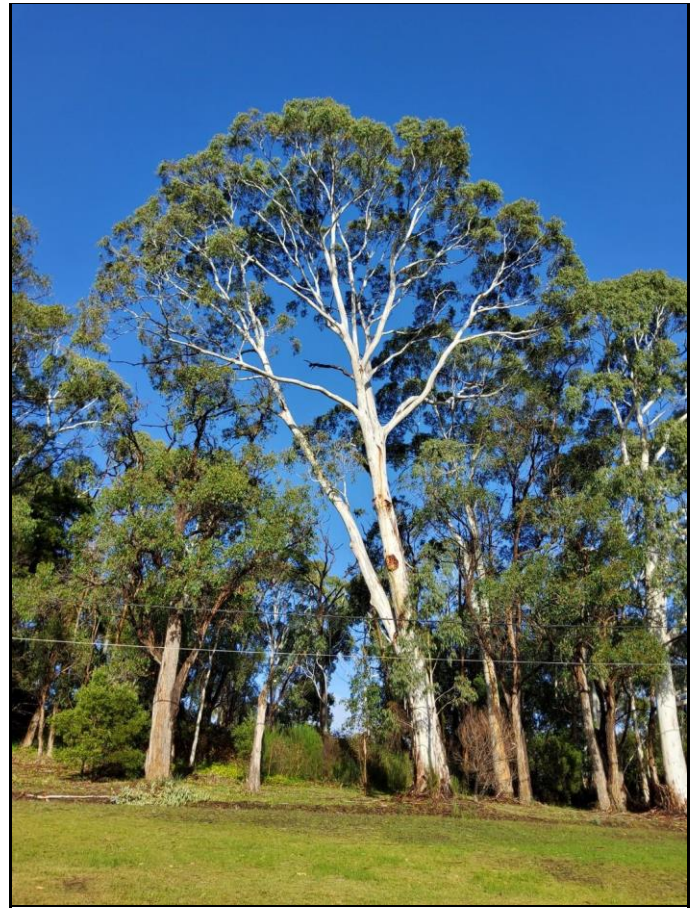
### Observations

This tree is considered to be in fair overall condition as evidenced by the moderate volume of deadwood and history of branch failure throughout the crown. The crown also retains an above average volume of epicormic growth.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Moderate</b>
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	<b>No Impact</b>
No encroachment into the Tree Protection Zone area has been identified.	
<b>Action</b>	<b>Protect Root Zone</b>
Protect the root zone and crown in accordance with the recommendations and principles of AS4970-2009 Protection of trees on development sites to ensure it is adequately protected.	

## Manna Gum

Inspected:	9 June 2021
Height:	>20 metres
Spread:	>20 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	>3 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	15.00 metres
Structural Root Zone:	3.85 metres



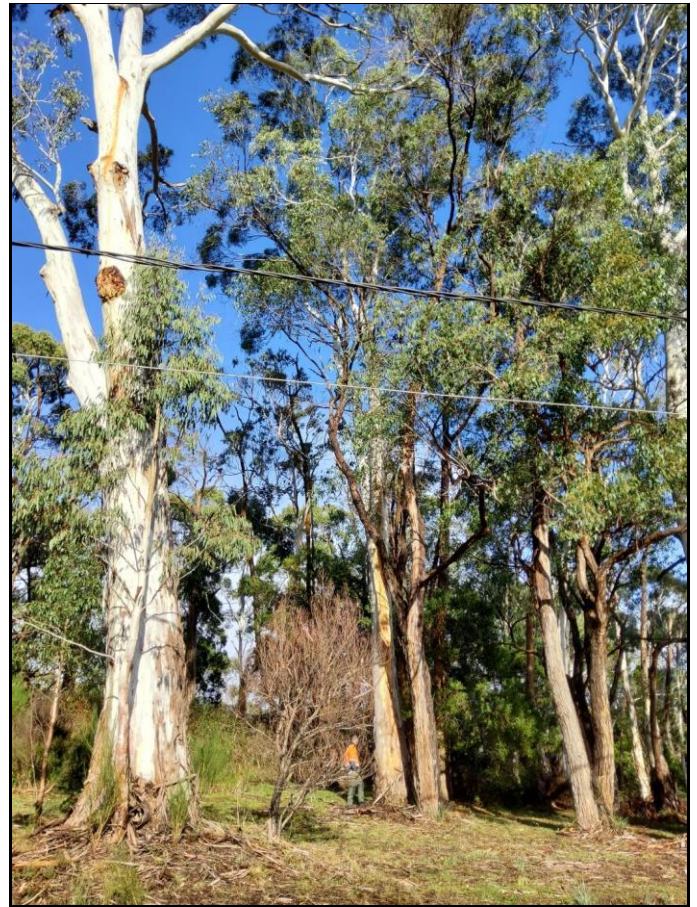
### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	High
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	Low
The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.	
<b>Action</b>	Protect Root Zone
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	15-20 metres
<b>Health:</b>	Good
<b>Structure:</b>	Good
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	>20 years
<b>Tree Protection Zone:</b>	10.80 metres
<b>Structural Root Zone:</b>	3.30 metres



### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment. This tree has a moderate trunk lean however this is natural and not considered to affecting the overall structural rating.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	Moderate
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	Low
The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.	
<b>Action</b>	Protect Root Zone
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009.	

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	10-15 metres
Spread:	10-15 metres
Health:	Fair
Structure:	Fair
Form:	Fair
Trunk Circumference:	<2 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	7.44 metres
Structural Root Zone:	2.81 metres



### Observations

This tree is considered to be in fair condition due to the moderate quantity of deadwood in the crown and slightly reduced overall structural rating. Additionally, this tree has a number of poorly tapered branches throughout the crown.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. However, this tree does not achieve a regulated trunk circumference and therefore is not regulated by the Planning, Development and Infrastructure Act 2016.	
<b>Retention Rating</b>	<b>Moderate</b>
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	<b>Conflicted</b>
The location of this tree is such that it requires removal as part of the bushfire mitigation for this project.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Messmate Stringy-bark

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	10-15 metres
<b>Health:</b>	Good
<b>Structure:</b>	Good
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	>20 years
<b>Tree Protection Zone:</b>	9.34 metres
<b>Structural Root Zone:</b>	3.10 metres



### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment. There is included bark in the primary structure however this is not impacting the overall structural rating at this point.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	Moderate
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	No Impact
No encroachment into the Tree Protection Zone area has been identified.	
<b>Action</b>	Protect Root Zone
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009.	



## Messmate Stringy-bark

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	5-10 metres
<b>Spread:</b>	5-10 metres
<b>Health:</b>	Good
<b>Structure:</b>	Poor
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	9.00 metres
<b>Structural Root Zone:</b>	3.04 metres



### Observations

This tree is considered to be in poor overall condition due to the structure of the primary trunk union which is supporting a dead leader.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Low</b>
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	<b>Conflicted</b>
The location of this tree is such that it requires removal as part of the bushfire mitigation for this project.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	>20 metres
<b>Health:</b>	Good
<b>Structure:</b>	Fair
<b>Form:</b>	Good
<b>Trunk Circumference:</b>	>3 metres
<b>Useful Life Expectancy:</b>	>10 years
<b>Tree Protection Zone:</b>	14.94 metres
<b>Structural Root Zone:</b>	3.77 metres



### Observations

This tree is considered to be in fair overall condition due to it having a moderate history of branch failure impacting its structural rating and therefore its overall condition.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	High
This tree has a High Retention Rating and should be protected in any future development.	
<b>Development Impact</b>	No Impact
No encroachment into the Tree Protection Zone area has been identified.	
<b>Action</b>	Protect Root Zone
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009.	

## Messmate Stringy-bark

Inspected:	9 June 2021
Height:	10-15 metres
Spread:	15-20 metres
Health:	Good
Structure:	Fair
Form:	Fair
Trunk Circumference:	>3 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	8.59 metres
Structural Root Zone:	2.99 metres



### Observations

This tree is considered to be in fair overall condition due to it having a moderate history of branch failure impacting its structural rating and therefore its overall condition.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than three metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Moderate</b>
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	<b>No Impact</b>
No encroachment into the Tree Protection Zone area has been identified.	
<b>Action</b>	<b>Protect Root Zone</b>
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	>20 metres
<b>Spread:</b>	15-20 metres
<b>Health:</b>	Good
<b>Structure:</b>	Good
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	>20 years
<b>Tree Protection Zone:</b>	10.56 metres
<b>Structural Root Zone:</b>	3.27 metres



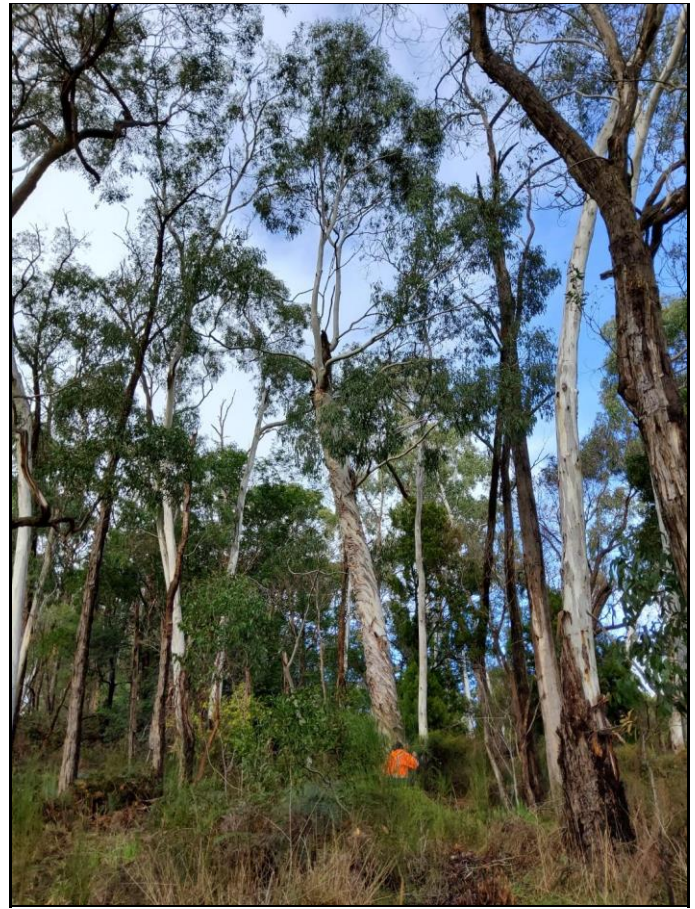
### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	<b>Moderate</b>
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	<b>No Impact</b>
No encroachment into the Tree Protection Zone area has been identified.	
<b>Action</b>	<b>Protect Root Zone</b>
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	10-15 metres
<b>Spread:</b>	<5 metres
<b>Health:</b>	Fair
<b>Structure:</b>	Poor
<b>Form:</b>	Poor
<b>Trunk Circumference:</b>	>2 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	7.80 metres
<b>Structural Root Zone:</b>	2.88 metres



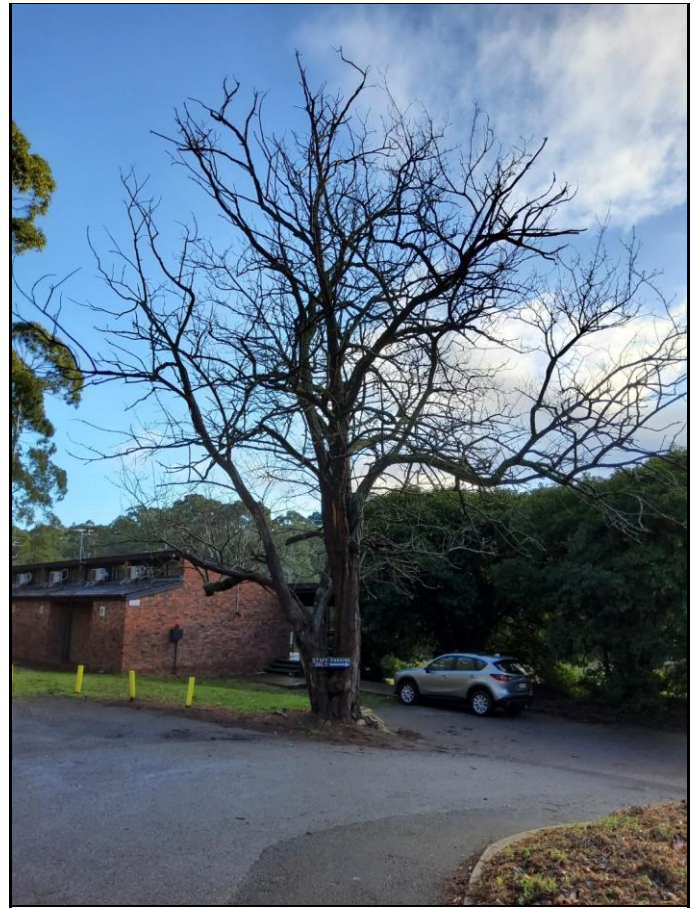
### Observations

This tree is considered to be in poor overall condition due to a history of substantial failure, a moderate level of epicormic growth and an overall reduction in its health rating. The trunk of this tree has failed at approximately eight metres above ground level, with the crown now consisting of epicormic regrowth.

<b>Legislative Status</b>	Controlled
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. This tree has a trunk circumference greater than two metres however it is exempt from control under the PDI Act as it is controlled under the Native Vegetation Act 1991 as per Regulation 3F Sub Regulation (4)(d).	
<b>Retention Rating</b>	Low
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	Low
The identified encroachment is less than 10% of the TPZ area and not expected to impact tree viability.	
<b>Action</b>	Protect Root Zone
Protect the root zone of this tree in accordance with the recommendations and principles of AS4970-2009. It should be noted however that this tree is in poor condition and is not suitable for long term retention in this type of development.	

## Black Locust

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	10-15 metres
<b>Spread:</b>	10-15 metres
<b>Health:</b>	Poor
<b>Structure:</b>	Fair
<b>Form:</b>	Fair
<b>Trunk Circumference:</b>	>3 metres
<b>Useful Life Expectancy:</b>	<10 years
<b>Tree Protection Zone:</b>	10.01 metres
<b>Structural Root Zone:</b>	3.19 metres



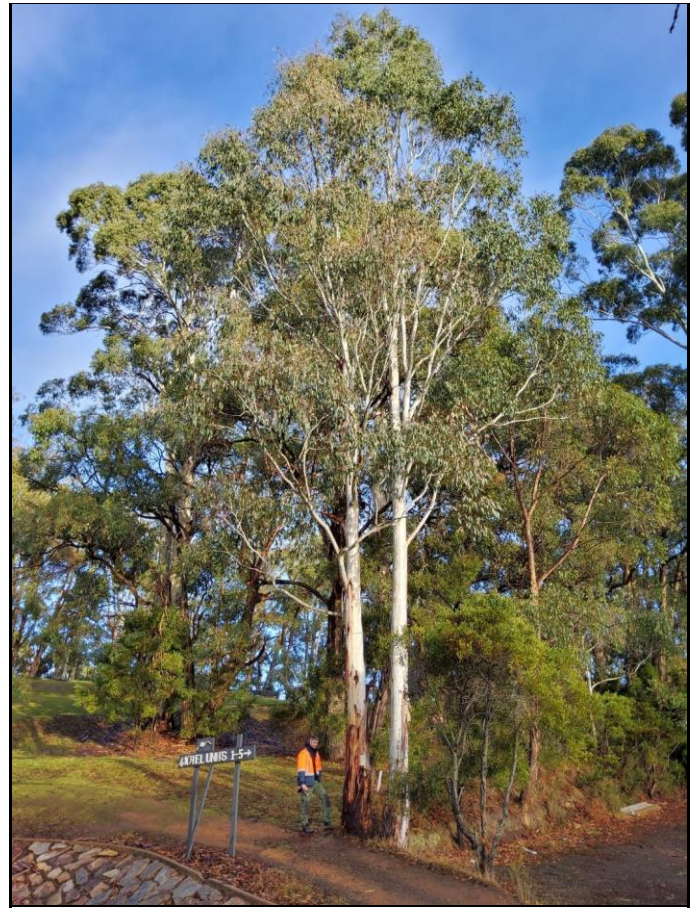
### Observations

This tree is considered to be in poor overall condition due to its poor health and reduced structure rating. This tree has a codominant form with included bark in the primary structure, there is also a moderate level of decay in the trunk and a substantial volume of deadwood in the crown.

<b>Legislative Status</b>	Exempt
This tree is not subject to control under either the Planning, Development and Infrastructure Act 2016 or the Native Vegetation Act 1991.	
<b>Retention Rating</b>	Low
This tree has a Low Retention Rating and should not form a material constraint to the redevelopment of this site.	
<b>Development Impact</b>	Conflicted
The identified encroachment is greater than 10% of the TPZ area and will also impact the SRZ and/or the trunk. On that basis the proposed development will negatively impact tree viability to the point where its removal is required.	
<b>Action</b>	Removal Required
Tree removal is required to facilitate the proposed development.	

## Manna Gum

Inspected:	9 June 2021
Height:	10-15 metres
Spread:	5-10 metres
Health:	Good
Structure:	Fair
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	5.40 metres
Structural Root Zone:	2.47 metres



### Observations

This tree is considered to be in fair condition as indicated by the reduced overall structural rating. This tree has a moderate history of small diameter branch failure.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. However, this tree does not achieve a regulated trunk circumference and therefore is not regulated by the Planning, Development and Infrastructure Act 2016.	
<b>Retention Rating</b>	<b>Moderate</b>
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	<b>Conflicted</b>
The identified encroachment is greater than 10% of the TPZ area and will also impact the SRZ and/or the trunk. On that basis the proposed development will negatively impact tree viability to the point where its removal is required.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	

## Manna Gum

<b>Inspected:</b>	9 June 2021
<b>Height:</b>	10-15 metres
<b>Spread:</b>	5-10 metres
<b>Health:</b>	Good
<b>Structure:</b>	Good
<b>Form:</b>	Good
<b>Trunk Circumference:</b>	<2 metres
<b>Useful Life Expectancy:</b>	>20 years
<b>Tree Protection Zone:</b>	6.24 metres
<b>Structural Root Zone:</b>	2.61 metres



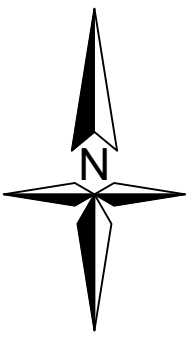
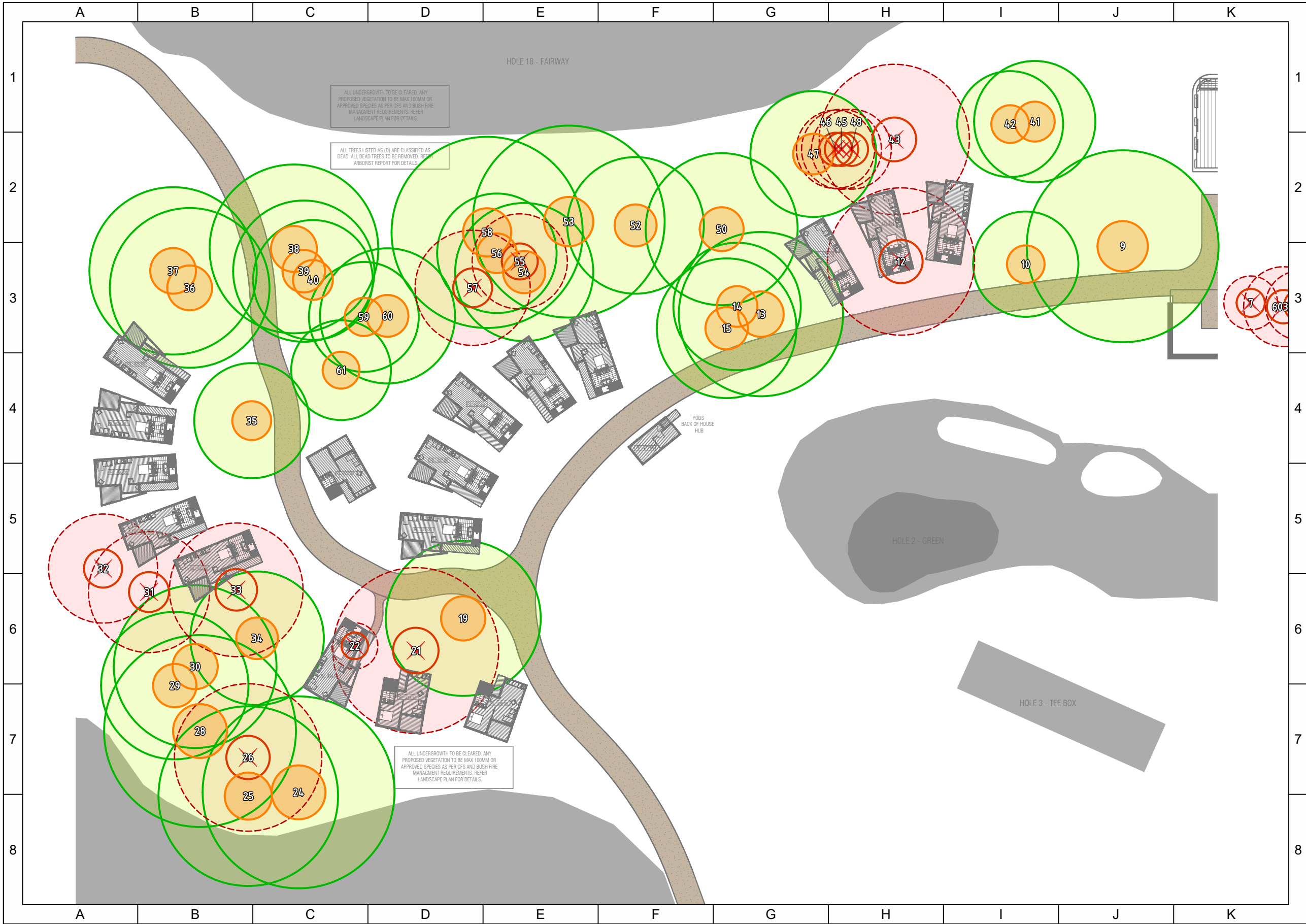
### Observations

The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.

<b>Legislative Status</b>	<b>Controlled</b>
This tree appears to be naturally occurring indigenous vegetation in an area subject to regulation under the Native Vegetation Act 1991 and its management is therefore controlled under this Act. However, this tree does not achieve a regulated trunk circumference and therefore is not regulated by the Planning, Development and Infrastructure Act 2016.	
<b>Retention Rating</b>	<b>Moderate</b>
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Development Impact</b>	<b>Conflicted</b>
The identified encroachment is greater than 10% of the TPZ area and will also impact the SRZ and/or the trunk. On that basis the proposed development will negatively impact tree viability to the point where its removal is required.	
<b>Action</b>	<b>Removal Required</b>
Tree removal is required to facilitate the proposed development.	



## Appendix C - Mapping

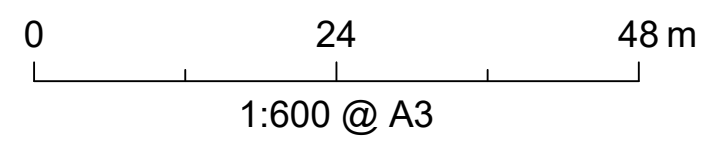


Legend	
<u>Trees to Remain</u>	
	TPZ
	SRZ
<u>Trees to be Removed</u>	
	TPZ
	SRZ

Date: 28/11/2022  
 Ref: ATS6360-035GoIRdDIR R1  
 Arborman Tree Solutions  
 23 Aberdeen Street  
 Port Adelaide SA 5015  
 0418 812 967  
[www.arborman.com.au](http://www.arborman.com.au)

## Tree Removals

Stirling Golf Club, 35 Golflinks Road, Stirling



## Appendix D - Tree Assessment Summary

# Tree Assessment Summary

Tree No.	Botanic Name	Legislative Status	Retention Rating	Development Impact	TPZ Radius	Observations	Action
7	<i>Eucalyptus obliqua</i>	Controlled	Low	Conflicted	4.20 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.	Removal Required
9	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	High	Low	15.00 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment. This tree has a moderate history of small diameter branch failure.	Specialised Construction
10	<i>Eucalyptus obliqua</i>	Controlled	Low	Low	8.23 metres	This tree is in poor overall condition as evidenced by the substantial volume of deadwood and the presence of stable included bark in the primary structure.	Specialised Construction
12	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Low	Conflicted	11.51 metres	This tree is considered to be in poor overall condition due to the considerably reduced foliage density, with high levels of dieback and deadwood throughout the crown. There are a number of relatively poorly installed cables in the mid-crown of this tree between the codominant stems, these are restricting sap flow and may be a factor in the reduced crown condition.	Removal Required
13	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Moderate	Low	12.84 metres	This tree is considered to be in fair overall condition as evidenced by the moderate volume of deadwood and history of branch failure throughout the crown. This tree has a moderate trunk lean however this is natural and not considered to be affecting the overall structural rating.	Specialised Construction
14	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Low	Low	9.96 metres	This tree is in poor overall condition as evidenced by the substantial levels of deadwood, branch failure and decay throughout the tree. There is a significant level of decay in the primary trunk union.	Specialised Construction

# Tree Assessment Summary

Tree No.	Botanic Name	Legislative Status	Retention Rating	Development Impact	TPZ Radius	Observations	Action
15	<i>Eucalyptus obliqua</i>	Controlled	Low	Low	10.92 metres	This tree is considered to be in poor overall condition as evidenced by the substantial volume of deadwood throughout the crown and moderate level of branch failure and epicormic growth.	Specialised Construction
19	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	High	Low	12.12 metres	This tree is considered to be in fair condition due to the moderate quantity of deadwood in the crown and slightly reduced overall structural rating.	Specialised Construction
21	<i>Eucalyptus obliqua</i>	Controlled	Low	Conflicted	12.96 metres	This tree is considered to be in poor overall condition as evidenced by the substantial level of dieback of the upper crown, the presence of poor quality branch unions and the moderate history of branch failure.	Removal Required
22	<i>Eucalyptus obliqua</i>	Controlled	Low	Conflicted	3.60 metres	This tree is considered to be in poor overall condition due to the level of dieback in the upper crown.	Removal Required
24	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	High	Low	15.00 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.	Protect Root Zone
25	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	High	No Impact	14.04 metres	This tree is considered to be in fair overall condition due to the moderate level of deadwood in the crown and the modest level of decay in the trunk and/or branches.	Protect Root Zone
26	<i>Eucalyptus obliqua</i>	Controlled	Low	Conflicted	11.52 metres	This tree is considered to be in poor overall condition as evidenced by the substantial volume of deadwood and moderate level of epicormic growth throughout the crown.	Removal Required
28	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	High	No Impact	15.00 metres	This tree is considered to be in fair overall condition due to its reduced structural rating associated with the moderate level of branch failure and the modest level of decay in the trunk and/or branches. This tree also has a moderate trunk lean that whilst not significant structurally is worthy of noting.	Protect Root Zone

# Tree Assessment Summary

Tree No.	Botanic Name	Legislative Status	Retention Rating	Development Impact	TPZ Radius	Observations	Action
29	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Low	No Impact	11.52 metres	This tree is in poor overall condition as evidenced by the substantial volume of deadwood and dieback and the significantly reduced foliage density. Additionally, this tree has a moderate history of branch failure and an increased level of epicormic growth.	Protect Root Zone
30	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Low	Low	12.72 metres	This tree is poor overall condition as evidenced by the high level of deadwood and dieback and the moderate levels of decay and epicormic growth.	Protect Root Zone
31	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Low	Conflicted	9.46 metres	This tree is considered to be in poor overall condition as evidenced by the elevated level of deadwood and dieback throughout the crown and the substantial history of branch failure and associated decay.	Removal Required
32	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Low	Conflicted	8.52 metres	This tree is considered to be in poor overall condition due to the substantial history of branch failure and the moderate volume of deadwood.	Removal Required
33	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Low	Conflicted	10.44 metres	This tree is considered to be in poor overall condition due to the substantial volume of deadwood and the significant level of decay in the trunk. This tree also has a moderate trunk lean that is significant structurally due to the level of decay in the trunk.	Removal Required
34	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Low	Low	10.44 metres	This tree is considered to be in poor overall condition as evidenced by the high level of deadwood and the substantially reduced foliage density throughout the crown. This tree also displays a moderate level of decay, epicormic growth and branch failure.	Protect Root Zone
35	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Low	Low	9.00 metres	This tree is considered to be in fair overall condition as evidenced by the moderate volume of deadwood and history of branch failure throughout the crown.	Specialised Construction

# Tree Assessment Summary

Tree No.	Botanic Name	Legislative Status	Retention Rating	Development Impact	TPZ Radius	Observations	Action
36	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	Moderate	Low	12.48 metres	This tree is considered to be in fair overall condition as evidenced by the moderate levels of deadwood and epicormic growth throughout the crown.	Specialised Construction
37	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	High	Low	13.08 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.	Specialised Construction
38	<i>Eucalyptus obliqua</i>	Controlled	Moderate	Low	13.19 metres	This tree considered to be in poor overall condition as evidenced by the substantial reduction in foliage density, the increased level of dieback and the presence of a partially included union in the primary structure.	Specialised Construction
39	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	Moderate	Low	11.04 metres	This tree is considered to be in fair condition as indicated by the reduced overall structural rating. This tree also has a moderate trunk lean that whilst not significant structurally is worthy of noting.	Specialised Construction
40	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	Moderate	Low	9.36 metres	This tree is considered to be in fair overall condition as evidenced by the moderate volume of deadwood and history of branch failure throughout the crown. This tree also has a moderate trunk lean that whilst not significant structurally is worthy of noting.	Specialised Construction
41	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	Low	No Impact	9.48 metres	This tree is considered to be in poor overall condition due to its poor structure rating. This tree has a significant history of small diameter branch failure and a moderate level of decay in the trunk.	Protect Root Zone
42	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	High	No Impact	8.28 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.	Protect Root Zone
43	<i>Eucalyptus obliqua</i>	Controlled	High	Conflicted	11.74 metres	This tree is considered to be in fair condition as indicated by the reduced overall structural rating. This tree has a moderate level of decay in the trunk.	Removal Required

# Tree Assessment Summary

Tree No.	Botanic Name	Legislative Status	Retention Rating	Development Impact	TPZ Radius	Observations	Action
45	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	High	Conflicted	6.24 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.	Removal Required
46	<i>Eucalyptus obliqua</i>	Controlled	High	Conflicted	6.12 metres	This tree is considered to be in fair overall condition due to its moderately reduced health rating.	Removal Required
47	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	High	Low	9.84 metres	This tree is considered to be in fair overall condition due to its moderately reduced health rating.	Protect Root Zone
48	<i>Eucalyptus obliqua</i>	Controlled	High	Conflicted	6.24 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.	Removal Required
50	<i>Eucalyptus obliqua</i>	Controlled	Low	Low	11.88 metres	This tree is considered to be in poor overall condition due to a reduced health rating including dieback and deadwood throughout the crown.	Protect Root Zone
52	<i>Eucalyptus obliqua</i>	Controlled	Moderate	No Impact	10.68 metres	This tree is considered to be in fair overall condition as evidenced by the moderate volume of deadwood and history of branch failure throughout the crown. The crown also retains an above average volume of epicormic growth.	Protect Root Zone
53	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	High	Low	15.00 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.	Protect Root Zone
54	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	Moderate	Low	10.80 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment. This tree has a moderate trunk lean however this is natural and not considered to affecting the overall structural rating.	Protect Root Zone
55	<i>Eucalyptus obliqua</i>	Controlled	Moderate	Conflicted	7.44 metres	This tree is considered to be in fair condition due to the moderate quantity of deadwood in the crown and slightly reduced overall structural rating. Additionally, this tree has a number of poorly tapered branches throughout the crown.	Removal Required



# Tree Assessment Summary

Tree No.	Botanic Name	Legislative Status	Retention Rating	Development Impact	TPZ Radius	Observations	Action
56	<i>Eucalyptus obliqua</i>	Controlled	Moderate	No Impact	9.34 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment. There is included bark in the primary structure however this is not impacting the overall structural rating at this point.	Protect Root Zone
57	<i>Eucalyptus obliqua</i>	Controlled	Low	Conflicted	9.00 metres	This tree is considered to be in poor overall condition due to the structure of the primary trunk union which is supporting a dead leader.	Removal Required
58	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	High	No Impact	14.94 metres	This tree is considered to be in fair overall condition due to it having a moderate history of branch failure impacting its structural rating and therefore its overall condition.	Protect Root Zone
59	<i>Eucalyptus obliqua</i>	Controlled	Moderate	No Impact	8.59 metres	This tree is considered to be in fair overall condition due to it having a moderate history of branch failure impacting its structural rating and therefore its overall condition.	Protect Root Zone
60	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	Moderate	No Impact	10.56 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.	Protect Root Zone
61	<i>Eucalyptus viminalis ssp. viminalis</i>	Controlled	Low	Low	7.80 metres	This tree is considered to be in poor overall condition due to a history of substantial failure, a moderate level of epicormic growth and an overall reduction in its health rating. The trunk of this tree has failed at approximately eight metres above ground level, with the crown now consisting of epicormic regrowth.	Protect Root Zone
101	<i>Robinia pseudoacacia</i>	Exempt	Low	Conflicted	10.01 metres	This tree is considered to be in poor overall condition due to its poor health and reduced structure rating. This tree has a codominant form with included bark in the primary structure, there is also a moderate level of decay in the trunk and a substantial volume of deadwood in the crown.	Removal Required

# Tree Assessment Summary

Tree No.	Botanic Name	Legislative Status	Retention Rating	Development Impact	TPZ Radius	Observations	Action
602	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Moderate	Conflicted	5.40 metres	This tree is considered to be in fair condition as indicated by the reduced overall structural rating. This tree has a moderate history of small diameter branch failure.	Removal Required
603	<i>Eucalyptus viminalis</i> <i>ssp. viminalis</i>	Controlled	Moderate	Conflicted	6.24 metres	The health and structure of this tree indicate it is in good overall condition and has adapted to its local environment.	Removal Required

## Appendix E - Tree Protection Zone Guidelines

## **Tree Protection Zone General Specifications and Guidelines**

The Tree Protection Zone(s) is identified on the site plan. The TPZ is an area where construction activities are regulated for the purposes of protecting tree viability. The TPZ should be established so that it clearly identifies and precludes development/construction activities including personnel.

If development activities are required within the TPZ then these activities must be reviewed and approved by the Project Arborist. Prior to approval, the Project Arborist must be certain that the tree(s) will remain viable as a result of this activity.

### **Work Activities Excluded from the Tree Protection Zone:**

- a) Machine excavation including trenching;
- b) Excavation for silt fencing;
- c) Cultivation;
- d) Storage;
- e) Preparation of chemicals, including preparation of cement products;
- f) Parking of vehicles and plant;
- g) Refuelling;
- h) Dumping of waste;
- i) Wash down and cleaning of equipment;
- j) Placement of fill;
- k) Lighting of fires;
- l) Soil level changes;
- m) Temporary or permanent installation of utilities and signs, and
- n) Physical damage to the tree.

## Protective Fencing

Protective fencing must be installed around the identified Tree Protection Zone (See Figure1). The fencing should be chain wire panels and compliant with AS4687 - 2007 *Temporary fencing and hoardings*. Shade cloth or similar material should be attached around the fence to reduce dust, other particulates and liquids entering the protected area.

Temporary fencing on 28kg bases are recommended for use as this eliminates any excavation requirements to install fencing. Excavation increase the likelihood of root damage therefore should be avoided where possible throughout the project.

Existing perimeter fencing and other structures may be utilised as part of the protective fencing.

Any permanent fencing should be post and rail with the set out determined in consultation with the Project Arborist.

Where the erection of the fence is not practical the Project Arborist is to approve alternative measures.

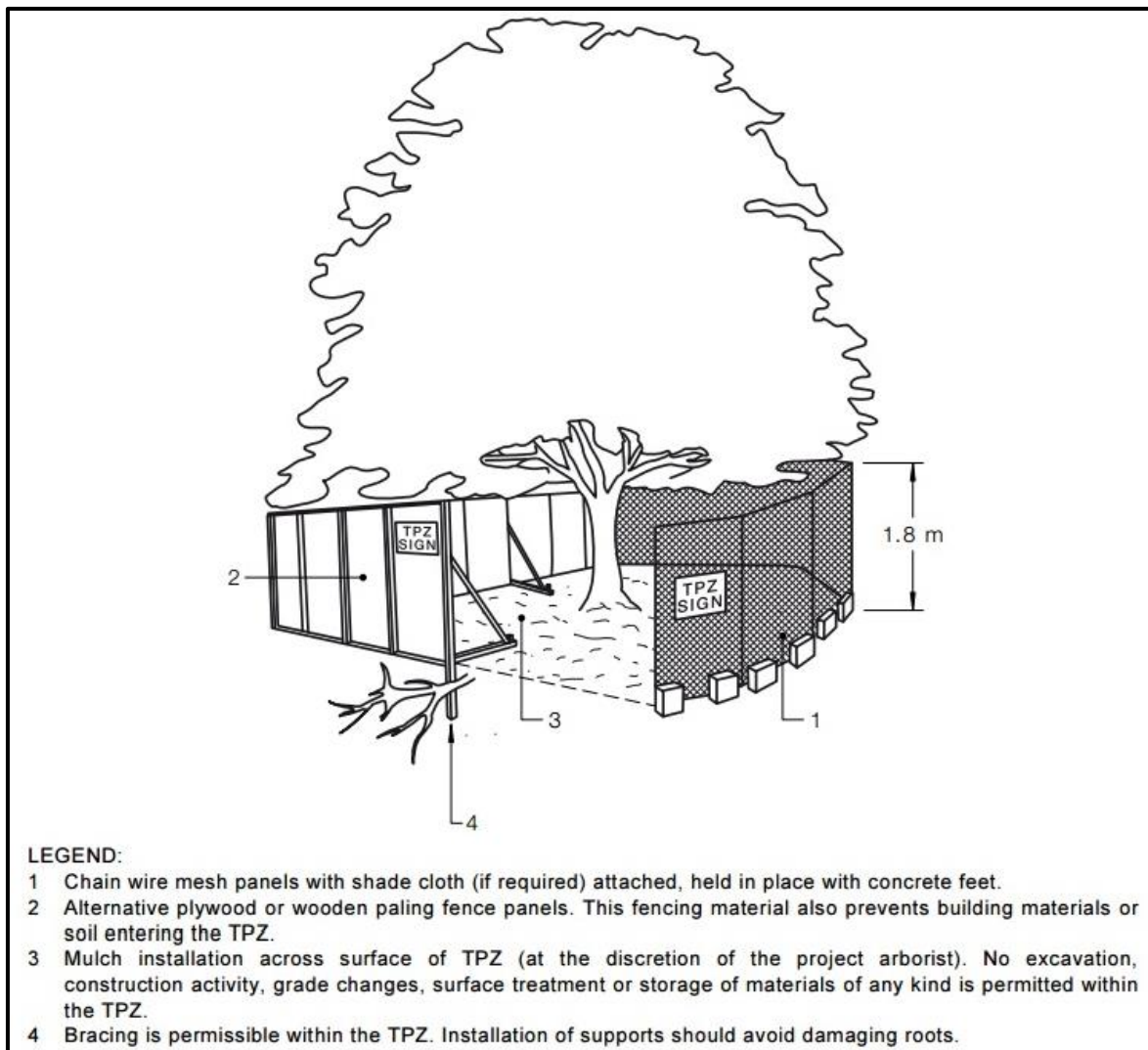


Figure 1 Showing example of protection fencing measures suitable.

## Other Protection Measures

### General

When a TPZ exclusion area cannot be established due to practical reasons or the area needs to be entered to undertake construction activities then additional tree protection measures may need to be adopted. Protection measures should be compliant with AS4970-2009 and approved by the Project Arborist

### Installation of Scaffolding within Tree Protection Area.

Where scaffolding is required within the TPZ branch removal should be minimised. Any branch removal required should be approved by the Project Arborist and performed by a certified Arborist and performed in accordance with AS4373-2007. Approval to prune branches must be documented and maintained.

Ground below scaffold should be protected by boarding (e.g. scaffold board or plywood sheeting) as shown in Figure below. The boarding should be left in place until scaffolding is removed.

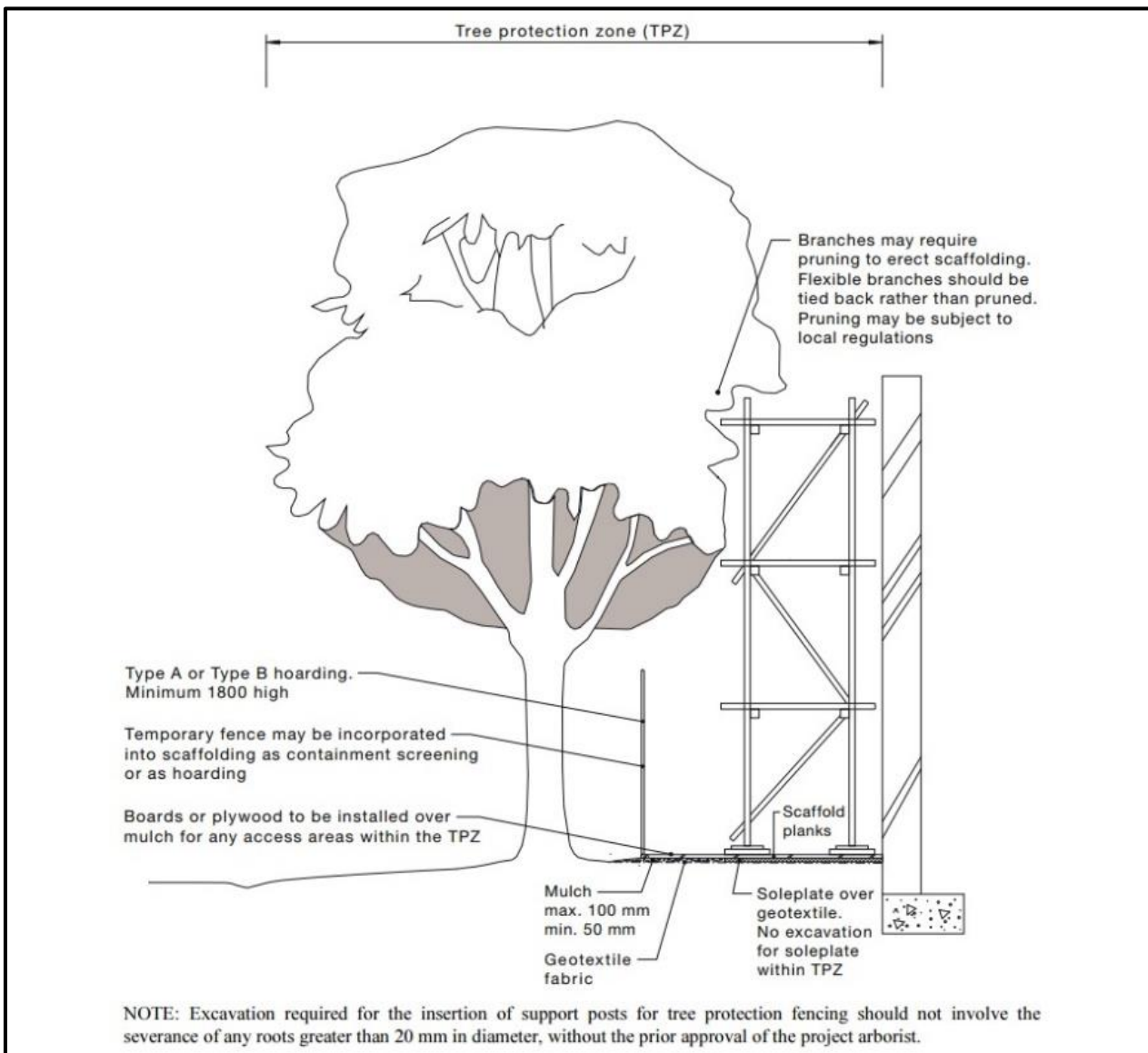


Figure 2 – Showing scaffolding constructed within TPZ.

## Ground Protection

Where access is required within the TPZ ground protection measures are required. Ground protection is to be designed to prevent both damage to the roots and soil compaction.

Ground protection methods include the placement of a permeable membrane beneath a layer of non-compactable material such as mulch or a no fines gravel which is in turn covered with rumble boards or steel plates.

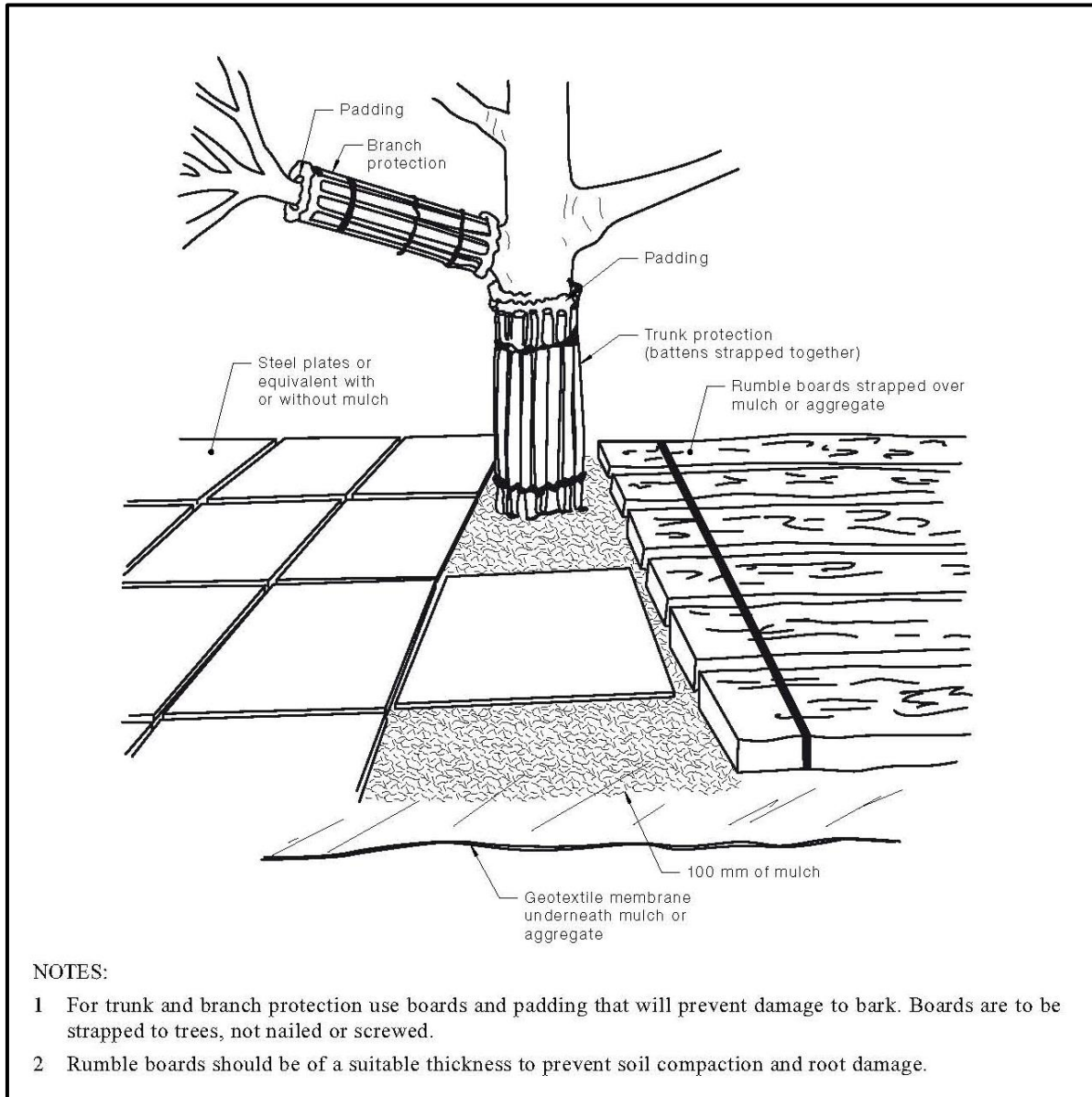


Figure 3 – Ground protection methods.

### Document Source:

Diagrams in this document are sourced from AS4970-2009 Protection of trees on development sites. Further information and guidelines are available in within that document.

## Paving Construction within a Tree Protection Zone

Paving within any Tree Protection Zone (TPZ) must be carried out above natural ground level unless it can be shown with non-destructive excavation (AirSpade® or similar) that no or insignificant root growth occupies the proposed construction area.

Due to the adverse effect filling over a Tree Protection Zone (TPZ) can have on tree health; alternative mediums other than soil must be used. Available alternative mediums include structural soils or the use of a cellular confinement system such as *Ecocell*®.

### Ecocell®

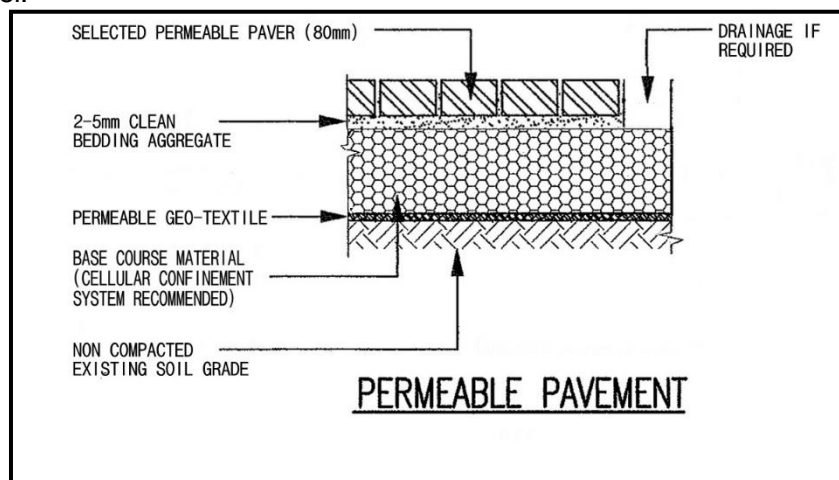
Ecocell® systems are a cellular confinement system that can be filled with large particle sized gravels as a sub-base for paving systems to reduce compaction to the existing grade.

### Site preparation

- Clearly outline to all contracting staff entering the site the purpose of the TPZ's and the contractors' responsibilities. No fence is to be moved and no person or machinery is to access the TPZ's without consent from the City of Unley and/or the Project Arborist.
- Fence off the unaffected area of the TPZ with a temporary fence leaving a 1.5 metre gap between the work area and the fence; this will prevent machinery access to the remaining root zone.

### Installation of Ecocell® and EcoTrihex Paving®

- Install a non-woven geotextile fabric for drainage and separation from sub base with a minimum of 600mm overlap on all fabric seams as required.
- Add Ecocell®, fill compartments with gravel and compact to desired compaction rate.
- If excessive groundwater is expected incorporate an appropriate drainage system within the bedding sand level.
- Add paving sand to required depth and compact to paving manufacturer's specifications.
- Lay EcoTrihex Paving® as per manufactures specifications and fill gaps between pavers with no fines gravel.
- Remove all debris, vegetation cover and unacceptable in-situ soils. No excavation or soil level change of the sub base is allowable for the installation of the paving.
- Where the finished soil level is uneven, gullies shall be filled with 20 millimetre coarse gravel to achieve the desired level.



This construction method if implemented correctly can significantly reduce and potentially eliminated the risk of tree decline and/or structural failure and effectively increase the size of the Tree Protection Zone to include the area of the paving.



## Certificates of Control

Stage in development	Tree management process	
	Matters for consideration	Actions and certification
Development submission	Identify trees for retention through comprehensive arboricultural impact assessment of proposed construction. Determine tree protection measures Landscape design	Provide arboricultural impact assessment including tree protection plan (drawing) and specification
Development approval	Development controls Conditions of consent	Review consent conditions relating to trees
<b>Pre-construction (Sections 4 and 5)</b>		
Initial site preparation	State based OHS requirements for tree work Approved retention/removal Refer to AS 4373 for the requirements on the pruning of amenity trees Specifications for tree protection measures	Compliance with conditions of consent  Tree removal/tree retention/transplanting Tree pruning Certification of tree removal and pruning  Establish/delineate TPZ Install protective measures Certification of tree protection measures
<b>Construction (Sections 4 and 5)</b>		
Site establishment	Temporary infrastructure Demolition, bulk earthworks, hydrology	Locate temporary infrastructure to minimize impact on retained trees Maintain protective measures Certification of tree protection measures
Construction work	Liaison with site manager, compliance Deviation from approved plan	Maintain or amend protective measures Supervision and monitoring
Implement hard and soft landscape works	Installation of irrigation services Control of compaction work Installation of pavement and retaining walls	Remove selected protective measures as necessary Remedial tree works Supervision and monitoring
Practical completion	Tree vigour and structure	Remove all remaining tree protection measures Certification of tree protection
<b>Post construction (Section 5)</b>		
Defects liability/ maintenance period	Tree vigour and structure	Maintenance and monitoring Final remedial tree works Final certification of tree condition

### Document Source:

This table has been sourced from AS4970-2009 Protection of trees on development sites. Further information and guidelines are available in within that document.

# Tree Protection Zone



# NO ACCESS

Contact: Arborman Tree Solutions

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## **Appendix 10**

*Appendix H of Development Report – Sustainability  
strategy report*

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# Mount Lofty Golf Estate

## Sustainability Strategy Report

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Project Number: 2623





Issue	Date	Change	Checked	Approved
01	07/09/2022	Development Report Issue	JB	DD

Our vision is to think beyond the square.

Our mission is to reduce the impact on the environment of our client's actions by providing innovative solutions, challenging perceived thinking, and pushing the boundaries of achievement whilst using all resources in a sustainable way.

We confirm that all work has been undertaken in accordance with our ISO 9001 accredited quality management system.

**Acknowledgement of country**

The dsquared team wish to acknowledge the Traditional Custodians of all country throughout Australia, and their cultural, spiritual, physical, and emotional connection with their land, waters, and community. We pay our respects to all Elders past, present, and emerging.

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# 1 Introduction

## 1.1 Introduction

This report presents the Sustainability Strategies and Ecologically Sustainable Design (ESD) initiatives proposed for the Mount Lofty Golf Estate development, which will reduce the development’s impact on the environment in both construction and operation.

The proposed development has been designed with a holistic approach to ESD, creating an exemplar environment for all users including visitors, guests, and staff, while minimising energy use and greenhouse gas emissions.

This report follows the development of the master plan and building designs by the design team led by R-Architecture. Computer building simulation design techniques have been employed to inform the design initiatives and to assess the sustainability performance of the built form.

## 1.2 Strategy

The sustainability strategy and outcomes proposed are summarised as follows:



## 2 Performance

### 2.1 Green Star certification

The project will obtain a certified Green Star As-Built rating using the Green Building Council of Australia's new rating tool 'Buildings v1', which is the GBCA's next-generation rating tool replacing the previous 'Design and As-Built' tool.

The project is targeting a 5 Star outcome under the GBCA's new Buildings v1 rating tool. The GBCA defines 5 Stars as 'Australian Excellence' in sustainable building design.

The project will also obtain a Green Star Design Certification prior to the construction stage commencing.

Obtaining a third-party certified Green Star rating acts as a verification method for the project's ESD design initiatives and modelled performance outcomes. This approach will ensure ESD remains a core part of the project scope throughout the detailed design and construction phases.

### 2.2 Energy

The development is being designed and will be constructed to meet the energy efficiency requirements of the Green Building Council of Australia's Green Star Buildings v1 rating tool, which are as follows:

- The development will achieve at least 10% better energy and greenhouse gas emissions performance compared with a NCC / BCA 2019 deemed-to-satisfy reference case; and
- The façade and building fabric will exceed the NCC / BCA 2019 deemed-to-satisfy requirements for energy efficiency and thermal performance.

Preliminary modelling of the proposed concept design indicates that the development's **energy consumption will be 24% lower** than a NCC 2019 deemed-to-satisfy reference case, and its **carbon emissions from energy use will be 18% lower**. Refer to section 3 for a list of energy efficiency initiatives which will contribute to achieving these outcomes.

	Reference Building (NCC 2019 code compliant)			Mount Lofty Golf Estate		
	Electricity	Gas	CO <sub>2</sub> emissions	Electricity	Gas	CO <sub>2</sub> emissions
	kWh p.a.	MJ p.a.	kg CO <sub>2</sub> e p.a.	kWh p.a.	MJ p.a.	kg CO <sub>2</sub> e p.a.
Hotel	375,681	443,790	185,390	387,452	0	162,730
Facilities Building	404,465	159,948	179,824	323,067	0	135,688
Accommodation Pods	132,145	91,440	61,188	124,262	0	52,190
<b>Total</b>	<b>912,291</b>	<b>695,178</b>	<b>426,402</b>	<b>834,781</b>	<b>0</b>	<b>350,608</b>

Energy modelled performance results



	Reference Building (NCC 2019 code compliant)	Mount Lofty Golf Estate	Improvement
Energy use (MJ p.a.)	3,979,426	3,005,212	24%
CO <sub>2</sub> emissions (kg CO <sub>2</sub> e p.a.)	426,402	350,608	18%

Energy modelled performance summary

### 2.3 Carbon emissions

The development will be all-electric and will not use fossil fuels (natural gas) for heating, cooling, or hot water services, promoting the transition to 100% renewable energy from off-site and on-site sources.

20% of the development's annual electrical demand will be supplied by on-site renewable energy via a rooftop solar PV system.

A Zero Carbon Action Plan will be prepared and will include strategies for how the project will achieve net zero carbon emissions in operation. This includes strategies for phasing-out and eliminating all fossil fuels from the development and transitioning away from petrol- and diesel-powered golf carts and grounds maintenance vehicles and equipment.

### 2.4 Daylight

All hotel suites and public facilities (golf club, restaurant, and function rooms) have access to daylight in accordance with Green Star standards.

The daylight access has been verified using IES Virtual Environment building computer simulation software, with modelled results as follows. Sample plots from the daylight modelling are provided in Appendix A.

	Occupied floor area (sqm)	Compliant area (sqm) <i>(Note 1)</i>	Compliant % <i>(Note 2)</i>	Green Star result
Facilities Building	1,802	993	55%	Complies
Hotel Building	3,084	1,488	48%	Complies
Accommodation Pods	651	433	66%	Complies
<b>Whole development</b>	<b>5,538</b>	<b>2,913</b>	<b>53%</b>	<b>1 out of 2 points achieved</b>

Daylight modelling results

Note 1: Compliance target is a minimum of 160 lux of daylight achieved during >80% of daytime hours.

Note 2: Green Star targets are 40% compliant area for 1 point, or 60% for 2 points.

Refer also to Appendix A for sample daylight modelling plots.

## 2.5 Water

The development will achieve at least a 10% reduction in potable water use when compared to a reference building in accordance with the Green Star Buildings v1 rating tool requirements.

Preliminary water balance modelling indicates the development will achieve a 33% reduction in potable water demand when compared with a 'standard practice' reference case as defined by the Green Building Council of Australia. This exceeds Green Star Water Use requirements under the Buildings v1 rating tool.

A 50 kL rainwater storage tank will be provided and harvest rainwater for landscape irrigation, laundry services, and washdown of bin rooms and golf carts, which will contribute 13% of the buildings' total annual water demands, or 25% of the buildings' non-potable water demands.

	Standard practice	Mount Lofty Golf Estate
Total water demand (kL p.a.)	6,380	4,884
Rainwater contribution (kL p.a.)	Nil	639 (13% of demand)
Resultant potable water demand (kL p.a.)	6,380	4,245
Improvement achieved	-	33%

Water modelling results

### 3 Initiatives

#### 3.1 Passive Design

The following passive design features are included:

1. Buildings are oriented north which captures free heating from the winter sun. External shade elements and balconies provide shade protection from the summer sun.
2. The building form, façade shading elements, and glazing system specifications have been informed by energy performance modelling and computer simulation techniques.
3. High performance double-glazed facades are provided throughout the development. Glass systems' solar heat gain coefficients (SHGCs) have been optimised for each building type depending on solar exposure, to provide an optimum balance between summer and winter comfort.

Façade glazing systems will meet the following performance specifications.

	U-value Whole of system W/m <sup>2</sup> .K	Solar Heat Gain Coefficient (SHGC)	Visible Light Transmittance (VLT)	Glazing system type
Hotel Building	3.2 or less	0.40 or less	45% or higher	Double-glazed Neutral glass with low-E performance coating
Facilities Building	3.2 or less	0.40 or less	45% or higher	Double-glazed Neutral glass with low-E performance coating
Eco Pods	3.5 or less	0.50 or less	50% or higher	Double-glazed Neutral or clear glass

Façade glazing performance specifications

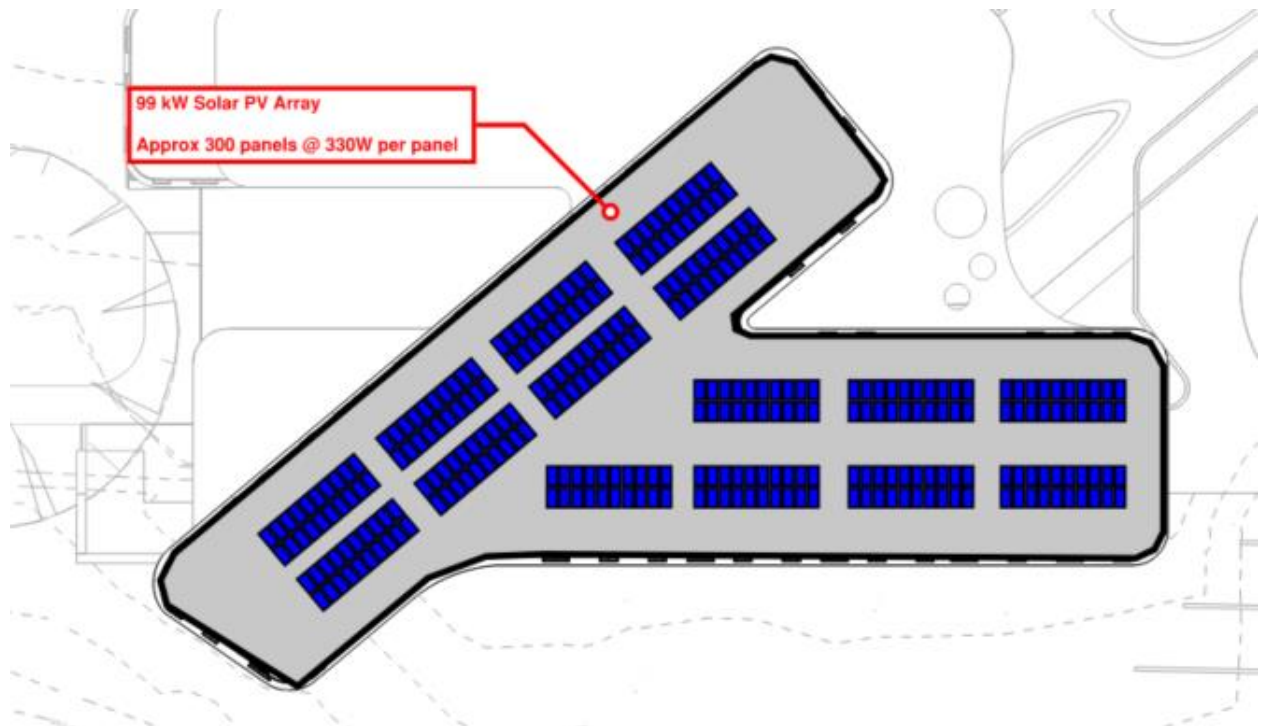
4. Natural ventilation is available in all hotel rooms and the gallery/café space, thereby reducing mechanical cooling demands.
5. The external façade will be subject to air leakage pressure testing to ATTMA standards, and the façade supplier required to meet prescribed air leakage rates as per GBCA / Green Star Standards. As well as significantly reducing the air conditioning energy consumption, this will also improve the indoor air quality, particularly during high external air pressure conditions.
6. Passive cooling from green roof, façade planters, and green landscaping around the buildings. Water transpiration from the plants and landscaping provides a natural cooling effect.
7. Light-coloured roof finishes and landscaping finishes will minimise heat absorption and reduce the heat island effect in accordance with Green Star standards. Roof finishes will have a solar reflective index (SRI) of minimum 82 and hardscaping elements at ground level will have a solar reflective index (SRI) of minimum 39.
8. Daylight is provided to all hotel rooms and indoor public spaces (Restaurant, Function Room, Golf Club and Sports Bar) which reduces artificial lighting demand.

### 3.2 Energy

The following Energy initiatives are included:

1. The building is fully electrified including cooling, heating, hot water, and cooking (no fossil fuels / natural gas).
2. A rooftop solar PV array provides renewable energy to power the building. Energy balance modelling demonstrates the system will provide at least 20% of the site's annual energy demand.

A solar PV layout sketch is shown as follows (refer also to Appendix B).



Proposed solar PV array

3. HVAC systems comprise high-efficiency air-cooled heat pump thermal plant for heat rejection and heat injection. All central plant is contained within distinct plant enclosures which minimises acoustic impacts and visual obtrusiveness of plant equipment.
  - A ground-loop heat exchange system is being explored as an alternative heat rejection strategy, in collaboration with specialist consultants GeoExchange. This option will further improve heating and cooling system efficiencies and will provide a natural and renewable source of thermal energy from the ground.
4. A shared condenser water loop system will provide heating and cooling energy to the Hotel and Facilities buildings using an efficient centralised approach.
5. Heat recovery between HVAC and domestic hot water systems via the shared condenser water loop system. In summer when HVAC systems are in cooling mode and rejecting heat from the occupied spaces into the condenser water loop, the rejected heat energy will be recovered and used to heat water for showering and other domestic hot water uses.
6. High-efficiency electric heat pump domestic hot water plant. System efficiency rating (Coefficient of Performance) will be in excess of 300% efficient.

7. All hotel rooms have access to natural ventilation via private balconies. Air-conditioning will shut down automatically whenever the balcony door is left open, to save energy when guests choose to open up their room and allow natural ventilation and external breezes to enter.
8. Air-conditioning and lighting in hotel rooms will switch off automatically when rooms are unoccupied.
9. Economy cycle HVAC mode provides free-cooling in public spaces (Restaurant, Function Room, Golf Club and Sports Bar).
10. Demand-controlled ventilation including indoor CO<sub>2</sub> monitoring will reduce thermal loads in public spaces (Restaurant, Function Room, Golf Club and Sports Bar) whilst maintaining a high indoor air quality at all times.
11. Automatic BMS controls for retail and commercial HVAC systems with distinct thermal zoning to suit the comfort needs of individual areas.
12. Energy efficient LED lighting throughout.
13. Energy metering and sub-metering of distinct load centres, connected to a fully integrated BMS.

### 3.3 Water

The following Water initiatives are included:

1. A rainwater capture and reuse system will provide rainwater for landscape irrigation, laundry services, and washdown of golf carts/waste storage rooms. A 50 kL rainwater storage tank will contribute 13% of the development's total water demand / 25% of non-potable water demand.
2. Landscaping comprises native and drought-tolerant planting species which have low irrigation water demands.
3. Water efficient fittings with the following minimum WELS ratings:
  - Taps 6 Stars
  - WCs 4 Stars
  - Urinals 4 Stars
  - Showers 4 Stars
4. Selecting water-efficient washing machines and dishwashers which are within one Star of the highest available water rating.
5. No water will be consumed for HVAC heat rejection purposes, i.e. no cooling towers. All HVAC heat rejection will be air-cooled or via ground heat exchange.
6. Stormwater systems designed such that pre-development peak stormwater outflows will not be exceeded, and all stormwater run-off will be appropriately treated before discharge to the local waterways. The use of stormwater detention tanks will contribute to meeting these outcomes.

### 3.4 Waste

The following Waste initiatives are included:

1. Construction waste will be minimised through efficient design techniques including standardisation and off-site pre-fabrication wherever practicable. A minimum 90% diversion from landfill rate will be targeted.
2. Separate bins will be provided for organic waste, recyclable waste, and general waste, to encourage and facilitate diversion of waste from landfill.

3. Waste storage facilities for the collection and disposal of general, recyclable, organic waste, and bulky waste, which will be separated on site to facilitate ease of disposal for recycling.
4. A site-specific Operational Waste Management Plan will be developed in accordance with Green Building Council of Australia guidelines for best practice waste management. The Plan will inform the design of waste storage and handling facilities, waste bin provisions, and signage requirements.

### 3.5 Indoor Environment Quality

The following Indoor Environment Quality initiatives are included:

1. All hotel suites and accommodation pods have access to natural ventilation via private balconies.
2. Mechanical ventilation will be provided to hotel rooms when balcony doors are closed, and to all public spaces. Outside air supplies will be in accordance with Green Star and AS1668.2 minimum requirements.
3. Daylight access is provided in all hotel suites, accommodation pods, and public spaces (Restaurant, Function Room, Golf Club and Sports Bar) in accordance with Green Star criteria (minimum 160 lux of daylight during at least 80% of daytime hours).
4. Glare from sunlight is managed through a combination of external shade elements, internal blinds, and building orientation (north-facing aspect).
5. Views to the surrounding natural landscapes are available in all occupied spaces.
6. The use of low VOC and low formaldehyde paints, sealants, adhesives, carpets, coverings, and furniture.
7. Acoustic performance in occupied spaces will be in accordance with Green Star and AS 2107 standards. Façade systems, acoustic treatments to internal ceilings and walls, and services plant will be designed to meet Green Star acoustic standards. This includes background noise levels, reverberation levels, and acoustic privacy requirements.
8. Air conditioning systems will be centralised, concealed, and located in acoustically sheltered plant areas, such that external noise will not impact on the amenity of guests, customers, or staff.

### 3.6 Construction

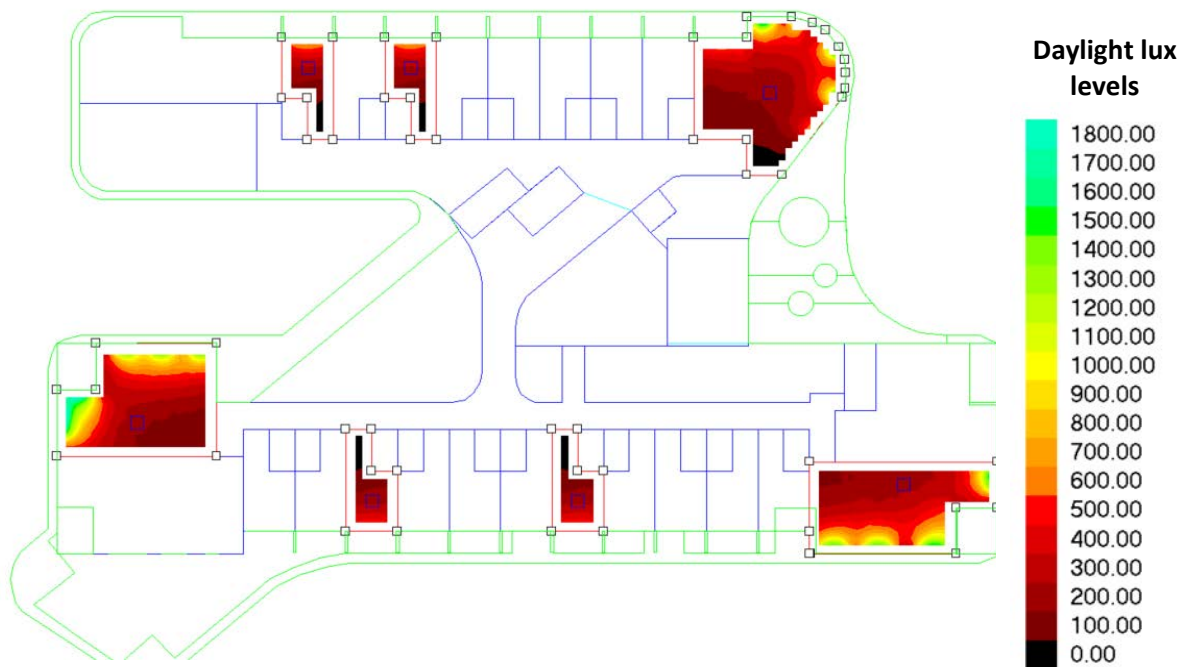
The following Construction initiatives are included:

1. Embodied carbon of construction (i.e. 'upfront emissions') will be at least 10% lower than a reference case, in line with Green Star requirements.
2. Refrigerants with low Global Warming Potential (GWP) ratings will be specified for central thermal plant and hot water plant.
3. Building materials which are made from recycled materials e.g. fly ash in concrete, reinforcement bar, recycled content floor coverings, and recycled insulation products, wherever viable.
4. Head contractor will be required to implement an Environmental Management Plan compliant with Green Star standards.
5. Using off site pre-fabrication techniques to reduce on site construction time, waste, and greenhouse gas emissions, wherever practicable.
6. Locally sourced materials and labour will be sought wherever viable.
7. Using Building Information Modelling (BIM) as a design and construction management tool to minimise on-site clashes and abortive/wasteful work.

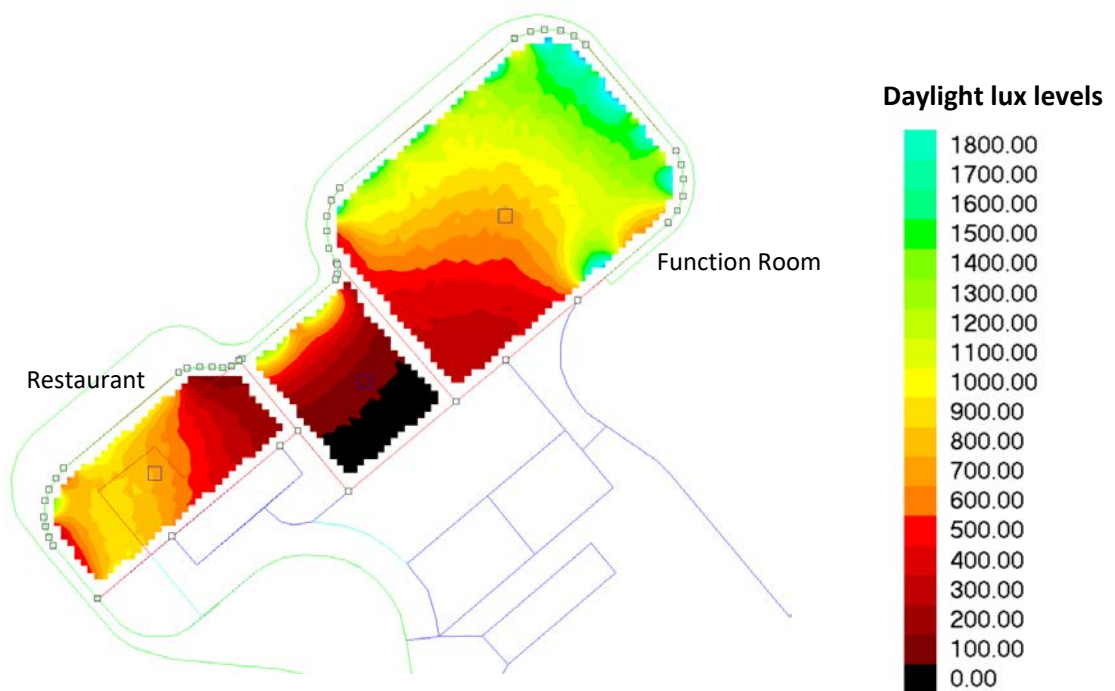
### 3.7 Community and Social Sustainability

The following social sustainability initiatives are included:

1. The development includes a Wellness Centre, Gym, and extensive common outdoor amenity space.
2. The Facilities building is designed and located as a shared gathering point for various users and visitors including golf players, hotel patrons, restaurant customers, gym users, and Function Room guests. Shared outdoor terraces encourage interaction and community between the various user groups.
3. A communal creche / childcare is provided in the Hotel building.
4. All public spaces have good access to daylight, ventilation, and views to the surrounding landscapes.
5. Heritage listed Scent Factory building from the historic Mount Lofty Flower Farm will be restored as part of the development works, and incorporated as an attraction feature for guests and visitors to the development.
6. Local ecology and vegetation will be featured and integrated into the development.



Daylight modelling plots – Hotel building, Level 1



Daylight modelling plots – Facilities building, Level 1





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## **Appendix 11**

*Appendix I of Development Report – Traffic and access impact statement*

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**MOUNT LOFTY GOLF ESTATE  
GOLFLINKS ROAD, STIRLING**

**TRAFFIC AND ACCESS IMPACT STATEMENT**



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Traffic and Access Impact Statement

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## 1. EXECUTIVE SUMMARY

CIRQA has been engaged to provide design and assessment advice for the Mount Lofty Golf Estate at 35 Golflinks Road, Stirling. Specifically, CIRQA has been engaged to provide advice in respect to traffic and parking aspects of the proposal.

This report provides a review of the subject site, the proposed development, its access and parking provisions and the associated traffic impact on the adjacent road network.

The proposal comprises the redevelopment of the Stirling Golf Club to provide tourist accommodation and associated hospitality facilities along with the existing golfing facilities (to be referred to as Mount Lofty Golf Estate).

Vehicle access to the site will be provided via the existing two-way access point on Golflinks Road and a secondary access point Old Carey Gully Road (albeit emergency vehicle access will also be accommodated at an additional access on Golflinks Road). The site has been designed such that all vehicles can enter and exit in a forward direction. The parking and access areas within the site will be provided in accordance with the relevant Australian Standards. Adequate areas for waste storage and collection have been provided within the site.

A total of 200 formalised parking spaces plus a porte cochère (set-down/pick-up) facility will be provided within the hotel and golf facility buildings. Additional parking will also be provided adjacent the 'Perfumery' building (20 spaces) with further informal parking opportunities within the site. There would be a shortfall in parking provision when assessed against the Deemed to Satisfy criteria of the Planning and Design Code. However, such an assessment grossly overestimates realistic demands associated with the proposed uses given the shared and complimentary parking arrangements that will be achieved within the site. An alternative assessment based on realistic demand rates (taking into account data from comparable developments) identifies that the proposed provision will be adequate to accommodate the overall peak parking requirements during key demand periods (and at all other times). Such an approach is contemplated by the Planning and Design Code (which allows application of lower parking rates where justified based on specific development and land use considerations).

The proposal is conservatively forecast to generate an additional 40 to 85 movements during the site's peak hours. While there will be an increase in movements on Golflinks Road and Old Carey Gully Road, the additional movements would be accommodated without significant impact on traffic conditions. Notably, the future traffic volumes on Golflinks Road would remain

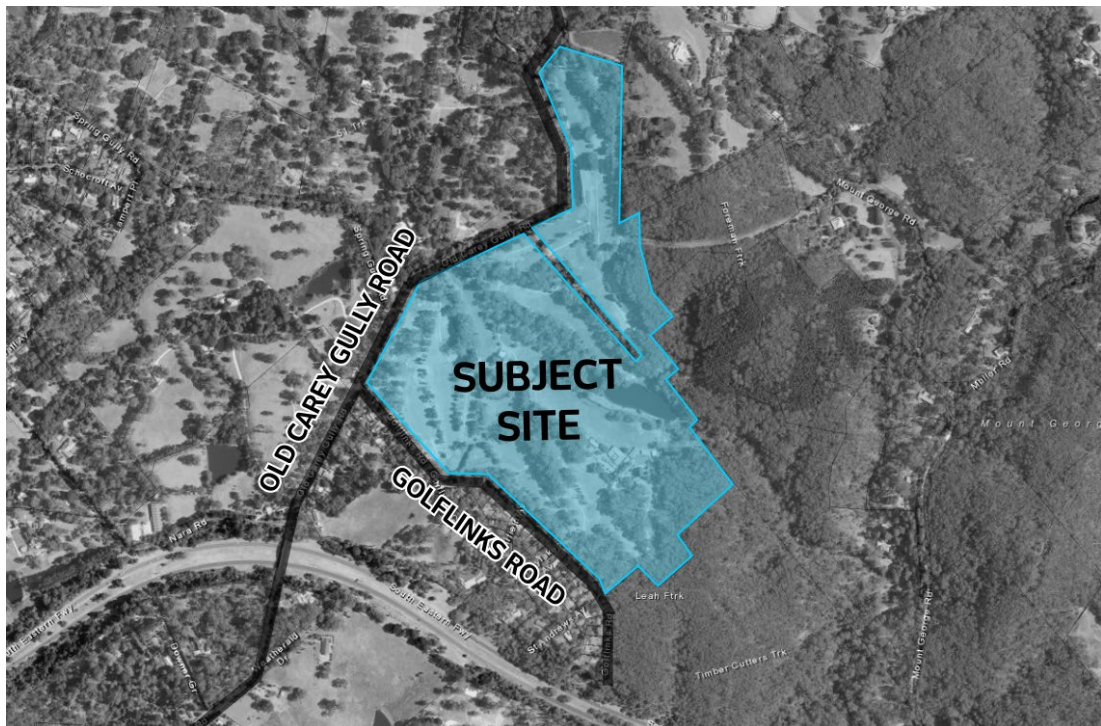
within the level typically associated with a local road and the proposal therefore will not change the nature or function of Golflinks Road (nor other adjacent roads).

Detailed analysis has also been prepared in respect to weekday am and pm peak hours and the weekend (Saturday) peak hour conditions at surrounding key intersections as well as the site's primary access point. The analysis identifies that the access point and key intersections surrounding the site would easily accommodate the additional movements with minimal impact. The analysis has also been prepared on a conservative basis and realistic results would be even better than suggested by the assessment. While minor shoulder sealing treatments would be of benefit on Golflinks Road and its intersection with Old Carey Gully Road, major upgrades to the adjacent road network are not considered necessary to accommodate the additional volumes forecast.

## 2. BACKGROUND

### 2.1 SUBJECT SITE

The subject site is located on the corner of Old Carey Gully Road and Golflinks Road, Stirling. The site is bound by residential properties to the north, Mount George Conservation Park to the east, Golflinks Road to the south and Old Carey Gully Road to the west. Figure 1 illustrates the location of the subject site with respect to the adjacent road network.



*Figure 1 – Location of the subject site with respect to the adjacent road network*

The Planning and Design Code identifies that the site is located within a Recreation Zone, with the following Overlays applicable:

- Environment and Food Production Area;
- Hazards (Bushfire – High Risk);
- Hazards (Flooding – Evidence Required);
- Local Heritage Place;
- Mount Lofty Ranges Water Supply Catchment (Area 2);
- Native Vegetation;
- Prescribed Water Resources Area;



- State Significant Native Vegetation;
- Traffic Generating Development; and
- Water Resources.

The subject site is currently occupied by the existing Stirling Golf Club including the 18-hole golf course and its associated clubroom, pro-shop, five motel rooms, offices, maintenance buildings and the 'Perfumery' building. The Club hosts functions and weddings (for up to 300 guests) as well as regular events.

General vehicle access is provided via a primary access point on Golflinks Road (near the southern end of the site), at which all turning movements are permitted. The site contains an easement for Davenport Road, which is an unsealed track that runs from Carey Gully Road along the Heysen Trail through the site. Maintenance access points are also provided on Carey Gully Road.

The primary parking areas are located to the east and south of the main buildings. A total of 71 parking spaces are provided in these areas. Additional informal parking is also available within the site.

## **2.2 ADJACENT ROAD NETWORK**

Golflinks Road is a local road under the care and control of Adelaide Hills Council. Golflinks Road generally comprises an approximately 5.5 m to 6.0 m wide carriageway with a single traffic lane in each direction. No Stopping restrictions apply on both sides of Golflinks Road. Traffic data recorded by Adelaide Hills Council indicates that the Average Annual Daily Traffic (AADT) volume is in the order of 444 vehicles per day (vpd). In comparison, 'local roads' are typically considered to have upper volume limits in the order of 1,500 to 2,000 vpd (such levels relate to amenity considerations as technical capacity would be higher). The default urban speed limit of 50 km/h applies on Golflinks Road.

Old Carey Gully Road is a minor collector road under the care and control of Adelaide Hills Council. Old Carey Gully Road comprises a 6.2 m wide carriageway (approximate) with a single traffic lane each direction. No Stopping restrictions apply on both sides of Old Carey Gully Road. The speed limit varies along the stretch of Old Carey Gully Road adjacent the site. Approximately 50 m north of the Cox Creek crossing, the speed limit changes with a 50 km/h zone south of this point and an 80 km/h zone north of this point. Traffic data recorded by Austraffic (on behalf of CIRQA) indicates Old Carey Gully Road has a daily traffic volume of approximately 1,625 vpd (which is well below the upper level of 3,000 vpd typically associated with minor collector roads).

Old Carey Gully Road and Golflinks Road form a priority-controlled T-intersection (with priority assigned to Old Carey Gully Road). All turning movements are permitted at this intersection.

A review of available crash statistics provided by the Department for Infrastructure and Transport (DIT) (for the last available 5-year period) indicates that there have been no reported crashes on Golflinks Road or at the intersection of Old Carey Gully Road/Golflinks Road.

### **2.3 WALKING AND CYCLING**

No footpaths or bicycle lanes are provided on either Golflinks Road or Old Carey Gully Road (both pedestrians and cyclists are required to share the carriageway with vehicles).

The Heysen Trail is located within the subject site (along the north-eastern side of the site). The Heysen Trail is South Australia's premier walking trail comprising approximately 1,200 km of trail between Cape Jervis (on the Fleurieu Peninsula) to Parachilna Gorge (in the Flinders Ranges). Given the subject section's location within the Adelaide Hills and relatively close proximity to Adelaide, the adjacent section forms one of the higher use portions of the trail.

### 3. PROPOSED DEVELOPMENT

#### 3.1 LAND USE AND YIELD

The traffic and parking assessments have been based upon plans prepared by R Architecture (Drawings TP01 to TP17 dated 29 November 2022). Specifically, the proposed development comprises redevelopment of the subject site including:

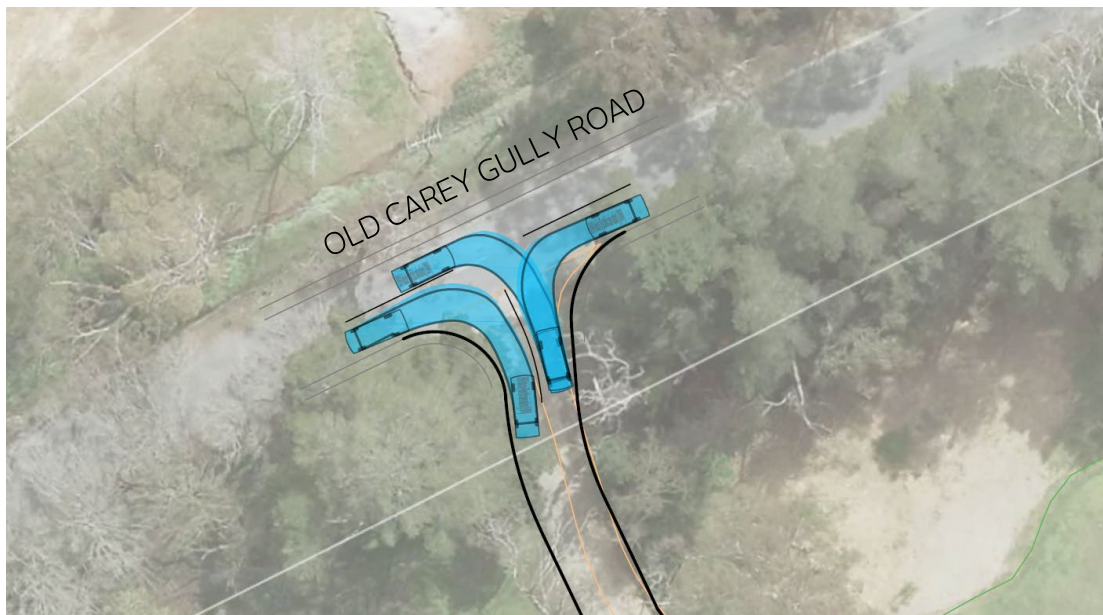
- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites;
  - 15 x two bedroom serviced apartments;
  - 15 x three bedroom serviced apartments;
  - 2 penthouse serviced apartments;
  - back of house, plant storage and maintenance areas;
  - a 537 m<sup>2</sup> function room (with a capacity for 270 patrons);
  - a 212 m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace (with a capacity for 80 patrons);
  - a 186 m<sup>2</sup> sports bar (with a capacity for 80 patrons);
  - a 189 m<sup>2</sup> gallery and café (with a capacity for 85 patrons); and
  - a 94 m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – ‘Pods’
  - 17 x one bedroom units; and
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions;
  - extension to the Perfumery to include a covered outdoor dining area; and
  - orchard and perfumery garden plantings to reimagine the former use of the building as a “Scent Factory”.
- Golf Course Facilities
  - retention of 18-hole golf course with improvements;
  - refurbished function facilities, cart storage and 138 m<sup>2</sup> clubhouse in new building; and
  - new 97 m<sup>2</sup> pro-shop, administration areas, gym and change rooms.

### 3.2 ACCESS AND PARKING DESIGN

Vehicle access to the site will be provided via the existing crossover on Golflinks Road. The internal driveway from the main access will provide access to the various parking areas, the loading/service bay and a porte cochère (set-down/pick-up lane). The existing geometry of the site access will be retained (which currently accommodates two-way movements as well as commercial vehicle movements associated with the existing site uses).

An additional emergency vehicle (only) access will be provided further west on Golflinks Road for CFS fire appliance access to the accommodation pods (CFS vehicles will also be able to utilise the main access and internal driveway). Detailed design of the vehicle connection to and in the vicinity of the pods shall ensure conformance with the *“Minister’s Code – Undertaking Development in Bushfire Protection Areas”* (as reflected in the Planning and Design Code). It is noted that emergency access will also be possible via the existing access points to Old Carey Gully Road.

The existing central access on Old Carey Gully Road will continue to be utilised for maintenance access for the site. Additionally, this access will be utilised for vehicle access to the ‘Perfumery’ building. The access shall be sealed and widened to accommodate two-way movements (i.e. a minimum width of 6.0 m). Figure 2 illustrates a concept layout of the access. Further liaison with Council should be undertaken as part of detailed design of the access. Minor trimming of roadside vegetation may also be required (to the north of the access) to ensure adequate sight distance provisions between drivers exiting the access and others travelling along Old Carey Gully Road.



*Figure 2 – Access treatment on Old Carey Gully Road to accommodate two-way movements*

No change in the use of Davenport Road is proposed as part of the project. The unmade road will be retained as a fire access track and as part of the Heysen Trail. Maintenance access for the golf course will also utilise sections of Davenport Port for access to/from the holes located north of it (as currently occurs).

The site will be serviced by parking areas within the two hotel/golf club buildings with a total of 200 parking spaces provided (of which four spaces will be reserved exclusively for use by people with disabilities). An additional three cars can be accommodated within the porte cochère (albeit this can also accommodate buses). In addition, in the order of 20 spaces will be provided adjacent the 'Perfumery' (with additional informal parking opportunities on or adjacent the associated internal access road). It is also noted that, if needed for large events, parking can be accommodated on the golf course holes (albeit such use would be rare/infrequent and not considered a typical design demand scenario).

The detailed design of the parking areas shall comply with the requirements of Australian/New Zealand Standard, *Parking Facilities Part 1: Off-street car parking* (AS/NZS 2890.1:2004) and Australian/New Zealand Standard, *Parking Facilities Part 6: Off-street parking for people with disabilities* (AS/NZS 2890.6:2009) in that:

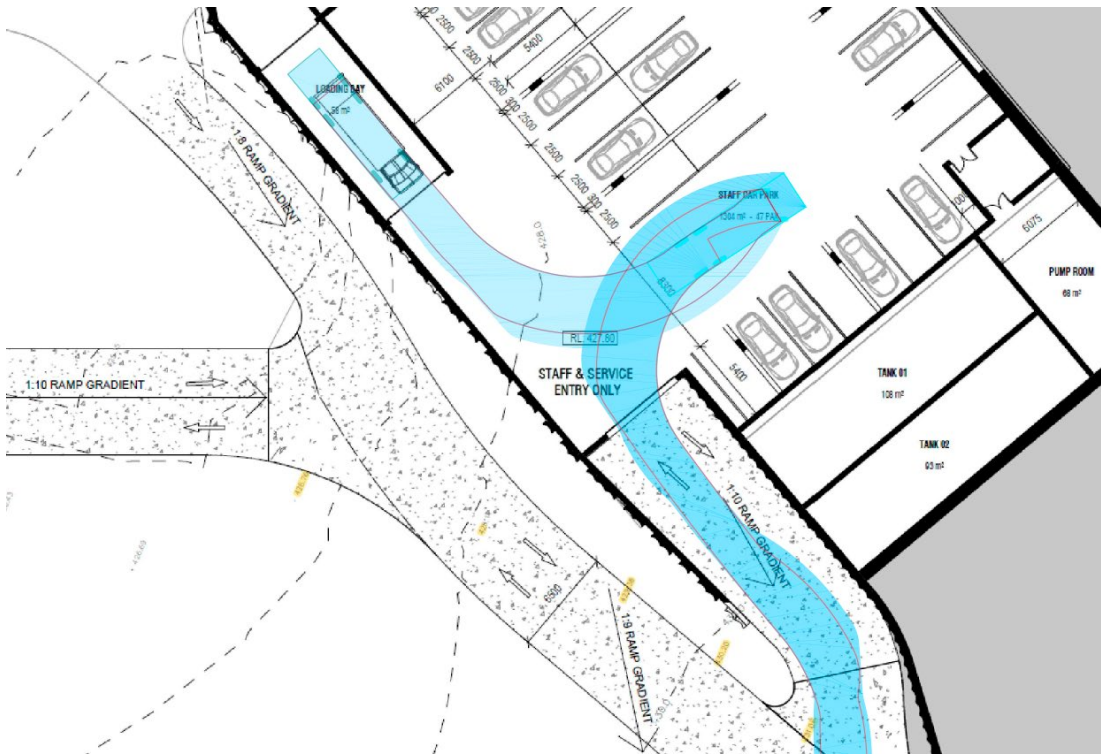
- regular parking spaces shall be at least 2.5 m wide and 5.4 m long (or 4.8 m long with 0.6 m overhang);
- the parking spaces for use by persons with disabilities shall be 2.4 m wide and 5.4 m long (with an adjacent shared space of the same dimension);

- the parking aisles shall be at least 5.8 m wide (albeit the primary circulation aisle will be 6.5 m where two-way to accommodate commercial vehicle movements);
- 1.0 m end-of-aisle extensions shall be provided beyond the last parking spaces in a 'blind' aisle;
- turn-around bays shall be provided at the end of the 'blind' aisles in publicly accessible parking areas;
- ramp gradients where only car access is required shall have a maximum grade of 1 in 5 with adjacent 1 in 8 transitions. Where commercial vehicle access is required, grades shall not exceed 1 in 6.5 (albeit will generally be flatter) with transitions also to be provided (detailed design should ensure site levels achieve the required ramping requirements of the relevant Australian Standards and that vertical clearance analysis is done for commercial vehicle areas). It would also be desirable to provide a separate pedestrian path from the main access with appropriate grades achieved (given the grades associated with the driveway); and
- a minimum headheight of 2.3 m shall be achieved within the general parking areas with a greater provision of at least 3.8 m for the service bay and associated access area (this will need to be confirmed as part of detailed design and can be conditioned accordingly).

### **3.3 DELIVERIES AND SERVICING**

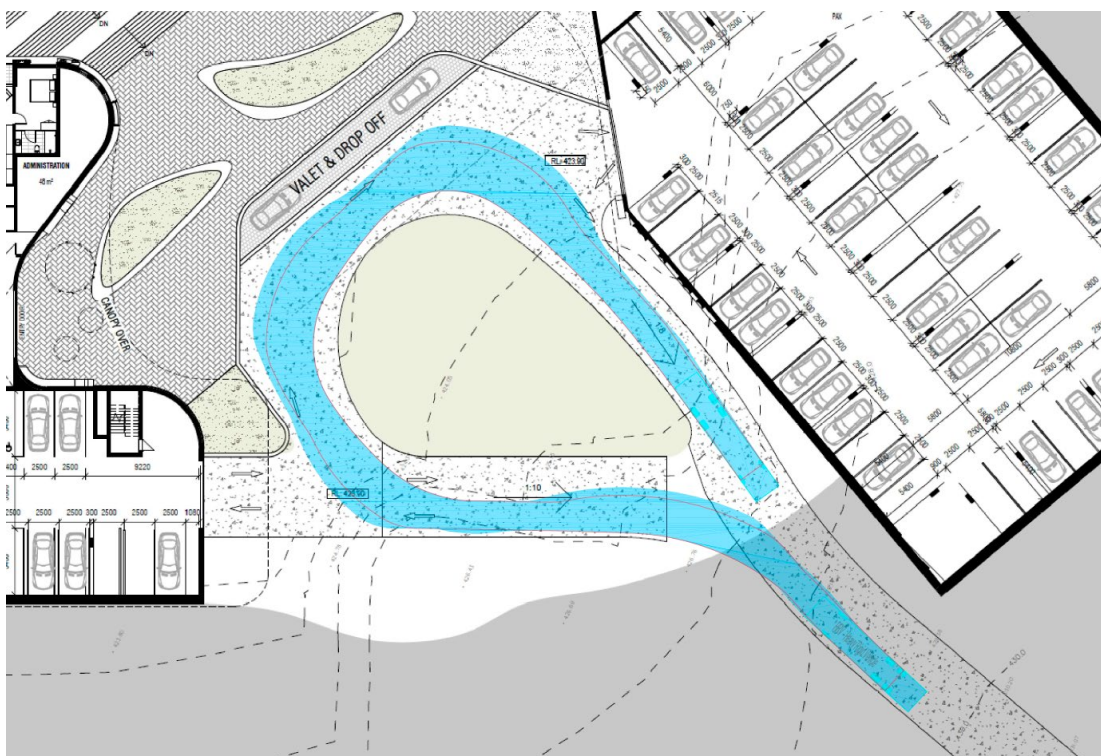
Deliveries and servicing (including refuse collection) will occur via a dedicated service bay within the eastern hotel building. This will be located adjacent the staff car park (where turnover of spaces will be low to avoid interaction between patron/guest vehicles and commercial vehicles). This area will accommodate vehicles up to 10.4 m in length allowing for a range of refuse collection vehicles and other delivery vehicles to access the site (albeit delivery vehicles would mostly be smaller than this size).

Figure 3 illustrates the turn path for a 10.4 m truck to enter and exit the site in a forward direction.



*Figure 3 – 10.4 m refuse collection vehicle turning movements*

The porte cochère will accommodate bus movements as well as CFS vehicle movements (allowing for turnaround by vehicles up to 12.5 m in length) as illustrated in Figure 4.



*Figure 4 – 12.5 m bus turnaround movement in porte cochère*

In respect to the accommodation of commercial vehicles associated with the site on Golflinks Road, it is noted that such vehicles are already required for access to/from the site. This includes heavy rigid trucks for refuse collection and buses for weddings/functions. Notably, the proposed function facility will have a similar (albeit slightly smaller) capacity than that currently identified for the site. Therefore, while the number of times buses are utilised per year may increase (if more weddings/functions are held), the number over a single hour (typical period for assessment of traffic impacts) would be unlikely to be associated with a notable change. Similarly, while there will be increased demands for servicing and deliveries, this does not necessarily mean a commensurate increase in commercial vehicle movements, particularly refuse collection trucks, as the existing services may (or could) have additional capacity available within the existing services. There would likely be an increase in the number of delivery movements made by commercial vehicles, however these would generally be smaller than the refuse collection vehicles (i.e. small to medium rigid vehicles).



#### 4. PARKING ASSESSMENT

The Planning and Design Code identifies a number of parking rates applicable to this development:

- **tourist accommodation** – one car parking space per accommodation unit/guest room [applied to the hotel accommodation and pods];
- **hotel** – one space for every 2 m<sup>2</sup> of total floor area in a public bar, plus one space for every 6 m<sup>2</sup> of total floor area available to the public in a lounge or beer garden, plus one space per two gaming machines, plus one space per three seats in a restaurant [applied to the food and beverage components of the hotel];
- **residential flat building** – dwelling with three or more bedrooms (including rooms capable of being used as a bedroom) – two spaces per dwelling [applied to the apartment dwellings];
- **indoor recreation facility** – 4.5 spaces per 100 m<sup>2</sup> of total floor area [applied to the gymnasium and wellness centre]; and
- **meeting hall** [applied to the function room] – 0.2 spaces per seat.

For the purposes of this assessment, it is assumed that parking demands associated with the golf course and its facilities (clubroom, pro-shop etc.) remain as per the current situation as there are no specific applicable rates for golf courses (albeit a literature review has indicated similar golf courses, including their various facilities, have been traditionally assessed on the basis of four spaces per hole – this would equate to 72 spaces which is similar to the above assumption).

On this basis the proposed uses within the site would require 196 parking spaces (rounded) plus the additional 71 spaces currently provided for the golf club and its facilities. However, the above rates are typically applied to standalone developments and are excessively conservative (and onerous) for application to the subject proposal.

Specifically, the above rates include no allowance for consideration of realistic occupancy rates and that the food, beverage, function, Perfumery building, gym and wellness areas are largely (and in some instances wholly) ancillary to the accommodation component.

There will also be shared demands between the tourist accommodation and the golf club (i.e. hotel guests who play golf at the site). Additionally, such an assessment does not consider the differing peaks of the uses (particularly the golf course compared to the proposed components) and the ability to provide a shared and complimentary parking arrangement within the site.

Notably, while the proposal would not strictly meet the Deemed to Satisfy criteria of the Code in respect to parking provision, it is noted that Performance Objective 5.1 of the General Development Policies (Transport, Access and Parking) states the following:

*“Sufficient on-site vehicle parking and specifically marked accessible car parking places are provided to meet the needs of the development or land use having regard to factors that may support a reduced on-site rate...” (our emphases)*

The Planning and Design Code therefore contemplates acceptance of lower parking provisions (than suggested by the specified rates) based on development and land use considerations.

In comparison to the direct application of the Code’s rates, it is noted that the recently approved Dock One Hotel in Port Adelaide was assessed by GTA Consultants (traffic consultants) on the basis of surveys at a number of similar suburban accommodation sites (and subsequently approved by the State Commission Assessment Panel). GTA adopted the average demand rate of 0.44 spaces per bedroom on a weekday evening and 0.4 spaces per bedroom on a weekend evening for assessment of the Hotel. It is noted that, if the 85<sup>th</sup> percentile rates were adopted, the demands would be 0.61 spaces per bedroom on a weekday evening and 0.58 spaces per bedroom on a weekend evening.

Notably, GTA stated that the accommodation “... would not typically be above 85% occupancy during normal operating conditions”. Furthermore, the hotel included a 270 m<sup>2</sup> restaurant which was assessed at being wholly ancillary to the accommodation use and no additional parking was provided for that use.

If the higher 85<sup>th</sup> percentile rate calculated from the GTA information was adopted, there would be a demand for 91 spaces during a weekday peak evening and 92 spaces during a weekend peak evening. While not addressed in the GTA assessment, it is noted that peak parking demands at accommodation facilities during the day (between 10:00 am and 6:00 pm) are much lower (in the order of 20% to 25%) than the evening peaks as guests are typically off-site at these times.

It is acknowledged that the locality of the Dock One Hotel provides a higher level of public transport accessibility. It is therefore considered that, for the accommodation component, the higher 85<sup>th</sup> percentile rates noted above should be adopted for the assessment of the proposal.

In respect to the other uses on the site, it is anticipated that the food and beverage uses will largely be ancillary to the accommodation uses (i.e. patrons of

these areas would generally also be guests of the hotel). Nevertheless, there would be potential for the general public to also access the facilities. Accordingly, it is considered pertinent to include a proportion of additional demand for these areas. For the gym, wellness centre and the Perfumery gift shop, it has been assumed that these will be wholly ancillary to the tourist accommodation and golf club (the Perfumery function area has been included). For the existing golf club, it is assumed that the current provision of 71 spaces is equivalent to its peak design demand.

In order to further consider likely demands associated with the overall proposal, an assessment has been made of three key demand periods, namely the hotel peak period (weekday evening), the golf course peak (Saturday lunch) and the hotel weekend peak period (weekend evenings). The following assumptions have been adopted for the two scenarios:

- **weekday (hotel) peak**

- the tourist accommodation (units/suites and pods) will generate at a peak demand for 91 spaces (based on the higher 85<sup>th</sup> percentile rates from the GTA survey data);
- the food and beverage components will generate at 50% of the Planning and Design Code rates (i.e. assuming peak occupancy but that half of the patrons are hotel guests and the remaining half are general public requiring parking);
- the apartment dwellings will generate a demand for four spaces (it is assumed that dedicated spaces will be assigned to the residents); and
- the golf club use generates a demand for 25% of its peak.

- **weekend lunch (golf) peak**

- the tourist accommodation (units/suites and pods) will generate at a demand for 26 spaces (based on a conservative assumption of 50% of guests remaining on-site during the day – noting that those playing golf are essentially 'double counted' in the golf club demand);
- the food and beverage components will generate at 50% of the Planning and Design Code rates (i.e. assuming 50% of the patrons during the lunch period are hotel guests and the remaining 50% are general public requiring parking);
- the apartment dwellings will generate a demand for four spaces (it is assumed that dedicated spaces will be assigned to the residents); and
- the golf club use generates a demand for its full peak of 65 spaces.

- **weekend evening (secondary hotel) peak**
  - the tourist accommodation (units/suites and pods) will generate at a peak demand for 92 spaces (based on the higher 85<sup>th</sup> percentile weekend rates from the GTA survey data);
  - the food and beverage components will generate at 25% of the Planning and Design Code rates (i.e. assuming 75% of the patrons are hotel guests and the remaining 25% are general public requiring parking);
  - the apartment dwellings will generate a demand for four spaces (it is assumed that dedicated spaces will be assigned to the residents); and
  - the golf club use generates a demand for 25% of its peak.

On the basis of the above, the parking assessment indicates an overall demand for 192 parking spaces during the weekday evening peak, 180 spaces during the Saturday lunch period and 167 parking spaces during the weekend hotel peak period. Such levels of demand would easily be accommodated with the proposed 220 spaces (including the Perfumery spaces) plus additional porte cochère spaces. In addition, there are additional informal/overflow parking areas within the site that could be used in the infrequent/unlikely event of higher demands (use of overflow areas can be managed by staff on an as needs basis).

It is noted that the above parking assessment methodology was the same as that adopted by CIRQA for the 35 South Marina's hotel development in North Haven which was approved by SCAP in 2020. The 35 South project was similar to the current proposal in that it considered the development of a hotel with associated food, beverage and function areas around an existing recreational (marina) use. The 35 South assessment (and its approval) acknowledged the variance in temporal demands associated with such a mixed-use development as applied above.

## **5. TRAFFIC GENERATION AND DISTRIBUTION**

### **5.1 CONSTRUCTION PHASE**

#### **5.1.1 CONSTRUCTION TRAFFIC GENERATION**

Movements generated during the construction phase would relate to the removal of demolition waste and delivery of construction materials as well as the movement of workers associated with the project. These movements will be associated with a range of vehicle types (from light vehicles to heavy commercial). Specific details are not yet available in respect to the number of anticipated staff/trades associated with the construction nor commercial vehicle movements. Such details will be dependent on the selection of the construction contractor, their construction methodology and timing. This could be further reviewed as part of the preparation of a Construction Environmental Management Plan (CEMP) once development approval has been achieved. However, for the purposes of this assessment, the following commentary is provided in respect to construction traffic management considerations.

Nevertheless, based on other projects CIRQA has provided advice on, it is anticipated that there would typically be 20 to 30 staff/trades on site each day during construction (this will vary depending on the construction phase). Assuming all workers drive to the site, this would result in at least 30 to 60 light vehicle movements per day (albeit this may be slightly higher as some workers may need to undertake additional trips). Generally, it is considered that in the order of 100 light vehicle movements could be generated per day (of construction). Vehicles associated with workers will typically be light/domestic vehicles (up to dual-cab 'ute' in size or similar).

Vehicle types associated with the construction of the infrastructure will include a range of demolition, general construction/delivery vehicles and earthmoving equipment. It is anticipated that such movements would be undertaken by 19.0 m Semi-Trailers or smaller rigid trucks (i.e. general access vehicles). Should access to the site be sought with larger and/or specialised vehicles (including Restricted Access Vehicles, oversize and/or overmass vehicles), access permits would be required to be sought from the National Heavy Vehicle Regulator (NHVR) and the relevant road authorities (the respective Councils and/or DIT). While numbers would need to be confirmed by the construction contractor, based on CIRQA's experience, it is anticipated there would be typically be in the order of 20 to 40 commercial vehicle movements per day (albeit, as with staff/trades movements, this will vary depending on the construction phase).

#### **5.1.2 CONSTRUCTION TRAFFIC DISTRIBUTION**

While subject to the specific construction contractor's methodology, it is anticipated that construction traffic would be distributed between the site's

existing access points on Golflinks Road and Old Carey Gully Road. Larger vehicles associated with the construction would desirably enter and exit via the Old Carey Gully Road access to minimise impacts on Golflinks Road and its adjacent residents.

Other than a small proportion of trades/construction staff originating from the north of the site or those locally based, it is anticipated that the vast majority of construction related movements would be undertaken via the South Eastern Freeway. Movements between the South Eastern Freeway and the site would utilise the route via Pomona Road, Gould Road, Old Mount Barker Road and Old Carey Gully Road.

## 5.2 OPERATIONAL PHASE

### 5.2.1 OPERATIONAL TRAFFIC GENERATION

The RTA's *"Guide to Traffic Generating Developments"* (the RTA Guide), and its subsequent updates, are documents commonly used by traffic engineers in order to determine the forecast traffic generation of a variety of land uses. The RTA Guide identifies the following peak period trip generation rates applicable to this development:

- **tourist accommodation** – 0.4 trips per unit;
- **high-density apartment dwellings** – 0.5 trips per dwelling; and
- **restaurant/café/function room** – 5.0 trips per 100 m<sup>2</sup> gross floor area;

On the basis of the above rates, the proposed (additional) uses are forecast to generate 128 additional peak hour trips. However, as with parking, not all uses will peak at the same time and the food and beverage facilities will largely be ancillary to tourist accommodation. Adopting similar assumptions as the parking assessment, it forecast that the peak traffic generation of the site would be in the order of 50 to 85 additional peak hour trips (assuming all uses are at full occupancy).

This would equate to a theoretical increase of approximately 675 additional daily movements. However, this assumes full occupancy of all uses on site which would rarely (if ever) occur. Typically, there will be fluctuations in occupancy of the various uses and the actual increase in the AADT volume would be more likely to be in the order of 350 additional daily trips (noting that volumes associated with the golf club are already accommodated on the adjacent road network).

The majority of movements associated with the development will be light/domestic vehicles, however, there will also be some commercial vehicle movements associated with service and delivery movements (a proportion of

which would already be generated by the existing uses). The following movements associated with the new development yields are anticipated:

- one linen service per day;
- two food and beverage deliveries per day;
- one to two 'non-perishables' delivery per day; and
- one to two refuse collection service per day.

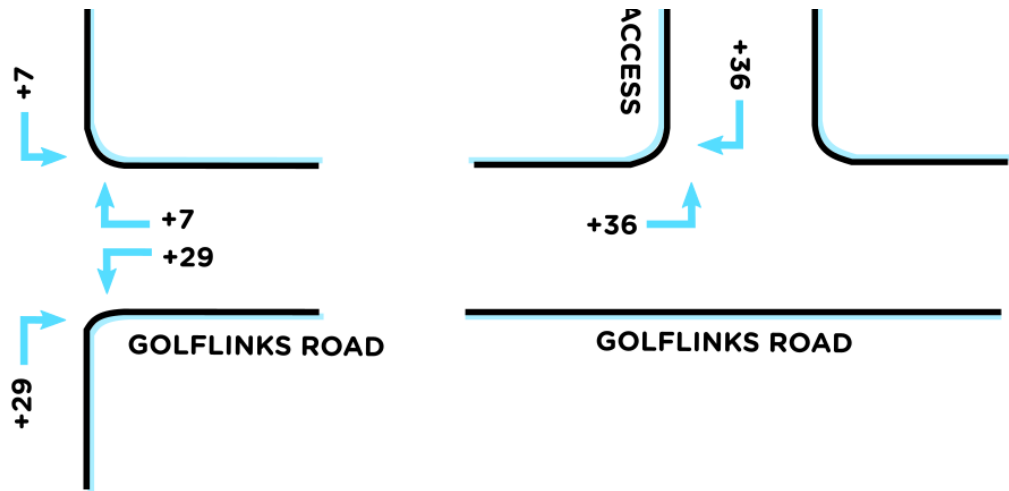
Accordingly, in the order of five to seven additional commercial vehicle movements would be anticipated each day (albeit this will fluctuate depending on scheduling as well as site occupancy). In reality, there are existing service and delivery movements currently associated with the golf facilities and there will be some efficiencies achieved (i.e. additional waste volumes collected as part of the existing collection services).

### **5.2.2 OPERATIONAL TRAFFIC DISTRIBUTION**

To determine the distribution of the above movements, the following assumptions were made:

- 85% of generated traffic enters and exits the site via the primary access point on Golflinks Road and 15% enters/exits via the Old Carey Gully Road access;
- all traffic utilising the Golflinks Road access enters and exits the site from the north-western side of the access (given Golflinks Road forms a 'dead-end' to the south-east of the access);
- 80% of traffic is distributed to/from the south via Old Carey Gully Road;
- 20% of traffic is distributed to/from the north via Old Carey Gully Road; and
- movements during the site's peak period are split 50% inbound and 50% outbound.

Based on the above distribution, the forecast additional (site) peak hour volumes at the site access and the Golflinks Road/Old Carey Gully Road intersection are illustrated in Figure 5 (note that this figure excludes existing traffic associated with the site which is already accommodated on the road network). This has been based on the worst-case generation of 85 additional peak hour trips.



*Figure 5 – Conservatively forecast additional traffic distributed onto the road network*

The majority of movements would then be distributed to/from Stirling and the South Eastern Freeway via the Old Mount Barker Road–Pomona Road route. The forecast distribution of movements at the access points and on the adjacent road network is provided in Appendix A.



## **6. TRAFFIC IMPACT**

### **6.1.1 CONSTRUCTION PHASE**

The number of vehicle movements associated with the construction phase would not be significant. Notably, the peak hour volumes during the construction phase would be well below that forecast for the operational phase. Detailed capacity analysis of impacts during the construction phase is not considered warranted (the analytic results would simply show more favourable results than identified for the operational phase as detailed in the following sub-section).

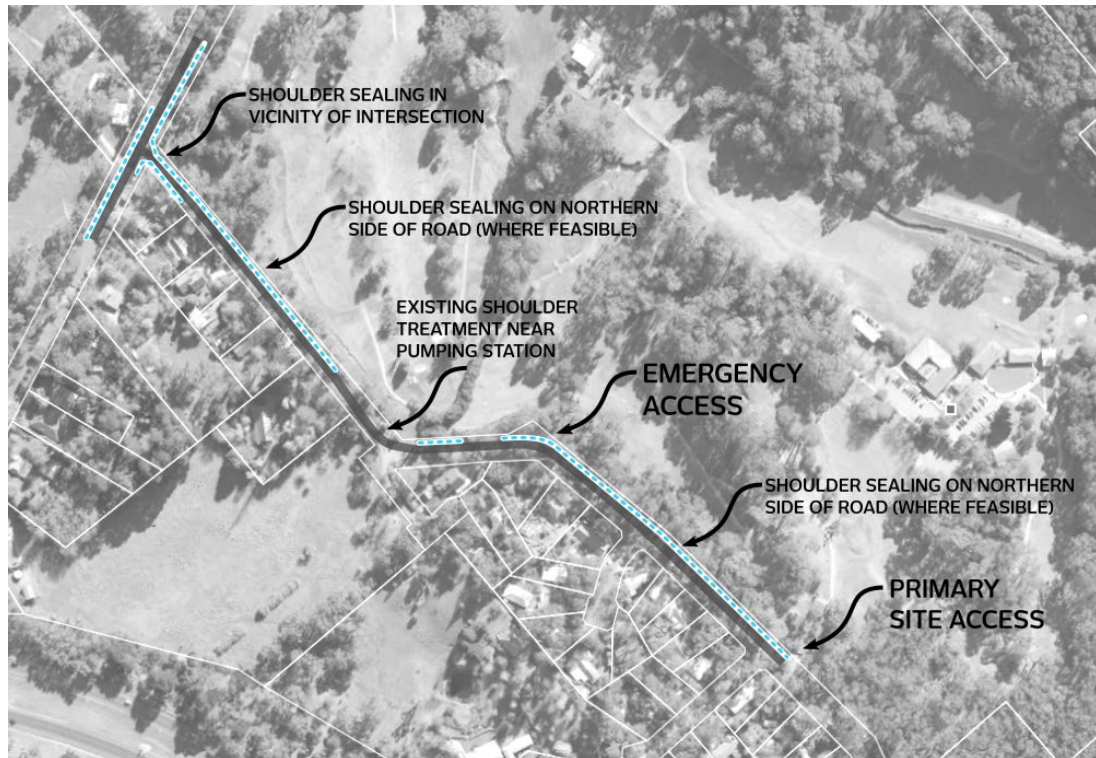
However, it is acknowledged that the construction phase would have a higher level of commercial vehicle movements to/from the site. In order to minimise impacts on Golflinks Road, it would be desirable that a proportion of commercial vehicle movements associated with construction be accommodated via the Old Carey Gully Road access (particularly large commercial vehicles such as Semi-Trailers).

The impacts of the construction vehicle movements should be considered further as part of the development with a CEMP prepared once the construction contractor has been appointed and their methodology identified.

### **6.1.2 OPERATIONAL PHASE**

The proposed development will result in the distribution of additional movements along Golflinks Road. While the proportional increase will be relatively high, the future traffic volumes on Golflinks Road would remain well below the capacity of a local road which is typically taken to be 1,500 vpd (notably, this upper level is based on amenity factors, rather than technical capacities which would be much higher). Therefore, while other road users (such as adjacent residents) would experience an increase in movements, the additional traffic activity is not considered excessive or unreasonable. Importantly, the proposal would not change the nature or function of Golflinks Road. Similarly, future volumes on Old Carey Gully Road would be within the level associated with its function as a minor collector road (i.e. less than 3,000 vpd). It is acknowledged that there would be an increase in commercial vehicle movements on Golflinks Road (in the order of five additional commercial vehicle movements per day). However, such vehicles already access the site for deliveries and servicing and are already accommodated via Golflinks Road. There would, however, be benefit in providing shoulder sealing along Golflinks Road to assist with accommodation of the additional commercial vehicle movements (where feasible). Generally, this can be achieved in the vicinity of the intersection with Old Carey Gully Road as well as along the northern side of Golflinks Road (such works on the southern side would impact embankments and gardens at the front of residential properties and be difficult to achieve without significant impact). Figure X illustrates the general

opportunities for shoulder sealing and these can be discussed further with Council as the application progresses.



*Figure 6 – Opportunities for shoulder sealing along Golflinks Road*

In respect to peak hour impacts, the peak period associated with the site would not directly align with the peak commuter (am and pm) periods. Volumes during the site’s peak hour associated with other (non-site) users of the adjacent roads would be relatively low.

Nevertheless, to provide a conservative assessment, analysis has been prepared of the impact of the proposal if its peak generation aligned with weekday am and pm peak hours as well as the Saturday peak hour. The further assessment has been undertaken for the primary access point and intersections associated with the primary access route through Stirling and to/from the South Eastern Freeway (the distribution to other intersections beyond this route would be very low and have minimal, if not negligible impact).

To inform the analyses, traffic surveys were undertaken at key surrounding intersections adjacent the site and within Stirling township on a weekday (10 August 2022) and on a Saturday (13 August 2022). The impact of the proposal on these intersections has been assessed utilising SIDRA intersection analysis software and is detailed for the key access points and intersections in the following sub-sections. The detailed SIDRA output for each location is provided in Appendices B to G.

### 6.1.3 GOLFLINKS ROAD SITE ACCESS

The SIDRA analysis identifies the following key results in relation to the impact of additional volumes at the site's primary access point on Golflinks Road:

- there will be extremely low increases in average delays at the intersection (0.2 or less additional seconds delay or less for any one movement during the weekday and weekend peak hours);
- there will be very low increases in 95<sup>th</sup> percentile queues at the intersection (less than one additional vehicle in the 95<sup>th</sup> percentile queue for any one movement during the weekday and weekend peak hours); and
- Levels of Service of 'A' (the best level of service) will be retained for all movements during the weekday and weekend peak hours.

Movements associated with this site will almost exclusively be left-in and right-out movements. Noting that the access point has sufficient geometry to accommodate movements in a two-way manner (including commercial vehicle access movements), the existing layout is considered appropriate.

### 6.1.4 GOLFLINKS ROAD/OLD CAREY GULLY ROAD INTERSECTION

The SIDRA analysis identifies the following key results in relation to the impact of additional volumes at the intersection of Golflinks Road/Old Carey Gully Road:

- there will be very low increases in average delays at the intersection (0.5 or less additional seconds delay or less for any one movement during the weekday and weekend peak hours);
- there will be very low increases in 95<sup>th</sup> percentile queues at the intersection (less than one additional vehicle in the 95<sup>th</sup> percentile queue for any one movement during the weekday and weekend peak hours); and
- Levels of Service of 'A' (the best level of service) will be retained for all movements during the weekday and weekend peak hours.

It is also noted that the increase in traffic would not warrant the provision of separated turn lanes as per the warrants of the Austroads' *"Guide to Traffic Management – Part 6: Intersections, Interchanges and Crossings Management"*. It would, however, be desirable to undertake basic shoulder sealing in the vicinity of the intersection as per the Austroads' requirements (given the increase in right-turn movements from Old Carey Gully Road to Golflinks Road).

As noted above, there will be a small increase in the number of additional commercial vehicle movements associated with the proposal. However, such vehicles already undertake movements to/from the site via the intersection of

Old Carey Gully Road to Golflinks Road. The existing intersection geometry is adequate to accommodate the swept paths of the commercial vehicles anticipated to be associated with the development (11 m rigid vehicles or shorter). Figure 6 illustrates the associated turn paths for the design vehicle.



*Figure 7 - Indicative commercial vehicle swept paths at the Golflinks Road/Old Carey Gully Road intersection*

### **6.1.5 OLD CAREY GULLY ROAD/OLD MOUNT BARKER ROAD INTERSECTION**

The SIDRA analysis identifies the following key results in relation to the impact of additional volumes at the intersection of Old Carey Gully Road/Old Mount Barker Road:

- there will be extremely low increases in average delays at the intersection (0.2 additional seconds delay or less for any one movement during the weekday and weekend peak hours);
- there will be very low increases in 95<sup>th</sup> percentile queues at the intersection (less than one additional vehicle in the 95<sup>th</sup> percentile queue for any one movement during the weekday and weekend peak hours with no increase in queues for some movements); and
- Levels of Service of 'A' (the best level of service) will be retained for all movements during the weekday and weekend peak hours.

The existing intersection geometry is sufficient to accommodate the additional traffic movements. In particular, commercial vehicle movements (which will typically be undertaken between the north-eastern and western legs) will be easily accommodated within the existing traffic lanes (refer Figure 7).



*Figure 8 - Indicative commercial vehicle swept paths at the Old Carey Gully Road/Old Mount Barker Road intersection*

### **6.1.6 OLD MOUNT BARKER ROAD/GOULD ROAD INTERSECTION**

The SIDRA analysis identifies the following key results in relation to the impact of additional volumes at the intersection of Old Mount Barker Road/Gould Road:

- there will be extremely low increases in average delays at the intersection (0.3 additional seconds delay or less for any one movement during the weekday and weekend peak hours);
- there will be very low increases in 95<sup>th</sup> percentile queues at the intersection (less than one additional vehicle in the 95<sup>th</sup> percentile queue for any one movement during the weekday and weekend peak hours with no increase in queues for some movements); and
- Levels of Service of 'A' (the best level of service) will be retained for all movements during the weekday and weekend peak hours.

A review of commercial vehicle turn paths (for movements to/from the site via the Freeway) indicates the existing intersection geometry will easily accommodate the associated turning movements. Figure 8 illustrates the commercial vehicle paths for the intersection as well as the staggered intersection of Gould Road with Pomona Road.



*Figure 9 - Indicative commercial vehicle swept paths at the intersections of Gould Road with Old Mount Barker Road and Pomona Road*

### **6.1.7 GOULD ROAD/POMONA ROAD INTERSECTION**

The SIDRA analysis identifies the following key results in relation to the impact of additional volumes at the intersection of Gould Road/Pomona Road:

- there will be extremely low increases in average delays at the intersection (0.4 additional seconds delay or less for any one movement during the weekday and weekend peak hours);
- there will be very low increases in 95<sup>th</sup> percentile queues at the intersection (less than one additional vehicle in the 95<sup>th</sup> percentile queue for any one movement during the weekday and weekend peak hours with no increase in queues for some movements); and
- Levels of Service of 'A' (the best level of service) will be retained for all movements during the weekday and weekend peak hours.

As illustrated in Figure 8 above, commercial vehicle movements associated with the site would easily be accommodated at the intersection. It is noted that there is some existing deterioration/potholing of the pavement on the Pomona Road approach which would desirably be addressed by Council (regardless of the subject proposal). Council may also wish to consider replacement of the missing

pavement bars on the Pomona Road approach to the intersection to assist with its delineation.

### **6.1.8 POMONA ROAD/MOUNT BARKER ROAD/AVENUE ROAD INTERSECTION**

The SIDRA analysis identifies the following key results in relation to the impact of additional volumes at the intersection of Pomona Road/Mount Barker Road/Avenue Road:

- there will be low increases in average delays at the intersection (typically less than one additional second delay for most movements during the weekday and weekend peak hours, albeit delays movements out of Pomona Road increase by 1 to 3 seconds);
- there will be low increases in 95<sup>th</sup> percentile queues at the intersection (less than one additional vehicle in the 95<sup>th</sup> percentile queue for any one movement during the weekday and weekend peak hours with the exception of movements out of Pomona Road which would have an increase of 1.5 vehicles to the 95<sup>th</sup> percentile queue, albeit still well within acceptable levels); and
- Levels of Service of 'B' or better for all movements will be retained during the weekday and weekend peak hours.

Noting the roundabout control of the intersection (and partial dual lane arrangements), movements (including those by commercial vehicles) will be easily accommodated.

## **6.2 TRAFFIC IMPACT CONCLUSIONS**

As above, while it is acknowledged that there will be an increase in movements on the adjacent road network as a result of the proposal, it is considered that the traffic impacts will be within acceptable levels and not result in significant impact on other road users in the vicinity of the site. Notably, the analysis identifies that there would be minimal change in traffic conditions on the adjacent road network. It is also reiterated that the assessment is conservative as it has applied the proposal's peak traffic generation directly to the existing peak hour movements on both weekdays and the weekend. In reality, these would not directly and completely align and conditions will be even better than suggested by the analysis. Some minor shoulder sealing treatments have been suggested to assist with the accommodation of the additional movements, however, major upgrades are not considered necessary or warranted as a result of the proposal.

# **APPENDIX A**

## **FORECAST PEAK HOUR DISTRIBUTION**



## Forecast Distribution of Peak Hour Trips

<b>Total Peak Hour Trips</b>	85
<b>Inbound (50%)</b>	42.5
<b>Outbound (50%)</b>	42.5

### Additional Trips

#### Golflinks Road Access

Access [N]	Left Out	
	Right Out	36
Golflinks Rd [E]	Right In	
	Straight Thru	
Golflinks Rd [W]	Left In	36
	Straight Thru	

#### Old Carey Gully Road Access

Old Carey Gully Rd [N]	Left In	
	Straight Thru	
Access [E]	Left Out	6
	Right Out	
Old Carey Gully Rd [S]	Right In	6
	Straight Thru	

#### Golflinks/Old Carey Gully

Old Carey Gully Rd [N]	Left In	7
	Straight Thru	6
Golflinks Rd [E]	Left Out	29
	Right Out	7
Old Carey Gully Rd [S]	Right In	29
	Straight Thru	6

#### Old Carey Gully/Old Mount Barker

Old Carey Gully Rd [N]	Left Out	4
	Right Out	32
Old Mount Barker Rd [E]	Right In	4
	Straight Thru	0
Old Mount Barker Rd [W]	Left In	32
	Straight Thru	0

#### Old Mount Barker/Gould

Old Mount Barker Rd [E]	Left Out	30
	Right Out	2
Old Mount Barker Rd [W]	Left In	2
	Straight Thru	0
Gould Road [S]	Right In	30
	Straight Thru	0

#### Gould/Pomona

Gould Road [N]	Right In	29
	Straight Thru	2
Gould Road [S]	Left In	0
	Straight Thru	2
Pomona Road [W]	Left Out	29
	Right Out	0

#### Pomona/Mt Barker/Avenue

Pomona Road [E]	Left Out	5
	Straight Thru	1
	Right Out	23
Mt Barker Rd [S]	Left Out	0
	Straight Thru	0
	Right Out	5
Avenue Rd [W]	Left Out	0
	Straight Thru	1
	Right Out	0
Mt Barker Rd [N]	Left Out	23
	Straight Thru	0
	Right Out	0

# **APPENDIX B**

## **SIDRA ANALYSIS - GOLFLINKS ROAD SITE ACCESS**

# MOVEMENT SUMMARY

Site: 101 [WED AM Existing (Site Folder: Site Access)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
East: Golflinks Road [E]														
5	T1	29	2.0	31	2.0	0.016	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	59.8
6	R2	1	2.0	1	2.0	0.016	5.5	LOS A	0.0	0.0	0.01	0.02	0.01	57.4
Approach		30	2.0	32	2.0	0.016	0.2	NA	0.0	0.0	0.01	0.02	0.01	59.7
North: Site Access [N]														
7	L2	1	2.0	1	2.0	0.003	5.6	LOS A	0.0	0.1	0.01	0.59	0.01	53.5
9	R2	3	2.0	3	2.0	0.003	5.6	LOS A	0.0	0.1	0.01	0.59	0.01	53.0
Approach		4	2.0	4	2.0	0.003	5.6	LOS A	0.0	0.1	0.01	0.59	0.01	53.1
West: Golflinks Road [W]														
10	L2	17	2.0	18	2.0	0.010	5.6	LOS A	0.0	0.0	0.00	0.55	0.00	53.8
11	T1	1	2.0	1	2.0	0.010	0.0	LOS A	0.0	0.0	0.00	0.55	0.00	55.2
Approach		18	2.0	19	2.0	0.010	5.3	NA	0.0	0.0	0.00	0.55	0.00	53.9
All Vehicles		52	2.0	55	2.0	0.016	2.4	NA	0.0	0.1	0.00	0.25	0.00	57.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

Site: 101 [WED PM Existing (Site Folder: Site Access)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
East: Golflinks Road [E]														
5	T1	17	2.0	18	2.0	0.010	0.0	LOS A	0.0	0.0	0.01	0.03	0.01	59.7
6	R2	1	2.0	1	2.0	0.010	5.5	LOS A	0.0	0.0	0.01	0.03	0.01	57.3
Approach		18	2.0	19	2.0	0.010	0.3	NA	0.0	0.0	0.01	0.03	0.01	59.5
North: Site Access [N]														
7	L2	1	2.0	1	2.0	0.006	5.6	LOS A	0.0	0.1	0.09	0.57	0.09	53.3
9	R2	6	2.0	6	2.0	0.006	5.6	LOS A	0.0	0.1	0.09	0.57	0.09	52.8
Approach		7	2.0	7	2.0	0.006	5.6	LOS A	0.0	0.1	0.09	0.57	0.09	52.9
West: Golflinks Road [W]														
10	L2	5	2.0	5	2.0	0.014	5.6	LOS A	0.0	0.0	0.00	0.12	0.00	57.2
11	T1	20	2.0	21	2.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	58.9
Approach		25	2.0	26	2.0	0.014	1.1	NA	0.0	0.0	0.00	0.12	0.00	58.6
All Vehicles		50	2.0	53	2.0	0.014	1.5	NA	0.0	0.1	0.02	0.15	0.02	58.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

Site: 101 [SAT Existing (Site Folder: Site Access)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
East: Golflinks Road [E]														
5	T1	1	2.0	1	2.0	0.001	0.0	LOS A	0.0	0.0	0.07	0.29	0.07	57.2
6	R2	1	2.0	1	2.0	0.001	5.5	LOS A	0.0	0.0	0.07	0.29	0.07	55.0
Approach		2	2.0	2	2.0	0.001	2.8	NA	0.0	0.0	0.07	0.29	0.07	56.1
North: Site Access [N]														
7	L2	1	2.0	1	2.0	0.007	5.6	LOS A	0.0	0.2	0.03	0.58	0.03	53.5
9	R2	8	2.0	8	2.0	0.007	5.5	LOS A	0.0	0.2	0.03	0.58	0.03	52.9
Approach		9	2.0	9	2.0	0.007	5.5	LOS A	0.0	0.2	0.03	0.58	0.03	53.0
West: Golflinks Road [W]														
10	L2	18	2.0	19	2.0	0.011	5.6	LOS A	0.0	0.0	0.00	0.52	0.00	54.0
11	T1	2	2.0	2	2.0	0.011	0.0	LOS A	0.0	0.0	0.00	0.52	0.00	55.5
Approach		20	2.0	21	2.0	0.011	5.0	NA	0.0	0.0	0.00	0.52	0.00	54.1
All Vehicles		31	2.0	33	2.0	0.011	5.0	NA	0.0	0.2	0.01	0.52	0.01	53.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [WED AM Future (Site Folder: Site Access)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
East: Golflinks Road [E]														
5	T1	29	2.0	31	2.0	0.017	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	59.8
6	R2	1	2.0	1	2.0	0.017	5.6	LOS A	0.0	0.0	0.01	0.02	0.01	57.4
Approach		30	2.0	32	2.0	0.017	0.2	NA	0.0	0.0	0.01	0.02	0.01	59.7
North: Site Access [N]														
7	L2	1	2.0	1	2.0	0.036	5.6	LOS A	0.1	0.8	0.06	0.59	0.06	53.4
9	R2	41	2.0	43	2.0	0.036	5.7	LOS A	0.1	0.8	0.06	0.59	0.06	52.9
Approach		42	2.0	44	2.0	0.036	5.7	LOS A	0.1	0.8	0.06	0.59	0.06	52.9
West: Golflinks Road [W]														
10	L2	55	2.0	58	2.0	0.032	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	53.6
11	T1	1	2.0	1	2.0	0.032	0.0	LOS A	0.0	0.0	0.00	0.57	0.00	55.1
Approach		56	2.0	59	2.0	0.032	5.5	NA	0.0	0.0	0.00	0.57	0.00	53.6
All Vehicles		128	2.0	135	2.0	0.036	4.3	NA	0.1	0.8	0.02	0.44	0.02	54.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

Site: 101 [WED PM Future (Site Folder: Site Access)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
East: Golflinks Road [E]														
5	T1	17	2.0	18	2.0	0.010	0.0	LOS A	0.0	0.0	0.02	0.03	0.02	59.6
6	R2	1	2.0	1	2.0	0.010	5.6	LOS A	0.0	0.0	0.02	0.03	0.02	57.3
Approach		18	2.0	19	2.0	0.010	0.3	NA	0.0	0.0	0.02	0.03	0.02	59.5
North: Site Access [N]														
7	L2	1	2.0	1	2.0	0.039	5.6	LOS A	0.1	0.9	0.13	0.57	0.13	53.2
9	R2	44	2.0	46	2.0	0.039	5.7	LOS A	0.1	0.9	0.13	0.57	0.13	52.7
Approach		45	2.0	47	2.0	0.039	5.7	LOS A	0.1	0.9	0.13	0.57	0.13	52.7
West: Golflinks Road [W]														
10	L2	43	2.0	45	2.0	0.036	5.6	LOS A	0.0	0.0	0.00	0.40	0.00	54.9
11	T1	20	2.0	21	2.0	0.036	0.0	LOS A	0.0	0.0	0.00	0.40	0.00	56.5
Approach		63	2.0	66	2.0	0.036	3.8	NA	0.0	0.0	0.00	0.40	0.00	55.4
All Vehicles		126	2.0	133	2.0	0.039	4.0	NA	0.1	0.9	0.05	0.41	0.05	54.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

Site: 101 [SAT Future (Site Folder: Site Access)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
East: Golflinks Road [E]														
5	T1	1	2.0	1	2.0	0.001	0.1	LOS A	0.0	0.0	0.13	0.28	0.13	57.0
6	R2	1	2.0	1	2.0	0.001	5.6	LOS A	0.0	0.0	0.13	0.28	0.13	54.8
Approach		2	2.0	2	2.0	0.001	2.9	NA	0.0	0.0	0.13	0.28	0.13	55.9
North: Site Access [N]														
7	L2	1	2.0	1	2.0	0.040	5.6	LOS A	0.1	0.9	0.07	0.58	0.07	53.4
9	R2	46	2.0	48	2.0	0.040	5.6	LOS A	0.1	0.9	0.07	0.58	0.07	52.9
Approach		47	2.0	49	2.0	0.040	5.6	LOS A	0.1	0.9	0.07	0.58	0.07	52.9
West: Golflinks Road [W]														
10	L2	56	2.0	59	2.0	0.033	5.6	LOS A	0.0	0.0	0.00	0.56	0.00	53.7
11	T1	2	2.0	2	2.0	0.033	0.0	LOS A	0.0	0.0	0.00	0.56	0.00	55.1
Approach		58	2.0	61	2.0	0.033	5.4	NA	0.0	0.0	0.00	0.56	0.00	53.7
All Vehicles		107	2.0	113	2.0	0.040	5.4	NA	0.1	0.9	0.03	0.56	0.03	53.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# **APPENDIX C**

## **SIDRA ANALYSIS - GOLFLINKS ROAD/OLD CAREY GULLY ROAD INTERSECTION**

# MOVEMENT SUMMARY

Site: 101 [WED AM Existing (Site Folder: Golflinks Road - Old Carey Gully Road)]

Existing Intersection  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Old Carey Gully Road [S]														
2	T1	51	1	54	2.0	0.035	0.1	LOS A	0.1	0.5	0.07	0.11	0.07	58.8
3	R2	11	0	12	0.0	0.035	5.7	LOS A	0.1	0.5	0.07	0.11	0.07	56.6
Approach		62	1	65	1.6	0.035	1.1	NA	0.1	0.5	0.07	0.11	0.07	58.4
East: Golflinks Road [E]														
4	L2	25	0	26	0.0	0.024	5.7	LOS A	0.1	0.6	0.16	0.55	0.16	53.1
6	R2	7	0	7	0.0	0.024	5.9	LOS A	0.1	0.6	0.16	0.55	0.16	52.6
Approach		32	0	34	0.0	0.024	5.8	LOS A	0.1	0.6	0.16	0.55	0.16	53.0
North: Old Carey Gully Road [N]														
7	L2	4	0	4	0.0	0.041	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	58.1
8	T1	71	0	75	0.0	0.041	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach		75	0	79	0.0	0.041	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.6
All Vehicles		169	1	178	0.6	0.041	1.6	NA	0.1	0.6	0.06	0.16	0.06	57.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

Site: 101 [WED PM Existing (Site Folder: Golflinks Road - Old Carey Gully Road)]

Existing Intersection  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Old Carey Gully Road [S]														
2	T1	66	3	69	4.5	0.050	0.1	LOS A	0.1	0.9	0.09	0.14	0.09	58.3
3	R2	21	0	22	0.0	0.050	5.7	LOS A	0.1	0.9	0.09	0.14	0.09	56.2
Approach		87	3	92	3.4	0.050	1.4	NA	0.1	0.9	0.09	0.14	0.09	57.8
East: Golflinks Road [E]														
4	L2	18	0	19	0.0	0.017	5.7	LOS A	0.1	0.4	0.15	0.55	0.15	53.2
6	R2	5	0	5	0.0	0.017	6.0	LOS A	0.1	0.4	0.15	0.55	0.15	52.7
Approach		23	0	24	0.0	0.017	5.8	LOS A	0.1	0.4	0.15	0.55	0.15	53.1
North: Old Carey Gully Road [N]														
7	L2	4	0	4	0.0	0.037	5.5	LOS A	0.0	0.0	0.00	0.04	0.00	58.0
8	T1	62	5	65	8.1	0.037	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.6
Approach		66	5	69	7.6	0.037	0.3	NA	0.0	0.0	0.00	0.04	0.00	59.5
All Vehicles		176	8	185	4.5	0.050	1.6	NA	0.1	0.9	0.06	0.16	0.06	57.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

Site: 101 [SAT Existing (Site Folder: Golflinks Road - Old Carey Gully Road)]

Existing Intersection  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV veh/h ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Old Carey Gully Road [S]														
2	T1	59	1	62	1.7	0.042	0.1	LOS A	0.1	0.6	0.07	0.12	0.07	58.6
3	R2	15	0	16	0.0	0.042	5.6	LOS A	0.1	0.6	0.07	0.12	0.07	56.5
Approach		74	1	78	1.4	0.042	1.2	NA	0.1	0.6	0.07	0.12	0.07	58.2
East: Golflinks Road [E]														
4	L2	24	0	25	0.0	0.020	5.7	LOS A	0.1	0.5	0.14	0.54	0.14	53.2
6	R2	4	0	4	0.0	0.020	5.9	LOS A	0.1	0.5	0.14	0.54	0.14	52.7
Approach		28	0	29	0.0	0.020	5.7	LOS A	0.1	0.5	0.14	0.54	0.14	53.1
North: Old Carey Gully Road [N]														
7	L2	2	0	2	0.0	0.032	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	58.2
8	T1	58	0	61	0.0	0.032	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		60	0	63	0.0	0.032	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
All Vehicles		162	1	171	0.6	0.042	1.6	NA	0.1	0.6	0.05	0.16	0.05	57.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

Site: 101 [WED AM Future (Site Folder: Golflinks Road - Old Carey Gully Road)]

Existing Intersection  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Old Carey Gully Road [S]														
2	T1	57	1	60	1.8	0.058	0.2	LOS A	0.2	1.6	0.15	0.24	0.15	57.2
3	R2	41	0	43	0.0	0.058	5.7	LOS A	0.2	1.6	0.15	0.24	0.15	55.2
Approach		98	1	103	1.0	0.058	2.5	NA	0.2	1.6	0.15	0.24	0.15	56.4
East: Golflinks Road [E]														
4	L2	55	0	58	0.0	0.052	5.8	LOS A	0.2	1.4	0.17	0.55	0.17	53.1
6	R2	15	0	16	0.0	0.052	6.1	LOS A	0.2	1.4	0.17	0.55	0.17	52.6
Approach		70	0	74	0.0	0.052	5.8	LOS A	0.2	1.4	0.17	0.55	0.17	53.0
North: Old Carey Gully Road [N]														
7	L2	12	0	13	0.0	0.048	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	57.7
8	T1	77	0	81	0.0	0.048	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	59.2
Approach		89	0	94	0.0	0.048	0.8	NA	0.0	0.0	0.00	0.08	0.00	59.0
All Vehicles		257	1	271	0.4	0.058	2.8	NA	0.2	1.6	0.11	0.27	0.11	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

Site: 101 [WED PM Future (Site Folder: Golflinks Road - Old Carey Gully Road)]

Existing Intersection  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Old Carey Gully Road [S]														
2	T1	72	3	76	4.2	0.072	0.2	LOS A	0.3	2.0	0.15	0.24	0.15	57.2
3	R2	51	0	54	0.0	0.072	5.7	LOS A	0.3	2.0	0.15	0.24	0.15	55.2
Approach		123	3	129	2.4	0.072	2.5	NA	0.3	2.0	0.15	0.24	0.15	56.4
East: Golflinks Road [E]														
4	L2	49	0	52	0.0	0.046	5.8	LOS A	0.2	1.2	0.16	0.55	0.16	53.1
6	R2	13	0	14	0.0	0.046	6.2	LOS A	0.2	1.2	0.16	0.55	0.16	52.6
Approach		62	0	65	0.0	0.046	5.8	LOS A	0.2	1.2	0.16	0.55	0.16	53.0
North: Old Carey Gully Road [N]														
7	L2	12	0	13	0.0	0.045	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	57.5
8	T1	68	5	72	7.4	0.045	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	59.1
Approach		80	5	84	6.3	0.045	0.8	NA	0.0	0.0	0.00	0.09	0.00	58.9
All Vehicles		265	8	279	3.0	0.072	2.8	NA	0.3	2.0	0.11	0.27	0.11	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

Site: 101 [SAT Future (Site Folder: Golflinks Road - Old Carey Gully Road)]

Existing Intersection  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV veh/h ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Old Carey Gully Road [S]														
2	T1	65	1	68	1.5	0.064	0.1	LOS A	0.2	1.7	0.14	0.24	0.14	57.3
3	R2	45	0	47	0.0	0.064	5.7	LOS A	0.2	1.7	0.14	0.24	0.14	55.3
Approach		110	1	116	0.9	0.064	2.4	NA	0.2	1.7	0.14	0.24	0.14	56.5
East: Golflinks Road [E]														
4	L2	54	0	57	0.0	0.048	5.7	LOS A	0.2	1.3	0.15	0.55	0.15	53.2
6	R2	12	0	13	0.0	0.048	6.1	LOS A	0.2	1.3	0.15	0.55	0.15	52.6
Approach		66	0	69	0.0	0.048	5.8	LOS A	0.2	1.3	0.15	0.55	0.15	53.1
North: Old Carey Gully Road [N]														
7	L2	10	0	11	0.0	0.040	5.5	LOS A	0.0	0.0	0.00	0.08	0.00	57.7
8	T1	64	0	67	0.0	0.040	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	59.3
Approach		74	0	78	0.0	0.040	0.8	NA	0.0	0.0	0.00	0.08	0.00	59.0
All Vehicles		250	1	263	0.4	0.064	2.8	NA	0.2	1.7	0.10	0.27	0.10	56.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# **APPENDIX D**

## **SIDRA ANALYSIS - OLD CAREY GULLY ROAD/ OLD MOUNT BARKER ROAD INTERSECTION**



# MOVEMENT SUMMARY

Site: 101 [WED AM Existing (Site Folder: Old Mt Barker Road - Old Carey Gully Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
East: Old Mount Barker Road [E]														
5	T1	170	2	179	1.2	0.115	0.0	LOS A	0.2	1.7	0.06	0.10	0.06	58.9
6	R2	35	1	37	2.9	0.115	5.7	LOS A	0.2	1.7	0.06	0.10	0.06	56.5
Approach		205	3	216	1.5	0.115	1.0	NA	0.2	1.7	0.06	0.10	0.06	58.5
North: Old Carey Gully Road [N]														
7	L2	43	0	45	0.0	0.092	5.8	LOS A	0.3	2.3	0.16	0.57	0.16	53.7
9	R2	60	0	63	0.0	0.092	6.6	LOS A	0.3	2.3	0.16	0.57	0.16	52.6
Approach		103	0	108	0.0	0.092	6.2	LOS A	0.3	2.3	0.16	0.57	0.16	53.0
West: Old Mount Barker Road [W]														
10	L2	35	1	37	2.9	0.052	5.7	LOS A	0.2	1.3	0.08	0.22	0.08	56.6
11	T1	50	2	53	4.0	0.052	0.1	LOS A	0.2	1.3	0.08	0.22	0.08	57.5
Approach		85	3	89	3.5	0.052	2.4	NA	0.2	1.3	0.08	0.22	0.08	57.1
All Vehicles		393	6	414	1.5	0.115	2.7	NA	0.3	2.3	0.09	0.25	0.09	56.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [WED PM Existing (Site Folder: Old Mt Barker Road - Old Carey Gully Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
East: Old Mount Barker Road [E]														
5	T1	100	2	105	2.0	0.082	0.1	LOS A	0.3	1.8	0.09	0.18	0.09	58.1
6	R2	43	1	45	2.3	0.082	5.7	LOS A	0.3	1.8	0.09	0.18	0.09	55.8
Approach		143	3	151	2.1	0.082	1.8	NA	0.3	1.8	0.09	0.18	0.09	57.4
North: Old Carey Gully Road [N]														
7	L2	24	0	25	0.0	0.076	5.8	LOS A	0.3	1.9	0.19	0.58	0.19	53.7
9	R2	56	5	59	8.9	0.076	6.5	LOS A	0.3	1.9	0.19	0.58	0.19	52.1
Approach		80	5	84	6.3	0.076	6.3	LOS A	0.3	1.9	0.19	0.58	0.19	52.6
West: Old Mount Barker Road [W]														
10	L2	53	2	56	3.8	0.067	5.8	LOS A	0.3	1.9	0.11	0.26	0.11	56.1
11	T1	55	1	58	1.8	0.067	0.1	LOS A	0.3	1.9	0.11	0.26	0.11	57.0
Approach		108	3	114	2.8	0.067	2.9	NA	0.3	1.9	0.11	0.26	0.11	56.6
All Vehicles		331	11	348	3.3	0.082	3.2	NA	0.3	1.9	0.12	0.30	0.12	55.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [SAT Existing (Site Folder: Old Mt Barker Road - Old Carey Gully Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV ] veh/h	[ Total veh/h ]	[ HV ] %				[ Veh. veh ]	[ Dist ] m				
East: Old Mount Barker Road [E]														
5	T1	36	0	38	0.0	0.030	0.1	LOS A	0.1	0.7	0.08	0.19	0.08	58.0
6	R2	17	0	18	0.0	0.030	5.6	LOS A	0.1	0.7	0.08	0.19	0.08	55.9
Approach		53	0	56	0.0	0.030	1.8	NA	0.1	0.7	0.08	0.19	0.08	57.3
North: Old Carey Gully Road [N]														
7	L2	25	0	26	0.0	0.059	5.7	LOS A	0.2	1.4	0.14	0.56	0.14	53.9
9	R2	46	0	48	0.0	0.059	5.9	LOS A	0.2	1.4	0.14	0.56	0.14	52.7
Approach		71	0	75	0.0	0.059	5.8	LOS A	0.2	1.4	0.14	0.56	0.14	53.1
West: Old Mount Barker Road [W]														
10	L2	54	1	57	1.9	0.059	5.7	LOS A	0.2	1.7	0.06	0.31	0.06	56.0
11	T1	42	1	44	2.4	0.059	0.0	LOS A	0.2	1.7	0.06	0.31	0.06	56.8
Approach		96	2	101	2.1	0.059	3.2	NA	0.2	1.7	0.06	0.31	0.06	56.3
All Vehicles		220	2	232	0.9	0.059	3.7	NA	0.2	1.7	0.09	0.36	0.09	55.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [WED AM Future (Site Folder: Old Mt Barker Road - Old Carey Gully Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
East: Old Mount Barker Road [E]														
5	T1	170	2	179	1.2	0.118	0.0	LOS A	0.3	1.8	0.06	0.11	0.06	58.8
6	R2	39	1	41	2.6	0.118	5.6	LOS A	0.3	1.8	0.06	0.11	0.06	56.5
Approach		209	3	220	1.4	0.118	1.1	NA	0.3	1.8	0.06	0.11	0.06	58.3
North: Old Carey Gully Road [N]														
7	L2	47	0	49	0.0	0.131	5.8	LOS A	0.5	3.3	0.18	0.59	0.18	53.6
9	R2	92	0	97	0.0	0.131	6.8	LOS A	0.5	3.3	0.18	0.59	0.18	52.4
Approach		139	0	146	0.0	0.131	6.4	LOS A	0.5	3.3	0.18	0.59	0.18	52.8
West: Old Mount Barker Road [W]														
10	L2	67	1	71	1.5	0.073	5.7	LOS A	0.3	2.1	0.11	0.31	0.11	55.8
11	T1	50	2	53	4.0	0.073	0.1	LOS A	0.3	2.1	0.11	0.31	0.11	56.6
Approach		117	3	123	2.6	0.073	3.3	NA	0.3	2.1	0.11	0.31	0.11	56.1
All Vehicles		465	6	489	1.3	0.131	3.2	NA	0.5	3.3	0.11	0.30	0.11	56.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [WED PM Future (Site Folder: Old Mt Barker Road - Old Carey Gully Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
East: Old Mount Barker Road [E]														
5	T1	100	2	105	2.0	0.085	0.1	LOS A	0.3	2.0	0.10	0.19	0.10	57.9
6	R2	47	1	49	2.1	0.085	5.6	LOS A	0.3	2.0	0.10	0.19	0.10	55.7
Approach		147	3	155	2.0	0.085	1.9	NA	0.3	2.0	0.10	0.19	0.10	57.2
North: Old Carey Gully Road [N]														
7	L2	28	0	29	0.0	0.112	5.8	LOS A	0.4	2.9	0.21	0.59	0.21	53.6
9	R2	88	5	93	5.7	0.112	6.6	LOS A	0.4	2.9	0.21	0.59	0.21	52.2
Approach		116	5	122	4.3	0.112	6.4	LOS A	0.4	2.9	0.21	0.59	0.21	52.5
West: Old Mount Barker Road [W]														
10	L2	85	2	89	2.4	0.089	5.8	LOS A	0.4	2.7	0.12	0.32	0.12	55.5
11	T1	55	1	58	1.8	0.089	0.1	LOS A	0.4	2.7	0.12	0.32	0.12	56.4
Approach		140	3	147	2.1	0.089	3.6	NA	0.4	2.7	0.12	0.32	0.12	55.9
All Vehicles		403	11	424	2.7	0.112	3.8	NA	0.4	2.9	0.14	0.35	0.14	55.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [SAT Future (Site Folder: Old Mt Barker Road - Old Carey Gully Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV veh/h ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
East: Old Mount Barker Road [E]														
5	T1	36	0	38	0.0	0.033	0.1	LOS A	0.1	0.8	0.09	0.21	0.09	57.7
6	R2	21	0	22	0.0	0.033	5.6	LOS A	0.1	0.8	0.09	0.21	0.09	55.6
Approach		57	0	60	0.0	0.033	2.1	NA	0.1	0.8	0.09	0.21	0.09	56.9
North: Old Carey Gully Road [N]														
7	L2	29	0	31	0.0	0.092	5.7	LOS A	0.3	2.3	0.16	0.57	0.16	53.8
9	R2	78	0	82	0.0	0.092	6.0	LOS A	0.3	2.3	0.16	0.57	0.16	52.7
Approach		107	0	113	0.0	0.092	5.9	LOS A	0.3	2.3	0.16	0.57	0.16	53.0
West: Old Mount Barker Road [W]														
10	L2	86	1	91	1.2	0.080	5.7	LOS A	0.3	2.4	0.08	0.36	0.08	55.4
11	T1	42	1	44	2.4	0.080	0.1	LOS A	0.3	2.4	0.08	0.36	0.08	56.2
Approach		128	2	135	1.6	0.080	3.8	NA	0.3	2.4	0.08	0.36	0.08	55.7
All Vehicles		292	2	307	0.7	0.092	4.3	NA	0.3	2.4	0.11	0.41	0.11	54.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# **APPENDIX E**

## **SIDRA ANALYSIS - OLD MOUNT BARKER ROAD/ GOULD ROAD INTERSECTION**

# MOVEMENT SUMMARY

 Site: 101v [WED AM Existing (Site Folder: Old Mt Barker Road - Gould Road)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV ] veh/h	[ Total veh/h ]	[ HV ] %				[ Veh. veh ]	[ Dist ] m				
South: Gould Road [S]														
1	L2	115	3	121	2.6	0.116	5.9	LOS A	0.5	3.3	0.23	0.50	0.23	52.8
3	R2	70	3	74	4.3	0.116	6.1	LOS A	0.5	3.3	0.23	0.50	0.23	52.3
Approach		185	6	195	3.2	0.116	6.0	NA	0.5	3.3	0.23	0.50	0.23	52.6
East: Old Mount Barker Road [E]														
4	L2	202	3	213	1.5	0.204	8.8	LOS A	0.9	6.4	0.31	0.89	0.31	51.5
5	T1	23	1	24	4.3	0.204	10.4	LOS B	0.9	6.4	0.31	0.89	0.31	51.1
Approach		225	4	237	1.8	0.204	9.0	LOS A	0.9	6.4	0.31	0.89	0.31	51.5
West: Old Mount Barker Road [W]														
11	T1	19	1	20	5.3	0.097	0.0	LOS A	0.0	0.0	0.00	0.54	0.00	55.5
12	R2	148	6	156	4.1	0.097	5.5	LOS A	0.0	0.0	0.00	0.54	0.00	53.4
Approach		167	7	176	4.2	0.097	4.9	NA	0.0	0.0	0.00	0.54	0.00	53.6
All Vehicles		577	17	607	2.9	0.204	6.8	NA	0.9	6.4	0.19	0.66	0.19	52.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

**Site: 101v [WED PM Existing (Site Folder: Old Mt Barker Road - Gould Road)]**

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV ] veh/h	[ Total veh/h ]	[ HV ] %				[ Veh. veh ]	[ Dist ] m				
South: Gould Road [S]														
1	L2	153	3	161	2.0	0.159	5.9	LOS A	0.7	4.8	0.23	0.50	0.23	52.9
3	R2	105	1	111	1.0	0.159	6.1	LOS A	0.7	4.8	0.23	0.50	0.23	52.4
Approach		258	4	272	1.6	0.159	6.0	NA	0.7	4.8	0.23	0.50	0.23	52.7
East: Old Mount Barker Road [E]														
4	L2	127	2	134	1.6	0.151	8.7	LOS A	0.6	4.5	0.29	0.90	0.29	51.4
5	T1	28	3	29	10.7	0.151	11.4	LOS B	0.6	4.5	0.29	0.90	0.29	50.8
Approach		155	5	163	3.2	0.151	9.2	LOS A	0.6	4.5	0.29	0.90	0.29	51.3
West: Old Mount Barker Road [W]														
11	T1	14	2	15	14.3	0.091	0.0	LOS A	0.0	0.0	0.00	0.55	0.00	55.4
12	R2	141	6	148	4.3	0.091	5.5	LOS A	0.0	0.0	0.00	0.55	0.00	53.3
Approach		155	8	163	5.2	0.091	5.0	NA	0.0	0.0	0.00	0.55	0.00	53.4
All Vehicles		568	17	598	3.0	0.159	6.6	NA	0.7	4.8	0.19	0.62	0.19	52.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

**Site: 101v [SAT Existing (Site Folder: Old Mt Barker Road - Gould Road)]**

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Gould Road [S]														
1	L2	163	0	172	0.0	0.147	5.9	LOS A	0.5	3.8	0.22	0.49	0.22	53.0
3	R2	75	2	79	2.7	0.147	6.3	LOS A	0.5	3.8	0.22	0.49	0.22	52.3
Approach		238	2	251	0.8	0.147	6.0	NA	0.5	3.8	0.22	0.49	0.22	52.8
East: Old Mount Barker Road [E]														
4	L2	87	2	92	2.3	0.099	8.9	LOS A	0.4	2.8	0.32	0.89	0.32	51.4
5	T1	15	0	16	0.0	0.099	10.5	LOS B	0.4	2.8	0.32	0.89	0.32	51.2
Approach		102	2	107	2.0	0.099	9.2	LOS A	0.4	2.8	0.32	0.89	0.32	51.4
West: Old Mount Barker Road [W]														
11	T1	17	1	18	5.9	0.113	0.0	LOS A	0.0	0.0	0.00	0.55	0.00	55.4
12	R2	182	1	192	0.5	0.113	5.5	LOS A	0.0	0.0	0.00	0.55	0.00	53.4
Approach		199	2	209	1.0	0.113	5.0	NA	0.0	0.0	0.00	0.55	0.00	53.6
All Vehicles		539	6	567	1.1	0.147	6.2	NA	0.5	3.8	0.16	0.59	0.16	52.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 Site: 101v [WED AM Future (Site Folder: Old Mt Barker Road - Gould Road)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV ] veh/h	[ Total veh/h ]	[ HV ] %				[ Veh. veh ]	[ Dist ] m				
South: Gould Road [S]														
1	L2	115	3	121	2.6	0.137	6.0	LOS A	0.6	4.4	0.26	0.50	0.26	52.7
3	R2	101	3	106	3.0	0.137	6.1	LOS A	0.6	4.4	0.26	0.50	0.26	52.2
Approach		216	6	227	2.8	0.137	6.1	NA	0.6	4.4	0.26	0.50	0.26	52.5
East: Old Mount Barker Road [E]														
4	L2	233	3	245	1.3	0.235	8.8	LOS A	1.1	7.5	0.32	0.89	0.32	51.5
5	T1	25	1	26	4.0	0.235	10.8	LOS B	1.1	7.5	0.32	0.89	0.32	51.1
Approach		258	4	272	1.6	0.235	9.0	LOS A	1.1	7.5	0.32	0.89	0.32	51.5
West: Old Mount Barker Road [W]														
11	T1	21	1	22	4.8	0.098	0.0	LOS A	0.0	0.0	0.00	0.53	0.00	55.6
12	R2	148	6	156	4.1	0.098	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	53.4
Approach		169	7	178	4.1	0.098	4.8	NA	0.0	0.0	0.00	0.53	0.00	53.7
All Vehicles		643	17	677	2.6	0.235	6.9	NA	1.1	7.5	0.21	0.66	0.21	52.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

 Site: 101v [WED PM Future (Site Folder: Old Mt Barker Road - Gould Road)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV ] veh/h	[ Total veh/h ]	[ HV ] %				[ Veh. veh ]	[ Dist ] m				
South: Gould Road [S]														
1	L2	153	3	161	2.0	0.180	6.0	LOS A	0.8	5.9	0.26	0.50	0.26	52.8
3	R2	136	1	143	0.7	0.180	6.1	LOS A	0.8	5.9	0.26	0.50	0.26	52.3
Approach		289	4	304	1.4	0.180	6.0	NA	0.8	5.9	0.26	0.50	0.26	52.6
East: Old Mount Barker Road [E]														
4	L2	158	2	166	1.3	0.183	8.7	LOS A	0.8	5.5	0.30	0.90	0.30	51.4
5	T1	30	3	32	10.0	0.183	11.8	LOS B	0.8	5.5	0.30	0.90	0.30	50.8
Approach		188	5	198	2.7	0.183	9.2	LOS A	0.8	5.5	0.30	0.90	0.30	51.3
West: Old Mount Barker Road [W]														
11	T1	16	2	17	12.5	0.092	0.0	LOS A	0.0	0.0	0.00	0.54	0.00	55.4
12	R2	141	6	148	4.3	0.092	5.5	LOS A	0.0	0.0	0.00	0.54	0.00	53.3
Approach		157	8	165	5.1	0.092	5.0	NA	0.0	0.0	0.00	0.54	0.00	53.5
All Vehicles		634	17	667	2.7	0.183	6.7	NA	0.8	5.9	0.21	0.63	0.21	52.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

 **Site: 101v [SAT Future (Site Folder: Old Mt Barker Road - Gould Road)]**

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Gould Road [S]														
1	L2	163	0	172	0.0	0.169	6.0	LOS A	0.7	5.1	0.27	0.49	0.27	52.8
3	R2	106	2	112	1.9	0.169	6.3	LOS A	0.7	5.1	0.27	0.49	0.27	52.2
Approach		269	2	283	0.7	0.169	6.1	NA	0.7	5.1	0.27	0.49	0.27	52.6
East: Old Mount Barker Road [E]														
4	L2	118	2	124	1.7	0.131	8.9	LOS A	0.5	3.8	0.33	0.89	0.33	51.4
5	T1	17	0	18	0.0	0.131	10.9	LOS B	0.5	3.8	0.33	0.89	0.33	51.2
Approach		135	2	142	1.5	0.131	9.2	LOS A	0.5	3.8	0.33	0.89	0.33	51.4
West: Old Mount Barker Road [W]														
11	T1	19	1	20	5.3	0.114	0.0	LOS A	0.0	0.0	0.00	0.55	0.00	55.4
12	R2	182	1	192	0.5	0.114	5.5	LOS A	0.0	0.0	0.00	0.55	0.00	53.5
Approach		201	2	212	1.0	0.114	5.0	NA	0.0	0.0	0.00	0.55	0.00	53.6
All Vehicles		605	6	637	1.0	0.169	6.4	NA	0.7	5.1	0.19	0.60	0.19	52.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# **APPENDIX F**

## **SIDRA ANALYSIS - GOULD ROAD/POMONA ROAD INTERSECTION**

# MOVEMENT SUMMARY

Site: 101 [WED AM Existing (Site Folder: Gould Road - Pomona Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV ] veh/h	[ Total veh/h ]	[ HV ] %				[ Veh. veh ]	[ Dist ] m				
South: Gould Road [S]														
1	L2	56	3	59	5.4	0.069	5.6	LOS A	0.0	0.0	0.00	0.27	0.00	55.9
2	T1	66	0	69	0.0	0.069	0.0	LOS A	0.0	0.0	0.00	0.27	0.00	57.6
Approach		122	3	128	2.5	0.069	2.6	NA	0.0	0.0	0.00	0.27	0.00	56.8
North: Gould Road [N]														
8	T1	81	4	85	4.9	0.045	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	267	3	281	1.1	0.176	5.9	LOS A	0.9	6.3	0.26	0.57	0.26	52.4
Approach		348	7	366	2.0	0.176	4.5	NA	0.9	6.3	0.20	0.44	0.20	54.0
West: Pomona Road [W]														
10	L2	103	2	108	1.9	0.162	5.8	LOS A	0.7	4.9	0.19	0.58	0.19	52.4
12	R2	58	2	61	3.4	0.162	9.2	LOS A	0.7	4.9	0.19	0.58	0.19	51.9
Approach		161	4	169	2.5	0.162	7.0	LOS A	0.7	4.9	0.19	0.58	0.19	52.2
All Vehicles		631	14	664	2.2	0.176	4.8	NA	0.9	6.3	0.16	0.44	0.16	54.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [WED PM Existing (Site Folder: Gould Road - Pomona Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV ] veh/h	[ Total veh/h ]	[ HV ] %				[ Veh. veh ]	[ Dist ] m				
South: Gould Road [S]														
1	L2	33	2	35	6.1	0.060	5.6	LOS A	0.0	0.0	0.00	0.18	0.00	56.5
2	T1	74	2	78	2.7	0.060	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	58.4
Approach		107	4	113	3.7	0.060	1.7	NA	0.0	0.0	0.00	0.18	0.00	57.8
North: Gould Road [N]														
8	T1	80	2	84	2.5	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	188	6	198	3.2	0.124	5.9	LOS A	0.6	4.3	0.24	0.57	0.24	52.3
Approach		268	8	282	3.0	0.124	4.1	NA	0.6	4.3	0.17	0.40	0.17	54.4
West: Pomona Road [W]														
10	L2	184	2	194	1.1	0.207	5.8	LOS A	0.9	6.6	0.20	0.57	0.20	52.9
12	R2	57	2	60	3.5	0.207	8.5	LOS A	0.9	6.6	0.20	0.57	0.20	52.3
Approach		241	4	254	1.7	0.207	6.4	LOS A	0.9	6.6	0.20	0.57	0.20	52.7
All Vehicles		616	16	648	2.6	0.207	4.6	NA	0.9	6.6	0.15	0.43	0.15	54.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



# MOVEMENT SUMMARY

Site: 101 [SAT Existing (Site Folder: Gould Road - Pomona Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV veh/h ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Gould Road [S]														
1	L2	19	0	20	0.0	0.035	5.5	LOS A	0.0	0.0	0.00	0.18	0.00	56.8
2	T1	44	0	46	0.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	58.4
Approach		63	0	66	0.0	0.035	1.7	NA	0.0	0.0	0.00	0.18	0.00	57.9
North: Gould Road [N]														
8	T1	78	2	82	2.6	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	191	1	201	0.5	0.119	5.7	LOS A	0.6	4.1	0.17	0.56	0.17	52.6
Approach		269	3	283	1.1	0.119	4.0	NA	0.6	4.1	0.12	0.40	0.12	54.6
West: Pomona Road [W]														
10	L2	194	2	204	1.0	0.164	5.7	LOS A	0.7	5.1	0.12	0.56	0.12	53.2
12	R2	26	0	27	0.0	0.164	7.8	LOS A	0.7	5.1	0.12	0.56	0.12	52.7
Approach		220	2	232	0.9	0.164	6.0	LOS A	0.7	5.1	0.12	0.56	0.12	53.1
All Vehicles		552	5	581	0.9	0.164	4.5	NA	0.7	5.1	0.11	0.44	0.11	54.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [WED AM Future (Site Folder: Gould Road - Pomona Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV veh/h ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Gould Road [S]														
1	L2	56	3	59	5.4	0.070	5.6	LOS A	0.0	0.0	0.00	0.27	0.00	55.9
2	T1	68	0	72	0.0	0.070	0.0	LOS A	0.0	0.0	0.00	0.27	0.00	57.7
Approach		124	3	131	2.4	0.070	2.5	NA	0.0	0.0	0.00	0.27	0.00	56.9
North: Gould Road [N]														
8	T1	83	4	87	4.8	0.046	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	296	3	312	1.0	0.195	5.9	LOS A	1.0	7.1	0.27	0.57	0.27	52.3
Approach		379	7	399	1.8	0.195	4.6	NA	1.0	7.1	0.21	0.45	0.21	53.8
West: Pomona Road [W]														
10	L2	132	2	139	1.5	0.187	5.8	LOS A	0.8	5.7	0.19	0.58	0.19	52.5
12	R2	58	2	61	3.4	0.187	9.7	LOS A	0.8	5.7	0.19	0.58	0.19	51.9
Approach		190	4	200	2.1	0.187	7.0	LOS A	0.8	5.7	0.19	0.58	0.19	52.3
All Vehicles		693	14	729	2.0	0.195	4.9	NA	1.0	7.1	0.17	0.45	0.17	53.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [WED PM Future (Site Folder: Gould Road - Pomona Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV ] veh/h	[ Total veh/h ]	[ HV ] %				[ Veh. veh ]	[ Dist ] m				
South: Gould Road [S]														
1	L2	33	2	35	6.1	0.061	5.6	LOS A	0.0	0.0	0.00	0.18	0.00	56.6
2	T1	76	2	80	2.6	0.061	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	58.4
Approach		109	4	115	3.7	0.061	1.7	NA	0.0	0.0	0.00	0.18	0.00	57.8
North: Gould Road [N]														
8	T1	82	2	86	2.4	0.045	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	217	6	228	2.8	0.143	5.9	LOS A	0.7	5.0	0.24	0.57	0.24	52.3
Approach		299	8	315	2.7	0.143	4.3	NA	0.7	5.0	0.18	0.41	0.18	54.2
West: Pomona Road [W]														
10	L2	213	2	224	0.9	0.231	5.8	LOS A	1.1	7.5	0.20	0.57	0.20	52.9
12	R2	57	2	60	3.5	0.231	8.9	LOS A	1.1	7.5	0.20	0.57	0.20	52.2
Approach		270	4	284	1.5	0.231	6.5	LOS A	1.1	7.5	0.20	0.57	0.20	52.7
All Vehicles		678	16	714	2.4	0.231	4.7	NA	1.1	7.5	0.16	0.44	0.16	54.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [SAT Existing Future (Site Folder: Gould Road - Pomona Road)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV veh/h ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Gould Road [S]														
1	L2	19	0	20	0.0	0.036	5.5	LOS A	0.0	0.0	0.00	0.17	0.00	56.9
2	T1	46	0	48	0.0	0.036	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	58.4
Approach		65	0	68	0.0	0.036	1.6	NA	0.0	0.0	0.00	0.17	0.00	58.0
North: Gould Road [N]														
8	T1	80	2	84	2.5	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	220	1	232	0.5	0.137	5.7	LOS A	0.7	4.8	0.18	0.56	0.18	52.6
Approach		300	3	316	1.0	0.137	4.2	NA	0.7	4.8	0.13	0.41	0.13	54.4
West: Pomona Road [W]														
10	L2	223	2	235	0.9	0.185	5.7	LOS A	0.8	5.9	0.13	0.55	0.13	53.2
12	R2	26	0	27	0.0	0.185	8.2	LOS A	0.8	5.9	0.13	0.55	0.13	52.7
Approach		249	2	262	0.8	0.185	6.0	LOS A	0.8	5.9	0.13	0.55	0.13	53.1
All Vehicles		614	5	646	0.8	0.185	4.6	NA	0.8	5.9	0.12	0.44	0.12	54.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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## **APPENDIX G**

### **SIDRA ANALYSIS - POMONA ROAD/MOUNT BARKER ROAD/AVENUE ROAD INTERSECTION**

# MOVEMENT SUMMARY

**Site: 101 [WED AM Existing (Site Folder: Mt Barker Road - Pomona Road - Avenue Road)]**

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	[ HV ] veh/h	[ Total veh/h	[ HV ] %				[ Veh. veh	[ Dist ] m				
South: Mount Barker Road [S]														
1	L2	103	6	108	5.8	0.293	6.6	LOS A	1.8	13.2	0.58	0.65	0.58	52.2
2	T1	415	19	437	4.6	0.293	6.6	LOS A	1.8	13.2	0.58	0.65	0.58	53.4
3	R2	28	1	29	3.6	0.293	10.8	LOS B	1.8	13.0	0.59	0.66	0.59	53.0
Approach		546	26	575	4.8	0.293	6.8	LOS A	1.8	13.2	0.58	0.65	0.58	53.2
East: Pomona Road [E]														
4	L2	51	1	54	2.0	0.366	9.9	LOS A	2.1	15.1	0.74	0.88	0.75	49.9
5	T1	54	2	57	3.7	0.366	9.2	LOS A	2.1	15.1	0.74	0.88	0.75	50.7
6	R2	112	3	118	2.7	0.366	13.4	LOS B	2.1	15.1	0.74	0.88	0.75	50.6
Approach		217	6	228	2.8	0.366	11.5	LOS B	2.1	15.1	0.74	0.88	0.75	50.5
North: Mount Barker Road [N]														
7	L2	107	4	113	3.7	0.183	7.3	LOS A	1.0	7.0	0.52	0.65	0.52	52.2
8	T1	330	24	347	7.3	0.491	6.1	LOS A	3.9	28.5	0.59	0.64	0.59	52.7
9	R2	177	6	186	3.4	0.491	10.1	LOS B	3.9	28.5	0.59	0.64	0.59	52.5
Approach		614	34	646	5.5	0.491	7.4	LOS A	3.9	28.5	0.58	0.64	0.58	52.6
West: Avenue Road [W]														
10	L2	210	4	221	1.9	0.562	9.0	LOS A	3.6	26.0	0.72	0.93	0.87	50.5
11	T1	62	3	65	4.8	0.562	9.3	LOS A	3.6	26.0	0.72	0.93	0.87	51.3
12	R2	116	2	122	1.7	0.562	13.4	LOS B	3.6	26.0	0.72	0.93	0.87	51.3
Approach		388	9	408	2.3	0.562	10.4	LOS B	3.6	26.0	0.72	0.93	0.87	50.9
All Vehicles		1765	75	1858	4.2	0.562	8.4	LOS A	3.9	28.5	0.63	0.74	0.67	52.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

**Site: 101 [WED PM Existing (Site Folder: Mt Barker Road - Pomona Road - Avenue Road)]**

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV veh/h ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Mount Barker Road [S]														
1	L2	132	6	139	4.5	0.275	7.1	LOS A	1.7	12.7	0.64	0.70	0.64	52.1
2	T1	295	19	311	6.4	0.275	7.2	LOS A	1.7	12.7	0.65	0.71	0.65	53.0
3	R2	35	1	37	2.9	0.275	11.3	LOS B	1.7	12.4	0.65	0.71	0.65	52.6
Approach		462	26	486	5.6	0.275	7.5	LOS A	1.7	12.7	0.65	0.70	0.65	52.7
East: Pomona Road [E]														
4	L2	47	4	49	8.5	0.336	12.3	LOS B	1.8	13.4	0.80	0.92	0.82	48.9
5	T1	52	1	55	1.9	0.336	10.9	LOS B	1.8	13.4	0.80	0.92	0.82	50.0
6	R2	57	1	60	1.8	0.336	15.0	LOS B	1.8	13.4	0.80	0.92	0.82	49.9
Approach		156	6	164	3.8	0.336	12.8	LOS B	1.8	13.4	0.80	0.92	0.82	49.6
North: Mount Barker Road [N]														
7	L2	87	2	92	2.3	0.196	6.8	LOS A	1.0	7.5	0.47	0.61	0.47	52.6
8	T1	497	19	523	3.8	0.683	6.3	LOS A	7.1	50.9	0.66	0.63	0.66	52.5
9	R2	319	7	336	2.2	0.683	10.2	LOS B	7.1	50.9	0.68	0.63	0.68	52.2
Approach		903	28	951	3.1	0.683	7.7	LOS A	7.1	50.9	0.65	0.63	0.65	52.4
West: Avenue Road [W]														
10	L2	123	6	129	4.9	0.336	6.5	LOS A	1.6	12.0	0.56	0.75	0.56	52.0
11	T1	41	2	43	4.9	0.336	6.6	LOS A	1.6	12.0	0.56	0.75	0.56	53.0
12	R2	90	4	95	4.4	0.336	10.8	LOS B	1.6	12.0	0.56	0.75	0.56	52.8
Approach		254	12	267	4.7	0.336	8.1	LOS A	1.6	12.0	0.56	0.75	0.56	52.4
All Vehicles		1775	72	1868	4.1	0.683	8.1	LOS A	7.1	50.9	0.65	0.69	0.65	52.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

**Site: 101 [SAT Existing (Site Folder: Mt Barker Road - Pomona Road - Avenue Road)]**

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	[ HV ] veh/h	[ Total veh/h	[ HV ] %				[ Veh. veh	[ Dist ] m				
South: Mount Barker Road [S]														
1	L2	81	0	85	0.0	0.294	6.7	LOS A	1.9	13.2	0.61	0.66	0.61	52.3
2	T1	381	8	401	2.1	0.294	6.7	LOS A	1.9	13.2	0.61	0.68	0.61	53.2
3	R2	75	0	79	0.0	0.294	10.9	LOS B	1.8	13.0	0.62	0.70	0.62	52.5
Approach		537	8	565	1.5	0.294	7.3	LOS A	1.9	13.2	0.61	0.68	0.61	53.0
East: Pomona Road [E]														
4	L2	83	0	87	0.0	0.526	12.8	LOS B	3.7	26.2	0.83	0.99	1.02	48.6
5	T1	95	0	100	0.0	0.526	11.7	LOS B	3.7	26.2	0.83	0.99	1.02	49.4
6	R2	116	0	122	0.0	0.526	15.9	LOS B	3.7	26.2	0.83	0.99	1.02	49.4
Approach		294	0	309	0.0	0.526	13.7	LOS B	3.7	26.2	0.83	0.99	1.02	49.2
North: Mount Barker Road [N]														
7	L2	84	0	88	0.0	0.168	7.6	LOS A	0.9	6.0	0.54	0.67	0.54	52.0
8	T1	444	7	467	1.6	0.585	6.7	LOS A	5.0	35.5	0.68	0.68	0.68	52.6
9	R2	170	0	179	0.0	0.585	10.7	LOS B	5.0	35.5	0.68	0.68	0.69	52.4
Approach		698	7	735	1.0	0.585	7.7	LOS A	5.0	35.5	0.66	0.68	0.67	52.5
West: Avenue Road [W]														
10	L2	170	2	179	1.2	0.499	8.3	LOS A	2.9	20.7	0.69	0.91	0.80	50.8
11	T1	53	1	56	1.9	0.499	8.5	LOS A	2.9	20.7	0.69	0.91	0.80	51.7
12	R2	122	0	128	0.0	0.499	12.7	LOS B	2.9	20.7	0.69	0.91	0.80	51.7
Approach		345	3	363	0.9	0.499	9.9	LOS A	2.9	20.7	0.69	0.91	0.80	51.3
All Vehicles		1874	18	1973	1.0	0.585	8.9	LOS A	5.0	35.5	0.68	0.77	0.73	51.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

**Site: 101 [WED AM Future (Site Folder: Mt Barker Road - Pomona Road - Avenue Road)]**

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	[ HV ] veh/h	[ Total veh/h	[ HV ] %				[ Veh. veh	[ Dist ] m				
South: Mount Barker Road [S]														
1	L2	103	6	108	5.8	0.303	6.8	LOS A	1.9	13.9	0.60	0.66	0.60	52.1
2	T1	415	19	437	4.6	0.303	6.8	LOS A	1.9	13.9	0.61	0.67	0.61	53.3
3	R2	33	1	35	3.0	0.303	10.9	LOS B	1.9	13.6	0.61	0.68	0.61	52.8
Approach		551	26	580	4.7	0.303	7.0	LOS A	1.9	13.9	0.61	0.67	0.61	53.1
East: Pomona Road [E]														
4	L2	56	1	59	1.8	0.414	10.5	LOS B	2.6	18.5	0.76	0.92	0.82	49.4
5	T1	55	2	58	3.6	0.414	9.8	LOS A	2.6	18.5	0.76	0.92	0.82	50.2
6	R2	135	3	142	2.2	0.414	14.0	LOS B	2.6	18.5	0.76	0.92	0.82	50.2
Approach		246	6	259	2.4	0.414	12.3	LOS B	2.6	18.5	0.76	0.92	0.82	50.0
North: Mount Barker Road [N]														
7	L2	130	4	137	3.1	0.220	7.4	LOS A	1.2	8.6	0.54	0.67	0.54	52.1
8	T1	330	24	347	7.3	0.494	6.1	LOS A	3.9	28.8	0.60	0.65	0.60	52.7
9	R2	177	6	186	3.4	0.494	10.2	LOS B	3.9	28.8	0.60	0.65	0.60	52.5
Approach		637	34	671	5.3	0.494	7.5	LOS A	3.9	28.8	0.59	0.65	0.59	52.5
West: Avenue Road [W]														
10	L2	210	4	221	1.9	0.575	9.4	LOS A	3.8	27.1	0.74	0.95	0.91	50.3
11	T1	63	3	66	4.8	0.575	9.7	LOS A	3.8	27.1	0.74	0.95	0.91	51.1
12	R2	116	2	122	1.7	0.575	13.7	LOS B	3.8	27.1	0.74	0.95	0.91	51.0
Approach		389	9	409	2.3	0.575	10.7	LOS B	3.8	27.1	0.74	0.95	0.91	50.6
All Vehicles		1823	75	1919	4.1	0.575	8.7	LOS A	3.9	28.8	0.65	0.76	0.69	51.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

**Site: 101 [WED PM Future (Site Folder: Mt Barker Road - Pomona Road - Avenue Road)]**

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	[ HV ] veh/h	[ Total veh/h	[ HV ] %				[ Veh. veh	[ Dist ] m				
South: Mount Barker Road [S]														
1	L2	132	6	139	4.5	0.284	7.3	LOS A	1.8	13.3	0.66	0.71	0.66	51.9
2	T1	295	19	311	6.4	0.284	7.4	LOS A	1.8	13.3	0.67	0.72	0.67	52.9
3	R2	40	1	42	2.5	0.284	11.5	LOS B	1.8	12.9	0.67	0.73	0.67	52.4
Approach		467	26	492	5.6	0.284	7.7	LOS A	1.8	13.3	0.67	0.72	0.67	52.6
East: Pomona Road [E]														
4	L2	52	4	55	7.7	0.424	14.2	LOS B	2.7	19.4	0.85	0.98	0.98	47.7
5	T1	53	1	56	1.9	0.424	12.7	LOS B	2.7	19.4	0.85	0.98	0.98	48.6
6	R2	80	1	84	1.3	0.424	16.9	LOS B	2.7	19.4	0.85	0.98	0.98	48.5
Approach		185	6	195	3.2	0.424	14.9	LOS B	2.7	19.4	0.85	0.98	0.98	48.3
North: Mount Barker Road [N]														
7	L2	110	2	116	1.8	0.203	6.8	LOS A	1.1	7.7	0.48	0.62	0.48	52.5
8	T1	497	19	523	3.8	0.705	6.5	LOS A	7.7	55.5	0.70	0.65	0.71	52.4
9	R2	319	7	336	2.2	0.705	10.5	LOS B	7.7	55.5	0.71	0.65	0.72	52.1
Approach		926	28	975	3.0	0.705	7.9	LOS A	7.7	55.5	0.68	0.64	0.69	52.3
West: Avenue Road [W]														
10	L2	123	6	129	4.9	0.344	6.6	LOS A	1.7	12.2	0.58	0.77	0.58	51.9
11	T1	42	2	44	4.8	0.344	6.8	LOS A	1.7	12.2	0.58	0.77	0.58	52.9
12	R2	90	4	95	4.4	0.344	11.0	LOS B	1.7	12.2	0.58	0.77	0.58	52.7
Approach		255	12	268	4.7	0.344	8.2	LOS A	1.7	12.2	0.58	0.77	0.58	52.3
All Vehicles		1833	72	1929	3.9	0.705	8.6	LOS A	7.7	55.5	0.68	0.71	0.69	51.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

**Site: 101 [SAT Future (Site Folder: Mt Barker Road - Pomona Road - Avenue Road)]**

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	[ HV ] veh/h	[ Total veh/h	[ HV ] %				[ Veh. veh	[ Dist ] m				
South: Mount Barker Road [S]														
1	L2	81	0	85	0.0	0.306	6.9	LOS A	2.0	14.1	0.64	0.68	0.64	52.2
2	T1	381	8	401	2.1	0.306	6.9	LOS A	2.0	14.1	0.64	0.70	0.64	53.0
3	R2	80	0	84	0.0	0.306	11.1	LOS B	1.9	13.8	0.65	0.72	0.65	52.4
Approach		542	8	571	1.5	0.306	7.5	LOS A	2.0	14.1	0.64	0.70	0.64	52.8
East: Pomona Road [E]														
4	L2	88	0	93	0.0	0.614	15.9	LOS B	5.3	37.0	0.90	1.07	1.21	46.7
5	T1	96	0	101	0.0	0.614	14.8	LOS B	5.3	37.0	0.90	1.07	1.21	47.4
6	R2	139	0	146	0.0	0.614	19.0	LOS B	5.3	37.0	0.90	1.07	1.21	47.3
Approach		323	0	340	0.0	0.614	16.9	LOS B	5.3	37.0	0.90	1.07	1.21	47.2
North: Mount Barker Road [N]														
7	L2	107	0	113	0.0	0.188	7.7	LOS A	1.0	6.8	0.55	0.68	0.55	51.9
8	T1	444	7	467	1.6	0.600	6.9	LOS A	5.4	38.1	0.70	0.70	0.72	52.5
9	R2	170	0	179	0.0	0.600	10.9	LOS B	5.4	38.1	0.70	0.70	0.72	52.3
Approach		721	7	759	1.0	0.600	7.9	LOS A	5.4	38.1	0.68	0.70	0.69	52.4
West: Avenue Road [W]														
10	L2	170	2	179	1.2	0.511	8.6	LOS A	3.1	21.5	0.70	0.92	0.83	50.6
11	T1	54	1	57	1.9	0.511	8.8	LOS A	3.1	21.5	0.70	0.92	0.83	51.5
12	R2	122	0	128	0.0	0.511	13.0	LOS B	3.1	21.5	0.70	0.92	0.83	51.5
Approach		346	3	364	0.9	0.511	10.2	LOS B	3.1	21.5	0.70	0.92	0.83	51.1
All Vehicles		1932	18	2034	0.9	0.614	9.7	LOS A	5.4	38.1	0.71	0.80	0.79	51.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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## **Appendix 12**

*Appendix J of Development Report – Waste management and minimisation plan*

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**MOUNT LOFTY GOLF ESTATE  
GOLFLINKS ROAD, STIRLING**

**WASTE MANAGEMENT AND MINIMISATION PLAN**



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Waste Management and Minimisation Plan

Project number: 21117

Client: Trice Pty Ltd

Client contact: Sonia Mercorella

Version	Date	Details/status	Prepared by	Approved by
Draft 1	15 Sep 22	For review	BNW	BNW
V1.0	08 Dec 22	For submission	BNW	BNW

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## 1. EXECUTIVE SUMMARY

CIRQA has been engaged to prepare a Waste Management and Minimisation Plan (WMMP) for the Mount Lofty Golf Estate development at 35 Golflinks Road, Stirling. The project forms the redevelopment of the existing Stirling Golf Club to provide tourist accommodation and associated hospitality facilities along with the existing golfing facilities.

This WMMP applies to waste generated from the site preparation and construction phase and the operational phases of the development. The WMMP has been prepared on the basis of plans prepared by R Architecture (Drawings TP01 to TP17 dated 29 November 2022).

The objective of the WMMP is to identify the guiding principles and procedures for the development during construction and operation. The WMMP has been prepared to reflect to requirements of the “*Environment Protection Act 1993*” and “*South Australia's Waste Strategy 2020-2025*”. Specifically, the WMMP aligns with the waste management hierarchy identified in these documents prioritising the avoidance, minimisation, reuse and recycling of waste (in that order) over disposal to land fill.

The WMMP identifies potential sources of waste during the construction and operation phases and the principles, procedures and responsibilities for the management and minimisation of waste materials associated with the development.

The provisions contained within the WMMP should be subject to further review as the construction methodology is refined and periodically during the operation of the site (in particular, once the tourism operator has been confirmed).

## **2. BACKGROUND**

### **2.1 OBJECTIVES**

The purpose of this WMMP is to outline the management and minimisation of waste generated during both the construction and operational phases of the proposed development. The WMMP includes review of potential waste sources during construction and operation and details measures for the management, reuse, recycling and disposal of the various waste materials.

### **2.2 LEGISLATIVE REQUIREMENTS AND RELATED DOCUMENTATION**

Within South Australia, the “*Environment Protection Act 1993*” (The Act) provides the legislative requirements in respect to the protection of the environment with the State. The Act includes consideration of the management and minimisation of waste. All waste management activities undertaken within and for the development (during both construction and operation) shall be undertaken in accordance with the requirement of The Act.

In addition to The Act, Green Industries SA has published “*South Australia’s Waste Strategy 2020-2025*” which sets out a framework of policies, strategies and plans for the management of waste within South Australia whilst meeting the State Government’s priority for economic growth. A key priority of SA’s Waste Strategy is a transition to a ‘circular economy’ which it defines as:

*“...an economic model that contemplates the production and goods and services:*

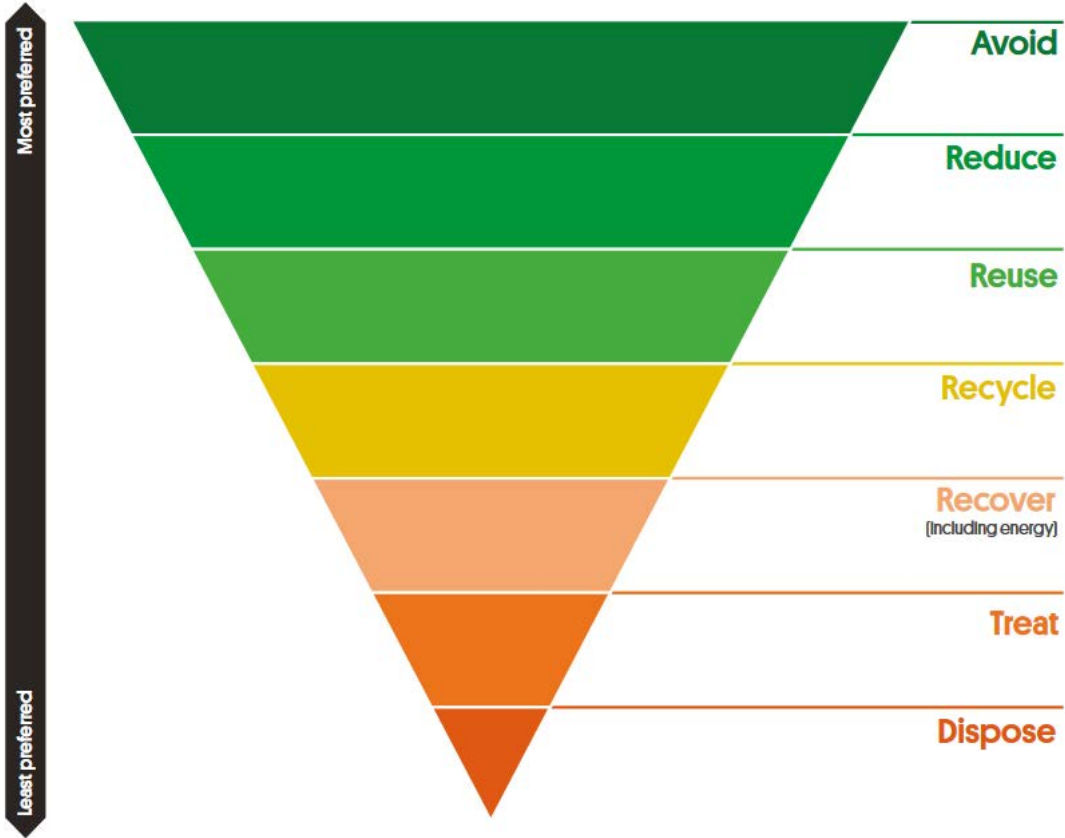
- by reducing reliance on virgin materials*
- on the basis of continuously functioning utility and an extended lifecycle*
- in a manner that eliminates, as far as is reasonably practicable, waste or pollution, or harm to the environment.”*

To support the transition to a ‘circular economy’, the Waste Strategy identifies the follows priority actions (which can be incorporated into the management of waste materials for the subject development during construction and operation):

- avoid waste;
- improve resource recovery;
- increase use of recycled material and build demand and markets for recycled products;
- better manage material flows to benefit human health and wellbeing, the environment, and the economy; and
- improve information to support innovation, guide investment and enable informed consumer decisions.



Such priorities are reflected in the 'Waste Management Hierarchy' (which is also identified in The Act) as illustrated in Figure 1. The management of waste associated with the construction and operation of the proposed development will be undertaken in line with the hierarchy.



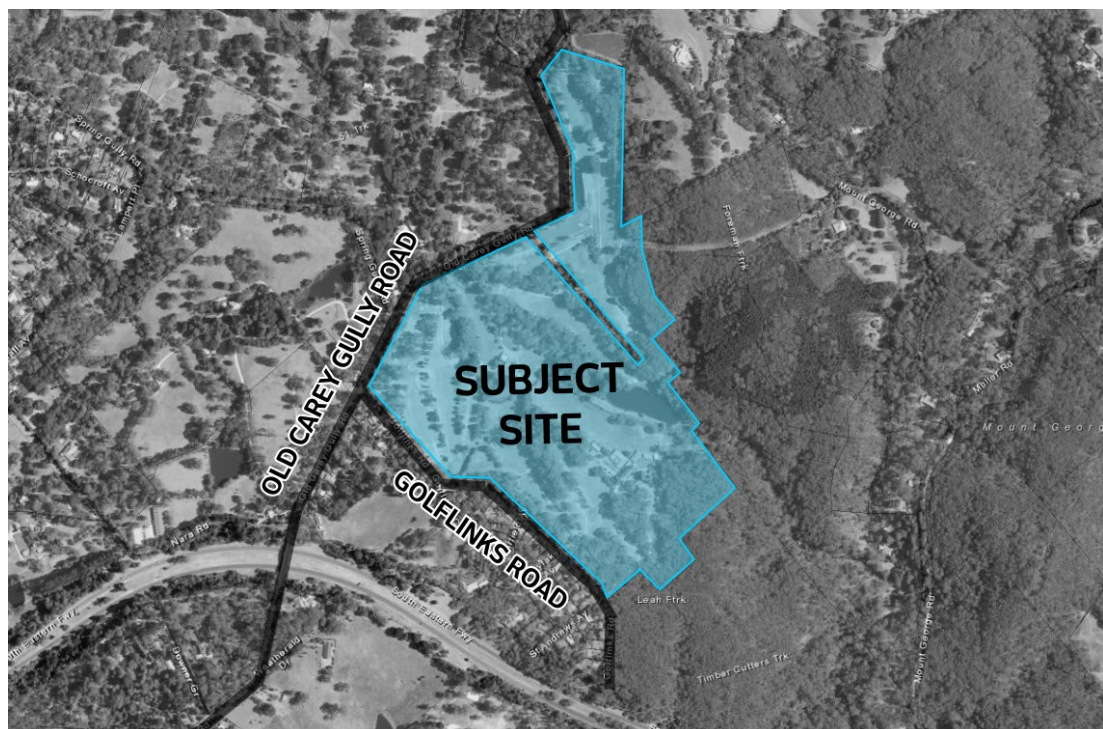
*Figure 1 - Waste management hierarchy*

(Source: after "South Australia's Waste Strategy 2020-2025", 2020)

### 3. PROJECT DESCRIPTION

#### 3.1 SUBJECT SITE

The subject site is located on the corner of Old Carey Gully Road and Golflinks Road, Stirling. The site is bound by residential properties to the north, Mount George Conservation Park to the east, Golflinks Road to the south and Old Carey Gully Road to the west. Figure 1 illustrates the location of the subject site.



*Figure 2 – Location of the subject site with respect to the adjacent road network*

The subject site is currently occupied by the existing Stirling Golf Club including the 18-hole golf course and its associated clubroom, pro-shop, five motel rooms, offices, maintenance buildings and the 'Perfumery' building. The Club hosts functions and weddings (for up to 300 guests) as well as regular events. Waste generated by the existing facilities are generally separated and stored on-site (generally adjacent the clubroom building) and collected by private refuse collection contractors.

#### 3.2 PROPOSED DEVELOPMENT

The proposed development comprises the demolition of the existing golf club buildings within the site and the construction of a new tourist accommodation facility. Specifically, the proposed development comprises:

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites;

- 15 x two bedroom serviced apartments;
- 15 x three bedroom serviced apartments;
- 2 penthouse serviced apartments;
- back of house, plant storage and maintenance areas;
- a 537 m<sup>2</sup> function room;
- a 212 m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace;
- a 186 m<sup>2</sup> sports bar.
- a 189 m<sup>2</sup> gallery and café; and
- a 94 m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – ‘Pods’
  - 17 x one bedroom units; and
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions;
  - extension to the Perfumery to include a covered outdoor dining area; and
  - orchard and perfumery garden plantings to reimagine the former use of the building as a “Scent Factory”.
- Golf Course Facilities
  - retention of 18-hole golf course with improvements;
  - refurbished function facilities, cart storage and 138 m<sup>2</sup> clubhouse in new building; and
  - new 97 m<sup>2</sup> pro-shop, administration areas, gym and change rooms.

### **3.3 DEMOLITION AND CONSTRUCTION PHASE**

The key construction activities to develop the new tourist accommodation facilities are anticipated to consist of the following:

- establishment of temporary construction site (offices, ablutions etc.) albeit during some stages of construction existing buildings may be utilised;
- demolition of a number of existing buildings, structures, paths and internal road/car park areas;
- clearance of vegetation where new works are proposed;
- earthworks/excavation where new works are proposed and (temporary) stockpiling of soils and fill;
- transport of construction equipment and materials to the site;

- construction of footings/foundations (concrete pouring);
- construction of new buildings and hard and soft landscaping;
- removal of construction waste materials (or reuse on-site where possible);
- rehabilitation of areas disturbed during the construction processes; and
- commissioning of the new facilities.

### **3.4 OPERATIONAL PHASE**

The key activities associated with the development (once completed and occupied) will relate to the continued use of the golfing facilities, accommodation of tourists, operation of the food, beverage and hospitality uses and various servicing and maintenance activities associated with the various facilities within the site. This will include the collection, segregation, reuse, recycling and removal of waste materials generated by the site's uses in line with this WMMP.

## 4. WASTE MANAGEMENT

The Waste Management Hierarchy identified in Section 2 forms the basis of the approach to waste management (and minimisation) for the proposed development. Such an approach aligns with the requirements of the “*Environment Protection Act 1993*” as well as the “*South Australia's Waste Strategy 2020-2025*”.

The management approach outlined in this WMMP will provide benefit to the owners and operators of the development as well as the broader community through reduced disposal costs, reduced liabilities and ethical/moral outcomes. The minimisation of waste materials will be particularly important for the tourist accommodation and hospitality uses given such uses traditionally generate relatively high levels of ‘waste to landfill’ (a reasonable proportion of which is avoidable).

### 4.1 DEMOLITION AND CONSTRUCTION PHASE

The demolition of existing buildings and infrastructure within the site and construction of the proposed development will result in the generation of a variety of waste materials. Table 1 identifies the primary potential sources of waste during these stages of the development.

*Table 1 – Potential Sources of Waste during the Construction Phase*

<b>Waste Type</b>	<b>Activity</b>
Spoil	Excavation and Site Preparation
Potentially Contaminated Soil	Excavation and Site Preparation
Clean Fill	Excavation and Site Preparation
Organic Waste/Vegetative Matter	Land and Vegetation Clearance
Waste Water	Demolition and Construction Processes
Waste Concrete	Demolition and Construction Processes
Scrap Metal	Demolition and Construction Processes
Timber Waste	Demolition and Construction Processes
Other Waste (Bricks, Plasterboard, Glass etc.)	Demolition and Construction Processes
Hazardous Materials/Chemicals	Demolition and Construction Processes

The various waste materials generated during the construction phases (including demolition) will be stored within the site and clearly separated for reuse, recycling or disposal. The ultimate locations and extent of area retained for separated waste storage will be identified once the construction contractor has been selected and its construction methodology identified. The WMMP can be updated once this has occurred (or, alternatively, this could form part of a Construction Environment Management Plan (CEMP). Given the size of the subject site, it is

anticipated that there will be ample area for the appropriate storage and segregation of waste materials during the construction phases.

During the construction phase, contractors and subcontractors will be required to adhere to the WMMP (and CEMP). The head contractor shall ensure that all workers/trades:

- take reasonable measures to avoid and minimise waste generation from their work;
- take reasonable measures to reuse and recycle waste materials from their work;
- minimise oversupply of materials and any oversupplied materials are returned to the supplier or reused/recycled; and
- appropriately separate waste streams and transfer to on-site collection and storage areas.

In addition, the head contractor/site manager will be responsible for:

- ensuring that adequate areas for the on-site storage of waste materials are set aside with clearly defined separation between waste types (including clear separation of materials for reuse and recycling);
- ensuring that there is coordination between subcontractors to minimise waste generation and maximisation of on-site reuse of waste materials;
- regularly monitor waste storage areas and containers to ensure appropriate waste separation is occurring and to minimise contamination or leakage;
- ensuring that works are inducted and trained in respect to the principles and requirements of the WMMP;
- ensuring contractors engaged to transport waste to recycling, reuse/recovery or disposal facilities are appropriately licenced; and
- ensuring that non-conformances are identified and corrective action is taken where required to ameliorate issues and/or hazards.

In respect to the management of hazardous waste during the construction phase, the following procedures shall be followed:

- all hazardous wastes are to be correctly identified and separated into individual categories;
- suspected hazardous waste will be treated as hazardous until confirmed otherwise; and

- all hazardous wastes are to be handled, stored (including clear signage identifying the waste and any associated risks) and disposed of in accordance with relevant legislation and policies.

Contractors transporting waste materials from the site to reuse/recovery, recycling or disposal facilities will be required to identify the intended facilities to ensure that they are appropriately licenced and relevant legislative requirements are met, that the principles of the WMMP are met and the maximum diversion from landfill is achieved.

## 4.2 OPERATIONAL PHASE

An assessment of the waste management considerations has been prepared based on typical generation rates adopted within SA (for instance, from Zero Waste's "South Australian Better Practice Guide", 2014). Specifically, the following rates have been adopted for the assessment of the proposal:

- **tourist accommodation** (applied to the hotel rooms and pods)
  - general waste – 5 L per bedroom per week;
  - recycling – 3 L per bedroom per week; and
  - green organics (including food waste) – 1.5 L per bedroom per week.
- **high density apartment dwellings** (applied to the apartments)
  - general waste – 30 L per bedroom per week;
  - recycling – 25 L per bedroom per week; and
  - green organics (including food waste) – 10 L per bedroom per week.
- **bar** (applied to the bar and clubhouse)
  - general waste – 5 L per 10 m<sup>2</sup> floor area per day;
  - recycling – 5 L per 10 m<sup>2</sup> floor area per day; and
  - green organics (including food waste) – 0.25 L per 10 m<sup>2</sup> floor area per day.
- **restaurant** (applied to restaurant, café, function area and perfumery building)
  - general waste – 30 L per 10 m<sup>2</sup> floor area per day;
  - recycling – 5 L per 10 m<sup>2</sup> floor area per day; and
  - green organics (including food waste) – 40 L per 10 m<sup>2</sup> floor area per day;
- **retail** (applied to pro-shop)
  - general waste – 5 L per 10 m<sup>2</sup> floor area per day;
  - recycling – 2.5 L per 10 m<sup>2</sup> floor area per day; and

- green organics (including food waste) – 0.25 L per 10 m<sup>2</sup> floor area per day.
- **office** (applied to golf administration area – noting that offices associated with the other uses are accounted for in the above rates)
  - general waste – 15 L per 10 m<sup>2</sup> floor area per week;
  - recycling – 15 L per 10 m<sup>2</sup> floor area per week; and
  - green organics (including food waste) – 2.5 L per 10 m<sup>2</sup> floor area per week.

For the gym and wellness centre, it is assumed that these are wholly ancillary to the tourist accommodation and waste associated with these uses is already accounted for in the 'per room' rates. In addition, a 30% discount has been applied to the café and perfumery areas (as café style dining typically generates lower rates than full service restaurants) and a 50% discount has been applied to the function room (as it would be unlikely that the function areas would be utilised at full occupancy every day of the week).

On the basis of the above rates, the new uses (excluding the golf facilities) are forecast to generate:

- **general waste** – 18,341 L per week;
- **recycling** – 4,612 L per week; and
- **green organics (including food waste)** – 21,776 L per week.

Based on the above, the following number of bins and servicing frequencies have been identified:

- **general waste** – ten (10x) 660 L bins serviced three times a week;
- **recycling** – four (4x) 660 L bins serviced twice a week (to maximise reuse and recycling, these will be further segregated to cardboard, plastics, glass and cans (one bin each); and
- **green organics (including food waste)** – eleven (12x) 660 L bins serviced three times per week.

In reality, lower levels of green organics waste will need to be collected from the site as the golf course will utilise a proportion for composting. Management and staff of the tourist accommodation and hospitality uses should maximise separation of green organic waste for composting (where safe and appropriate). Similarly, green waste (such as grass clippings, vegetation trimmings etc.) from the golf course maintenance will also be retained on-site for composting. External



areas (adjacent maintenance facilities) will be set aside for composting of organic materials and reuse within the golf course and landscaped areas within the site.

It is also likely that there will be additional efficiencies achieved in waste management than suggested by direct application of the above 'stand-alone' rates.

Nevertheless, as a worst case, the bin store areas have been designed to accommodate 28x 660L bins as illustrated on the R Architecture plans. The above assessment indicates that there will be a need for approximately 25 bins (660 L) and that sufficient room has therefore been provided to accommodate likely waste generation levels. Specifically, there will be a bin room on the lower ground floor (with room for 14 bins) and a bin room adjacent the service bay on Level 1 (with room for 14 bins). Staff will rotate bins between the two areas as required when they become full and for collection.

In addition to the above primary waste streams, it is anticipated that there would also be a range of secondary waste materials generated by the operation of the site. These include used batteries, used ink/toner cartridges, disused and electronics/IT equipment.

Waste materials not able to be reused within the site will be collected by waste contractors from the service bay on Level 1 for transport to recycling, recovery or waste disposal facilities. As detailed in the traffic impact report for the development, the service area has been designed to adequately and safely accommodate refuse collection vehicle movements.

The following specific responsibilities and tasks should be undertaken by building management/maintenance staff during the operation of the site:

- ensure that the waste area is secured to avoid theft and/or inappropriate use of the waste provisions;
- ensure that the waste area and transfer pathways are inspected and cleaned routinely to ensure these areas are kept hygienic and clear of loose waste;
- ensure that bins are labelled/signed appropriately to identify the relevant waste type;
- ensure that staff (including cleaning and maintenance contractors) are inducted and educated in respect to the appropriate management and disposal of waste within the site; and
- ensure that staff (including cleaning and maintenance contractors) adhere to the waste management arrangements and manage undesirable behaviour as and if required.

### **4.3 TRAINING AND EDUCATION**

During both the construction and operational phases, site employees and contractors shall be inducted in respect to principles and procedures outlined in this WMMP. In particular, all employees and contractors are to have a clear understanding of the prioritisation of waste avoidance, reuse and recycling, the segregation of waste types and where they are stored.

## **5. WASTE MINIMISATION**

### **5.1 WASTE AVOIDANCE AND MINIMISATION**

The generation of waste will be avoided where possible during the construction phase by the strategic selection of materials during the detailed design and documentation of the project. In particular, the following outcomes shall be sought through the documentation, tendering and procurement stages of the development:

- the selection of materials for the proposal should include consideration of and, where possible/feasible, adopt options which reduce waste generation for the development;
- the specification and procurement of materials should be carefully planned to ensure that materials are not unnecessarily over-supplied;
- opportunities for prefabrication of items should also be explored during detailed design and procurement and adopted where practical to minimise surplus material;
- specification of recyclable materials and items where possible to minimise waste to landfill during construction;
- request that packaging materials utilised by suppliers are recyclable or returnable for reuse; and
- identify construction methodologies to minimise vegetation clearance and excavation where possible.

During the operation of the development, there will be a number of opportunities to avoid and minimise the generation of waste. Notably, significant proportions of waste generation at tourist facilities typically relate to packaging waste which can relatively easily be avoided or minimised. Best practice measures to avoid and minimise waste include:

- selection of goods and products with less packaging and returnable packaging;
- sourcing of goods and products locally, where possible (this could include on-site growing of herbs, fruits and/or vegetables);
- storage of perishable goods in appropriate conditions to avoid spoil;
- minimising the number of individually packaged toiletries within accommodation rooms (e.g. use refillable soap and shampoo dispensers instead of small individual products, non-essential toiletries provided on request only);

- requiring that single use plastic straws, cutlery and stirrers, polystyrene cups, bowls, plates and containers, and oxo-degradable plastic products not be supplied or used (noting that such products are banned by the “*Single-use and Other Plastic Products (Waste Avoidance) Act 2020*”);
- avoidance of single use plastic water bottles (for instance, use of glass bottles for water pitchers at conferences/functions);
- avoid use of paper napkins by using washable cloth napkins instead;
- use of cloth bags for collection of linen, towels and guest laundry items instead of plastic bags; and
- minimising printing of paper where possible (such as issuing of receipts/invoices via email or phone messaging, use double sided printing, etc.).

## **5.2 REUSE AND RECYCLING**

In order to maximise opportunities for reuse of waste materials on or off site, waste streams are to be separated (during both construction and operational phases). Waste streams will be segregated into appropriate dedicated bins and/or storage areas within the site and, where not able to be reused within the site, transported to designated waste facilities (where possible, recycling facilities). In particular, during both construction and operation, waste material should be reused or recycled where possible including clean fill, concrete, brick, timber, metals, plastics, cardboard/paper and glass.

Segregation of waste streams will occur at the source (where practical) to minimise additional handling and inefficiencies. For instance, waste bins within tourist accommodation rooms will allow for segregation of general waste from recyclables to minimise waste to landfill and ease of waste separation by staff. Similarly, interim waste storage within kitchens, bars etc. will also include provisions for segregation at the source prior to transfer to the waste storage and collection areas.

Table 2 illustrates key opportunities for recycling and reuse associated with the operation of the development.

*Table 2 - Recycling and Reuse Opportunities*

<b>Waste Type</b>	<b>Recycling/Reuse Opportunity</b>
Clean Fill	Reuse within site or transport to other project sites for use
Rocks/Stones	Reuse within landscaping on-site or transport to other sites for use
Vegetation Trimmings/Grass Clippings	Mulch/compost and reuse for landscaping on-site
Waste Concrete or Bricks	Reuse within site, transport to other project sites for use or recycling facilities
Scrap Metal	Transport to scrap metal recycler
Timber Waste	Mulch on site and reuse for landscaping (if possible), pallets to be returned to supplier for reuse, other timber transported to salvage resellers
Food Supply Containers (Foam or Cardboard Boxes)	Returned to supplier for reuse
Recyclables (Glass, Cardboard, Plastic, Cans etc.)	Transport to recycling facilities
Green/Organic/Food Waste	Compost on-site where possible or transport to organic recycling facilities
Other (Batteries, Cartridges, Electronics)	Transport to recycling facilities

### **5.3 TREATMENT AND DISPOSAL**

Where possible, waste materials should be reused on-site. For waste materials that cannot be used within the site, these will be collected by private waste contractors for off-site reuse and recycling (where possible) and final disposal (when reuse or recycling is not possible).

To manage the treatment and disposal of waste material during the construction and operational phases of the develop, the following measures will be implemented:

- waste material that cannot be reused or recycled will be clearly separated from those materials that can be;
- storage bins for all waste streams will be clearly signed/labelled to ensure mixing of waste types does not occur;
- staff (including cleaning and maintenance contractors) will be inducted in respect to the WMMP, its principles and the required waste management practices for the development; and
- hazardous materials will be disposed in accordance with relevant legislation and guidelines.

Waste contractors (including transport providers) shall be appropriately licenced for the removal and treatment of waste materials collected from the site. Similarly, facilities utilised for recycling and/or disposal shall also be licenced.

## 6. REVIEW

Given the construction contractor has not yet been selected and detailed construction methodology is not yet available, it is desirable that this WMMP is reviewed (and updated if necessary) prior to construction. This could be undertaken in conjunction with the preparation of a Construction Environment Management Plan (CEMP) for the project.

Similarly, the operator of the tourism accommodation has not yet been confirmed and, once identified, it would be desirable that the WMMP be reviewed and updated (if necessary). Many tourism accommodation operators have similar waste management policies and plans and there would be an opportunity to align and refine them with the WMMP (and vice versa) prior to opening of the facilities.

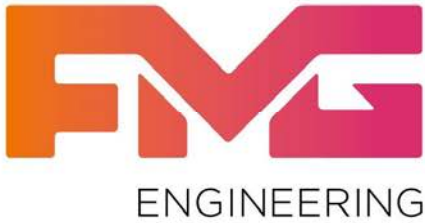
In addition, it is desirable that the WMMP be periodically reviewed once the development is operational to ensure that best practice measures are undertaken, relevant legislative requirements are met (particularly when these change over time) and that the objectives of the Plan remain relevant and are adequately addressed. Periodic review will also allow opportunities for emerging and future technologies (such as small scale waste to energy technology) to be considered for the site once feasible for implementation at such a facility.

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## **Appendix 13**

*Appendix K of Development Report – Geotechnical investigations*

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# Preliminary Geotechnical Investigation Report

## Civil Engineering at Stirling Golf Club

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<b>Job Number</b>	275203
<b>Client</b>	Venture Capital Developments Pty Ltd
<b>Site</b>	Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152
<b>Date</b>	04/05/2021
<b>Revision</b>	0

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## 1.0 Introduction

FMG Engineering (FMG) has been commissioned to undertake a preliminary geotechnical investigation at Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152 for a Development Application to develop the site as Mount Lofty Golf Estate. The approximate site extents are shown below in Figure 1.



Figure 1: Site location

### 1.1 Proposed development and objectives

We understand from the documents and discussions provided that the proposed Mount Lofty Golf Estate development comprises accommodation Chalets, hotel, restaurant, pro shop, carpark and amphitheatre etc. Maximum building height of two-storey is proposed. We have been provided with the following drawings on which we have based this assumption.

- *MOUNT LOFTY COURSE MASTER PLAN*

A preliminary geotechnical investigation was required to better understand the top soil profiles and to classify the site soils. The approved scope of work can be found in our Fee Proposal letter (EST23936).

### 1.2 Reporting

This report summarizes the methodology adopted and the works undertaken during the site investigation, followed by the investigation findings and site classification. Borelogs are appended.

## 2.0 Preliminary / Desktop study

### 2.1 Site description

The site investigation area is located within the established Stirling Golf Club site. The site is approximately 20km South East of the Adelaide CBD and 0.5km off South Eastern Freeway. The site is near the toe of a hill sloping down towards the north, and terraced for buildings and carpark. A small dam and creek are noted north of the proposed development. A significant number of trees are present on site and on surrounding lands.

Surrounding site conditions comprise:

- North: Golf court
- East: Vacant land
- South: Golf court and Golflinks Road on upper hill
- West: Mount George

### 2.2 Geology

The South Australian Department for Energy and Mining online GIS database "SARIG" indicates that the regional near surface geology across the entire site to be Barossa Complex, described as Metamorphic rocks with retrograde metamorphism; metasediments, strongly banded parallel to gneissic foliation; minor intrusive granitic, pegmatitic and amphibolitic dykes. Granulite facies metapelites.

Nearby boreholes in the SARIG and FMG database indicate that the weathered rock bed could be at shallow depth (0.5m from shallowest record).

## 3.0 Site investigation and results

### 3.1 Methodology

Independent service locating was undertaken by ILS prior to drilling.

Borehole were located according to verbal advice provided by yourselves, and are shown on the site plan included in Appendix A. As advised, an additional borehole than proposed in our initial proposal was added. A total of 11 Boreholes were drilled using a Rockmaster 4WD mounted drill rig owned and operated by SPK Geodrill under the supervision of a Geotechnical Engineering on 29<sup>th</sup> April 2021.

Thick walled tubes were used to recover relatively continuous cores. Tubes were progressed by pushing the tube against the weight of the vehicle, by a high-frequency hydraulic hammer, and rotation of the tubes.

Only BH10 was terminated at the target depth, the rest of boreholes were all terminated when high resistance was encountered to push tubes. Depth achieved ranged from 0.4m to 4.0m. Recovered samples were placed in trays and transported to our laboratory for logging.

Visual tactile logging was carried out in accordance with AS1726 by an experienced Soil Technician and checked by Geotechnical Engineer. Borelogs are included in Appendix B.

A summary of achieved depths is shown in Table 1.

*Table 1 Summary of achieved depths*

TEST	DEPTH ACHIEVED (m)	TEST	DEPTH ACHIEVED (m)
BH01	2.2	BH07	0.4
BH02	2.8	BH08	1.8
BH03	2.3	BH09	2.1
BH04	1.2	BH10	4.0
BH05	2.1	BH11	3.0
BH06	1.6		

### 3.2 Summary of subsoil conditions

A description of the materials encountered during the investigation is included in the borehole log included in Appendix B and a generalised summary can be found in the table below. It should be noted that pocket penetrometer readings included on the logs indicate an approximation of unconfined shear strength and have been used in the interpretation of the allowable bearing capacities given in the footing recommendations section.

High resistance encountered to the drilling is interpreted as weathered rock. Weathering is likely to decrease with depth, with an increase in rock strength. It should be noted that the drilling method used does not provide any information regarding defects or bedding of the rock, and hence can not provide any data on the strength nor stability of the rock mass.

Table 2 outlines a summary of subsurface conditions.

*Table 2 Summary of subsurface conditions*

MATERIAL	DEPTH ENCOUNTERED (m)					
	BH01	BH02	BH03	BH04	BH05	BH06
Fill	0-0.2	0-0.35	N.E	N.E	0-0.2	0-0.2
Natural soils	0.2-1.8	0.35-2.6	0-1.6	0-0.7	0.2-1.5	0.2-1.3
Rock	1.8-2.2	2.6-2.8	1.6-2.3	0.7-1.2	1.5-2.1	1.3-1.6

MATERIAL	DEPTH ENCOUNTERED (m)				
	BH07	BH08	BH09	BH10	BH11
Fill	0-0.2	0-0.3	0-0.65	0-1.4	0-0.25
Natural soils	0.2-0.3	0.3-1.4	0.65-1.7	1.4-4.0	0.25-2.8
Rock	0.3-0.4	1.4-1.8	1.7-2.1	N.E	2.8-3.0

N.E Not Encountered

The natural subsurface conditions encountered in the boreholes are considered consistent with the regional geology from our desktop study.

### 3.3 Groundwater

Groundwater was not observed during drilling. It should be noted that the occurrence of groundwater may vary seasonally with rainfall intensity and duration.

### 3.4 Site classification

Free swell  $y_s$  values have been calculated in accordance with AS2870-2011. Although AS2870-2011 is considered appropriate for this application the design should be based on engineering principles.

The site in its current condition is classified as CLASS **P** (problem site) due to the presence of fill and trees and **M-D** due to soil reactivity.

The characteristic surface movement due to soil shrinking and swelling ( $y_s$ ) has been calculated in accordance with AS2870-2011 "Residential Slabs and Footings" (to the nearest 5mm). Taking into account the effects of trees in accordance with AS2870-2011, the additional characteristic surface movement due to ground tree effects ( $y_t$ ) has also been calculated.

- $y_s = 35\text{mm}$
- $y_t = 15\text{mm}$

The site classification is strongly related to depth of the rock. Locations where rock is shallow have lower shrink-swell potential. Values of heave  $y_s$  vary from 2mm at Borehole 7 to 37mm at Boreholes 2 and 11.

It must be emphasised that in classifying this site, FMG Engineering did not place sole reliance on the borelog as a means of being an absolute representation of all subsurface features existing at this site. The following have also been taken into consideration.

- The broad experience of FMG Engineering
- Well established and relevant local knowledge of the general behavioural characteristics of foundation soils in the vicinity of the site
- Specific geotechnical reports and classification on adjacent sites which were referred to
- FMG Engineering's vast experience relating to past performance of existing structures in the general area
- Published geological maps
- Engineering assessment of the likely characteristic surface movement ( $y_s$ ) based on estimated  $I_{ps}$  values as noted on the borelog.  $I_{ps}$  values are based on Shrink Swell tests ( $I_{ss}$ ) carried out in a laboratory on similar soils to this site
- It can occasionally be difficult to distinguish between natural soil and controlled FILL during testing. It is also impossible to distinguish between uncontrolled FILL and controlled FILL without appropriate information. It shall be the Client's responsibility to determine whether any controlled FILL exists on the site, and to provide FMG with the relevant Certificate(s) at the time of our engagement, prior to the fieldwork being carried out. FMG takes no responsibility for any additional costs which may be incurred due the presence of Controlled FILL which is not detected during our testing, and which is instead logged as either (uncontrolled) FILL or natural soil.

## 4.0 Important notes about the interpretation and use of this geotechnical report

These notes are offered to help in the interpretation of your Geotechnical Report.

The level of investigation and degree of certainty required is dependent upon the complexity of the proposed construction.

Should a more conclusive assessment be required regarding the subsoil conditions at the property, FMG Engineering can arrange to undertake a more detailed study including further sampling and laboratory testing. There will always be uncertainties arising from the practical limitations of the extent and nature of site testing and localised changes in soil conditions may not be found in any cause.

This report should be read as a whole. Borelogs should not be separated from the body of the report and interpreted independently. The whole of this report should be provided to contractors in order to provide the best available information to the contractors. To avoid any misinterpretation of the contents of the report consult the geotechnical engineer for any queries or proposed changes or unexpected conditions.

### 4.1 The limitations of a geotechnical investigation

Although the information provided by a geotechnical investigation can reduce exposure to such risks, no geotechnical investigation, however diligently carried out, can eliminate them. Even a rigorous professional assessment may fail to detect all subsoil and ground water variations on a site. The geology of the site may make predicting changes difficult.

A geotechnical investigation is based upon a unique set of project conditions.

Your report should not be used:

- When the nature of the proposed development or use is changed, for example if a residential development is proposed instead of a commercial one
- When the size or configuration of the proposed development is altered
- When the location or orientation of the proposed structure is modified
- When there is a change of ownership
- For application to an adjacent site.

The circumstances about a particular development or contract may require a specified approach to the assessment of soil and groundwater conditions.

To help avoid costly problems, refer to your consultant to determine how any factors which have changed subsequent to the date of the report may affect our recommendations.

### 4.2 Geotechnical 'findings' are professional estimates

Site assessment identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing is interpreted by geologists, engineers or scientists who then render an opinion about overall subsurface conditions

and the nature and homogeneity of subsurface conditions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, and no subsurface exploration programme, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise its impact. For this reason, owners should retain the services of their consultants through the development stage, to identify variations, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site or during the tender process.

A report prepared for the purposes of the geotechnical engineer's direct client may not meet the objectives of a third party or contractor. Consult the geotechnical engineer for guidance in the application of the report to your purposes.

### **4.3 Unforeseen conditions**

Should conditions encountered on site be markedly different from those anticipated and described in this report then FMG Engineering should be notified immediately. Early identification of site anomalies generally results in any problems being more readily resolved and allows reinterpretation and assessment of the implications for future work.

### **4.4 Safety in design**

This Geotechnical Report presents factual information about the soil conditions at the subject site. This may be used for design purposes. At the time that this report was prepared, FMG Engineering were not informed of the details at the proposed building (workplace) to be constructed. Consequently, FMG Engineering have not carried out a Preliminary Hazard Analysis nor been able to consider Safety in Design for the proposed development. It is the responsibility of the designer to use the information contained within this report when undertaking a Safety in Design assessment for the specific development.

Please contact FMG Engineering if Safety in Design analysis is required as the project develops.





# **Appendix A**

Site plan





# **Appendix B**

**Borelogs**

**Engineering Log - Borehole**

Project No.: S53897/275203

Client: Venture Capital Developments Pty Ltd	Commenced: 29/04/2021
Project Name: Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152	Completed: 29/04/2021
Hole Location:	Logged By: PP
Hole Position: Coordinate System: MGA94 54H	Checked By: FF
Drill Model: Rockmaster	RL Surface:
Drill Operator: SPK GeoDrill Pty Ltd	Hole Diameter: 50mm
	Datum:

Drilling Information				Soil Description						Observations							
Method	Penetration	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations					
PT	Groundwater Not Encountered	PP: 0.50m 400kPa	1	1	[Cross-hatch]	FILL	GRAVELLY SAND: pale grey yellow; of non plasticity; with silt; sand, medium grained; gravel, angular, up to 20mm; dry to moist; loose.	D - M	L	0%		FILL					
					[Dotted]	SC-SM	CLAYEY SILTY SAND: pale brown yellow; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	L - MD	0.5%		TOPSOIL					
					[Horizontal lines]	CH	CLAY: grey mottled brown; of high plasticity, trace sand; moist; very stiff.	M	VSt	3.5%		ALLUVIUM					
					[Vertical lines]	CI-CH	SILTY SANDY CLAY: pale brown orange; of medium to high plasticity, trace gravel; gravel, angular, up to 20mm; moist; stiff.	M	St	2%							
					[Dotted]	SC	CLAYEY SAND: pale cream yellow ; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	L - MD	0.3%							
					[Horizontal lines]	CI	SILTY SANDY CLAY: pale grey mottled yellow; of medium plasticity; moist; stiff.	M	St	1.5%							
					[Vertical lines]		WEATHERED SILTSTONE: trace of gravel, angular, up to 20mm, silty clay in seams. of low plasticity, pale orange mottled cream.	M	H	0.3%		RESIDUAL SOIL					
					[Vertical lines]		WEATHERED SILTSTONE: fragmented pieces, non-plastic. pale yellow cream. Hole Terminated at 2.20m - Refusal	M	H	0%		BEDROCK					
								2	2								
								?	3								

<p><b>Method</b></p> <p>PT - Push tube</p>	<p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p>	<p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow △ Partial Loss ▲ Complete Loss</p>	<p><b>Penetration</b></p> <p>[No resistance symbol] No resistance [Step symbol] range to refusal</p>	<p><b>Samples and Tests</b></p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test PP - Pocket Penetrometer</p>	<p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p> <p>&gt; PL = PL &lt; PL</p>	<p><b>Photo</b></p>
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**Engineering Log - Borehole**

Project No.: S53897/275203

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Project Name: Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152	Completed: 29/04/2021
Hole Location:	Logged By: PP
Hole Position: Coordinate System: MGA94 54H	Checked By: FF
Drill Model: Rockmaster	RL Surface:
Drill Operator: SPK GeoDrill Pty Ltd	Hole Diameter: 50mm
	Datum:

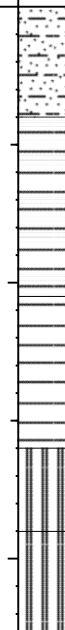
Drilling Information				Soil Description					Observations					
Method	Penetration	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations	
PT	Groundwater Not Encountered		PP: 0.50m 400kPa	1	1		FILL	GRAVELLY SAND: black to orange brown; of low plasticity; with clay / silt; sand, medium grained; gravel, angular, up to 20mm; moist; loose; some roots, glass pieces were observed.	M	L	0.3%			FILL
							SC-SM	CLAYEY SILTY SAND: pale brown yellow; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	L-MD	0.5%		TOPSOIL	
							CH	CLAY: grey mottled brown; of high plasticity, trace sand; moist; very stiff.	M	VSt	3.5%		ALLUVIUM	
							CI-CH	SILTY SANDY CLAY: pale brown orange; of medium to high plasticity, trace gravel; gravel, angular, up to 20mm; moist; stiff.	M	St	2%			
							CI	SILTY SANDY CLAY: pale grey mottled yellow; of medium plasticity; moist; stiff.	M	St	1.5%			
							SC	CLAYEY SAND: pale cream yellow ; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	L-MD	0.3%			
				2	2			WEATHERED SILTSTONE: fragmented pieces, non-plastic. pale yellow cream. Hole Terminated at 2.80m - Refusal	M	H	0%		BEDROCK	
				?	3									

<p><b>Method</b></p> <p>PT - Push tube</p>	<p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p>	<p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow ▽ Partial Loss ▲ Complete Loss</p>	<p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p>	<p><b>Plastic Limit</b></p> <p>&gt; PL = PL &lt; PL</p>	<p><b>Penetration</b></p> <p> No resistance range to refusal</p>	<p><b>Photo</b></p>
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**Engineering Log - Borehole**

Project No.: S53897/275203

Client: Venture Capital Developments Pty Ltd	Commenced: 29/04/2021
Project Name: Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152	Completed: 29/04/2021
Hole Location:	Logged By: PP
Hole Position: Coordinate System: MGA94 54H	Checked By: FF
Drill Model: Rockmaster	RL Surface:
Drill Operator: SPK GeoDrill Pty Ltd	Hole Diameter: 50mm
	Datum:

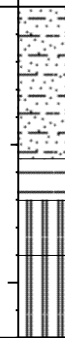
Drilling Information				Soil Description					Observations				
Method	Penetration	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
PT	Groundwater Not Encountered			1	1		SC-SM	CLAYEY SILTY SAND: pale brown yellow; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	L - MD	0.5%	100	TOPSOIL
							CI-CH	SILTY SANDY CLAY: pale brown orange; of medium to high plasticity, trace gravel; gravel, angular, up to 20mm; moist; stiff.	M	St	2%	200	ALLUVIUM
							CI	SILTY SANDY CLAY: pale grey mottled yellow; of medium plasticity; moist; stiff.	M	St	1.5%	300	
								WEATHERED SILTSTONE: trace of gravel, angular, up to 20mm, silty clay in seams. of low plasticity, pale orange mottled cream.	M	H	0.3%	400	RESIDUAL SOIL
								WEATHERED SILTSTONE: fragmented pieces, non-plastic. pale yellow cream.	M	H	0%	500	BEDROCK
				2	2			Hole Terminated at 2.30m - Refusal					
				?	3								

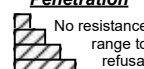
<p><b>Method</b></p> <p>PT - Push tube</p>	<p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p>	<p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow △ Partial Loss ▲ Complete Loss</p>	<p><b>Penetration</b></p> <p>▨ No resistance ▧ range to refusal</p>	<p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p> <p>&gt; PL = PL &lt; PL</p>	<p><b>Samples and Tests</b></p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test PP - Pocket Penetrometer</p>	<p><b>Photo</b></p>
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**Engineering Log - Borehole**

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Hole Location:	Logged By: PP
Hole Position: Coordinate System: MGA94 54H	Checked By: FF
Drill Model: Rockmaster	RL Surface:
Drill Operator: SPK GeoDrill Pty Ltd	Hole Diameter: 50mm
	Datum:

Drilling Information				Soil Description					Observations				
Method	Penetration	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
PT	Groundwater Not Encountered			1	1		SC-SM	CLAYEY SILTY SAND: pale brown yellow; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	L-MD	0.5%		TOPSOIL
							CI	SILTY SANDY CLAY: pale grey mottled yellow; of medium plasticity; moist; stiff.	M	St	1.5%	ALLUVIUM	
								WEATHERED SILTSTONE: trace of gravel, angular, up to 20mm, silty clay in seams. of low plasticity, pale orange mottled cream.	M	H	0.3%	RESIDUAL SOIL	
								WEATHERED SILTSTONE: fragmented pieces, non-plastic. pale yellow cream. Hole Terminated at 1.20m - Refusal	M	H	0%	BEDROCK	
				2	2								
				3	3								

<p><b>Method</b></p> <p>PT - Push tube</p>	<p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p>	<p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow ▲ Partial Loss ▲ Complete Loss</p>	<p><b>Photo</b></p>
<p><b>Samples and Tests</b></p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test PP - Pocket Penetrometer</p>	<p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p>	<p><b>Plastic Limit</b></p> <p>&gt; PL = PL &lt; PL</p>	<p><b>Penetration</b></p> <p></p>	

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	Datum:

Drilling Information				Soil Description					Observations			
Method	Penetration	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
PT	Groundwater Not Encountered	PP: 0.50m 400kPa	1	1		FILL	SILTY SAND: pale orange brown; of non plasticity; with clay / gravel; sand, medium to fine grained; gravel, angular, up to 20mm; dry to moist; loose.	D - M	L	0%		FILL
						SC-SM	CLAYEY SILTY SAND: pale brown yellow; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	L - MD	0.5%		TOPSOIL
						CH	CLAY: grey mottled brown; of high plasticity, trace sand; moist; very stiff.	M	VSt	3.5%		ALLUVIUM
						CI-CH	SILTY SANDY CLAY: pale brown orange; of medium to high plasticity, trace gravel; gravel, angular, up to 20mm; moist; stiff.	M	St	2%		
						CI	SILTY SANDY CLAY: pale grey mottled yellow; of medium plasticity; moist; stiff.	M	St	1.5%		
							WEATHERED SILTSTONE: trace of gravel, angular, up to 20mm, silty clay in seams. of low plasticity, pale orange mottled cream.	M	H	0.3%		RESIDUAL SOIL
			2	2			WEATHERED SILTSTONE: fragmented pieces, non-plastic, pale yellow cream. Hole Terminated at 2.10m - Refusal	M	H	0%		BEDROCK
			?	3								

<p><b>Method</b></p> <p>PT - Push tube</p> <p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p> <p><b>Samples and Tests</b></p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test PP - Pocket Penetrometer</p> <p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p> <p><b>Plastic Limit</b></p> <p>&gt; PL = PL &lt; PL</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p> <p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow △ Partial Loss ▲ Complete Loss</p> <p><b>Penetration</b></p> <p> No resistance range to refusal</p>	<p>Photo</p>
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**Engineering Log - Borehole**

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Hole Position: Coordinate System: MGA94 54H	Checked By: FF
Drill Model: Rockmaster	RL Surface:
Drill Operator: SPK GeoDrill Pty Ltd	Hole Diameter: 50mm
	Datum:




Drilling Information				Soil Description					Observations			
Method	Penetration	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
PT	Groundwater Not Encountered	PP: 0.50m 400kPa	1	1	[Cross-hatch]	FILL	SILTY SAND: pale orange brown; of non plasticity; with clay / gravel; sand, medium to fine grained; gravel, angular, up to 20mm; dry to moist; loose.	D - M	L	0%		FILL
					[Dotted]	SC-SM	CLAYEY SILTY SAND: pale brown yellow; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	L - MD	0.5%		TOPSOIL
					[Horizontal lines]	CH	CLAY: grey mottled brown; of high plasticity, trace sand; moist; very stiff.	M	Vst	3.5%		ALLUVIUM
					[Horizontal lines]	CI-CH	SILTY SANDY CLAY: pale brown orange; of medium to high plasticity, trace gravel; gravel, angular, up to 20mm; moist; stiff.	M	St	2%		
					[Horizontal lines]	CI	SILTY SANDY CLAY: pale grey mottled yellow; of medium plasticity; moist; stiff.	M	St	1.5%		
					[Vertical lines]		WEATHERED SILTSTONE: trace of gravel, angular, up to 20mm, silty clay in seams. of low plasticity, pale orange mottled cream.	M	H	0.3%		RESIDUAL SOIL
					[Vertical lines]		WEATHERED SILTSTONE: fragmented pieces, non-plastic. pale yellow cream. Hole Terminated at 1.60m - Refusal	M	H	0%		BEDROCK
			2	2								
			3	3								



<p><b>Method</b></p> <p>PT - Push tube</p>	<p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p>	<p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow △ Partial Loss ▲ Complete Loss</p>	<p><b>Photo</b></p>
<p><b>Samples and Tests</b></p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test PP - Pocket Penetrometer</p>	<p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p>	<p><b>Plastic Limit</b></p> <p>&gt; PL = PL &lt; PL</p>	<p><b>Penetration</b></p> <p>[Diagonal lines] No resistance [Staircase] range to refusal</p>	

**Engineering Log - Borehole**

Project No.: S53897/275203

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	Datum:

Drilling Information				Soil Description						Observations			
Method	Penetration	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
PT		Water Not Encountered					FILL	GRAVELLY SAND: pale orange brown; of non plasticity; with clay / silt; sand, medium to fine grained; gravel, angular, up to 50mm; dry to moist; loose.	D - M	L	0%		FILL
							SC-SM		M	L - MD	0.5%		TOPSOIL
								CLAYEY SILTY SAND: pale brown yellow; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	H	0%		BEDROCK
				1	1			WEATHERED SILTSTONE: fragmented pieces, non-plastic. pale yellow cream. Hole Terminated at 0.40m - Refusal					
				2	2								
				3	3								

<p><b>Method</b></p> <p>PT - Push tube</p>	<p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p>	<p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow △ Partial Loss ▲ Complete Loss</p>	<p><b>Penetration</b></p> <p> No resistance  range to refusal</p>	<p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p> <p><b>Plastic Limit</b></p> <p>&gt; PL = PL &lt; PL</p>	<p><b>Samples and Tests</b></p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test PP - Pocket Penetrometer</p>	<p><b>Photo</b></p>
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**Engineering Log - Borehole**

Project No.: S53897/275203

Client: Venture Capital Developments Pty Ltd	Commenced: 29/04/2021
Project Name: Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152	Completed: 29/04/2021
Hole Location:	Logged By: PP
Hole Position: Coordinate System: MGA94 54H	Checked By: FF
Drill Model: Rockmaster	RL Surface:
Drill Operator: SPK GeoDrill Pty Ltd	Hole Diameter: 50mm
	Datum:

Drilling Information				Soil Description						Observations		
Method	Penetration	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
PT	Groundwater Not Encountered	PP: 0.40m 400kPa	1	1		FILL	GRAVELLY SAND: pale grey yellow; of non plasticity; with silt; sand, medium grained; gravel, angular, up to 25mm; dry to moist; loose; old paving base and bitumen.	D - M	L	0%	100	FILL  ALLUVIUM   RESIDUAL SOIL  BEDROCK
						CH	CLAY: grey mottled brown; of high plasticity, trace sand; moist; very stiff.	M	VSt	3.5%	200	
						CI-CH	SILTY SANDY CLAY: pale brown orange; of medium to high plasticity, trace gravel; gravel, angular, up to 20mm; moist; stiff.	M	St	2%	300	
						CI	SILTY SANDY CLAY: pale grey mottled yellow; of medium plasticity; moist; stiff.	M	St	1.5%	400	
							WEATHERED SILTSTONE: trace of gravel, angular, up to 20mm, silty clay in seams. of low plasticity, pale orange mottled cream.	M	H	0.3%	500	
			2	2			WEATHERED SILTSTONE: fragmented pieces, non-plastic. pale yellow cream. Hole Terminated at 1.80m - Refusal					
			3	3								

<p><b>Method</b></p> <p>PT - Push tube</p>	<p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p>	<p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow △ Partial Loss ▲ Complete Loss</p>	<p><b>Penetration</b></p> <p> No resistance range to refusal</p>	<p><b>Photo</b></p>
<p><b>Samples and Tests</b></p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test PP - Pocket Penetrometer</p>	<p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p>	<p><b>Plastic Limit</b></p> <p>&gt; PL = PL &lt; PL</p>			

**Engineering Log - Borehole**

Project No.: S53897/275203

Client: Venture Capital Developments Pty Ltd	Commenced: 29/04/2021
Project Name: Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152	Completed: 29/04/2021
Hole Location:	Logged By: PP
Hole Position: Coordinate System: MGA94 54H	Checked By: FF
Drill Model: Rockmaster	RL Surface:
Drill Operator: SPK GeoDrill Pty Ltd	Hole Diameter: 50mm
	Datum:

Drilling Information				Soil Description					Observations				
Method	Penetration	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations	
PT	Groundwater Not Encountered	PP: 0.80m 400kPa	1	1		FILL	SILTY SAND: pale orange brown; of low plasticity; with clay / gravel; sand, medium to fine grained; gravel, angular, up to 20mm; dry to moist; loose; bitumen concrete fragments.	D - M	L	0.3%			FILL
						SC-SM	CLAYEY SILTY SAND: pale brown yellow; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	L - MD	0.5%		TOPSOIL	
						CH	CLAY: grey mottled brown; of high plasticity, trace sand; moist; very stiff.	M	VSt	3.5%		ALLUVIUM	
						CI-CH	SILTY SANDY CLAY: pale brown orange; of medium to high plasticity, trace gravel; gravel, angular, up to 20mm; moist; stiff.	M	St	2%			
						CI	SILTY SANDY CLAY: pale grey mottled yellow; of medium plasticity; moist; stiff.	M	St	1.5%			
							WEATHERED SILTSTONE: trace of gravel, angular, up to 20mm, silty clay in seams. of low plasticity, pale orange mottled cream.	M	H	0.3%		RESIDUAL SOIL	
							WEATHERED SILTSTONE: fragmented pieces, non-plastic. pale yellow cream. Hole Terminated at 2.10m - Refusal	M	H	0%		BEDROCK	
			?	3									

<p><b>Method</b></p> <p>PT - Push tube</p>	<p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p>	<p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow ▲ Partial Loss ▲ Complete Loss</p>	<p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p>	<p><b>Plastic Limit</b></p> <p>&gt; PL = PL &lt; PL</p>	<p><b>Penetration</b></p> <p> No resistance range to refusal</p>	<p><b>Photo</b></p>
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**Engineering Log - Borehole**

Project No.: S53897/275203

Client: Venture Capital Developments Pty Ltd	Commenced: 29/04/2021
Project Name: Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152	Completed: 29/04/2021
Hole Location:	Logged By: PP
Hole Position: Coordinate System: MGA94 54H	Checked By: FF
Drill Model: Rockmaster	RL Surface:
Drill Operator: SPK GeoDrill Pty Ltd	Hole Diameter: 50mm
	Datum:

Drilling Information				Soil Description					Observations					
Method	Penetration	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations	
PT	Groundwater Not Encountered		PP: 1.50m 400kPa	1	1		FILL	GRAVELLY SAND: pale grey yellow; of non plasticity; with silt; sand, medium grained; gravel, angular, up to 20mm; dry to moist; loose.	D - M	L	0%		FILL	
								SILTY SANDY CLAY: black brown; of low plasticity, trace gravel; gravel, angular, up to 30mm; moist; firm.	M	F	0.5%			
					2	2		CH	CLAY: grey mottled brown; of high plasticity, trace sand; moist; very stiff.	M	VSt	3.5%		ALLUVIUM
									CI-CH	SILTY SANDY CLAY: pale brown orange; of medium to high plasticity, trace gravel; gravel, angular, up to 20mm; moist; stiff.	M	St		2%
										SC	CLAYEY SAND: pale cream yellow ; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M		L - MD
3	3		CI	SILTY SANDY CLAY: pale grey mottled yellow; of medium plasticity; moist; stiff.	M	St	1.5%							

Hole Terminated at 4.00m - Target depth

<p><b>Method</b></p> <p>PT - Push tube</p>	<p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>	<p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow △ Partial Loss ▲ Complete Loss</p>
<p><b>Samples and Tests</b></p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test PP - Pocket Penetrometer</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p>	<p><b>Penetration</b></p> <p> No resistance range to refusal</p>
<p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p>	<p><b>Plastic Limit</b></p> <p>&gt; PL = PL &lt; PL</p>	

**Engineering Log - Borehole**

Project No.: S53897/275203

Client: Venture Capital Developments Pty Ltd	Commenced: 29/04/2021
Project Name: Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152	Completed: 29/04/2021
Hole Location:	Logged By: PP
Hole Position: Coordinate System: MGA94 54H	Checked By: FF
Drill Model: Rockmaster	RL Surface:
Drill Operator: SPK GeoDrill Pty Ltd	Hole Diameter: 50mm
	Datum:

Drilling Information				Soil Description					Observations										
Method	Penetration	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency / Relative Density	Estimated Ipt	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations							
PT	Groundwater Not Encountered	PP: 0.60m 400kPa	1	1	[Cross-hatched]	FILL	SILTY SAND: pale orange brown; of non plasticity; with clay / gravel; sand, medium to fine grained; gravel, angular, up to 20mm; dry to moist; loose.	D - M	L	0%		FILL							
						[Dotted]	SC-SM	CLAYEY SILTY SAND: pale brown yellow; of low plasticity, trace gravel; sand, medium to fine grained; gravel, sub-rounded to angular, up to 10mm; moist; loose to medium dense.	M	L - MD	0.5%		TOPSOIL						
						[Horizontal lines]	CH	CLAY: grey mottled brown; of high plasticity, trace sand; moist; very stiff.	M	VSt	3.5%		ALLUVIUM						
								2	2	[Vertical lines]	CI-CH	SILTY SANDY CLAY: pale brown orange; of medium to high plasticity, trace gravel; gravel, angular, up to 20mm; moist; stiff.	M	St	2%				
											CI	SILTY SANDY CLAY: pale grey mottled yellow; of medium plasticity; moist; stiff.	M	St	1.5%				
			3	3	[Vertical lines]		WEATHERED SILTSTONE: trace of gravel, angular, up to 20mm, silty clay in seams. of low plasticity, pale orange mottled cream.	M	H	0.3%		RESIDUAL SOIL							
													BEDROCK						
							WEATHERED SILTSTONE: fragmented pieces, non-plastic, pale yellow cream. Hole Terminated at 3.00m - Refusal												

<p><b>Method</b></p> <p>PT - Push tube</p>	<p><b>Consistency / Relative Density</b></p> <p>VS - Very Soft S - Soft F - Firm Vst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>	<p><b>Water</b></p> <p>▽ Level (Date) ▽ Inflow △ Partial Loss ▲ Complete Loss</p>	Photo
<p><b>Samples and Tests</b></p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test PP - Pocket Penetrometer</p>	<p><b>Moisture Condition</b></p> <p>D - Dry M - Moist W - Wet</p>	<p><b>Plastic Limit</b></p> <p>&gt; PL = PL &lt; PL</p>	
<p><b>Classification Symbols and Soil Descriptions</b></p> <p>Based on Unified Soil Classification System</p>	<p><b>Penetration</b></p> <p>[No resistance] [Step pattern] range to refusal</p>		

# Borelogs and laboratory test results

## Soil description notes

The dominant soil constituents are given in capital letters followed by secondary textures. The dominant feature is determined from the Unified Soil Classification System and a soil symbol is used to define a soil layer as follows:

*Table 3 Borelog symbols*

USC SYMBOL	SYMBOL MEANING
<b>GW</b>	Well graded gravel
<b>GP</b>	Poorly graded gravel
<b>GM</b>	Silty gravel
<b>GC</b>	Clayey gravel
<b>SW</b>	Well graded sand
<b>SP</b>	Poorly graded sand
<b>SM</b>	Silty sand
<b>SC</b>	Clayey sand
<b>ML</b>	Silt of low plasticity
<b>CL</b>	Clay of low plasticity
<b>OL</b>	Organic soil of low plasticity
<b>CI</b>	Clay of intermediate plasticity
<b>MH</b>	Silt of high plasticity
<b>CH</b>	Clay of high plasticity
<b>OH</b>	Organic soil of high plasticity
<b>Pt</b>	Peaty soil

The appropriate symbols are selected on the results of visual examination, field tests and available laboratory tests, such as, sieve analysis, liquid limit and plasticity index.

## Plasticity

The potential for undergoing change in volume with moisture change is assessed from its degree of plasticity. The classification of the degree of plasticity in terms of the Liquid Limit (%) is as follows:

*Table 4 Description of plasticity*

DESCRIPTION OF PLASTICITY	LIQUID LIMIT FOR SILT (%)	LIQUID LIMIT FOR CLAY (%)
<b>Low</b>	≤ 50	≤ 35
<b>Medium</b>	Not Applicable	>35 - ≤ 50
<b>High</b>	>50	>50

## Condition

The consistency of a cohesive soil is defined by descriptive terminology such as very soft, soft, firm, stiff, very stiff and hard. These terms are fixed by the shear strength of the soil as observed visually by the pocket penetrometer values and resistance to deformation to hand moulding.

Relative density terms such as very loose, loose, medium, dense and very dense are used to describe silt and sandy materials, and these are usually based on resistance to drilling penetration. Other condition terms, such as friable, powdery or crumbly may also be used.

## Moisture content

For cohesive soils, the following code is used:

*Table 5 Code for cohesive soils*

SYMBOL	PLASTIC CONDITION	MOISTURE CONDITION
<b>MC≈LL</b>	Moisture content near the liquid limit	Moist to wet
<b>MC&lt;LL</b>	Moisture content less than liquid limit	Moist to wet
<b>MC&gt;PL</b>	Moisture content greater than plastic limit	Damp to moist
<b>MC≈PL</b>	Moisture content near the plastic limit	Damp to moist
<b>MC&lt;≈PL</b>	Moisture content less than or equal to plastic limit	Dry to damp to moist
<b>MC&lt;PL</b>	Moisture content less than plastic limit	Dry to damp
<b>MC&lt;&lt;PL</b>	Moisture content much less than plastic limit	Dry

For cohesionless soils, the following code is used:

*Table 6 Code for cohesionless soils*

MOISTURE CONDITION	DEGREE OF SATURATION
<b>Dry</b>	0
<b>Humid</b>	1 to 25
<b>Damp</b>	25 to 50
<b>Moist</b>	50 to 75
<b>Wet</b>	75 to 99
<b>Saturated</b>	100

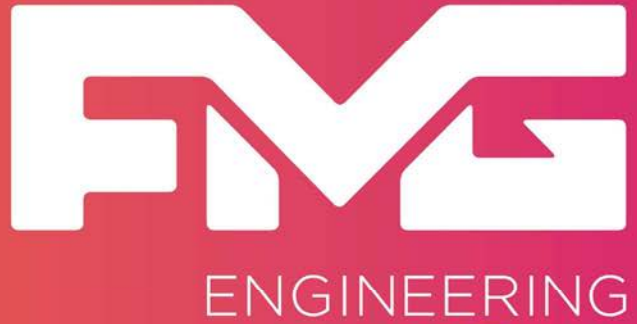
## Cohesive consistency – Pocket penetrometer (PP)

The instrument is used in the field or the laboratory to provide approximate determination of unconfined compressive strength of cohesive soils. The values are recorded in kPa, as follows:

*Table 7 Values for cohesive consistency*

STRENGTH	SYMBOL	READINGS (kPa)
<b>Very Soft</b>	VS	<25
<b>Soft</b>	S	25 to 50
<b>Firm</b>	F	50 to 100
<b>Stiff</b>	St	100 to 200
<b>Very Stiff</b>	VSt	200 to 400
<b>Hard</b>	H	>400





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**ABN: 58 083 071 185**

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## **Appendix 14**

*Appendix L of Development Report – Design Statement*

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## **MOUNT LOFTY GOLF ESTATE – DESIGN STATEMENT**

### **INTRODUCTION**

Mt Lofty Golf Estate was established in 1921. The founders imagined that their descendants would “build and rebuild the club as they like”. They hoped only that it would “retain the friendly and social atmosphere for which The Mount Lofty Club is, and has been, so highly regarded”<sup>1</sup>. The Applicant’s vision is to return the Stirling Golf Club to its original name; the Mt Lofty Golf Estate. The aim is to achieve this vision in time for the Club’s centenary celebrations which commence in 2026.

This Design Statement outlines:

- The design philosophy,
- The evolution of the proposal (including options explored and discounted) from the initial concept to the final design with reference to the Design Review Panel process which the Applicant undertook,
- Site access,
- Servicing strategy, including emergency access,
- Building site selection,
- Built form and visual impact,
- Materiality,
- Landscaping, including the proposal’s response to the unique landscape setting and any work in the public realm,
- Environmentally Sustainable Design,
- Universal/equitable access,
- Adaptive reuse of the Local Heritage Place – the Perfumery.

### **DESIGN PHILOSOPHY**

The key objectives of the design philosophy are:

- Minimise impact to existing site topography
- Preserve and enhance native flora and fauna
- Preserve and enhance the original publicly accessible golf course
- Respect for Traditional Owners
- Reflect the history and character of the Adelaide Hills
- Optimise views
- Showcase environmentally sustainable design
- Showcase local produce
- Preserve and enhance local amenity
- Grow regional tourism and make a positive economic contribution

The design philosophy evolved from a detailed site analysis and investigations process. The consideration of topography, existing built form, flora and fauna, key view corridors and

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<sup>1</sup> Cox, B., 1975, Out of the Rough, A history of the Mount Lofty Golf Club, Gillingham Printers Pty Ltd, Adelaide South Australia, pg 90.

environmental conditions informed the building's siting and design. Detailed site investigations were undertaken in relation to the existing trees, vegetation and waterways, with a 'retain and protect' approach employed. The resultant architecture aims to maximise the opportunities to integrate and merge the landscape into the built form and minimise the architectural response to the land.

The constraints and opportunities of the site informed the siting of buildings. Three potential locations were investigated as part of the initial site investigations which informed the site's location. Site selection was based on the following criteria:

- Topography
- Minimising view impacts from the Heysen Trail
- Distance to Mount George Conservation Park
- Availability and proximity to services
- Minimising visual impacts to residents on Golf Links Road
- Minimising functional impacts to the existing 18-hole Golf Course
- Minimising the need for removal of trees and vegetation - through application of advice sought from the Native Vegetation Council (NVC)
- Minimising cut and fill
- Minimising impacts to people and property in the event of a bushfire - through application of advice sought from the Country Fire Service (CFS)

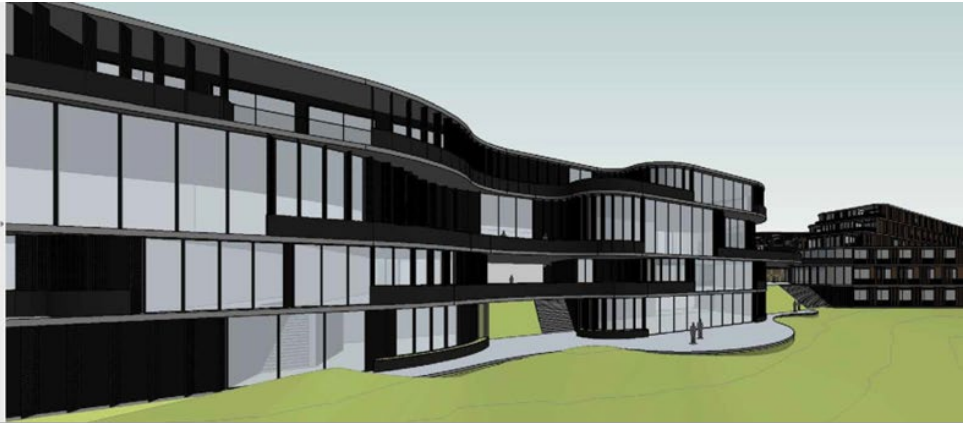
## **DESIGN EVOLUTION**

The proposed design has evolved considerably from the initial master planning proposals. It was initially proposed that the development would be a hotel while maintaining the existing golf pro-shop and clubhouse. This evolved with the building being in various positions. Eventually it was deemed most appropriate to locate the hotel closer to the existing buildings to provide better connections and easier site operation and management. The initial design approach was based on 'boxier' geometry. Through the design review process with the State Commission Assessment Panel (SCAP), a more organic and terraced building form was established to help the building sit more comfortably within the landscape.

The accommodation PODs went through a similar design process. The early locations for the PODs were considered to have a large impact on native vegetation and bushfire safety. In addition to this having the PODs located far away from the main building, although provided a unique experience from a user perspective, they were not suitable from a management and servicing perspective. Therefore, the current location was determined to be best i.e. close to the main hotel building while still having the character being amongst the trees and landscape. Once this location was established, the layout and number of PODs also went through various iterations to achieve an outcome that minimized the impact on native vegetation along with providing a safe and accessible accommodation in the event of a bushfire. The number of PODs was reduced from 20 to 17 as part of the design evolution.

The Applicant also took advantage of the opportunity to engage in the Design Review Panel (DRP) and Pre-lodgement Panel Process to assist in the evolution of the proposed development and gain formal agency feedback. Taking on board the Government Architect's feedback, the scale of the development and the design concept has evolved considerably since inception. A visual representation of the design's evolution throughout the design review process is provided overleaf.

The visual bulk and scale has been substantially reduced through the design's evolution. Materials selection and a reduction in the scale of the proposed buildings, played a large part in integrating the built form into its surroundings.



## **BUILT FORM AND SITE SELECTION**

The proposal utilises location of the existing golf club and car parks. In its current form, the site is already highly modified comprising the golf course and golf club buildings and car parking areas. The use of this area minimises the impact on the surrounding landscape and vegetation, along with benefiting from the existing site cuts and benching.

The built form has an organic appearance, with curved building forms complimenting the dynamic nature of the site's topography. As the building rises it steps back and twists to create a more interesting visual appearance, along with orientating the building to the various panoramic views of the site and to the northern aspect.

The built form is intentionally split into two for a few reasons. The first to create a unique arrival experience with a larger central courtyard and pedestrian promenade. The gap between the buildings gives people a glimpse of the landscape beyond. Only until you enter the building and are met with a wall of glass do you get the full impact of the impressive landscape.

The other benefit of the separation is to create clear separation of uses. People staying at the hotel have clear separation from the golf club. These are still linked at the lower ground level to allow for functional management and services of the development.

This break in built form also provides some relief when viewing the building from across the site. It was important that the vegetation and canopies of the trees were visible behind and between the buildings.

The building also steps back as it gets taller, maintaining a 3-4 storey form as it terraces back towards Golf Links Road with the steep topography. The buildings form nestles into the landscape and topography rather than appear as though it was dropped onto the site.

The site of the proposed development was chosen because:

- It utilises the existing 'pad' where the clubrooms are located, minimising the need for significant cut and fill
- It designs with the sites unique topography by stepping the building form, and
- It can connect to existing services (with some upgrades), and
- It minimises the potential for impacts to views from external vantage points by locating the buildings centrally within the site and at a low point of the site, and
- Minimises impacts to the function of the golf course through utilising the area presently occupied by the existing golf club buildings, and
- Is located away from Mount George Conservation Park.

## **BUILT FORM AND VISUAL IMPACT**

Given the location of the proposal being in the Mt Lofty Ranges, it required a bespoke approach to siting, design and architecture, which responded to the scenic and natural character of the area. The proposed design sought to achieve this through:

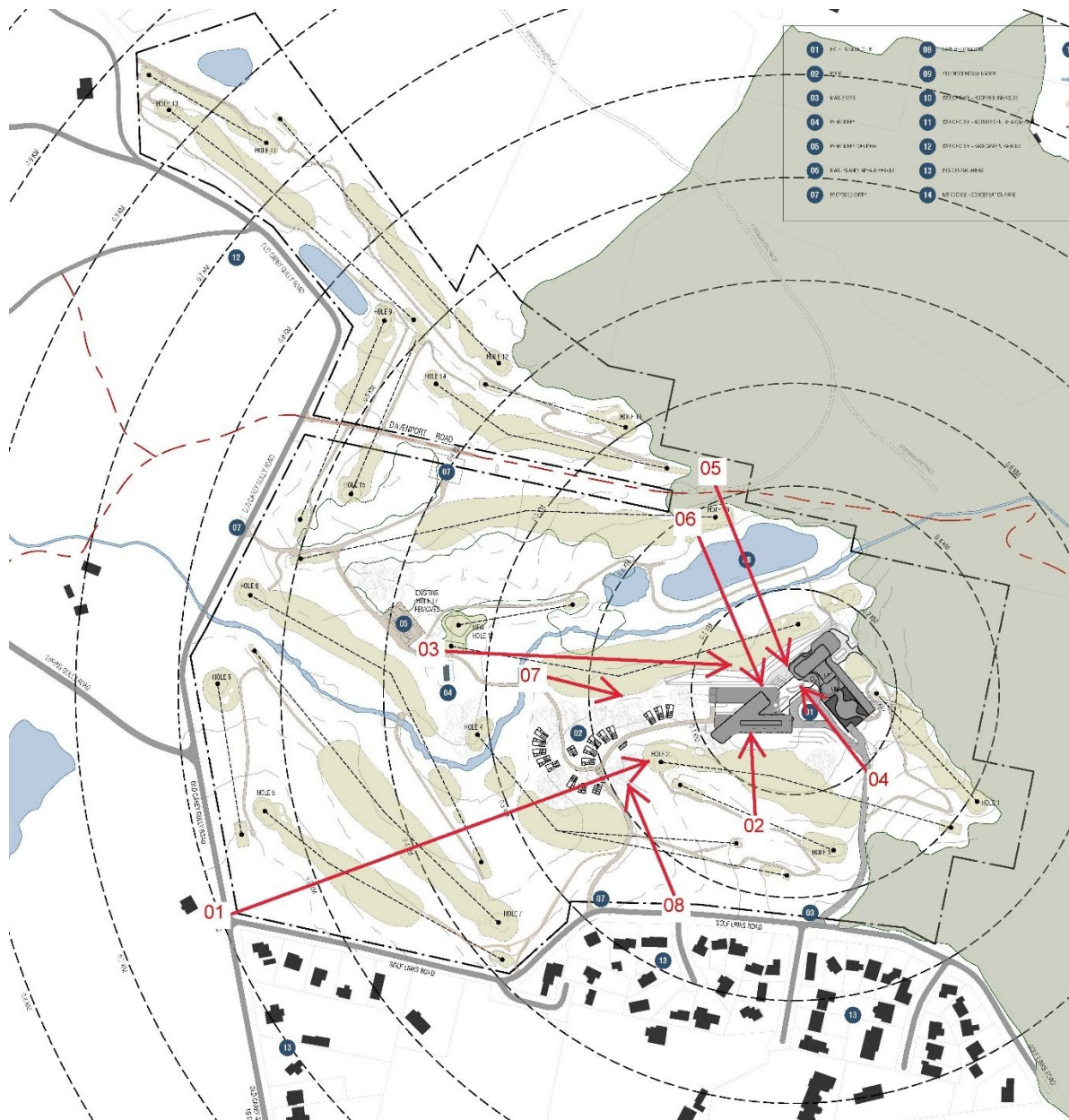
- High quality design complementary to the locality,
- Maximises views to and from the site,
- Architectural form and materiality which responds to its natural surroundings,
- Building scale which responds to the site's peri-urban and highly accessible context.

The design and its evolution as described in this design statement achieves the above. This assists in minimising the visual impact of the proposed development. Of note also, is the existing condition of the site, it is a highly modified landscape, and has been as such for at least the least 50 years. The appearance of the land is in contrast to the nearby residential properties on Golf Links Road and the densely vegetated natural landscape of the Mount George Conservation Park. Manmade structures

are anticipated in association with a golf course. To this extent, a member of the general public would expect to see built form associated with the golf course, in this location, as has occurred for many years at this site.

The following views have been analysed of the proposed built form, to detail how it will sit visually in the landscape and the level of visual impact post development.

### VIEWING ANGLES



This visual impact analysis was based on the following criteria:

1. Whether the view is from an external or internal vantage points, the following scale was applied: 2 – external view point, 1 – internal view point.
2. How different the view is post development compared to pre-development, the following scale was applied: 3 – very different, 2 – somewhat different, 1 – not very different, 0 - barely visible.

The higher the rating, the greater the post development visual impact, for example:

- 1 - low impact
- 2 – low to medium impact
- 3 – medium impact
- 4 – medium to high impact
- 5 – high impact

#### VIEW 01



This view is from Old Carey Gully Road and Golflinks Road, it is external from the site (2) and the post development view is barely visible (0) = total visual impact = (2) – **low to medium visual impact**

#### VIEW 02



This view is from well within the site, approximately 130m away from the nearest residential property at Golflinks Road. It demonstrates the topography of the site and the siting of the built form at low point of the land. It is an internal view (1) and the view is somewhat different (2) given that from this vantage point would have always contained the built form of the existing golf club buildings = total visual impact = 3 – **medium impact.**



#### VIEW 03



This view is internal to the site (1). It is of the 18<sup>th</sup> hole towards the facilities building and new clubrooms. In the existing this view provides important visual relief, common to Golf Courses around the world, whereby the end of the course is in sight. This view demonstrates the buildings materiality in action and how it assists in blending it into its landscape context. The view is somewhat different (2) given that from this vantage point, a golfer would always be able to see the built form of the golf club buildings = total visual impact = 3 – **medium impact**.

#### VIEW 04



View 04 is internal to the site (1). It was the architects intention to create a sense of arrival at this location. The split in the built form at this view point provides visual relief and provides a strong visual

link through to Mt George. This view is somewhat different (2). The total visual impact from View 04 is 3 - **medium impact**.

#### VIEW 05



This view is internal to the site (1), as the Heysen Trail traverses the site in this location. The visual impact from this vantage point is very different (3). Retention of established trees assists in mitigating the extent of visual impact of the development from this view. It is not uncommon that man-made structures are visible from the Heysen Trail given its expansive length and diverse terrain. A walker on the Heysen Trail would have always viewed built form from this location, albeit that the scale has now changed. The total visual impact from View 05 is 4 - **medium to high impact**.

#### VIEW 06



As with View 05, this view is internal to the site (1) and the visual impact from this vantage point is very different (3). The impacts stated in View 05 are the same as View 06. The total visual impact from View 06 is 4 – **medium to high impact**.

#### VIEW 07



View 07 is internal to the site (1). It is not very different when compared to existing (2). The use of materials, the scale of the PODs and their orientation assists in mitigating visual impacts from this view point. Total visual impact = 2 – **low to medium impact**

#### VIEW 08



View 08 is external to the site (2). The development is barely visible from this view (2). The siting of the PODs, the use of materials natural toned materials and their scale assists in mitigating visual impacts from this view point. Total visual impact = 2 – **low to medium impact**

The cumulative visual impact arising from the development is 3 - **medium impact**. This was based on an average of the impacts from each view point, as follows:

- View 01 = 2 – **low to medium visual impact**
- View 02 = 3 – **medium impact**
- View 03 = 3 – **medium impact**
- View 04 = 3 – **medium impact**
- View 05 = 4 – **medium to high impact**
- View 06 = 4 – **medium to high impact**
- View 07 = 2 – **low to medium impact**
- View 08 = 2 – **low to medium impact**

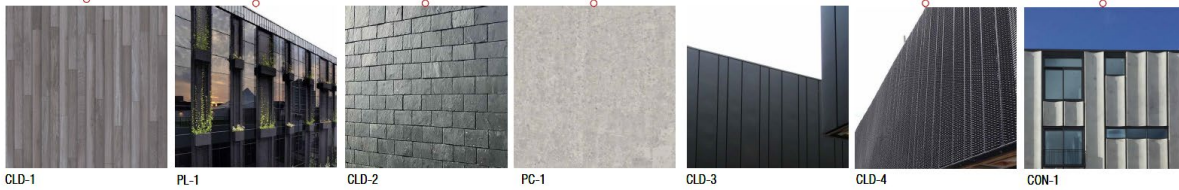
**Total visual impact (based on an average of the above) = 3 - medium impact**

The cumulative visual impact is **medium**. A degree of visual impact is anticipated in a development of this scale. The architectural response sought to minimise visual impacts through:

- Choice of materials, the use of timber cladding, curved precast concrete and slate cladding respond to the sites natural surroundings,
- Breaking up the building form into two parts to provide visual relief and provide a landscaped backdrop,
- Designing with the sites topography to minimise views of the building form from external vantage points, and
- Optimise views from within the site from the accommodation and golf course to create a high amenity accommodation and golfing experience.

## **MATERIALITY**

The chosen materials palette is depicted below. The use of timber cladding, curved precast concrete and slate cladding were key shifts in the design evolution which responded to the sites natural surroundings. The façade is intended to patina over time, allowing it to settle into its landscape context. Exposed concrete, complimented with black metal accents provide a sleek and modern appearance juxtaposed against the softness of the timber cladding.



MATERIALS & FINISHED SCHEDULE	
<b>WALLS</b>	<p>CON-1: INSITU CONCRETE SLAB EDGE AND WALLS COLOUR: NATURAL CONCRETE</p> <p>PC-1: CURVED PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE</p> <p>PC-2: PRECAST CONCRETE PANELS COLOUR: NATURAL CONCRETE</p> <p>CLD-1: TIMBER CLADDING - MORTLOCK TRENDPLANK SHIPLAP CLADDING SPECIES: PACIFIC TEAK - BAL-19 COMPLIANT (OR EQUIVALENT) CLEAR OILED FINISH TO WEATHER</p> <p>CLD-2: SLATE SHINGLE CLADDING. COLOUR: NATURAL FINISH</p> <p>CLD-3: PANALISED METAL CLADDING. 300MM INTERLOCKING PROFILE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)</p> <p>CLD-4: PERFORATED METAL CLADDING. COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)</p>
<b>RAISED PLANTERS</b>	<p>PL-1: PREFABRICATED ALUMINIUM PLANTER WITH WIRE TRELIS COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)</p>
<b>BALUSTRADE</b>	<p>BAL-1: STEEL BLADE BALUSTRADE COLOUR: COLORBOND NIGHT SKY (BLACK OR EQUIVALENT)</p>
<b>WINDOWS</b>	<p>WN-1: POWDERCOAT ALUMINIUM FRAME WINDOWS WITH GLAZING. COLOUR: BLACK (OR SIMILAR)</p>
<b>DOORS</b>	<p>CARPARK DOORS: PERFORATED METAL SECTIONAL GARAGE DOORS COLOUR: COLORBOND NIGHT SKY- BLACK (OR SIMILAR)</p>

**FINISHES LEGEND**

- CON-1** INSITU CONCRETE FINISH
- PC-1** CURVED PRECAST PANELS
- PC-2** PRECAST PANELS
- CLD-1** TIMBER CLADDING
- CLD-2** NATURAL SLATE CLADDING
- CLD-3** METAL PANALISED CLADDING
- CLD-4** PERFORATED METAL CLADDING
- WN-1** POWDERCOATED ALUMINIUM WINDOWS
- PL-1** PREFABRICATED METAL PLANTER WITH TRELIS
- BAL-1** METAL BLADE BALUSTRADE

**LANDSCAPE**

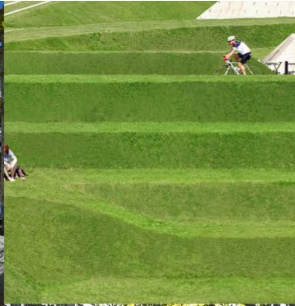
Local Landscape Architects, Oxigen, undertook the landscape design for the site. The approach focuses on re-establishing the site’s tree canopy and increasing the site’s green credentials through the application of distinct landscape typologies. The middle and under-storey canopies are re-

established under the existing native tree canopy. Blackberries, gorse and other weed species are removed. The new native planting comprises species native to the Adelaide Hills region with an emphasis on wattles, bottlebrush and correa comprising yellow and red winter and early summer flowerings. Whenever possible, the existing forest of Manna Gum and Stringybark are retained. Particular care is taken to preserve views to Mt George and to position the new built form so to reduce the impact on views from the Heysen Trail. The choice of materials reflects the desire to blend the building with its surroundings. The following extracts from the landscape design strategy detail approach to planting, site design and materiality.

FLEXIBLE OUTDOOR SEATING SPACES



LAWN TERRACES



ROOFTOP GREENING



MOUNDED FEATURE PLANTERS



UPPER LEVEL DECKS + BALCONIES



MEADOW PLANTING



ORNAMENTAL TREES

P2 - SMALL BOARDWALK

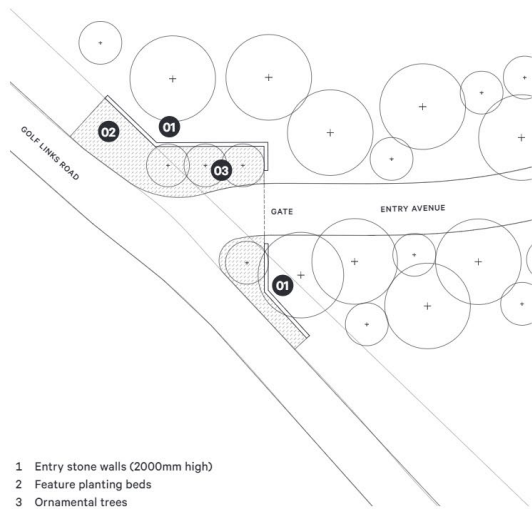


P1 - COMPACTED GRANULITIC PAVING



LOW LEVEL NATIVE GRASSES

Source: Oxigen



STONE ENTRY WALL



SIGNAGE AND ACCESS GATE



TREE LINED AVENUE



RE-INSTATED UNDERSTOREY PLANTING

Material and elements play an important role in providing amenity and contributing to visual consistency throughout the key sites.

- Paving and hardscape elements are of enduring quality enable safe movement, are robust and low maintenance.
- Public outdoor spaces are integrated through consistent materials and detailing.
- Locally sourced materials are used where possible.
- Materials are selected for their durability and whole of life costing.



P1 + P2 Stone / Precast pavers

- High quality unit pavers
- Stepping stones (Pods)



P3 - Concrete

- Honed and gritblast non-slip insitu concrete paving
- Used for paths, plazas and thresholds



Hotmix Roads

- Sealed entry roads and carparks
- Kerbless / Flush Kerbs



Corten Steel

- Feature edging



W1 - Gabion Wall - Local Stone

- Large walls where long spans are required.



Compacted Sand / Gravel Paving

- Local compacted sand
- High quality unit pavers
- Used for pedestrianised areas (Pods)



Local Stone

- Feature paving, walls, edging, steps, terraces



Timber

- Class 1 seasoned hardwood or thermally modified timber
- Natural grey finish
- Used for decks, trims and fences

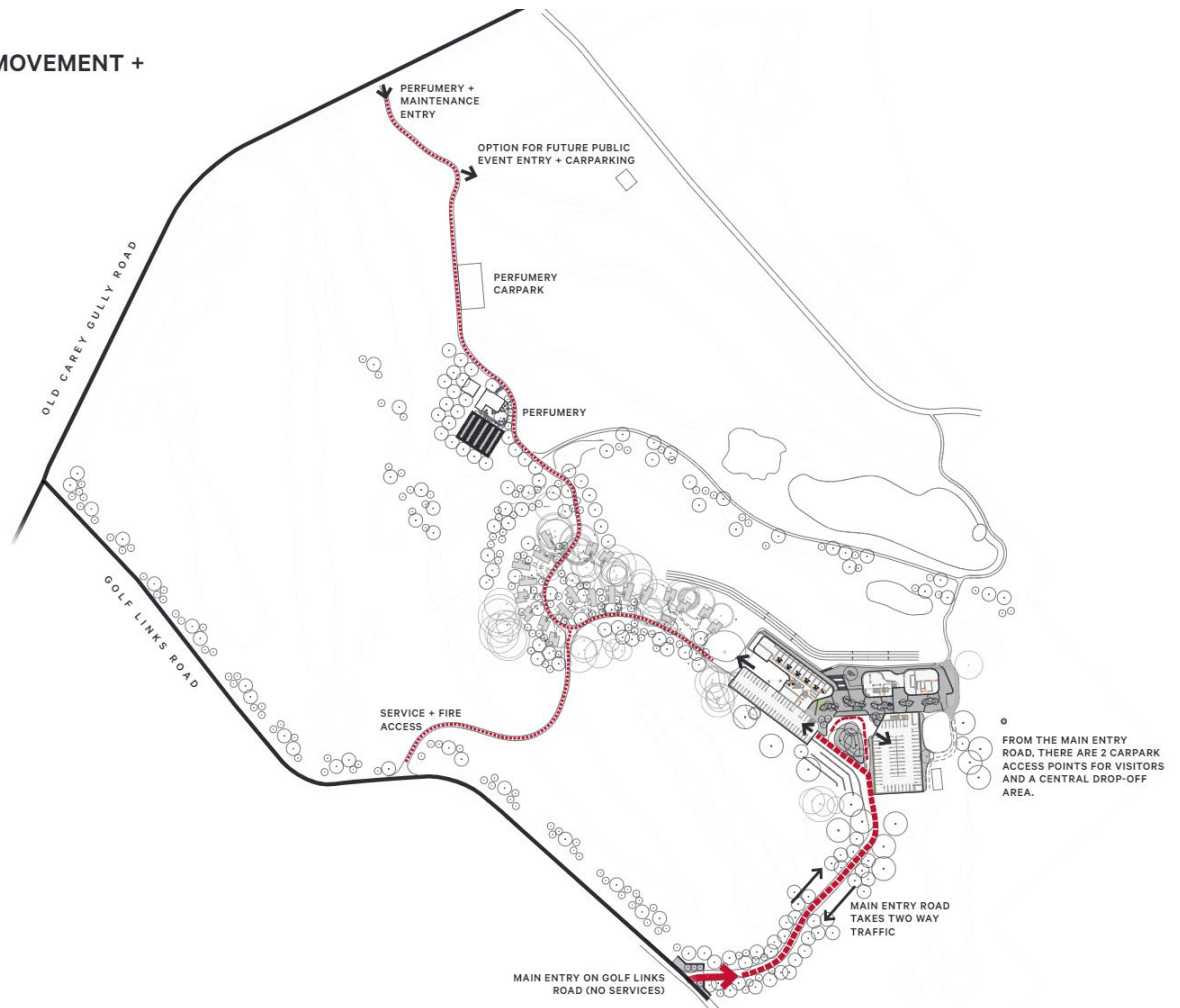
Source: Oxigen

## SITE ACCESS

The design proposes to upgrade the existing infrastructure and utilise the existing points of access where possible. Additional site access has been proposed to Golf Links road which is to be used for emergency access and egress. Not for regular day to day use. There is also existing access via Old Carey Gully Road which is to be upgraded for vehicular access. This connects to the proposed parking adjacent to the refurbished heritage building. The existing network of pathways are to be upgraded to comply with vehicle and fire truck access and circulation.

Services/maintenance and delivery vehicles will use the main access. There is a loading bay and circulation provided from this point that links to all aspects of the building.

## SITE VEHICLE MOVEMENT + ENTRIES



Source: Oxigen

## ENVIRONMENTALLY SUSTAINABILITY DESIGN

A key driver in the project was to showcase environmentally sustainable design. From design inception ESD initiatives were integrated into the architecture to reduce the development's impact on the environment in both construction and operation. These ESD initiatives were derived using computer building simulation design techniques so that the sustainability performance of the built form could be assessed.

The architectural response to ESD is:

- Buildings oriented toward the north which captures free heating from the winter sun with external shade elements and balconies used to provide shade protection from the summer sun, reducing the reliance on active climate control techniques.
- Facade shading elements and glazing specifications have been selected by energy performance modelling and computer simulation techniques.
- A tailored approach has been taken regarding facade glazing. Solar heat gain coefficients have been optimised for each building type to ensure a balance between summer and winter temperature regulating.
- Air leakage pressure testing will be conducted on the external facade to ensure ideal air leakage rates, significantly reducing air conditioning energy consumption.
- Installation of a green roof, facade planters and extensive landscaping will provide a passive cooling effect from water transpiration and act as a barrier
- Completely electrified energy system with no fossil fuels or natural gas required.



- Installation of 300 solar voltaic panels on the rooftop at 330W per panel, providing 20% of the total energy requirement of the building.

Additional sustainable practices will be incorporated in the hiring of local labour and materials as well as selecting recycled materials and highly efficient water and electrical fittings.

The confluence of these actions and practices reduce the energy consumption of the proposal by 24% (and the carbon emissions from energy use by 18%) when compared to a reference study from the National Construction Code (DSquared, 2022).

### **UNIVERSAL ACCESS**

The proposal has been designed to provide universal / equitable access where possible. Upon arrival by vehicle, people are able to move throughout the ground floor freely with a large pedestrian concourse proposed to link the variety of amenities provided on this level. Lifts have been provided in various locations to allow for safe access to all other levels of the buildings.

Due to the steep sloping nature of the site – compliant ramps are generally not possible due to the existing gradients. Golf Carts will be readily for people to move throughout the site – linking the proposed perfumery, PODs and main building areas.

### **ADAPTIVE REUSE OF THE LOCAL HERITAGE PERFUMERY**

The design intent for the perfumery is to restore the existing heritage building to its original state (or as close as possible). The building is to be refurbished with a new modern structure to sit adjacent providing additional amenity and dining spaces. The materiality will consist of mainly glass and metal to provide a contrast and clear modern addition to the existing stone building. The intent is to have modern pavilion in juxtaposition, providing a clear timeline of architectural styles. The new pavilion will be looked to touch lightly on the ground. The interior of the heritage building is to have minimal work done to showcase the stone structure and exposed timber trusses. There is existing power and water provided to the building. As this is currently used as the site maintenance building and office.

Oxigen Landscape Architects proposed reinforcing the historical ties to the use of the Perfumery building in the adjacent landscape design. A scent garden, tree orchard and potential outdoor seating provide opportunities to enjoy the adaptive reuse of the Local Heritage Place.



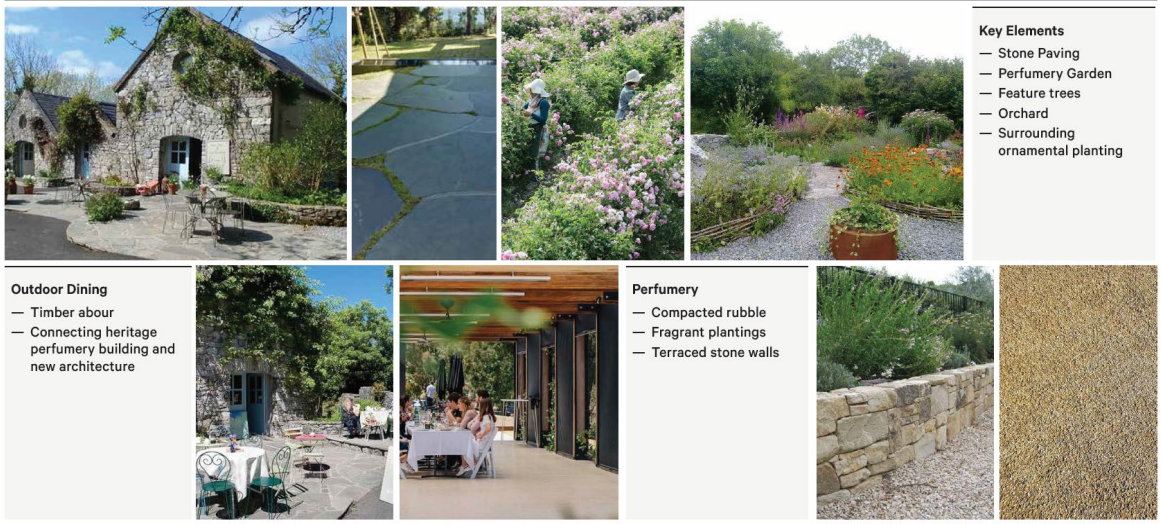
Source: RArchitecture

PERFUMERY  
SITE



Source: Oxigen





- Key Elements**
- Stone Paving
  - Perfumery Garden
  - Feature trees
  - Orchard
  - Surrounding ornamental planting

- Outdoor Dining**
- Timber abour
  - Connecting heritage perfumery building and new architecture

- Perfumery**
- Compacted rubble
  - Fragrant plantings
  - Terraced stone walls

Source: Oxigen

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## **Appendix 15**

*Appendix M of Development Report –  
Environmental heritage impact assessment report*

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**Mount Lofty Golf Estate  
Environmental & Heritage Impact Assessment**

# Mount Lofty Golf Estate Environmental & Heritage Impact Assessment Report

13/12/2022

Version 4

Prepared by EBS Ecology for Trice - Project & Development Managers on behalf of Mount Lofty Estate Pty Ltd.

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Cover photograph: *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* woodland over *Acacia melanoxylon* (photo by EBS Ecology).

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## GLOSSARY AND ABBREVIATION OF TERMS

ASRIS	Australian Soil Research Information System
ASS	Acid Sulfate Soil
AGD – AAR	Attorney General’s Department – Aboriginal Affairs and Reconciliation
BAM	Bushland Assessment Method
BDBSA	Biological Databases of South Australia
CD	Consent Determination
CEMP	Construction Environmental Management Plan
CPTED	Crime Prevention Through Environmental Design
DAWE	Department of Agriculture, Water and the Environment
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DDA	Disability Discrimination Act
Declared Weed	A weed that is regulated under the <i>Landscape South Australia Act 2019</i> due to its threat to primary industry, the natural environment and/or public safety
DEW	Department for Environment and Water
EBS Ecology	Environmental and Biodiversity Services: Ecology
EBS Group	Environmental and Biodiversity Services Group
EBS Heritage	Environmental and Biodiversity Services: Heritage
EHIA	Environmental and Heritage Impact Assessment
EHIA R	Environmental and Heritage Impact Assessment Report
EPA	Environment Protection Authority (South Australian)
EP Act	<i>Environment Protection Act 1993</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ha	hectare(s)
IBRA	Interim Biogeographical Regionalisation of Australia
ILUA	Indigenous Land Use Agreement
km	kilometre(s)
KYAC	Kaurna Yerta Aboriginal Corporation
LMR	Landscape Management Region
LSA Act	<i>Landscape South Australia Act 2019</i>
m	metre(s)

MGCP	Mount George Conservation Park
Mount Lofty Estate	Mount Lofty Golf Estate Pty Ltd
MNES	Matters of National Environmental Significance
NPW Act	<i>National Parks and Wildlife Act 1972</i>
NV Act	<i>Native Vegetation Act 1991</i>
NVC	Native Vegetation Council
PDI Act	<i>Planning, Development and Infrastructure Act 2016</i>
PIRSA	Primary Industries and Regions SA
PMR	Protected Matters Report
PMST	Protected Matters Search Tool
Project	The proposed redevelopment of the Stirling Golf Course at the Stirling Golf Club, by Mount Lofty Golf Estate Pty Ltd (Mount Lofty Estate)
SA	South Australia / South Australian
SCAP	State Commission Assessment Panel
SEB	Significant Environmental Benefit
SEDMP	Soil Erosion and Drainage Management Plan
sp.	Species (singular)
ssp.	Subspecies
STAM	Scattered Tree Assessment Method
TPZ	Tree Protection Zone
Trice	Trice – Project & Development Managers
UBS	Unit Biodiversity Score
WAA	Water Affecting Activities
WAAP	Water Affecting Activities Permit
WQRA	Water Quality Risk Assessment
WoNS	Weed of National Significance
WSUD	Water Sensitive Urban Design
°C	degrees Celsius



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# 1 INTRODUCTION

Mount Lofty Golf Estate Pty Ltd (Mount Lofty Estate) are proposing to redevelop the Stirling Golf Course at the Stirling Golf Club (The Project), located in Stirling, South Australia (SA). EBS Group (EBS Ecology and EBS Heritage) has been engaged by Trice – Project & Development Managers (Trice) on behalf of Mount Lofty Estate to undertake an environmental and heritage impact assessment (EHIA) for the Project to identify potential environmental and heritage constraints and provide input into the design. An overview of the EHIA findings is provided below, while more information on the Project and the assessment of environmental and heritage impacts are provided in subsequent sections of this EHIA Report (EHIAR).

The potential impact of the Project on the following environmental and heritage aspects has been assessed:

- Vegetation;
- Fauna;
- Pest animals, plants and biosecurity;
- Water quality;
- Site contamination;
- Noise and vibration;
- Air quality;
- Land Use, Planning and Amenity;
- Sustainability;
- Waste management;
- Historical Heritage;
- Aboriginal Heritage; and
- Native Title.

## 1.1 Overview of EHIA report findings

The environmental impacts will be due to removal of native vegetation, including possibly threatened species and ecological communities and significant construction which has the potential to impact native fauna and associated habitat. There is also the potential that there will be impact to the conservation values of the Mount George Conservation Park (MGCP). Additionally, there will be potential impacts on the integrity and geomorphology of the watercourse and surface water storage structures (i.e., dam or lake and on downstream flows).

The Project will have a material impact on a local heritage place as it is proposed that there will be partial demolition, restoration, conservation, reuse, and new built form elements adjacent to the local heritage place. The Project may have impacts on heritage sites, objects, and remains of Aboriginal People.

A summary of (1) approvals, permits, licences and/or authorisations required; (2) completed and required technical investigations and assessments required; (3) recommendations for design development required; and (4) recommendations for construction, is provided below. However, refer to Section 3 Assessment of Environmental Impacts for more detailed information, including the various measures proposed to avoid, minimise, manage and/or mitigate potential environmental impacts associated with the Project.

**1.1.1 Required approvals, permits, licences and/or authorisations**

A summary of approvals, permits and authorisations required to progress the Project to delivery (construction) is provided in Table 1. Refer to Appendix 1 for a summary of applicable environmental legislation and Appendix 2 for a summary of applicable heritage legislation.

**Table 1. Summary of required approvals / permits / licences / authorisations likely to be required.**

Approval / permit / licence / authorisation	Applicable	Legislation / policy	Approving authority	Timeframe	Reference
Vegetation removal approval (non-native vegetation)	Yes	Adelaide Hills Council policy.	Adelaide Hills Council	Consult with Council directly to understand timeframes.	Section 3.1 Vegetation
Vegetation removal approval (native vegetation)	Yes	Approval in accordance with the <i>Native Vegetation Regulations 2017</i> required to clear native vegetation protected by the <i>Native Vegetation Act 1991</i> .	Native Vegetation Branch within the Department for Environment and Water (DEW).	Allow approximately 10 weeks to obtain approval once clearance application submitted.	Section 3.1 Vegetation
Development Approval	Yes	<i>Planning, Development, and Infrastructure Act 2016</i> required for tree damaging activities (Regulated/Significant Trees)	Adelaide Hills Council	Consult with Adelaide Hills Council and/or SCAP to understand timeframes	Section 3.1 Vegetation
EPBC Act Referral	Potentially	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Department of Climate Change, Energy, the Environment and Water (DCCEEW)	Allow approximately 6-12 weeks. Department of Climate Change, Energy, the Environment and Water (DCCEEW)	Section 3.2 Fauna
Permit to transport Declared weed species on a public road	Likely	<i>Landscape South Australia Act 2019</i>	Hills and Fleurieu Landscape Board	Allow approximately 2 weeks to obtain permit.	Section 3.3 Pest plants, animals
Water Affecting Activities Permit (WAAP)	Possibly	<i>Landscape South Australia Act 2019</i>	Hills and Fleurieu Landscape Board	At least 2-3 months prior to construction.	Section 3.4 Water quality
Earthworks Drainage Licence (construction works)	Likely	<i>Environment Protection Act 1993</i>	Environment Protection Authority (EPA)	Unknown, contact the EPA.	Section 3.4 Water quality
Night Works	Possibly	<i>Environment Protection Act 1993</i>	EPA	Unknown, contact the EPA.	Section 3.6 Noise and vibration
Local, State or National Heritage Approval	Yes	<i>Heritage Places Act 1993</i>	Department of Agriculture, Water, and the Environment	Unknown, contact the South Australian Heritage Council	Section 4.1
Aboriginal Heritage	Possibly	<i>Aboriginal Heritage Act 1988</i>	Attorney General's Department – Aboriginal Affairs and Reconciliation (AGD-AAR)	Unknown	Section 4.2

Native Title	No	<i>Native Title Act 1994</i>	Attorney General's Department – Aboriginal Affairs and Reconciliation (AGD-AAR)	Not applicable	Section 4.3
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### 1.1.2 Completed and required technical investigations and assessments

A summary of completed and required technical investigations and assessments required to progress the Project to delivery (construction) is provided in Table 2.

**Table 2. Summary of completed and required technical investigations.**

Investigation / Assessment	Completed	Timing	Reference
Ecological assessment (including assessment of vegetation, fauna, pest plants and animals)	Yes	August/September 2022	Sections 3.1.1; 3.2.1; 3.3.1; 3.4.1  <i>Mount Lofty Golf Estate – Ecological Flora and Fauna Assessment (EBS Ecology 2022a)</i>
Native Vegetation Clearance approval	No	During design development	Sections 3.1.1; 3.2.1; 3.3.1; 3.4.1
Arborist assessment / advice	Yes	July 2022	Arborman Tree Solutions <i>Preliminary Tree Assessment and Arboricultural Impact Assessment and Development Impact Report</i> (Arborman Tree Solutions 2022a and 2022b)
Water Quality Risk Assessment (design phase)	No	During design development	Section 3.4.5
Groundwater Risk Assessment (can be included with Site Contamination Assessment below)	No	During design development	Section 3.4.5
Acid sulfate soil risk assessment (can be included with Site Contamination Assessment below)	No	During design development	Section 3.4.5; 3.5.5
Water Quality Risk Assessment (Construction phase)	No	Prior to construction	Section 3.4.5
Site Contamination Assessment (including groundwater and acid sulfate soil assessments)	No	Prior to construction	Section 3.5.5
Construction Noise and Vibration Assessment	No	Prior to construction	Section 3.6.5
Heritage assessment (Cultural Heritage Impact Statement and Management Plan Framework)	Yes	September 2022	Section 4 <i>Mount Lofty Golf Estate – Cultural Heritage Management Plan Framework and Mount Lofty Golf Estate – Heritage Impact</i>



			Statement (EBS Heritage 2022a and EBS Heritage 2022b)
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### **Ecological Assessment**

An ecological assessment has been completed for the Project by EBS Ecology (EBS Ecology 2022). It included a desktop assessment and field survey to identify potential ecological constraints, including any flora (vegetation) and fauna or ecological communities of national environmental significance protected by the *Environment and Biodiversity Conservation Act 1999* (EPBC Act) as well as State threatened flora and fauna species protected by the *National Parks and Wildlife Act 1972* (NPW Act). Please refer to the *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a) for more detail.

### **Heritage Assessment**

A cultural heritage desktop assessment has been completed for the Project by EBS Heritage (EBS Heritage 2022) to identify potential heritage constraints, including any important sites of significance protected by the *Aboriginal Heritage Act 1988*. Refer to the *Mount Lofty Golf Estates Cultural Heritage Desktop Assessment* (EBS Heritage 2021), *Mount Lofty Golf Estate Cultural Heritage Management Plan Framework* (EBS Heritage 2022a) and *Mount Lofty Golf Estate Heritage Impact Statement* (EBS Heritage 2022b) for more detail.

### **Community Engagement and Stakeholder Management Plan for Planning Studies**

Community Consultation and Engagement is critical for the project as the State’s economy and Adelaide Hills Community will likely be impacted during construction and operation which may result in immediate and long-term effects on residents, businesses and surrounding uses. The proposed development has the potential to significantly boost the local and state economy through local, regional, interstate and potentially international tourism as well as local job opportunities.

#### **1.1.3 Recommendations for design development**

A summary of recommendations for design development required to progress the Project to delivery (construction) is provided in Table 3.

**Table 3. Summary of recommendations for design development.**

<b>Aspect / Issue / Constraint</b>	<b>Required Mitigation / Recommendation for Design</b>	<b>Reference</b>
<b>Vegetation</b>	Review and adjust the design (where possible and practicable) to retain as much vegetation as possible and avoid clearance of vegetation, particularly vegetation considered important fauna habitat (i.e., Significant and/or Significant Regulated trees).	Section 3.1.5
<b>Fauna and fauna habitat</b>	Where possible, adopt the recommendations outlined within the <i>Mount Lofty Golf Estate Ecological Flora and Fauna Assessment</i> (EBS Ecology 2022a).	Section 3.2.5
<b>Water Quality</b>	Incorporate water sensitive urban design measures which seek to minimise the impacts of the Project, protect water quality and make more efficient use of water (e.g., stormwater drainage), where practicable.	Section 3.4.5

	Undertake a Water Quality Risk Assessment during the planning stage to assist in identifying appropriate management measures to avoid and/or manage the potential or likely impacts of operation of the Project (including use of the area, such as car parking) upon water quality.	Section 3.4.5
<b>Site Contamination</b>	Undertake a site contamination investigation to identify and understand the risk of encountering contaminated materials during construction works.  Consider undertaking further investigation and seeking specialist advice, for example from a soil contamination expert, on acid sulfate soil potential and risk during construction as well as potential management requirements during construction (if required).	Section 3.5.5
<b>Noise and vibration</b>	Consider engaging a suitably qualified consultant to undertake a noise and vibration assessment to identify likely noise and vibration levels and associated impacts.	Section 3.6.4
<b>Land use, planning, sustainability and amenity</b>	Implement good urban design principles and investigate opportunities for a bespoke approach to the design which will correlate to the scenic value and natural character of the area. Investigate and implement Crime Prevention through Environmental Design (CPTED) principles. Utilise appropriate accessibility to toilet facilities and carparking as per the <i>Disability Discrimination Act 1992</i> (DDA).	Section 3.8.5
<b>Historical Heritage</b>	Consider undertaking pre-construction dilapidation surveys/property condition assessments of the local heritage to assess potential for impact from vibration during construction.	Section 4.1.5
<b>Aboriginal Heritage</b>	If required, conduct a cultural heritage survey with participation of the Kurna People. Ensure appropriate approvals/permits are received prior to undertaking any excavation if required. Implement site inductions for personnel to provide an understanding of the Aboriginal heritage aspects associated with the Project site and construction activities.	Section 4.2.5

#### 1.1.4 Recommendations for construction

A summary of recommendations for construction is provided in Table 4.

**Table 4. Summary of recommendations for construction.**

Aspect / Issue / Constraint	Required Mitigation / Recommendation for Construction	Reference
<b>Environmental Management</b>	Document and implement a Project specific Construction Environmental Management Plan (CEMP) prepared by a suitably qualified environmental consultant which identifies the potential environmental impacts of construction works and includes avoidance, minimisation, management and mitigation measures to be implemented during construction. The CEMP should also identify any regulatory/approval requirements applicable to the Project and include an appropriate environmental inspection, monitoring and corrective action response procedure. The CEMP should be prepared in accordance with the Environment Protection Authority (EPA) <i>Industry Guideline: Construction Environmental Management Plan</i> Guideline (EPA 2019a).	Various
<b>Vegetation</b>	Seek specialist arborist advice where encroachment into the Tree Protection Zone (TPZ) cannot be avoided.	Section 3.1

Aspect / Issue / Constraint	Required Mitigation / Recommendation for Construction	Reference
	Offset vegetation removal at a minimum ratio of 1:1, or as otherwise agreed with Alexandrina Council.	
<b>Fauna</b>	Engage a suitably qualified fauna specialist to complete a fauna check and relocate fauna if required, prior to clearing vegetation and/or impacting any other fauna habitat.	Section 3.2
<b>Pest plants, animals, and biosecurity</b>	Control Declared plants and other pest plant species prior to and during construction.	Section 3.3
<b>Water Quality</b>	Undertake a Water Quality Risk Assessment prior to construction to assist in identifying appropriate management measures to avoid and/or manage the potential or likely impacts of construction works upon water quality.	Section 3.4
	Implement a Water Quality Monitoring Plan during construction.	Section 3.4
	Implement a Soil Erosion and Drainage Management Plan during construction.	Section 3.4
<b>Site Contamination</b>	If required, document and implement a Contamination and Remediation Management Plan as part of the Project specific CEMP, which includes contingency procedures to identify and manage soil and/or groundwater contamination during construction activities	Section 3.5
<b>Noise and vibration</b>	Document and implement a Construction Noise and Vibration Management Plan (CNVMP) as part of the Project specific CEMP to avoid, minimise and manage noise and vibration impacts during construction. If required, document and implement a Night Works Management Plan as part of the CNVMP (if night works are to occur).	Section 3.6
<b>Air quality</b>	Document and implement a simple Air Quality Management and Monitoring Plan (as part of the Project specific CEMP) which includes effective air quality/dust monitoring (i.e., visual monitoring) and mitigation measures, such as use of a water cart, when required.	Section 3.7
<b>Land use, planning, sustainability and amenity</b>	Implement a Traffic Management Plan as part of advanced notification of potential delays to manage traffic during construction works.	Section 3.8
<b>Waste management</b>	Implement minimal resource usage as well as reusing any materials associated within construction works, where possible. Ensure waste is managed, contained, and disposed of in accordance with EPA guidelines. Investigate and document the materials used in construction and the possibility of utilising recycled materials and green waste provisions where it is possible.	Section 3.9
<b>Historical Heritage</b>	Consider undertaking pre-construction dilapidation survey/property condition assessment of the local heritage and contributory places to assess potential for impact from vibration during construction. Implement a Construction Noise and Vibration Management Plan as part of the Project CEMP. Implement a simple project Air Quality Management and Monitoring Plan as part of the CEMP.	Section 4.1
<b>Aboriginal Heritage</b>	If required, monitoring of ground-breaking activities by representatives of the Kaurna People. Implement a site discovery procedure as part of the Project CEMP.	Section 4.2
<b>Native Title</b>	Consult with the Native Title Claimants.	Section 4.3

## 2 PROJECT DETAILS

### 2.1 Background

The proposed Mount Lofty Golf Estate's new development is summarised as follows:

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m<sup>2</sup> function room.
  - A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace.
  - 186m<sup>2</sup> sports bar.
  - A 189m<sup>2</sup> gallery and cafe.
  - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – 'Pods'
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
  - Extension to the Perfumery to include a covered outdoor dining area.
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a "Scent Factory".
  - Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
  - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.
  - A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.

- Designated waste storage areas.
- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

The proponents additionally intend to rebrand the development as the Mount Lofty Golf Estate which was the original name of the course when it opened in 1925. The aim of the development will be to improve access to tourists and capitalise on the growing tourism market.

The development has been declared a major project by the Minister for Planning and Local Government (the South Australian Government Gazette 2020, p. 5848) and will be assessed by a state-run process. At the time of preparing this report, the development design has not been finalised and layout will be guided by the reports of numerous specialists.

## **2.2 Project location**

The Project is located at the Stirling Golf Club at 35 Golflinks Road, Stirling, approximately 15 km southeast of Adelaide. It is located adjacent to the Mount George Conservation Park (MGCP) as well as several residential properties (Figure 1).

## **2.3 Project Area**

The Project Area subject to this EHIAR is shown in Figure 1 and includes the current Stirling Golf Club.

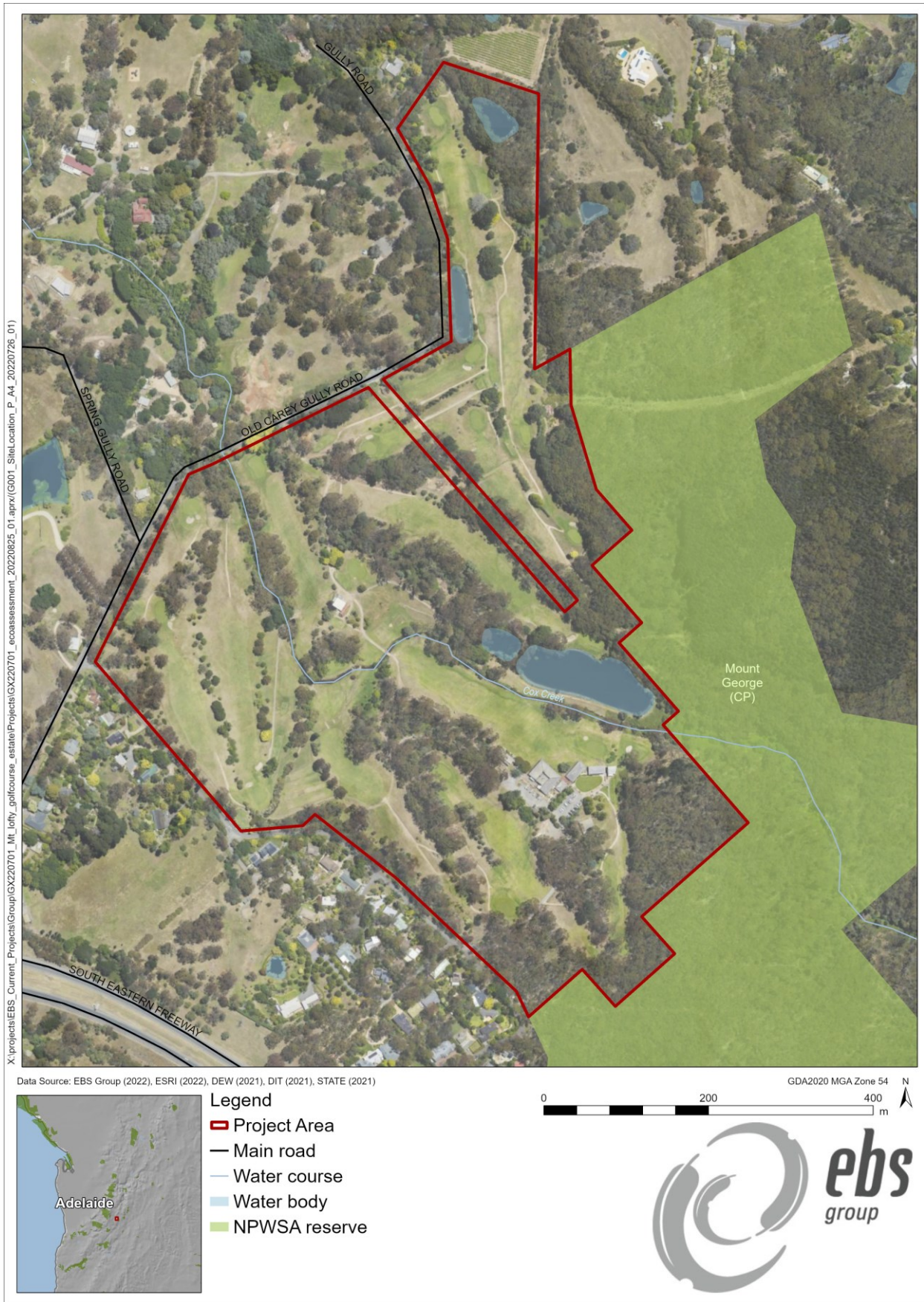


Figure 1. The Project Area at the Stirling Golf Club.

## 2.4 Project scope and design

The Project includes upgrades and works in the following key areas:

- Hotel with 70 suites and two penthouse apartments, function facilities and associated infrastructure;
- New clubhouse facility and pro-shop, administration areas and change rooms;
- Retention and improvements to the 18-hole golf course;
- Car parking in the order of 200 spaces across two parking areas;
- Restaurant;
- Nature Based Accommodation – 17 private retreat pods;
- Wellness Centre; and
- Amphitheatre.

At the time of preparing this report, the development design has not been finalised and the layout will be guided by the reports of numerous specialists. As such, no commencement date has been announced as development designs are likely to change.

## 2.5 Construction activities

Key construction activities for the Project are likely to include:

- Set-up of construction compound and/or laydown areas;
- Vegetation removal and/or pruning;
- Conservation works and adaptive reuse of a local heritage place for temporary clubrooms;
- Conservation works and adaptive reuse of a local heritage place to accommodate a multipurpose café, retail and function space;
- Tree removal and associated landscaping to develop a scent garden and orchard;
- Service location and relocation if required;
- General earthworks, including clearing and grubbing, excavation and/or placement of fill material; to reform road/carpark surfaces and paths where required;
- Asphalt and/or spray seal works;
- Paving and concrete works;
- Stormwater drainage works;
- Lighting and communications;
- Installation of signage, interpretation, and line marking;
- Building replacement works or upgrades;
- Landscaping;
- Furniture and fixtures; and
- Pack-up and removal of construction compound and/or laydown areas.

Key construction equipment to be used is likely to include:

- Scissor lifts and Elevated Work Platforms;

- Scaffolding;
- Hand-held equipment (drills, grinders, welders etc);
- Excavators;
- Profiler;
- Roller / compactor;
- Front end loader;
- Grader;
- Asphalt hopper;
- Kerbing machine;
- Small and large cranes;
- Tipper truck;
- Water truck;
- Water pump(s); and
- Light vehicles.

## **2.6 Administrative boundaries**

The Project Area is located within the Hills and Fleurieu Landscape Management Region (LMR) and the Adelaide Hills Council Local Government Area.

## **2.7 Climate and weather**

The Project Area is in the Mount Lofty Ranges and experiences dry, mild to warm summers and cool, wet winters. Climate data sourced from the Bureau of Meteorology (BoM) Mounty Lofty AWS (#23842) weather station indicates the greatest rainfall occurs in July, with an average of 147.9 millimetres (mm), while February is the driest month with only 37 mm recorded (Figure 2) (BOM 2022). July is the coolest month, with an average maximum temperature of 8.9°C and average minimum temperature of 5°C recorded. January is the warmest month, with an average maximum temperature of 22.7 degrees Celsius (°C) and an average minimum temperature of 12.5°C recorded (Figure 2) (BOM 2022).



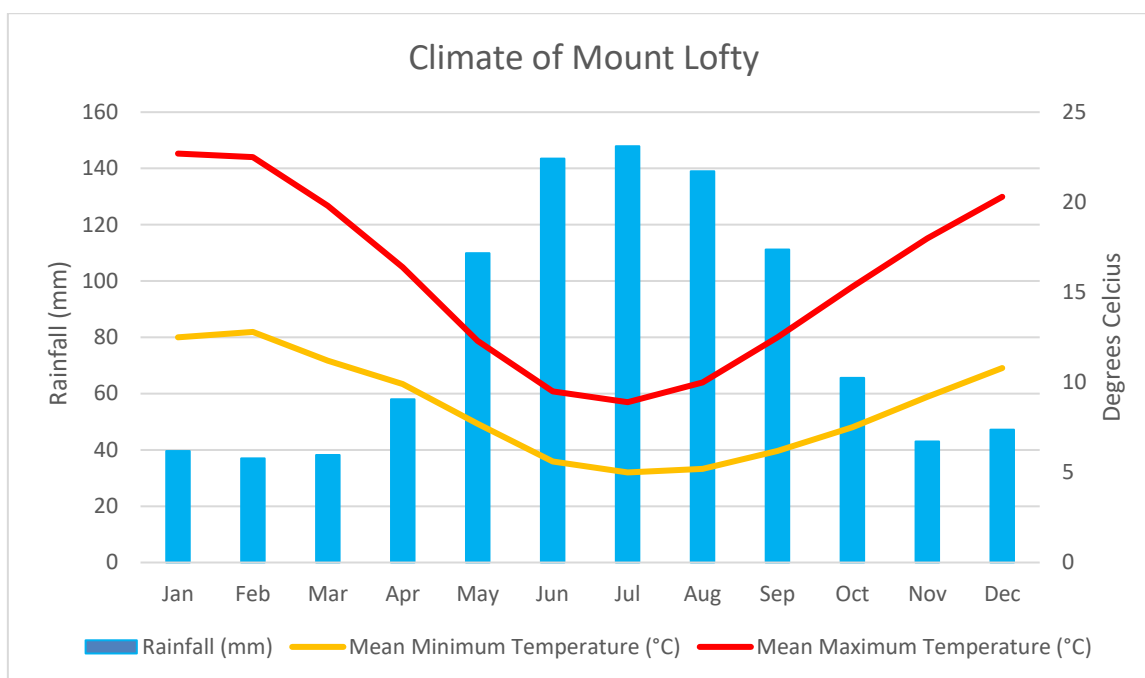


Figure 2. Climate data, including mean monthly rainfall as well as mean maximum and mean minimum temperature (BoM 2022).

## 2.8 Interim Biogeographical Regionalisation of Australia (IBRA)

The Interim Biogeographical Regionalisation of Australia (IBRA) identifies geographically distinct bioregions based on common climate, geology, landform, native vegetation, and species information, which is used to assess and plan for the protection of biodiversity (Department of Climate Change, Energy, the Environment and Water - DCCEEW 2022). The bioregions are further refined into subregions and environmental associations.

The Project Area is located within the Flinders Lofty IBRA bioregion, the Mount Lofty Ranges IBRA subregion and the Uraidla IBRA environmental association. An environmental landscape summary of this bioregion, subregion and environmental association is provided in Table 5.

Table 5. IBRA bioregion, subregion, and environmental association environmental landscape summary.

Flinders Lofty Block IBRA bioregion
Temperate to arid Proterozoic ranges, alluvial fans and plains, and some outcropping volcanics, with the semi-arid to arid north supporting native cypress, black oak (belah) and mallee open woodlands, <i>Eremophila</i> and <i>Acacia</i> shrublands, and bluebush/saltbush chenopod shrublands on shallow, well-drained loams and moderately-deep, well-drained red duplex soils. The increase in rainfall to the south corresponds with an increase in low open woodlands of <i>Eucalyptus obliqua</i> and <i>E. baxteri</i> on deep lateritic soils, and <i>E. fasciculosa</i> and <i>E. cosmophylla</i> on shallower or sandy soils.
Mount Lofty Ranges IBRA subregion
This subregion extends from north of the Fleurieu Peninsula to the Barossa Valley and is predominantly an undulating to low hilly upland with steeper marginal ranges and hills. The Barossa Valley is the lowest area in this subregion and represents a structural basin. The rest of the subregion consists of hilly uplands on sandstone and shale with northerly trending strike ridges and dissected lateritic tableland remnants. Low open woodland commonly dominated by <i>Eucalyptus obliqua</i> and <i>E. baxteri</i> are found in higher rainfall areas on deep, lateritic soils. Shallower or sandy soils support <i>E. fasciculosa</i> , <i>E. cosmophylla</i> and in the northern part of the region <i>E. goniocalyx</i> . <i>E.</i>

<i>Ieucoxylon</i> dominates the woodlands on podzolised soils in the lower rainfall areas, <i>E. viminalis</i> ssp. <i>cygnetensis</i> dominate the wetter and cooler woodlands and <i>E. odorata</i> characterises drier sites. Eucalypts give way to drooping sheoak ( <i>Allocasuarina verticillata</i> ) in the most arid woodlands and in coastal situations on shallow rocky soils.	
Remnant vegetation	Approximately 15% (46342 ha) of the subregion is mapped as remnant native vegetation, of which 27% (12706 ha) is formally conserved.
Landform	Hills and valleys; alternating subparallel hilly ridges and valleys with a general N-S trend in north. In south, hilly dissected tableland.
Geology	Dissected lateritized surface in south.
Soil	Hard setting loams with red clayey subsoils, Highly calcareous loamy earths, Hard setting loams with mottled yellow clayey subsoil, Coherent sandy soils, Cracking clays.
Vegetation	Eucalyptus woodlands with a shrubby understorey.
Conservation significance	129 species of threatened fauna, 270 species of threatened flora. 4 wetlands of national significance.
<b>Uraidla IBRA environmental association</b>	
Remnant vegetation	Approximately 26% (3674 ha) of the association is mapped as remnant native vegetation, of which 20% (749 ha) is formally conserved.
Landform	Hilly uplands on sandstone and shale with long smooth slopes.
Geology	Sandstone, shale and alluvium.
Soil	Hard pedal or apedal mottled-yellow soils, red duplex soils on the slopes, grey-brown weakly structured sandy soils and bleached sands.
Vegetation	Open forest of messmate stringybark or brown stringybark on the slopes and crests, and open forests of mountain gum on the valley floors.
Conservation significance	29 species of threatened fauna, 96 species of threatened flora. 1 wetlands of national significance.

## 2.9 EHIA report timing

This EHIA Report has been prepared very early during the Project planning stage in order to identify the potential impacts of the Project, as well as options and recommendations for avoiding, minimising, managing and mitigating identified potential impacts, and any approvals, licences or permits that may be required in accordance with State and Commonwealth legislation. Several project approvals / permits or licences potentially may take up to three to six months to obtain, sufficient time should be added to project timelines before construction commences for this to occur. Updates to this EHIAR throughout the project may also be required.

## 2.10 Limitations

This EHIA Report and the findings and recommendations within it are based on assessment of Project information provided by Trice – Project & Development Managers on behalf of Mount Lofty Estate Pty Ltd as well as other information available via desktop assessment, such as online databases, at the time of assessment. The findings and conclusions expressed by EBS Group are based solely upon information in existence at the time of the assessment. It is possible that different conclusions and recommendations may be made with additional information and/or after further project development.

### 3 ASSESSMENT OF ENVIRONMENTAL IMPACTS

This section presents an assessment of potential impacts (both positive and negative) of the Project during construction and operation, as well as avoidance, minimisation, management and mitigation measures to address the impacts. As stated previously, the potential impact of the Project on the following environmental aspects has been assessed:

- Vegetation;
- Fauna;
- Pest animals, plants and biosecurity;
- Water quality;
- Site contamination;
- Noise and vibration;
- Air quality;
- Land Use, Planning, Sustainability and Amenity;
- Waste Management;
- Historical Heritage;
- Aboriginal Heritage; and
- Native Title.

#### 3.1 Vegetation

##### ***3.1.1 Technical investigations undertaken or required***

A vegetation assessment, including both desktop and site/field assessment, was undertaken for the Project by EBS Ecology in August/September 2022. Refer to the *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a) for more detail.

##### ***3.1.2 Assessment methodology***

The vegetation assessment included both desktop and field assessment, with the desktop assessment involving searches of the following information sources:

- The EPBC Act Protected Matters Search Tool (PMST), via the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW); and
- Biological Databases of South Australia (BDBSA), via the Department for Environment and Water (DEW).

The desktop assessment also involved an assessment of the likelihood of occurrence within the Project Area for threatened flora species and ecological communities identified via the above searches.

The field assessment was conducted on 26 August 2022 by EBS Ecology and involved a vegetation survey to record the following (where relevant):

Where time permitted, vegetation data was collected in accordance with the Bushland Assessment Method (BAM) (NVC 2020a) and Scattered Tree Assessment Method (STAM) (NVC 2020b). Detailed vegetation assessment is reported in the *Native Vegetation Clearance Mount Lofty Golf Estate Data Report* EBS Ecology (2022b *in preparation*).

For areas containing patches of native vegetation protected by the *Native Vegetation Act 1991* (NV Act), Vegetation Associations and condition were surveyed in accordance with the Bushland Assessment Method (BAM), which is outlined in the *Native Vegetation Council (NVC) Bushland Assessment Manual* (NVC 2020) and derived from the Nature Conservation Society of South Australia's *Bushland Condition Monitoring* methodology (Croft *et al.* 2005).

The BAM is used to assess areas of native vegetation requiring clearance and calculate the Significant Environmental Benefit (SEB) offset requirements.

For trees protected by the *Native Vegetation Act 1991* (NV Act), trees were surveyed in accordance with the STAM, which is outlined in the *NVC STAM Manual* (2020). The STAM is used to assess scattered trees/tree groups that require clearance and calculate the SEB offset requirements.

Refer to the *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a) for more detail.

### **3.1.3 Existing vegetation**

A total of 84 threatened flora species have been identified via desktop assessment as potentially occurring within the Project Area. The EPBC Act Protected Matters Report (PMR) identified 11 nationally threatened flora species protected by the EPBC Act (DCCEEW 2022e), while the BDBSA search identified 73 state threatened flora species protected by the NPW Act (DEW 2022). Of the 84 species identified, 47 are considered unlikely to occur within the Project Area as the suitable habitat or associated vegetation is not present or the Project Area is outside of the known range. 30 species possibly may occur within the area, six species are considered likely to occur in the area, whilst one is considered highly likely/known to occur in the Area: State Rare, *Eucalyptus viminalis ssp. viminalis* (Manna Gum).

Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. The understorey in areas of native vegetation not directly associated with the golf course was heavily degraded and introduced flora species such as *Fumaria capreolata* (White-flower Fumitory), *Iris sp.* (Iris) and *Rubus fruticosus aggregate* (Blackberry) were dominant in these areas. MGCP is directly adjacent (to the east and southeast) of the Project Area and supports a large assemblage of both nationally and State listed flora and fauna. Two vegetation associations and 71 scattered trees, of which 42 were Regulated/Regulated Significant trees, including three *Acacia melanoxylon* (Blackwood), 24 *Eucalyptus obliqua* (Messmate Stringybark) and 44 State Rare *Eucalyptus viminalis ssp. viminalis* (Manna Gum), were recorded within the Project Area.

No nationally threatened flora or Threatened Ecological Communities (TECs) were recorded within the Project Area during the field survey. One flora species of State Rare status was identified within the Project Area: *Eucalyptus viminalis ssp. viminalis* (Manna Gum).

All trees were categorised based on their Unit Biodiversity Score (UBS). A tree with a UBS of less than 4 was categorised as low in quality and should be retained as much as possible but may be removed. A tree with a UBS between 4 and 7 was categorised as moderate in quality and should be retained where possible and a tree with a UBS of greater than 7 was categorised as high in quality and should be avoided. All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species.

A total of 60 flora species, including 31 introduced species were recorded within the Project Area. Timing of the survey likely influenced this result, with spring annual forbs and grasses only just beginning to flower or appear. Only one species of conservation significance was identified during the field survey: State Rare, Refer to the *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a) for more detail on any of the above.

### **3.1.4 Impacts to existing vegetation**

As outlined within the *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a), the Project has potential for impact on both flora and fauna at the Mount Lofty Golf Estate site, based on the current design plans. The current design also appears to be minimising impact given the placement of new infrastructure largely already avoids established remnant vegetation.

Construction works also have the potential to damage retained vegetation, particularly if vegetation protection controls are not implemented during works.

### **3.1.5 Alternatives, mitigation and opportunities**

The following alternatives, avoidance, minimisation and management measures are recommended to minimise negative impacts to vegetation:

- Where possible, adopt the recommendations outlined within the *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a).
- Review and adjust the design (where possible and practicable) to retain as much vegetation as possible and avoid clearance of vegetation, particularly vegetation considered important for fauna habitat.
- Where impacts to vegetation cannot be avoided, ensure that they are minimised as much as possible in order to minimise impacts to flora, and fauna habitat. For example, there may be alternate design options available to minimise impacts and pruning may be a viable option in some situations.
- Where impacts to vegetation cannot be avoided, the degree of impact, such as removal or pruning, will need to be assessed and should be documented for planning and construction purposes, as well as approval purposes.
- Seek approval in accordance with the NV Act to impact native vegetation.
- If required, seek approval from the Adelaide Hills Council to impact (remove and/or prune as required) vegetation that cannot be retained.
- Notify Project stakeholders (such as local business operators) and the local community about vegetation impacts and proposed offsets (prior to impacting any vegetation).
- Prior to the commencement of construction works, including clearing and/or grubbing:

- Ensure that all site personnel complete a project specific induction and/or toolbox training session to understand their responsibility to avoid and minimise impacts to vegetation;
- Ensure that vegetation requiring removal and/or pruning is clearly marked on site and that plant/machinery operators understand the markings and what is approved for removal and/or pruning;
- Ensure that construction site layout, including the location of site access, construction site offices, and laydown areas avoid and minimise impacts to vegetation, as much as possible.
- Ensure that construction methods specifically avoid and minimise impacts to vegetation, as much as possible.
- Ensure that only vegetation approved for removal or pruning is impacted.
- Seek additional approval if additional vegetation clearance (i.e., not already approved) is required.
- If removal or pruning of trees is required, ensure that the works are undertaken by a suitably qualified arboricultural contractor and that all pruning is undertaken in accordance with AS 4373 *Pruning of Amenity Trees*.
- Record details of vegetation removed to assist with offsetting it after construction.
- Document vegetation protection, management and mitigation measures within the vegetation section of the project specific CEMP.

### ***Vegetation clearance remediation***

Offset the impact of vegetation removal by replacing vegetation at a minimum ratio of 1:1, or as otherwise agreed with Adelaide Hills Council, or as required by the native vegetation clearance approval and/or Development Approval (for Regulated/Significant Trees). If individual trees are required to be removed, replace them with advanced, semi-mature trees, of the same or similar species, where possible and practicable and as negotiated with Adelaide Hills Council.

#### ***3.1.6 Approvals, permits and authorisations***

The NV Act applies across the Project Area. If any native vegetation protected by the NV Act is required to be cleared for the Project, a native vegetation clearance application will need to be submitted to the Native Vegetation Council (NVC) via the Native Vegetation Assessment Branch within DEW.

Regulated and Significant Tree controls associated with the PDI Act apply across the Project Area. As such, trees within the Project Area are subject to Regulated and Significant Tree controls.

## **3.2 Fauna**

### ***3.2.1 Technical investigations undertaken or required***

A fauna assessment, including both desktop and site/field assessment, was undertaken for the Project by EBS Ecology in August/September 2022 as part of the *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a).

No other technical investigation into fauna is likely to be required.

### 3.2.2 *Assessment methodology*

The fauna assessment included both desktop and field assessment, with the desktop assessment involving searches of the following information sources:

- The EPBC Act Protected Matters Search Tool (PMST), via the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW); and
- Biological Databases of South Australia (BDBSA), via the Department for Environment and Water (DEW).

The desktop assessment also involved an assessment of the likelihood of occurrence within the Project Area for threatened fauna species and ecological communities identified via the above searches.

The field assessment was conducted on 26 August 2022 by EBS Ecology. All native and exotic fauna species opportunistically encountered (directly observed, or tracks, scats, burrows, nests and other signs of presence) during the field survey were recorded. Potential fauna refuge sites such as hollows were noted as an indication of availability of suitable habitat.

### 3.2.3 *Existing environment*

The EPBC Act PMST (DCCEEW 2022e) identified 10 Nationally listed threatened fauna species protected by the EPBC Act, including 8 birds and 2 mammals. The BDBSA search (DEW 2022) identified 30 species listed under the NPW Act including 24 avian species, three mammals and three reptiles. There are four EPBC Act listed species identified as likely to occur within the Project Area:

- Bassian Thrush (*Zoothera lunulata halmaturina*) - Nationally Endangered and State Rare;
- Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – Nationally Endangered and State Endangered;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – Nationally Vulnerable and State Rare; and
- Southern Brown Bandicoot (*Isodon obesulus obesulus*) – Nationally Endangered and State Vulnerable;

One additional nationally listed threatened species was assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- White-throated Needletail (*Hirundapus caudacutus*) – nationally Vulnerable and migratory and State Vulnerable.

A total of eleven species are listed as threatened under the NPW Act and likely or highly likely/known to occur within the Project Area

- Beautiful Firetail (*Stagonopleura bella*) – State Rare;
- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area;
- Elegant Parrot (*Neophema elegans elegans*) – State Rare;
- Jacky Winter (*Microeca fascinans fascinans*) – State Rare;

- Little Eagle (*Hieraaetus morphnoides*) – State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Scarlet Robin (*Petroica boodang boodang*) – State Rare;
- Square-tailed Kite (*Lophoictinia isura*) – State Endangered;
- White-winged Chough (*Corcorax melanorhamphos*) – State Rare;
- Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable.

Additionally, sixteen species under the NPW Act are possible to occur within the Project Area.

A total of 22 fauna species were observed and recorded during the field survey. Apart from the NPW Act Rare *Trichosurus vulpecula* (Common Brushtail Possum), all of the fauna species recorded during the field survey are considered to be quite common and none are threatened. Majority of the fauna species recorded during the field survey were observed to be using the trees within the Project Area, particularly the many *Eucalyptus viminalis ssp. viminalis* (Manna Gum) trees and other Eucalyptus species trees. As such, these trees are considered to provide useful habitat for fauna within the Project Area.

Vegetation within the Project Area provides habitat for local fauna species. Given the wide array of vegetation of different height classes, forms, species diversity and spatial distribution, the remnant woodland vegetation of the Project Area is an area of considerable fauna habitat. The site therefore provides resources for fauna and areas for habitat use.

Refer to the *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a) for more information.

### **3.2.4 Impacts to existing environment**

The Project has the potential to impact on fauna and fauna habitat via clearance of vegetation, particularly if areas of vegetation are required to be removed or pruned to enable construction of the design. Whilst impacts to existing vegetation (fauna habitat) required for the Project are not yet known (designs yet to be finalised), impacts on fauna and fauna habitat are expected to be limited to localised, minor habitat loss associated with vegetation clearance and/or pruning, and temporary habitat disturbance (such as noise) during construction.

Construction works also have the potential to damage retained fauna habitat (vegetation), particularly if vegetation (fauna habitat) protection controls are not implemented during works.

Increased human disturbance and vehicle traffic due to increased visitation to the area may have the potential to impact fauna species moving within the project area e.g., injury or roadkill.

### **3.2.5 Alternatives, mitigation and opportunities**

The following alternatives, avoidance, minimisation and management measures are recommended to minimise negative impacts to fauna and fauna habitat:



- Collate additional information to determine if a referral under the EPBC Act (i.e., undertake an EPBC Self-assessment of MNES, conduct targeted threatened species surveys), is required.
- Implement all alternatives, avoidance, minimisation and management measures for vegetation outlined above in Section 3.1.5, where possible.
- Where possible, adopt the recommendations outlined within the *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a).
- Prior to the commencement of construction works, including clearing and/or grubbing, ensure that all site personnel complete a project specific induction and/or toolbox training session to understand their responsibility to avoid and minimise impacts to native fauna and fauna habitat.
- Engage a suitably qualified fauna specialist to complete a fauna check and relocate fauna if required, prior to clearing vegetation and/or impacting any other fauna habitat, particularly if individual trees are required to be removed.
- Minimise vegetation clearance during construction, to minimise impacts to fauna habitat and fauna.
- Ensure all construction works are undertaken in a manner to minimise disturbance to existing vegetation and fauna habitats, including aquatic fauna and habitats.
- Undertake daily checks for any fauna that are trapped within the site (e.g., within but not limited to pits, trenches, excavations) before any works commence.
- If any fauna is present and likely to be impacted by the works, either wait for it to move away on its own accord and undertake work elsewhere until it has moved on, encourage it to move away (without harming any fauna), assist it to move away by providing a ramp or way of climbing out, or have a suitably qualified fauna specialist relocate it to a similar habitat.
- Implement all reasonably practicable measures to prevent injury to fauna.
- Contact Fauna Rescue SA, the RSPCA or a veterinarian for advice if any injured fauna is found on site during construction (as appropriate).
- Notify the Contract Manager if any injured or dead native fauna is found on the site.
- Document fauna protection, management and mitigation measures within the fauna section of the project specific CEMP.
- Consider increased road signage about potential fauna movement within the area to decrease the impact from vehicle movement. Speed humps could also be considered to slow down travel speeds.

### **3.2.6 Approvals, permits and authorisations**

The following approvals, permits and/or authorisations may be required:

- Permits to 'take' and 'release' fauna in accordance with the NPW Act (Sections 53(1)(d) and 55 respectively) from the DEW Fauna Permit Unit.
- Permit to 'Destroy Wildlife' in accordance with the NPW Act (Sections 53(1)(c) and 53(1)(d)).

A suitably qualified fauna specialist is likely to be able to obtain these permits as part of their work.

### 3.3 Pest plants, animals and biosecurity

#### 3.3.1 Technical investigations undertaken or required

The *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a) included assessment of pest plants and animals.

No other technical investigation into pest plants and animals is likely to be required.

#### 3.3.2 Assessment methodology

Pest plants and animals were assessed during the vegetation and fauna assessments, which as outlined previously in Section 3.1.2 and Section 3.2.2 respectively, included both desktop and field assessment. Refer to Section 3.1.2 and Section 3.2.2 as well as the *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a) for more detail.

#### 3.3.3 Existing environment

A total of 31 pest plant species were recorded within the Project Area during the vegetation assessment field survey as listed in Table 6.

**Table 6. Exotic flora species recorded within the Project Area (EBS Ecology 2022).**

Scientific Name	Common Name	Declared	WoNS
<i>Acacia mearnsii</i>	Black Wattle		
<i>Agapanthus praecox ssp. orientalis</i>			
<i>Anagallis sp.</i>			
<i>Asphodelus fistulosus</i>	Onion Weed		
<i>Briza maxima</i>	Large Quaking-grass		
<i>Cenchrus clandestinus</i>	Kikuyu		
<i>Cytisus scoparius</i>	English Broom	Yes	Yes
<i>Dactylis glomerata</i>	Cocksfoot		
<i>Freesia cultivar</i>	Freesia		
<i>Fumaria capreolata</i>	White-flower Fumitory		
<i>Galium aparine</i>	Cleavers		
<i>Genista monspessulana</i>	Montpellier Broom	Yes	Yes
<i>Hakea sp.</i>	Hakea/Needlewood		
<i>Hedera helix</i>	English Ivy		
<i>Hypochaeris glabra</i>	Smooth Cat's Ear		
<i>Iris sp.</i>	Iris		
<i>Narcissus sp.</i>			
<i>Oxalis pes-caprae</i>	Soursob		
<i>Oxalis purpurea</i>	One o'clock		
<i>Pinus radiata</i>	Radiata Pine		
<i>Pittosporum undulatum</i>	Sweet Pittosporum	Yes	
<i>Plantago lanceolata var.</i>	Ribwort		
<i>Quercus ilex</i>			
<i>Rhamnus alaternus</i>	Blowfly Bush	Yes	
<i>Romulea sp.</i>	Onion-grass		
<i>Rubus fruticosus aggregate</i>	Blackberry	Yes	Yes

Scientific Name	Common Name	Declared	WoNS
<i>Senecio pterophorus</i>	African Daisy		
<i>Sonchus sp.</i>	Sow-thistle		
<i>Sporobolus africanus</i>	Rat-tail Grass		
<i>Ulex europaeus</i>	Gorse	Yes	Yes
<i>Vinca major</i>	Blue Periwinkle		

Six of these are Declared under the *South Australia Act 2019* (LSA Act): *Cytisus scoparius* (English Broom), *Genista monspessulana* (Montpellier Broom), *Pittosporum undulatum* (Sweet Pittosporum), *Rhamnus alaternus* (Blowfly Bush), *Rubus fruticosus aggregate* (Blackberry) and *Ulex europaeus* (Gorse) and four are Weeds of National Significance (WoNS): *Cytisus scoparius* (English Broom), *Genista monspessulana* (Montpellier Broom), *Rhamnus alaternus* (Blowfly Bush), *Rubus fruticosus aggregate* (Blackberry) and *Ulex europaeus* (Gorse). Introduced flora species which were dominant in the Project Area include *Fumaria capreolata* (White-flower Fumitory), *Iris sp.* (Iris) and *Rubus fruticosus aggregate* (Blackberry).

The nearest records of Phytophthora to the Project Area are in MGCP approximately 600 metres away, although neither of the two records have been confirmed via a soil test (DEW 2022a).

Phytophthora dieback as a result of the plant pathogen *Phytophthora cinnamomi* poses a significant threat to the environment. This pathogen is easily spread and can cause severe disease and death of plant species. Any activity that moves soil, water or plant material can spread Phytophthora (DCCEEW 2021).

No pest animal species were observed or recorded within the Project Area during the field survey for the vegetation and fauna assessments. However, it is possible that pest animal species such as, but not limited to, feral Cat (*Felis catus*), Brown Hare (*Lepus capensis*), House Mouse (*Mus musculus*), European Rabbit (*Oryctolagus cuniculus*), Brown Rat (*Rattus norvegicus*), Black Rat (*Rattus rattus*), Fallow Deer (Dama Dama) and Red Fox (*Vulpes vulpes*) may occasionally occur within the Project Area.

### 3.3.4 Impacts to existing environment

Construction works, particularly excavation and other earthworks, have the potential to increase the occurrence and coverage of the thirty-one pest plant species known to occur within the Project Area. The use of construction plant and machinery also has the potential to introduce additional pest plant species into the Project Area, particularly if standard weed hygiene measures are not implemented during construction works.

Generally, the Project is considered unlikely to result in any change to the potential for pest animal species to occur within the Project Area. However, construction site facilities, such as site offices and lunchrooms, have the potential to provide food resources and/or shelter for pest animal species such as House Mouse (*Mus musculus*), Brown Rat (*Rattus norvegicus*), Black Rat (*Rattus rattus*) and Red Fox (*Vulpes vulpes*) temporarily during construction works, particularly if pest animal controls are not implemented.

### 3.3.5 Alternatives, mitigation and opportunities

The following alternatives, avoidance, minimisation and management measures are recommended to minimise the potential for pest plant and animal issues:

- Control, transport and dispose of Declared plants, including *Cytisus scoparius* (English Broom), *Genista monspessulana* (Montpellier Broom), *Pittosporum undulatum* (Sweet Pittosporum), *Rhamnus alaternus* (Blowfly Bush), *Rubus fruticosus aggregate* (Blackberry) and *Ulex europaeus* (Gorse), in accordance with LSA Act requirements, prior to and during construction works. Waste material from Declared Weeds is usually required to be disposed of at a licensed waste depot. Advice can be obtained from Landscape South Australia (<https://statewide.landscape.sa.gov.au>), particularly the Hills and Fleurieu Landscape Board and / or Primary Industries and Regions SA (PIRSA) BiosecuritySA (<https://www.pir.sa.gov.au/biosecurity>);
- Control other pest plant species prior to and during construction works (to prevent an increase in their occurrence and/or coverage within the Project Area).
- Ensure that pest plant control activities do not harm native vegetation, planted amenity vegetation or fauna and fauna habitat.
- Ensure effective hygiene practices are used on all vehicles, plant and equipment during construction (to avoid spreading and/or introducing weed species within the Project Area).
- Ensure imported fill (if required) is sourced from a registered quarry, clean and free of weed material (to reduce the risk of weed introduction).
- Ensure appropriate pest animal management measures, such as securing and regularly disposing of food waste are implemented during construction (to avoid causing pest animal issues).
- Ensure pest plant and animal species management and mitigation measures are documented in a project specific CEMP and implemented during construction.
- The potential spread of Phytophthora will need to be addressed throughout the Project. Specific management measures will need to be implemented to prevent the potential spread of Phytophthora.

### **3.3.6 Approvals, permits and authorisations**

The following approvals, permits and/or authorisations may be required:

- A permit (likely to be a written exemption from the Hills and Fleurieu Landscape Board) is likely to be required to transport Declared plants on a public road, in accordance with the LSA Act.

## **3.4 Water quality**

### **3.4.1 Technical investigations undertaken or required**

The *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022) identified water bodies relevant to the Project Area. However, no specific water quality investigations have been undertaken as it is not known at this early planning stage if any construction works will impact upon any waterways. Further investigation into potential water quality impacts should be undertaken as part of the detailed design process.

### **3.4.2 Assessment methodology**

Various layers available on NatureMaps (DEW 2022a) that provide information on water have been reviewed as part of this EHIAR report to identify existing water conditions and potential constraints applicable to water quality.

Additional databases including WaterConnect (DEW 2022b), and the Australian Soil Resource Information System (ASRIS) (ASRIS 2014) have also been reviewed to obtain groundwater well information and acid sulfate soil information respectively.

### **3.4.3 Existing environment**

The *Mount Lofty Golf Estate Ecological Flora and Fauna Assessment* (EBS Ecology 2022a) identified that the Project Area is located within the Hills and Fleurieu LMR. It also identified (via desktop assessment involving use of the EPBC Act Protected Matters Search Tool) that the Project Area is not located immediately near an EPBC Act listed waterbody.

Cox Creek runs through the Project Area from the adjacent Mount George Conservation Park. There are also three artificially constructed lakes or dams to the north of the Stirling Golf Club clubhouse and in the northern section of the Project Area.

Naturemaps suggests that there may possibly be dams as well as groundwater wells within the northern extent of Project Area:

- Unit number: 662806695, Drillhole number: 53664, Status: Operational (OPR)
- Unit number 662813442, Drillhole number 604111, Status: Abandoned (ABN)
- Unit number 662806696, Drillhole number: 53665, Status: Operational (OPR)
- Unit number: 662806445, Drillhole number: 53414, Status: Abandoned (ABN)
- Unit number: 662811601, Drillhole number 58570, Status: Operational (OPR)
- Unit number: 662806446, Drillhole number: 53415, Status: Abandoned (ABN)

However, WaterConnect information on these wells is very limited. Whilst the depth to groundwater is unknown, the Onkaparinga River Surface water Basin, Western Mount Lofty Ranges Prescribed Water Resources Area and Cox Creek Ground Water Management Zone is located within the Project Area and as such it is possible that groundwater may be encountered during excavation works as part of construction.

### **3.4.4 Impacts to existing environment**

There is likely to be a minor increase in non-permeable surface area via the sealing and extension of car parks and infrastructure construction. However, this is likely to be an insignificant increase and is not expected to impact the surrounding catchment.

The Project has the potential to impact upon water quality, particularly if stormwater drainage during construction is not controlled or managed appropriately to prevent pollution.

There is a minor risk of pollution, including hydrocarbon spills, during construction works and operation of the Project (i.e., via use of the area, particularly vehicles). However, the risk is not expected to increase from the current level of risk.

There is a very minor risk of erosion and sedimentation during construction works, particularly during earthworks.

Review of ASRIS data and NatureMaps (DEW 2022a) suggests that there are listings for the occurrence of acid sulfate soils (ASS) nearby the project site (ASRIS 2022). These records are listed as both Negligible ASS risk (DEW 2022a) and Extremely Low Probability for ASS (ASRIS 2022).

Water is likely to be required during construction works for construction activities. It is not known if recycled water is available nearby, for use during construction.

### ***Water Affecting Activities***

Water Affecting Activities (WAAs) are “*activities that can potentially have adverse impacts on the health and condition of water resources, other water users and ecosystems that depend on water resources*” (DEWNR undated). WAAs outlined in the LSA Act which may require a permit, which is referred to as a Water Affecting Activities Permit (WAAP), include but are not limited to:

- the erection, construction or placement of any building or structure in a watercourse or lake or on the floodplain of a watercourse;
- draining or discharging water directly or indirectly into a watercourse or lake;
- depositing or placing an object or solid material in a watercourse or lake;
- obstructing a watercourse or lake in any other manner;
- depositing or placing an object or solid material on the floodplain of a watercourse or near the bank or shore of a lake to control flooding from the watercourse or lake;
- destroying vegetation growing in a watercourse or lake or growing on the floodplain of a watercourse;
- excavating or removing rock, sand or soil from—
  - a watercourse or lake or the floodplain of a watercourse; or
  - an area near to the banks of a lake so as to damage, or create the likelihood of damage to, the banks of the lake.

#### ***3.4.5 Alternatives, mitigation and opportunities***

The following alternatives, avoidance, minimisation and management measures are recommended to minimise the potential for impacts to water quality:

- If required, contact the Hills and Fleurieu LMR to confirm if a WAAP is required during construction works and any other subsequent requirements and timeframes.
- Incorporate water sensitive urban design (WSUD) measures which seek to minimise the impacts of the Project, protect water quality and make more efficient use of water (e.g., stormwater drainage), where practicable. More information on water sensitive urban design can be found at: <https://www.watersensitivesa.com>.

- Undertake a Water Quality Risk Assessment (WQRA) during the planning stage to assist in identifying appropriate management measures to avoid and/or manage the potential or likely impacts of operation of the Project (including use of the area, such as car parking) upon water quality.
- Consider investigating the depth to groundwater prior to construction works to better understand and manage the risk of encountering groundwater during construction works.
- If required, ensure groundwater management and contingency measures are implemented, with consideration of and in accordance with *Environment Protection Act 1993* (EP Act) and *Environment Protection (Water Quality) Policy 2015* requirements, during construction works to avoid impacts (such as pollution) to groundwater.
- Ensure drainage is designed to meet relevant standards for achieving containment from storm events and potential spillages, thereby reducing the risk of discharge of pollutants into Cox Creek.
- Consider undertaking further investigation and seeking specialist advice, for example from a soil contamination expert, on acid sulfate soil potential and risk during construction as well as potential management requirements during construction (if required). Refer to *EPA Guidelines: Site contamination – acid sulfate soil materials* (EPA 2007) for management measures required if acid sulfate soils are encountered.
- Undertake a WQRA prior to construction to assist in identifying appropriate management measures to avoid and/or manage the potential or likely impacts of construction works upon water quality. If during completion of the WQRA it is determined that the need for any on site water quality monitoring is required during construction (due to the possibility of sediment laden runoff entering the stormwater system or adjacent waters) the following should be used as a guideline:
  - The nature of the threat from a discharge;
  - The level of protection for the environment: and
  - The environmental value of the waters, as prescribed in the South Australian *Environment Protection (Water Quality) Policy 2015* and the Hills and Fleurieu Landscape Region Management Plan.
- As a minimum, a simple water quality monitoring plan should be documented in the Project's CEMP and implemented during construction (for example during weekly inspections and during/immediately after rainfall events), including:
  - Visual inspection of site erosion and drainage management measures;
  - Visual inspection of drainage discharge points;
  - Photo points; and
  - Temperature and rainfall from nearest Bureau of Meteorology weather station.

Records of results/findings of water quality monitoring should be documented and made available for future reference, if required.

- Document and implement a simple, site specific, Soil Erosion and Drainage Management Plan (SEDMP) as part of the Project specific CEMP, to manage the risk of erosion and sedimentation during construction. It is recommended that the SEDMP is prepared in accordance with the EPA's *Stormwater Pollution Prevention Code of Practice for Local, State and Federal Government* (EPA

1998), which identifies strategies for the collection, treatment, storage and disposal of stormwater during construction and is available at: [https://www.epa.sa.gov.au/files/47791\\_govcop1.pdf](https://www.epa.sa.gov.au/files/47791_govcop1.pdf).

- Ensure construction plant and equipment is in good working order, well maintained and inspected regularly for loose or deteriorating hoses and fittings.
- Ensure a spill kit (including for aquatic environments) is available on-site during construction to clean up any spills and ensure that workers know how to use it.
- Ensure an emergency response procedure for spills (including into aquatic environments) is documented within the Project CEMP and implemented if required.
- Investigate the potential to use recycled water or non-mains water during construction.
- Refer to the *Environment Protection (Water Quality) Policy 2015* which specifies that several pollutants cannot be discharged into any waters, including the stormwater system, or onto land from where they are reasonably likely to enter waters.
- Ensure water quality protection, management and mitigation measures are documented in a project specific CEMP and implemented during construction.
- Prior to the commencement of construction works, ensure that all site personnel complete a Project specific induction to understand their responsibility to avoid and minimise impacts to water quality during construction works.

#### **3.4.6 Approvals, permits and authorisations**

The following approvals, permits and/or authorisations may be required:

- **WAAP:** Consult with the Hills and Fleurieu Landscape Board regarding the Project and associated construction works to determine if a WAAP is required. Note that it may take 2-3 months for a WAAP application to be assessed and a permit issued (DEWNR undated).
- **Earthworks Drainage Licence:** The EP Act and associated *Water Quality Policy 2015* require dewatering to be carried out in a manner that does not cause environmental harm. Large earthworks activities that involve dewatering may require an authorisation in the form of a licence, referred to as an '**earthworks drainage**' licence. The threshold for an earthwork's drainage licence is stated in Schedule 1 of the EP Act as:

*the conduct of earthworks operations in the course of which more than 100 kL of wastewater containing suspended solids in a concentration exceeding 25 mg/L is discharged directly or indirectly to marine waters or inland waters.*

Note that *wastewater* includes stormwater from a construction site. As such, consider obtaining an earthworks drainage licence from the EPA prior to construction works (if considered required in accordance with Schedule 1 of the EP Act). Refer to the EPA Guideline *Environmental management of dewatering during construction activities* (EPA 2021a) for more information.

- **Dredging Licence:** Any dredging works, for example within Cox Creek, may require an authorisation in the form of a licence, referred to as a '**dredging**' licence. Schedule 1 of the EP Act defines dredging as:



*...removing solid matter from the bed of any marine waters or inland waters by any digging or suction apparatus, but excluding works carried out for the establishment of a visual aid to navigation and any lawful fishing or recreational activity.*

Note that *solid matter* includes but is not limited to sand, sediment, organic matter and rocks and *the bed of inland waters* is the portion of substrate within waters, including the substrate of a water body which confines the flow of waters but does not include the bank of a water body which confines water as they rise out of the bed. As such, if any construction works are required in Cox Creek, a dredging licence may possibly be required from the EPA prior to construction works (if considered required in accordance with Schedule 1 of the EP Act). Refer to the EPA *Dredge guideline* (EPA 2020) for further information on what is and is not considered dredging and associated requirements.

### **3.5 Site contamination**

#### ***3.5.1 Technical investigations undertaken or required***

EBS is not aware of any specific site contamination investigation undertaken for the Project. However, a site contamination investigation, which classifies soil for reuse and/or disposal is likely to be required if material is proposed to be re-used on site or disposed offsite.

#### ***3.5.2 Assessment methodology***

Desktop assessment has been undertaken as part of this EHIA report to identify potential site contamination issues. Aerial imagery available on NatureMaps (DEW 2022a) has been reviewed and knowledge of the site obtained from the field survey for vegetation and fauna assessment has also contributed to the assessment.

The EPA site contamination index has been searched to identify site contamination information received by the EPA (EPA 2021b). As part of this process, 'Groundwater Prohibition Area' and 'Section 83A Notification' layers available on LocationSA MapViewer (Government of South Australia 2022) have been reviewed to identify existing known or potentially contaminated areas.

#### ***3.5.3 Existing environment***

No site contamination or potentially contaminating activity within the Project Area is listed in the EPA site contamination index (EPA 2021b). No 'Groundwater Prohibition Area' or 'Section 83A Notification' applies within or adjacent to the Project Area (Government of South Australia 2021).

#### ***3.5.4 Impacts to existing environment***

Construction works are likely to involve excavation of soil and other materials that are potentially contaminated, which may require offsite disposal.

As stated previously in Section 3.4.4, review of ASRIS data suggests that there is low probability of occurrence of acid sulfate soils within the project site (ASRIS 2022). These records are listed as both Negligible ASS risk (DEW 2022a) and Extremely Low Probability for ASS (ASRIS 2022). As such any potential excavation works within the Project Area may present a low risk for acid sulfate soils.

There is a risk of spills or leakage of hazardous materials (such as diesel and other hydrocarbons) from construction plant and equipment during construction. It is also likely that construction works, and use of a site office will require disposal of waste, including hydrocarbons and other chemical substances.

There is also a minor risk of hydrocarbon spills during operation of the Project (i.e., via use of the area, particularly by vehicles). However, the risk is not expected to increase from the current level of risk.

### **3.5.5 Alternatives, mitigation and opportunities**

The following alternatives, avoidance, minimisation and management measures are recommended to avoid, minimise and/or mitigate the potential for contamination impacts:

- Prior to construction, undertake a site contamination investigation to identify and understand the risk of encountering contaminated materials during construction works, particularly if disposal of excess soil / fill material is likely to be required during construction. The assessment of site contamination should be undertaken in accordance with the framework provided in the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (as amended 2013). Refer to *EPA Guidelines for the assessment and remediation of site contamination* (EPA 2019b) for more detail. If site contamination exists, the provisions of Part 10A of the EP Act apply.
- Ensure any contamination investigation report(s) meet the requirements of the EP Act. Note that the EPA is a referral body for site contamination assessment under the *Planning, Development and Infrastructure Act 2016*.
- As stated previously in Section 3.4.5, consider undertaking further investigation and seeking specialist advice, for example from a soil contamination expert, on acid sulfate soil potential and risk during construction as well as potential management requirements during construction (if required). Refer to *EPA Guidelines: Site contamination – acid sulfate soil materials* (EPA 2007) for management measures required if acid sulfate soils are encountered.
- If required, document and implement a Contamination and Remediation Management Plan as part of the Project specific CEMP, which includes contingency procedures to identify and manage soil and/or groundwater contamination during construction activities.
- Ensure all work is undertaken in accordance with the following (as a minimum):
  - EP Act;
  - *Environment Protection (Water Quality) Policy 2015*;
  - *Work Health and Safety Act 2012*; and
  - *Work Health and Safety Regulations 2012*.
- Ensure that any reuse of fill material is undertaken in accordance with the EPA *Standard for the production and use of Waste Derived Fill* (EPA 2013). Standards and specifications under clause 4 of the *Environment Protection (Waste to Resources) Policy 2010*, specify how and when certain materials can be reused and cease to be considered waste. Refer to [https://www.epa.sa.gov.au/environmental\\_info/waste\\_recycling/waste-management](https://www.epa.sa.gov.au/environmental_info/waste_recycling/waste-management) for more information (if required).
- If required, consult with the EPA regarding re-use of materials and any licence or authorisation required.

- Ensure that any asbestos materials are managed in accordance with the *How to safely remove asbestos Code of Practice (Safe Work Australia 2018)* and Safework SA requirements.
- Ensure construction plant and equipment is in good working order, well maintained and inspected regularly for loose or deteriorating hoses and fittings.
- Ensure a suitable spill kit (including for aquatic environments) is available on-site during construction to clean up any spills and that workers know how to use it.
- Ensure an emergency response procedure for spills (including into aquatic environments) is documented within the Project CEMP and implemented if required.
- Ensure that all potentially contaminating materials used during construction are listed in a Hazardous Materials Register, including storage location details, proper usage, safe handling procedures and appropriate disposal.
- Ensure site contamination management and mitigation measures are documented in the Project specific CEMP and implemented during construction.
- Prior to the commencement of construction works, ensure that all site personnel complete a Project specific induction to understand their responsibility to avoid, minimise and/or manage impacts caused by contamination.

### **3.5.6 Approvals, permits and authorisations**

As stated above, it is recommended that the EPA is consulted regarding re-use of materials and any licence or authorisation required. An approval, permit and/or authorisation from the EPA may be required for the following activities:

- Hot Mix Asphalt Preparation: the conduct of works at which crushed or ground rock aggregates are mixed with bituminous or asphaltic materials (by heating in a furnace, kiln or other fuel fired plant) for the purposes of producing road building mixtures;
- Waste transport: the conduct of: a waste transport business, being the collection or transport for fee or reward of: waste soil containing a listed waste in a concentration above that naturally occurring in soil in the area) (refer to Schedule 1, Part A of the EP Act).

## **3.6 Noise and vibration**

### **3.6.1 Technical investigations undertaken or required**

EBS is not aware of any specific noise and/or vibration assessment undertaken for the Project. However, as explained further below, a noise and vibration assessment, potentially may be required.

### **3.6.2 Assessment methodology**

Aerial imagery available on NatureMaps (DEW 2022a) has been reviewed as part of this EHIA report to identify potential noise and/or vibration sensitive receivers surrounding the Project Area and associated potential noise/and or vibration impacts. Knowledge of the site obtained from the field survey for vegetation and fauna assessment has also contributed to this process.

### **3.6.3 Existing environment**

The Project Area is located near a number of noise and vibration sensitive receivers (residential properties) located adjacent to the Project Area along St Andrews Avenue, Hoylake Avenue, Murfield Avenue and Old Carey Gully Road. These properties are located adjacent to and within 200m of the Project Area.

Impacts to existing environment

#### *Operational noise*

Operation of the Project (i.e. golf course, restaurant, private pods etc) is not expected to cause noise levels that might impact surrounding noise sensitive receivers. However, it is unknown how the amphitheatre will be used and whether this may cause noise levels that might impact surrounding noise sensitive receivers.

#### *Operational vibration*

Operation of the Project (i.e. golf course, restaurant, private pods etc) is not expected to cause vibration levels that might impact surrounding vibration sensitive receivers.

#### *Construction noise*

The use of construction plant and equipment during construction works will produce levels of noise which have the potential to impact on noise sensitive receivers located adjacent to and within approximately 200m of the Project Area. However, any potential noise impact will be temporary and limited to construction works.

#### *Construction vibration*

Similarly, the use of construction plant and equipment during construction works will produce levels of vibration which may have the potential to impact on vibration sensitive receivers located within and/or adjacent to the Project Area.

### **3.6.4 Alternatives, mitigation and opportunities**

The following alternatives, avoidance, minimisation and management measures are recommended to minimise the potential for impacts from noise and/or vibration:

- Consider engaging a suitably qualified consultant to undertake a noise and vibration assessment to identify likely noise and vibration levels and associated impacts.
- Document and implement a Construction Noise and Vibration Management Plan (CNVMP) as part of the Project specific CEMP to avoid, minimise and manage noise and vibration impacts during construction.
- If required, document and implement a Night Works Management Plan as part of the CNVMP (if night works are to occur).
- Ensure that all potential noise and/or vibration sensitive receivers are notified and informed of potential impacts during construction works.
- Ensure that all construction works are undertaken in accordance with the *Environment Protection (Noise) Policy 2007*.

- Prior to the commencement of construction works, ensure that all site personnel complete a Project specific induction to understand their responsibility to avoid and minimise impacts caused by noise and vibration.

### **3.6.5 Approvals, permits and authorisations**

The following approvals, permits and/or authorisations may be required:

- Approval from the EPA to undertake construction work outside of the *restricted hours of operation* (construction noise that causes an adverse impact on amenity is only permitted between 7 am and 7 pm, Monday to Saturday). Refer to the EPA *Noise Information Sheet: Construction Noise* (EPA 2017) for more information.

## **3.7 Air quality**

### **3.7.1 Technical investigations undertaken or required**

No specific air quality investigation has been undertaken for the Project, nor is it considered necessary.

### **3.7.2 Assessment methodology**

Aerial imagery available on NatureMaps (DEW 2022a) has been reviewed as part of this EHIA report to identify potential air quality sensitive receivers surrounding the Project Area and associated potential air quality impacts. Knowledge of the site obtained from the field survey for vegetation and fauna assessment has also contributed to this process.

### **3.7.3 Existing environment**

Several air quality sensitive receivers (residential properties) are located adjacent to and within 200m of the Project Area.

### **3.7.4 Impacts to existing environment**

#### *Operational emissions*

Operation of the Project (i.e. golf course, restaurant, private pods etc) is not expected to cause air quality issues that might impact surrounding air quality sensitive receivers.

#### *Construction emissions*

The use of construction plant and equipment will produce exhaust emissions and it is likely that construction works, including earthworks, may generate small amounts of dust. However, these impacts are only temporary and are expected to be very minor or insignificant. Construction materials need to be stored appropriately to prevent scattering of material by wind.

### **3.7.5 Alternatives, mitigation and opportunities**

The following alternatives, avoidance, minimisation and management measures are recommended to minimise the potential for impacts to air quality:

- As no significant increase in emissions is expected during operation of the Project, an air quality assessment (which considers operational emissions) is not required.
- Ensure construction works comply with the *Environment Protection (Air Quality) Policy 2016*.
- Document and implement a simple Air Quality Management and Monitoring Plan (as part of the Project specific CEMP) which includes effective air quality/dust monitoring (i.e., visual monitoring) and mitigation measures, such as use of a water cart, when required.
- Prior to the commencement of construction works, ensure that all site personnel complete a Project specific induction to understand their responsibility to avoid and minimise impacts to air quality during construction.

### **3.7.6 Approvals, permits and authorisations**

No approval, permit and/or authorisation has been identified.

## **3.8 Land Use, Planning, Sustainability and Amenity**

### **3.8.1 Technical investigations undertaken or required**

No specific investigations have been undertaken for the Project, nor is it considered necessary.

### **3.8.2 Assessment methodology**

The South Australian Planning and Design Code and the South Australian Property and Planning Atlas (land use zoning and policy) has been reviewed as part of this EHIA report.

### **3.8.3 Existing environment**

The Project Area is zoned Recreation/ Reserves. Development in this area has several policies which will apply.

### **3.8.4 Impacts to existing environment**

As outlined in Section 2.4, the Project includes upgrades and works including installation of a hotel and two penthouse apartments, function facilities, clubhouse facility and pro-shop, 200 space carpark, restaurant, private retreat pods, wellness centre, amphitheatre and upgrades to the 18-hole golf course.

The proposed development will have an impact on surrounding highly valued rural landscape where environmental sustainability is important.

Construction works and the use and transportation of construction equipment to the site are likely to impact upon amenity and traffic. However, this will only be temporary during construction.

Construction works are unlikely to involve night works or the use of temporary lighting which may affect amenity values. There is however a potential for minor traffic delays adjacent to the Project Area during construction works as the location is located near residential properties from a local road to the golf course.

### **3.8.5 Alternatives, mitigation and opportunities**

The following alternatives, avoidance, minimisation and management measures are recommended to minimise the potential for impacts:

- If required, seek advice from a planning consultant regarding any approvals required for the Project in accordance with the PDI Act and/or any other legislation.
- Crime Prevention through Environmental Design (CPTED) principles should be investigated for the operational phase of the project. Smart lighting, CCTV, digital and smart signage could all be integrated into the Project design and be located in key locations.
- In addition, DDA (*Disability Discrimination Act 1992*) compliance requirements should be outlined for the Project. Access to toilet facilities and car parking and should be investigated.
- A Traffic Management Plan should be implemented which would include advance notification of potential delays to manage traffic during construction works.
- Ensure signage and safe access for all areas of works is provided for construction and that the public and local residents are aware of potential parking and path closures during works.
- The provision of (or futureproofing for) consumer utility services e.g., water, power and communications should be considered in the design.
- Consider integrating the infrastructure with the landscape to minimise the impact of the architectural response to the land.
- Rehabilitate impacted areas as much as possible to allow vegetation to regenerate and provide amenity again. Undertake replanting / landscaping of any disturbed areas.
- Integrate good urban design principles and investigate opportunities for a bespoke approach to the design which will correlate to the scenic value and natural character of the area.
- The proponent should showcase the Project's sustainability ambitions in a bold and distinctive manner.

### **3.8.6 Approvals, permits and authorisations**

If required, seek development approval for the Project, in accordance with the PDI Act.

## **3.9 Waste Management**

### **3.9.1 Technical investigations undertaken or required**

No specific waste management investigation has been undertaken for the Project, nor is it considered necessary.

### **3.9.2 Assessment methodology**

The *Environment Protection (Waste to Resources) Policy 2010* and the *Green Industries Act 2004* has been reviewed as part of this EHIA report to identify potential waste management measures which could be implemented for the Project.

### **3.9.3 Existing environment**

The Project Area currently consists of limited waste management provisions beside rubbish bins.

### **3.9.4 Impacts to existing environment**

#### *Operational issues*

The Project is likely to cause small increases in sewage, grey water, and food waste as a result of the installation of hotel and pod accommodation and associated infrastructure (i.e., toilets and restaurant).

#### *Construction issues*

Construction works are likely to generate waste, such as excess fill materials, which may require management, removal, transport and disposal. A small amount of waste including food waste, sullage (grey water) and sewage will be generated by workers daily during occupancy of the site office. Construction waste entering the environment may present a choking hazard for mammals and birds.

### **3.9.5 Alternatives, mitigation and opportunities**

The following alternatives, avoidance, minimisation and management measures are recommended to minimise the potential for impacts to waste management:

- Opportunities for recycling and green waste provisions on site should be investigated for the Project;
- Minimise the number of resources, such as fuel, which are consumed during construction works;
- Reuse all excavated fill materials or retain within construction works, where possible;
- Any material from vegetation removal and/or pruning works (excluding tree hollows and salvageable timber) should be mulched (if possible) and re used / retained onsite if suitable;
- Ensure general onsite waste and site office waste are adequately contained and disposed of in accordance with EPA guidelines;
- Disposal of waste to a licenced waste depot for placement in landfill should only occur if reuse or recycling is not possible;
- Ensure waste is managed to limit attraction of introduced invasive fauna foraging for food e.g. sealed bins;
- Investigation into the materials used in construction and the possibility of utilising recycled materials and green waste provisions where it is possible.
- Include waste and resource management measures within the Project specific CEMP.

Follow the waste management hierarchy for the management of waste in order, in which avoidance of the production of waste, minimisation of the production of waste, reuse of waste, recycling of waste, recovery of energy and other resources from waste, treatment of waste to reduce potentially degrading impacts and disposal of waste in an environmentally sound manner, are pursued in order with, first, avoidance of the production of waste, and second, to the extent that avoidance is not reasonably practicable, minimisation of the production of waste, and third, to the extent that minimisation is not reasonably practicable, reuse of waste.



### **3.9.6 Approvals, permits and authorisations**

As stated in Section 3.5, it is recommended that the EPA is consulted regarding re-use of materials and any licence or authorisation required. An approval, permit and/or authorisation from the EPA may be required for the following activities:

- Waste transport: the conduct of: a waste transport business, being the collection or transport for fee or reward of: waste soil containing a listed waste in a concentration above that naturally occurring in soil in the area) (refer to Schedule 1, Part A of the EP Act).

## 4 ASSESSMENT OF HERITAGE IMPACTS

### 4.1 Historical Heritage

#### 4.1.1 *Technical investigations undertaken or required*

A cultural heritage desktop assessment was undertaken for the Project by EBS Heritage in May 2021. Refer to the *Mount Lofty Golf Estate Environmental & Heritage Impact Assessment Report* (EBS Heritage 2021) for more detail.

#### 4.1.2 *Assessment methodology*

The historical heritage assessment was undertaken as a desktop study involving searches of the following information sources:

- Australian Heritage Database, via the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW); and
- South Australian Heritage Places Database, via the Department for Environment and Water (DEW).

The desktop assessment also involved an assessment of the likelihood for unknown historical heritage to occur within the Project Area.

#### 4.1.3 *Existing historical heritage*

- There are no historic places listed in the Australian Heritage Database within the proposed project area (DCCEEW 2021).
- There are no State heritage places listed in the SA Heritage Places Database within the proposed project area (DEW 2021).
- There is one local heritage place (ID 15127) listed in the SA Heritage Places Database within the proposed project area (DEW 2021).

#### 4.1.4 *Impacts to existing historical heritage*

As outlined within the *Mount Lofty Golf Estate Heritage Impact Statement* (EBS Heritage 2022b), the Project has potential for impact on the local heritage listed former Scent Factory (ID 15127). The redesign for the local heritage place has not been finalised and no plans, elevations or materials schedule are currently available. The impacts to the local heritage place are therefore currently unknown.

Construction works are not expected to damage the fabric of the building nor the heritage values. Instead, adaptive reuse will aid its preservation and enhance the heritage values, with building repairs and the establishment of a perfumery garden and orchard next to the former Scent Factory improving the area's heritage significance through its connection back to the building's original purpose as a perfumery.

It is possible that this heritage place may be impacted directly or indirectly through dust and vibration from construction equipment during works.

#### **4.1.5 Alternatives, mitigation, and opportunities**

Appropriate risk mitigation measures should be undertaken to address the impact from dust and vibrations as a result of constructions equipment during construction works:

- As there is potential for vibration impacts to heritage places during construction, consider undertaking pre-construction dilapidation surveys/property condition assessments of the local heritage and contributory places to understand their current condition and potential for impact from vibration during construction.
- Implement a Construction Noise and Vibration Management Plan as part of the Project CEMP.
- Implement a simple project Air Quality Management and Monitoring Plan as part of the CEMP, which includes effective dust monitoring (i.e., visual monitoring) and mitigation during construction, such as use of a water cart, when required.

#### **4.1.6 Approvals, permits, and authorisations**

*The Heritage Places Act 1993* applies to the local heritage place. As the heritage place is to be partially demolished, restored, conserved, reused or new built form elements installed, a Heritage Impact Statement will be required on the works that will affect the heritage place. Associated design plans, materials palette and documentation will be required prior to any approval being granted by the State Planning Commission for this component of works.

## **4.2 Aboriginal Heritage**

#### **4.2.1 Technical investigations undertaken or required**

A cultural heritage desktop assessment was undertaken for the Project by EBS Heritage in May 2021. Refer to the *Mount Lofty Golf Estate Environmental & Heritage Impact Assessment Report* (EBS Heritage 2021) for more detail.

#### **4.2.2 Assessment methodology**

The Aboriginal heritage assessment was undertaken as a desktop study involving searches of the following information sources:

- Australian Heritage Database, via DCCEEW;
- Register of Aboriginal Sites and Objects, via the Attorney General's Department – Aboriginal Affairs and Reconciliation (AGD-AAR); and
- South Australian Museum database, via the South Australian Museum.

The desktop assessment also involved an assessment of the likelihood for unknown Aboriginal heritage to occur within the Project Area.

#### **4.2.3 Existing Aboriginal heritage**

The project area is within the Native Title Determination of the Kurna People. The Kurna Yerta Aboriginal Corporation (KYAC) is a registered native title body corporate under the *Native Title Act 1993* and manages native title rights and interests across the Adelaide Region following the Consent Determination (CD) of

the Kurna native title claim. The CD recognises KYAC's right to maintain and protect places of importance under traditional laws, customs and practices on the land and waters within the determination.

There are no Aboriginal places listed in the Australian Heritage Database within, or near to the proposed Project area (DAWE 2020).

There is one Aboriginal site protected under the AH Act within 1000 metres (m) of the project area. The registered site is on the western side of Carey Gully Road, opposite the northern end of the golf course near Hole 10 and therefore out of the Project area. Given the distance of the site from the Project area, construction during the proposed development will not disturb this known site.

#### **4.2.4 Impacts to Aboriginal heritage**

It is unlikely that the Project will impact upon any Aboriginal heritage sites and/or objects, as the Project area is located within an area which would have been subject to significant disturbance during previous activities and developments, including construction works for the existing golf course and clubrooms. Furthermore, the subsoil consists of high plasticity clay which is heavy and difficult to dig into and it appears the depth from surface to bedrock is minimal. Therefore, the risk of encountering Aboriginal sites and/or objects during construction works is expected to be low.

#### **4.2.5 Alternatives, mitigation, and opportunities**

- A cultural heritage survey undertaken with the participation of the Kurna People may be deemed a requirement by the State Planning Commission as part of the Development Approval;
- Monitoring of ground-breaking activities by representatives of the Kurna, may be deemed a requirement by the State Planning Commission as part of the Development Approval;
- A Cultural Heritage Management Plan may be deemed a requirement by the State Planning Commission as part of the Development Approval;
- Mitigation measures to minimise any potential impacts to Aboriginal heritage should be documented in the Project CEMP, including (but not limited to):
  - Ensuring appropriate approvals/permits are received prior to undertaking any excavation (if required);
  - Inducting site personnel to provide an understanding of the Aboriginal heritage aspects associated with the Project site and construction activities; and
  - Implementation of a site discovery procedure.

#### **4.2.6 Approvals, permits and authorisations**

Note that in the unlikely event that an Aboriginal heritage site and/or object is found during construction works, a permit/approval in accordance with the *Aboriginal Heritage Act 1988* is likely to be required to 'damage, disturb or interfere' with the site and/or object.

## 4.3 Native Title

### 4.3.1 Technical investigations undertaken or required

A cultural heritage desktop assessment was undertaken for the Project by EBS Heritage in May 2021. Refer to the *Mount Lofty Golf Estate Environmental & Heritage Impact Assessment Report* (EBS Heritage 2021) for more detail.

### 4.3.2 Assessment methodology

The native title assessment was undertaken as a desktop study involving searches of the following information sources:

- Register of Applications and Determinations, via the National Native Title Register; and
- Register of Indigenous Land Use Agreements, via the National Native Title Register.

### 4.3.3 Existing native title

The search of the National Native Title Register identified the Kurna Peoples as native title holders for the lands within and surrounding Stirling (Table 7). The Kurna Yerta Aboriginal Corporation (KYAC) is a registered native title body corporate under the *Native Title Act 1993* and manages native title rights and interests across the Adelaide Region following the Consent Determination (CD) of the Kurna native title claim.

**Table 7. Native Title Claim relevant to project area.**

Name	Tribunal No.	Status	Determination Outcome	Registered Native Title Body Corporate
Kurna Peoples Native Title Claim	SCD2018/2000	Determined	Native title exists in parts of the determination area	Kurna Yerta Aboriginal Corporation

Source: Register of Native Title Claims.

The Kurna Peoples have an Indigenous Land Use Agreement (ILUA) which is a voluntary agreement between the native title group and The Attorney-General for the State of South Australia regarding the use and management of the determination land and waters (Table 8).

**Table 8. Registered Indigenous Land Use Agreement.**

Name	Tribunal file no	Status
Kurna People Native Title Settlement ILUA	SI2018/004	ILUA registered 19 November 2018

Source: Register of Indigenous Land Use Agreements.

### 4.3.4 Approvals, permits and authorisations

As a courtesy and out of respect for the Traditional Owners, notify the Kurna Yerta Aboriginal Corporation of the proposed works.

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## 6 APPENDICES

### 6.1 Appendix 1. Applicable environmental legislation

Table 9. Summary of applicable environmental legislation.

Legislation/Policy	Details
<b>Commonwealth</b>	
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	<p>The Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places, defined in the Act as 'Matters of National Environmental Significance' (MNES). There are nine MNES protected under the Act:</p> <ol style="list-style-type: none"> <li>1. World Heritage properties;</li> <li>2. National Heritage places;</li> <li>3. Wetlands of international importance (listed under the Ramsar Convention);</li> <li>4. Listed threatened species and ecological communities;</li> <li>5. Migratory species protected under international agreements;</li> <li>6. Commonwealth marine areas;</li> <li>7. The Great Barrier Reef Marine Park;</li> <li>8. nuclear actions (including uranium mines); and</li> <li>9. a water resource, in relation to coal seam gas development and large coal mining development.</li> </ol> <p>Any action (for example a project or development) that has, will have, or is likely to have a significant impact on any MNES requires referral to seek approval under the EPBC Act. The EPBC Act Significant Impact Guidelines (DOE 2013) provide overarching guidance on determining whether an action is likely to have a significant impact on a matter of national environmental significance.</p>
<b>South Australian</b>	
<i>Environment Protection Act 1993</i>	<p>The <i>Environment Protection Act 1993</i> (EP Act) is the primary pollution control legislation in South Australia. Section 25 of the Act requires a 'general environmental duty' of all persons undertaking an activity that may pollute to take all reasonable and practicable measures to prevent or minimise any resulting environmental harm. Specific offences also exist under the Act including for:</p> <ul style="list-style-type: none"> <li>• Causing serious or material environmental harm or an environmental nuisance by polluting the environment;</li> <li>• Failing to inform the Environment Protection Authority (EPA) of an incident that has caused, or threatens to cause, serious or material environmental harm as soon as reasonably practicable; and</li> <li>• Failing to notify the EPA of site contamination that threatens or affects groundwater.</li> </ul> <p>Section 36 of the EP Act outlines the requirement for a licence to undertake a prescribed activity of environmental significance. Schedule 1 of the EP Act lists prescribed activities of environmental significance, including the following which are relevant to the project:</p> <p><i>recreational activity;</i></p> <ul style="list-style-type: none"> <li>• (7)(6) Earthworks Drainage</li> </ul> <p><i>The conduct of earthworks operations in the course of which more than 100 kilolitres of wastewater containing suspended solids in a concentration exceeding 25 milligrams per litre is discharged directly or indirectly to marine waters or inland waters;</i></p>
<i>Environment Protection (Water Quality) Policy 2015</i>	<p>The <i>Environment Protection (Water Quality) Policy 2015 (Water Quality Policy)</i> prohibits the pollution of stormwater systems and the state's natural waters. Clause 17 of the Water Quality Policy states that a person must not discharge or deposit a pollutant listed in Schedule 4 of the Policy into any waters or onto land where it might enter waters. The pollutants listed in Schedule 4 specific to this Project include:</p> <ul style="list-style-type: none"> <li>• cleaning agents</li> <li>• detergents and their by-products</li> </ul>

Legislation/Policy	Details
	<ul style="list-style-type: none"> <li>• fuel dispensing area wash water</li> <li>• wash down water from cleaning vehicles, plant or equipment</li> <li>• oil, grease, lubricants and petroleum products</li> <li>• rubbish</li> <li>• solvents</li> </ul> <p>In addition, clause 11 of the <i>Water Quality Policy</i> states that a person who is undertaking an activity, or is an occupier of land, must take all reasonable and practicable measures (not being measures that themselves cause environmental harm) to avoid the discharge or deposit of waste from that activity or land into any waters; or onto land in a place from which it is reasonably likely to enter any waters.</p>
<i>Environment Protection (Air Quality) Policy 2016</i>	<p>The <i>Environment Protection (Air Quality) Policy 2016</i> states that an occupier of a premises at which a process referred to in Schedule 1 of that Policy is carried out must not cause or permit air pollution from that process beyond the maximum pollution levels set out in Schedule 1 or otherwise in contravention of a requirement.</p>
<i>Environment Protection (Noise) Policy 2007</i>	<p>The <i>Environment Protection (Noise) Policy 2007</i> sets out procedures for measuring noise to determine compliance, to fix noise goals for most noise sources compliance with which will satisfy the general environmental duty under section 25 of the Act and to set out criteria for determining what requirements (if any) the Authority or another administering agency will impose to deal with noise sources not complying with applicable noise goals under this policy.</p> <p>Although Section 22 of the <i>Environment Protection (Noise) Policy 2007</i> specifically excludes road, rail and public infrastructure construction work from Division 1 of the Policy (which deals with construction noise), DPTI and its contractors still have a responsibility under Section 25 of the <i>Environment Protection Act 1993</i> to have a “duty of care” to not pollute the environment through noisy activities:</p> <p style="text-align: center;"><i>“a person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm.”</i></p>
<i>Environment Protection (Waste to Resources) Policy 2010</i>	<p>The <i>Environment Protection (Waste to Resources) Policy 2010</i> objective is to achieve sustainable waste management by applying the waste management hierarchy consistently with the principles of ecologically sustainable development set out in Section 10 of the Act.</p> <p>In order to meet the waste management objective, waste management in SA should also promote best practice and accountable waste management, taking into account regional differences within the State. It will also include effective recording, monitoring and reporting systems with respect to waste transport, resource recovery and waste disposal and promote environmental responsibility and involvement in waste avoidance, waste minimisation and waste management within the community.</p>
<i>Green Industries SA Act, 2004</i>	<p>An Act to continue the statutory corporation Zero Waste SA as Green Industries SA, to build on the waste management reforms effected by Zero Waste SA, to promote innovation and business activity in the waste management, resource recovery and green industry sectors in the State; and for other purposes.</p>
<i>Landscape South Australia Act 2019</i>	<p>The <i>Landscape South Australia Act 2019</i> (LSA Act) repealed the <i>Natural Resources Management Act 2004</i>. Under the LSA Act, new regional landscape boards have been established. The aim is to deliver landscape related services to regional communities, including effective water management, pest plant and animal control, soil and land management and support for broader sustainable primary production programs. Invasive weed species are listed as Declared plants under the LSA Act and landholders have a legal responsibility to manage declared pest plants and animals and prevent land and water degradation.</p> <p>The LSA Act defines provisions for the management and protection of water resources, including <i>water affecting activities</i>. The following requirements within the LSA Act, may be applicable to this Project:</p> <p><i>Part 8—Management and protection of water resources</i></p> <p><i>Division 2—Control of activities affecting water</i></p> <p><i>Subdivision 3—Control of activities</i></p> <p style="text-align: center;"><i>104—Water affecting activities</i></p>

Legislation/Policy	Details
	<p>(4) <i>Subject to this Act, a person must not undertake any of the following activities contrary to a water allocation plan or a water affecting activities control policy that applies or makes provision in relation to the region or area in which the activity is to be undertaken:</i></p> <ul style="list-style-type: none"> <li>(b) <i>the erection, construction or placement of any building or structure in a watercourse or lake or on the floodplain of a watercourse;</i></li> <li>(d) <i>depositing or placing an object or solid material in a watercourse or lake</i></li> <li>(g) <i>destroying vegetation growing in a watercourse or lake or growing on the floodplain of a watercourse;</i></li> <li>(h) <i>excavating or removing rock, sand or soil from–</i> <ul style="list-style-type: none"> <li>(i) <i>a watercourse or lake or the floodplain of a watercourse;</i></li> </ul> </li> </ul> <p>Approval, in the form of a Water Affecting Activities Permit (WAAP), is usually required from the relevant Landscape Management Board to undertake a Water Affecting Activity.</p>
<p><i>National Parks and Wildlife Act and Regulations 1972</i></p>	<p>The <i>National Parks and Wildlife Act 1972</i> (NPW Act) allows for the protection of habitat and wildlife through the establishment of parks and reserves (both on land and in State waters); the protection of native flora and fauna; identifies flora and fauna species considered to be of conservation significance (under Schedules 7, 8, and 9 of the Act); and provides for the taking of plants (s.49) and use of approved wildlife through a system of permits allowing certain actions, i.e. keeping and selling (s.58), harvesting (s.60G), farming (s.60C), hunting (s.68A), releasing (s.55) and undertaking scientific research (s.53) on/of native fauna species.</p> <p>A person must not “take” a native plant, protected animal or the eggs of a protected animal without approval (s.48A). Significant penalties apply. To take a native plant means to remove the plant or part of the plant, from the place in which it is growing; or to damage the plant. To take a protected animal means to remove, hunt, catch, restrain, kill or injure an animal, or attempt to do so. A person may take non-prescribed plant species from private land with the consent of the owner; however, these species may also be covered under the <i>Native Vegetation Act 1991</i>.</p>
<p><i>Native Vegetation Act 1991</i></p>	<p>Native vegetation that is present within the Project Area is subject to the <i>Native Vegetation Act 1991</i> (NV Act). This legislation is principally in place to provide incentives and assistance for the preservation and enhancement of native vegetation and to control the clearance of native vegetation.</p> <p>Native vegetation refers to any naturally occurring local plant species that is indigenous to South Australia, from small ground covers and native grasses to large trees and water plants. It also includes naturally occurring regrowth and in certain circumstances, dead trees.</p> <p>The <i>Native Vegetation Regulations 2017</i> outline the circumstances where clearing native vegetation is permitted, outside of the clearance controls in the NV Act. The Regulations allow clearance for certain activities, such as mining and exploration, building homes, upgrading infrastructure (e.g. power lines) and road maintenance.</p>
<p><i>Planning, Development and Infrastructure Act 2016</i></p>	<p>The <i>Planning, Development and Infrastructure Act 2016</i> (PDI Act) repealed the <i>Development Act 1993</i> and was brought into operation in stages over a five-year implementation program to reform and modernise the State’s planning system. The PDI Act, along with the <i>Planning, Development and Infrastructure (General) Regulations 2017</i> (PDI Regs) and <i>Planning and Design Code</i>, provide the legislative framework for carrying out planning and development works within the state. The <i>Planning and Design Code</i> is the cornerstone of the new system and has replaced all council development plans to become the single source of planning policy for assessing development applications. No development can be undertaken without an appropriate Development Approval being obtained from the relevant authority after an application and assessment process.</p> <p><i>Development</i> is defined by the PDI Act and PDI Regs and includes building work and any work that could materially affect the heritage value of the place (DEW 2020a).</p> <p>The PDI Act and the PDI Regs provide provision for the protection of ‘regulated trees’ and ‘significant trees’, while the PDI Act considers any tree damaging activity in relation to a regulated tree as <i>development</i>.</p>

**Note: This summary is not intended to be a substitute for particular legal advice and does not address the legal implications of every set of circumstances.**

## 6.2 Appendix 2. Applicable heritage legislation

Legislation/Policy	Details
<b>Commonwealth</b>	
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Refer to Appendix 1 for detail.
<b>South Australian</b>	
<i>Planning, Development and Infrastructure Act 2016</i>	<p>The <i>Planning, Development and Infrastructure Act 2016</i> (PDI Act) repealed the <i>Development Act 1993</i> and was brought into operation in stages over a five-year implementation program to reform and modernise the State's planning system. The PDI Act, along with the <i>Planning, Development and Infrastructure (General) Regulations 2017</i> (PDI Regs) and <i>Planning and Design Code</i>, provide the legislative framework for carrying out planning and development works within the state. The <i>Planning and Design Code</i> is the cornerstone of the new system and has replaced all council development plans to become the single source of planning policy for assessing development applications. No development can be undertaken without an appropriate Development Approval being obtained from the relevant authority after an application and assessment process.</p> <p>In accordance with the PDI Act, any <i>development</i> within a State Heritage Area (declared under the <i>Heritage Places Act 1993</i>) must be approved by the relevant (planning) authority. <i>Development</i> is defined by the PDI Act and PDI Regs and includes building work and any work that could materially affect the heritage value of the place (DEW 2020a).</p> <p>The PDI Act and the PDI Regs provide provision for the protection of 'regulated trees' and 'significant trees', while the PDI Act considers any tree damaging activity in relation to a regulated tree as <i>development</i>.</p>
<i>Aboriginal Heritage Act 1988</i>	<p>The <i>Aboriginal Heritage Act 1988</i> (AHA) Act repealed and replaced the <i>Aboriginal and Historic Relics Preservation Act 1965</i>, which was the first state legislation to protect Aboriginal Australian heritage in Australia. The AHA Act is the principal South Australian legislation and preserving the state's Aboriginal heritage. The Aboriginal Affairs and Reconciliation Division of the South Australian Department of the Premier and Cabinet has responsibility for managing this legislation, so ensuring that South Australia's Aboriginal heritage is protected, preserved, and transmitted into the future. Within South Australia it is a criminal offence to:</p> <ul style="list-style-type: none"> <li>• Excavate land uncovering Aboriginal sites, objects or remains without the Minister's authority;</li> <li>• Damage Aboriginal sites, objects or remains without authority;</li> <li>• Fail to report the discovery of an Aboriginal site or object or remains to the Minister;</li> <li>• Fail to comply with directions the responsible Minister may give (in the form of a notice to interested parties) prohibiting or restricting access to Aboriginal sites, objects or remains.</li> </ul>
<i>Heritage Places Act 1993</i>	<p><i>The Heritage Places Act 1988</i> is in place to make provision for the identification, recording and conservation of places and objects of non-Aboriginal heritage significance;</p> <ul style="list-style-type: none"> <li>• Historical towns and areas;</li> <li>• Buildings, artefacts and objects;</li> <li>• Archaeological artefacts;</li> <li>• Geological specimens and paleontological areas.</li> </ul> <p>The Act also serves to establish the South Australian Heritage Council.</p>



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## **Appendix 16**

*Appendix N of Development Report – Cultural heritage management plan framework*

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**Mount Lofty Golf Estate  
Cultural Heritage Management Plan Framework**

# Mount Lofty Golf Estate Cultural Heritage Management Plan Framework

30 November 2022

Version 3

Prepared by EBS Heritage for Mount Lofty Golf Estate Pty Ltd

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Cover photograph: Proposed site for orchard and garden (photo by EBS Ecology).

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## GLOSSARY AND ABBREVIATION OF TERMS

AAR	Aboriginal Affairs and Reconciliation
AH Act	<i>Aboriginal Heritage Act 1988</i>
CHMP	Cultural Heritage Management Plan
AGD-AAR	Attorney General's Department – Aboriginal Affairs and Reconciliation (formally DPC-AAR)
Guidelines	<i>Guidelines for the Preparation of a Development Report, Mount Lofty Golf Estate</i>
KYAC	Kaurna Yerta Aboriginal Corporation
m	meter(s)
Mount Lofty Golf Estate	Mount Lofty Golf Estate Pty Ltd
n.d.	no date

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# 1 INTRODUCTION

This Cultural Heritage Management Plan (CHMP) Framework has been prepared in response to the *Guidelines for the Preparation of a Development Report, Mount Lofty Golf Estate* (the Guidelines) (State Planning Commission 2022) to address the issues / impacts of the development, on the cultural heritage of First Nations People. It has been identified in the Guidelines that the proposed development has the potential to impact on sites and places of Aboriginal heritage through disturbance during construction.

The CHMP Framework document sets out in detail how the risk will be managed and the controls that will be implemented to ensure that no damage is caused to Aboriginal heritage during the construction and operational phases of the development.

## 1.1 Project description

Mount Lofty Golf Estate Pty Ltd (Mount Lofty Golf Estate) is proposing to redevelop the Stirling Golf Course. As part of the redevelopment, they are intending to undertake the following works:

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m<sup>2</sup> function room.
  - A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace.
  - 186m<sup>2</sup> sports bar.
  - A 189m<sup>2</sup> gallery and cafe.
  - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – ‘Pods’
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
  - Extension to the Perfumery to include a covered outdoor dining area.
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a “Scent Factory”.
  - Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:

- Retention of 18-hole golf course with improvements.
- Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
- New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.
  - A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
  - Designated waste storage areas.
- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

At the time of preparing this CHMP Framework, the design for the redevelopment had not been finalised. This CHMP framework document has been written with the intent that it will be valid, irrespective of the final design of the development.

## 1.2 Project location

The Stirling Golf Club is located at 35 Golflinks Road, Stirling South Australia in the Hundred of Onkaparinga, within the Local Government Area of the Adelaide Hills Council, the Landscape Management Region of the Hills and Fleurieu and the Native Title Determination of the Kurna People.

The proposed redevelopment is situated on Certificate of Title 5891, Folio 805 (Allotment 53 in Deposited Plan 59212) and is boarded to the east by the Mount George Conservation Park and to the west by Old Carey Gully Road. Refer to Appendix 1 for a map of the project area.

### 1.3 Purpose of the CHMP Framework

The purpose of the CHMP Framework is to:

- Demonstrate the commitment by Mount Lofty Golf Estate to consulting and working with the Kaurna Yerta Aboriginal Corporation (KYAC), the registered native title body corporate for the Kaurna people.
- Ensure Mount Lofty Golf Estate meets its statutory obligations under the *Aboriginal Heritage Act 1988* (AH Act) in relation to the management and protection of Aboriginal cultural heritage.
- Demonstrate the measures that will be implemented to manage and protect Aboriginal cultural heritage in the pre-construction, construction, and operation phases of the project.
- Demonstrate the cultural heritage stop work / discovery and reporting procedures should Aboriginal heritage be identified during either the construction or operational phases of the project.

## 2 SCOPE OF WORKS

The redevelopment of the Stirling Golf Club and Golf Course is anticipated to be undertaken using a combination of traditional construction methods together with less invasive measures like the Surefoot™ concrete free footing system. The essential pre-construction, construction and operational phase activities are set out in sections 2.1, 2.2 and 2.3 respectively.

Mount Lofty Golf Estate acknowledge that despite best efforts to identify and avoid Aboriginal heritage sites, a risk remains that on-ground works could result in damage, disturbance or interference to Aboriginal heritage sites, objects and ancestral remains which are protected by the AH Act. To ensure protection of any Aboriginal cultural heritage, mitigation measures will be documented in the CHMP and be implemented by Mount Lofty Golf Estate staff, contractors and sub-contractors during all phases of the project.

### 2.1 Essential pre-construction activities

The AH Act does not mandate a requirement for a cultural heritage survey where there is a low likelihood of disturbance to Aboriginal heritage. The cultural heritage desktop assessment (EBS 2021) identified that there was a low likelihood of disturbance to unknown Aboriginal heritage, therefore a cultural heritage survey has not been undertaken at this stage of the project design.

The following preconstruction activities were undertaken prior to the development of this CHMP Framework:

- Geotechnical sampling,
- Flora and Fauna Survey, and
- Arborist Survey.

### 2.2 Essential construction activities

The following essential construction activities are anticipated to be undertaken during the redevelopment of the project area:

- Establishment of new roads and car parking facilities,
- Vegetation clearance and earthworks at new hotel building, 20 private retreats (pods) and one service pod,
- Pouring of concrete footings for new clubhouse facility and pro-shop, administration areas and change rooms,
- Upgrades to current 18-hole golf course,
- Land clearance and earthworks for the refurbishment, and expansion of the Local Heritage Place,
- Landscaping and establishing a perfumery garden and orchard,
- Establishment of associated temporary facilities,

- Establishment of fire protection infrastructure,
- Establishment of waste facilities,
- Storm water management,
- Clean up of waste materials and rehabilitation of temporary areas of disturbance,
- Repurposing dam for stormwater management, and
- Alteration on current electrical infrastructure and establishment of new onsite transformer.

### **2.3 Essential operational activities**

The following essential operational activities are anticipated to be ongoing after completion of the redevelopment:

- Maintenance of the hotel building, private retreats and service pod,
- Maintenance of the golf course and gardens,
- Maintenance of fire protection infrastructure,
- Maintenance of roads and car parking facilities,
- Maintenance of onsite wastewater treatment,
- Maintenance of electricity transformer, and
- Continued refuse collection, deliveries and other hotel servicing.

### 3 ABORIGINAL CULTURAL HERITAGE

There is one Aboriginal site protected under the AH Act within 1000 metres (m) of the project area (Appendix 2). The registered site is on the western side of Carey Gully Road, opposite the northern end of the golf course near Hole 10 and therefore out of the project area. Given the distance of the site from the project area, construction during the proposed development will not disturb this known site.

There are no Aboriginal places listed in the Australian Heritage Database within, or near to the proposed project area.

#### 3.1 Risk assessment

Given that many sites and objects have previously been recorded throughout the Adelaide Hills, it would normally be anticipated that construction works would pose a high likelihood that unknown Aboriginal sites or objects of Aboriginal significance would be disturbed during construction. Only one site of Aboriginal significance however was identified within 1000 m of the project area, and none recorded in the golf course.

Geotechnical sampling showed that there is a fill layer of between 0.20 m and 0.35 m across most of the site, meaning that it is unlikely that Aboriginal artefacts would be found within the project area, on the surface and in situ. Under the fill layer is topsoil which on average is a depth of between 0.10 m and 0.30 m. The layer directly under the topsoil and through to the bedrock, was predominately high plasticity clay which is generally heavy and difficult to dig into. These results reinforce that the likelihood of disturbing ancestral burials or other Aboriginal cultural items is low, as aboriginal artefacts are generally found in sandy or gravelly soils not in compacted clays.

During construction of the Mount Lofty Golf Course, groundwork activities however may inadvertently disturb previously undiscovered sites of Aboriginal cultural significance. Table 1 outlines mitigation and management controls that will be implemented to avoid and / or minimise impacts to Aboriginal cultural heritage values.

**Table 1. Aboriginal cultural heritage mitigation and management controls.**

Aspect	Detail
Objective	<ul style="list-style-type: none"> <li>Avoid or minimise the impacts of construction, operation, and maintenance of the project on Aboriginal sites, objects of significance or remains.</li> </ul>
Management Strategy	<ul style="list-style-type: none"> <li>Minimise any heritage impacts within the construction footprint, and to avoid impacts outside of the construction footprint.</li> </ul>
Legislation and other guidance	<ul style="list-style-type: none"> <li><i>Aboriginal Heritage Act 1988</i> (SA)</li> <li>Discovery of Aboriginal Sites and Objects Fact sheet (Department of Premier and Cabinet – Aboriginal Affairs and Reconciliation (DPC-AAR), n.d.)</li> <li>Project Planning and Aboriginal Heritage Guide (DPC-AAR n.d.)</li> </ul>
Potential impacts	<ul style="list-style-type: none"> <li>Damage, disturbance or interference with areas of Aboriginal cultural heritage significance.</li> <li>Damage, disturbance or interference to identified or unidentified sites, objects or remains.</li> </ul>



Mitigation and control measures	<ul style="list-style-type: none"> <li>• Desktop assessment of registered and recorded sites via the Central Archive, including the Register of Aboriginal Sites and Objects, maintained by Attorney General's Department - AAR.</li> <li>• Utilise previously disturbed areas for infrastructure wherever practicable.</li> <li>• Induct all staff and contractors on cultural heritage prior to any onsite construction work.</li> <li>• Undertake a cultural heritage survey with native title claimants, if required.</li> <li>• Develop and implement a Cultural Heritage Management Plan detailing the procedures for the identification, management and protection of Aboriginal cultural heritage sites including monitoring of ground disturbance activities in agreed locations with relevant traditional owner representatives, if required.</li> </ul>
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### 3.2 Cultural heritage surveys – pre-construction phase

Given that the property has been operating as a golf course for 95 years and prior to that for at least 75 years it was used for mixed farming, dairying, iron mining and timber milling, suggests that there is a low likelihood of identifying or disturbing unknown surface Aboriginal sites or objects of significance as fill has been laid down across the site and the topsoil and subsurface layer have previously been disturbed.

The AH Act does not mandate a requirement for a cultural heritage survey where there is a low likelihood of disturbance to Aboriginal heritage therefore a cultural heritage survey was not undertaken prior to the pre-construction activities detailed in section 2.1.

### 3.3 Monitoring and cultural heritage surveys – construction phase

Following the completion of the detailed design for the project and additional geotechnical sampling, monitoring of ground disturbance activities in certain agreed locations, may need to be undertaken to ensure sites of Aboriginal heritage value are protected.

#### 3.3.1 *Monitoring*

Although it is not a requirement under the AH Act, having Aboriginal Monitors present during ground works may be considered, as it is effective for the early detection of artefacts, objects and burial sites during works. Monitoring involves the continuous observation of earthmoving works to:

- Watch the sediments being excavated to see any change;
- Inspect and sieve the removed soil to ensure that no discoveries go unnoticed; and
- Ensure that harm to any cultural heritage that may be present is mitigated when and where it cannot be reasonably avoided.

Monitoring of earthworks is undertaken until the specified depth required for development is reached or until compact clay or bedrock is reached at which point the chance of encountering archaeological features is significantly reduced.

The requirement for an Aboriginal heritage monitoring program will be assessed once the final design for the project has been completed.

### **3.3.2 Cultural heritage survey**

The AH Act does not mandate a requirement for an Aboriginal heritage survey unless there is a high likelihood of disturbance to unknown Aboriginal sites/objects. The risk assessment undertaken as part of the cultural heritage desktop assessment (EBS 2021) determined that there are no known Aboriginal sites within the project area and the likelihood of the project works disturbing unknown sites is low. A cultural heritage survey is therefore currently deemed unwarranted.

Following the completion of the detailed design for the project, the requirement for a cultural heritage survey will be reassessed.

### **3.4 Cultural heritage surveys – operations phase**

It is unlikely further cultural heritage surveys will be required once the Mount Lofty Golf Estate is operational. Mount Lofty Golf Estate will however manage ongoing compliance with the AH Act in accordance with its operational heritage management system and in consultation with the KYAC.

## 4 CHMP FRAMEWORK

Mount Lofty Golf Estate does not currently intend to make any application for a Section 23 authority under the AH Act given that there is no known Aboriginal cultural heritage within the project area and the cultural heritage risk assessment has determined that the likelihood of disturbance to unknown Aboriginal cultural heritage is low. Nor does the proponent intend to undertake a cultural heritage survey prior to construction commencing, unless mandated in the Ministers Response Document.

Should any known Aboriginal sites be identified prior to construction or unknown Aboriginal heritage be identified during construction activities, a cultural heritage survey may be warranted and/or requested by the KYAC. A CHMP will then be developed that will include the following information and requirements in relation to the management and protection of Aboriginal cultural heritage during construction and operation of the:

- requirements and responsibilities for all employees, contractors and subcontractors,
- awareness training for all workers to understand cultural heritage considerations associated with the project,
- area-specific site inductions and training,
- protocols for discovery of Aboriginal sites, objects or remains and reporting requirements, in accordance with the AH Act,
- requirements to avoid sites of Aboriginal cultural heritage significance as determined from pre-construction surveys and in consultation with the KYAC,
- Stop work/site discovery procedure if any Aboriginal sites or objects are exposed during construction and engage a suitably qualified heritage consultant and / or appropriate authority to investigate. Work will not continue in that part of the project area until direction has been provided by a suitable authority, and
- exclusion areas to be implemented around sites of cultural heritage significance.

### 4.1 Pre-construction phase

The AH Act does not mandate a requirement for a cultural heritage survey where there is a low likelihood of disturbance to Aboriginal heritage therefore a cultural heritage survey was not undertaken prior to the pre-construction activities detailed in section 2.1.

### 4.2 Construction phase

During construction activities, Aboriginal heritage protection and management measures will include:

- ongoing heritage inductions to make all project personnel aware of Aboriginal heritage sites and appropriate management procedures in place to avoid impact,
- monitoring of construction works in higher sensitivity or higher risk locations by KYAC representatives,
- robust measures to address site discoveries during construction,

- where sites are identified during construction, Mount Lofty Golf Estate will aim to relocate works to avoid impact,
- If works are unable to be relocated, Mount Lofty Golf Estate will work closely with the KYAC and the contractor to find a suitable solution in accordance with the requirements of the AH Act,
- at the conclusion of construction Mount Lofty Golf Estate intends to undertake a compliance audit to ensure all heritage management conditions have been met and that that the mitigation measures and controls operated effectively.

### **4.3 Operations phase**

Mount Lofty Golf Estate will manage ongoing compliance with the AH Act in accordance with its operational heritage management system, any CHMP, and in consultation with the KYAC.

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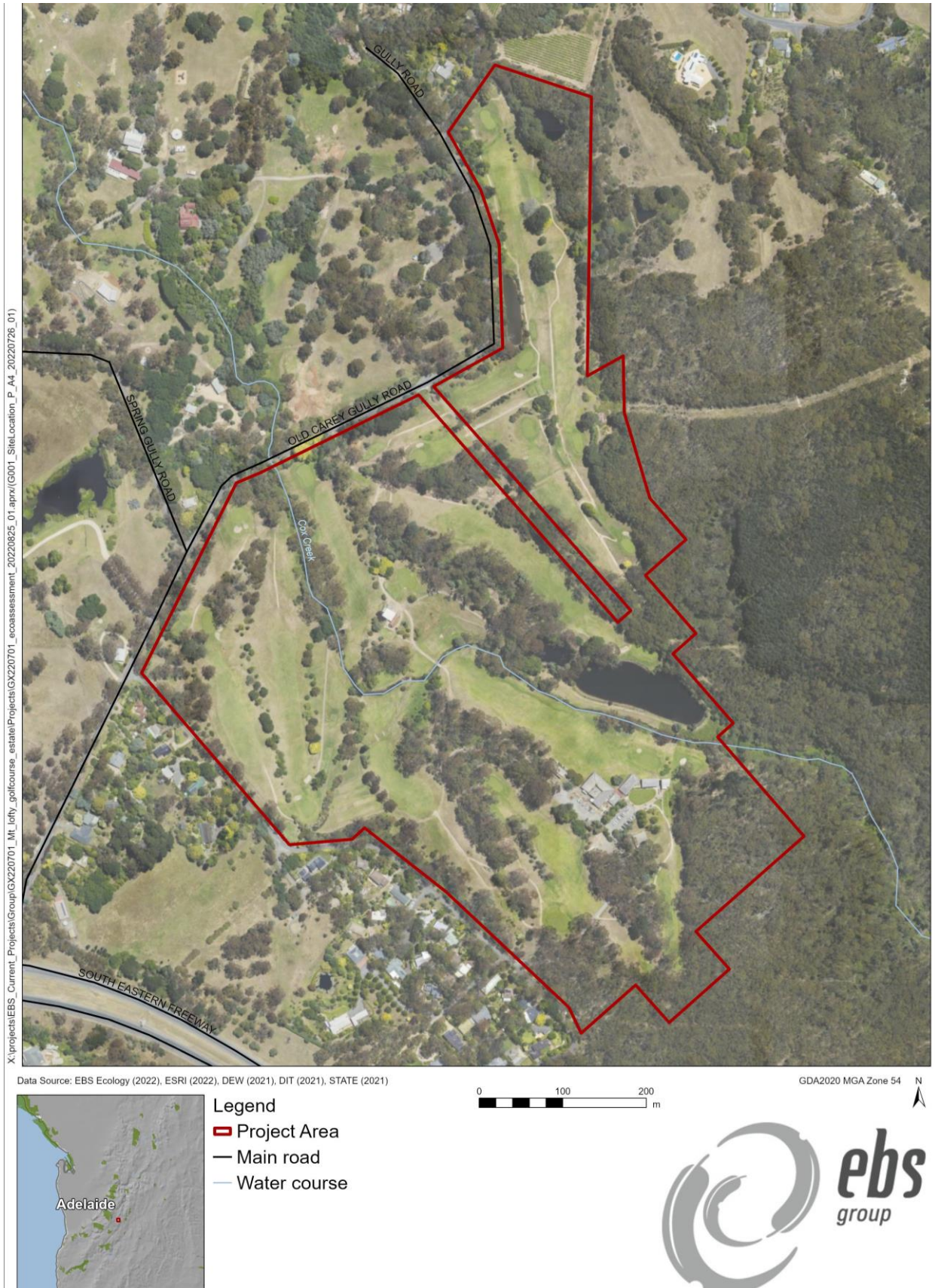
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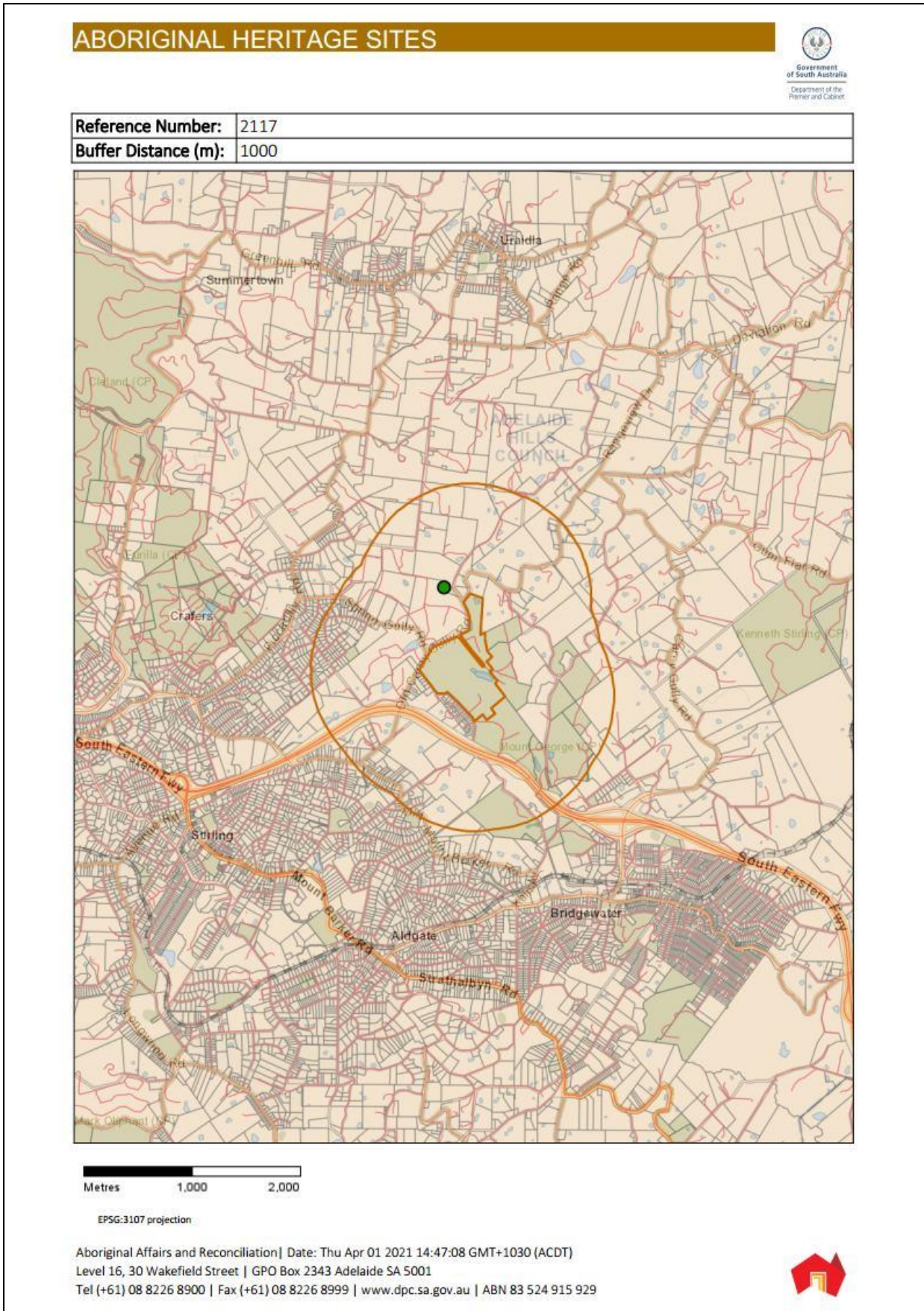
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# 6 APPENDICES

## Appendix 1 – Location of the project area.



## Appendix 2 – Location of Aboriginal site in relation to project area.





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## **Appendix 17**

*Appendix O of Development Report – Ecological  
flora and fauna assessment*

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**Mount Lofty Golf Estate  
Ecological Flora and Fauna Assessment**

# Mount Lofty Golf Estate Ecological Flora and Fauna Assessment

13 December 2022

Version 3

Prepared by EBS Ecology for Trice – Project & Development Managers on behalf of Mount Lofty Estate Pty Ltd

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Cover photograph: VA A1 – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* woodland over *Acacia melanoxylon*.

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## GLOSSARY AND ABBREVIATION OF TERMS

ALA	Atlas of Living Australia
BAM	Bushland Assessment Method
BDBSA	Biological Databases of South Australia
CEMP	Construction Environmental Management Plan
Clearance	The killing, destruction, removal or damage of vegetation including pruning
DA	Development Application
DAWE	Department of Agriculture, Water and the Environment (Commonwealth) (now DCCEEW)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth) (previously DAWE)
DEH	Department for Environment and Heritage
DEW	Department for Environment and Water
EBS Ecology	Environmental and Biodiversity Services Pty Ltd, trading as EBS Ecology
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ha	hectare(s)
IBRA	Interim Bio-regionalisation of Australia
km(s)	kilometre(s)
LSA Act	<i>Landscape South Australia Act 2019</i>
m(s)	metre(s)
MGCP	Mount George Conservation Park
Mount Lofty Estate	Mount Lofty Golf Estate Pty Ltd
MNES	Matters of National Environmental Significance, as defined under the EPBC Act
mm(s)	Millimetre(s)
Native vegetation	A plant or plants of a species indigenous to South Australia (including dead trees >600mm diameter, and planted vegetation protected under the Native Vegetation Act such as SEB's or Heritage Agreements)
NPW Act	<i>National Parks and Wildlife Act 1972</i>
NV Act	<i>Native Vegetation Act 1991</i>
NV Regs	<i>Native Vegetation Regulations 2017</i>
NVC	Native Vegetation Council
PDI Act	<i>Planning, Development and Infrastructure Act 2016</i>
PMST	Protected Matters Search Tool
the Project	The proposed redevelopment of the Stirling Golf Course at the Stirling Golf Club consisting of a redeveloped golf course, hotel, hotel pods and associated infrastructure
the Project Area	Proposed development at the Stirling Golf Club, 35 Golflinks Road, Stirling South Australia 5152
SA	South Australia / South Australian

Search Area	5 km buffer of the Project Area considered in the desktop assessment database searches
SEB	Significant Environmental Benefit
ssp.	Subspecies
sp.	Species (singular)
SSCC	SA Seed Conservation Centre
STAM	Scattered Tree Assessment Method
STCS	Subtropical and Temperate Coastal Saltmarsh TEC
TEC	Threatened Ecological Communities
TPZ	Tree Protection Zone
Trice	Trice – Project & Development Managers
TSSC	Threatened Species Scientific Committee
UBS	Unit Biodiversity Score
VA(s)	Vegetation Association(s)
WoNS	Weeds of National Significance
%	Percent

## EXECUTIVE SUMMARY

EBS Ecology were engaged by Trice – Project & Development Managers (Trice) on behalf of Mount Lofty Golf Estate Pty Ltd to undertake an ecological flora and fauna assessment for the proposed redevelopment of the Stirling Golf Club in South Australia. The development was declared a major project on 17<sup>th</sup> December 2020 by the Minister for Planning and Local Government and therefore the development will be assessed by a state-run process. It is proposed that the redevelopment will include new practice facilities, a new Clubhouse and Pro Shop, new car parking and maintenance facilities, a new wedding centre, hotel and chalets, a spa and wellness centre, restaurants, an outdoor entertainment and event space along with re-routing and improving the existing golf course.

This ecological flora and fauna assessment report summarises the relevant ecological protection legislation, the results of the desktop and field assessments and identifies potential ecological constraints with the proposed Project. Mitigation and management measures are presented to reduce any impacts to ecological matters, where possible.

### Desktop assessment results

A desktop assessment was conducted to assess the potential for any threatened and migratory species (both nationally and State listed) to occur within the Project Area. This was achieved by undertaking database searches using a 5 km buffer of the Project Area (Search Area). A Protected Matters Search Tool (PMST) report was generated on 11 August 2022 to identify MNES under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). A Biological Database of South Australia (BDBSA) was undertaken (Recordset number: DEWNRBDBSA220816-1) to identify threatened flora and fauna species under the *National Parks and Wildlife Act 1972* (NPW Act) previously recorded within 5 km of the Project Area.

#### **Matters of National Environmental Significance**

The PMST report identified 36 threatened species and 13 migratory species protected under the EPBC Act) which may be relevant to the Project Area.

#### **EPBC Act listed threatened species**

The PMST report identified 18 flora and 18 fauna species listed as threatened under the EPBC Act as potentially occurring within 5 kilometres (km) of the Project Area. The report identified six species as 'known to occur'.

#### **EPBC Act listed migratory species**

the PMST report identified 10 species listed as migratory under the EPBC Act that might occur within 5 km of the Project Area. Only one migratory species has been identified by the PMST report as known to occur within the Search Area, Rufous Fantail (*Rhipidura rufifrons*).

#### **NPW Act listed threatened species**

The database searches indicate that, excluding species also listed under the EPBC Act, 107 flora and 38 fauna species listed as threatened under the NPW Act have been recorded previously within 5 km of the Project Area. This includes 95 Rare, 29 Vulnerable and 21 Endangered species.

### **Threatened Ecological Communities**

No Threatened Ecological Communities will be impacted by the proposed project as there are no TECs located within 5 km of the Project or within the Project Area.

### **Nationally important wetlands**

Two nationally important wetlands were identified within 5 kilometres of the proposed Project. These two wetlands are located outside of Project Area itself and as such the proposed Project will not impact on them.

### **Introduced Species**

A BDBSA search identified 45 Declared flora species under the *Landscape South Australia Act 2019* (LSA Act), that have records within 5 km of the Project Area. Of these, 17 are Weeds of National Significance (WoNS).

A BDBSA search identified 19 introduced fauna species that have records within 5 km of the Project Area.

### **Phytophthora**

The nearest records of Phytophthora to the Project Area are in Mount George Conservation Park (MGCP) approximately 600 m away, although neither of the two records have been confirmed via a soil test. The risk of potential spread of Phytophthora would need to be addressed throughout the Project.

### **Field survey results**

The field survey for the ecological assessment was conducted on 26 August to assess the site and determine high and low value habitat and ecological constraints within the Project Area. Where time permitted, vegetation data was collected in accordance with legislative requirements, but further field surveys will be required once detailed design are finalized.

### **Flora**

A total of 60 flora species, including 31 introduced species were recorded within the Project Area during the field assessment.

Pockets of remnant native vegetation coexist with large remnant scattered trees and planted vegetation within the Project Area. Two vegetation associations (VAs) were recorded within the Project Area:

- Vegetation Association A1 – *Eucalyptus viminalis ssp. viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon*.
- Vegetation Association A1b – *Eucalyptus viminalis ssp. viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey.

A total of 71 native scattered trees were recorded within the Project Area, which included three *Acacia melanoxylon* (Blackwood), 24 *Eucalyptus obliqua* (Messmate Stringybark) and 44 State Rare *Eucalyptus viminalis ssp. viminalis* (Manna Gum). All trees were categorised based on their Unit Biodiversity Score and were of a mature age, ranging from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species.

No flora species listed under the EPBC Act were recorded within the Project Area.

One flora species listed under the NPW Act as Rare was recorded in the Project Area:

- *Eucalyptus viminalis ssp. viminalis* (Manna Gum).

A total of 31 introduced flora species were recorded during the field survey. Seven of these species are Declared under the *Landscape South Australia Act 2019* (LSA Act) and five are WoNS.

### **Fauna**

A total of 21 fauna species were recorded within the Project Area, 20 were birds and one was a mammal.

No fauna species listed under the EPBC Act were recorded within the Project Area.

One fauna species listed under the NPW Act as Rare was recorded in the Project Area:

- Common Brushtail Possum (*Trichosurus vulpecula*).

One of these species is introduced fauna:

- Common Blackbird (*Turdus merula*)

Pockets of remnant native vegetation were often degraded by the presence of introduced flora species and fragmented from more intact remnant native vegetation but may be used by fauna as wildlife corridors to more intact and better quality native vegetation, particularly to the surrounding areas in MGCP.

All the scattered trees within the Project Area provide good resting, foraging and roosting habitat for fauna.

A total of 25 scattered trees contain hollows which provide suitable breeding habitat for fauna species.

### **Phytophthora**

No areas of Phytophthora dieback were observed during the field survey.

## **Likelihood of occurrence assessment**

### **Threatened flora**

Database searches identified 11 flora species listed as threatened under the EPBC Act as known or likely to occur within 5 kilometres of the Project Area. None of these flora species were assessed as potentially occurring within the Project Area itself, based on survey effort, recent records and suitable habitat within the Project Area.

An additional 73 flora species listed as threatened under the NPW Act have records within 5 kilometres of the Project Area. Of these, 37 threatened flora species were assessed as relevant to the proposed project, as follows:

- Seven flora species are deemed *known / highly likely or likely* to occur within the Project Area based on recent records and suitable habitat; and
- 30 flora species listed under the NPW Act were assessed as *possible* to occur within the Project Area based on recent records and suitable habitat.

### **Threatened fauna**

Database searches identified 10 fauna species listed as threatened under the EPBC Act as known or likely to occur within 5 kilometres of the Project Area, consisting of eight birds and two mammals. Of these, four



fauna species (2 birds and 2 mammals) were assessed as likely to occur within the Project Area based on survey effort, recent records and suitable habitat:

- Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare;
- Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and
- Southern Brown Bandicoot (*Isodon obesulus obesulus*) – nationally Endangered and State Vulnerable.

One additional nationally listed threatened species was assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- White-throated Needletail (*Hirundapus caudacutus*) – nationally Vulnerable and migratory and State Vulnerable.

An additional 30 fauna species listed as threatened under the *National Parks and Wildlife Act 1972* have records within 5 kilometres of the Project Area. Of these, 27 threatened fauna species were assessed as relevant to the proposed project, as follows:

- 11 fauna species (9 bird species and 2 mammal species) are deemed *known / highly likely or likely* to occur within the Project Area based on recent records and suitable habitat; and
- 16 fauna species (14 bird species, one frog species, one mammal species) were assessed as *possible* to occur within the Project Area based on recent records and suitable habitat.

### **Migratory fauna**

Database searches identified five fauna species listed as migratory under the EPBC Act as known or likely to occur within 5 kilometres of the Project Area. Of these, two migratory species were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- Fork-tailed Swift (*Apus pacificus*) – nationally migratory;
- Satin Flycatcher (*Myiagra cyanoleuca*) – nationally migratory and State Endangered.

## Potential impacts to flora and fauna

The Project Area is largely comprised of pockets of remnant native vegetation, scattered trees and planted (amenity) vegetation associated with the golf course. MGCP is directly adjacent to the Project Area and supports a large assemblage of both nationally and State listed flora and fauna (DEH 2006). Few patches of naturally occurring native or remnant vegetation remain in the landscape, and those that do are generally impacted at some level by weed invasion and lacking an intact understorey. Regardless, vegetation that remains in the Project Area is of high habitat value as it provides a corridor for movement to better quality vegetation. Additionally, the remaining remnant scattered trees contain a significant number of hollows, likely to be utilised by less conspicuous or nocturnal species and utilised for nesting, either by birds or other fauna.

## Recommendations and considerations

The following broad recommendations and considerations should be taken into account for the proposed Project:

- Retain high value vegetation where possible, particularly those areas assessed as having high fauna habitat value (in particular trees/vegetation with a high biodiversity score and trees with hollows) and consider Project design that avoids this constraint.
- Utilise existing disturbed areas including areas defined as exotic vegetation for Project infrastructure where possible. See [Appendix 10](#) for a map and photographs of suggested areas and routes that EBS recommends in order to avoid impact to native vegetation.
- Ensure infrastructure is a sufficiently located away from large remnant trees (i.e., a minimum of 10 metres away but preferably outside of the Tree Protection Zone (TPZ) of trees).
- Ensure that the design and construction methods minimise impacts to all vegetation, as much as possible, including impacts to the TPZ of large remnant trees.
- Vegetation clearing required for the Project outside the parameters of maintenance activities would require approval under the *Native Vegetation Act 1991* (NV Act). This would require a Clearance Data Report and a Clearing Application lodged with the Native Vegetation Council. The completion of additional field work may also be required.
- If native flora species that provide suitable resting, foraging and breeding areas for some fauna species are impacted by works then a suitably qualified fauna spotter (or the likes) needs to assess the presence of fauna prior to any flora removal.
- Collate additional information to determine if a referral under the EPBC Act (i.e., undertake an EPBC Self-assessment of MNES, conduct targeted threatened species surveys), is required.
- Develop a Construction Environmental Management Plan (CEMP) for the construction phase of the project that includes detailed strategies for the management of native vegetation and fauna. This should include the management of Declared and Environmental weeds across the Project Area to prevent their spread into surrounding areas as well as Phytophthora risk.

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## **Attachments**

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# 1 INTRODUCTION

Mount Lofty Golf Estate Pty Ltd (Mount Lofty Estate) are proposing to redevelop the Stirling Golf Course at the Stirling Golf Club (The Project), located in Stirling, South Australia (SA). Trice – Project & Development Managers (Trice) on behalf of Mount Lofty Estate have engaged EBS Ecology (EBS) to undertake an ecological flora and fauna assessment to support the Development Application (DA).

The proposed Mount Lofty Golf Estate's new development is summarised as follows:

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m<sup>2</sup> function room.
  - A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace.
  - 186m<sup>2</sup> sports bar.
  - A 189m<sup>2</sup> gallery and cafe.
  - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – 'Pods'
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
  - Extension to the Perfumery to include a covered outdoor dining area.
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a "Scent Factory".
  - Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
  - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.



- A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
- Designated waste storage areas.
- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

The proponents additionally intend to rebrand the development as the Mount Lofty Golf Estate which was the original name of the course when it opened in 1925. The aim of the development will be to improve access to tourists and capitalise on the growing tourism market.

The development has been declared a major project by the Minister for Planning and Local Government (the South Australian Government Gazette 2020, p. 5848) and will be assessed by a state-run process. At the time of preparing this report, the development design has not been finalized and layout will be guided by the reports of numerous specialists. Preliminary drawings of the Project Area (as provided to EBS on 08/09/22) are provided in [Attachment 1](#).

## 1.1 Objectives

The overall aim of the ecological flora and fauna assessment is to identify potential ecological constraints associated with the proposed Project. The flora and fauna assessment includes a desktop assessment and a site assessment. The specific objectives include the following:

- Identify, describe and map state and nationally threatened flora and fauna and ecological communities across the Project Area to enable assessment by State *National Parks and Wildlife Act 1972* (NPW Act) and Commonwealth regulators *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). This will include native as well as introduced flora and fauna species;
- Determine the likelihood of presence likelihood of presence and status of State (NPW Act) and Commonwealth (EPBC Act), listed flora and fauna species and ecological communities, including Weeds of National Significance (WoNS) and other weed species;
- Assess the impacts the proposed works are likely to have on any matters of State and/or National Environmental Significance;
- Review information regarding the habits and habitat requirements of threatened species; and
- Provide recommendations to avoid impacts to biodiversity including clearing of native vegetation and impact to threatened species and ecological communities.

## 1.1 Project Area

The Project Area is located at the Stirling Golf Club at 35 Golflinks Road, Stirling, which is located approximately 2.5 kilometres (km) northwest of Bridgewater and 15 km southeast of Adelaide (Figure 1, pg. 2).

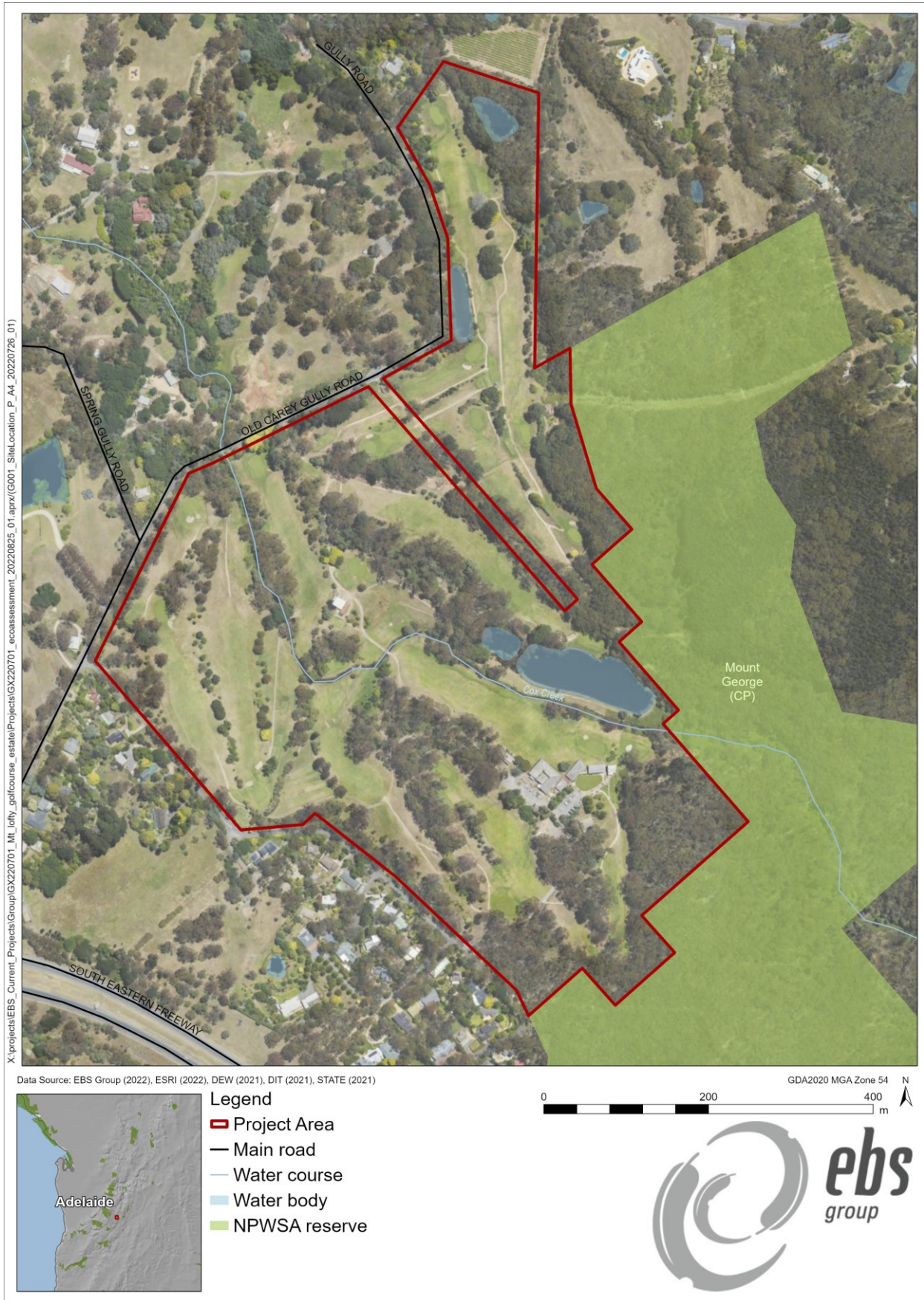


Figure 1. The Project Area at the Stirling Golf Club.

## 2 BACKGROUND INFORMATION

### 2.1 Administrative boundaries

This Project is located within the Adelaide Hills Council Local Government Area. It is situated within the Hills and Fleurieu Landscape Management Region and the Onkaparinga Hundred (DEW 2022a).

### 2.2 Interim Biogeographic Regionalisation for Australia (IBRA)

The Project Area occurs in the Mount Lofty Ranges subregion of the Flinders Lofty Block Bioregion. At a local scale the IBRA subregions are further categorised by Environmental Associations, the Project Area falls within the Uraidla Environmental Association (Table 1).

Approximately 15% (46,342 ha) of the Mount Lofty Ranges IBRA Subregion and approximately 26% (3,674 ha) of the Uraidla IBRA Environmental Association is mapped as remnant vegetation. Of this, 27% (12,706 ha) and 20% (749 ha) is formerly conserved and protected, respectively (DCCEEW 2022a).

**Table 1. IBRA bioregion, subregion, and environmental association environmental landscape summary.**

<b>Flinders Lofty Block IBRA bioregion</b>	
Temperate to arid Proterozoic ranges, alluvial fans and plains, and some outcropping volcanics, with the semi-arid to arid north supporting native cypress, black oak (belah) and mallee open woodlands, Eremophila and Acacia shrublands, and bluebush/saltbush chenopod shrublands on shallow, well-drained loams and moderately deep, well-drained red duplex soils. The increase in rainfall to the south corresponds with an increase in low open woodlands of <i>Eucalyptus obliqua</i> and <i>E. baxteri</i> on deep lateritic soils, and <i>E. fasciculosa</i> and <i>E. cosmophylla</i> on shallower or sandy soils.	
<b>Mount Lofty Ranges IBRA subregion</b>	
This subregion extends from north of the Fleurieu Peninsula to the Barossa Valley and is predominantly an undulating to low hilly upland with steeper marginal ranges and hills. The Barossa Valley is the lowest area in this subregion and represents a structural basin. The rest of the subregion consists of hilly uplands on sandstone and shale with northerly trending strike ridges and dissected lateritic tableland remnants. Low open woodland commonly dominated by <i>Eucalyptus obliqua</i> and <i>E. baxteri</i> are found in higher rainfall areas on deep, lateritic soils. Shallower or sandy soils support <i>E. fasciculosa</i> , <i>E. cosmophylla</i> and in the northern part of the region <i>E. goniocalyx</i> . <i>E. leucoxydon</i> dominates the woodlands on podzolised soils in the lower rainfall areas, <i>E. viminalis</i> ssp. <i>cygnetensis</i> dominate the wetter and cooler woodlands and <i>E. odorata</i> characterises drier sites. Eucalypts give way to drooping sheoak ( <i>Allocasuarina verticillata</i> ) in the most arid woodlands and in coastal situations on shallow rocky soils.	
Remnant vegetation	Approximately 15% (46,342 hectares (ha)) of the subregion is mapped as remnant native vegetation, of which 27% (12,706 ha) is formally conserved.
Landform	Hills and valleys; alternating subparallel hilly ridges and valleys with a general N-S trend in north. In south, hilly dissected tableland.
Geology	Dissected lateritized surface in south.
Soil	Hard setting loams with red clayey subsoils, highly calcareous loamy earths, Hard setting loams with mottled yellow clayey subsoil, Coherent sandy soils, Cracking clays.
Vegetation	Eucalyptus woodlands with a shrubby understorey.
Conservation significance	129 species of threatened fauna, 270 species of threatened flora. 4 wetlands of national significance.

<b>Uraidla IBRA environmental association</b>	
Remnant vegetation	Approximately 26% (3,674 ha) of the association is mapped as remnant native vegetation, of which 20% (749 ha) is formally conserved.
Landform	Hilly uplands on sandstone and shale with long smooth slopes.
Geology	Sandstone, shale and alluvium.
Soil	Hard pedal or apedal mottled-yellow soils, red duplex soils on the slopes, grey-brown weakly structured sandy soils and bleached sands.
Vegetation	Open forest of messmate stringybark or brown stringybark on the slopes and crests, and open forests of mountain gum on the valley floors.
Conservation significance	29 species of threatened fauna, 96 species of threatened flora. 1 wetlands of national significance.

### **2.3 Current land use**

The Project Area is currently the site of the Stirling Golf Club. Pockets of remnant native vegetation and planted vegetation cooccur within the area. The Stirling Golf Club is adjacent to Mount George Conservation Park (MGCP) (see Figure 1, p4).

### **2.4 Watercourses and wetlands**

Cox Creek runs through the Project Area from the adjacent Mount George Conservation Park. There are also three artificially constructed lakes or dams to the north of the Stirling Golf Club clubhouse and in the northern section of the Project Area (see Figure 1, p4).

### **2.5 Conservations areas**

The MGCP is located directly adjacent to the Stirling Golf Club and supports a large assemblage of both nationally and State listed flora and fauna (DEH 2006) (see Figure 1, p4).

Kenneth Stirling Conservation Park and Cleland National Park are within 2.5 km of the Project Area. Like MGCP, these conservation areas also support many nationally and State listed flora and fauna.

### 3 COMPLIANCE AND LEGISLATIVE SUMMARY

Impacts to biodiversity including clearing of native vegetation and impact to threatened species and ecological communities as a result of the Project, are subject to Commonwealth and State legislation as listed in Table 2.

**Table 2. Commonwealth and South Australian legislation relevant to the Project Area.**

Jurisdiction	Legislation
Commonwealth	<ul style="list-style-type: none"> <li>• <i>Environment Protection and Biodiversity Conservation Act 1999</i></li> </ul>
South Australia	<ul style="list-style-type: none"> <li>• <i>Native Vegetation Act 1991</i></li> <li>• <i>National Parks and Wildlife Act 1972</i></li> <li>• <i>Landscape South Australia Act 2019</i></li> <li>• <i>Planning Development and Infrastructure Act 2016</i></li> </ul>

3.1 **Note:** This summary is not intended to be a substitute for particular legal advice and does not address the legal implications of every set of circumstances.

#### 3.2 Environment Protection and Biodiversity Conservation Act 1999

The *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Environment Protection and Biodiversity Conservation Regulations 2000* provide a legal framework to protect and manage Nationally and Internationally important flora, fauna, ecological communities and heritage places – defined in the Act as Matters of National Environmental Significance (MNES). The nine MNES protected under the Act are:

1. World Heritage properties;
2. National Heritage places;
3. Wetlands of international importance (listed under the Ramsar Convention);
4. Listed threatened species and ecological communities;
5. Migratory species protected under international agreements;
6. Commonwealth marine areas;
7. The Great Barrier Reef Marine Park;
8. Nuclear actions (including uranium mines); and
9. A water resource, in relation to coal seam gas development and large coal mining development.

Two (2) of the nine (9) MNES protected under the Act are of relevance to the Project Area:

- listed threatened species and ecological communities; and
- migratory species protected under international agreements.

Any action that has, will have, or is likely to have a significant impact on MNES requires referral under the EPBC Act. Substantial penalties apply for undertaking an action that has, will have, or is likely to have a significant impact on a MNES without approval.

The EPBC Act Significant Impact Guidelines provide overarching guidance on determining whether an action is likely to have a significant impact on a matter of national environmental significance (refer to EBS 2022b for further details on the significant impact for Endangered and Vulnerable species).

### 3.3 Native Vegetation Act 1991

The Project Area is in the Adelaide Hills council, which is currently subject to the *Native Vegetation Act 1991* (NV Act). Native vegetation within the Project Area is protected under the NV Act and *Native Vegetation Regulations 2017*. Any proposed clearance of native vegetation in South Australia (unless exempt under the *Native Vegetation Regulations 2017*) is to be assessed against the NV Act Principles of Clearance and requires approval from the Native Vegetation Council (NVC). A net environmental benefit, either through contribution to the Native Vegetation Fund or via implementation of an on-ground Significant Environmental Benefit (SEB), is generally conditional on an approval being granted.

Native vegetation refers to any naturally occurring local plant species that are indigenous to South Australia, from small ground covers and native grasses to large trees and water plants.

"Clearance", in relation to native vegetation, means:

- The killing or destruction of native vegetation.
- The removal of native vegetation.
- The severing of branches, limbs, stems, or trunks of native vegetation.
- The burning of native vegetation.
- Any other substantial damage to native vegetation, and includes the draining or flooding of land, or any other act or activity, that causes the killing or destruction of native vegetation, the severing of branches, limbs, stems or trunks of native vegetation or any other substantial damage to native vegetation.

Approval must be obtained before performing any activity that could cause substantial damage to native plants. This also applies to dead trees that may provide habitat for animals. These activities include but are not limited to:

- The cutting down, destruction or removal of whole plants.
- The removal of branches, limbs, stems, or trunks (including brush cutting and woodcutting).
- Burning.
- Poisoning.
- Slashing of understorey.
- Drainage and reclamation of wetlands.
- Grazing by animals (in some circumstances).
- Change of land use.

Under the NV Act, the NVC considers applications to clear native vegetation under ten principles. Native vegetation should not be cleared if it is significantly at odds with these principles:

- It contains a high level of diversity of plant species.
- It is an important wildlife habitat.
- It includes rare, vulnerable, or endangered plant species.
- The vegetation comprises a plant community that is rare, vulnerable, or endangered.

- It is a remnant of vegetation in an area which has been extensively cleared.
- It is growing in, or association with, a wetland environment.
- It contributes to the amenity of the area.
- The clearance of vegetation is likely to contribute to soil erosion, salinity, or flooding.
- The clearance of vegetation is likely to cause deterioration in the quality of surface or underground water.
- After clearance, the land is to be used for a purpose which is unsustainable.

The principles apply in all cases, except where the clearance of native vegetation fits an exemption set out in the *Native Vegetation Regulations 2017* or can be classified as an 'intact stratum'. 'Intact stratum' means that applications will usually be denied when the vegetation has not been seriously degraded by human activity within the last 20 years.

All approved vegetation clearance must also be conditional on achieving a SEB to offset the clearance. The requirement for a SEB also applies to several of the exemptions. Potential SEB offsets include:

- The establishment and management of a set-aside area to encourage the natural regeneration of native vegetation.
- The protection and management of an established area of native vegetation.
- Entering into a Heritage Agreement on land where native vegetation is already established to further preserve or enhance the area in perpetuity.
- A payment to the Native Vegetation Fund.

### 3.4 National Parks and Wildlife Act 1972

Native plants and animals in South Australia are protected under the *National Parks and Wildlife Act 1972* (NPW Act). It is an offence to take a native plant or protected animal without approval. Threatened plant and animal species are listed in Schedules 7 (Endangered species), 8 (Vulnerable species) and 9 (Rare species) of the Act. Persons must not:

- Take a native plant on a reserve, wilderness protection area, wilderness protection zone, land reserved for public purposes, a forest reserve or any other Crown land.
- Take a native plant of a prescribed species on private land. Take a native plant on private land without the consent of the owner (such plants may also be covered by the *Native Vegetation Act 1991*).
- Take a protected animal or the eggs of a protected animal without approval.
- Keep protected animals unless authorised to do so.
- Use poison to kill a protected animal without approval.

Conservation rated flora and fauna species listed on Schedules 7, 8, or 9 of the NPW Act may occur within the Project Area. Persons must comply with the conditions imposed upon permits and approvals.



### **3.5 Landscape South Australia Act 2019**

The *Landscape South Australia Act 2019* (LSA Act) has repealed the *Natural Resources Management Act 2004*. Under the LSA Act, new regional landscape boards have been established. The aim is to deliver Landscape related services to regional communities, including effective water management, pest plant and animal control, soil and land management and support for broader sustainable primary production programs. Under the LSA Act, landholders have a legal responsibility to manage declared pest plants and animals and prevent land and water degradation.

### **3.6 Planning Development and Infrastructure Act 2016**

The *Planning, Development and Infrastructure Act 2016* (PDI Act) repealed the *Development Act 1993*. The PDI Act, along with the *Planning, Development and Infrastructure (General) Regulations 2017* and *Planning and Design Code*, provide the legislative framework for carrying out planning and development works within the state. The *Planning and Design Code* is the cornerstone of the new system and has replaced all council development plans to become the single source of planning policy for assessing development applications. No development can be undertaken without an appropriate Development Approval being obtained from the relevant authority after an application and assessment process.

#### ***3.6.1 Regulated and significant trees***

The *Planning and Design Code* includes a new Regulated and Significant Tree Overlay, which requires conservation of regulated and significant trees to provide aesthetic and environmental benefits and mitigate tree loss (Desired Outcome 1 of the Assessment Provisions within the Regulated and Significant Tree Overlay).

The Project Area is not located within the Regulated and Significant Tree Overlay (which only applies to the Adelaide metropolitan area and hills face zone from Gawler to Aldinga Beach). As such, Regulated and Significant Tree controls associated with the PDI Act do not apply across the Project Area.

## 4 METHODS

### 4.1 Desktop assessment

A desktop assessment was conducted to assess the potential for any threatened and migratory species (both nationally and State listed) to occur within the Project Area. This was achieved by undertaking database searches using a 5 km buffer of the Project Area (Search Area).

#### 4.1.1 Protected Matters Search Tool

A Protected Matters Search Tool (PMST) report was generated on 11 August 2022 to identify MNES under the EPBC Act (DCCEEW 2022b). The PMST is maintained by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) and was used to identify flora and fauna species or ecological communities of national environmental significance that may occur or have suitable habitat within the Project Area. Species and Threatened Ecological Communities (TECs) identified in the PMST report that are known or likely to occur within the Search Area were assessed for their likelihood of occurrence within the Project Area. All species considered exclusively marine (including whales, sharks, fish, dolphins, marine turtles and marine birds) were not assessed in this desktop assessment report as the Project Area is terrestrial. No species listed as marine by the PMST report have been included as the Project Area is not within a marine protected area. A 5 km buffer from the Project Area was applied to the PMST.

#### 4.1.2 Biological Database of South Australia

A Biological Database of South Australia (BDBSA) search was obtained from the Department of Environment and Water (DEW) on 16 August 2022 (Recordset number: DEWNRBDBSA220816-1) to identify threatened flora and fauna species previously recorded within 5 km of the Project Area (DEW 2022b). A buffer of 5 km from the Project Area was used to determine where possible threatened species occurred closest to the Project Area.

The BDBSA is comprised of an integrated collection of corporate databases which meet DEW standards for data quality, integrity and maintenance. In addition to DEW biological data, the BDBSA also includes data from partner organisations (Birds Australia, Birds SA, Australasian Wader Study Group, SA Museum, and other State Government Agencies). Only species with records since 1995 and a spatial reliability of less than 1 km were assessed for their likelihood of occurrence.

#### 4.1.3 Literature review

Existing information and literature relevant to the Project Area was reviewed, including:

- Aerial imagery;
- Spatial datasets, e.g., DEW biological survey sites, IBRA, vegetation cover, protected areas, vegetation floristic mapping, surface and ground water and roadside significant sites from NatureMaps (DEW 2022a); and
- Reports, design drawings, plans and web-based information, including:
  - Design Drawings and CAD files as provided by Trice.

- Preliminary Tree Assessment ATS6360-035GoIRdPTA (Arborman 2022a)
- Arboricultural Impact Assessment and Development Impact Report Site: Stirling Golf Club, 35 Golflinks Road, Stirling ATS6360-035GoIRdDIR (Arborman 2022b)
- South Australian (SA) Planning and Design Code, Part 10;
- SA Planning and Property Atlas; and
- EPBC Act species profiles, conservation advice and recovery plans.

The aforementioned information was used to assess:

- Vegetation cover within the Project Area and immediate surrounds;
- Potential vegetation associations present (including threatened ecological communities); and
- Flora and fauna species of conservation significance known or likely to occur within the area.

#### 4.1.4 Assessment of the likelihood of occurrence

The likelihood of each threatened flora and fauna species potentially occurring within the Project Area was assessed. A likelihood of occurrence rating (Highly Likely / Known, Likely, Possible, Unlikely) was assigned to each threatened species identified in the desktop database searches. The ratings take the following criteria into consideration:

Each threatened species has been rated as either highly likely/known, likely, possible, or unlikely to occur in the Project Area according to the criteria listed in Table 3.

**Table 3. Criteria for the likelihood of occurrence of threatened species.**

Likelihood	Criteria
Highly Likely/Known	<ul style="list-style-type: none"> <li>• BDBSA records in the last 10 years, the species does not have highly specific needs, and the habitat is largely intact.</li> <li>• Species observed within the Project Area during field survey.</li> </ul>
Likely	<ul style="list-style-type: none"> <li>• BDBSA records in the last 10 years, the species does not have highly specific habitat needs and the habitat is largely intact, or</li> <li>• BDBSA records in the last 10 years, the species does have highly specific habitat needs and these needs occur in the area.</li> </ul>
Possible	<ul style="list-style-type: none"> <li>• No BDBSA records, survey effort is considered not adequate, suitable habitat does occur (or isn't known if it does occur) and species of similar habitat needs have been recorded in the area, or</li> <li>• BDBSA records within the last 40 years, and the area is not largely intact, or</li> <li>• BDBSA records in the last 10 years, the species does not have highly specific needs, and habitat is largely intact.</li> </ul>
Unlikely	<ul style="list-style-type: none"> <li>• No BDBSA records despite survey effort considered adequate, or</li> <li>• No BDBSA records and survey effort is considered not adequate, and no suitable habitat is known to occur in the area, or</li> <li>• No BDBSA records and survey effort is not considered adequate, and no suitable is known to occur in the area, and species of similar habitat needs have no records either.</li> </ul>

## 4.2 Field assessment

The field survey for the ecological assessment was conducted on 26 August 2022 by N. Piscioneri and NVC Accredited J. Skewes to assess the site and determine high and low value habitat and ecological features within the Project Area.

Where time permitted, vegetation data was collected in accordance with the Bushland Assessment Method (BAM) (NVC 2020a) and Scattered Tree Assessment Method (STAM) (NVC 2020b). Detailed vegetation assessment is reported in the *Native Vegetation Clearance Mount Lofty Golf Estate Data Report EBS Ecology (2022b in preparation)*.

### 4.2.1 Fauna

No targeted surveys for threatened fauna were undertaken.

All native and exotic vertebrate fauna species opportunistically encountered during the field survey (directly observed, or tracks, scats, burrows, nests, and other signs of presence) were recorded across the Project Area. Potential fauna refuge sites, such as hollows, rock crevices and creek lines were noted as an indication of availability of suitable habitat. Particular attention was given to identifying potential habitat for threatened species. For each opportunistic fauna observation, the species, number of individuals, GPS location, detection methodology (sight, sound, or sign) and habitat were recorded.

## 4.3 Limitations

### 4.3.1 Desktop assessment

The desktop assessment was based on existing datasets and references from a range of sources. EBS has not attempted to verify the accuracy of any such information. The findings and conclusions expressed by EBS are based solely upon information in existence at the time of the assessment.

Flora and fauna records were sourced from the PMST and BDBSA. The BDBSA only includes verified flora and fauna records submitted to DEW or partner organisations. It is recognised that knowledge is poorly captured, and it is possible that significant species occur that are not reflected by database records. Although much of the BDBSA data has been through a variety of validation processes, the lists may contain errors and should be used with caution. DEW give no warranty that the data is accurate or fit for any particular purpose of the user or any person to whom the user discloses the information.

The EPBC Act protected matters report and BDBSA flora and fauna records were limited to a 5 km buffer around the Project Area. Fauna species, in particular birds can traverse distances in excess of 20 km. It is also acknowledged that the presence of species may not be adequately represented by database records. Hence the EPBC and BDBSA results may not highlight all potential threatened flora and fauna species that may occur in the area, within a 5 km radius. A precautionary approach has therefore been adopted, with reference to existing EPBC and BDBSA records and native vegetation cover. The combination of database records and background research have provided a solid baseline foundation for determining the flora and fauna that are likely to, or are known to, occur within the Project Area.

#### **4.3.2 Mapping**

Mapping may be inaccurate and not reflect the vegetation on site. Some types of native vegetation based on interpretation of imagery are difficult to observe and distinguish (e.g., native grasslands and low shrublands). Hence these types of vegetation may be under-represented.

#### **4.3.3 Flora**

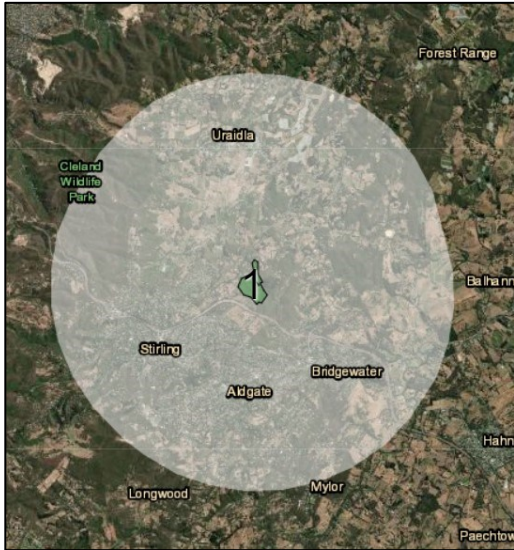
The ecological assessment was conducted just before spring. Threatened orchid species and numerous forbs, herbs and grasses are only just beginning to flower at this time of year, and therefore it is possible that species were present that were undetectable at the time of the field survey.

## 5 DESKTOP ASSESSMENT RESULTS

### 5.1 Matters of National Environmental Significance (MNES)

The PMST report identified 36 threatened species and 13 migratory species protected under the EPBC Act, which may be relevant to the Project Area. Table 4 summarises the results of the PMST report and the relevant MNES are discussed further below.

**Table 4. Summary of the EPBC Act Protected Matters Search Tool results (5 km buffer).**

	Matters of National Environment Significance under EPBC Act	Identified within the search area
 <p>PMST search area (1) with 5 km buffer.</p>	World Heritage Properties	None
	National Heritage Properties	None
	Wetlands of International Importance	None
	Great Barrier Reef Marine Park	None
	Commonwealth Marine Areas	None
	Listed Threatened Ecological Communities	0
	Listed Threatened Species	36 (18 flora and 18 fauna)
	Listed Migratory Species	13
	Commonwealth Lands	13
	Commonwealth Heritage Places	None
	Listed Marine Species	19
	Whales and other Cetaceans	None
	Critical Habitats	None
	Commonwealth Reserves Terrestrial	None
	Australian Marine Parks	None
	Habitat critical to the Survival of Marine Turtles	None
	State and Territory Reserves	53
	Regional Forest Agreements	None
	Nationally Important Wetlands	2
	EPBC Act referrals	4
Key Ecological Features	None	
Biologically Important Areas	None	
Bioregional Assessments	None	
Geological and Bioregional Assessments	None	

### 5.2 EPBC Act listed threatened species

The PMST report identified 18 flora species and 18 fauna species (13 birds, three mammals, one frog and one reptile) listed as threatened under the EPBC Act as potentially occurring within 5 km of the Project Area. The report identified six species as 'known to occur', as listed in Table 5.

Searches of the BDBSA and Bird Life Australia Atlas indicate that historical records of 14 species occur within the Search Area.

**Table 5. Threatened flora and fauna species potentially occurring within 5 km of the Project Area.**

Scientific name	Common name	Conservation status		Presence Type	Year of last record
		EPBC Act	NPW Act		
<b>FLORA</b>					
<i>Caladenia argocalla</i>	White-beauty Spider-orchid	EN	E	Likely to occur	No record
<i>Caladenia behrii</i>	Pink-lipped Spider-orchid	EN	E	Likely to occur	No record
<i>Caladenia gladiolata</i>	Bayonet Spider-orchid	EN	E	Likely to occur	No record
<i>Caladenia rigida</i>	Stiff White Spider-orchid	EN	E	Likely to occur	1961
<i>Caladenia tensa</i>	Greencomb Spider-orchid	EN		May occur	No record
<i>Corybas dentatus</i>	Toothed Helmet-orchid	VU		May occur	No record
<i>Dodonaea procumbens</i>	Trailing Hop-bush	VU		May occur	No record
<i>Euphrasia collina subsp. osbornii</i>	Osborn's Eyebright	EN	E	Known to occur	1973
<i>Glycine latrobeana</i>	Clover Glycine	VU	V	Likely to occur	1990
<i>Olearia pannosa ssp. pannosa</i>	Silver Daisy-bush	VU		May occur	No record
<i>Prasophyllum goldsackii</i>	Goldsack's Leek-orchid	EN		May occur	No record
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	VU	R	Likely to occur	No record
<i>Prasophyllum pruinatum</i>	Plum Leek-orchid	EN	E	Known to occur	1941
<i>Pterostylis cucullata</i>	Leafy Greenhood	VU	E	Likely to occur	1913
<i>Senecio macrocarpus</i>	Large-fruit Fireweed	VU		May occur	No record
<i>Thelymitra epipactoides</i>	Metallic Sun-orchid	EN		May occur	No record
<i>Thelymitra matthewsii</i>	Spiral Sun-orchid	VU	E	Likely to occur	No record
<i>Veronica derwentiana subsp. homalodonta</i>	Mount Lofty Speedwell	CE	E	Likely to occur	No record
<b>FAUNA</b>					
<i>Aprasia pseudopulchella</i>	Flinders Ranges Worm-lizard	VU		May occur	No record
<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN	E	Known to occur	No record
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE, Mi		May occur	No record
<i>Cinclosoma punctatum anachoreta</i>	Mt Lofty Ranges Spotted Quail-thrush	CE		May occur	1924
<i>Dasyurus maculatus maculatus</i>	Spot-tailed Quoll	EN		May occur	No record
<i>Falco hypoleucos</i>	Grey Falcon	VU	R	Likely to occur	No record
<i>Grantiella picta</i>	Painted Honeyeater	VU	R	Likely to occur	No record
<i>Hirundapus caudacutus</i>	White-throated Needletail	VU, Mi	V	Likely to occur	1990
<i>Hylacola pyrrhopygia parkeri</i>	Chestnut-rumped Heathwren	EN	E	Known to occur	2020
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot	EN	V	Known to occur	2021
<i>Leipoa ocellata</i>	Malleefowl	VU	V	Likely to occur	No record
<i>Litoria raniformis</i>	Growling Grass Frog	VU		May occur	1978
<i>Numenius madagascariensis</i>	Eastern Curlew	CE, Mi		May occur	No record
<i>Pedionomus torquatus</i>	Plains-wanderer	CE		May occur	No record
<i>Polytelis anthopeplus monarchoides</i>	Regent Parrot	CE		May occur	1996
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	R	Likely to occur	2020
<i>Rostratula australis</i>	Australian Painted Snipe	EN	E	Likely to occur	1980
<i>Zoothera lunulata halmaturina</i>	Bassian Thrush	EN	R	Known to occur	2022

Conservation status (EPBC Act/NPW Act): CE = Critically Endangered. EN/E = Endangered. VU/V = Vulnerable. R = Rare. Mi = Migratory.

Presence Type: As identified in the PMST report.

Year of last record: Historical records within 5 km of the Project Area, obtained from the *BDBSA* and *Bird Life Australia – Bird Atlas Database*.

### 5.3 EPBC Act listed migratory species

Excluding species also listed as threatened, the PMST report (DCCEEW 2022b) identified 10 bird species listed as migratory under the EPBC Act that might occur within 5 km of the Project Area. These species are listed in Table 6. Note that migratory species that also have a threatened status are discussed in [Section 5.2](#).

Only one migratory species has been identified by the PMST report as known to occur within the Search Area, Rufous Fantail (*Rhipidura rufifrons*).

**Table 6. Listed migratory species potentially occurring within 5 km of the Project Area.**

Scientific name	Common name	Conservation status		Presence Type	Year of last record
		EPBC Act	NPW Act		
<i>Actitis hypoleucos</i>	Common Sandpiper	Mi	R	May occur	No record
<i>Apus pacificus</i>	Fork-tailed Swift	Mi	-	Likely to occur	No record
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Mi	-	May occur	No record
<i>Calidris melanotos</i>	Pectoral Sandpiper	Mi	-	May occur	No record
<i>Gallinago hardwickii</i>	Latham's Snipe	Mi	-	Likely to occur	No record
<i>Motacilla cinerea</i>	Grey Wagtail	Mi	-	May occur	No record
<i>Motacilla flava</i>	Yellow Wagtail	Mi	-	May occur	No record
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Mi	-	Likely to occur	No record
<i>Rhipidura rufifrons</i>	Rufous Fantail	Mi	-	Known to occur	No record
<i>Tringa nebularia</i>	Common Greenshank	Mi	-	Likely to occur	No record

Conservation status (EPBC Act/NPW Act): CE = Critically Endangered. EN/E = Endangered. VU/V = Vulnerable. R = Rare. Mi = Migratory

Presence Type: As identified in the PMST report.

Year of last record: Historical records within 5 km of the Project Area, obtained from the *BDBSA* and *Bird Life Australia – Bird Atlas Database*.

### 5.4 NPW Act listed threatened species

The database searches indicate that, excluding species also listed under the EPBC Act, 107 flora and 38 fauna species listed as threatened under the NPW Act have been recorded previously in the Search Area. This includes 95 Rare, 29 Vulnerable and 21 Endangered species.

A list of all species listed as threatened under the NPW Act recorded previously in the Search Area is provided in [Appendix 1](#).

### 5.5 Listed Threatened Ecological Communities (TEC)

No TECS were identified by the PMST to potentially occur within 5km of the Project Area.

As such, no TECs will be impacted by the proposed project.



## 5.6 Nationally important wetlands

Two nationally important wetlands were identified within 5 km of the proposed Project:

- Englebrook Reserve
- Cleland Perched Swamps

Englebrook Reserve is a nationally important wetland located to the south of Bridgewater which conserves an intact *Eucalyptus obliqua* (Messmate Stringybark) open forest and several flora species of significance (Seaman 2002). This area is approximately 3 km southeast of the Project Area.

The Cleland Perched Swamps are a nationally important wetland consisting of 5 small swamps located within Cleland National Park and Eurilla Conservation Park. These swamps are important due to the presence of many State listed flora species and for the presence of the nationally listed Southern Brown Bandicoot (*Isoodon obesulus obesulus*) (Seaman 2002). These swamps are between approximately 2.5 to 5 km west of the Project Area.

These wetlands are not located within the Project Area itself and as such the proposed Project will not impact on them.

## 5.7 State and Territory Reserves

A total of 53 State and Territory Reserves were identified in the PMST. Of these, five reserves are within 1 km of the Project Area:

- Heritage Agreement 357
- Heritage Agreement 856
- Heritage Agreement 1609
- Heritage Agreement 1610; and
- Mount George Conservation Park (MGCP).

MGCP is the most relevant of these reserves to the Project. This reserve is directly adjacent (to the east and southeast) of the Project Area (see Figure 1, pg. 2) and supports a large assemblage of both nationally and State listed flora and fauna (DEH 2006). Species that have been observed within MGCP include but are not limited to the nationally Endangered and State Rare Bassian Thrush (*Zoothera lunulata halmaturina*) and State Rare Scarlet Robin (*Petroica boodang boodang*) (DEW 2022b).

## 5.8 Introduced Species

### 5.8.1 Introduced flora species

A BDBSA search identified 45 Declared flora species under the LSA Act, that have records within 5 km of the Project Area. Of these, 17 are Weeds of National Significance (WoNS). A summary of these species and the latest sighting (year) is provided in Table 7.

**Table 7. Declared weeds identified within 5 km of the Project Area (DEW 2022b).**

Scientific Name	Common Name	Weeds of National Significance (WoNS)	Latest sighting (year)
<i>Acer negundo</i>	Box Elder		2015
<i>Alisma lanceolatum</i>	Water Plantain		2014
<i>Arundo donax</i>	Giant Reed		2020
<i>Asparagus asparagoides f.</i>	Bridal Creeper	Yes	2019
<i>Asparagus scandens</i>	Snakefeather	Yes	2018
<i>Billardiera heterophylla</i>	Blue-bell Creeper		2022
<i>Cenchrus macrourus</i>	African Feather-grass		2013
<i>Chrysanthemoides monilifera ssp. monilifera</i>	Boneseed	Yes	2022
<i>Convolvulus arvensis</i>	Field Bindweed		2009
<i>Coprosma repens</i>	New Zealand Mirror-bush		2021
<i>Cortaderia selloana ssp. selloana</i>	Common Pampas Grass		2022
<i>Crataegus monogyna</i>	Hawthorn		2022
<i>Cytisus scoparius</i>	English Broom	Yes	2022
<i>Echium plantagineum</i>	Salvation Jane		2022
<i>Erica arborea</i>	Tree Heath		2022
<i>Erica baccans</i>	Berry-flower Heath		2021
<i>Euphorbia terracina</i>	False Caper		2012
<i>Fraxinus angustifolia ssp. angustifolia</i>	Narrow-leaved Ash		2022
<i>Fraxinus angustifolia ssp. oxycarpa</i>	Desert Ash		2009
<i>Gazania linearis</i>	Gazania		2018
<i>Genista monspessulana</i>	Montpellier Broom	Yes	2022
<i>Leptospermum laevigatum</i>	Coast Tea-tree		1990
<i>Moraea flaccida</i>	One-leaf Cape Tulip		2019
<i>Pinus halepensis</i>	Aleppo Pine		2019
<i>Pittosporum undulatum</i>	Sweet Pittosporum		2022
<i>Polygala myrtifolia</i>	Myrtle-leaf Milkwort		2009
<i>Rhamnus alaternus</i>	Blowfly Bush		2022
<i>Rosa canina</i>	Dog Rose		2022
<i>Rosa rubiginosa</i>	Sweet Briar		2022
<i>Rubus anglocandicans</i>		Yes	2022
<i>Rubus erythrops</i>		Yes	2022
<i>Rubus fruticosus aggregate</i>	Blackberry	Yes	2018
<i>Rubus laciniatus</i>	Cut-leaf Blackberry	Yes	2022
<i>Rubus leucostachys</i>	Blackberry	Yes	2019
<i>Rubus riddelsdellii</i>		Yes	2011
<i>Rubus rubritinctus</i>		Yes	2016
<i>Rubus ulmifolius var. anoplothysus</i>	Thornless Blackberry	Yes	2009

<i>Rubus ulmifolius</i> var. <i>ulmifolius</i>	Blackberry	Yes	2018
<i>Salix alba</i>	White Willow	Yes	2012
<i>Salix cinerea</i>	Grey Sallow	Yes	2019
<i>Silene vulgaris</i>	Bladder Campion		2017
<i>Silybum marianum</i>	Variegated Thistle		2020
<i>Ulex europaeus</i>	Gorse	Yes	2022
<i>Watsonia meriana</i> var. <i>bulbillifera</i>	Bulbil Watsonia		2022
<i>Zantedeschia aethiopica</i>	White Arum Lily		2020

Given the large number of Declared weeds recorded within 5 km of the Project Area, there is a large risk of these species and other environmental weeds becoming established within the Project Area and in the surrounding areas due to the proposed Project. Implementation of correct transportation of Declared Weeds and associated permits to transport these weeds on a public road may be required.

### 5.8.2 Introduced fauna species

A BDBSA search identified 19 introduced fauna species (eight birds, eight mammals two fish and one slug) that have records within 5 km of the Project Area. A summary of these species and the latest sighting (year) is provided in Table 8.

**Table 8. Introduced fauna species identified within 5 km of the Project Area (DEW 2022b).**

Common Name	Scientific Name	Latest sighting (year)
Black Rat	<i>Rattus rattus</i>	2022
Brown Rat	<i>Rattus norvegicus</i>	2020
Common Blackbird	<i>Turdus merula merula</i>	2022
Eastern Gambusia	<i>Gambusia holbrooki</i>	2005
European Brown Hare	<i>Lepus europaeus</i>	2019
European Goldfinch	<i>Carduelis carduelis britannica</i>	2022
European Greenfinch	<i>Chloris chloris</i>	2020
European Rabbit	<i>Oryctolagus cuniculus</i>	2022
Fallow Deer	<i>Cervus dama</i>	2022
Feral Cat	<i>Felis catus</i>	2022
Feral Pigeon	<i>Columba livia</i>	2002
House Mouse	<i>Mus musculus</i>	2019
House Sparrow	<i>Passer domesticus domesticus</i>	2016
Indian Peafowl	<i>Pavo cristatus</i>	2000
Mallard	<i>Anas platyrhynchos platyrhynchos</i>	2004
Red Fox	<i>Vulpes vulpes</i>	2022
Redfin Perch	<i>Perca fluviatilis</i>	2005
Spotted Dove	<i>Spilopelia chinensis</i>	2017
Yellow Cellar Slug	<i>Limacus flavus</i>	2016

## 5.9 Phytophthora

Phytophthora dieback as a result of the plant pathogen *Phytophthora cinnamomi* poses a significant threat to the environment. This pathogen is easily spread and can cause severe disease and death of plant species. Any activity that moves soil, water or plant material can spread Phytophthora (DCCEEW 2021).

The nearest records of Phytophthora to the Project Area are in MGCP approximately 600 metres away, although neither of the two records have been confirmed via a soil test (DEW 2022a).

The potential spread of Phytophthora will need to be addressed throughout the Project.

## 6 FIELD SURVEY RESULTS

### 6.1 Flora

A detailed vegetation assessment is reported elsewhere in the *Native Vegetation Clearance Mount Lofty Golf Estate Data Report* EBS Ecology (2022b *in preparation*), but the below sections broadly describe the vegetation present on site.

Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. A total of 60 flora species, including 31 introduced species were recorded within the Project Area. Timing of the survey likely influenced this result, with spring annual forbs and grasses only just beginning to flower or appear. Flora species observed during the survey are provided in [Appendix 2](#).

#### 6.1.1 Vegetation associations

Two vegetation associations (VAs) were recorded within the Project Area, as assessed using the BAM:

- Vegetation Association A1 – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* woodland over *Acacia melanoxylon*.
- Vegetation Association A1b – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* woodland over *Acacia melanoxylon* and degraded understorey.

Photographs of VA A1 and VA A1b are provided in Figure 2 and Figure 3.

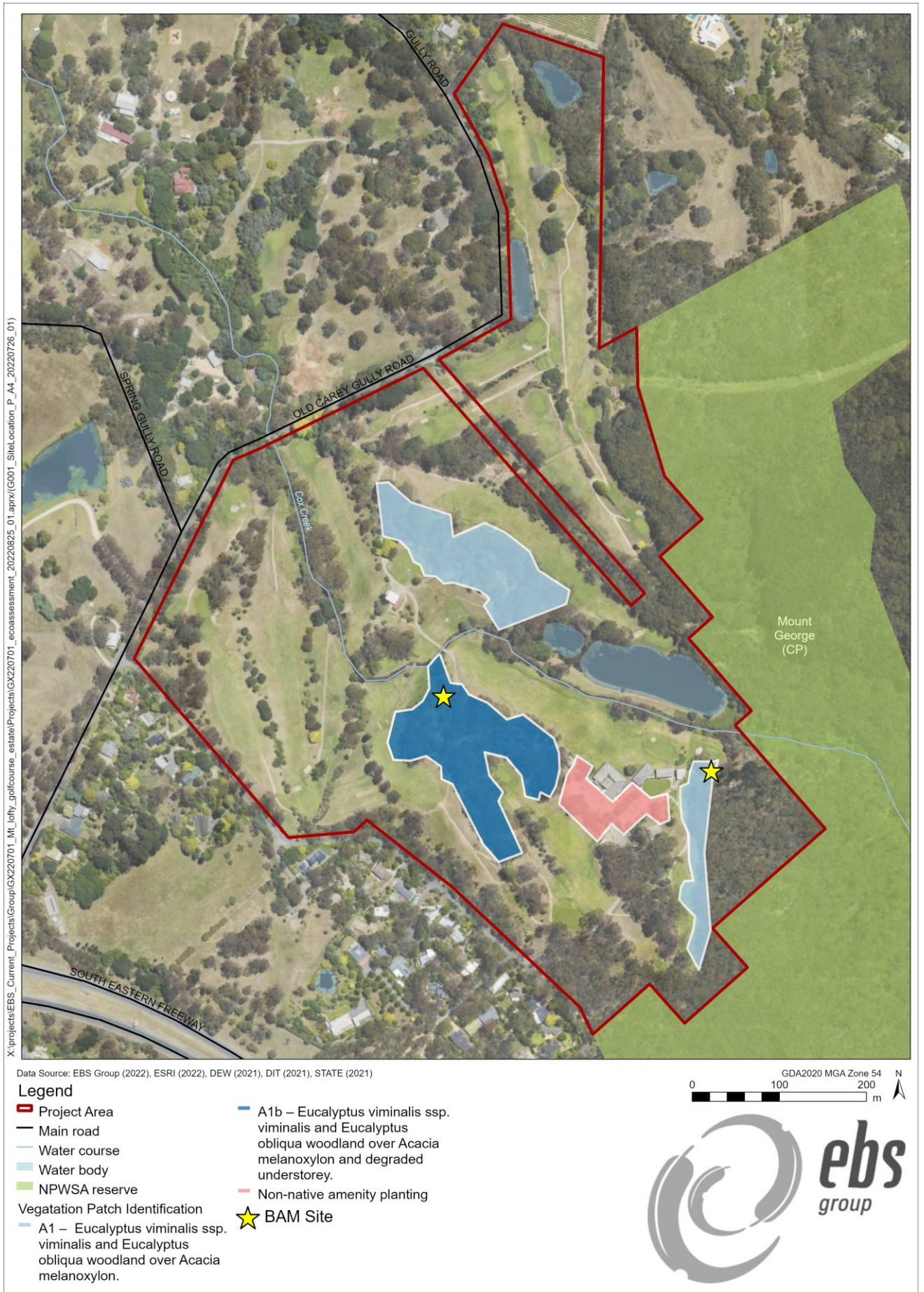
Both vegetation associations and any areas of planted vegetation are provided in Figure 4. Any fairways and greens associated with the golf course are classified as exotic vegetation but are not mapped.



Figure 2. VA A1 – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* woodland over *Acacia melanoxylon*.



Figure 3. VA A1b – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* woodland over *Acacia melanoxylon* and degraded understorey.



**Figure 4. Vegetation associations and planted vegetation recorded within the Project Area. Any fairways and greens associated with the golf course are classified as exotic vegetation but are not mapped.**

**6.1.2 Scattered trees**

A total of 71 native scattered trees were recorded within the Project Area, which included three *Acacia melanoxylon* (Blackwood), 24 *Eucalyptus obliqua* (Messmate Stringybark) and 44 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) (Figure 5). Of these xx were previously assessed by Arborman (Arborman 2022a). The tree ID numbering of Arborman has been provided in Table 9, for cross-referencing purposes.

All trees were categorised based on their Unit Biodiversity Score (UBS). A tree with a UBS of less than 4 was categorised as low in quality and should be retained as much as possible but may be removed. A tree with a UBS between 4 and 7 was categorised as moderate in quality and should be retained where possible and a tree with a UBS of greater than 7 was categorised as high in quality and should be avoided. All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species.

A summary of the scattered trees recorded within the Project Area is provided in Table 9.

**Table 9. Scattered trees recorded within the Project Area.**

Tree no.	Scientific Name	No. of trees	EPBC Act	NPW Act	Hollows	Unit Biodiversity Score (UBS)	Arborist Report Tree no.
1	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R	2 small	4.69	
2	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R		2.61	
3	<i>Acacia melanoxylon</i>	1				2.55	
4	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R	1 small	6.24	
5	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R		2.22	
6	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	2		R		3.67	2 and 3
7	<i>Eucalyptus obliqua</i>	1				1.23	4
8	<i>Acacia melanoxylon</i>	1			1 medium	2.54	
9	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R	1 small	8.58	5
10	<i>Eucalyptus obliqua</i>	1			1 small	4.35	44
11	<i>Eucalyptus obliqua</i>	1				0.42	
12	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R		2.13	45
13	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R	1 small 1 medium	8.71	46
14	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R		5.95	48
15	<i>Eucalyptus obliqua</i>	1			1 small	2.42	47
16	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R		3.91	
17	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R		2.27	
18	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R		2.50	
19	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1		R	2 small 2 medium	7.03	35



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Tree no.	Scientific Name	No. of trees	EPBC Act	NPW Act	Hollows	Unit Biodiversity Score (UBS)	Arborist Report Tree no.
20	<i>Eucalyptus obliqua</i>	1				0.59	
21	<i>Eucalyptus obliqua</i>	1				2.02	34
22	<i>Eucalyptus obliqua</i>	1				0.54	33
23	<i>Eucalyptus obliqua</i>	1				1.99	
24	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 small 3 medium 1 large	11.25	36
25	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		6.03	37
26	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		1.13	38
27	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		2.12	
28	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 medium	9.08	39
29	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 small	6.09	40
30	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 small	7.01	41
31	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 large	2.03	42
32	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		3.51	43
33	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 medium	4.39	31
34	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 small	7.01	32
35	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 large	4.05	30
36	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		4.53	28
37	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	2 small	4.84	27
38	<i>Eucalyptus obliqua</i>	1			1 small 1 medium	5.99	26
39	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 medium	7.79	25
40	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		6.24	24
41	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		6.14	6
42	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		4.15	7
43	<i>Eucalyptus obliqua</i>	1				3.66	9
44	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		1.42	
45	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		2.43	11
46	<i>Eucalyptus obliqua</i>	1				2.50	12
47	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		4.27	13
48	<i>Eucalyptus obliqua</i>	1				2.51	10
49	<i>Eucalyptus obliqua</i>	1				2.51	

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Tree no.	Scientific Name	No. of trees	EPBC Act	NPW Act	Hollows	Unit Biodiversity Score (UBS)	Arborist Report Tree no.
50	<i>Eucalyptus obliqua</i>	1			4 small	6.66	14
51	<i>Acacia melanoxylon</i>	1				4.07	
52	<i>Eucalyptus obliqua</i>	1			1 small	4.51	15
53	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 small 1 medium	9.60	16
54	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		4.67	20
55	<i>Eucalyptus obliqua</i>	1				2.59	19
56	<i>Eucalyptus obliqua</i>	1				4.47	18
57	<i>Eucalyptus obliqua</i>	1				2.35	21
58	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		7.63	17
59	<i>Eucalyptus obliqua</i>	1				3.61	23
60	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 small 1 medium	7.00	22
61	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	1 small	4.29	29
62	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		1.19	
63	<i>Eucalyptus obliqua</i>	1				0.52	
64	<i>Eucalyptus obliqua</i>	1				1.36	
65	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		3.64	
66	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R	2 small	3.64	
67	<i>Eucalyptus obliqua</i>	1				3.48	
68	<i>Eucalyptus viminalis ssp. viminalis</i>	1		R		2.42	
69	<i>Eucalyptus obliqua</i>	1				1.33	
70	<i>Eucalyptus obliqua</i>	1		R		3.34	

**Conservation status:** Aus: Australia (EPBC Act). SA: South Australia (NPW Act).

**Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level.

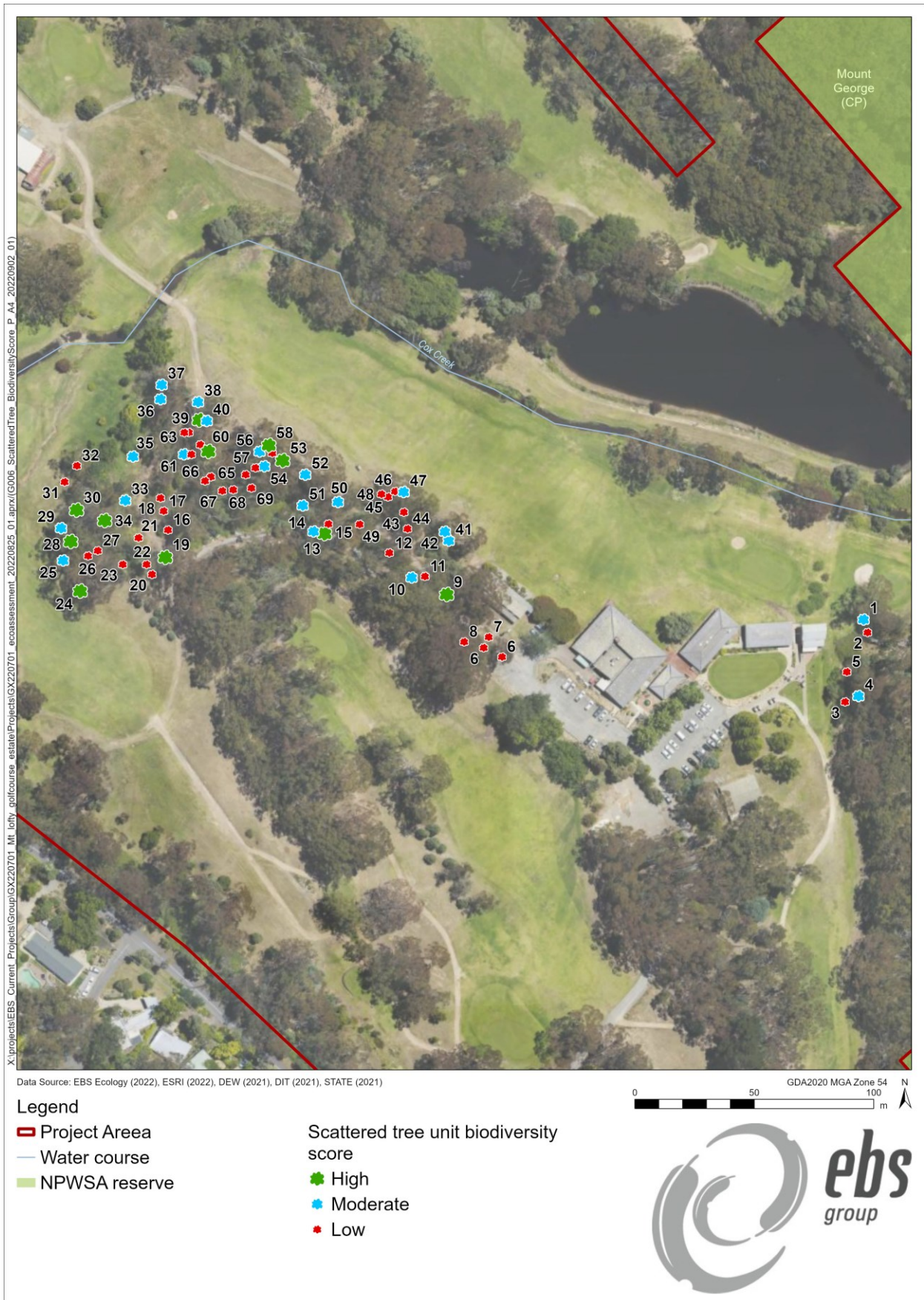


Figure 5. Scattered trees recorded within the Project Area, categorised according to Unit Biodiversity Score (UBS)

### 6.1.3 Threatened flora

No flora species listed under the EPBC Act were recorded within the Project Area.

One flora species listed under the NPW Act as Rare was recorded in the Project Area:

- *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum).

This species was present in large numbers throughout the Project area in remnant patches of native vegetation and as scattered trees.

### 6.1.4 Non-native amenity planting

Fairways and greens directly associated with the golf course were broadly classified as exotic vegetation that is planted and therefore amenity vegetation. These patches were only broadly assessed, are not provided in detail, and are not mapped. Planting of amenity vegetation was also recorded surrounding the main clubhouse (see Figure 4). If these areas are impacted, approval may still be required under the *PDI Act*.

### 6.1.5 Introduced flora

A total of 31 introduced flora species were recorded during the field survey. Seven of these species are Declared under the LSA Act and five are WoNS (Table 10). Introduced flora species which were dominant in the Project Area include *Fumaria capreolata* (White-flower Fumitory), *Iris* sp. (Iris) and *Rubus fruticosus aggregate* (Blackberry).

**Table 10. Introduced flora species recorded during the field survey.**

Scientific Name	Common Name	Declared	WoNS
<i>Acacia mearnsii</i>	Black Wattle		
<i>Agapanthus praecox</i> ssp. <i>orientalis</i>			
<i>Anagallis</i> sp.			
<i>Asphodelus fistulosus</i>	Onion Weed		
<i>Briza maxima</i>	Large Quaking-grass		
<i>Cenchrus clandestinus</i>	Kikuyu		
<i>Cytisus scoparius</i>	English Broom	Yes	Yes
<i>Dactylis glomerata</i>	Cocksfoot		
<i>Freesia cultivar</i>	Freesia		
<i>Fumaria capreolata</i>	White-flower Fumitory		
<i>Galium aparine</i>	Cleavers		
<i>Genista monspessulana</i>	Montpellier Broom	Yes	Yes
<i>Hakea</i> sp.	Hakea/Needlewood		
<i>Hedera helix</i>	English Ivy		
<i>Hypochaeris glabra</i>	Smooth Cat's Ear		
<i>Iris</i> sp.	Iris		
<i>Narcissus</i> sp.			
<i>Oxalis pes-caprae</i>	Soursob		
<i>Oxalis purpurea</i>	One-o'clock		
<i>Pinus radiata</i>	Radiata Pine		
<i>Pittosporum undulatum</i>	Sweet Pittosporum	Yes	

Scientific Name	Common Name	Declared	WoNS
<i>Plantago lanceolata</i> var.	Ribwort		
<i>Quercus ilex</i>			
<i>Rhamnus alaternus</i>	Blowfly Bush	Yes	
<i>Romulea</i> sp.	Onion-grass		
<i>Rubus fruticosus</i> aggregate	Blackberry	Yes	Yes
<i>Senecio pterophorus</i>	African Daisy		
<i>Sonchus</i> sp.	Sow-thistle		
<i>Sporobolus africanus</i>	Rat-tail Grass		
<i>Ulex europaeus</i>	Gorse	Yes	Yes
<i>Vinca major</i>	Blue Periwinkle		
<i>Acacia mearnsii</i>	Black Wattle		
<i>Agapanthus praecox</i> ssp. <i>orientalis</i>			
<i>Anagallis</i> sp.			
<i>Asphodelus fistulosus</i>	Onion Weed		
<i>Briza maxima</i>	Large Quaking-grass		
<i>Cenchrus clandestinus</i>	Kikuyu		
<i>Cytisus scoparius</i>	English Broom	Yes	Yes
<i>Dactylis glomerata</i>	Cocksfoot		
<i>Freesia</i> cultivar	Freesia		

## 6.2 Fauna

A more detailed fauna assessment is reported elsewhere in the *Native Vegetation Clearance Mount Lofty Golf Estate Data Report* EBS Ecology (2022b *in preparation*), but the below sections broadly describe the fauna and fauna habitat present on site.

### 6.2.1 Threatened fauna

A total of 22 fauna species were recorded within the Project Area, 20 were birds and two were mammals.

No fauna species listed under the EPBC Act were recorded within the Project Area.

One fauna species listed under the NPW Act as Rare was recorded in the Project Area:

- Common Brushtail Possum (*Trichosurus vulpecula*).

The scat of this species was observed in VA A1 directly adjacent to the main building of the Golf Club.

One of the species recorded within the Project Area is introduced fauna:

- Common Blackbird (*Turdus merula*)

Fauna species observed during the survey are provided in [Appendix 3](#).

### 6.2.2 Fauna habitat

Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation within the Project Area.

Two VAs were recorded within the Project Area and intact native vegetation is present in some areas of the Project Area and in the adjacent MGCP. Many of these pockets of remnant native vegetation were degraded by the presence of introduced flora species and fragmented from more intact remnant native vegetation. Nonetheless, they may be used by fauna as wildlife corridors to more intact and better quality native vegetation, particularly to the surrounding areas in MGCP.

A total of 71 scattered trees were recorded within the Project Area. All the scattered trees within the Project Area provide good resting, foraging and roosting habitat for fauna and all trees score a maximum threatened fauna suitability score of 1.8 (trees are assigned a value between 0 and 1.8 points based on habitat score according to the STAM). A total of 25 scattered trees contain hollows (see Table 9), which provide suitable breeding habitat for fauna species.

### **6.2.3 *Phytophthora***

No areas of *Phytophthora* dieback were observed during the Field survey. Nonetheless, given there are *Phytophthora* records within 600 m of the Project Area, the potential spread of *Phytophthora* needs to be addressed throughout the Project.

## **6.3 Likelihood of occurrence assessment**

### **6.3.1 *Threatened flora***

The PMST (DCCEEW 2022b) identified 11 flora species listed as threatened under the EPBC Act as known or likely to occur within 5 km of the Project Area (Table 11). None of the species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat. A BDBSA search identified 73 additional State listed flora species, that have records within 5 km of the Project Area, with <1 km reliability (Table 11), which did not appear on the PMST (DEW 2022b). A total of seven of the species were assessed as known / highly likely or likely to occur within the Project Area based on survey effort, recent records and suitable habitat:

- *Acacia gunnii* (Ploughshare Wattle) – State Rare;
- *Deyeuxia densa* (Heath Bent-grass) – State Rare;
- *Deyeuxia minor* (Small Bent-grass) – State Vulnerable;
- *Dianella longifolia* var. *grandis* (Pale Flax-lily) – State Rare;
- *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) – State Rare and observed within the Project Area;
- *Gastrodia sesamoides* (Potato Orchid) – State Rare;
- *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare.

An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat.

BDBSA flora record located within 5 km of the Project Area is provided in [Appendix 4](#).

A detailed likelihood assessment of threatened flora species information including distribution and preferred habitat information for the Project Area is provided in [Appendix 5](#).

**Table 11. Threatened flora identified by the PMST and/or BDBSA search in the Project Area (DCCEEW 2022b; DEW 2022b).**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Acacia gunnii</i>	Ploughshare Wattle		R	2	2022	<b>Likely</b>
<i>Acacia iteaphylla</i>	Flinders Ranges Wattle		R	2	2022	<b>Possible</b>
<i>Acacia stricta</i>	Hop Wattle		R	2	2005	<b>Unlikely</b>
<i>Amphibromus archeri</i>	Pointed Swamp Wallaby-grass		R	2	2018	<b>Possible</b>
<i>Austrostipa tenuifolia</i>			R	2	2018	<b>Possible</b>
<i>Baloskion tetraphyllum</i> ssp. <i>Tetraphyllum</i>	Tassel Cord-rush		V	2	2012	<b>Unlikely</b>
<i>Bauera rubioides</i>	Wiry Bauera		R	2	2011	<b>Unlikely</b>
<i>Blechnum nudum</i>	Fishbone Water-fern		R	2	2022	<b>Unlikely</b>
<i>Blechnum wattsii</i>	Hard Water-fern		R	2	2010	<b>Unlikely</b>
<i>Boronia nana</i> var. <i>hyssopifolia</i>	Dwarf Boronia		R	2	2022	<b>Possible</b>
<i>Boronia parviflora</i>	Swamp Boronia		R	2	2018	<b>Unlikely</b>
<i>Caladenia argocalla</i>	White-beauty Spider-orchid	EN	E	1	Likely	<b>Unlikely</b>
<i>Caladenia behrii</i>	Pink-lipped Spider-orchid	EN	E	1	Likely	<b>Unlikely</b>
<i>Caladenia gladiolata</i>	Bayonet Spider-orchid	EN	E	1	Likely	<b>Unlikely</b>
<i>Caladenia leptochila</i> ssp. <i>Leptochila</i>	Narrow-lip Spider-orchid		R	2	2020	<b>Possible</b>
<i>Caladenia necrophylla</i>	Late Spider-orchid		R	2	2008	<b>Unlikely</b>
<i>Caladenia pusilla</i>	Pigmy Caladenia		R	2	2013	<b>Possible</b>
<i>Caladenia rigida</i>	Stiff White Spider-orchid	EN	E	1	Likely	<b>Unlikely</b>
<i>Caleana major</i>	Large Duck-orchid		V	2	2000	<b>Unlikely</b>
<i>Callistemon brachyandrus</i>	Prickly Bottlebrush		R	2	2019	<b>Unlikely</b>
<i>Cardamine paucijuga</i>	Annual Bitter-cress		R	2	2011	<b>Possible</b>
<i>Coronidium gunnianum</i>	Pale Everlasting		E	2	2006	<b>Possible</b>
<i>Deyeuxia densa</i>	Heath Bent-grass		R	2	2021	<b>Likely</b>
<i>Deyeuxia minor</i>	Small Bent-grass		V	2	2020	<b>Likely</b>

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Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily		R	2	2019	Likely
<i>Dicksonia antarctica</i>	Soft Tree-fern		E	2	2020	Unlikely
<i>Dipodium pardalinum</i>	Leopard Hyacinth-orchid		V	2	2012	Possible
<i>Diuris behrii</i>	Behr's Cowslip Orchid		V	2	2015	Possible
<i>Diuris chryseopsis</i>	Cowslip Orchid		E	2	1998	Unlikely
<i>Drosera binata</i>	Forked Sundew		R	2	2017	Possible
<i>Drosera stricticaulis</i>	Erect Sundew		V	2	1998	Unlikely
<i>Eryngium ovinum</i>	Blue Devil		V	2	2013	Possible
<i>Eryngium vesiculosum</i>	Prostrate Blue Devil		R	2	2010	Possible
<i>Eucalyptus dalrympleana</i> ssp. <i>Dalrympleana</i>	Candlebark Gum		R	2	2022	Possible
<i>Eucalyptus fasciculosa</i>	Pink Gum		R	2	2021	Possible
<i>Eucalyptus viminalis</i> ssp. <i>Viminalis</i>	Manna Gum		R	2	2022	Known/Highly Likely
<i>Euphrasia collina</i> subsp. <i>Osbornii</i>	Osborn's Eyebright	EN	E	1	Known	Unlikely
<i>Gastrodia sesamoides</i>	Potato Orchid		R	2	2021	Likely
<i>Gleichenia microphylla</i>	Coral Fern		R	2	2022	Unlikely
<i>Glycine latrobeana</i>	Clover Glycine	VU	V	1	Likely	Unlikely
<i>Gonocarpus micranthus</i> ssp. <i>Micranthus</i>	Creeping Raspwort		R	2	2018	Possible
<i>Goodenia brunnea</i>			R	2	2018	Unlikely
<i>Grevillea aquifolium</i>	Prickly Grevillea		R	2	1997	Unlikely
<i>Hypolepis rugosula</i>	Ruddy Ground-fern		R	2	2022	Unlikely
<i>Juncus amabilis</i>			V	2	2009	Unlikely
<i>Lagenophora sublyrata</i>	Slender Bottle-daisy		V	2	2019	Possible
<i>Leionema hillebrandii</i>	Mount Lofty Phebalium		R	2	2022	Possible
<i>Logania saxatilis</i>	Rock Logania		R	2	1996	Unlikely
<i>Luzula flaccida</i>	Pale Wood-rush		V	2	2020	Possible
<i>Lycopodiella lateralis</i>	Slender Clubmoss		R	2	2017	Unlikely



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Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Lycopodium deuterodensum</i>	Bushy Clubmoss		E	2	2009	Unlikely
<i>Machaerina gunnii</i>	Slender Twig-rush		R	2	2018	Unlikely
<i>Melaleuca armillaris</i> ssp. <i>Akineta</i>	Needle-leaf Honey-myrtle		R	2	2008	Unlikely
<i>Mentha diemenica</i>	Slender Mint		R	2	2011	Possible
<i>Nymphoides crenata</i>	Wavy Marshwort		R	2	1995	Unlikely
<i>Poa umbricola</i>	Shade Tussock-grass		R	2	2018	Unlikely
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	VU	R	1	Likely	Unlikely
<i>Prasophyllum pruinatum</i>	Plum Leek-orchid	EN	E	1	Known	Unlikely
<i>Pterostylis cucullata</i>	Leafy Greenhood	VU	E	1	Likely	Unlikely
<i>Pterostylis setifera</i>	Bristly Greenhood		E	2	2018	Unlikely
<i>Pultenaea graveolens</i>	Scented Bush-pea		R	2	2022	Possible
<i>Pultenaea kraehenbuehlii</i>	Tothill Bush-pea		R	2	2018	Unlikely
<i>Ranunculus glabrifolius</i>	Shining Buttercup		V	2	2000	Possible
<i>Rytidosperma laeve</i>	Smooth Wallaby-grass		R	2	2017	Possible
<i>Rytidosperma tenuius</i>	Short-awn Wallaby-grass		R	2	2022	Likely
<i>Schizaea fistulosa</i>	Narrow Comb-fern		V	2	2008	Unlikely
<i>Schoenus latelaminatus</i>	Medusa Bog-rush		V	2	2012	Unlikely
<i>Schoenus lepidosperma</i> ssp. <i>lepidosperma</i>	Slender Bog-rush		R	2	2018	Unlikely
<i>Scutellaria humilis</i>	Dwarf Skullcap		R	2	2021	Unlikely
<i>Senecio pinnatifolius</i> var. <i>pinnatifolius</i>			R	2	2015	Possible
<i>Sphaerolobium minus</i>	Leafless Globe-pea		R	2	2008	Unlikely
<i>Sprengelia incarnata</i>	Pink Swamp-heath		R	2	2017	Unlikely
<i>Thelymitra aristata</i>	Great Sun-orchid		E	2	2008	Possible
<i>Thelymitra batesii</i>			R	2	2021	Possible
<i>Thelymitra circumsepta</i>	Naked Sun-orchid		E	2	2018	Unlikely
<i>Thelymitra grandiflora</i>	Great Sun-orchid		R	2	2019	Possible
<i>Thelymitra ixiooides</i>	Spotted Sun-orchid		E	2	2013	Possible

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Thelymitra latifolia</i>	Blue Star Sun-orchid		V	2	2004	Possible
<i>Thelymitra matthewsii</i>	Spiral Sun-orchid	VU	E	1	Likely	Unlikely
<i>Thysanotus tenellus</i>	Grassy Fringe-lily		R	2	2015	Unlikely
<i>Todea barbara</i>	King Fern		E	2	2018	Unlikely
<i>Veronica derwentiana subsp. Homalodonta</i>	Mount Lofty Speedwell	CE	E	1	Likely	Unlikely
<i>Xanthosia tasmanica</i>	Southern Xanthosia		R	2	2015	Possible
<i>Xyris operculata</i>	Tall Yellow-eye		R	2	2008	Unlikely

**Conservation status:** Aus: Australia (EPBC Act). SA: South Australia (NPW Act).

**Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. Ssp.: the conservation status applies at the sub-species level.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

Source of Information:

1: PMST (DCCEEW 2022b) – 5 km buffer applied to Project Area;

2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area.

### 6.3.2 Threatened fauna

The PMST (DCCEEW 2022b) identified 10 nationally listed threatened fauna species as known or likely to occur within 5 km of the Project Area, consisting of eight birds and two mammals. A BDBSA search identified two additional nationally listed threatened fauna species that have records within 5 km of the Project Area (Table 12), which did not appear on the PMST (DEW 2022b). In total, four threatened fauna species were assessed as likely to occur within the Project Area based on survey effort, suitable habitat and recent records:

- Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare;
- Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and
- Southern Brown Bandicoot (*Isodon obesulus obesulus*) – nationally Endangered and State Vulnerable.

One additional nationally listed threatened species was assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- White-throated Needletail (*Hirundapus caudacutus*) – nationally Vulnerable and migratory and State Vulnerable.

A BDBSA search identified 30 additional State listed fauna species that have records within 5 km of the Project Area (Table 12), which did not appear on the PMST (DEW 2022b). A total of 11 of these species were assessed as likely to occur within the Project Area based on survey effort, recent records and suitable habitat:

- Beautiful Firetail (*Stagonopleura bella*) – State Rare;
- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area;
- Elegant Parrot (*Neophema elegans elegans*) – State Rare;
- Jacky Winter (*Microeca fascinans fascinans*) – State Rare;
- Little Eagle (*Hieraaetus morphnoides*) – State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Scarlet Robin (*Petroica boodang boodang*) – State Rare;
- Square-tailed Kite (*Lophoictinia isura*) – State Endangered;
- White-winged Chough (*Corcorax melanorhamphos*) – State Rare;
- Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable.

An additional 16 species were assessed as possible to occur within the Project Area based on recent records and suitable habitat.

BDBSA fauna record located within 5 km of the Project Area is provided in [Appendix 6](#).

Birdlife Australia fauna record located within 5 km of the Project Area is provided in [Appendix 7](#).

A detailed likelihood assessment of threatened fauna species information including distribution and preferred habitat information for the Project Area is provided in [Appendix 8](#).

**Table 12. Threatened fauna species identified by the PMST and/or BDBSA search in the Project Area (DCCEE 2022b; DEW 2022b).**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<b>AMPHIBIA</b>						
<i>Pseudophryne bibronii</i>	Brown Toadlet		R	2	2009	Possible
<b>AVES</b>						
<i>Anhinga novaehollandiae novaehollandiae</i>	Australasian Darter		R	2, 3	2018 / 2018	Possible
<i>Biziura lobata menziesi</i>	Musk Duck		R	2, 3	2015 / 2002	Possible
<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN	E	1	Known	Unlikely

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Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Cereopsis novaehollandiae novaehollandiae</i>	Cape Barren Goose		R	3	2009	Possible
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN	E	3	2002	Unlikely
<i>Climacteris affinis</i>	White-browed Treecreeper		R	2	2021	Possible
<i>Corcorax melanorhamphos</i>	White-winged Chough		R	2, 3	2020 / 2020	Likely
<i>Falco hypoleucos</i>	Grey Falcon	VU	R	1	Likely	Unlikely
<i>Falco peregrinus macropus</i>	Peregrine Falcon		R	2, 3	2015 / 2020	Likely
<i>Falcunculus frontatus frontatus</i>	Eastern Shriketit		R	2, 3	2006 / 2006	Possible
<i>Grantiella picta</i>	Painted Honeyeater	VU	R	1	Likely	Unlikely
<i>Hieraaetus morphnoides</i>	Little Eagle		V	2	2019	Likely
<i>Hirundapus caudacutus</i>	White-throated Needletail	VU, Mi (T)	V	1	Likely	Possible
<i>Hylacola cauta cauta</i>	Shy Heathwren		R	3	1998	Possible
<i>Hylacola pyrrhopygia parkeri</i>	Chestnut-rumped Heathwren	EN	E	1, 2, 3	Known / 2020 / 2020	Likely
<i>Leipoa ocellata</i>	Malleefowl	VU	V	1	Likely	Unlikely
<i>Lewinia pectoralis pectoralis</i>	Lewin's Rail		V	2	2010	Possible
<i>Lophoictinia isura</i>	Square-tailed Kite		E	2	2019	Likely
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater		V	2, 3	2002 / 2000	Possible
<i>Microeca fascinans fascinans</i>	Jacky Winter		R	2, 3	2018 / 2001	Likely
<i>Neophema elegans elegans</i>	Elegant Parrot		R	2	2021	Likely
<i>Oxyura australis</i>	Blue-billed Duck		R	3	2018	Possible
<i>Pachycephala inornata</i>	Gilbert's Whistler		R	3	2007	Possible
<i>Petroica boodang boodang</i>	Scarlet Robin		R	2, 3	2022 / 2020	Likely
<i>Petroica phoenicea</i>	Flame Robin		V	3	2003	Possible
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater		R	2	2020	Possible
<i>Polytelis anthopeplus monarchoides</i>	Regent Parrot	VU	V	2	1996	Unlikely
<i>Rostratula australis</i>	Australian Painted Snipe	EN	E	1	Likely	Unlikely
<i>Stagonopleura bella</i>	Beautiful Firetail		R	3	2020	Likely
<i>Turnix varius varius</i>	Painted Buttonquail		R	2	2012	Possible
<i>Zanda funerea whiteae</i>	Yellow-tailed Black Cockatoo		V	2, 3	2022 / 2020	Likely
<i>Zapornia tabuensis</i>	Spotless Crake		R	2	2010	Possible

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Zoothera lunulata halmaturina</i>	Bassian Thrush	EN	R	1, 2, 3	Known / 2022 / 2018	Likely
<b>MAMMALIA</b>						
<i>Antechinus agilis</i>	Agile Antechinus		E	2	2021	Possible
<i>Antechinus flavipes</i>	Yellow-footed Antechinus		V	2	2021	Likely
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot	EN	V	1, 2	Known / 2021	Likely
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	R	1, 2	Likely / 2020	Likely
<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R	2	2022	Highly Likely / Known
<b>REPTILIA</b>						
<i>Egernia cunninghami</i>	Cunningham's Skink		E	2	2022	Unlikely
<i>Varanus rosenbergi</i>	Heath Goanna		V	2	2014	Unlikely
<i>Varanus varius</i>	Lace Monitor		R	2	2013	Unlikely

**Conservation status:** Aus: Australia (EPBC Act). SA: South Australia (NPW Act).

**Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

- 1: PMST (DCCEEW 2022b) – 5 km buffer applied to Project Area;
- 2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;
- 3: Birdlife Australia (DEW 2022b) – 5 km buffer applied to Project Area.

### 6.3.3 Migratory fauna

The PMST (DCCEEW 2022b) identified five nationally listed migratory species as known or likely to occur within 5 km of the Project Area (Table 13). In total, two nationally listed migratory species were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- Fork-tailed Swift (*Apus pacificus*) – nationally migratory;
- Satin Flycatcher (*Myiagra cyanoleuca*) – nationally migratory and State Endangered.

BDBSA fauna records indicate that the Satin Flycatcher (*Myiagra cyanoleuca*) has been previously recorded within 5 km of the Project Area. BDBSA fauna record located within 5 km of the Project Area is provided in [Appendix 6](#).

A detailed likelihood assessment of nationally listed migratory species information including distribution and preferred habitat information for the Project Area is provided in [Appendix 9](#).

**Table 13. Migratory species identified by the PMST and/or BDBSA search in the Project Area (DCCEEW 2022b; DEW 2022b).**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Apus pacificus</i>	Fork-tailed Swift	Mi (Ma)		1	Likely	Possible
<i>Gallinago hardwickii</i>	Latham's Snipe	Mi (W)	R	1	Likely	Unlikely
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Mi (T)	E	1, 2	Likely / 2005	Possible
<i>Rhipidura rufifrons</i>	Rufous Fantail	Mi (T)		1	Known	Unlikely
<i>Tringa nebularia</i>	Common Greenshank	Mi (T)		1	Likely	Unlikely

**Conservation status:** Aus: Australia (EPBC Act). SA: South Australia (NPW Act).

**Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

1: PMST (DCCEEW 2022b) – 5 km buffer applied to Project Area;

2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;

## 7 DISCUSSION

### 7.1 Vegetation

Vegetation assessed within the Project Area consisted of the following:

- Pockets of remnant native vegetation categorised into one of two VAs:
  - Vegetation Association A1 – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* woodland over *Acacia melanoxylon*.
  - Vegetation Association A1b – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* woodland over *Acacia melanoxylon* and degraded understorey.
- Scattered trees of species *Acacia melanoxylon* (Blackwood), *Eucalyptus obliqua* (Messmate Stringybark) or *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum).
- Exotic vegetation associated with the golf course including any fairways, greens and planted vegetation directly surrounding most buildings but as defined in Figure 4.

### 7.2 Threatened flora

No flora species listed as threatened under the EPBC Act were recorded during the field survey.

One flora species listed under the NPW Act as Rare was recorded in the Project Area:

- *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum)

This species was present in large numbers throughout the Project area in remnant patches of native vegetation and as scattered trees.

The PMST identified 11 flora species listed as threatened under the EPBC Act as known or likely to occur within 5 km of the Project Area (Table 5). None of the species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat.

A BDBSA search identified 73 additional State listed flora species, that have records within 5 km of the Project Area, with <1 km reliability (Table 5), which did not appear on the PMST. A total of seven of the species were assessed as known / highly likely or likely to occur within the Project Area based on recent records and suitable habitat.

### 7.3 Nationally threatened fauna

None of the fauna species recorded within the Project Area were listed as threatened under the EPBC Act

One fauna species listed under the NPW Act as Rare was recorded in the Project Area:

- Common Brushtail Possum (*Trichosurus vulpecula*).

Nationally threatened fauna species that were assessed as likely to occur within the Project Area are discussed below.

### **7.3.1 Bassian Thrush (*Zoothera lunulata halmaturina*)**

The Bassian Thrush is nationally listed as Endangered, and State listed as Rare. Based upon the desktop assessment this species was considered likely to be present in the Project Area.

Bassian Thrush occur on Kangaroo Island and the adjacent mainland, in the southern Flinders Ranges and in the Mount Lofty Ranges (DAWE 2022). They mostly inhabit damp eucalypt forest or woodland usually with a thick canopy and understorey of trees, shrubs, and leaf litter (Garnett and Baker 2021; Higgins et al. 2006).

The species is described as shy and secretive which makes it difficult to detect and inconspicuous in leaf litter. Within South Australia (except for Kangaroo Island) the main threats to Bassian Thrush include habitat clearing, inappropriate fire regimes and habitat modification due to reduced natural water flow (DAWE 2022).

Damp eucalypt forest or woodland with a thick canopy and understorey of trees, shrubs and leaf litter was present in some areas of the Project Area. However, given these areas were often degraded by the presence of introduced flora species and fragmented from more intact remnant native vegetation, they may only be used by the Bassian Thrush as corridors to better quality vegetation. As such, the Project is likely to have a negligible impact on this species due to the large amount of suitable habitat located outside of the Project Area, in MGCP for instance.

### **7.3.2 Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*)**

The Chestnut-rumped Heathwren is nationally, and State listed as Endangered and based upon the desktop assessment was considered likely to be present in the Project Area.

Chestnut-rumped Heathwren are confined to the Fleurieu Peninsula and southern Mount Lofty Ranges where they are generally confined to several conservation and national parks in South Australia (Wilson and Bignall 2009). They mostly inhabit heath and dense undergrowth within Eucalypt forests and woodlands. The vegetation type does vary in which they occur, but a dense understorey is a key characteristic of their habitat (Pickett 2007).

Like Bassian Thrush, the Chestnut-rumped Heathwren are described as shy, secretive and tend to remain amongst cover (Wilson and Bignall 2009). Most of the suitable habitat for this species has been cleared within the Mounity Lofty Ranges and remaining habitat is fragmented and degraded in areas (Garnett and Baker 2021).

Heath and dense undergrowth within Eucalypt forests and woodlands was present in some areas of the Project Area. However, as previously mentioned, these areas were often degraded by the presence of introduced flora species and fragmented from more intact remnant native vegetation. Similar to the Bassian Thrush, the Chestnut-rumped Heathwren may only use these areas as corridors to better quality vegetation. As such, the Project is likely to have a negligible impact on this species due to the large amount of suitable habitat located outside of the Project Area, in MGCP for instance.



### **7.3.3 Grey-headed Flying-fox (*Pteropus poliocephalus*)**

The Grey-headed Flying-fox is nationally listed as Vulnerable, and State listed as Rare. Based upon the desktop assessment this species was considered likely to be present in the Project Area.

In South Australia, there are two Grey-headed Flying-fox colonies (as of 2019), which are located at Botanic Park in Adelaide (25,000 individuals in 2021) and Millicent in the State's southeast (DEW 2022c). Grey-headed Flying-fox forage over a wide area, with individuals capable of travelling 40 km between their roost and feeding sites in a night (Eby and Law 2008). They consume fleshy fruits and blossoms, and within the Botanic Park area have been observed feeding on the fruits of the Morton Bay Fig (*Ficus macrophylla*) and the blossoms of eucalypts (*Eucalyptus spp.*) (Van Weenen 2015). All scattered tree species that were recorded within the Project Area can be classified as potential food sources for the Grey-headed Flying-fox (Eby and Law 2008).

Whilst the Project Area contained significantly large remnant *Eucalyptus* species including *E. viminalis ssp. viminalis* and *E. obliqua*, there were no roosts recorded within the Project Area. The location of the Project is 15 km southeast of the Botanic Park roost (Eby and Law 2008) and foraging is less likely to occur with increasing distance away from the known roosts (McDonald-Madden *et al.* 2005). As such, the Project is likely to have a negligible impact on this species due to the large amount of suitable foraging habitat outside of the Project Area and the distance away from the nearest roost.

### **7.3.4 Southern Brown Bandicoot (*Isodon obesulus obesulus*)**

The Southern Brown Bandicoot is nationally listed as Endangered, and State listed as Vulnerable. Based upon the desktop assessment this species was considered likely to be present in the Project Area.

Southern Brown Bandicoot occur in the Mount Lofty Ranges, Fleurieu Peninsula, and on Kangaroo Island in South Australia. This species prefers dense ground cover, tall grass and low shrubbery. They live near swamps and rivers as well as in thick scrub in drier areas (TSSC 2016b). Additionally, this species is known to inhabit dense, thick weed species such as Blackberry (*Rubus sp.*) and Gorse (*Ulex europaeus*) (Bruce *et al.* 2022). Predation by invasive species such as foxes and cats as well as habitat loss and degradation remain the primary threats to this species persistence (TSSC 2016b).

Dense ground cover was present in some areas of the Project Area, but many areas were degraded by the presence of introduced flora species and fragmented from more intact remnant native vegetation. The Southern Brown Bandicoot has previously been recorded in areas of dense, thick weed species (Bruce *et al.* 2022) and areas that are generally degraded. Areas of thick weeds species such as *Rubus spp.* were present in some areas of the Project Area but did not form large dense thickets suitable for the Southern Brown Bandicoot. As the Project Area is adjacent MGCP and other areas of more intact vegetation, fragmented vegetation present in the Project Area is not likely to be preferred by this species and as such the Project is likely to have a negligible impact on their persistence in the general area.

## 7.4 State threatened fauna

A total of 11 State listed fauna species that have records within 5 km of the Project Area were assessed as highly likely / known or likely to occur within the Project Area as highlighted in [Section 6.3.1](#).

A number of these species are woodlands bird species, such as the State listed Rare Jacky Winter (*Microeca fascinans fascinans*) and State listed Rare Scarlet Robin (*Petroica boodang boodang*). Many of these species prefer to nest in dense, intact foliage (Birdlife Australia 2022) which exists in fragmented pockets throughout the Project Area. The Project is likely to have a negligible impact on these species due to the large amount of suitable habitat located outside of the Project Area in MGCP and adjacent reserves for example.

The Common Brushtail Possum is State listed as Rare and based upon the desktop assessment was considered highly likely / known to be present in the Project Area. The scat of this species was observed in vegetation association A1 directly adjacent to the main building of the Golf Club. This species is an arboreal animal with a diet consisting mainly of leaves, flowers, and fruit. This species prefers to nest in the hollows of Eucalypt or Sheoak trees. However, they also prefer dark, dense vegetation and confined spaces. This species is extremely territorial, and relocation of this species may cause severe stress and even death (Strahan & van Dyck 2008). It is likely that the Common Brushtail Possum uses vegetation within the Project Area, due to the presence of scat and large number of suitable habitat trees for nesting and foraging purposes. Furthermore, there were a total of 25 scattered trees that were recorded within the Project Area that contained hollows suitable for use by the Common Brushtail Possum.

There are four State listed fauna species that were assessed as likely to occur within the Project Area, primarily as flyover only:

- Little Eagle (*Hieraaetus morphnoides*) – State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Square-tailed Kite (*Lophoictinia isura*) – State Endangered;
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable.

These species are likely to fly over the Project Area and may utilise large remnant scattered trees for perching or roosting.

## 7.5 Potential impacts to flora and fauna

The Project Area is largely comprised of pockets of remnant native vegetation, scattered trees and planted (amenity) vegetation associated with the golf course. MGCP is directly adjacent to the Project Area and supports a large assemblage of both nationally and State listed flora and fauna (DEH 2006). Few patches of naturally occurring native or remnant vegetation remain in the landscape, and those that do are generally impacted at some level by weed invasion and lacking an intact understorey. Regardless, vegetation that remains in the Project Area is of high habitat value as it provides a corridor for movement to better quality vegetation. Additionally, the remaining remnant scattered trees contain a significant number of hollows, likely to be utilised by less conspicuous or nocturnal species and utilised for nesting, either by birds or other fauna.

## 7.6 Legislative compliance

### 7.6.1 *Assessment under the NV Act*

Clearing of native vegetation is believed to be covered by the following regulation:

#### **Regulation 12(27) —Major projects**

This pathway will need to be verified by the NVC.

## 8 RECOMMENDATIONS AND CONSIDERATIONS

The following broad recommendations and considerations should be taken into account for the proposed Project:

- Retain high value vegetation where possible, particularly those areas assessed as having high fauna habitat value (in particular trees/vegetation with a high biodiversity score and trees with hollows) and consider Project design that avoids this constraint.
- Utilise existing disturbed areas including areas defined as exotic vegetation for Project infrastructure where possible. See [Appendix 10](#) for a map and photographs of suggested areas and routes that EBS recommends in order to avoid impact to native vegetation.
- Ensure infrastructure is a sufficiently located away from large remnant trees (i.e., a minimum of 10 metres away but preferably outside of the Tree Protection Zone (TPZ) of trees).
- Ensure that the design and construction methods minimise impacts to all vegetation, as much as possible, including impacts to the TPZ of large remnant trees.
- Vegetation clearing required for the Project outside the parameters of maintenance activities would require approval under the *Native Vegetation Act 1991* (NV Act). This would require a Clearance Data Report and a Clearing Application lodged with the Native Vegetation Council. The completion of additional field work may also be required.
- If native flora species that provide suitable resting, foraging and breeding areas for some fauna species are impacted by works then a suitably qualified fauna spotter (or the likes) needs to assess the presence of fauna prior to any flora removal.
- Collate additional information to determine if a referral under the EPBC Act (i.e., undertake an EPBC Self-assessment of MNES, conduct targeted threatened species surveys), is required.
- Develop a Construction Environmental Management Plan (CEMP) for the construction phase of the project that includes detailed strategies for the management of native vegetation and fauna. This should include the management of Declared and Environmental weeds across the Project Area to prevent their spread into surrounding areas as well as Phytophthora risk.

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## 10 APPENDICES

### Appendix 1. Species listed as threatened under the NPW Act recorded previously in the Search Area

Scientific name	Common name	Conservation status		Year of last record	Data Source
		EPBC Act	NPW Act		
<b>Flora</b>					
<i>Acacia gunnii</i>	Ploughshare Wattle	-	R	2022	1
<i>Acacia iteaphylla</i>	Flinders Ranges Wattle	-	R	2022	1
<i>Acacia stricta</i>	Hop Wattle	-	R	2005	1
<i>Amphibromus archeri</i>	Pointed Swamp Wallaby-grass	-	R	2018	1
<i>Anogramma leptophylla</i>	Annual Fern	-	R	1990	1
<i>Austrostipa densiflora</i>	Fox-tail Spear-grass	-	R	1992	1
<i>Austrostipa multispiculis</i>	Many-flowered Spear-grass	-	R	1998	1
<i>Austrostipa tenuifolia</i>		-	R	2018	1
<i>Baloskion tetraphyllum</i> ssp. <i>tetraphyllum</i>	Tassel Cord-rush	-	V	2012	1
<i>Bauera rubioides</i>	Wiry Bauera	-	R	2011	1
<i>Blechnum nudum</i>	Fishbone Water-fern	-	R	2022	1
<i>Blechnum watsii</i>	Hard Water-fern	-	R	2010	1
<i>Boronia nana</i> var. <i>hyssopifolia</i>	Dwarf Boronia	-	R	2022	1
<i>Boronia parviflora</i>	Swamp Boronia	-	R	2018	1
<i>Caladenia leptochila</i> ssp.	Narrow-lip Spider-orchid	-	R	2020	1
<i>Caladenia necrophylla</i>	Late Spider-orchid	-	R	2008	1
<i>Caladenia pusilla</i>	Pigmy Caladenia	-	R	2013	1
<i>Caladenia reticulata</i>	Veined Spider-orchid	-	R	1950	1
<i>Caladenia vulgaris</i>	Plain Caladenia	-	R	1991	1
<i>Caleana major</i>	Large Duck-orchid	-	V	2000	1
<i>Callistemon brachyandrus</i>	Prickly Bottlebrush	-	R	2019	1
<i>Cardamine paucijuga</i>	Annual Bitter-cress	-	R	2011	1
<i>Carex gunniana</i>	Mountain Sedge	-	R	1987	1
<i>Cladium procerum</i>	Leafy Twig-rush	-	R	1904	1
<i>Coronidium gunnianum</i>	Pale Everlasting	-	E	2006	1
<i>Daviesia benthamii</i> ssp. <i>humilis</i>	Mallee Bitter-pea	-	R	1982	1
<i>Deyeuxia densa</i>	Heath Bent-grass	-	R	2021	1
<i>Deyeuxia minor</i>	Small Bent-grass	-	V	2020	1
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily	-	R	2019	1
<i>Dicksonia antarctica</i>	Soft Tree-fern	-	E	2020	1
<i>Dipodium pardalinum</i>	Leopard Hyacinth-orchid	-	V	2012	1
<i>Dipodium punctatum</i>		-	E	1972	1
<i>Diuris behrii</i>	Behr's Cowslip Orchid	-	V	2015	1
<i>Diuris brevifolia</i>	Short-leaf Donkey-orchid	-	E	1917	1
<i>Diuris chryseopsis</i>	Cowslip Orchid	-	E	1998	1
<i>Drosera binata</i>	Forked Sundew	-	R	2017	1
<i>Drosera stricticaulis</i>	Erect Sundew	-	V	1998	1

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Scientific name	Common name	Conservation status		Year of last record	Data Source
		EPBC Act	NPW Act		
<i>Eryngium ovinum</i>	Blue Devil	-	V	2013	1
<i>Eryngium vesiculosum</i>	Prostrate Blue Devil	-	R	2010	1
<i>Eucalyptus dalrympleana</i> ssp. <i>dalrympleana</i>	Candlebark Gum	-	R	2022	1
<i>Eucalyptus fasciculosa</i>	Pink Gum	-	R	2021	1
<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	Manna Gum	-	R	2022	1
<i>Gastrodia sesamoides</i>	Potato Orchid	-	R	2021	1
<i>Gleichenia microphylla</i>	Coral Fern	-	R	2022	1
<i>Gonocarpus micranthus</i> ssp. <i>micranthus</i>	Creeping Raspwort	-	R	2018	1
<i>Goodenia brunnea</i>		-	R	2018	1
<i>Grevillea aquifolium</i>	Prickly Grevillea	-	R	1997	1
<i>Haloragis myriocarpa</i>		-	R	1991	1
<i>Histiopteris incisa</i>	Bat's-wing Fern	-	E	1980	1
<i>Hypericum japonicum</i>	Matted St John's Wort	-	R	1990	1
<i>Hypolepis rugosula</i>	Ruddy Ground-fern	-	R	2022	1
<i>Juncus amabilis</i>		-	V	2009	1
<i>Juncus australis</i>	Austral Rush	-	R	1990	1
<i>Juncus prismatocarpus</i>	Branching Rush	-	E	1982	1
<i>Lagenophora sublyrata</i>	Slender Bottle-daisy	-	V	2019	1
<i>Leionema hillebrandii</i>	Mount Lofty Phebalium	-	R	2022	1
<i>Logania saxatilis</i>	Rock Logania	-	R	1996	1
<i>Luzula flaccida</i>	Pale Wood-rush	-	V	2020	1
<i>Luzula ovata</i>	Clustered Wood-rush	-	R	1996	1
<i>Lycopodiella lateralis</i>	Slender Clubmoss	-	R	2017	1
<i>Lycopodium deuterodensum</i>	Bushy Clubmoss	-	E	2009	1
<i>Machaerina gunnii</i>	Slender Twig-rush	-	R	2018	1
<i>Melaleuca armillaris</i> ssp. <i>akineta</i>	Needle-leaf Honey-myrtle	-	R	2008	1
<i>Mentha diemenica</i>	Slender Mint	-	R	2011	1
<i>Microtis atrata</i>	Yellow Onion-orchid	-	R	1917	1
<i>Montia fontana</i> ssp. <i>chondrosperma</i>	Waterblinks	-	V	1997	1
<i>Myriophyllum amphibium</i>	Broad Milfoil	-	R	1990	1
<i>Myriophyllum papillosum</i>	Robust Milfoil	-	R	1981	1
<i>Nymphoides crenata</i>	Wavy Marshwort	-	R	1995	1
<i>Oreomyrrhis eriopoda</i>	Australian Carraway	-	E	1990	1
<i>Philotheca angustifolia</i> ssp. <i>angustifolia</i>	Narrow-leaf Wax-flower	-	R	1917	1
<i>Poa umbricola</i>	Shade Tussock-grass	-	R	2018	1
<i>Potamogeton ochreatus</i>	Blunt Pondweed	-	R	1990	1
<i>Prasophyllum australe</i>	Austral Leek-orchid	-	R	1908	1
<i>Prasophyllum constrictum</i>	Tawny Leek-orchid	-	R	1980	1
<i>Pterostylis curta</i>	Blunt Greenhood	-	R	1942	1
<i>Pterostylis setifera</i>	Bristly Greenhood	-	E	2018	1
<i>Pultenaea graveolens</i>	Scented Bush-pea	-	R	2022	1
<i>Pultenaea kraehenbuehlii</i>	Tothill Bush-pea	-	R	2018	1

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Scientific name	Common name	Conservation status		Year of last record	Data Source
		EPBC Act	NPW Act		
<i>Ranunculus glabrifolius</i>	Shining Buttercup	-	V	2000	1
<i>Rytidosperma laeve</i>	Smooth Wallaby-grass	-	R	2017	1
<i>Rytidosperma tenuius</i>	Short-awn Wallaby-grass	-	R	2022	1
<i>Schizaea fistulosa</i>	Narrow Comb-fern	-	V	2008	1
<i>Schoenus latelaminatus</i>	Medusa Bog-rush	-	V	2012	1
<i>Schoenus lepidosperma</i> ssp. <i>lepidosperma</i>	Slender Bog-rush	-	R	2018	1
<i>Scutellaria humilis</i>	Dwarf Skullcap	-	R	2021	1
<i>Senecio pinnatifolius</i> var. <i>pinnatifolius</i>		-	R	2015	1
<i>Sphaerolobium minus</i>	Leafless Globe-pea	-	R	2008	1
<i>Sprengelia incarnata</i>	Pink Swamp-heath	-	R	2017	1
<i>Swainsona behriana</i>	Behr's Swainson-pea	-	V	1925	1
<i>Thelymitra aristata</i>	Great Sun-orchid	-	E	2008	1
<i>Thelymitra batesii</i>		-	R	2021	1
<i>Thelymitra circumsepta</i>	Naked Sun-orchid	-	E	2018	1
<i>Thelymitra grandiflora</i>	Great Sun-orchid	-	R	2019	1
<i>Thelymitra holmesii</i>	Blue Star Sun-orchid	-	V	1990	1
<i>Thelymitra inflata</i>	Plum Sun-orchid	-	V	2001	1
<i>Thelymitra ixioides</i>	Spotted Sun-orchid	-	E	2013	1
<i>Thelymitra latifolia</i>	Blue Star Sun-orchid	-	V	2004	1
<i>Thelymitra mucida</i>	Plum Sun-orchid	-	R	1998	1
<i>Thysanotus tenellus</i>	Grassy Fringe-lily	-	R	2015	1
<i>Todea barbara</i>	King Fern	-	E	2018	1
<i>Utricularia lateriflora</i>	Small Bladderwort	-	V	1970	1
<i>Veronica gracilis</i>	Slender Speedwell	-	V	1947	1
<i>Viminaria juncea</i>	Native Broom	-	R	1992	1
<i>Viola betonicifolia</i> ssp. <i>betonicifolia</i>	Showy Violet	-	E	1900	1
<i>Xanthosia tasmanica</i>	Southern Xanthosia	-	R	2015	1
<i>Xyris operculata</i>	Tall Yellow-eye	-	R	2008	1
<b>Fauna</b>					
<i>Anhinga novaehollandiae</i> <i>novaehollandiae</i>	Australasian Darter	-	R	2018	1, 2
<i>Antechinus agilis</i>	Agile Antechinus	-	E	2021	1
<i>Antechinus flavipes</i>	Yellow-footed Antechinus	-	V	2021	1
<i>Biziura lobata menziesi</i>	Musk Duck	-	R	2015	1, 2
<i>Cereopsis novaehollandiae</i> <i>novaehollandiae</i>	Cape Barren Goose	-	R	2009	2
<i>Climacteris affinis</i>	White-browed Treecreeper	-	R	2021	1
<i>Corcorax melanorhamphos</i>	White-winged Chough	-	R	2020	1, 2
<i>Egernia cunninghami</i>	Cunningham's Skink	-	E	2022	1
<i>Falco peregrinus macropus</i>	Peregrine Falcon	-	R	2020	1, 2
<i>Falcunculus frontatus frontatus</i>	Eastern Shriketit	-	R	2013	1, 2
<i>Gerygone olivacea olivacea</i>	White-throated Gerygone	-	R	2007	2
<i>Hieraaetus morphnoides</i>	Little Eagle	-	V	2019	1
<i>Hylacola cauta</i>	Shy Heathwren	-	R	1998	2

## Mount Lofty Golf Estate - Ecological Flora and Fauna Assessment

Scientific name	Common name	Conservation status		Year of last record	Data Source
		EPBC Act	NPW Act		
<i>Lewinia pectoralis pectoralis</i>	Lewin's Rail	-	V	2010	1
<i>Lophoictinia isura</i>	Square-tailed Kite	-	E	2019	1, 2
<i>Melithreptus gularis</i>	Black-chinned Honeyeater	-	V	2000	2
<i>Microeca fascinans fascinans</i>	Jacky Winter	-	R	2018	1
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	-	E	2005	1
<i>Myiagra inquieta</i>	Restless Flycatcher	-	R	1978	1
<i>Neophema elegans elegans</i>	Elegant Parrot	-	R	2021	1
<i>Oriolus sagittatus sagittatus</i>	Olive-backed Oriole	-	R	1985	1
<i>Ornithorhynchus anatinus</i>	Platypus	-	E	1990	1
<i>Oxyura australis</i>	Blue-billed Duck	-	R	2018	2
<i>Pachycephala inornata</i>	Gilbert's Whistler	-	R	2007	2
<i>Petroica boodang boodang</i>	Scarlet Robin	-	R	2022	1, 2
<i>Petroica phoenicea</i>	Flame Robin	-	V	2007	1, 2
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	-	E	1928	1
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater	-	R	2020	1
<i>Pseudophryne bibronii</i>	Brown Toadlet	-	R	2009	1
<i>Stagonopleura bella</i>	Beautiful Firetail	-	R	2020	2
<i>Stagonopleura guttata</i>	Diamond Firetail	-	V	2007	2
<i>Stictonetta naevosa</i>	Freckled Duck	-	V	2014	2
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	-	R	2022	1
<i>Turnix varius varius</i>	Painted Buttonquail	-	R	2012	1
<i>Varanus rosenbergi</i>	Heath Goanna	-	V	2014	1
<i>Varanus varius</i>	Lace Monitor	-	R	2013	1
<i>Zanda funerea whiteae</i>	Yellow-tailed Black Cockatoo	-	V	2022	1, 2
<i>Zapornia tabuensis</i>	Spotless Crane	-	R	2010	1

Conservation status (EPBC Act/NPW Act): CE = Critically Endangered. EN/E = Endangered. VU/V = Vulnerable. R = Rare. Mi = Migratory.

Presence Type: As identified in the PMST report.

Year of last record: Historical records within 5 km of the Project Area, obtained from the *BDBSA* and *Bird Life Australia – Bird Atlas Database*.

Data source: 1 = BDBSA, 2 = Bird Life Australia – Bird Atlas Database.

## Appendix 2. Flora species recorded within the Project Area

Scientific Name	Common Name	EPBC Act	NPW Act
<i>Acacia mearnsii</i> *	Black Wattle		
<i>Acacia melanoxylon</i>	Blackwood		
<i>Acaena echinata</i>	Sheep's Burr		
<i>Acrotriche serrulata</i>	Cushion Ground-berry		
<i>Agapanthus praecox ssp. orientalis</i> *			
<i>Anagallis sp.</i> *			
<i>Asphodelus fistulosus</i> *	Onion Weed		
<i>Astroloma humifusum</i>	Cranberry Heath		
<i>Banksia marginata</i>	Silver Banksia		
<i>Briza maxima</i> *	Large Quaking-grass		
<i>Bursaria spinosa ssp. spinosa</i>	Sweet Bursaria		
<i>Cassytha sp.</i>	Dodder-laurel		
<i>Cenchrus clandestinus</i> *	Kikuyu		
<i>Cytisus scoparius</i> *	English Broom		
<i>Dactylis glomerata</i> *	Cocksfoot		
<i>Dianella revoluta var. revoluta</i>	Black-anther Flax-lily		
<i>Dichondra repens</i>	Kidney Weed		
<i>Drosera whittakeri</i>	Scented Sundew		
<i>Epacris impressa</i>	Common Heath		
<i>Eucalyptus obliqua</i>	Messmate Stringybark		
<i>Eucalyptus viminalis ssp. viminalis</i>	Manna Gum		R
<i>Exocarpos cupressiformis</i>	Native Cherry		
<i>Freesia cultivar</i> *	Freesia		
<i>Fumaria capreolata</i> *	White-flower Fumitory		
<i>Galium aparine</i> *	Cleavers		
<i>Genista monspessulana</i> *	Montpellier Broom		
<i>Geranium sp.</i>	Geranium		
<i>Gonocarpus sp.</i>	Raspwort		
<i>Hakea sp.</i> *	Hakea/Needlewood		
<i>Hedera helix</i> *	English Ivy		
<i>Hypochaeris glabra</i> *	Smooth Cat's Ear		
<i>Iris sp.</i> *	Iris		
<i>Kennedia prostrata</i>	Scarlet Runner		
<i>Lepidosperma semiteres</i>	Wire Rapier-sedge		
<i>Leptospermum continentale</i>	Prickly Tea-tree		
<i>Lomandra juncea</i>	Desert Mat-rush		
<i>Lomandra micrantha ssp. micrantha</i>	Small-flower Mat-rush		
<i>Lomandra multiflora ssp.</i>	Many-flower Mat-rush		
<i>Luzula meridionalis</i>	Common Wood-rush		
<i>Narcissus sp.</i> *			
<i>Oxalis perennans</i>	Native Sorrel		
<i>Oxalis pes-caprae</i> *	Soursob		
<i>Oxalis purpurea</i> *	One-o'clock		

Scientific Name	Common Name	EPBC Act	NPW Act
<i>Pinus radiata</i> *	Radiata Pine		
<i>Pittosporum undulatum</i> *	Sweet Pittosporum		
<i>Plantago lanceolata var.</i> *	Ribwort		
<i>Platylobium obtusangulum</i>	Holly Flat-pea		
<i>Pteridium esculentum ssp. esculentum</i>	Bracken Fern		
<i>Pterostylis nutans</i>	Nodding Greenhood		
<i>Pultenaea daphnoides</i>	Large-leaf Bush Pea		
<i>Quercus ilex</i> *			
<i>Rhamnus alaternus</i> *	Blowfly Bush		
<i>Romulea sp.</i> *	Onion-grass		
<i>Rubus fruticosus aggregate</i> *	Blackberry		
<i>Senecio pterophorus</i> *	African Daisy		
<i>Sonchus sp.</i> *	Sow-thistle		
<i>Sporobolus africanus</i> *	Rat-tail Grass		
<i>Themeda triandra</i>	Kangaroo Grass		
<i>Ulex europaeus</i> *	Gorse		
<i>Vinca major</i> *	Blue Periwinkle		

**Conservation status:**

Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (T): listed as a Migratory Terrestrial species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act. \* indicates an introduced species.



**Appendix 3. Fauna species recorded within the Project Area**

Scientific Name	Common Name	EPBC Act	NPW Act	Number of individuals
<b>AVES</b>				
<i>Acanthiza lineata</i>	Striated Thornbill			3
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill			2
<i>Anthochaera carunculata</i>	Red Wattlebird			1
<i>Cacatua sanguinea sanguinea</i>	Little Corella			1+
<i>Caligavis chrysops</i>	Yellow-faced Honeyeater			2
<i>Chenonetta jubata</i>	Maned Duck			1+
<i>Colluricincla harmonica</i>	Grey Shrikethrush			1
<i>Cormobates leucophaea</i>	White-throated Treecreeper			2
<i>Corvus mellori</i>	Little Raven			1
<i>Dacelo novaeguineae</i>	Laughing Kookaburra			3
<i>Dicaeum hirundinaceum</i>	Mistletoebird			1
<i>Egretta novaehollandiae</i>	White-faced Heron			1 (flying over)
<i>Gymnorhina tibicen</i>	Australian Magpie			1+
<i>Malurus cyaneus</i>	Superb Fairywren			1+
<i>Phaps chalcoptera</i>	Common Bronzewing			1
<i>Platycercus elegans</i>	Crimson Rosella			2
<i>Rhipidura albiscapa</i>	Grey Fantail			1
<i>Smicrornis brevirostris</i>	Weebill			1+
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet			2
<i>Turdus merula*</i>	Common Blackbird			1+
<b>MAMMLIA</b>				
<i>MACROPODIDAE</i>	Kangaroos			1
<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R	scat observed only

**Conservation status:**

Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (T): listed as a Migratory Terrestrial species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act. \* indicates an introduced species.

Appendix 4. BDBSA flora record within 5 km of the Project Area

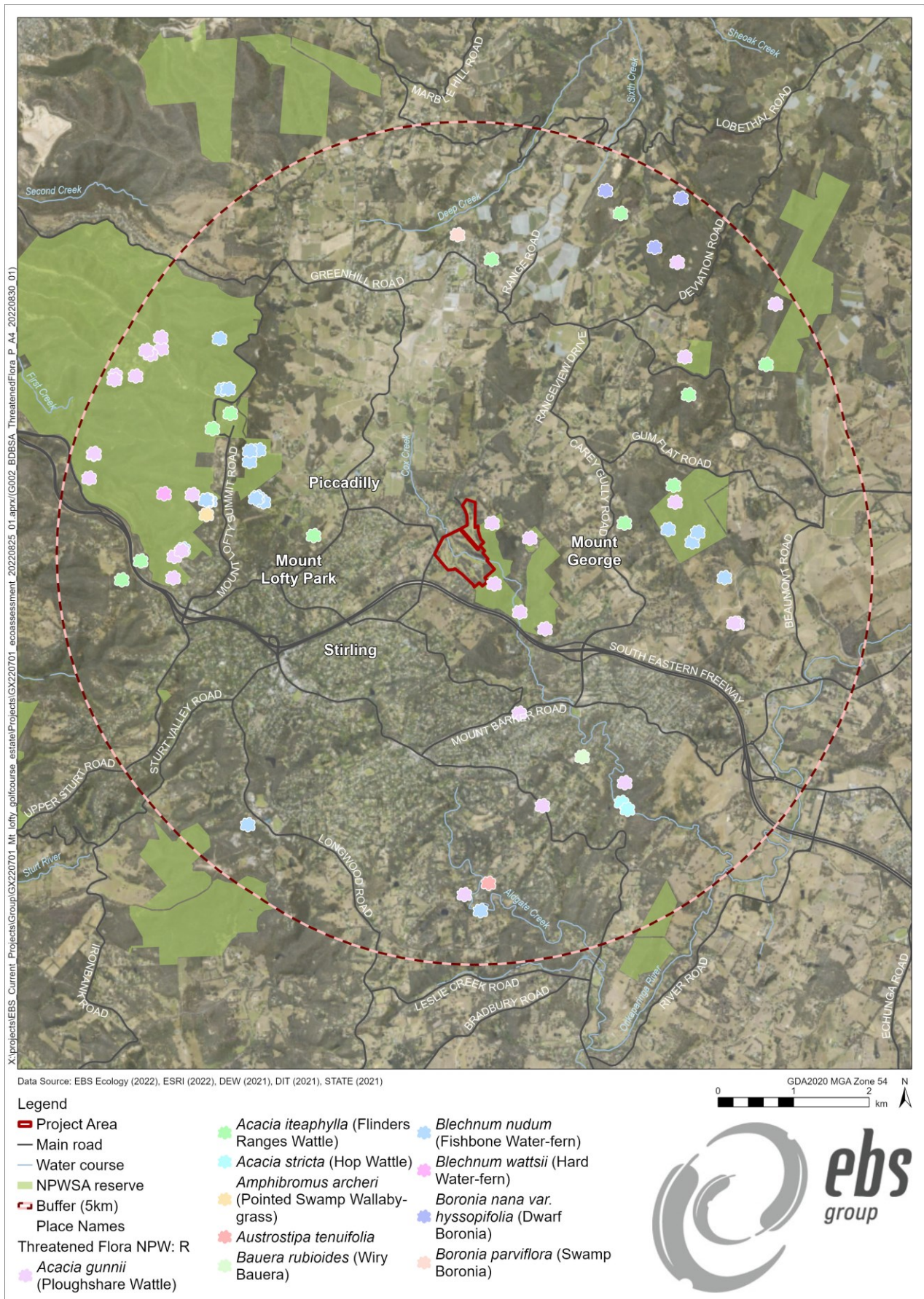


Figure 6. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 1 of 5).

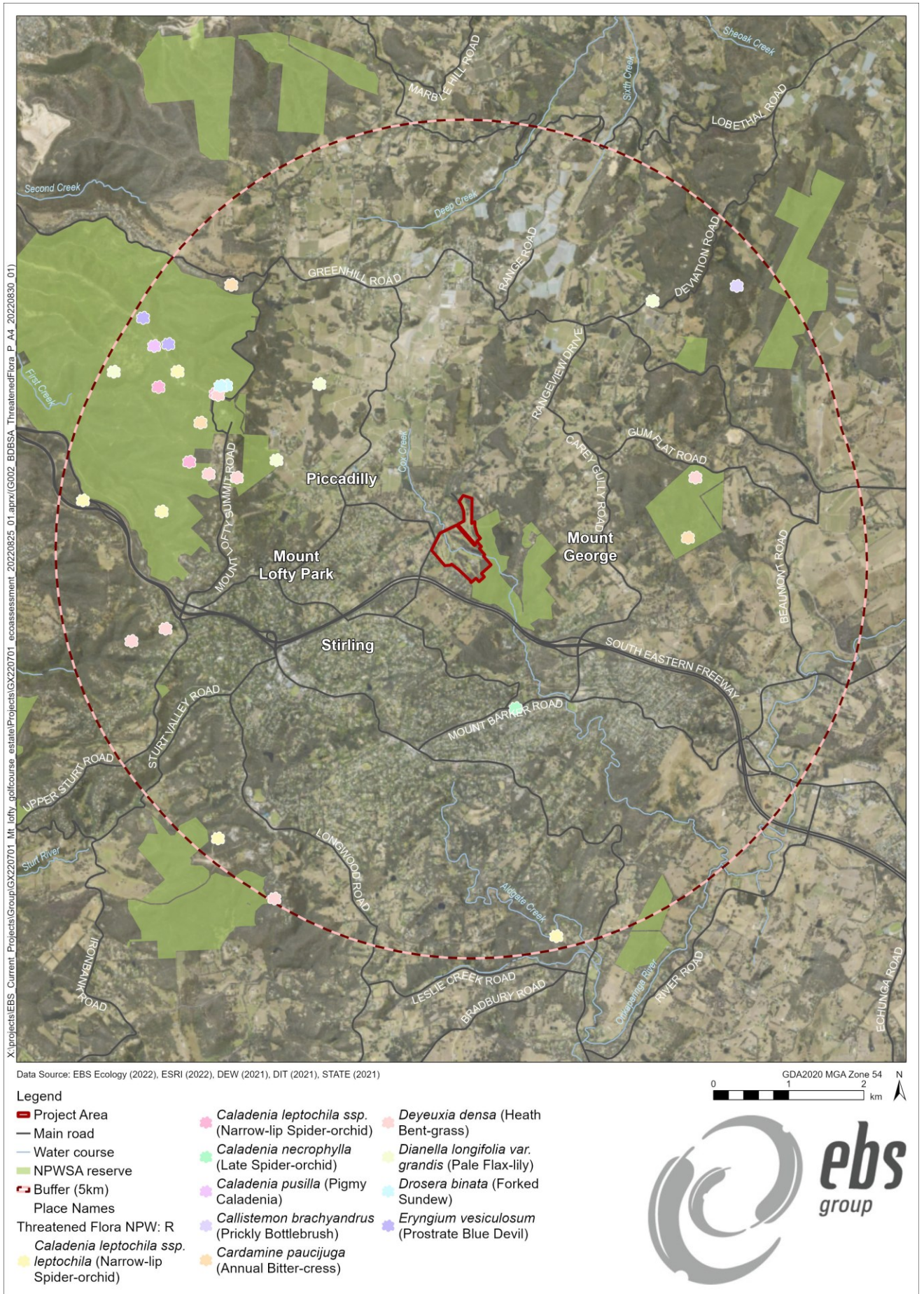


Figure 7. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 2 of 5).

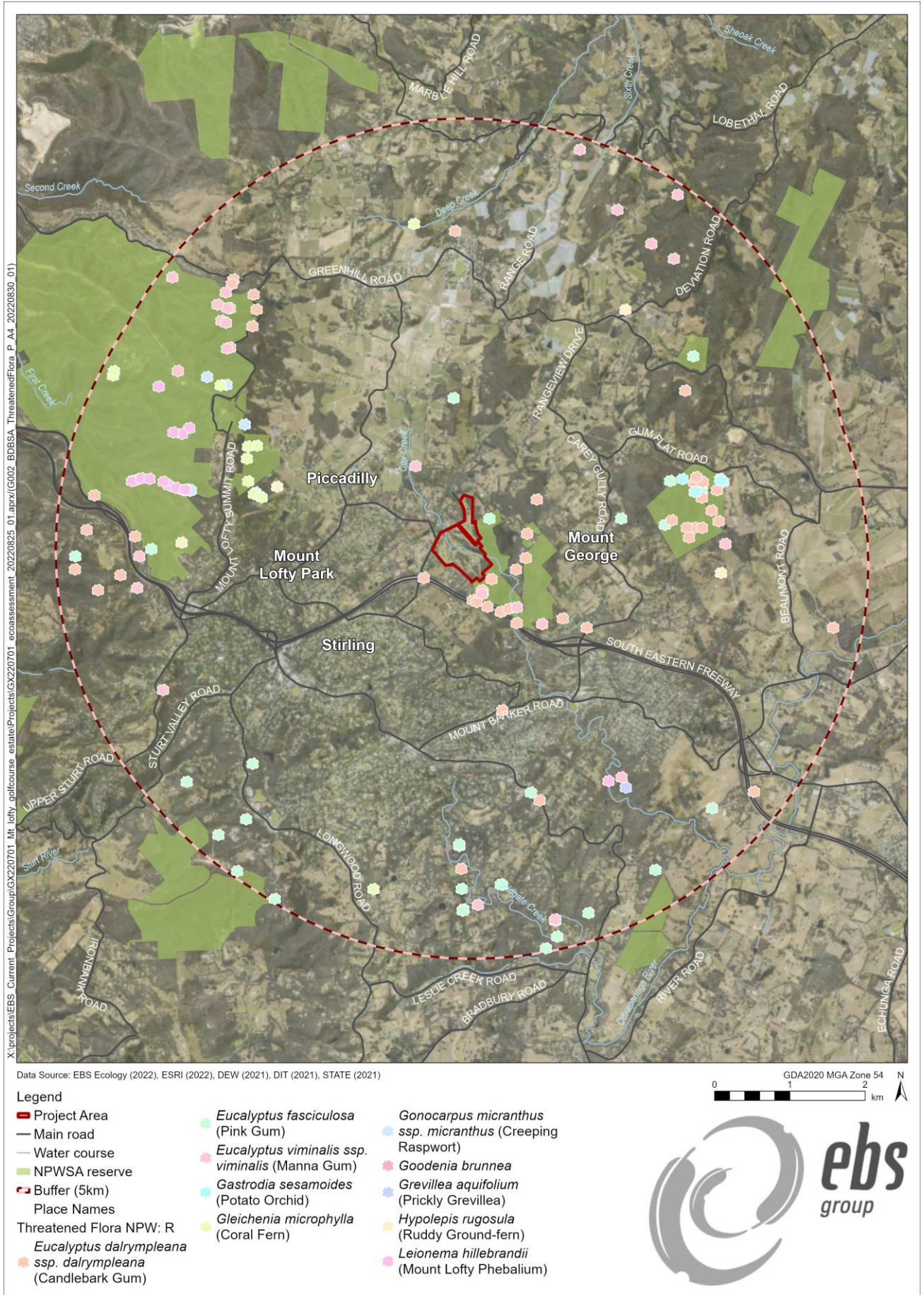


Figure 8. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 3 of 5).

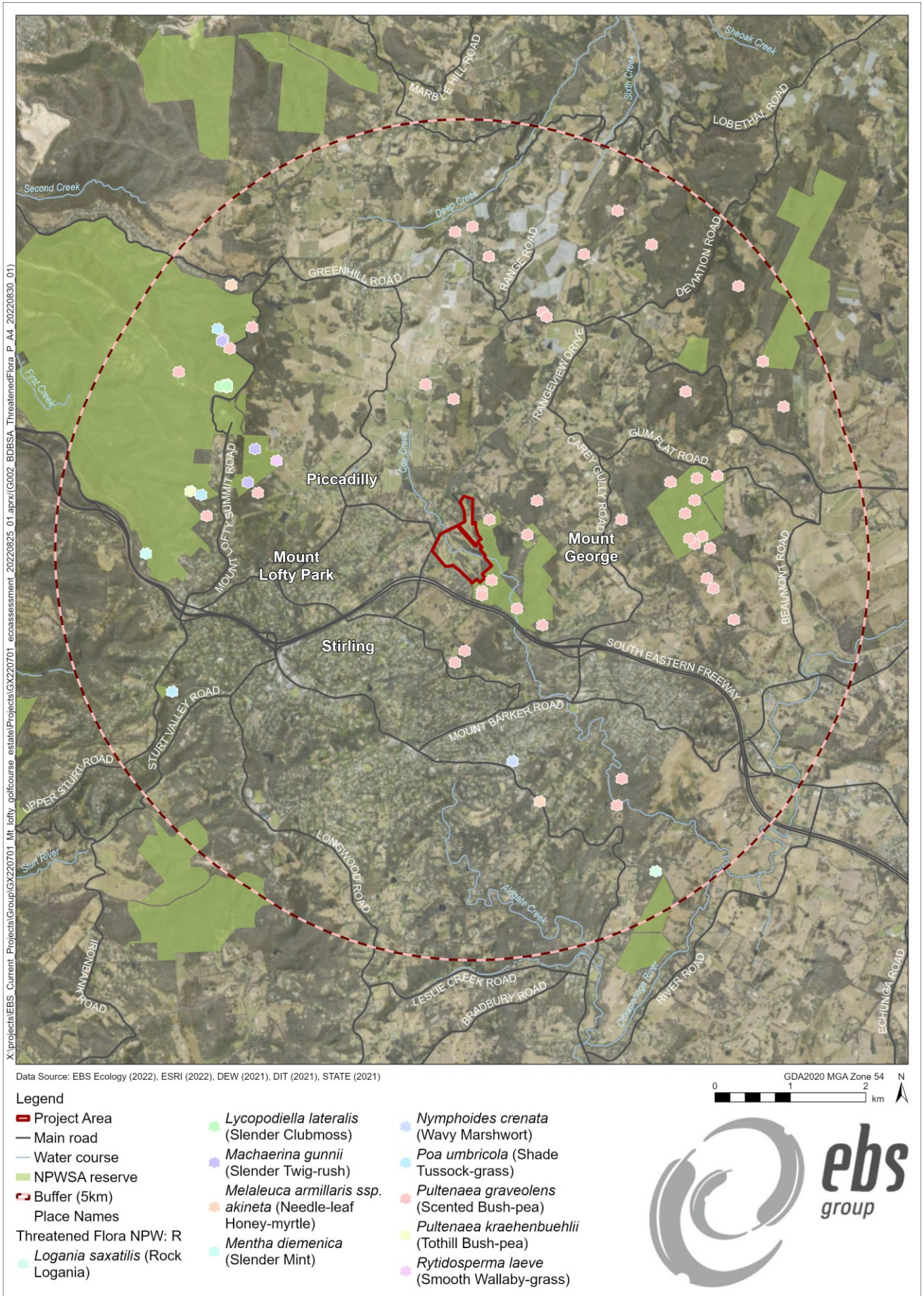


Figure 9. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 4 of 5).

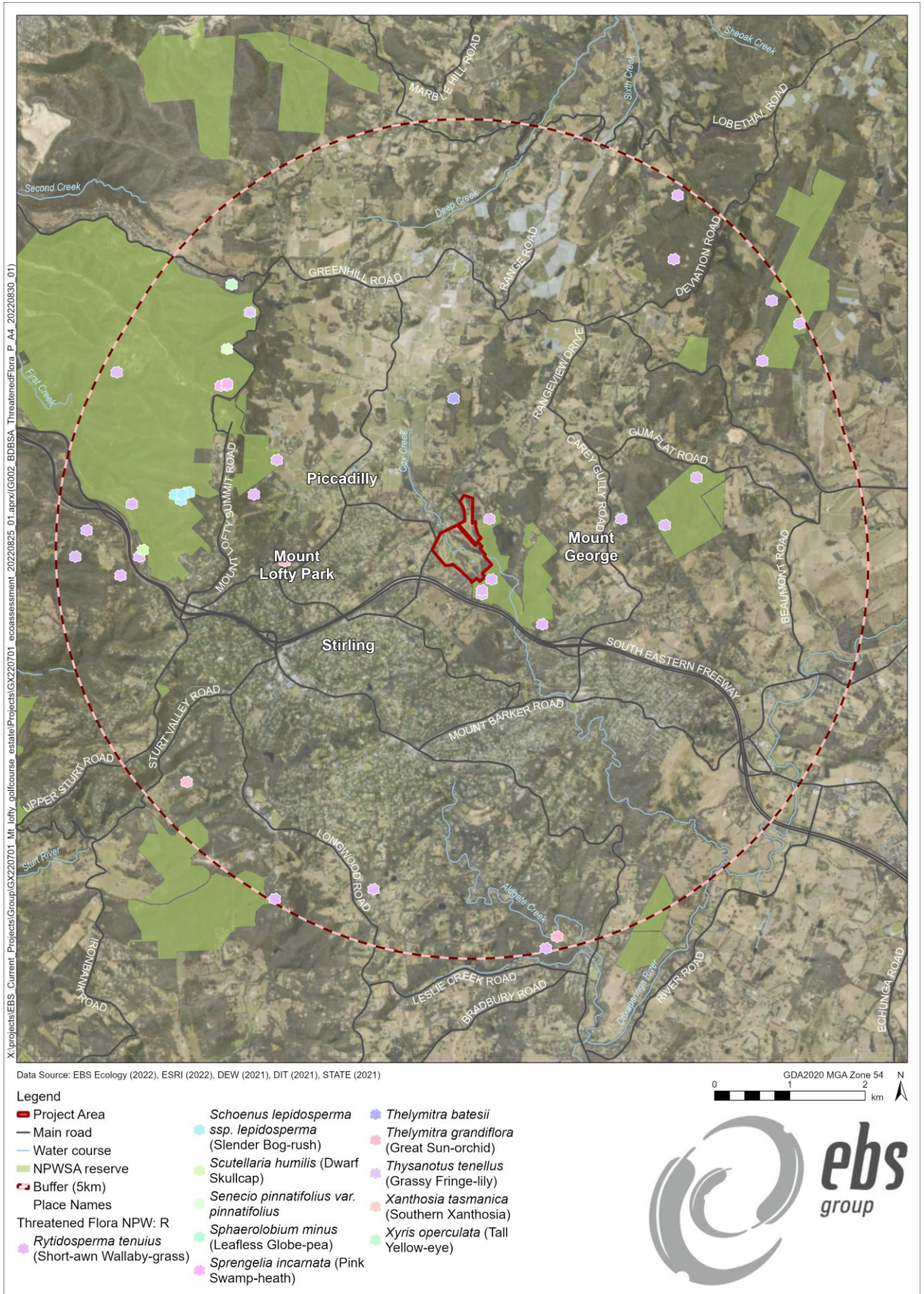


Figure 10. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 5 of 5).

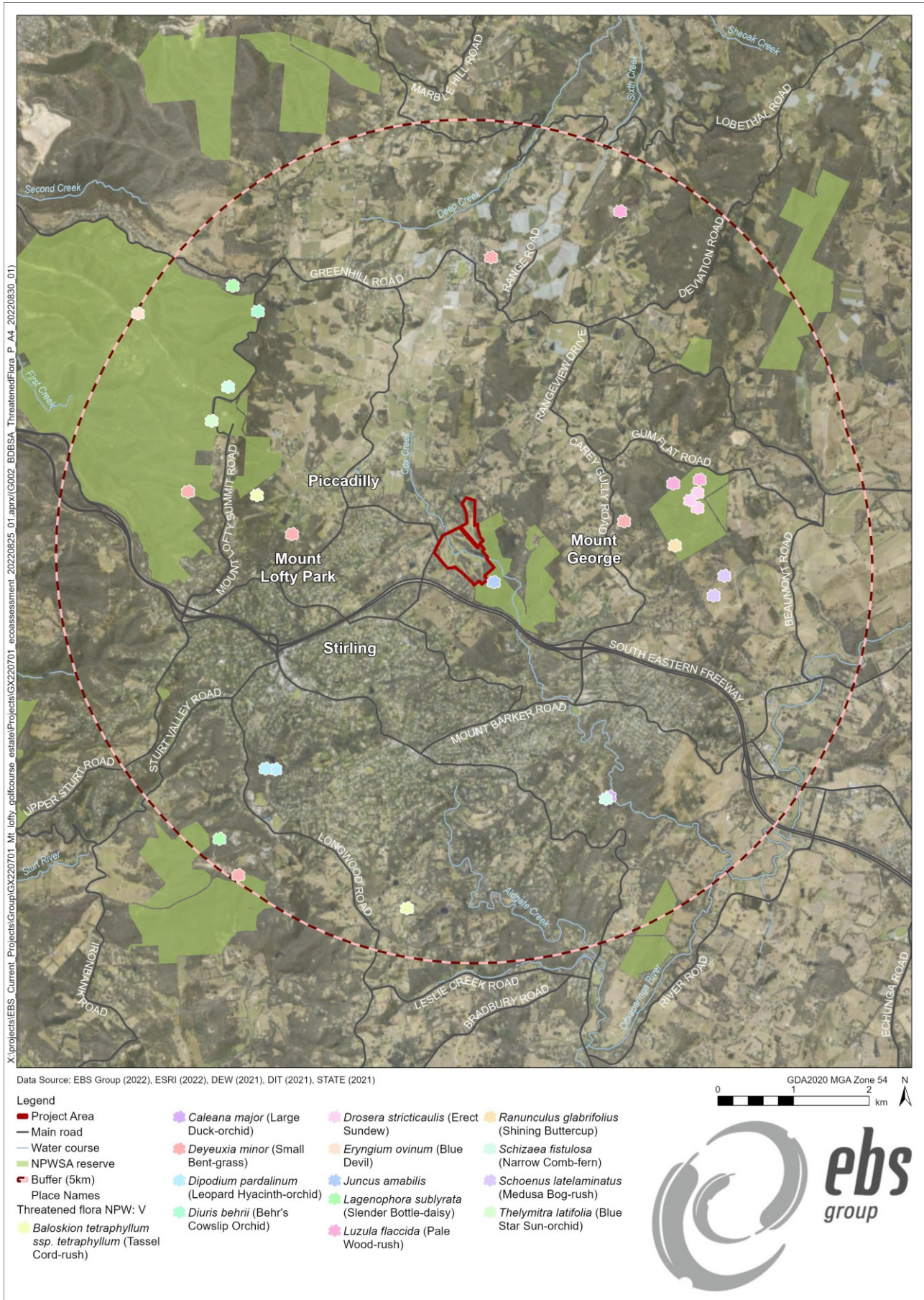


Figure 11. BDBSA flora record for State listed Vulnerable species, located within 5 km of the Project Area.

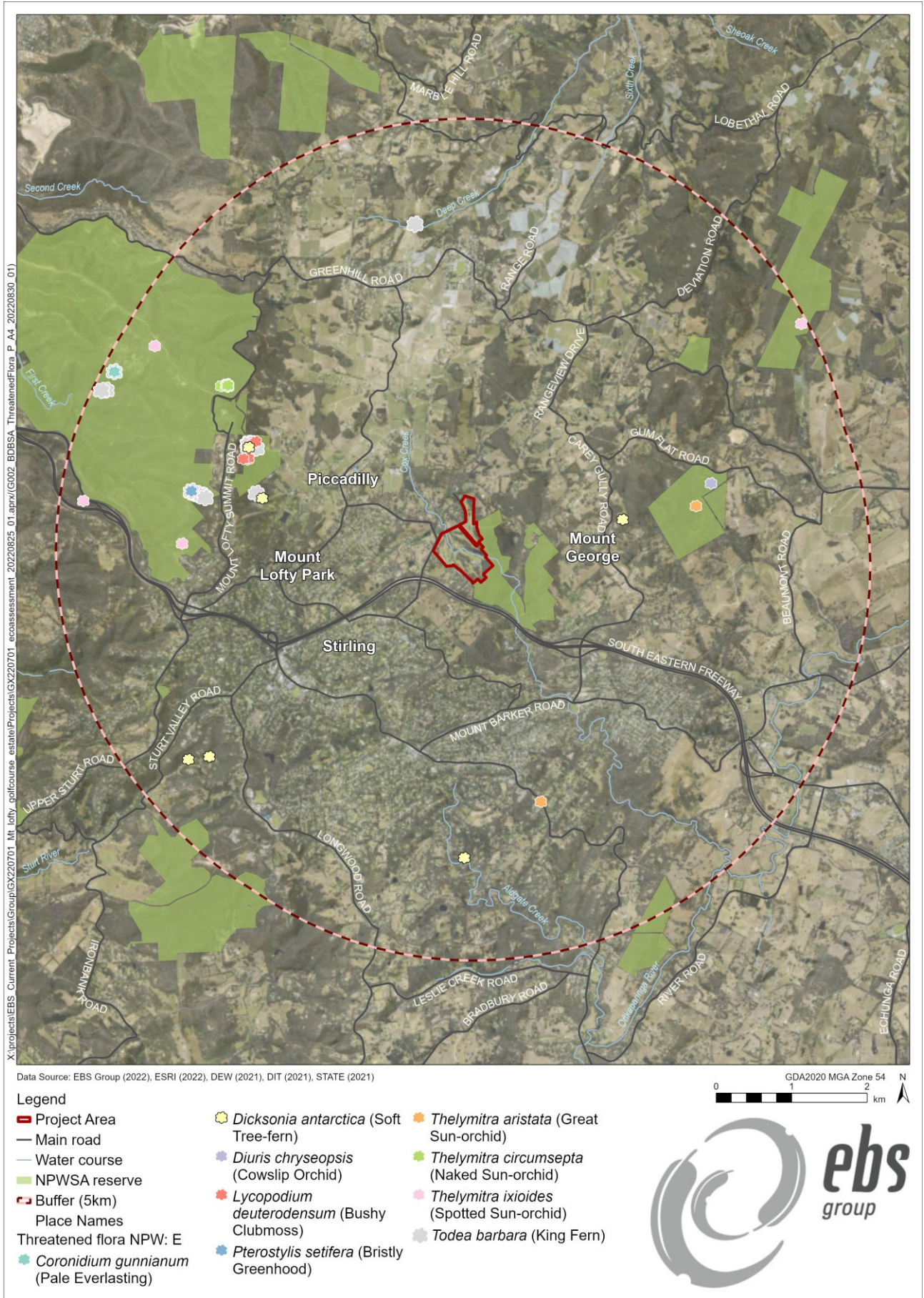


Figure 12. BDBSA flora record for State listed Endangered species, located within 5 km of the Project Area.



**Appendix 5. Assessment of likelihood of national (EPBC Act) and State (NPW Act) listed threatened flora identified by the PMST (DCCEEW 2022b) and BDBSA (DEW 2022b) to occur in the Project Area**

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Acacia gunnii</i>	Ploughshare Wattle		R	2	2022	Usually on rocky hillsides and amongst rocky outcrops in open forest, associated with <i>Eucalyptus obliqua</i> and <i>Eucalyptus baxteri</i> (SSCC 2018).	<b>Likely</b> – Some suitable habitat within the Project Area and <i>E obliqua</i> observed during the field survey.
<i>Acacia iteaphylla</i>	Flinders Ranges Wattle		R	2	2022	Naturally occurs in the Flinders Ranges, across to the Gawler Ranges, and on the Eyre Peninsula. Naturalised beyond its native range in some parts of south-eastern and southern SA (SSCC 2018).	<b>Possible</b> – Some suitable habitat within the Project Area. Although widely planted, regeneration of this species is likely.
<i>Acacia stricta</i>	Hop Wattle		R	2	2005	Found primarily in small, localised areas in the southeast of SA between Millicent and Mount Gambier in association with <i>Eucalyptus baxteri</i> over a heathy understorey, often in damp areas (SSCC 2018).	<b>Unlikely</b> – Despite recent records, this species is generally confined to the southeast of SA.
<i>Amphibromus archeri</i>	Pointed Swamp Wallaby-grass		R	2	2018	Grows in damp areas such as lagoons, waterholes, and swamps, often on predominantly sandy soils. Found in KI, in the Mount Lofty Ranges and in the southeast of SA (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat including water sources are present in the Project Area, though not within proposed areas of impact.
<i>Austrostipa tenuifolia</i>			R	2	2018	Found on the Eyre Peninsula, Mount Lofty Ranges, the Murray, and the upper South-east in South Australia, growing sandy soils in grassland or grassy woodland associated with <i>Callitris</i> or <i>Allocasuarina</i> (SSCC 2018).	<b>Possible</b> – Recent records, though associated vegetation community is not present in Project Area.
<i>Baloskion tetraphyllum</i> ssp. <i>tetraphyllum</i>	Tassel Cord-rush		V	2	2012	Very limited occurrences in the lower South-east of South Australia, between Millicent and Mount Gambier, usually in swamping areas (SSCC 2018).	<b>Unlikely</b> – Despite recent records, this species is generally confined to the southeast of SA.
<i>Bauera rubioides</i>	Wiry Bauera		R	2	2011	Found on Kangaroo Island and in the southern Mount Lofty Ranges in South Australia, growing in damp heathland and heathy forests (SSCC 2018).	<b>Unlikely</b> – Despite recent records, this species is generally confined to Kangaroo Island.

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		Aus	SA				
<i>Blechnum nudum</i>	Fishbone Water-fern		R	2	2022	Found on Kangaroo Island and southern Mount Lofty Ranges in South Australia, growing along stream banks in shaded gullies (SSCC 2018).	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Blechnum watsii</i>	Hard Water-fern		R	2	2010	SA: SL KI SE. The habitat of this species is usually identical to those of <i>Blechnum minus</i> and <i>Blechnum nudum</i> . These three species always co-occur and are often intermingled within the same clump. Grows in wet forest types such as rainforest, wet eucalypt forest and riparian vegetation where it can form the dominant groundcover. Grows in great profusion in permanently damp areas and is most abundant on stream banks and near waterfalls. It can sometimes form extensive colonies on flatter sites or in gully bottoms.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Boronia nana</i> var. <i>hyssopifolia</i>	Dwarf Boronia		R	2	2022	Occurs in the SE region of SA. Growing in sandy heath with <i>Eucalyptus obliqua</i> , <i>Leptospermum continentale</i> , <i>Stylidium graminifolium</i> , <i>Thelionema caespitosum</i> and dune crests with <i>Eucalyptus baxteri</i> association.	<b>Possible</b> – Some suitable habitat within the Project Area including <i>Eucalyptus spp.</i>
<i>Boronia parviflora</i>	Swamp Boronia		R	2	2018	Found on the western end of Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia growing in wet heath and swampy areas (SSCC 2018).	<b>Unlikely</b> – Minimal suitable swampy habitat in Project Area. Isolated nearby record not positively identified.
<i>Caladenia argocalla</i>	White-beauty Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Endemic to the Mount Lofty Ranges Region of SA. Occurs in intact grassy woodlands often with <i>E. leucoxyton</i> (South Australian Blue Gum) and <i>Allocasuarina verticillata</i> (Drooping Sheoak). Usually grows on a gentle slope with a southerly aspect and in clay loam soils. Flowering from late September to October (Quarmby 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Caladenia behrii</i>	Pink-lipped Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Occurs on the Fleurieu Peninsula of SA. Grows in fertile, shallow loams, amongst <i>Eucalyptus goniocalyx</i> / <i>E. fasciculosa</i> woodland and amongst <i>E. obliqua</i> / <i>E. microcarpa</i> / <i>E. leucoxyton</i> woodland. The understorey is usually open and shrubby. Also recorded amongst <i>E. fasciculosa</i> & <i>Xanthorrhoea semiplana</i> . Generally found in quartzite-derived soils on steep south facing slopes but also on ridge tops and occasionally near creek beds. Often grows alongside bushwalking paths, vehicle tracks or roads due to the openness of these locations (TSSC 2021).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.

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		Aus	SA				
<i>Caladenia gladiolata</i>	Bayonet Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Occurs singly or in small groups in shrubby or grassy woodland and forest in well-drained soils dominated by <i>Eucalyptus leucoxylon</i> , <i>Eucalyptus cladocalyx</i> or <i>Eucalyptus fasciculosa</i> . Only known from a few populations (Quarmby 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Caladenia leptochila</i> ssp. <i>leptochila</i>	Narrow-lip Spider-orchid		R	2	2020	Found growing in clay or gravelly soils in shrubby forest in the Mount Lofty Ranges (Jones, 2006).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Caladenia necrophylla</i>	Late Spider-orchid		R	2	2008	Mainly occurs in the south-east region of SA but has also been found in EP, KI, MU regions. Grows in heathy open forest, coastal shrub, heathland, tea-tree scrub.	<b>Unlikely</b> – Despite recent records, this species is generally confined to the southeast of SA.
<i>Caladenia pusilla</i>	Pigmy Caladenia		R	2	2013	SA: FR EP SL KI SE. Within the Eyre Peninsula region grows in Koppio Hills and Blue gum woodland. On KI, grows on mounds near river, sandy clay in heath. Within the Southern Lofty region, grows in stringybark scrub.	<b>Possible</b> – Some suitable habitat within the Project Area including stringybark scrub.
<i>Caladenia rigida</i>	Stiff White Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Inhabits ridge tops and hillslopes in grey-brown loam often associated with coarse quartzite gravel or sandstone pebbles. Vegetation is usually an open-forest with a relatively open understorey of low shrubs and sedges (Quarmby 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Caleana major</i>	Large Duck-orchid		V	2	2000	Usually found in Eucalyptus woodland, coastal or swampy shrubland and heathland. Forms small colonies in white sands in open <i>Eucalyptus baxteri</i> forest and often associated with <i>Banksia ornata</i> (ALA 2022).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Callistemon brachyandrus</i>	Prickly Bottlebrush		R	2	2019	Found along the Murray River in South Australia mainly between Swan Reach and Waikerie growing in the sandy soils of alluvial flats (SSCC 2018).	<b>Unlikely</b> – Despite recent records, this species is generally confined to the mid-Murray region of SA.
<i>Cardamine paucijuga</i>	Annual Bitter-cress		R	2	2011	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in rich soils in moist to dry habitats (SSCC 2018).	<b>Possible</b> – Some suitable habitat within the Project Area.
<i>Coronidium gunnianum</i>	Pale Everlasting		E	2	2006	Found in the southern Mount Lofty Ranges, Burra Gorge and a single record from the lower South-east in South Australia, growing in grasslands and riverine woodlands on soils that are prone to inundation (SSCC 2018).	<b>Possible</b> – Some suitable habitat within the Project Area.

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		Aus	SA				
<i>Deyeuxia densa</i>	Heath Bent-grass		R	2	2021	Commonly in heaths, sedgelands and in stream banks in damp, open to lightly shaded sites.	<b>Likely</b> – Some suitable habitat within the Project Area and recent records.
<i>Deyeuxia minor</i>	Small Bent-grass		V	2	2020	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower-South-east growing in damp areas under light eucalypt cover or margins of wet sclerophyll forest (SSCC 2018).	<b>Likely</b> – Some suitable habitat within the Project Area and recent records.
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily		R	2	2019	Occurs under a variety of overstorey Eucalypt species but is a grassy woodland specialist, e.g., Blue Gum, Candlebark, Manna Gum, Stringybark and Grey Box.	<b>Likely</b> – Some suitable habitat within the Project Area and recent records.
<i>Dicksonia antarctica</i>	Soft Tree-fern		E	2	2020	SA: SL SE. Grows in numerous types of plant communities and is particularly abundant in wet forest communities. It occurs in forest types ranging from rainforest to sheltered gullies within dry sclerophyll forest and subalpine forest.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Dipodium pardalinum</i>	Leopard Hyacinth-orchid		V	2	2012	Occurs from Naracoorte on the Victorian border to the Mount Lofty Ranges. In the Adelaide-Mount Lofty region the species is found in <i>Eucalyptus obliqua</i> woodland growing in association with <i>Acacia myrtifolia</i> , <i>Xanthorrhoea semiplana</i> ssp. <i>tateana</i> and <i>Pteridium esculentum</i> (Willson and Bignall 2009).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area including <i>Eucalyptus obliqua</i> , though associated understorey species not present.
<i>Diuris behrii</i>	Behr's Cowslip Orchid		V	2	2015	Found in the southern Flinders Ranges and the Mount Lofty Ranges with a few records from Eyre Peninsula growing in native grassland, open woodland and grassy forest; grows on more fertile soils, especially amongst <i>Themeda</i> sp. (Kangaroo Grass) and <i>Triodia</i> on gentle slopes and flats (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Diuris chryseopsis</i>	Cowslip Orchid		E	2	1998	Presumed extinct in the Mt Lofty Ranges (but may have been rediscovered in Kuitpo Native Forest Reserve) and found only between Naracoorte and Mount Gambier in South Australia, growing in damper grassy patches in woodland around waterholes, along creeks, on cooler slopes in rich, moist soils (SSCC 2018).	<b>Unlikely</b> – No recent records and this species is generally confined to the southeast of SA.
<i>Drosera binata</i>	Forked Sundew		R	2	2017	Found in the southern Mount Lofty Ranges, on the western end on Kangaroo Island and in the lower South-east in South Australia, growing in wet sand and sandy peat in swamps, on creek banks and seepage lines in rock-faces (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.

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		Aus	SA				
<i>Drosera stricticaulis</i>	Erect Sundew		V	2	1998	Found on southern Eyre Peninsula and on Dutchmans Stern in the Flinders Ranges in South Australia, growing on sandy clay-loam along watercourses and granite outcrops (SSCC 2018).	<b>Unlikely</b> – No recent records and this species is generally confined to the Eyre Peninsula in SA.
<i>Eryngium ovinum</i>	Blue Devil		V	2	2013	Found in the wetter parts of the Mount Lofty Ranges and a few sites in the lower South-East in South Australia, growing in open woodland on damp clay and sandy soils (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Eryngium vesiculosum</i>	Prostrate Blue Devil		R	2	2010	Found scattered in South Australia, from the Lake Eyre region to the lower South-east, growing in sandy flats in low-lying damp areas (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Eucalyptus dalrympleana</i> ssp. <i>dalrympleana</i>	Candlebark Gum		R	2	2022	Often in poorer sandy soils, in woodland or as an emergent in low shrublands. Commonly associated with <i>E. baxteri</i> , <i>E. cosmophylla</i> , <i>E. diversifolia</i> , <i>E. leptophylla</i> and <i>E. leucoxyllon</i> (Nicolle, 2013).	<b>Possible</b> – Very recent records, some suitable habitat and associated species are present within the Project Area.
<i>Eucalyptus fasciculosa</i>	Pink Gum		R	2	2021	Grows on moist, well-drained alluvial soils near watercourses but also grows on drier sites at higher altitudes. Tolerates snow and some flooding (Nicolle, 2013).	<b>Possible</b> – Very recent records and some suitable habitat is present within the Project Area.
<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	Manna Gum		R	2	2022	Generally recorded as growing in mallee scrubland but has also been found growing in coastal heathlands, sclerophyll forests and woodlands. It is also found in heathy openings in wet sclerophyll forest and in a swamp at Mt Compass (Nicolle, 2013).	<b>Known / Highly Likely</b> – Recorded within the Project Area.
<i>Euphrasia collina</i> subsp. <i>osbornii</i>	Osborn's Eyebright	EN	E	1	Species or species habitat known to occur within area	Confined to SA. Has been collected in the Upper SE (Yumali-Meningie Road), on eastern KI. (Dudley Peninsula-W of Cape Willoughby), Eyre Peninsula (Venus Bay), Yorke Peninsula, Northern Lofty region (Clare, Burra), Southern Lofty region (inc. Fleurieu Peninsula and Mt Compass) and the Flinders Ranges. Generally recorded as growing in mallee scrubland but has also been found growing in coastal heathlands, sclerophyll forests and woodlands. It is also found in heathy openings in wet sclerophyll forest and in a swamp at Mt Compass (Moritz and Bickerton 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Gastrodia sesamoides</i>	Potato Orchid		R	2	2021	Found in the southern Mount Lofty Ranges, Kangaroo Island and the lower South-east in South Australia, growing in areas of high rainfall in wet sclerophyll forests, dry sclerophyll forests, woodlands and riparian areas (SSCC 2018).	<b>Likely</b> – Some suitable habitat within the Project Area and recent records.

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		Aus	SA				
<i>Gleichenia microphylla</i>	Coral Fern		R	2	2022	Found southern Mount Lofty and the lower South- East in South Australia, growing in sunny damp sites around swamps and at bases of cliffs in open forest (SSCC 2018).	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Glycine latrobeana</i>	Clover Glycine	VU	V	1	Species or species habitat likely to occur within area	Inhabits native grasslands, dry sclerophyll forests, woodlands and low open woodlands, typically with a grassy ground layer, and growing on undulating plains. Prefers gentle south-west facing ridge slopes and lower south facing river valley slopes (Carter and Sutter 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Gonocarpus micranthus</i> ssp. <i>micranthus</i>	Creeping Raspwort		R	2	2018	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing on wet, peaty soils and is generally confined to damp or boggy situations (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Goodenia brunnea</i>			R	2	2018	This goodenia grows in rocky situations and near watercourses primarily in the far north-west of South Australia.	<b>Unlikely</b> – No recent records and this species is generally confined to the far northwest of SA.
<i>Grevillea aquifolium</i>	Prickly Grevillea		R	2	1997	On calcareous sand in sclerophyllous woodland, and in heath on sands, limestone pavements and sandstone outcrops.	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Hypolepis rugosula</i>	Ruddy Ground-fern		R	2	2022	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing along shady streams or open wetter areas. Where it forms dense thickets. It is frequently in ditches or on embankments beside tracks (SSCC 2018).	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Juncus amabilis</i>			V	2	2009	Found in the southern Mount Lofty Ranges and the South-east in South Australia, growing damp sites.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Lagenophora sublyrata</i>	Slender Bottle-daisy		V	2	2019	Found on Kangaroo Island, southern Mount Lofty Ranges and lower South-east in South Australia, growing in moist gullies and near water (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Leionema hillebrandii</i>	Mount Lofty Phebalium		R	2	2022	Found in heathy woodland and forest gullies. Often in open rocky habitat along steep gullies.	<b>Possible</b> – Very recent records and some suitable habitat is present in the Project Area.

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		Aus	SA				
<i>Logania saxatilis</i>	Rock Logania		R	2	1996	Occurs in the FR, NL, MU, SL regions of SA. Associated with Grassy Woodlands in the foothills and hills face of the Southern Lofty Ranges.	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Luzula flaccida</i>	Pale Wood-rush		V	2	2020	Found in the southern Mount Lofty Ranges and the lower South-east in South Australia, growing in moist rather shady sites in grassy woodland or open grassland (SSCC 2018).	<b>Possible</b> – Very recent records and some suitable habitat is present in the Project Area.
<i>Lycopodiella lateralis</i>	Slender Clubmoss		R	2	2017	The species occurs in scattered swampy places in the vicinity of Mt Compass, Mt Lofty and on KI.	<b>Unlikely</b> – Recent records nearby and some suitable habitat within the Project Area but Project impact area does not incorporate creek / watercourse.
<i>Lycopodium deuterodensum</i>	Bushy Clubmoss		E	2	2009	Found in one location in the southern Mount Lofty Ranges in South Australia, growing on steep hill slopes over sandstone and quartzite on the edge of a gully swamp within open stringybark forest with a dense understorey of bracken, sedges, shrubs, herbs and grasses (SSCC 2018).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Machaerina gunnii</i>	Slender Twig-rush		R	2	2018	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in wet heathlands and swampy woodlands (SSCC 2018).	<b>Unlikely</b> – No recent records nearby despite some suitable habitat within the Project Area.
<i>Melaleuca armillaris ssp. akineta</i>	Needle-leaf Honey-myrtle		R	2	2008	Found primarily in the Gawler Ranges of South Australia, where it grows on ridges and granite outcrops (Brophy et al. 2013).	<b>Unlikely</b> – No very recent records and this species is generally confined to the Gawler Ranges in SA.
<i>Mentha diemenica</i>	Slender Mint		R	2	2011	This species is scattered throughout <i>Eucalyptus ovata</i> dominated woodland.	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Nymphoides crenata</i>	Wavy Marshwort		R	2	1995	Fresh water to 1.5 m deep in swamps, lagoons, channels and streams; also frequent in temporarily inundated depressions.	<b>Unlikely</b> – No recent records nearby despite some suitable habitat within the Project Area.
<i>Poa umbricola</i>	Shade Tussock-grass		R	2	2018	Associated with woodland communities where it is often straggling among rocks.	<b>Unlikely</b> – Despite recent records, rocky outcrops in which this species requires are not present.

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		Aus	SA				
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	VU	R	1	Species or species habitat likely to occur within area	Pale Leek-orchid is known singly or in groups in better soils of woodland and grassy open forest. Recorded in woodlands and forests dominated by <i>Eucalyptus leucoxyton</i> , <i>E. goniocalyx</i> , <i>E. fasciculosa</i> , <i>E. microcarpa</i> , <i>Callitris gracilis</i> / <i>Eucalyptus fasciculosa</i> , and <i>Allocasuarina verticillata</i> (Bates 2009).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Prasophyllum pruinatum</i>	Plum Leek-orchid	EN	E	1	Species or species habitat known to occur within area	It has been recorded in the Adelaide and MLR region from eight geographically isolated and distinct locations, which extend from the Barossa Valley to Belair NP. Preferred habitat includes open woodland and grassy forest, in the open or in the shelter of broom-like shrub growing in fertile loams, usually with other leek-orchids (Bates, 2009).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Pterostylis cucullata</i>	Leafy Greenhood	VU	E	1	Species or species habitat likely to occur within area	There are two subspecies of <i>Pterostylis cucullata</i> . One is a coastal ssp. that occurs in stabilised coastal sand dunes, on open ground but under a scrub layer. The other ssp. is a montane variety which occurs on riverbanks or protected alluvial flood plains (TSSC 2016a).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Pterostylis setifera</i>	Bristly Greenhood		E	2	2018	Found in a variety of habitats, in SA in open areas of mallee type vegetation and small red sand dune areas covered with <i>Callitris</i> .	<b>Unlikely</b> – Despite recent records no mallee habitat is present within the Project Area.
<i>Pultenaea graveolens</i>	Scented Bush-pea		R	2	2022	Found in the southern Flinders Range and the southern Mount Lofty Ranges in South Australia, with a single record from Kangaroo Island, growing in dry sclerophyll woodland (SSCC 2018).	<b>Possible</b> – Very recent record and some suitable habitat within the Project Area.
<i>Pultenaea kraehenbuehlii</i>	Tothill Bush-pea		R	2	2018	Endemic to South Australia and found only in the Tothill Range except for one record from Cleland National Park, growing in open grassland to open low woodland sometime dominated by <i>Allocasuarina verticillata</i> (SSCC 2018).	<b>Unlikely</b> – Project Area not within known isolated population, and no suitable habitat occurs.
<i>Ranunculus glabrifolius</i>	Shining Buttercup		V	2	2000	Found only in Mount George Conservation Park in SA where it occurs in damp ground in depressions or beside watercourses.	<b>Possible</b> – Recent records and only found in Mount George Conservation Park which is adjacent to the Project Area. Project impact area does not incorporate creek / watercourse.



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		Aus	SA				
<i>Rytidosperma laeve</i>	Smooth Wallaby-grass		R	2	2017	Ecologically variable, from alpine moorland to open grassland or light woodland, often in seasonally damp habitats (Sharp and Simon 2022).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Rytidosperma tenuius</i>	Short-awn Wallaby-grass		R	2	2022	Grows in altitudes between 5–750 m, on Tablelands usually in somewhat damp habitats, rarely dominant; along the coastal shelf a very common constituent of disturbed road verges.	<b>Likely</b> – Very recent records and some suitable habitat is present in the Project Area.
<i>Schizaea fistulosa</i>	Narrow Comb-fern		V	2	2008	In SA this species is usually found on raised soil mounds in swamps or under scrub in moist situations. It is often found associated with <i>S. bifida</i> . There appear to be intermediate forms between these two species in SA.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Schoenus latelaminatus</i>	Medusa Bog-rush		V	2	2012	Grows in seasonally wet areas along creek beds and in marshy paddocks.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Schoenus lepidosperma</i> ssp. <i>lepidosperma</i>	Slender Bog-rush		R	2	2018	Grows in damp areas in heath or woodland in sandy soils.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Scutellaria humilis</i>	Dwarf Skullcap		R	2	2021	Grows in various habitats, often in moist sheltered areas, particularly along creeks or gullies, widespread from coastal to inland districts. Single isolated record from Cleland National Park, most records further south on Fleurieu Peninsula.	<b>Unlikely</b> – Despite recent records the Project Area is outside of its typical distribution.
<i>Senecio pinnatifolius</i> var. <i>pinnatifolius</i>			R	2	2015	Commonly found in moist gullies where they are locally widespread. Predominantly occurs in areas of moderate to high rainfall.	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Sphaerolobium minus</i>	Leafless Globe-pea		R	2	2008	Scattered mainly across higher rainfall areas in sclerophyll forests, woodlands and heathlands.	<b>Unlikely</b> – No recent records nearby despite some suitable habitat within the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Sprengelia incarnata</i>	Pink Swamp-heath		R	2	2017	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in wet heathland, sedgeland and other swampy vegetation on peaty or sandy soils (SSCC 2018).	<b>Unlikely</b> – Despite recent records, Cleland National Park is the closest area that this species occurs in. It is unlikely to occur in the Project Area.
<i>Thelymitra aristata</i>	Great Sun-orchid		E	2	2008	Found primarily in the south-east in South Australia, north of Mt Gambier, growing in clay or gravel soils in forest or scrubland around swamp margins in damp sands (SSCC 2018). Past records from Mount George Conservation Park adjacent the Project Area.	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Thelymitra batesii</i>			R	2	2021	Endemic to South Australia and found in the southern Flinders Ranges and the Mount Lofty Ranges, growing in heathy woodlands and heathy open forest on sandy and gravelly clay loam soils (SSCC 2018).	<b>Possible</b> – Very recent records and some suitable habitat is present in the Project Area.
<i>Thelymitra circumsepta</i>	Naked Sun-orchid		E	2	2018	Occurs in the SL region of SA. Found among low shrubs in open forest or in open rocky sites on well-drained and moisture retentive soils.	<b>Unlikely</b> – despite recent records, no suitable rocky or open forest sites occur in Project Area.
<i>Thelymitra grandiflora</i>	Great Sun-orchid		R	2	2019	Occurs singly or as small clumps of plants in forest clearings, woodland and scrub in well drained gravelly clay soils which may be laterite or podsols, or mixed with sand, extending to dry rocky ridges in better soils (Bates 2009).	<b>Possible</b> – Very recent records and some suitable habitat is present in the Project Area.
<i>Thelymitra ixioides</i>	Spotted Sun-orchid		E	2	2013	Found in the southern Mount Lofty Ranges and the lower South-east in South Australia, growing in woodland or swampy ground (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Thelymitra latifolia</i>	Blue Star Sun-orchid		V	2	2004	In SA found from the southern Flinders Ranges southward through the Mount Lofty Ranges to the South-east. Found in woodlands in various soil types from leached pale sands to yellow gravelly clays and may occur near swamps.	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Thelymitra matthewsii</i>	Spiral Sun-orchid	VU	E	1	Species or species habitat likely to occur within area	Currently known to occur in Vic., SA and NZ. Favours open forests and woodlands in well-drained sand and clay loams. It is a post-disturbance coloniser that is usually found in open areas around old quarries and gravel pits, on road verges, disused tracks and animal trails. In SA, it is known from three fairly old collections from KI and SW of Keith. It has recently been found to occur south of Meningie, and on western KI. Widely but sporadically distributed in Vic and SA. Grows in heathy open forest and woodlands on well-drained sand, gravel and clay loams, especially where there has been soil disturbance. Open ground layer is common (Duncan 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Thysanotus tenellus</i>	Grassy Fringe-lily		R	2	2015	Perennial Fringed lily species located in SA where it prefers <i>Eucalyptus</i> woodlands, <i>Lomandra effusa</i> Open Sedgeland, <i>Dodonaea lobulata</i> shrublands and Bluebush shrublands (Sirisena 2010).	<b>Unlikely</b> – No recent records nearby despite some suitable habitat within the Project Area.
<i>Todea barbara</i>	King Fern		E	2	2018	Occurs in the MLR where it occurs in swamps, swampy gullies and creek beds. All extant populations occur adjacent to permanent water, springs or soaks.	<b>Unlikely</b> – Recent records nearby and some suitable habitat within the Project Area but Project impact area does not incorporate creek / watercourse.
<i>Veronica derwentiana</i> subsp. <i>homalodonta</i>	Mount Lofty Speedwell	CE	E	1	Species or species habitat likely to occur within area	Occurs in moist areas, gullies, creeklines and high rainfall areas. Largely occurs in <i>Eucalyptus obliqua</i> Forests with or without additional overstorey species (such as <i>Eucalyptus fasciculosa</i> , <i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i> & <i>Eucalyptus leucoxylon</i> ) (TSSC 2009).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Xanthosia tasmanica</i>	Southern Xanthosia		R	2	2015	Found on Kangaroo Island and the southern Mount Lofty Ranges in South Australia, growing in shallow sand on rocky coastal heath and in woodland (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Xyris operculata</i>	Tall Yellow-eye		R	2	2008	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in wet heathlands and swampy areas (SSCC 2018).	<b>Unlikely</b> – No recent records and this species is generally confined to the areas around Mount Compass and on Kangaroo Island.

**Conservation status:**

Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. ENE: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

**PMST result: Likelihood of species or species habitat to occur within 5 km of the Project Area.**

**Source of Information:**

**1: PMST (DCCEEW 2022b) – 5 km buffer applied to Project Area;**

**2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;**

**Abbreviations within Distribution and preferred habitat:**

**EP: Eyre Peninsula; FP: Fleurieu Peninsula; FR: Flinders Ranges; KI: Kangaroo Island; MLR: Mount Lofty Ranges; MU: Murraylands; NL: Northern Lofty; NP: National Park; NSW: New South Wales QLD: Queensland; SL: Southern Lofty; SE: Southeast / South-Eastern; SW: South-Western; Tas: Tasmania; Vic: Victoria; WA: Western Australia; YP: Yorke Peninsula.**

**Appendix 6. BDBSA fauna record within 5 km of the Project Area**

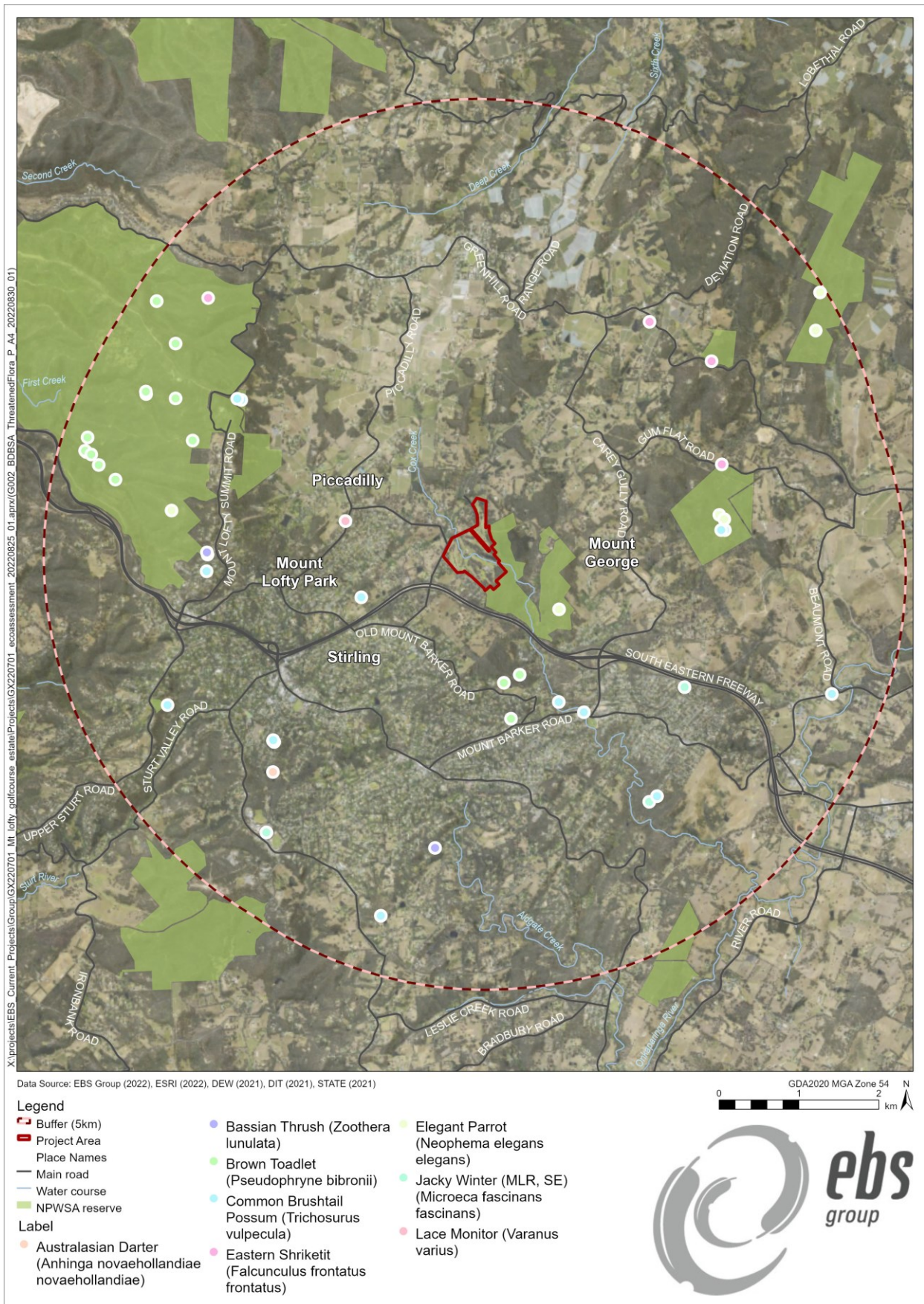


Figure 13. BDBSA fauna record for State listed Rare species, located within 5 km of the Project Area (Map 1 of 2).

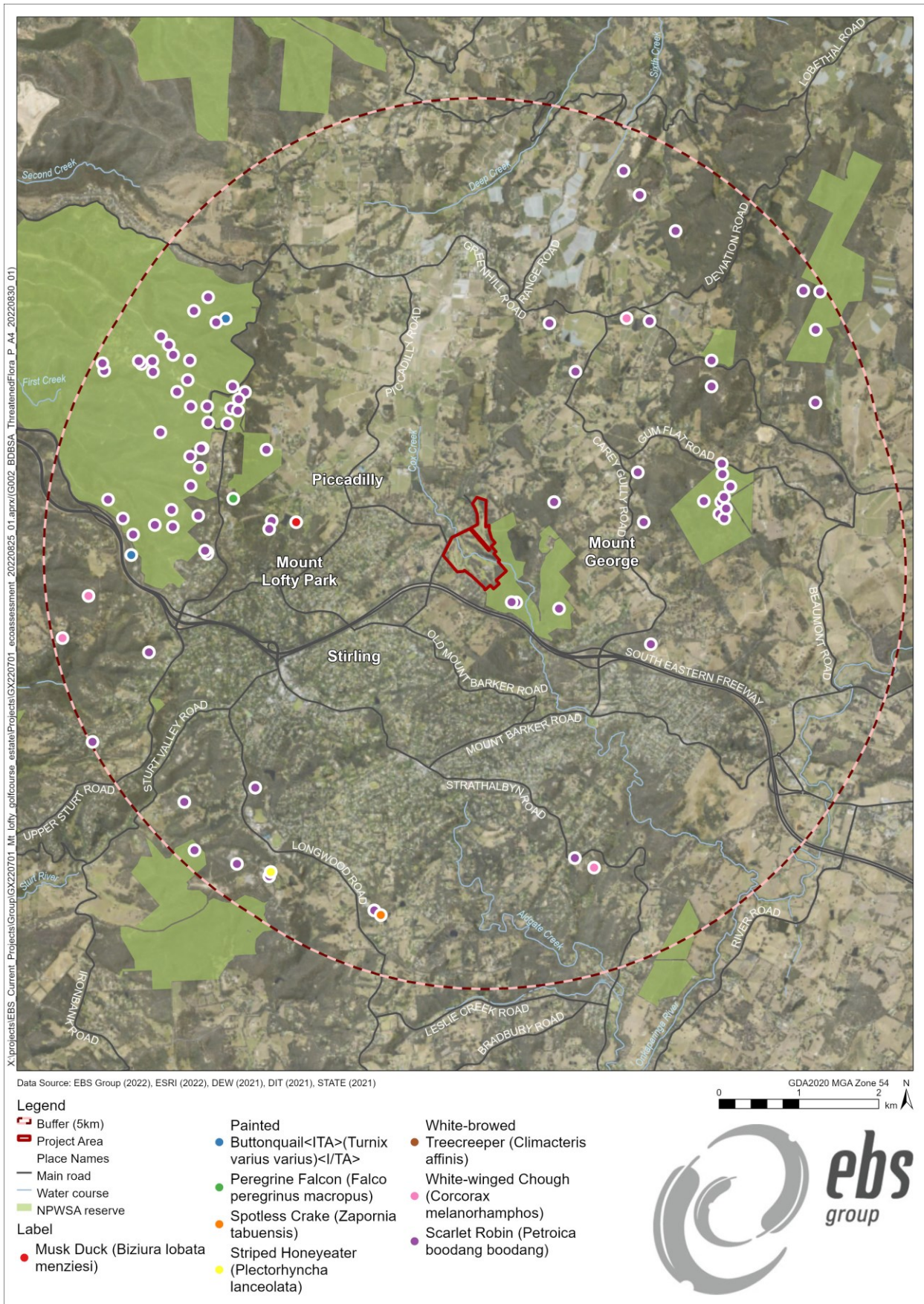


Figure 14. BDBSA fauna record for State listed Rare species, located within 5 km of the Project Area (Map 2 of 2).

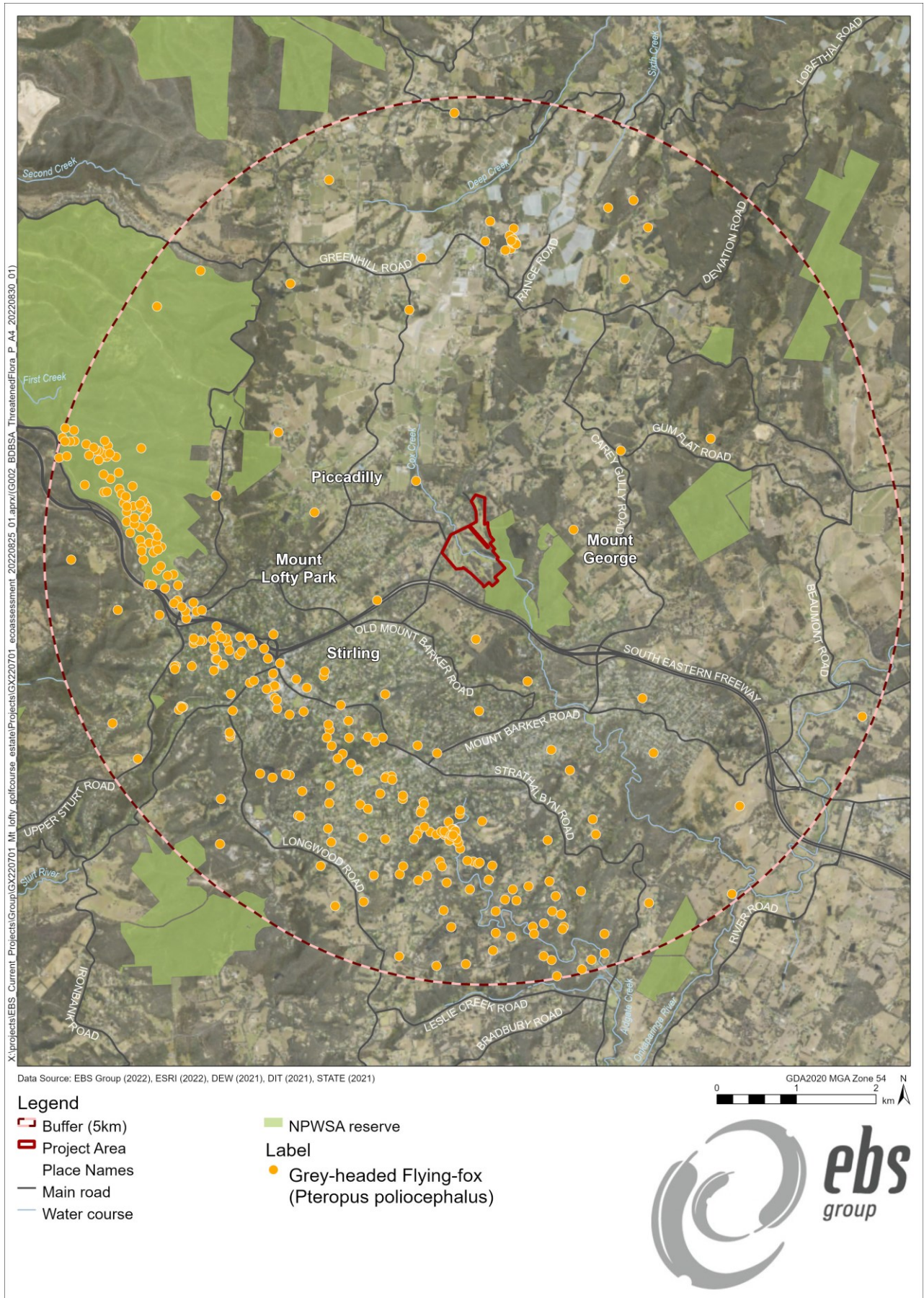


Figure 15. BDBSA fauna record for *Pteropus poliocephalus* (Grey-headed Flying-fox), located within 5 km of the Project Area.

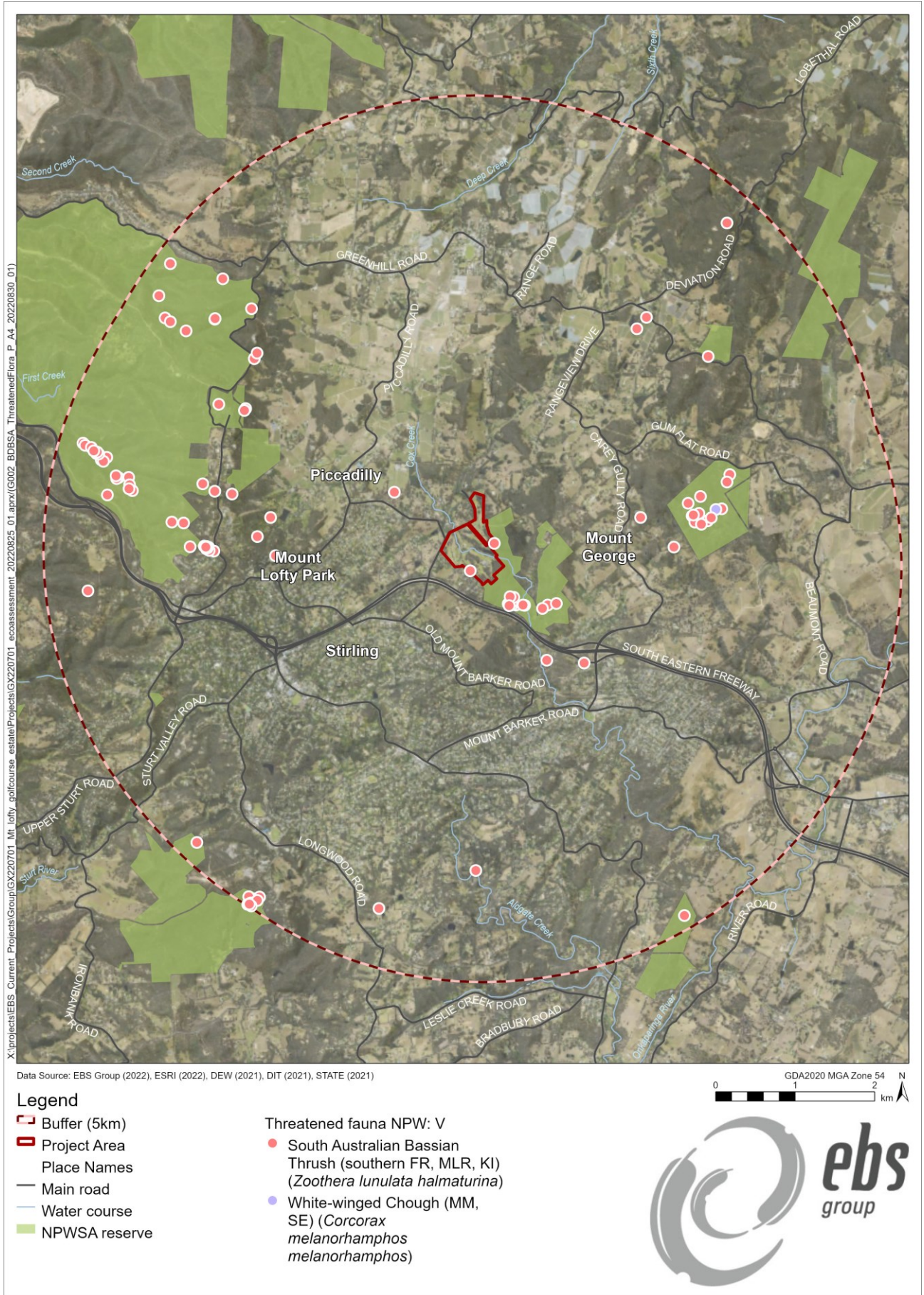


Figure 16. BDBSA fauna record for State listed Vulnerable species, located within 5 km of the Project Area.



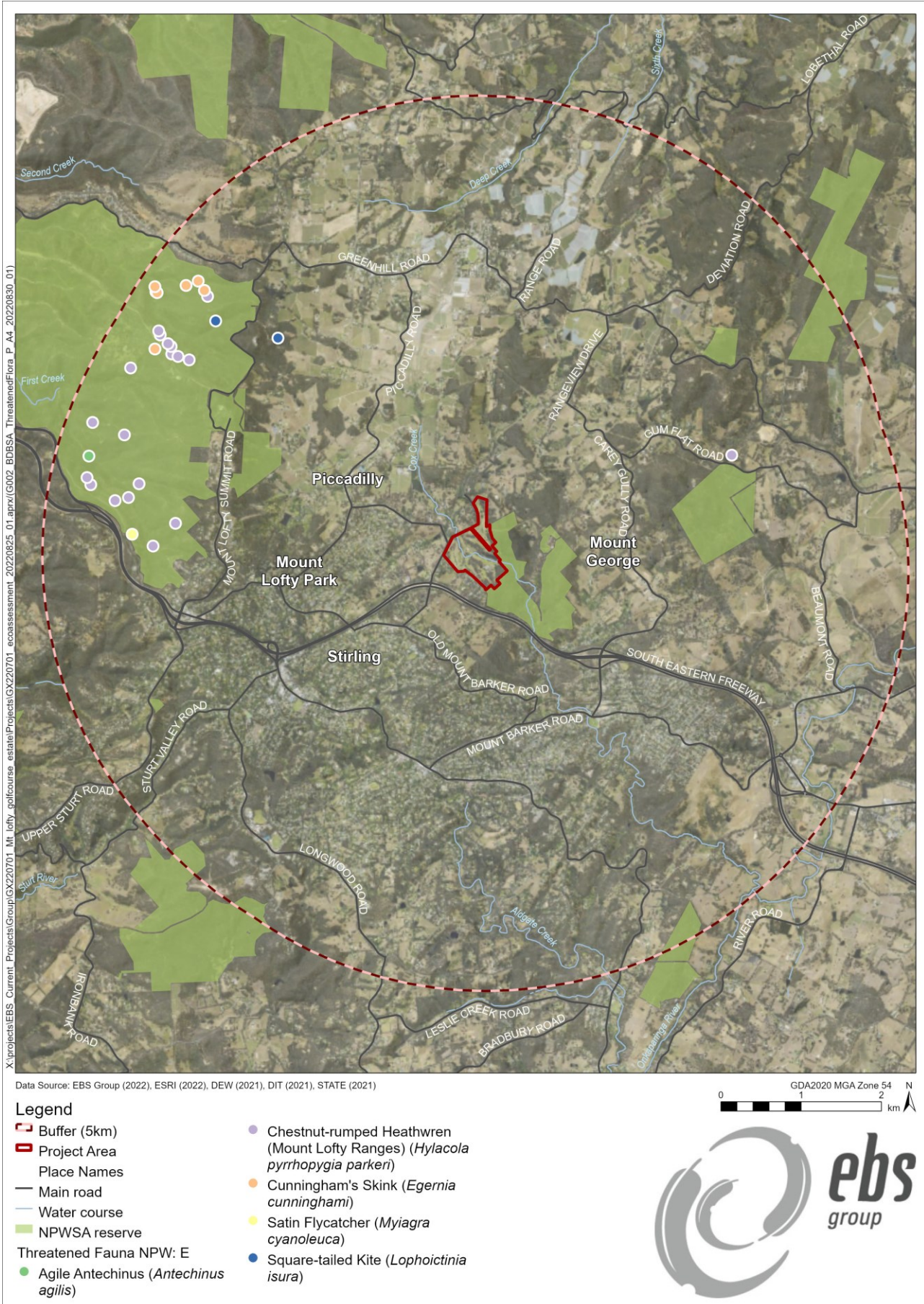


Figure 17. BDBSA fauna record for State listed Endangered species, located within 5 km of the Project Area.

Appendix 7. BDBSA Birdlife record within 5 km of the Project Area

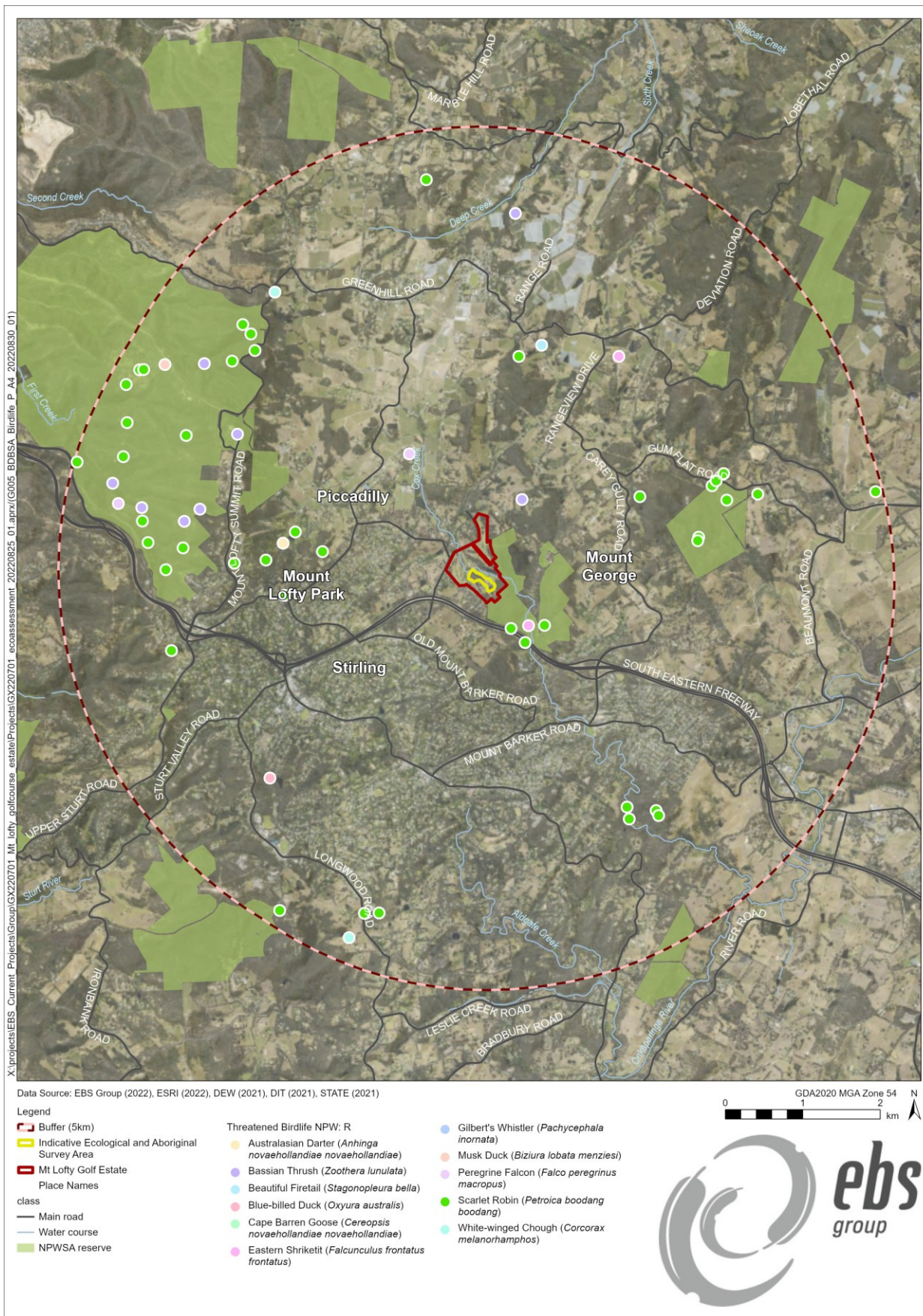


Figure 18. BDBSA Birdlife record for State listed Rare species, located within 5 km of the Project Area.

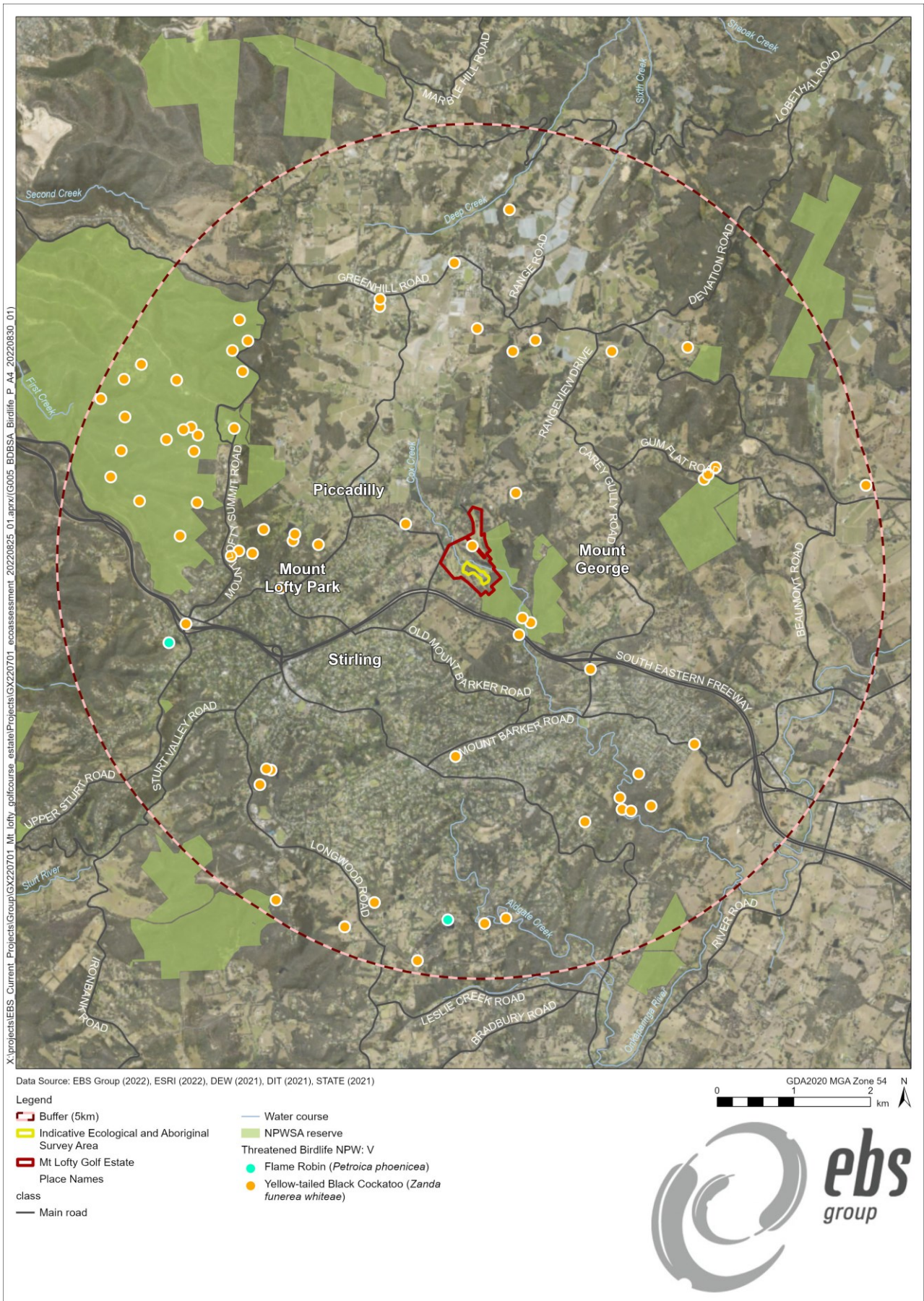


Figure 19. BDBSA Birdlife record for State listed Vulnerable species, located within 5 km of the Project Area.

**Appendix 8. Assessment of likelihood of national (EPBC Act) and State (NPW Act) listed threatened fauna identified by the PMST (DCCEEW 2022b) and BDBSA (DEW 2022b) to occur in the Project Area (exclusively marine species have been omitted).**

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<b>AMPHIBIA (AMPHIBIANS)</b>							
<i>Pseudophryne bibronii</i>	Brown Toadlet		R	2	2009	In SA, it occurs in the SE, KI, MLR and FR regions. Found in damp areas with cover provided by logs and stones. Occupies forests, heathlands and grasslands. Occasionally utilizes small temporary dams and vegetated roadside drainage lines and ditches which are characterized by leaf litter and grassy debris (Wilson and Bignall 2009).	<b>Possible</b> – Some suitable habitat within the Project Area including water sources, most recent nearby record over 10 years old.
<b>AVES (BIRDS)</b>							
<i>Anhinga novaehollandiae novaehollandiae</i>	Australasian Darter		R	2, 3	2018 / 2018	Habitat is lakes, rivers, swamps; rarely coastal (Pizzey and Knight 2013).	<b>Possible</b> – Some suitable habitat within the Project Area including water sources.
<i>Biziura lobata menziesi</i>	Musk Duck		R	2, 3	2015 / 2002	Lakes, reservoirs and wetlands including well-vegetated swamps and fresh and brackish habitats (Pizzey and Knight 2013).	<b>Possible</b> – Some suitable habitat within the Project Area including permanent water sources.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN	E	1	Species or species habitat known to occur within area	Freshwater wetlands and rarely in estuaries or tidal wetlands, favouring wetlands dominated by sedges, rushes and reeds growing over a muddy or peaty substrate (Pizzey and Knight 2013).	<b>Unlikely</b> – No recent records despite suitable habitat present.
<i>Cereopsis novaehollandiae novaehollandiae</i>	Cape Barren Goose		R	3	2009	Mostly inhabits small, windswept and generally uninhabited offshore islands, but ventures to adjacent mainland farming areas in search of food in summer (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area including water sources and open grassy areas.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN	E	3	2002	Likes tidal mudflats, sand flats and shelly beaches, salt marshes and mangroves (Pizzey and Knight 2013).	<b>Unlikely</b> – No suitable habitat, migratory species which does not depend on vegetation present in the Project Area
<i>Climacteris affinis</i>	White-browed Treecreeper		R	2	2021	Distributed across southern arid and semi-arid areas of Australia, from Western Australia, through South Australia, New South Wales and into north-western Victoria. Habitat is Acacia woodlands, belah and Callitris.	<b>Possible</b> – Some suitable habitat within the Project Area but vagrant species to general area.
<i>Corcorax melanorhamphos</i>	White-winged Chough		R	2, 3	2020 / 2020	Prefers drier forests, woodlands of <i>Eucalyptus</i> sp., crops and pastures (Pizzey and Knight 2013).	<b>Likely</b> – Some suitable habitat within the Project Area and recent records.
<i>Falco hypoleucos</i>	Grey Falcon	VU	R	1	Species or species habitat likely to occur within area	The species is mainly found where annual rainfall is less than 500 mm and is essentially always confined to the arid and semi-arid zones. The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (Schoenjahn et al. 2020).	<b>Unlikely</b> – No recent records and habitat within the Project Area is unsuitable.
<i>Falco peregrinus macropus</i>	Peregrine Falcon		R	2, 3	2015 / 2020	Found everywhere from woodlands to open grasslands and coastal cliffs – though less frequently in desert regions. This species prefers open habitats such as grasslands, tundra and meadows and nests on cliff faces and in crevices (Pizzey and Knight 2013).	<b>Likely</b> – Some suitable habitat within the Project Area. Likely to occur as flyover only.
<i>Falcunculus frontatus frontatus</i>	Eastern Shrike-tit		R	2, 3	2006 / 2006	Eucalyptus woodlands and forest, within a wide range of woodland/forest communities. Prefers dense grasslands, often on the edges of open forests, and bracken (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area, most recent nearby record over 15 years old.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Grantiella picta</i>	Painted Honeyeater	VU	R	1	Species or species habitat likely to occur within area	Forest, woodland, dry scrub, often with abundant mistletoe. Dependent on mistletoe berries (DAWE 2021a).	<b>Unlikely</b> – No recent records despite some suitable habitat.
<i>Hieraaetus morphnoides</i>	Little Eagle		V	2	2019	Occurs in sparse populations in eastern South Australia where it prefers grasslands and grassy woodlands but will inhabit a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones (Birdlife Australia 2022).	<b>Likely</b> – Some suitable habitat within the Project Area. Likely to occur as flyover only.
<i>Hirundapus caudacutus</i>	White-throated Needletail	VU, Mi (T)	V	1	Species or species habitat likely to occur within area	Almost exclusively aerial in Australia, recorded most commonly above wooded areas (Pizzey and Knight 2013).	<b>Possible</b> – Some suitable habitat present. Possible to occur as flyover only.
<i>Hylacola cauta cauta</i>	Shy Heathwren		R	3	1998	Prefers dense shrubby or heath understorey in mallee woodland, mallee shrubland or mallee heath in coastal and semi-arid regions, often where spinifex ( <i>Triodia</i> ) occurs and with dense shrubs such as Banksia, Hakea and Grevillea, also tea-tree ( <i>Leptospermum</i> ) and cypress pine ( <i>Callitris</i> ) (Gregory, 2020).	<b>Possible</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<i>Hylacola pyrrhopygia parkeri</i>	Chestnut-rumped Heathwren	EN	E	1, 2, 3	Species or species habitat known to occur within area / 2020 / 2020	Inhabits heaths of coastal, mountain and hinterland areas, dense undergrowth of forests and woodlands. Found in South-eastern Australia. In SA occurs in the SE, Adelaide Mount Lofty Ranges and Northern Yorke districts (Wilson and Bignall 2009).	<b>Likely</b> – known to occur in adjacent Mount Gorge CP, may utilise Project Area fringe from time to time, though unlikely to be core habitat as the understorey vegetation was open, disturbed and weedy in most places.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Leipoa ocellata</i>	Malleefowl	VU	V	1	Species or species habitat likely to occur within area	In South Australia, the Malleefowl is distributed from the south-east, north to the Murray-Mallee region and west to Streaky Bay, south of 32°S. The species also occurs west of the Eyre Peninsula. Occupies shrublands and low woodlands that are dominated by mallee vegetation. It also occurs in other habitat types including eucalypt or native pine Callitris woodlands, acacia shrublands, Broombush Melaleuca uncinata vegetation or coastal heathlands (Benshemesh 2007).	<b>Unlikely</b> – No recent records and no mallee habitat within the Project Area.
<i>Lewinia pectoralis pectoralis</i>	Lewin's Rail		V	2	2010	Swamp woodlands; rushes, reeds, rank grass in swamps, creeks paddocks; wet heaths, tree ferns; samphire in saltmarsh.	<b>Possible</b> – Some suitable habitat within the Project Area including water sources.
<i>Lophoictinia isura</i>	Square-tailed Kite		E	2	2019	The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses (Pizzey and Knight 2013).	<b>Likely</b> – Some suitable habitat within the Project Area. Likely to occur as flyover only.
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater		V	2, 3	2002 / 2000	The Black-chinned Honeyeater is found in the upper levels of open eucalypt forests and woodlands dominated by box and ironbark eucalypts. It is often found along waterways, especially in arid and semi-arid areas and in northern Australia. It is occasionally seen in gardens and street trees (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area.
<i>Microeca fascinans fascinans</i>	Jacky Winter		R	2, 3	2018 / 2001	Widely distributed throughout mainland Australia. Prefer open woodland (Eucalypt and mallee) with an open shrub layer and bare ground. Often seen in farmland and parks (Morcombe, 2021).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Neophema elegans elegans</i>	Elegant Parrot		R	2	2021	Wide variety of habitats, including grasslands, shrublands, mallee, woodlands and thickets, bluebush plains, heathlands, saltmarsh and farmland (Pizzey and Knight 2013).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<i>Oxyura australis</i>	Blue-billed Duck		R	3	2018	Habitat is permanent swamps with dense vegetation. Large open lakes, tidal inlets and bays (Pizzey and Knight 2013).	<b>Possible</b> – Some suitable habitat within the Project Area including permanent water sources.
<i>Pachycephala inornata</i>	Gilbert's Whistler		R	3	2007	Usually inhabit semi-arid mallee or box-ironbark eucalypt, acacia, cypress-pine or Belah shrublands and woodlands (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area.
<i>Petroica boodang boodang</i>	Scarlet Robin		R	2, 3	2022 / 2020	This species occurs in foothill forests, woodlands and watercourses. In autumn-winter, they occur in more open habitats such as river red gum woodlands, golf courses, parks, orchards and gardens (Birdlife Australia 2022).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<i>Petroica phoenicea</i>	Flame Robin		V	3	2003	Endemic to south-eastern Australia, and ranges from near the Queensland border to southeast South Australia and also in Tasmania. Breeds in eucalypt forests and woodlands, with access to open areas, such as subalpine woodland, recently burnt forest, recently logged forest and pine plantations (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area.



Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater		R	2	2020	The Striped Honeyeater is found in eastern Australia, mainly inland, from the Yorke Peninsula, South Australia to the coast of New South Wales, around Toukley, and north to Charters Towers, Queensland. The Striped Honeyeater is found in forests and woodlands, often along rivers, as well as mangroves and in urban gardens (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area but vagrant species to general area.
<i>Polytelis anthopeplus monarchoides</i>	Regent Parrot	VU	V	2	1996	The Regent Parrot (eastern) is confined primarily to the semi-arid interior of south-eastern mainland Australia. It inhabits riparian or littoral River Red Gum ( <i>Eucalyptus camaldulensis</i> ) forests or woodlands and adjacent Black Box ( <i>E. largiflorens</i> ) woodlands (Baker-Gabb and Hurley 2011).	<b>Unlikely</b> – No very recent records despite some suitable habitat.
<i>Rostratula australis</i>	Australian Painted Snipe	EN	E	1	Species or species habitat likely to occur within area	The Australian Painted Snipe inhabits many different types of shallow, brackish or freshwater terrestrial wetlands, especially temporary ones which have muddy margins and small, low-lying islands. Suitable wetlands usually support a mosaic of low, patchy vegetation, as well as lignum and Canegrass (Birdlife Australia 2022).	<b>Unlikely</b> – No recent records despite some suitable habitat.
<i>Stagonopleura bella</i>	Beautiful Firetail		R	3	2020	Occurs in the AMLR/Eyre Peninsula region of SA where it resides in a wide range of Eucalypt dominated vegetation communities that have a grassy understorey, including woodland, forest and mallee. Only small pockets have been observed near the coast (Birdlife Australia 2022).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<i>Turnix varius varius</i>	Painted Buttonquail		R	2	2012	These birds range almost continuously, in appropriate habitat, from about the Atherton Tableland in Qld, round the coast to the EP and north to the southern Flinders Ranges in SA, avoiding only the driest regions of Qld and NSW. Temperate and eastern tropical forests and woodlands form the habitats of this species (Morcombe 2021).	<b>Possible</b> – Some suitable habitat within the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Zanda funerea whiteae</i>	Yellow-tailed Black Cockatoo		V	2, 3	2022 / 2020	Eucalyptus forests and woodlands. Plantations of Eucalyptus and introduced Pinus sp. (Pizzey and Knight 2013)	<b>Likely</b> – Some suitable habitat within the Project Area. Likely to occur as flyover only.
<i>Zapornia tabuensis</i>	Spotless Crane		R	2	2010	Mostly found in well vegetated freshwater wetlands with rushes and reeds. Will also frequent muddy areas, reedbeds or wetlands.	<b>Possible</b> – Some suitable habitat within the Project Area including water sources.
<i>Zoothra lunulata halmaturina</i>	Bassian Thrush	EN	R	1, 2, 3	Species or species habitat known to occur within area / 2022 / 2018	Damp, densely forested areas and gullies are favoured by the Bassian Thrush, usually with a thick canopy overhead and leaf-litter below (DAWE 2022).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<b>MAMMALIA (MAMMALS)</b>							
<i>Antechinus agilis</i>	Agile Antechinus		E	2	2021	Forests in the south-eastern corner of Australia. Prefers areas with dense ground cover and hiding places such as fallen logs.	<b>Possible</b> – Some suitable habitat within the Project Area generally confined to the far southeast of SA.
<i>Antechinus flavipes</i>	Yellow-footed Antechinus		V	2	2021	Inhabits dry forests on the inland side of the Great Dividing Range, Australia (Kelly et al. 2008).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot	EN	V	1, 2	Species or species habitat known to occur within area / 2021	This species prefers dense ground cover, tall grass and low shrubbery. They live near swamps and rivers as well as in thick scrub in drier areas. They make their nests on the ground and in logs. The nests consist of sticks, leaves, grass, and soil (TSSC 2016b).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	R	1, 2	Foraging, feeding or related behaviour likely to occur within area / 2020	Grey-headed Flying-foxes forage up to 40 km from their roost at Botanic Park each night. Food plants are typically planted trees, both native and exotic, that provide fruit or a rich source of nectar (DAWE 2021b). This species may occur within the Project Area; however, they would only be expected to visit for short periods if suitable flower or fruit resources are available.	<b>Likely</b> – Some suitable foraging habitat within the Project Area. Project Area is less than 50 km from nearest camp at Botanic Park in Adelaide
<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R	2	2022	Utilises various woodland habitats and suburban environs. Feeds on flowers, fruit, buds and leaves of native vegetation. Requires hollows (within dead or alive tree) or on ground for daytime nesting (Strahan & van Dyck 2008).	<b>Highly Likely / Known</b> – Some suitable habitat including hollows within the Project Area. Scat from this species was observed within the Project Area.
<b>REPTILIA (REPTILES)</b>							
<i>Egernia cunninghami</i>	Cunningham's Skink		E	2	2022	Occurs in forests and rock outcrops where they bask on top of outcrops and will scurry between rock ledges to shelter.	<b>Unlikely</b> – despite very recent records, no rock outcrops are present in the Project Area for shelter.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Varanus rosenbergi</i>	Heath Goanna		V	2	2014	Habitat across southern Australia includes coastal heaths, humid woodlands, and wet and dry sclerophyll forests (Cogger 2014).	<b>Possible</b> – recent records within 10 years. Species occupies large ranges which incorporate heath, wet and dry forest, and woodlands, such as those found in the Project Area. No termite mounds observed in Project Area but may occur nearby.
<i>Varanus varius</i>	Lace Monitor		R	2	2013	This species is a large arboreal lizard which is found in eastern and south-eastern Australia from Cape York Peninsula (Queensland) to south-eastern South Australia. Lace Monitors occur in well-timbered areas from dry woodlands to cool temperate forests in southern Australia (Cogger, 2014). Restricted distribution in SA, occurring in upper reaches of the SA Murray Darling Basin and isolated population in the southern Flinders Ranges.	<b>Unlikely</b> – outside of known distribution. Nearby record is isolated and thought to be escapee from Cleland Wildlife Park.

**Conservation status:**

Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. ENE: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

- 1: PMST (DCCEEW 2022b) – 5 km buffer applied to Project Area;
- 2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;
- 3: Birdlife Australia (DEW 2022b) – 5 km buffer applied to Project Area.

**Abbreviations within Distribution and preferred habitat:**

EP: Eyre Peninsula; FP: Fleurieu Peninsula; FR: Flinders Ranges; KI: Kangaroo Island; MLR: Mount Lofty Ranges; MU: Murraylands; NL: Northern Lofty; NP: National Park; NSW: New South Wales QLD: Queensland; SL: Southern Lofty; SE: Southeast / South-Eastern; SW: South-Western; Tas: Tasmania; Vic: Victoria; WA: Western Australia; YP: Yorke Peninsula.

**Appendix 9. Assessment of likelihood of nationally (EPBC Act) listed migratory species identified by the PMST (DCCEEW 2022b) and BDBSA (DEW 2022b) to occur in the Project Area (exclusively marine species have been omitted).**

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<b>AVES (BIRDS)</b>							
<i>Apus pacificus</i>	Fork-tailed Swift	Mi (Ma)		1	Species or species habitat likely to occur within area	Widespread but almost exclusively aerial. Mostly occur over inland plains and dry or open habitats.	<b>Possible</b> – Some suitable habitat present. Possible to occur as flyover only.
<i>Gallinago hardwickii</i>	Latham's Snipe	Mi (W)	R	1	Species or species habitat likely to occur within area	This is a wetland species which prefers shallow water dominated by tussocks, sedges, rushes and reeds (Pizzey and Knight 2013).	<b>Unlikely</b> – No recent records despite some suitable habitat.
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Mi (T)	E	1, 2	Species or species habitat likely to occur within area / 2005	Known inhabitant of forest, woodland, mangroves and coastal heath scrub. Prefers dense, wet gullies of heavy eucalypt forest in breeding season (Morcombe, 2021).	<b>Possible</b> – Some suitable habitat within the Project Area.
<i>Rhipidura rufifrons</i>	Rufous Fantail	Mi (T)		1	Species or species habitat known to occur within area	Occur in moist eucalypt forests and rainforests, where they usually inhabit the dense, shady undergrowth of gullies (Birdlife Australia 2022).	<b>Unlikely</b> – No recent records and habitat within the Project Area is unsuitable.
<i>Tringa nebularia</i>	Common Greenshank	Mi (T)		1	Species or species habitat likely to occur within area	Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass (Morcombe 2021).	<b>Unlikely</b> – No recent records despite some suitable habitat.

**Conservation status:**

Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (T): listed as a Migratory Terrestrial species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

PMST result: Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

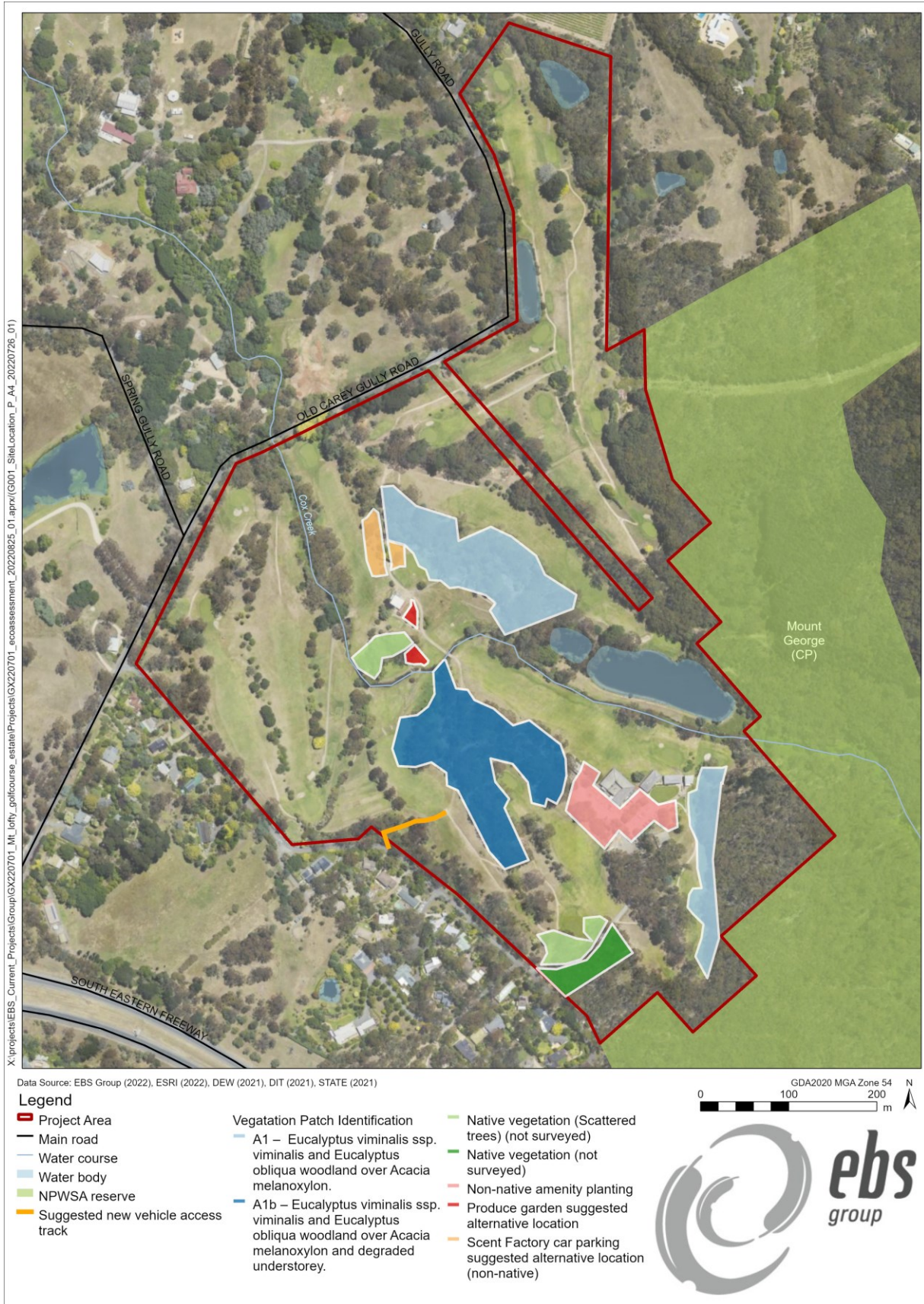
1: PMST (DCCEEW 2022b) – 5 km buffer applied to Project Area;

2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;

Abbreviations within Distribution and preferred habitat:

EP: Eyre Peninsula; FP: Fleurieu Peninsula; FR: Flinders Ranges; KI: Kangaroo Island; MLR: Mount Lofty Ranges; MU: Murraylands; NL: Northern Lofty; NP: National Park; NSW: New South Wales QLD: Queensland; SL: Southern Lofty; SE: Southeast / South-Eastern; SW: South-Western; Tas: Tasmania; Vic: Victoria; WA: Western Australia; YP: Yorke Peninsula.

**Appendix 10. Suggested areas and routes that EBS recommends in order to avoid native vegetation.**



**Figure 20. Vegetation and suggested areas that EBS recommends be used for associated infrastructure and roads.**



Figure 21. Scent Factory car parking suggested alternative location (1 of 2).



Figure 22. Scent Factory car parking suggested alternative location (2 of 2).



Figure 23. Produce garden suggested alternative location (1 of 2).



Figure 24. Produce garden suggested alternative location (2 of 2).





Figure 25. New vehicle access suggestion (see Figure 20 for suggested route).



Figure 26. Large, scattered trees (Significant and Regulated) with a non-native understorey, adjacent the main access road.



Figure 27. Native vegetation (not surveyed) adjacent the main access road.



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## **Appendix 18**

*Appendix P of Development Report – Hazard  
management plan*

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# RISK & HAZARD MANAGEMENT MANUAL

Mount Lofty Golf Estate Pty Ltd

September 2022



**MOUNT LOFTY**  
**Golf Estate**

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***Disclaimer***

This information is for guidance only and is not to be taken as an expression of the law. It should be read in conjunction with the relevant legislation.

This review represents an assessment of risk at a point in time. MLGE must conduct its activities in a changing environment due to the dynamics of both the strategic and organisational environments.

The information in this Guide is intended to provide golf course and groundskeeping employers and workers with an overview of the occupational health and safety requirements.

## **PART A: HAZARD MANAGEMENT & WHS ARRANGEMENTS**

### **1. PURPOSE**

The purpose of this Plan is to establish and maintain an effective health and safety management system.

The Mt Lofty Golf Estate (MLGE) is committed to implementing a structured approach to workplace health and safety to achieve a consistently high standard of safety performance.

This plan will assist MLGE in meeting its obligations in accordance with work health and safety legislation.

This plan applies to all officers and workers and to other persons at risk from work carried out at MLGE workplaces.

Please note, an operator for the Hotel has not been agreed. The Risk Hazard Management Plan will be revisited upon the appointment of an operator.

### **2. WORK HEALTH AND SAFETY (WHS) POLICY**

The OHS Policy is a statement that defines the employer's commitment to a healthy and safe workplace. It determines the level of health and safety in the workplace in the same way that commitment to quality determines the quality of the end product or service. It must be communicated to all workers and updated every year for true impact.

The Statement of Commitment and the Implementation of Policy Commitment provide the overarching direction MLGE will follow in pursuit of workplace health and safety outcomes. These commitments are:

#### **2.1. Statement Of Commitment**

MLGE is committed to providing a workplace that enables all work activities to be carried out safely. We will take all reasonably practicable measures to eliminate or minimise risks to the health, safety and welfare of workers, contractors, visitors, and anyone else who may be affected by our operations.

We are committed to ensuring we comply with the Work Health and Safety Act 2011 (the Act). We will also comply with any other relevant legislation, applicable Codes of Practice and Australian Standards as far as possible.

This Hazard Management/ WHS Management Plan and MLGE's WHS Policies and Procedures set out the safety arrangements and principles which are to be observed by MLGE and its workers to ensure compliance with the WHS Act and to provide appropriate mechanisms for continuing consultation and management of WHS matters.

#### **2.2. Implementation Of Policy Commitment**

MLGE is committed to ensuring, so far as is reasonably practicable, the health and safety of its workers (employees, contractors, labour hire workers, outworkers, apprentices, students or volunteers) while they are at work, and that the health and safety of other persons (e.g. visitors) is not put at risk from our operations. This will be achieved by:

- providing and maintaining a healthy and safe work environment through the



implementation of safe work practices, safe systems of work and the provision of safe plant and equipment;

- ensuring that workplaces under the control of MLGE are safe, without risk to health, and have safe means of access and egress;
- routinely consulting in order to maintain effective and co-operative relationships between
- and its workers, and with other duty holders, on health and safety matters in the
- workplace; and
- reviewing, through appropriate mechanisms, the effectiveness of the safety measures taken.

MLGE’s commitment to providing safe and healthy working environments for its workers includes:

- providing relevant, up-to-date WHS information to all workers on matters such as workplace safety and their responsibilities;
- providing expert assistance in WHS matters where necessary;
- providing instruction and/or training in work processes where appropriate;
- developing and implementing strategies which include workplace assessment, hazard identification, and appropriate remedial action to eliminate or control hazards; and
- implementing and maintaining appropriate information, reporting and statistical systems.

### 2.3. Health & Safety Program

An OHS Program is an organised, written action plan to identify and control hazards, define safety responsibilities, and respond to emergencies. The objective of a program is to integrate safety and health into all work practices and conditions.

Here are the components of an OHS program required for workplaces:

- Training and supervision
- Written work procedures
- Hazard identification system
- Workplace inspections
- Investigations of incidents and injuries
- Keeping records and monitoring effectiveness

## 3. DEFINITIONS

Terminology	Definition
Person Conducting a Business or Undertaking (PCBU)	<p>A PCBU has the primary duty of care to ensure, so far as is reasonably practicable:</p> <ul style="list-style-type: none"> <li>• The health and safety of its workers while they are at work, and</li> <li>• That the health and safety of other persons is not put at risk from work carried out as part of the conduct of the PCBU.</li> </ul> <p>MLGE is a PCBU</p>

Officer	<p>It is an officer’s duty to exercise due diligence to ensure that the PCBU complies with its health and safety obligations under the WHS Act.</p> <ul style="list-style-type: none"> <li>• The Members of the Board for MLGE will usually be Officers under the WHS Act.</li> <li>• The General Manager may be an Officer under the WHS Act</li> </ul> <p>Note: A person is an Officer under the WHS Act only if they “make, or participate in making, decisions that affect the whole, or a substantial part, of the business of the corporation; or who has the capacity to affect significantly the corporation’s financial standing”. Whether a person is an Officer or not under the WHS Act will depend on the facts of the particular situation.</p>
Worker	<p>Previously known as ‘employee’.</p> <p>The term worker includes employees, contractors and sub-contractors and their employees, labour hire employees, outworkers, apprentices and trainees, work experience students and volunteers.</p>
Health and Safety Representative (HSR)	<p>A worker elected by members of their work group to represent them in health and safety matters.</p>
Other persons	<p>Includes any visitors</p>

#### 4. RESPONSIBILITIES

As the duty holder, MLGE, being the PCBU, must:

- ensure the health and safety of its workers and others in our workplace
- ensure the health and safety of other persons is not put at risk from work carried out as part of its operations
- provide and maintain a work environment that is without risks to health and safety
- provide and maintain safe plant and structures
- provide and maintain safe systems of work
- ensure the safe use, handling and storage of plant, structures and substances
- provide adequate facilities for the welfare of workers
- provide information, training, instruction and supervision
- monitor the health of workers and the conditions of our workplaces. Specific duties as a PCBU also include:
- record and notify Work safe authorities. of any notifiable incidents arising out of the conduct of the business or undertaking
- ensure authorisations are in place for any high risk work or plant
- consult so far as reasonably practicable with other PCBUs or persons who have a duty in regard to a work health and safety matter
- consult so far as reasonably practicable with workers, their representatives and Health and Safety Representatives on work health and safety matters.

##### 4.1. The Chairperson and members of the Board

The Chairperson and members of the Board, as officers, are responsible for ensuring that complies with any duty or obligation under the WHS Act. This is achieved by these officers exercising due diligence, which means they:

- acquire and keep an up to date knowledge of work health and safety matters
- gain an understanding of MLGE's operations and the hazards and risks involved
- ensure that appropriate resources and processes are provided to enable hazards to be identified and risks to be eliminated or minimised
- ensure that information regarding incidents, hazards and risks is received, considered and responded to in a timely way
- ensure that MLGE has, and implements, processes for complying with its WHS duties and obligations
- verify the provision and use of the resources and processes listed above.

This may include:

- having work health and safety as a standing agenda item for each Board meeting
- integrating WHS laws into everyday business through consultation with Managers and all workers
- developing a work health and safety management system framework, which will be reviewed on a regular basis by the Chairperson and Board members
- ensuring that WHS risk management is incorporated into all business activities and that hazard identification, risk assessment and control is an on-going process, including:
  - development and maintenance of a WHS risk register
  - development and maintenance of WHS policies and procedures
  - ensuring an effective injury/incident reporting procedure
  - ensuring appropriate processes are in place for WHS issues relating to contractor management
  - ensuring that the procurement of any equipment takes into account WHS matters
  - ensuring that regular hazard inspections of the MLGE workplaces occur
  - ensuring that WHS is a standing agenda item at all staff meetings
  - incorporating WHS updates and information into regular reporting provided to the Board by General Managers
  - ensuring that WHS issues are part of all training provided for staff, including induction
  - ensuring that contractors and visitors to MLGE are provided with appropriate and reasonable WHS information at site entry, and
  - ensuring that the work environment is a safe environment.

#### **4.2. General Manager**

The General Manager, (if an officer), is responsible for ensuring that WHS policies and procedures are implemented in the workplace and/or systems of work under their control. As an integral part of their normal duties, the General Manager will:

- consult with their workers on measures to protect their health and safety
- actively follow agreed safety practices and model positive attitudes towards health and safety matters
- arrange for their workers to be instructed in healthy and safe systems of work and procedures and supervise the practice of safe working procedures
- notify the Chairperson and/or other members of the Board of all incidents, hazardous situations, dangerous occurrences or immediate risks to health and safety of any workers
- ensure that all workers are informed of this policy

- undertake consultation with all managers and workers on change that may affect their health and safety
- ensure that WHS is a standing agenda item at all staff meetings
- communicate WHS matters to the Chairperson of the Board.

#### 4.3. Managers and Leaders

Managers and leaders are responsible for providing a workplace that is, as far as reasonably practicable, safe and healthy workplace for workers and visitors, in particular in the areas of their control. This includes:

- modelling health and safety leadership
- demonstrating a commitment to good health and safety performance, by:
- talking about safety at regular meetings
- ensuring safe work procedures are followed
- reporting incidents, hazards and safety concerns promptly
- assessing task risk and not allowing an activity to continue until it can be controlled adequately
- fostering a strong work health and safety culture where worker input is valued
- promoting and implementing the MLGE Work Health and Safety Management System
- actively support the identification of hazards and risks and the management of these
- understand and monitor safety performance objectives
- proactively manage other duty holders (e.g. contractors), when required.

#### 4.4. Workers

Workers must take reasonable care for their own health and safety while they are at work, and take reasonable care that their acts or omissions do not adversely affect the health and safety of other persons. They must comply, so far as they are reasonably able, with any reasonable instruction given by the General Manager, as well as co-operating with any reasonable policy or procedure which relates to workplace health and safety. On a day to day basis, this includes:

- to the extent of the worker's control or influence over working conditions and methods, take reasonable care to work safely
- making sure that the work area safe when leaving it
- make proper use of all appropriate safeguards, safety devices and personal protective equipment
- follow agreed safe working practices and rules
- report all known hazards, accidents and incidents as soon as possible.

It is acknowledged that, in accordance with the Act, a worker may cease, or refuse to carry out work if they have a reasonable concern the work would expose the worker to a serious risk to their health or safety. The Act requires workers who cease work to notify the relevant manager that they have ceased unsafe work as soon as practicable after doing so. It also requires workers to remain available to carry out 'suitable alternative work'. This would not however require workers to remain at any place that poses a serious risk to their health or safety.

#### 4.5. Contractors

Contractors, sub-contractors and self-employed persons are defined as "workers" under the WHS Act if they carry out work in any capacity for MLGE. They are required to:

- comply with the requirements of the WHS legislation
- have in place any work health and safety policies and programs required under State or Territory safety legislation
- consult with MLGE about safety matters and comply with MLGE policies
- work safely and to include the safety of MLGE staff and visitors in their safety plans.

If any staff member believes that a contractor may be engaging in an unsafe work practice, they are required to report this issue to their manager.

#### 4.6. Visitors

Visitors and other persons to MLGE also have responsibilities to abide by our workplace safety rules and procedures. These responsibilities include to:

- take reasonable care for their own health and safety and for the health and safety of other persons
- comply with, so far as they are reasonably able, all reasonable safety directions provided by MLGE staff
- report all safety related incidents to MLGE staff
- ensure the adequate supervision of any accompanying children
- not enter any restricted area without authorisation or escort
- not bring or consume alcohol or illegal drugs at MLGE workplaces
- not willfully or recklessly interfere with MLGE property.

Every individual in a workplace has a direct responsibility for creating a healthy and safe workplace. The responsibility is shared, from owners/ operators through a management team and to all workers.

Below is a sample of OHS responsibilities for quick reference, and states the duties of employees, workers, and other persons:

POSITION	OHS RESPONSIBILITIES
Owner/ Operator and Senior Manager	<ul style="list-style-type: none"> <li>• Provide policy direction and planning</li> <li>• Review control information</li> <li>• Delegate responsibility and authority</li> <li>• Allocate budget</li> <li>• Cooperate with safety committees and representatives</li> <li>• Hold line managers accountable for safe production</li> <li>• Make sure line managers have adequate resources and support</li> <li>• Assist the health and safety committee or representative</li> </ul>
Supervisors	<ul style="list-style-type: none"> <li>• Train operators and others</li> <li>• Supervise workers to ensure safe work procedures are followed correctly</li> <li>• Communicate hazard information and control procedures</li> <li>• Consult with workers on matters of health and safety</li> <li>• Provide feedback to senior executive</li> <li>• Hold accountable those managers, supervisors, and workers reporting to them</li> </ul>
All Workers	<ul style="list-style-type: none"> <li>• Comply with company rules and procedures</li> </ul>

- Wear personal protective equipment as required
  - Use machinery, equipment, and materials only as authorised
  - Follow job procedures
  - Report hazards, unsafe conditions, or actions to your supervisor
  - Report incidents
  - Report all injuries for first aid, no matter how minor
  - Make recommendations on health and safety issues
  - Take worker health and safety concerns to management
- Health & Safety  
Representatives

The OHS responsibilities should be clearly stated to and understood by everyone to which they apply, and they must be set out in an OHS policy where a policy is required.

## 5. CONSULTATION AND COMMUNICATION ARRANGEMENTS

Open communication between workers and managers is important to ensuring a safe workplace. Therefore, workers are encouraged to:

- ask questions relating to WHS
- bring up safety concerns
- make recommendations regarding WHS
- give regular feedback
- become involved in evaluation of safety issues
- participate in any WHS related problem solving process.
- It is important that workers help shape decisions about WHS particularly when:
  - identifying hazards and assessing risks
  - making decisions about ways to eliminate or minimise those hazards or risks
  - proposing business changes that may affect the health and safety of workers
  - purchasing of new equipment or substances
  - developing or changing job tasks or safety procedures.

All workers belong to a work group and are encouraged to raise any work health and safety concerns they may have with their manager and/or Health and Safety Representative. If the issue identified remains unresolved, it should be raised directly with the General Manager.

### 5.1. Health and Safety Representatives (HSR)

HSRs are elected by members of a work group in order to represent the interests of that work group in matters relating to work health and safety. HSRs must undertake approved training to exercise their powers, and may:

- consult with workers on a regular basis
- inspect a work area as required
- participate in workplace accident and incident investigations as required
- participate in any change management discussions that may affect the health and safety of workers
- provide advice to managers on the welfare of workers in their work group.

HSRs cannot exercise their powers under the Act unless they are trained. HSRs are not liable for acts or omissions that are undertaken in good faith. HSRs are not entitled to personal or

medical information about a worker without their consent unless that information is of a general form that does not identify workers specifically.

## 5.2. Health and Safety Committee

Health and Safety Committees provide the forum for the constructive discussion of measures to assure health and safety in the workplace. At the Health and Safety Committee will meet quarterly and:

- facilitate co-operation between the PCBU and workers in the instigation, development and implementation of WHS policies and procedures
- assist in developing standards, rules and procedures relating to health and safety
- consult with workers regarding their WHS concerns
- consult with management regarding worker WHS concerns including change that may influence WHS more broadly
- ensure the conduct of regular workplace inspections.
- ensure that the minutes of the latest Health and Safety Committee meeting will be made available for all workers to review.

## 6. TRAINING

The General Manager will conduct a training needs analysis and arrange for appropriate WHS training to be undertaken by workers as required.

Where required, MLGE workers are to demonstrate their competencies to perform required tasks safely. In tasks with a high potential for injury, a separate documented assessment of a person's competency may be undertaken.

As a guide, competency assessments should be signed and dated by the assessor/assessed and contain the following elements:

- task or equipment description
- information on licenses held (or other relevant qualifications)
- a checklist containing the essential competencies that were demonstrated, and
- comments or confirmation that the competency was met.

MLGE is committed to developing a suite of competencies to deal with all safety sensitive work tasks.

## 7. WHS RISK ASSESSMENT

The purpose of any WHS risk assessment is to ensure that, for any identified hazards, appropriate control measures are implemented in order to protect workers, contractors and visitors from risks to their health, safety and welfare.

Control measures for WHS hazards should be implemented as required using the following hierarchy of control, in order of preference these measures relate to:

- elimination (removal of the hazard)
- substitution (substitute the hazard for something which is less hazardous e.g. replace a hazardous chemical with one which is not hazardous)
- isolation (isolate the hazard from people e.g. place a noisy piece of equipment in another location)
- engineering (e.g. guarding on machinery)

- administrative (e.g. provision of training, policies and procedures, signage)
- personal protective equipment (e.g. use of hearing , eye protection, high visibility vests).

Outcomes of risk assessments will be documented and the control measures reviewed at least annually or earlier should a task or activity be the subject of a WHS incident or a change of process or requirement. Current risk assessments will ensure that MLGE achieves the goal of eliminating or minimising the risk workers may be exposed to.

## 8. RIGHT OF ENTRY

A WHS permit entry holder must also hold a current Fair Work Act 2009 entry permit. Their WHS entry permit and photographic identification must be available at all times for inspection. Where there is a suspected workplace WHS contravention, a permit holder is not required to give prior notice. However, as soon as reasonably practicable they must give notice of their entry and the suspected contravention to MLGE or the person with management or control of the workplace.

The permit holder may, in relation to the suspected contravention, inspect any work system, plant substance or structure; consult with MLGE and its workers; be allowed to inspect and make copies of relevant documents (unless to do so would contravene a State or Commonwealth law); and warn any person of a serious risk to health and safety if immediate or imminent.

Otherwise a permit holder is required to give at least 24 hours' notice (and no more than 14 days) to the MLGE before entering a workplace to consult on WHS matters or provide advice on those matters to relevant workers.

MLGE must not, without reasonable excuse, refuse or unduly delay a permit holder's entry into a MLGE workplace or obstruct them from exercising their rights under the WHS Act.

The permit holder must not intentionally and unreasonably delay, hinder or obstruct any person or disrupt any work at a workplace or otherwise act in an improper manner.

## 9. WHS ISSUE RESOLUTION

Wherever possible, any WHS concerns will be resolved through consultation between workers, their representatives and/or their manager. If the concern cannot be resolved, then it can be referred to the General Manager for resolution. Ultimately any issue remaining unresolved may be referred to the Board. Where the issue remains unresolved the default procedure for issue resolution set out in the WHS Regulations must be followed.

If reasonable efforts have been made to resolve an issue and it remains unresolved, any party to the issue can ask Work safe authorities to appoint an inspector to assist in resolving the matter.



## PART B: GENERAL WHS INFORMATION

### 1. EMERGENCY PROCEDURES

An emergency evacuation plan has been developed and this plan, together with a list of emergency contacts, is displayed in the following locations:

- office/ reception
- common areas
- workshops
- sheds
- male toilets
- female toilets

The Emergency Contacts List is at *Attachment 1*. All fire emergency equipment, such as horns, sirens, and fire extinguishers, will be tested by an approved provider every 12 months.

### 2. HAZARD/INJURY/ INCIDENT REPORTING

How to Report a Hazard or Injury or Incident:

All managers and workers including contractors are required to complete an incident form if a hazard/ injury/ incident occurs, and:

- Advise the Department Manager of the incident or injury or hazard
- For recording purposes complete a Hazard/ Injury/ Incident Report Form
- Complete the relevant sections of the form giving details of the incident. The form should be completed even when an injury has not occurred, that is, in the event of a near miss
- All hard copy forms should be signed by the relevant parties
- The Department Manager or their delegate must record all injuries on the injury register

The Hazard/ Injury/ Incident Report form is at *Attachment 2*.

### 3. REPORTING OF NOTIFIABLE INCIDENTS

Any serious incidents or illness must be notified immediately to your Department Manager. After becoming aware that any such incident has occurred, it is the Department Manager's responsibility to report 'notifiable incidents' to the GM and ensure work safety authorities are notified. If you want to claim work compensation you must lodge a claim for work related injury or stress. By law, the club can't refuse your claim and can't dismiss you for making a claim.

Definition of "notifiable incident": 'Notifiable incidents' include the following:

- the death of a person
- a serious injury or illness of a person

Serious injury or illness includes immediate treatment as an in-patient in a hospital; immediate treatment for certain serious injuries; or medical treatment within 48 hours of exposure to a substance

- a dangerous incident

A 'dangerous incident' means any incident in relation to a workplace that exposes a worker or any other person to a serious risk to a person's health or safety caused by incidents such as uncontrolled escape, spillage or leakage of a substance, an uncontrolled implosion, explosion, fire; or uncontrolled

escape of gas or steam.

#### HAZARD/INCIDENT/INJURY REPORTING—SUMMARY FOR THE DEPARTMENT MANAGER

- Ensure that the manager or worker has completed a hazard/incident/injury form.
- Review the incident with the manager or worker to determine if any actions need to be taken to eliminate or minimise the risk of the incident or hazard recurring.
- Complete the injury register.
- If the incident results in a death, serious injury or illness or a dangerous incident, notify Work Safety authorities immediately.
- Maintain records of all the above.

#### 4. FIRST AID

##### Definitions:

- First aid is the immediate treatment or care given to a person suffering from an injury or illness until more advanced care is provided or the person recovers.
- First aid officer is a person who has successfully completed a nationally accredited training course or an equivalent level of training that has given them the competencies required to administer first aid.

MLGE has in place the following first aid procedures, as required by First Aid in the Workplace Code of Practice

- The appointment and training of First Aid Officers (FAO)
- The provision of first aid kits within the workplace
- Clear signage with the name of the FAO and the location of the first aid kits
- The provision of a suitable first aid kit in all MLGE vehicles. It is the FAO's responsibility to ensure that the contents of all first aid kits are maintained

##### First Aid Officer Training:

- The minimum level of training for a FAO is the Senior First Aid Certificate (or equivalent)
- Refresher training should be undertaken every three years.

##### First Aid Officer Responsibilities:

- The FAO is approved to render first aid assistance in the workplace.
- The FAO should ensure that they do not administer first aid services beyond their level of training.

- > A record of any first aid treatment given should be kept by the FAO and reported to the Department Manager on a regular basis to assist with reviewing first aid arrangements.

Contact details for MLGE FAOs are displayed on all noticeboards.

#### FIRST AID—SUMMARY FOR THE DEPARTMENT MANAGER

- Ensure that a First Aid Officer (FAO) has been appointed and trained.
- Keep a copy of the FAO's qualifications.
- Ensure that a first aid kit is provided and maintained by the FAO.
- Advise all managers and workers of the name of the FAO and the location of the kit.
- Place a sign on the wall where the kit is located.

- First Aid in the Workplace Code of Practice [[link here](#)] available on the Work safe authorities. website.

## 5. WHS TRAINING AND INDUCTION

### 5.1. Training

MLGE is committed to providing appropriate training to ensure workers have the skills and knowledge necessary to fulfil their WHS obligations. WHS training is a fundamental requirement for MLGE to achieve a safe workplace. The WHS training needs for MLGE will be determined in consultation with managers and workers, as well as through review of the WHS Risk Register, however it can be generally categorised into three kinds:

- Generic WHS Training—skills and knowledge which is commonly required, e.g. induction training, WHS risk management training, evacuation procedures.
- Risk Specific WHS Training—training required for those persons conducting activities with a specific risk to health and safety or a verification activity, e.g. first aid training, hazardous substances training, manual handling training, confined spaces training, working from heights.
- Task Specific WHS Training—skills and licensing which are required depending on the specific hazards and risk, e.g. any farm equipment operation, high risk work licenses such as for driving forklifts, cranes.

### 5.2. Documentation for Training

Training records shall be maintained as evidence of training delivery and assessment of competence.

### 5.3. WHS Induction

All new managers and workers are required to be provided with WHS information regarding the workplace as part of their overall induction and introduction to MLGE. A thorough WHS induction process assists new staff to feel welcome, become integrated into the organisation and ensure that they are able to work safely.

The WHS Induction Checklist at **Attachment 3** should be used in conjunction with the general induction training program for land workers to ensure that all new workers are aware of the WHS systems, policies and procedures in place within MLGE.

### 5.4. Procedure

The Department Manager must ensure a WHS induction is provided on the new team leader or worker's first day. If the Department Manager is not available, he or she should organise for a replacement to conduct the induction. The Department Manager must:

- use the attached WHS Induction Checklist (Attachment 3) to ensure that all WHS issues are covered
- on completion of the induction, sign the checklist and ensure that the new worker also signs
- file a copy of the induction checklist on the worker's file
- provide the new worker with access to this WHS Management Plan and the WHS Policies and Procedures Manual. A new Department Manager will be inducted by the outgoing Manager or a Board Member.

### 5.5. WHS Induction for Contractors/ Visitors

All contractors/ visitors should be provided with a Safety Briefing prior to entering the MLGE premises.

All contractors/ visitors must sign in and be provided with a copy of the MLGE Safety Briefing Handout to read, and to then sign, acknowledging that they have read and understood the information. These documents are included at **Attachment 4**.

### 5.6. Detailed WHS Induction for Contractors

For contractors (e.g., trade persons) the requirements for induction will depend on the work to be undertaken and the duration of their stay at the workplace. At a minimum, contractors should be advised of emergency procedures and location of facilities. Refer to Attachment 5. All WHS training provided to managers, workers and contractors should be recorded in the WHS Training Register (Attachment 6). Alternatively, this training register can be incorporated into the overall Staff Development and Training Register which details all professional development and training undertaken by MLGE managers and workers.

## 6. RISK MANAGEMENT AND THE RISK REGISTER

WHS risk management is a systematic process of hazard identification, risk assessment, and risk control with the aim of providing healthy and safe conditions for managers, workers, visitors and contractors at MLGE.

As required by the WHS Act, MLGE has adopted a risk management approach to underpin its WHS Management System. This approach involves all managers and workers in identifying hazards, assessing and prioritising risks, implementing control measures and reviewing how effective the control measures are.

All workers are responsible for assisting in managing the particular risks associated with their specific work environment. Risk management strategies used by MLGE include:

- regular hazard inspections of the MLGE environment
- a comprehensive risk register detailing all WHS risks associated with the operation and activities of the
- documented WHS policies and procedures
- risk assessments of newly purchased equipment
- risk assessments for any change to work processes
- hazard, injury, incident reporting procedures
- incident investigations (at the direction of the Department Manager)

#### Definitions:

- WHS Hazard: Anything which has the potential to cause injury or illness.
- WHS Risk: A WHS risk is the chance of someone becoming injured or ill as a result of a workplace hazard. This significance of the risk is determined by considering the likelihood of it happening and the consequences if it does happen.
- WHS Risk Control: WHS risk control is action taken to eliminate or reduce the likelihood that exposure to a hazard will result in injury or illness to people or damage to property and the environment.

## 6.1. The Risk Management Process

WHS risk management should be undertaken for all activities where there is the potential for harm including:

- before activities commence;
- before the introduction of new equipment, procedures or processes;
- when equipment, procedures or processes are modified.

### Step 1: Identify the Hazard

A hazard is a source or potential source of injury, ill health or disease. Hazard identification is the process of identifying all situations and events that could cause injury or illness by examining a work area/task for the purpose of identifying all threats which are ‘inherent in the job’. Tasks can include, but may not be limited to using tools, hazardous chemicals, dealing with people, and lifting/moving items.

### Step 2: Assess the Risk

Assessing the risk from a hazard determines its significance. Firstly, consider the consequences should something happen; will it cause a serious injury, illness or death or a minor injury. Secondly, consider how likely is this to occur—very likely, not likely at all or somewhere in between? Some of the things to think about include:

- how often is the task undertaken
- how frequently are people near the hazard
- how many people are near the hazard at a particular time
- has an incident happened before
- have there been any ‘near misses’

Use the table below to determine how significant the risk is.

Where a manager, worker, contractor, or visitor to the workplace identifies a hazard, MLGE requires that it is eliminated or reduced in consultation with the relevant stakeholders.

- Step 1: identify the Consequences—or how severely could it hurt someone
- Step 2: identify the Likelihood—or how likely is it for an injury to occur
- Step 3 & 4: identify the Risk Priority Score—to prioritise your actions
- Step 5: apply the hierarchy of hazard control
- Step 6: identify who, how and when the effectiveness of controls will be checked and reviewed

Step 1—CONSEQUENCES How severely could it hurt someone? or How ill could it make someone?— Circle it		Step 2—LIKELIHOOD How likely is it for an injury to occur?—Circle it			
		Very likely, could happen frequently	Likely, could happen occasionally	Unlikely, could happen, but rare	Very unlikely, could happen, probably never will
		L1	L2	L3	L4
Kill or cause permanent disability or ill health	C1	Very high risk (1)	Very high risk (1)	High Risk (2)	Substantial Risk (3)

Long term illness or serious injury	C2	Very high risk (1)	High Risk (2)	Substantial Risk (3)	Moderate Risk (4)
Medical attention and several days off work	C3	High Risk (2)	Substantial Risk (3)	Moderate Risk (4)	Acceptable Risk (5)
First Aid needed	C4	Substantial Risk (3)	Moderate Risk (4)	Acceptable Risk (5)	Low Risk (6)

Step 3: Risk Priority Score Identifies the Necessary Action and Response

Step 3—RISK PRIORITY SCORE	Step 4—ACTION AND RESPONSE
<b>1 = Very High Risk</b>	Stop the activity—immediate action is required to ensure safety—safety measures applied must be cleared by the Department Manager before any activity recommences.  Proceed with caution—immediate reporting of emerging or ongoing risk exposure at this level to the Department Manager for decision is mandatory.
<b>2 = High Risk</b>	
<b>3 = Substantial Risk</b>	Be aware—action required as soon as possible to prevent injury or illness.  Report these risks to the responsible Manager during the current shift or before the next shift.
<b>4 = Moderate Risk</b>	
<b>5 = Acceptable Risk</b>	Do something when possible. Manage by routine procedures.
<b>6 = Low Risk</b>	These risks should be recorded, monitored and controlled by the responsible Manager.

Step 4: Control The Hazards

Control the hazards—the aim is to implement the most reliable controls to create a safe workplace rather than simply relying on people to behave safely, following processes or using protective equipment. In many cases, a combination of several control strategies may be the best solution.

Hierarchy of control strategies (in order of preference):

- eliminate the hazard; remove the equipment from use, dispose of unwanted chemicals
- substitute; use a non-hazardous chemical, use a different machine that can do the same task
- isolation; contain noisy machinery within a booth
- engineering controls; design equipment differently, providing lifting devices to minimise manual handling
- administrative processes; task variation, job rotation, training
- personal protective equipment; gloves, hearing protection, eye protection

Step 5: Review the Process

Continuously review to monitor and improve control measures and find safer ways of doing things.

## 6.2. Documentation for Risk Assessment

The documentation required for a WHS risk assessment will depend on the operation or activity being assessed. The appropriate WHS Risk Assessment Form must be used when undertaking a risk assessment of the various activities of the MLGE. The WHS Risk Assessment Proforma and procedure for conducting an assessment is at **Attachment 7**.

## 6.3. The Risk Register

The risk assessment data collected from identifying, assessing and controlling risks should be documented on a centralised risk register for MLGE. The risk register holds a list of MLGE key risks that need to be monitored and managed. The risk register is to be managed by the Department Manager who should be notified if new hazards are identified and controls implemented so that the risk register can be amended.

The General Manager is responsible for overseeing the Risk Register, and for ensuring that effective control measures are implemented and that risks are monitored and reviewed on a regular basis.

## 7. WORKPLACE HAZARD INSPECTIONS

MLGE is required by WHS legislation to be proactive in identifying hazards in the workplace which may affect the health and safety of its workers and eliminating or minimising the risks arising from those hazards.

In order to ensure a safe and healthy workplace, the Department Manager and/or nominated manager/s accompanied by Health and Safety Representatives (HSRs) should undertake WHS hazard inspections of the workplace regularly and at any other times as required. The hazard inspection should be undertaken by following the principles of WHS risk management and using the attached information and checklists (**Attachments 8 and 9**).

If any hazards are identified through the hazard inspection process, controls must be implemented to ensure that the risk to health and safety is eliminated or minimised.

In addition to these regular inspections, all managers should also conduct weekly hazard inspections of their work sites in conjunction with HSRs. Any hazards noted during these inspections should immediately be reported to the Department Manager and appropriate remedial action taken.

All hazard inspection documentation should be filed by the Department Manager.

## 8. PURCHASING

Prior to purchasing any goods or services for the workplace, they should be assessed to determine if there are any associated health and safety hazards. This includes the purchase of equipment such as machinery, tools, furniture, chemicals, as well as contracted services such as maintenance.

## 9. RECORD KEEPING

The General Manager should see the retention of all WHS and workers compensation documents. These documents are required to be filed for 30 years in safe storage accessible only to authorised personnel in accordance with the Privacy Amendment (Enhancing Privacy Protection) Act 2012 (Cth).

## 10. DOCUMENTS TO BE DISPLAYED

- Emergency contacts page (Attachment 1)
- Emergency Evacuation Plan
- Return to Work Policy
- Work Health and Safety Policy
- Accident/Incident Notification details
- Compensation and Return to Work information

## 11. IMPORTANT CONTACT NUMBERS

Contact details to be provided upon the appointment of an operator.



## PART C: SPECIFIC WHS REQUIREMENTS

### 1. ASBESTOS

It is highly likely that the premises to be occupied by MLGE were built before 31 December 2003 and therefore, there is a requirement for MLGE To comply with these measures outlined including an asbestos management plan and asbestos register. Do not repair or conduct work on any building without first checking the asbestos register. A sample register is included at **Attachment 10**.

### 2. INAPPROPRIATE BEHAVIOUR

Bullying, harassment, discrimination and violence of any form will not be tolerated at MLGE.

MLGE undertakes to investigate all complaints formally made and will take action to resolve the complaint. If the complaint is found to be valid, action may include any combination of the following:

- Asking for an apology
- Creating an agreement with the offender that will stop the behaviour of concern
- Conciliation/ mediation conducted by an independent/ impartial third party to seek a mutually acceptable solution
- Disciplinary action in the form of verbal, written or final warning or dismissal
- All violence will be reported to the police.

In determining the action to be taken, the following factors will be considered:

- Severity and frequency of the behaviour
- Whether there have been previous incidents or prior warnings.

### 3. CONTRACTORS

MLGE is committed to ensuring that all workers under its control, including contractors and sub-contractors have a safe and healthy environment in which to perform their duties.

Contractors are likely to be workers employed by MLGE to undertake a specific task; the delivery/ pickup of goods, tradespeople undertaking repair or maintenance work within the MLGE workplace. In order to achieve this objective, it is recognised that contractors need to be:

- suitably experienced to perform the tasks
- in possession of all necessary licenses, permits, registrations and insurance required to perform the works safely and in compliance with appropriate regulations
- notified of any potential hazards associated with the location or use of the area where the works are to be carried out
- made aware of MLGE emergency procedures

If reasonable, and if the work will involve high risk tasks, have completed the Detailed WHS Induction Checklist for Contractors (**Attachment 5**).

All contractors must abide by WHS requirements which will be advised to them before engagement.

#### 4. DANGEROUS GOODS AND HAZARDOUS SUBSTANCES

Hazardous substances are chemicals, organic matter and other substances which pose a health risk when people are exposed to them. These may include glues, paints, solvents, corrosives, adhesives, thinners, cleaning solutions, chemicals, flammable and Dangerous Goods. Dangerous goods are hazardous substances that are also explosive or flammable in nature with storage required that is fit for purpose.

All chemicals will be included in the hazardous substances register and have their current Safety Data Sheet (SDS) present for each chemical on the register. All workers shall have access to information about the chemicals in the event of a spillage or exposure, even where MLGE workers would not normally use the chemicals directly. Quantities of hazardous substances stored for use shall be kept to a minimum.

A hazardous substances register will be developed to record any substances purchased or used by the MLGE (see **Attachment 11**). This will be reviewed on a regular basis.

#### 5. ELECTRICAL SAFETY

Failure to maintain electrical equipment in a safe condition, or to use equipment in accordance with manufacturer's instructions may result in injury or death to workers or other parties.

All electrical equipment must be protected from damage, used safely and checked regularly. In addition, there are other requirements that must also be implemented for 'specified electrical equipment'. These requirements include combinations of testing and recording and connection to safety switches.

Regular inspection and testing of in-service electrical equipment by a competent person is a way to ensure this safety duty is met. The WHS legislation requires that electrical equipment is inspected and tested in accordance with Australian Standard 3760: 2010 In-service safety inspection and testing of electrical equipment. Only authorised electrical personnel are to perform installation, inspection, testing and labelling activities.

##### 5.1. Testing Frequency

The frequency of inspections that are outlined in Section 2 of the Standard, AS/NZS 3760:2010 are recommended but can be varied subject to a risk assessment. The Australian standard includes a table that sets out testing and inspection intervals for various types of equipment from 3 months (for equipment that is high use, high risk, or hire equipment) to up to 5 years (for equipment that is not open to abuse, flexing of cords, etc). In addition to the regular testing and inspection, the standard specifies that electrical equipment is to be inspected and tested:

- before return to service after a repair or servicing, which could have affected the electrical safety of the equipment, and
- before return to service from a second-hand sale, to ensure equipment is safe.

Generally, the following should be followed:

- tools and leads: every 12 months (low use)
- Safety Switches: monthly
- Offices: every 3 to 5 years

## 5.2. Residual Current Devices

The fitting of Residual Current Devices (RCD) on certain equipment can considerably reduce the risk of electrocution. An RCD (also known as a safety switch) works by detecting a current leakage. When RCD detects this current leakage, it turns the power off almost immediately. Whilst an electric shock may still be received, the duration will be shortened reducing the risk of serious injury.

## 5.3. Unsafe Equipment

Equipment that may be unsafe should be withdrawn immediately from service and have a label attached warning against further use. Arrangements should be made, as soon as possible, for such equipment to be disposed, destroyed, or repaired by an authorised repair agent or competent person.

The MLGE Electrical Safety Policy provides further information in relation to this workplace hazard and its management. This Policy is included in the WHS Policies and Procedures Manual.

## 6. CONFINED SPACES

All confined spaces are placarded with access strictly controlled. Entry requires the issue of a confined spaces permit on each occasion. No employee or contractor will be issued a permit to work in any confined space on the property unless they are trained and supervised. When working in a confined space a trained bystander must be present at all times. A register of identified confined spaces and entry permits is maintained at the office.

## 7. FALLS FROM HEIGHT

There is a risk of serious injury from falling when working above ground height. No worker will work at height without ensuring that ladders, steps and handrails are secure or fall prevention/arrest harnesses are in place. These structures include, but are not limited to:

- Overhead fuel, water tanks and windmills
- Buildings and roofs
- High machinery; cherry pickers, trucks and trailers.

MLGE will ensure that:

- Workers working at height are made aware of the hazards and risk management procedures
- Fall arrest or fall prevention harnesses are provided and used
- Workers are instructed in the correct use of fall prevention or fall arrest harnesses. Contractors will ensure that they:
  - Observe and apply risk management procedures when working at heights
  - Use the required personal protective equipment (PPE) where indicated.

## 8. MANUAL HANDLING

Manual handling is any task that requires you to push, pull, lift, carry, move, hold or lower any object, person or animal. Manual tasks include tasks that have repetitive actions, sustained postures and may involve exposure to vibration. The types of injuries related to manual handling include repetitive strain injuries, muscle injuries, tendon and ligament injuries, bone injuries and injuries from falling objects.

Manual handling hazards are managed at MLGE by a risk management process in order to prevent or minimise the risk of injuries caused by manual tasks.

The process involves conducting a risk assessment on manual tasks carried out in the workplace, working out how to address any problems, choosing and implementing appropriate solutions, and following up to check that the solutions work.

Examples of manual handling tasks in the MLGE environment include:

- lifting and moving equipment
- general repairs

Preventing Manual Handling injuries

- decide what changes can be made to reduce the risks of injury. If possible, select permanent changes (such as workplace layout, tools and equipment)
- avoid double handling of items
- provide mechanical aids (hoists)
- redesign the task (such as rotating workers)
- identify changes that are possible immediately, and those that may take time to implement
- document your risk control decisions for each task assessed, and set timelines for changes
- trial the changes in consultation with workers before making them permanent
- provide training if new equipment is introduced.

When loading/unloading vehicles

- use lift equipment wherever practicable, otherwise
- prepare by stretching and warming up, especially after prolonged sitting in the vehicle
- slide the item as close as possible to you before lifting
- keep you back straight and bend your knees when lifting
- put loads down in the same manner in which they were picked up
- where possible store frequently used items at a suitable height; between waist and shoulder height, which reduces the need for forward bending when lifting, and
- whenever possible use trolleys for moving larger and heavy items

## 9. PLANT AND EQUIPMENT

The definition of plant encompasses hand tools either powered or non-powered (electric drills, hammers) and extends to farm machinery, office furniture and any other equipment used for work purposes.

### 9.1. Risk Management

A risk management process is a systematic method for making plant as safe as possible and can also be incorporated into other workplace risk management systems. This risk management approach should be undertaken before purchasing of, or alterations to plant, changing the way it is used, relocating it, or if additional health and safety information becomes available.

### 9.2. Maintenance and repair

Plant must be maintained and cleaned following the procedures recommended by the designer or manufacturer or by a competent person. Only a competent person may inspect

and repair damaged plant.

Unsafe and/or malfunctioning plant and equipment can be identified by any manager, worker or contractor by a number of methods such as:

- equipment inspections;
- verbal reporting of equipment malfunction to the appropriate manager
- hazard and incident reporting.

Once identified, the unsafe or malfunctioning plant/equipment should be reported to the appropriate manager in order for repair to be organised. Plant/equipment which has been identified as unsafe should be disconnected from the power supply and clearly labelled as unsafe and not be used. If possible the plant/equipment should be moved to a location where it is not accessible.

### 9.3. Record Keeping

Records of inspection, testing and monitoring are required to be maintained by . As a minimum, records should include details of inspections, maintenance, repair, calibration and alteration of plant.

## 10. PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment (PPE) may be required to protect managers and workers during general, specific and hazardous tasks. PPE is the least effective way to control risk and is always the last resort to protect workers. The types of PPE used at MLGE might include:

- respirators and masks
- foot protection (safety shoes and boots)
- body protection (high visibility clothing, long sleeves, wide brimmed hats, gloves)
- helmets
- any substance used to protect health, for example, sunscreen.

If required, workers are obliged to use PPE when required and when reasonably practicable. Other requirements include:

- workers should be fully trained in the safe use, storage and maintenance of PPE
- PPE must be checked before use for the correct type, fit and undamaged
- do not reuse disposable, contaminated or damaged PPE
- store PPE correctly.

## 11. SLIPS, TRIPS AND FALLS

Slips, trips and falls are one of the major types of accidents in workplaces and may be due to poor housekeeping practices such as water or oil spilt. Material placed untidily or using walkways for storage can also be a cause of these types of incidents. When assessing the potential for slips, trips and falls, make sure you look at out of sight areas such as storage rooms, stairways and workshops.

### 11.1. Prevention

Reduce the risk of injury by following these guidelines:

- avoid walking on slippery floors
- keep floors free of water and grease

- clean floors regularly
- post warning signs around spills or wet floors
- install non-slip tiling or other non-slip floor products
- use rubber mats in areas where the floors are constantly wet
- use non-slip footwear
- clean up spills immediately
- install adhesive strips and slip resistant paint to improve slip resistance. The best method will depend on the existing floor surface.
- use floor cleaning products to remove oil and grease.
- agree on written standards with contract cleaners to ensure that any cleaning agents leave the floor in a non-slip condition.
- use storage areas for equipment and be alert to the dangers of leaving boxes, rubbish, bags and furniture in walkways, entrances and exits.

## 12. DRUGS AND ALCOHOL

maintains the right to refuse work to any worker or contractor who, in the opinion of MLGE management, is in an unfit state to perform their work in a safe manner. To assist in these requirements, workers, contractors and visitors shall observe that:

- No alcohol may be consumed or permitted on property at any time unless expressly authorised by management and only when work is completed for the day
- No illegal drugs shall be consumed or permitted on property at any time or under any circumstance
- If, in the opinion of management, a worker is unfit to work safely, they will be sent/taken home
- Workers who are taking prescription medication that may affect their safety at work (that cause drowsiness), are to inform management of the circumstances so that appropriate duties may be assigned.
- MLGE encourages all employees not to smoke. Please do not smoke in any vehicle, tractor or building.

## 13. UV RADIATION

Ultraviolet radiation (UV) exposure can cause sunburn, skin and eye damage and skin cancer. UV protective clothing, hats, sunglasses and SPF 30 sunblock will be provided as PPE and are required to be worn for outdoor tasks.

## 14. VEHICLES

### 14.1. Alcohol and Drugs

MLGE managers and workers must not drive a personal or MLGE vehicle on work related business in circumstances where that member would breach applicable road transport law by driving under the influence of alcohol or drugs.

### 14.2. Licenses

MLGE managers and workers who are required to drive a vehicle on work related business must hold a current valid driver's license of the appropriate class and notify the Department Manager if the license is suspended or revoked. A copy of the current driver's license must be provided to the Department Manager or their delegate to be retained on file.

### 14.3. Mobile Phones

The use of a hand-held mobile telephone while driving is a safety risk and is against the law. MLGE managers and workers are not to use a hand-held mobile telephone while driving a motor vehicle or other motorised equipment at a MLGE workplace.

### 14.4. Seat Belts

It is a legal and MLGE requirement that seat belts are worn at all times in a moving vehicle. The driver is responsible for ensuring that all passengers wear a seat belt when the vehicle is in motion on a public road or at an MLGE workplace.

### 14.5. Smoking

Smoking in any MLGE vehicle by either drivers or passengers is prohibited.

### 14.6. Load Restraint in Vehicles

- All equipment in vehicles must be restrained firmly in order to avoid the risk of the items becoming airborne and causing missile injuries in the case of a vehicle collision
- The tension in the load restraining straps should be checked regularly during the journey
- Distribute the load evenly within the vehicle
- Ensure no loose items are within the passenger area as they may become projectiles in the event of an accident. Do not exceed load/ weight capacity of the vehicle.

## 15. WORKING ALONE

The risk of injury or harm for people who work alone may be increased because of difficulty contacting emergency services when they are required. Emergency situations may arise because of the sudden onset of a medical condition, accidental work-related injury or disease, attack by an animal, exposure to the elements, or by becoming stranded without food or water.

The consequences of an incident arising when working alone may be very serious so MLGE managers and workers shall implement the following for each alone work task:

- a telephone call to home base on arrival and departure at a remote work site
- development and approval of trip itineraries for extended trips and adherence to the itinerary
- pre-trip agreement on departure and arrival times and accommodation arrangements
- for travel in remote areas an emergency location beacon should be carried in the vehicle
- pre-arranged mobile/ satellite phone calls at scheduled times
- appropriate first aid kit
- sufficient water for emergency purposes.

## 16. HAZARDOUS SUBSTANCES

Golf course and groundskeeping workers can be exposed to a wide range of hazardous substances in the course of their work, including:

- Fuel, oil, and grease
- Pesticides, fertilizers
- Cleaning materials and disinfectants

- Paint and wood preservatives
- Dust and vapors, including fumes, from engine exhausts, battery charging and welding
- Contact with dead animals or animal waste
- Contact with poisonous plants

These substances may have an adverse effect on health, rather than affect general safety. Some of those effects include skin irritation, asthma, loss of consciousness, cancer, and infection.

To protect workers from these hazardous substances, the employer must:

- Make workers aware of these types of hazards as they exist in the workplace
- Eliminate the hazard if possible
- Instruct workers on how to best protect themselves if the hazard cannot be eliminated, including the appropriate personal protective equipment (PPE)

### **16.1. First Aid**

To save precious seconds in an injury emergency, adequate first aid supplies and trained workers should be readily available. Ensure that your workplace meets the first aid requirements to help treat workers in the event of minor or major injuries on the job.

### **16.2. Keeping records**

Record keeping may not be foremost in the mind of an employer or worker during an emergency, but it is important. Here are some items to consider recording:

- Date and time the injury/ illness occurred and when it was reported
- Where the injury occurred
- The cause of the injury/ illness
- The worker's full name, age, and position
- A brief description of the injury/ illness and first aid rendered (if any)
- Transportation arrangements made (if any) to treat the worker
- Names of any witnesses
- Name and signature of the first aid attendant

### **16.3. First Aid - Communication**

It is critical that workers know where to go for first aid in case they suffer an injury or illness. Signs showing the location of first aid supplies and services must be posted in conspicuous areas of the workplace.

Ensure your workers are aware of the:

- Location of first aid kits (and first aid rooms, if any)
- Names and locations of certified first aid attendants
- Emergency procedures
- Emergency phone numbers

Post this information in a conspicuous area such as break room, cafeteria, or restrooms, and follow up with verbal communication as often as is necessary.

### **16.4. In summary**



1. Ensure that the appropriate number of workers hold valid emergency, standard, or advanced first aid certificates from recognised training agencies.
2. Keep a record of all injuries - even minor and note any first aid care that was given.
3. Ensure that First Aid service is accessible to all workers during all working hours.
4. Ensure that transportation is always available to transport an injured worker.
5. Ensure workers understand the need for first aid kits; that the kit is adequate for the number of workers and located in the current work area.

## 17. EQUIPMENT

Golf course and groundskeeper workers may use a wide range of equipment in the course of work, including:

- Golf cars
- Commercial mowing equipment, push mowers
- Leaf blowers, edgers, trimmers
- Chainsaws
- Aeration and irrigation equipment
- Powered and non-powered tools

Powered machinery and equipment are often designed to move fast and be powerful enough to cut, crush and alter many kinds of materials. Naturally, the human body is no match for this type of machinery and equipment. Workers need to know the hazards and be trained to recognize and avoid the dangers for each piece of equipment and machinery.

### 17.1. Employers need to ask the following questions:

- Are workers aware of hazards of all equipment and machinery they are using?
- Is all equipment and machinery maintained in safe working condition, and are all safety features working properly?
- Do workers inspect the tools, equipment, or machinery before each use?
- Do I have safe work procedures in place and are they being followed and enforced?
- Are workers trained in the safe operation of the equipment and machinery and can they demonstrate their knowledge?
- Do workers report any concerns regarding defective or unsafe tools, equipment, or machinery?

### 17.2. What about ROPS?

ROPS (Roll Over Protective Structure) is a cab or frame that provides a safe environment for the driver of a vehicle or other powered mobile equipment (i.e., Tractor) in the event of a rollover. ROPS must pass a series of crush tests and meet standards\*. Having a homemade bar attached to the vehicle's axle, or simple sunshades, is not adequate to protect the operator if the vehicle overturns.

ROPS are required for the following equipment:

Agricultural, construction, earthmoving, forestry, and industrial machines including:

- Crawler tractors, loaders, tree harvesters, skidders, and forwarders;
- Wheeled dozers, loaders, skidders, and forwarders;
- Motor graders, tandem rollers, and compactors;

- Self-propelled wheeled scrapers;
- Agricultural and industrial tractors; and
- Off-highway equipment;
- Any other equipment designated by the Director of OHS as requiring ROPS.

### 17.3. Seatbelts

Additionally, any vehicles or equipment in your workplace that is required to have ROPS must also be equipped with seatbelts for operators and passengers that meet relevant standards.

However, it is not enough to simply equip the vehicles – seatbelts must be worn! This further ensures that operators and passengers are fully protected in the event of a rollover.

### 17.4. Cages

When workers are exposed to the danger of being struck by airborne golf balls, the employer is required to provide appropriate protective equipment. Oftentimes, the most appropriate protective equipment is a caged barrier around the operator of equipment that is being used on the fairway. The cage must be designed so that a speeding golf ball will not pass through, yet without affecting the operator's visibility.

### 17.5. Mechanical Safety

Unintended contact with moving machinery continues to cause terrible injuries in the workplace. Do not underestimate the power behind a machine or equipment such as mowing equipment, a chainsaw, or trimmer. Section 30 of the Occupational Health & Safety General Regulations outlines requirements with respect to mechanical safety in the workplace, including:

- Safeguarding the moving parts of machinery, properly and always. Do not tamper with the safeguards!
- Ensuring the operator is competent in operating the machinery or equipment.
- Ensuring workers do not wear loose-fitting clothing or jewelry which can become entangled in moving equipment.

Always know and follow the **manufacturer's specifications** of any tool, equipment, or machine, with respect to proper use, training, PPE, and service and maintenance requirements. Be able to provide evidence of training for individual workers and produce a copy of the operator's manual if asked by an OHS Officer.

### 17.6. Personal Protective Equipment (PPE)

When it is impossible to eliminate a hazard entirely (this is always the desired course of action), an employer needs to ensure workers are well protected with appropriate Personal Protective Equipment (PPE). It is the responsibility of the employer to assess each task to determine the correct PPE to be worn by workers. It is then the worker's responsibility to follow the employer's directive and wear the required PPE. Examples of PPE include:

- Hearing protection
- Eye/ face protection
- Head protection
- Hand and foot protection
- Respiratory protection

Workers using PPE must be given pre-job instruction by the employer to understand its use,

limitations, and its maintenance requirements. Always refer to the operator's manual for equipment and machinery to be sure. Workers wearing or using PPE need to test/ inspect the equipment before each use and must not wear it if it is defective.

Here are some general guidelines to follow (refer to the OH&S Act & Regulations for specific requirements):

- Properly fitting, long- or short-sleeved shirts and long pants are best to prevent injury from the sun as well as scratches and bites.
- High-top, lace-up shoes and boots with traction soles and steel-reinforced toes provide support and protection to the workers' toes, feet, and ankles.
- Face shields or goggles protect eyes from dust and flying particles when using chainsaws or brush cutters.
- Wraparound sunglasses with UVA and UVB protection to reduce the risk of cataracts from sun exposure.
- Appropriate hearing protection devices (earmuffs, ear plugs) provide protection from noise produced by equipment.
- Proper respiratory protection may be necessary in extremely dusty conditions or when working with or around chemicals.
- Appropriate head protection is indicated when working under low branches or where there may be a hazard from falling objects (e.g., Cages around mowing equipment to protect from airborne golf balls)
- Gloves should be selected based upon the task to be performed. Various glove styles provide hand protection from hazards such as cuts, scrapes, chemical/ thermal burns, and vibrating equipment.

## 18. HEARING CONSERVATION

According to the World Health Organization, noise-induced hearing impairment is the most common irreversible (and preventable) occupational hazard world-wide. Additionally, Noise creates other safety concerns. It interferes with communication, can mask the sound of alarms (e.g., back-up alarms, smoke alarms), and can increase fatigue and decrease mental alertness especially during prolonged exposure.

The Occupational Health and Safety General Regulations require employers to implement a noise conservation program where its workers are exposed to excessive noise levels\*. If the employer cannot eliminate the noise hazard entirely, efforts must first be made to reduce the noise hazards as much as possible, and finally to provide CSA-approved hearing protection to exposed workers. Be sure to train workers on proper use and care of PPE and appropriately supervise workers to ensure PPE is being properly used.

- The hearing conservation program must consider:
  - how noise levels will be measured
  - how workers will be educated and trained in the program and safe work procedures
  - what types of engineering control are considered and/or used
  - what areas in the workplace are at risk and therefore require warning signs
  - annual hearing tests for workers at risk; how administered and by whom
  - an annual review of the program for changes/ updates.

## 19. ENVIRONMENTAL CONDITIONS

Working outdoors may expose a worker to serious hazards that are not normally considered in an indoor work area.

### **19.1. Hot weather work – Heat stress and sun safety**

Heat stress - Although the human body is very resilient and adaptable, working in a hot work environment can be dangerous. Heat, humidity, and physical exertion are factors that, when combined, can create a hazard to workers. Heat cramps, heat exhaustion, and heat stroke can result.

Sun safety - Workers need to protect themselves from sunburn and possible skin cancer by covering up with lightweight clothing and using sunscreen. Also wearing sunglasses with UVA/ UVB protection is important.

### **19.2. Bites and stings**

Working outdoors in the summer months means having to fend off bees, wasps, stinging ants, mosquitoes, and other pests on occasion. While most of these creatures can be simply a nuisance, a few can deliver painful and even fatal stings or bites. Wearing protective clothing or insect repellent will help prevent stings and bites from insects. Take every precaution possible if a worker is especially sensitive to stings and bites, and ensure that all incidents get reported, no matter the severity of a worker's reaction.

Additionally, there are biological hazards that exist for workers who come in contact with animals. Animal bites or attacks can cause injury and transfer bacteria from the animal to a worker. If a worker is required to remove a dead animal or bird from the workplace, the employer must ensure that safe and non-hazardous removal procedures are in place and that they are properly followed.

### **19.3. Lightning**

Severe weather can be a safety risk to workers who work outdoors. When you see lightning, or think a thunderstorm is on the way, get indoors. If you can't get inside a building quickly enough, find a low spot and crouch down. Never take shelter under a tall tree.

Victims struck by lightning get a bad electrical shock and maybe burns, but they carry no electrical charge and can be moved safely. A person struck by lightning can often be revived by prompt administration of CPR (Cardiopulmonary Resuscitation) and oxygen. Employers must ensure their workers receive lightning safety training.

**PART D: FORMS AND CHECKLISTS**
**ATTACHMENT 1 - Emergency Contacts List**

*(To be displayed in appropriate location/s)*

CONTACTS		PHONE
POLICE (local Department)		
EMERGENCY SERVICES (police, fire and RFDS)		000 Using Land Line 112 Using Mobile UHF Band
UTILITIES - Electrical		
UTILITIES - Gas		
UTILITIES – Sewerage and stormwater		
Doctor’s surgery address:		
Physical site address:		
Adjacent Occupants Contacts:		
First Aid Officer/s: (TBA)		

## ATTACHMENT 2 - Hazard/ Injury/ Incident Report Form

Notifiable incidents must be reported to Work Safe Authorities

<b>PART A: HAZARD/ INJURY/ INCIDENT REPORT (to be completed by the involved worker or manager)</b>			
Is this a <input type="checkbox"/> Hazard report <input type="checkbox"/> Injury report <input type="checkbox"/> Incident (i.e. near miss) report?			
Is this a Notifiable Incident? <input type="checkbox"/> No <input type="checkbox"/> Yes Date Reported to Work safe authorities.:			
Workplace Location:			
Date of Incident:	Date Reported:	Time of Incident:	am
Name of person reporting the incident/ hazard/ near miss (print name):			
Name of person injured (if applicable):			
Nature of injury (if applicable):			
Part of body injured (if applicable):			
Treatment Outcome (If applicable): <input type="checkbox"/> Nil Required <input type="checkbox"/> First Aid <input type="checkbox"/> Medical treatment from GP <input type="checkbox"/> Hospital			
Location of the hazard/ injury/ incident:			
Description of hazard/ injury/ incident:			
How did the hazard/ injury/ incident occur (contributing factors)?			

**PART B: CORRECTIVE ACTIONS (to be completed by the Department Manager)**

What needs to happen? <i>(to ensure that similar incidents do not occur in the future or to minimise the risk from the hazard)</i>	By when?	Person Responsible

**PART C: SIGN OFF**

Person Reporting (print name):	Department Manager (print name):
Signature:	Signature:
Date:	Date:
Contact Phone Number:	Contact Phone Number:

**ATTACHMENT 3 - WHS Induction Checklist For New Workers**

Worker's Name		Position/ Job Title	
Start Date		Supervisor Name	

Introduction		Date completed
	Introduce other staff and the supervisor	
	Introduce the first aid officer and show location of first aid supplies	
	Explain and demonstrate emergency procedures	
	Show location of exits and equipment	
	Show the work area, toilet, drinking water and eating facilities	
	Show how to safely use, store and maintain equipment (tools etc) and hazardous substances (if applicable)	
Work Health and Safety		
	WHS Induction Training Program for Land Workers (complete copy)	
On completion of Safety Induction Training Program confirm the following:		
	Roles and responsibilities of people in the workplace regarding WHS	
	Hazards in the workplace and how they are controlled	
	How to report hazards	
	How to report an injury and the importance of immediate reporting of serious injuries.	
	Consultation about WHS—how they will be kept informed about health and safety issues	
	Injury and Return to Work Procedures	

WHS Induction conducted by:

Person providing the induction (print name):	
Signature:	Date:
Worker's Signature:	Date:



## **ATTACHMENT 4 - Induction For Contractors/ Visitors**

Welcome to Mount Lofty Golf Estate Safety Briefing for Contractors and Visitors

Mount Lofty Golf Estate (MLGE) is committed to ensuring the health and safety of our managers, workers, contractors and all other visitors.

For your safety and the safety of others, it is a condition of entry to this Worksite that you take a few minutes to read this briefing.

### **General Safety Information**

- All visitors are required to report to the main office on arrival.
- Observe any posted speed and parking restrictions.
- Obey all safety signs and barricades.
- Violent, threatening or other unacceptable behaviour is not tolerated.
- Smoking, alcohol and illegal drugs are not permitted on MLGE premises.
- Weapons, including knives, are not permitted on MLGE premises.
- Visitors and contractors intending to bring dangerous goods and/or hazardous substances onto the worksite must declare these at the main office prior to entering the site.
- All hazards, incidents and injuries must be reported to the main office. Injuries will be recorded in the Register of Injuries.
- First Aid treatment is available on site.

### **Emergency Procedures**

In a life threatening emergency DIAL 000 for Fire, Police and Ambulance. In all cases advise a MLGE staff member. Follow directions of MLGE staff in the event of an evacuation.

### **Evacuation Procedures**

When the evacuation alarm sounds:

- Evacuate the building and proceed to the assembly area identified on the site map.
- Remain in the assembly area until advised otherwise.

### **Contractors**

All contractors are to report to the main office to:

- Indicate the location and duration of the job
- Sign in/ out of MLGE Visitor Register
- Advise of the status of the job before leaving the site
- Remove all job and personal rubbish

Additionally, the contractor may be required to:

- Produce a copy of their Safety Management Plan, including use of personal protective equipment and controls for site specific hazards, including signage and removal of job and personal rubbish.
- Produce Public Liability Insurance documentation before work is commenced.
- Complete a Prohibited Employment Declaration concerning tasks requiring specific training or licenses.

**CONTRACTORS/ VISITORS/ SIGN IN SHEET**

IN		CONTRACTOR/ VISITOR DETAILS							OUT	
DATE	TIME	NAME	ADDRESS/ ORGANISATION	PERSON VISITED (or purpose of visit if Supplier or Contractor)	Safety Briefing Information provided	Signature of Contractor/ Visitor/ acknowledging Safety Briefing	INSERT SHORT ORG NAME HERE representative signature		TIME	
	am/pm								am/pm	
	am/pm								am/pm	
	am/pm								am/pm	
	am/pm								am/pm	
	am/pm								am/pm	
	am/pm								am/pm	
	am/pm								am/pm	
	am/pm								am/pm	
	am/pm								am/pm	

## CONTRACTORS/ VISITORS SIGN IN INSTRUCTIONS

All contractors and visitors must be provided with a Safety Briefing prior to coming onto the worksite. Upon arrival to the front office, ensure that:

- a laminated copy of the MLGE Safety Briefing is given to any contractors or visitors who will be coming onto the site.
- verbal advice is given regarding evacuation procedures.
- an extra map of the worksite is provided to the contractor/ visitor, showing the facilities (e.g., toilets), evacuation routes and assembly points.
- the contractor/ visitor is advised to report any hazards, incidents, or injuries to the front office immediately.
- the contractor/ visitor is advised where they can seek first aid treatment, if required.

The contractor/ visitor is required to sign the Sign In sheet acknowledging that they have read and understood the MLGE Safety Briefing.

**ATTACHMENT 5 - Detailed Whs Induction Checklist For Contractors**
**1. Contract Details**

Contract Name:  
 Contract Duration Dates:            to  
 Contractor Name:  
 Contact:  
 Contractor Representative:  
 Work area to be Inducted:

**2. Information Checklist**

<b>Contractor qualification/ license:</b>	
Contractor qualification/ license and public liability/workers compensation cover provided	Yes
<b>Safe Work Method Statement (SWMS):</b>	
Safe Work Method Statement (SWMS) document/s with risk assessment and detailed controls (may be detailed in an attachment) sighted and discussed with the Department Manager	Yes (work will not commence until sighted)
<b>Site Induction:</b>	
Provided with MLGE contact numbers: Emergencies	Yes
First aid requirements discussed	Yes
Accident/ incident & hazard reporting procedures for MLGE discussed	Yes
Emergency procedures at MLGE discussed	Yes
Discuss building access requirements/ hours of work	Yes
Identification of restricted access areas	Yes
Discuss vehicle access to work site	Yes
Advised of MLGE Alcohol/ Drugs and Smoking policies	Yes
<b>Consultation - discussion and agreement reached with contractor regarding:</b>	
Asbestos management plan viewed	Yes
Location of any barricades to be erected	Yes
Access to electricity/ use of extension leads	Yes
Contractors tools tested & tagged	Yes
Delivery/ Storage/ Removal of building waste	Yes
Storage of building material	Yes
Excavation sites	Yes
Lock out procedures for plant and equipment	Yes
Disconnection of utilities	Yes
Impact on fire alarm/smoke detection systems	Yes
Noise control measures	Yes
<b>Chemicals (If Applicable)</b>	
Will chemicals be used on the job?	Yes
Safety Data Sheets for the chemicals being used are provided?	Yes
<b>Hot Work (If applicable) A hot works permit is required for welding, soldering, or other related heat or spark producing operations.</b>	
Is the fire alarm system isolated or turned off?	Yes
Is a hot work permit required and supplied to the worksite?	Yes
Will additional firefighting equipment be located next to the work site?	Yes

<b>Working at heights (if applicable)</b>	
Has a contractor completed a working at height safety training?	Yes
Are procedures detailed in the safe work method statement?	Yes
<b>Working in a confined space (if applicable)</b>	
Has the contractor completed confined space safety training?	Yes
Are procedure detailed in the safe work method statement	Yes

### 3. Sign-Off

By signing this form I, the undersigned, agree that: <ul style="list-style-type: none"> <li>➤ I have participated in and understood the WHS Induction.</li> <li>➤ I agree to abide by the safety policies and procedures identified above whilst working for MLGE</li> </ul>			
Responsible MLGE staff member		Date	
Contractor Representative		Date	

## ATTACHMENT 6 - WHS Training Register

Publication: August 2022

Revision: September 2022

This training register records the work health and safety (WHS) training undertaken by managers and workers, as required by the WHS Act 2011. Training can take place by a supervisor on-the-job, or by an instructor outside of the workplace. WHS training will provide workers with the information and skills they need to perform their duties without risk to their health and safety.

Recognises that WHS training may be required when:

- a new person starts work—induction, on the job training
- new machinery/ equipment or hazardous chemicals, products or other things are introduced to the workplace
- a worker's job change
- there are new work health and safety regulations that affect our industry
- there has been an incident/ near miss or injury at work.

To ensure the training was successful, MLGE will annually review WHS training to ensure that our managers and workers:

- understand what is required of them
- have the knowledge and skills needed to work safely and without risk to their health and safety
- are actually working as they have been trained.

Additionally, MLGE will use this register as part of regular overall reviews of the WHS management system with the goal of determining if:

- there has been any improvement in health and safety performance
- the feedback from people who have been trained
- further information and/or training needed
- whether the most suitable training method was used
- improvements that can be made.

Training records will be monitored so that refresher training can be given when needed.

### WHS TRAINING REGISTER

Who was trained/ job title	Reason for training	Duration of training	Who provided training	Method of training e.g. on the job, theory, practical	Location of training	Scheduled date	Date completed

## ATTACHMENT 7 - WHS Risk Assessment Proforma

<b>Workplace location:</b>	
<b>Name and position of person/s conducting assessment:</b>	
<b>Date:</b>	

Serial	Hazard Identification		Risk Assessment		Risk Control			Review	
	What is the Hazard?	What injury, illness or consequence could occur?	List any Control Measures already implemented	Risk Level	Describe what can be done to reduce the harm further	Whom Responsible	When By	Are the Controls Effective? (Revised Risk Score*)	Date Finalised

### Conducting A Risk Assessment

Step 1: Identify the Consequences - or how severely could it hurt someone
Step 2: Identify the Likelihood - or how likely is it for an injury to occur
Steps 3 & 4: Identify the Risk Priority Score - to prioritise your actions
Step 5: Apply the hierarchy of hazard control
Step 6: Identify who, how and when the effectiveness of controls will be checked and reviewed



Step 1 - CONSEQUENCES How severely could it hurt someone?		Step 2 - LIKELIHOOD			
		Very likely, could happen frequently	Likely, could happen occasionally	Unlikely, could happen, but rare	Very unlikely, could happen, probably never will
		L1	L2	L3	L4
Kill or cause permanent disability or ill health	C1	Very high risk (1)	Very high risk (1)	High Risk (2)	Substantial Risk (3)
Long term illness or serious injury	C2	Very high risk (1)	High Risk (2)	Substantial Risk (3)	Moderate Risk (4)
Medical attention and several days off work	C3	High Risk (2)	Substantial Risk (3)	Moderate Risk (4)	Acceptable Risk (5)
First Aid needed	C4	Substantial Risk (3)	Moderate Risk (4)	Acceptable Risk (5)	Low Risk (6)

Step 3 - RISK PRIORITY SCORE	Step 4 - ACTION AND RESPONSE
1 = Very High Risk	Stop the activity - immediate action is required to ensure safety—safety measures applied must be cleared by the Department Manager before any activity recommences. Proceed with caution - immediate reporting of emerging or ongoing risk exposure at this level to the Department Manager for decision is mandatory.
2 = High Risk	
3 = Substantial Risk	Be aware - action required as soon as possible to prevent injury or illness. Report these risks to the responsible Manager during the current shift or before the next shift.
4 = Moderate Risk	
5 = Acceptable Risk	Do something when possible. Manage by routine procedures.
6 = Low Risk	These risks should be recorded, monitored and controlled by the responsible Manager.

### CONTROLLING THE RISKS—THE HIERARCHY OF CONTROL

Once the risk assessment process has been completed, those hazards identified as being a VERY HIGH RISK or HIGH RISK should be addressed as a matter of priority. In considering options for controlling the identified risks, the hierarchy of controls helps to ensure that the most effective controls are implemented.

Risk Control Hierarchy
Elimination: this is the best control measure. e.g. remove a trip hazard.
Substitution: e.g. substitute a hazardous chemical with a less hazardous substance.
Isolation: e.g. barricade off the area where the hazard is present.
Engineering: e.g. re-design of tools and equipment, provision of load shifting equipment (trolleys etc.).
Administrative: e.g. written procedures, training, warning signs.
Personal Protective Equipment (PPE): Introduce PPE only when other control measures cannot be implemented or as a supplement.

## ATTACHMENT 8 - WHS Hazard Inspection Procedure

Identify hazards in MLGE workplaces by:

- Conducting regular systematic inspections of the workplace
- Observe what hazards exist in the workplace and ask “what if?”
- Listen to feedback from people working with the task
- Maintain records of processes used to identify hazards

### Frequency

Location	Frequency	By whom?
Buildings	Ongoing	The relevant manager, HSR or worker
	Formally - annually	The relevant manager accompanied by a HSR
Workshops and Yards	Ongoing	The relevant manager, HSR or worker
	Formally – quarterly - location or task based	The relevant manager accompanied by a HSR
	Formally – annually - complete	The relevant manager accompanied by a HSR

### Check

- Air quality - extraction systems and ventilation
- Amenities - ventilation, slip/ trip hazards, cleaning and hygiene
- Asbestos - register, management plan, condition
- Chemicals/ dangerous goods - storage, labeling, spills, safety data sheets, PPE
- Electrical - leads, loading, testing and tagging
- Fire/ emergency/ first aid - communication, fire extinguishers, first aid kits
- Office/ buildings - cleanliness, equipment serviceability, space, ergonomics
- Workshops - walkways, waste, storage, tools
- Lighting - adequacy, glare, cleanliness, repair
- Storage - adequacy, compatible materials, design, repair
- Machinery - guarding, maintenance, calibration
- Manual or mechanical handling - loads, equipment, training
- Noise - noise levels, designated zones, use of PPE
- PPE - availability, purpose, repair
- Premises security - adequacy, lighting
- Miscellaneous issues

At the end of the inspection a report should be drafted detailing all of the safety hazards identified. The report should provide a description of the risk assessment undertaken for each of these items and the risk rating allocated to each. This is done by considering the following:

- The frequency of persons exposed to the hazard - days per week, times per day.
- What the consequences might be - personal injury, environmental damage, associated costs or losses to replace or repair - how severe the outcome.
- What systems are currently in place, how effective are they or what other information is required.

**ATTACHMENT 9 - WHS Hazard Inspection Quick Checklist**

Work Health and Safety Hazard Inspection Summary							
Location details:					Date of Inspection:		
Inspection undertaken by:			Accompanying Manager: Accompanying HSR:				
Reference Number	Identified Hazard/ Issue	Location	Recommended Control Measure	Priority	To be endorsed by Department Manager		
					To be actioned by:	Completion Date:	Review Date:

Quick Hazard Inspection Checklist	
Area Assessed:	
Date:	
ITEM	COMMENTS
Are the following safe and fit for purpose? Answering "No" will require corrective action stated in Comments	
<b>1. Buildings</b> <ul style="list-style-type: none"> <li>&gt; air-conditioning</li> <li>&gt; ventilation</li> <li>&gt; adequate lighting</li> <li>&gt; glare problems</li> <li>&gt; ergonomics</li> <li>&gt; amenities clean</li> <li>&gt; amenities serviceable</li> <li>&gt; slip/trip hazards</li> <li>&gt; electrical testing/tagging</li> <li>&gt; smoke alarms</li> <li>&gt; fire extinguishers</li> <li>&gt; safety signage/ information</li> </ul>	
<b>2. Chemicals</b> <ul style="list-style-type: none"> <li>&gt; appropriately stored</li> <li>&gt; excess quantities beyond immediate use</li> <li>&gt; decanted materials labelled</li> <li>&gt; Safety Data Sheets available</li> <li>&gt; spills procedure</li> <li>&gt; first aid</li> <li>&gt; PPE</li> </ul>	
<b>3. All Electrical</b> <ul style="list-style-type: none"> <li>&gt; leads, plugs, switches in good condition</li> <li>&gt; leads safely positioned; any temp leads; tagged</li> <li>&gt; tagging current</li> <li>&gt; RCD testing</li> </ul>	
<b>4. Fire &amp; Emergencies</b> <ul style="list-style-type: none"> <li>&gt; fire extinguishers/hoses checked and serviceable</li> <li>&gt; exit signage</li> <li>&gt; exits clear</li> <li>&gt; signage of HSRs, FAOs, Fire Wardens</li> <li>&gt; designated assembly areas</li> </ul>	
<b>5. First Aid</b> <ul style="list-style-type: none"> <li>&gt; first aid kits adequately stocked</li> <li>&gt; first aid kits clearly located</li> <li>&gt; first aid room adequately stocked</li> <li>&gt; FAO appointed and trained</li> </ul>	
<b>6. Workshops</b> <ul style="list-style-type: none"> <li>&gt; machine guarding in place</li> <li>&gt; safety lockout procedures observed</li> <li>&gt; walkways clear</li> <li>&gt; waste disposal</li> <li>&gt; housekeeping</li> <li>&gt; storage</li> <li>&gt; maintenance</li> </ul>	

Quick Hazard Inspection Checklist	
Area Assessed:	
Date:	
ITEM	COMMENTS
Are the following safe and fit for purpose? Answering “No” will require corrective action stated in Comments	
<ul style="list-style-type: none"> <li>&gt; electrical</li> <li>&gt; battery recharging area</li> <li>&gt; designated noise zones</li> <li>&gt; PPE</li> </ul>	
<b>7. Walkways, stairs &amp; landings</b> <ul style="list-style-type: none"> <li>&gt; surface in good condition</li> <li>&gt; no clutter, trip hazards</li> <li>&gt; rails stable</li> </ul>	
<b>8. Storage &amp; manual handling</b> <ul style="list-style-type: none"> <li>&gt; adequate for needs; items appropriately stored</li> <li>&gt; safe work method statements for hazardous tasks</li> <li>&gt; loads configured to reduce risk</li> <li>&gt; lift equipment provided and serviceable</li> <li>&gt; training in manual tasks</li> </ul>	
<b>9. Specific wok</b>	
<b>10. Noise</b> <ul style="list-style-type: none"> <li>PPE available for designated noise zones</li> </ul>	
<b>11. Security</b> <ul style="list-style-type: none"> <li>&gt; visitor procedures</li> <li>&gt; signage</li> <li>&gt; lighting</li> </ul>	
<b>12. Miscellaneous (list)</b>	

**ATTACHMENT 10 - Suggested Asbestos Register**

Site			Competent Person	
Identification Date	Type of Asbestos	Condition of Asbestos	Location (specific)	Is this an inaccessible area?

ATTACHMENT 11 - Hazardous Substances Register

Name of Substance	Supplier	Location of Substance	Is it Hazardous? Yes/ No	Current SDS i.e. less than 5-yrs old/ date of issue	Risk Assessment Yes/ No	Uses

## WORKPLACE HAZARDS AND THEIR CONTROL

### UNSAFE ACTS

Unsafe Acts occur when employees do not conform or depart from an established standard, rules or policy. These often happen when an employee has improper attitude, physical limitations or lacks knowledge or skills. Examples include improper posture when lifting, not using appropriate gloves when handling chemicals or reporting to work under the influence of liquor or drugs.

### UNSAFE CONDITIONS

Unsafe Conditions are the physical or chemical properties of a material, machine or the environment which could possibly cause injury to people, damage to property, disrupt operations or other forms of losses. These conditions could be guarded or prevented. For example, the lack of safety guards on machinery or the presence of slippery and wet floors.

Accidents and diseases in the workplace can be prevented by identifying the risks and then taking the appropriate preventive measures. Employers are required to conduct risk assessments to evaluate how work is organized and performed and to identify potential hazards. After identifying potential hazards:

- Assess the risks to workers
- Eliminate or minimize the risks
- Educate and train workers in safe work practices and procedures.

The common workplace hazards in hotels and the preventive measures possible are described in this section.

	HAZARD	CONTROL
1	<p><b>Cuts</b></p> <p>Cuts are among the major risks in the hotel industry. They may occur from the use of knives and machinery in kitchens, laundry shops and engineering workshops. You may be injured while using or cleaning machinery/equipment as a result of coming into contact or being trapped between moving parts. Cuts may also arise from handling broken glass or porcelain by room attendants.</p> <p>Machinery used in the kitchens and laundries like mincers, food mixers, meat slicers and ironing machines should be properly guarded. Where this is not feasible, sensors or two-hand controls can be used. A guard that is provided but not put in position would not serve its intended purpose. Regular maintenance would also reduce accidents that result from faulty machinery. Staff should be encouraged to maintain good housekeeping at the workplace.</p>	<p><b>Use Machinery with care</b></p> <ul style="list-style-type: none"> <li>• Do not wear loose or frayed clothing or jewellery that could get caught between moving parts.</li> <li>• Ensure that safety guards are in place before operating any machinery.</li> <li>• Follow the operating instructions from the manufacturer or supplier.</li> <li>• Do not try to reach into any moving parts of the machinery with your fingers. Use a pusher/tool to avoid contact.</li> <li>• Make sure equipment is switched off prior to cleaning.</li> </ul> <p><b>Use Knives with care</b></p> <ul style="list-style-type: none"> <li>• Use the right knife for the job.</li> <li>• Always use a proper cutting board.</li> <li>• Make sure the knife is sharp.</li> <li>• Store knives in proper racks with the blade pointing down in a visible place.</li> <li>• Cut away from your body when cutting, trimming or de-boning.</li> <li>• Use protective gear such as mesh gloves.</li> </ul>



		<ul style="list-style-type: none"> <li>Wash and clean sharp tools separately from other utensils.</li> </ul>
2	<p><b>Struck by Objects</b></p> <p>Injuries can occur when persons are hit by hard, heavy or sharp objects. When materials are not properly stacked they may collapse, causing injuries to persons nearby. Narrow and cluttered passageways can contribute to the risk of such accidents. When trolleys and carts are not handled with care, accidents may also arise.</p>	<p><b>Prevent being Struck</b></p> <ul style="list-style-type: none"> <li>Ensure goods and materials are stacked properly.</li> <li>Make use of the appropriate personal protective equipment.</li> <li>Do not rush through swing doors, especially with trolleys.</li> </ul>
3	<p><b>Burns &amp; Scalds</b></p> <p>The use of ovens and deep fryers without due care can cause burns and scalds. A blast of heat or steam can be released when opening hot oven doors, saucepan lids, etc. Staff should know the possible hazards and the preventive measures when handling such appliances or hot liquids.</p>	<p><b>Handle Hot Items with Care</b></p> <ul style="list-style-type: none"> <li>Organize your work area to prevent contact with flames and hot objects. Don't reach across hot surfaces.</li> <li>Keep the floors clear.</li> <li>Use gloves for handling hot objects.</li> <li>Ensure safe temperature levels for hot liquid like oil or boiling water.</li> <li>Ensure that the handles of pots and pans do not stick out from the counter or stove.</li> <li>Do not open cookers and steam ovens that are still pressurized.</li> <li>Open lids towards the direction away from you.</li> <li>Open hot water and hot liquid faucets slowly to avoid splashes</li> </ul>
4	<p><b>Slips, Trips &amp; Falls</b></p> <p>Many workplace injuries also result from workers slipping on floors, tripping over physical obstructions or falling from height. This could be due to insufficient lighting, poor housekeeping, wet and slippery floors, and lack of handrails on platforms or staircases, unsafe use of ladders or carelessness.</p>	<p><b>Preventing Slips, Trips and Falls</b></p> <ul style="list-style-type: none"> <li>Avoid creating obstacles in work areas and floors.</li> <li>Keep floors and stairs dry and clean.</li> <li>Wear footwear appropriate to the type of floor surface like non-slip working shoes or make use of anti-slip flooring.</li> <li>Ensure carpets and rugs are free of holes and loose edges.</li> <li>Create and maintain proper lighting.</li> <li>Hang power cords over aisles or work areas to prevent tripping accidents.</li> <li>Ensure elevated platforms are guarded against the fall of persons. Provide alternatives like safety harnesses where physical guards are not feasible.</li> </ul> <p><b>Safe use of ladders</b></p> <ul style="list-style-type: none"> <li>Inspect the ladder before and after each use.</li> </ul>

		<ul style="list-style-type: none"> <li>• Do not use defective ladders e.g. broken or missing rungs: loose hinges, or missing screws or bolts</li> <li>• Set ladders on a stable and level surface using slip-resistant heels or have someone hold the ladder.</li> <li>• Maintain three points of contact when using ladders. “Three points of contact” means two feet and one hand or two hands and one foot are always in contact with the ladder.</li> <li>• Face the ladder when standing on it and when climbing up or down, gripping two sides with both hands to maintain a three-point contact.</li> <li>• Stay within the side rails. Do not stretch the body to reach spots on either side of the ladder. Move the ladder to the preferred position instead.</li> <li>• Use barricades and warning signs to keep vehicle and foot traffic away from ladders.</li> </ul>
5	<p><b>Noise Hazard</b></p> <p>The hotel environment is generally quiet but there are certain areas where staff may be exposed to a noise hazard (i.e. engineering workshops, boiler rooms and disco). Hearing loss may result from long-term exposure to hazardous noise levels.</p> <p>According to the Occupational Safety and Health Standards of the Department of Labor and Employment, a person should not be exposed to noise levels exceeding 90dBA for 8 hours a day to prevent hearing loss. Where the permissible noise exposure level is exceeded, measures should be taken to lessen the noise exposure.</p>	<p><b>Some Noise Control solutions</b></p> <ul style="list-style-type: none"> <li>• Replace noisy machinery.</li> <li>• Keep sources of noise away from hard walls or corners.</li> <li>• Isolate or enclose sources of noise.</li> <li>• Construct suitable noise barriers.</li> <li>• Line interior surfaces with sound absorbing materials.</li> <li>• Maintain machinery and equipment at regular intervals.</li> <li>• Wear PPEs such as ear plugs or ear muffs.</li> </ul>
6	<p><b>Extreme Temperature</b></p> <p>Kitchen, boiler room and laundry staff may be subjected to heat stress from the machinery or equipment used in their workplace. This can cause headaches, fatigue and discomfort. It may also result in heat related illnesses such as prickly heat, heat exhaustion (fainting) or heat stroke.</p> <p>Staff can also be exposed to cold temperatures while retrieving or storing items in cold storage rooms. Freezing of the</p>	<p><b>Avoid suffering a Heat Related illness</b></p> <ul style="list-style-type: none"> <li>• Wear appropriate clothing.</li> <li>• Drink water and rest in a cool area.</li> <li>• Improve the ventilation in the workplace.</li> <li>• Be aware of emergency / first aid procedures associated with heat related illnesses.</li> </ul>

	<p>tissues results in frost nip or frost bite. They should wear warm clothing while working in such cold environments.</p>	
7	<p><b>Electrocution</b>          Electrocution occurs when the human body becomes part of an electric circuit through which current passes. Electrical hazards include electrical shock, burns sustained at the point of contact, and injuries due to muscle spasm causing, for example, a fall from a ladder. Electrical equipment and appliances should be regularly inspected by a qualified electrician to ensure good working condition.</p>	<p><b>Handle Electrical Appliances with Care</b></p> <ul style="list-style-type: none"> <li>• Report any damaged plugs, wires, electrical equipment.</li> <li>• Ensure faulty equipment is taken out of use until repaired (label as faulty or remove the plug to prevent use).</li> <li>• Keep power cords away from heat, water and oil.</li> <li>• Do not clean electrical equipment with flammable or toxic solvents.</li> <li>• Do not overload electrical points.</li> <li>• Pull the electrical plug, not the cord.</li> <li>• Establish a set of lockout-tagout procedures for the repair and maintenance of electrical equipment.</li> </ul>
8	<p><b>Fire &amp; Explosion</b>          Workplaces which use flammable substances (i.e. LPG) or high-pressure applications, like kitchens, laundries and boiler rooms are at risk for fire and explosion. The main hazards are gas leakage followed by ignition (when mixed with air it is highly flammable and potentially explosive). Improper usage or faulty electrical installations could also result in fires.</p> <p>Some hotels use pressure vessels like steam boilers for supplying their laundries and guests with steam and hot water. These steam boilers are usually located in specially designated boiler rooms. Air receivers are also used in the tool rooms and workshops. These pressure vessels should be inspected regularly as required by law. Regular maintenance should also be carried out by the boiler attendants. Staff, especially those working in the kitchens, should be taught on how to detect gas leakage.</p>	<p><b>LPG/Gas Safety</b></p> <ul style="list-style-type: none"> <li>• Know where the gas shut off valve is and how to use it. It should be located in a safe area (away from cookers and heat) with proper signage.</li> <li>• Store all cylinders (full or empty) in an upright position externally in a secure well ventilated area. Do not store below ground level, or adjacent to openings of buildings or drains.</li> <li>• Keep storage areas clear of combustible materials and ignition sources and clearly mark with warning such as no smoking and fire procedure signs.</li> <li>• Provide and maintain suitable fire fighting equipment, e.g. dry powder extinguishers, and ensure it is readily accessible</li> <li>• In rooms where LPG appliances are used, ensure plenty of high and low level ventilation and provide a readily accessible isolation point to switch off the supply quickly in case of an emergency.</li> <li>• Turn off cylinder valves at the end of each working day.</li> </ul> <p><b>In Case of Fire</b></p> <ul style="list-style-type: none"> <li>• Do not panic. Be calm, but act quickly.</li> <li>• Know the types of fire extinguishers and how to use them.</li> </ul>

		<ul style="list-style-type: none"> <li>• Take note of the location of the fire extinguishers and alarms.</li> <li>• If the fire is small and localized, put it out with a fire extinguisher. If the fire is large, don't risk your safety. Don't attempt to fight it with a fire extinguisher.</li> <li>• Sound the alarm to inform other staff and customers. Make sure that people are leaving the building. Do not allow anyone to go back into the building.</li> <li>• Don't use elevators. Use the stairs.</li> </ul> <p><b>Fire Extinguishers - Types &amp; Usage</b></p> <ul style="list-style-type: none"> <li>• Fire extinguishers are designed to put out small fires, not large ones.</li> <li>• Extinguishers are labeled A, B, C, or D or a combination of these letters to indicate what type of fire it can be used on.</li> </ul> <p><b>A</b> - use for fires from burning paper, wood, drapes, or upholstery .</p> <p><b>B</b> - use for fires from burning gasoline, solvents, cooking shortening, or grease.</p> <p><b>C</b> - use for fires from burning wiring, fuse boxes, or electrical sources.</p> <ul style="list-style-type: none"> <li>• Fire extinguishers must be recharged/refilled professionally after any use. A partially used one is as good as an empty one.</li> <li>• Fire extinguishers are to be serviced and checked semi-annually by an authorized agent.</li> <li>• Extinguishers should be installed away from potential fire hazards and near an escape route.</li> </ul>
9	<p><b>Chemical Hazard</b></p> <p>Some chemicals are hazardous and may be flammable, toxic, corrosive or carcinogenic. The most common risks are through contact with the skin or eyes, breathing in or swallowing. Many cleaning chemicals are hazardous because they are corrosive and can cause burns or rashes from allergy or irritation from direct skin contact. Volatile chemicals such as solvents can be inhaled. Chemical spills and splashes may harm the eyes. High concentrations of vapor or gas can accumulate particularly in poorly ventilated</p>	<p><b>Safe work practices when working with Hazardous Chemicals</b></p> <ul style="list-style-type: none"> <li>• Make sure every chemical has a Material Safety Data Sheet and all containers are properly labeled.</li> <li>• Always instructions and information in the use of cleaning chemicals.</li> <li>• When handling substances, especially concentrates (if unavoidable), always wear PPE, e.g. rubber gloves. If there is any danger of splashing, wear eye protection suitable for splash risks, e.g. goggles or visors.</li> </ul>

	<p>and confined areas. It is therefore important that employees who work with chemicals are aware of the hazards.</p>	<ul style="list-style-type: none"> <li>• Ensure that rubber gloves are free from holes, tears or thin patches. If any of these faults are present ask for replacements immediately.</li> <li>• Never mix cleaning chemicals.</li> <li>• When diluting always add the concentrated liquid to water, not the water to the concentrate.</li> <li>• If cleaning chemicals are accidentally splashed onto your skin or eyes, flush the infected area with running water. Seek medical advice if irritation persists and tell your employer.</li> <li>• If you are dispensing powders, always use a scoop; never use your hand.</li> <li>• Open windows or air vents for proper ventilation. A suitable fume mask and goggles may also be required depending on manufacturer's instructions.</li> <li>• Always store chemicals as manufacturers advise, for example away from heat, sunlight, foodstuffs and humans, especially children.</li> <li>• Check chemical containers regularly for damage or leakage.</li> <li>• Ensure chemicals are disposed of properly by following the instructions given in the safety data sheet.</li> </ul>
<p>10</p>	<p><b>Biological Hazards</b></p> <p>Staff can be exposed to blood and other body fluids through needlestick and other sharps injuries. They may accidentally get in contact with used needles between bedsheets, under beds, in garbage containers, and hidden in washrooms.</p> <p>These items could be contaminated with blood and body fluids infected with micro-organisms that can cause diseases. These are known as bloodborne pathogens. The bloodborne pathogens of most concern are the human immunodeficiency virus (HIV) and the hepatitis B and C viruses. These viruses cause diseases that can lead to death.</p>	<p><b>Preventing exposure to HIV/AIDS, and Hepatitis B and C</b></p> <ul style="list-style-type: none"> <li>• Wash your hands frequently.</li> <li>• Never handle broken glass with your bare hands. Use tongs or pliers or a broom and dustpan to pick up the glass. Place the broken glass in a separate and secure container.</li> <li>• Don't compress garbage or reach into garbage containers with your bare hands. Remove the contents by lifting out the bag or liner.</li> <li>• Hold garbage bags away from the body.</li> <li>• Sheets, bedspreads, towels or linens contaminated with blood or other body fluids should be handled with care.</li> <li>• Contaminated laundry should be appropriately identified.</li> <li>• Always wear rubber or latex gloves when handling used linen or cleaning the bathroom. For protection from</li> </ul>

		<p>blood spatters or splashes into the eyes or mouth eye and face protection should be worn.</p> <ul style="list-style-type: none"> <li>• Always discard the gloves after use or after a contamination incident. Remove gloves in a way that prevents your unprotected skin from contacting the outside, or contaminated portion of the gloves. After removing the gloves, wash your hands with an anti-bacterial soap.</li> <li>• If the mucous membranes of the eyes, nose, or mouth are affected, flush with lots of clean water at a sink or eyewash station.</li> <li>• If there is a wound, allow it to bleed freely. Then wash the area thoroughly with non-abrasive soap and water.</li> <li>• If an area of non-intact skin is affected, wash the area thoroughly with non-abrasive soap and water.</li> </ul>
11	<p><b>Workplace Violence</b>          Workplace violence is a situation in which a person is abused, threatened, intimidated or assaulted in his or her employment. Workplace violence includes threatening behavior, verbal or written threats, harassment, verbal abuse and physical attacks.</p>	<p><b>Dealing with Irate Customers</b></p> <ul style="list-style-type: none"> <li>• Avoid escalating the situation. Remain calm and polite, and try to calm the other person.</li> <li>• Once you think the customer has remained his calm, you can ask polite questions to gather more information on the incident. This will help you resolve the problem better and effectively.</li> <li>• If you cannot calm the person, ask for help.</li> <li>• Work towards the best potential solution to the customer’s problem. If resolving the problem is not in your scope of powers, escalate the issue to the appropriate colleague who can handle it.</li> </ul>
12	<p><b>Ergonomic Stresses</b>          Musculoskeletal injuries are injuries and disorders that affect the human body’s movement or musculoskeletal system (i.e. muscles, tendons, ligaments, nerves, etc.). It could be due to a single incident such as lifting a very heavy load or slipping and falling. However, it is more often due to gradual wear and tear from frequent and repetitive activities.</p>	<ul style="list-style-type: none"> <li>•</li> </ul>

	<p>The chance of sprains and strains increases with the effort and frequency of lifts, and with the awkwardness of postures required to access and move these materials. Slips and falls can also cause serious strains and sprains. Risks for slips and falls include uneven or slippery floor surfaces, the presence of spilled materials, and excessively worn footwear soles.</p>	
<p>13</p>	<p><b>Awkward Postures</b></p> <p>Working with the body in a neutral position reduces stress and strain on the muscles, tendons, and skeletal system. Awkward postures are deviations of body parts from their neutral position. Awkward body posture leads to exhaustion, discomfort and increased risk of injury.</p> <p>Poor workstation design fosters an awkward body posture. Awkward body posture hinders breathing and blood circulation and contributes to musculoskeletal injuries.</p> <p>Examples of awkward postures include bending the back during bed making, reaching overhead during cleaning and improper posture while sitting.</p>	<p><b>Preventing disorders from Awkward Postures</b></p> <ul style="list-style-type: none"> <li>• Use tools that will allow you to work in neutral postures. Don't overstretch yourself. Reach only as high as is comfortable for you.</li> <li>• Use height-adjustable workbenches and chairs.</li> <li>• Avoid bending over by using lift devices to hold items at waist-height.</li> <li>• Use step stools or ladders to avoid reaching overhead.</li> <li>• Use long-handled tools to decrease reaching and stooping.</li> <li>• Store heavier or frequently used items at a height between workers' hips and chest to reduce awkward postures when handling these items.</li> <li>• Perform work at the proper heights :Above the elbows with elbow support for precision work such as cleaning or sorting.</li> <li>• At the elbows for light work such as peeling and cutting vegetables.</li> <li>• Between the waist and elbows for heavy work demanding downward forces such as cutting or slicing meat.</li> <li>• When awkward postures cannot be avoided: Take regular breaks</li> <li>• Perform a variety of jobs to change postures</li> <li>• Complete forceful actions closer to neutral posture</li> </ul> <p><b>Avoid Awkward Sitting Positions</b></p> <ul style="list-style-type: none"> <li>• Avoid bending forward and to the sides.</li> <li>• Do not slouch.</li> <li>• Make sure the height of your chair is just right.</li> </ul> <p>Avoid chairs that are too high or too low.</p>

		<ul style="list-style-type: none"> <li>• Ensure proper height for your work table. Do not work with shoulders and arms raised to prevent neck and shoulder pain.</li> </ul>
14	<p><b>Manual Handling</b></p> <p>Strains and sprains to the lower back and even the neck and limbs, may occur among hotel staff involved in manual materials handling activities. Improper lifting may cause painful back injuries and muscle strain.</p> <p>Manual Handling involves moving or supporting objects by one or more employees. It includes lifting, putting down, pushing, pulling, carrying objects.</p>	<p><b>Preventing injuries from Manual Handling</b></p> <ul style="list-style-type: none"> <li>• Assess the weight. Make sure you can lift the load without over-exertion.</li> <li>• Do not lift objects beyond your physical strength. Get help.</li> <li>• Use mechanical aids such as trolleys, pushcarts, hoists or conveyors if available.</li> <li>• Push rather than pull.</li> <li>• Prepare for the lift by warming up the muscles.</li> <li>• Use the muscle power of the legs, not the back when lifting. Stand over the object and bend your knees.</li> <li>• Use a wide stance to gain balance.</li> <li>• Keep the load as close to the body as possible. Keep your back comfortably straight.</li> <li>• Hold the object securely and check for slipping.</li> <li>• Make sure you can see over the object while carrying it.</li> <li>• Avoid sudden movements or jerking.</li> <li>• Avoid twisting and bending to the side while lifting.</li> <li>• Do not bend over when setting a load down.</li> <li>• Small steps are best when walking with a load.</li> <li>• Don't store heavy items in small, confined areas where the worker may not be able to use proper lifting techniques.</li> <li>• Wear proper gloves or other personal protective equipment when handling objects with sharp edges, or objects that are very hot or cold.</li> <li>• Wear safety shoes to protect your feet.</li> </ul>
15	<p><b>Prolonged Standing</b></p> <p>Most jobs in the hotel involve standing work for many hours. Standing for a long period of time can contribute to aches and pain in the lower limb.</p>	<p><b>Preventing disorders from Prolonged Standing</b></p> <ul style="list-style-type: none"> <li>• Use foot rails or footrests to be able to shift body weight from one leg to the other to reduce stress on your back and legs.</li> <li>• Change working positions frequently.</li> </ul>



		<ul style="list-style-type: none"> <li>• Controls and tools should be positioned so the worker can reach them easily without twisting or bending. Avoid overreaching.</li> <li>• Wear shoes with well-cushioned insteps and soles to relieve the stress on your knees and back</li> <li>• Wear shoes that allow your toes to move freely.</li> <li>• DO NOT wear shoes with heels higher than 5 cm (2 inches).</li> </ul>
16	<p><b>Repetitive Movement</b>          Repetitive use of the hands and upper limb may cause pain in wrist, elbow and shoulder. Persons at risk include room attendants, laundry operators and kitchen staff.</p>	<p><b>Preventing disorders from Repetitive Movements</b></p> <ul style="list-style-type: none"> <li>• Position hand and wrist comfortably.</li> <li>• Reduce repetition as much as possible by pacing your work at a comfortable rate. Vary your tasks and take a few minutes to do something that uses different muscles.</li> <li>• Use ergonomically designed tools.</li> <li>• Maintain tools in good working condition to avoid the need to exert excessive force.</li> <li>• Take “micro pauses”. Let muscles rest by pausing for 5 to 10 seconds.</li> <li>• Once in a while, return to an upright posture and let your arms hang loosely by your sides.</li> </ul>
17	<p><b>Handling Luggage</b>          Particularly when loading and unloading from vehicles, carts, and hotel rooms, can cause fatigue, discomfort, and risk of injury. Awkward body postures increase the stress on ligaments and joints. This can lead to strain and injury to the back, shoulders and hands if the load or frequency is excessive or if incorrect lifting methods are used. Proper equipment and training in the proper lifting and carrying techniques should be provided to prevent back strain and injury.</p>	<ul style="list-style-type: none"> <li>• Use ramps rather than stairs.</li> <li>•</li> <li>• Use a trolley for heavy luggage or when carrying over long distance.</li> <li>• Push rather than pull trolleys.</li> <li>• Ensure trolleys are properly maintained. eg tyres are fully inflated and wheels aligned.</li> <li>• Wear proper shoes.</li> <li>• Plan your lift before doing it.</li> <li>• Use the muscle power of the legs, not the back when lifting. Don’t twist or bend your body to the side. Move your feet to face the load.</li> <li>• When lifting bags from a car trunk, face the trunk squarely with both feet firmly on the ground. Use a wide stance to gain balance.</li> <li>• Keep the load as close to the body as possible. Pull luggage that are in the back of the trunk close to you first before lifting.</li> </ul>

		<ul style="list-style-type: none"> <li>• Bend your knees, not your back.</li> <li>• Do not bend over when setting a load down.</li> </ul>
18	<p><b>Front Desk Staff</b></p> <p>Front desk staff spend many hours standing to serve customers at the reception counter. They work with visual display units, answer phone calls and handle payment. This may involve repetitive work, awkward postures and prolonged standing.</p> <p>Excessive bending of the neck and back during writing, keyboard work or using the calculator when the height of the desk is too low can cause neck and back aches. The monitor height may be also too low for the standing position and there may also be glare problems if not positioned properly.</p> <p>Prolonged standing with high heel shoes may contribute to aches and pain in the legs and feet and the back.</p> <p>Sprains and strains can be prevented by proper workstation design and placement of equipment and adopting proper work postures.</p>	<ul style="list-style-type: none"> <li>• Do not overstretch yourself. Avoid bending and twisting to reach the telephone or keyboard.</li> <li>• Avoid bending your back. Make sure the computer monitor is neither too low nor too high.</li> <li>• Hold the telephone receiver while writing or typing. Don't clip it between your ear and shoulder.</li> <li>• Put one foot on a step or rail to reduce stress on your back and legs when standing for long periods. From time to time, alternate the foot you have on the rail.</li> <li>• Wear shoes with enough cushioning to relieve the stress on your knees and back when standing for long periods.</li> <li>• Vary your working position often.</li> </ul>
19	<p><b>Room Attendants</b></p> <p>Room attendants are prone to strains from bending, pushing, repeated lifting and reaching when making beds, cleaning bathrooms, vacuuming carpets, wiping furniture and pushing carts.</p> <p>Awkward postures, repetitive forceful movements and manual materials handling can lead to strains and injuries to the back, shoulder, arm and hand.</p> <p>Strains and injuries can be prevented by working correctly. Room attendants should be given appropriate equipment and training in proper work methods and postures to reduce the risk of strains and injuries.</p>	<p><b>Housekeeping</b></p> <ul style="list-style-type: none"> <li>• Bend your knees when changing pillow covers or duvet covers. Avoid bending your back.</li> <li>• Use a tool with long handles or use a step ladder to reach high furniture or lighting.</li> <li>• Kneel when cleaning low furniture.</li> <li>• Use light-and easy to use vacuum cleaners.</li> <li>• Kneel when vacuuming under furniture to avoid bending the back.</li> <li>• Carts should not be overloaded and obstruct the vision. They should be stable and easy to move.</li> <li>• Push carts rather than pull.</li> <li>• Maintain good working condition of the carts. Wheels should be aligned and turn smoothly.</li> <li>• Kneel next to the bath tub to avoid excessive back bending and arm reaching when cleaning the tub.</li> <li>• Use tools with long handles for cleaning hard to reach areas.</li> </ul>

<p>20</p>	<p><b>Chefs and other kitchen staff</b></p> <p>Chefs and other kitchen staff are involved in food preparation (cutting, grinding, mixing, arranging), baking or cooking, food transfer and dishwashing.</p> <p>Working in the kitchen involves prolonged standing, awkward postures, manual handling and repetitive hand motions. These can increase the risk of sprains and injuries involving the hands, shoulders, back and neck.</p>	<ul style="list-style-type: none"> <li>• Use trolleys whenever possible for heavy items.</li> <li>• Provide tables, counters and trolleys of the same height to enable items to be slid across.</li> <li>• Use a work surface that is waist level for forceful tasks (e.g. chopping).</li> <li>• Use a work surface that is elbow height for finely detailed work (e.g. creaming cakes).</li> <li>• Stand close and use the front of the work surface to avoid over-reaching.</li> <li>• Position frequently used items close to your work area and at a convenient height</li> <li>• Select utensils designed to reduce awkward postures and force (eg good grip).</li> <li>• Avoid twisting or bending back.</li> <li>• Hold the rinse nozzle at mid-body height.</li> <li>• Use a platform to reduce depth of deep sink to reduce bending.</li> </ul>
<p>21</p>	<p><b>Waiters and Servers</b></p> <p>Waiters and servers often carry trays of dishes or glasses; bend and reach to clear, wipe, set tables and serve customers at tables. They also carry heavy tables, chairs and other equipment when setting up function rooms.</p> <p>Repetitive heavy lifting and awkward postures can put a lot of strain on the neck, back, shoulder, arms and hands.</p> <p>Training in proper lifting, use of appropriate equipment such as trolleys and proper work practices are important</p>	<ul style="list-style-type: none"> <li>• Balance the load and keep the tray dry and clean.</li> <li>• Place heavy items close to the center of the tray.</li> <li>• Carry most of the load over the shoulder.</li> <li>• Keep the shoulder, elbow and wrist in neutral posture whenever possible.</li> <li>• Carry reasonable number of plates at a time.</li> <li>• Carry the tray as close to your body as possible.</li> <li>• Balance the tray on both your arm and hand when carrying small trays of drinks.</li> <li>• Use both hands for support and balance when carrying large trays.</li> <li>• When pouring, move the glass or cups as close to you as possible to avoid over-reaching.</li> <li>• Move around the table to serve guests.</li> <li>• Use trolleys when carrying tables and chairs whenever possible.</li> <li>• Ensure a good grip when carrying.</li> <li>• Avoid bending or twisting the back.</li> </ul>

		<ul style="list-style-type: none"> <li>• Limit the number of chairs stacked together when lifting.</li> <li>• Have two or more people carry heavy or bulky items.</li> </ul>
22	<p><b>Laundry Operations</b></p> <p>Laundry Operations in a hotel include sorting, washing, drying, folding of linens as well as washing, drying and ironing of uniforms and guests' laundry.</p> <p>Handling laundry requires force and some tasks may be repetitive and involve awkward postures and prolonged standing which can be stressful on the hands, wrists, back, shoulders and lower limbs.</p> <p>Proper work design and automation of certain processes as well as training in proper work methods and postures can help to reduce the risk of strains and injuries. Job rotation and scheduled rest b</p>	<ul style="list-style-type: none"> <li>• Reduce manual handling of laundry through design of work flow or automation.</li> <li>• Reduce bending to retrieve laundry from the bottom of the bins by using bins with a self-elevating base.</li> <li>• Reduce pulling and pushing forces by using lighter bins with wheels designed for hard floors.</li> <li>• Make sure the bins are serviced regularly with particular attention to the wheels.</li> <li>• Use a foot bar to be able to switch the weight of the body from one foot to the other.</li> <li>• Use anti-fatigue mats and shoes with good insoles to reduce discomfort due to prolonged standing.</li> <li>• Practice job rotation or vary job tasks during the shift.</li> <li>• Hangers should be at a lower position (i.e. shoulder level) to reduce excessive reaching and working overhead.</li> <li>• Take regular breaks and perform stretching exercises.</li> </ul>
23	<p><b>Golf Training – Students</b></p> <p>Injury to student/s including</p> <ul style="list-style-type: none"> <li>• Cuts &amp; Abrasions</li> <li>• Bruising</li> <li>• Asthma</li> <li>• Broken Limbs</li> </ul>	<p>Warm up / Cool down</p> <ul style="list-style-type: none"> <li>• Explanation &amp; Modelling of correct golf techniques.</li> <li>• Question &amp; Answer session on golf skills, techniques &amp; etiquette</li> <li>•</li> <li>• Student dress, including footwear, must comply with the requirements of the golf club or facility being used</li> <li>• Students are encouraged to have their own set of golf clubs, sufficient golf balls &amp; tees; teachers are to ensure that equipment used is in good condition; clubs with smooth grips, loose heads &amp; shaft irregularities must be repaired or replaced</li> <li>• Individual programs based on age &amp; sequential development</li> </ul>

		<ul style="list-style-type: none"> <li>• Supervision of students whilst undertaking task</li> <li>• Staff with knowledge of first aid and /or first aid qualifications</li> <li>• A well-equipped medical kit with EpiPen available</li> </ul>
24	<b>Biological material</b> <ul style="list-style-type: none"> <li>• Bodily fluids (e.g. blood, sweat, saliva)</li> </ul>	<ul style="list-style-type: none"> <li>• Comply with HLS-PR-004: Infection Control and Management of Prescribed Contagious Conditions and Infection Control Guidelines. Students with open cuts and abrasions are to be removed from the activity and treated immediately. If bleeding cannot be controlled completely, the participant should not be allowed to return the activity. All clothing, equipment and surfaces contaminated by blood should be treated as potentially infectious.</li> <li>• •Have sufficient and suitable containment material (bandages, etc) available</li> <li>• •Ensure that personal items are not shared.</li> </ul>
25	<b>Animal bites/ diseases</b> <ul style="list-style-type: none"> <li>• Insects</li> <li>• Dangerous/ poisonous organisms</li> </ul>	<ul style="list-style-type: none"> <li>• Check area for ant nests if conducted outside</li> <li>• •Activity is conducted in an area free from poisonous plants and vegetation</li> <li>• •Constant assessment for snakes if conducted outside</li> </ul>
26	<b>Environmental conditions</b> <ul style="list-style-type: none"> <li>• Weather</li> <li>• Surfaces</li> <li>• Surrounds</li> <li>• Temperatures</li> </ul>	<p>Ensure students wear appropriate clothing &amp; sun protection</p> <ul style="list-style-type: none"> <li>• •Assess weather conditions before and during activity (e.g. temperature, storms)</li> <li>• •Check and assess surrounds for loose items, debris and hazards and suitability for participants.</li> <li>• •Consider hazards associated with types of fencing material, gates and other infrastructure for windy conditions</li> <li>• •In poor weather conditions, Golf activity will be conducted either inside or in a suitable undercover area outside</li> </ul>
27	<b>Physical Injury</b> <ul style="list-style-type: none"> <li>• Spinal</li> <li>• Falls</li> <li>• Slips &amp; trips</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure trip hazards are not present in the activity area</li> <li>• •Communicate and demonstrate 'safe areas' 'hitting areas' and danger areas for activities</li> </ul>

		<ul style="list-style-type: none"> <li>• Communicate and demonstrate correct technique to minimise risk of injury</li> <li>• Warmup stretching/games conducted prior to Golf activity</li> <li>• Closed in footwear to be worn at all times</li> </ul>
28	<b>Physical exertion</b> <ul style="list-style-type: none"> <li>• Strains and sprains</li> <li>• Cramps</li> <li>• Exhaustion and fatigue</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure the suitability and competency of students participating in the activity</li> <li>• Ensure regular consumption of water appropriate to the activity intensity and duration</li> <li>• Constantly monitor students for fatigue and exhaustion</li> <li>• Follow a programme of graded development in Basic physical fitness &amp; Skills of the activity</li> </ul>
29	<b>Students</b> <ul style="list-style-type: none"> <li>• Special needs</li> <li>• High risk behaviours</li> <li>• Medical conditions</li> <li>• Student numbers</li> </ul>	<p>Obtain relevant medical information</p> <ul style="list-style-type: none"> <li>• When students with medical conditions are involved, ensure that relevant medical/emergency plans and medications are readily available (insulin, Ventolin, EpiPen etc...)</li> <li>• Where necessary, obtain advice from relevant advisory visiting teachers or specialist teachers</li> <li>• Ensure there is adequate adult supervision</li> <li>• Ensure all students adhere to safe areas and danger areas at all times</li> <li>• Jewellery can be a serious hazard when undertaking many activities. All forms of jewellery should be considered in terms of the risk it presents for each activity. Procedures are in place to dissuade or protect (e.g. tape) the wearing of jewellery accordingly.</li> </ul>
30	<p>Being struck by a ball hit offline by a player on another part of the golf course/ Personal injury to other course users, spectators and equipment</p>	<p>All players must remain alert at all times.</p> <ul style="list-style-type: none"> <li>• Players who have played an offline shot must immediately shout "FORE" to alert all surrounding players.</li> <li>• Staff are provided with appropriate PPE in the form of a hard hat and safety visor, work boots, gloves, overalls and waterproof clothing. Safety glasses and ear defenders are available on site too.</li> <li>• Staff must be aware of golfers on the course and move to allow play to pass</li> </ul>

		them safely before returning to work task.
31	Being struck by the swinging club of a playing partner.	<ul style="list-style-type: none"> <li>• Players must stand at least 2 metres away from the arc of the swinging club.</li> </ul>
32	Tripping on uneven, sloping, or slippery ground.	<ul style="list-style-type: none"> <li>• Tripping hazards should be removed by &amp; Green keeping staff.</li> <li>• Course inspection routinely and closed when weather is poor</li> </ul>
33	Slipping when entering or exiting a tee block	<ul style="list-style-type: none"> <li>• Trolleys &amp; motorised buggies are not to be taken on to these slopes in dry or wet conditions</li> </ul>
34	Slipping on an undulated wet part of ground.	<ul style="list-style-type: none"> <li>• All golfers should ensure they have golf shoes which are adequate &amp; suitable for the ground/weather conditions on the day of play.</li> </ul>

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## **Appendix 19**

*Appendix Q of Development Report – Bushfire  
Survival Plan*

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# Mount Lofty Golf Estate Bushfire Survival Plan

THIS BUSHFIRE SURVIVAL PLAN FORMS PART OF THE OVERALL BUSHFIRE  
MANAGEMENT STRATEGY FOR THE ESTATE.

IT MAY BE DISTRIBUTED AS A STANDALONE DOCUMENT FOR ISSUE  
TO STAFF, OR OTHER INTERESTED PARTIES

A MODIFIED VERSION CAN ALSO BE MADE AVAILABLE FOR REFERENCE BY  
GUESTS

## IMPORTANT INFORMATION

ADDRESS

TELEPHONE

MAXIMUM IN RESIDENCE

HOTEL *xx*

ACCOMMODATION PODS *yy*

FIRE BAN DISTRICT *District 2*

FIRE BAN DATES *1 December 2022 - 30 April 2023*

CONTACT NUMBERS:

<b>EMERGENCY: Fire, Police, Ambulance</b>		<b>000</b>
<b>GENERAL MANAGER</b>		<b>04XX YYY ZZZ</b>
SA Country Fire Service (CFS)		SES 8463 4171
	8391 1866 Mt Barker	MEDICAL EMERGENCIES Clinic TBA
ELECTRICITY		Lofty Coaches Mt Barker 8391 5272 / 0435 212 262
GAS		Bus Transportation SouthLink / LinkSA Aldgate 8339 7544 / 0409 092 114

NEAREST SAFER PRECINCT *Stirling*

LAST RESORT REFUGE *(TBA)*

# Mount Lofty Golf Estate Bushfire Survival Plan

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## FOREWORD

Bushfires and grassfires pose a significant threat to all those living, working or travelling in the Adelaide Hills. Preparation and planning is paramount to protecting our business, guests & staff.

Mount Lofty Golf Estate recognises that there is potential emergencies in the work place and aims to ensure the health, safety and welfare of all persons on site at the Mylor Baptist camp. It will do this by developing and implementing policies and procedures of a high standard. In this case it is Bushfire safety.

Mount Lofty Golf Estate priorities are:

*Priority 1: Protection of Life.*

The first priority is to ensure that all people who may be in danger are forewarned and that action is taken to guarantee their safety (including evacuation), before any steps are taken to prevent the spread of fire, secure assets or to fight the fire.

*Priority 2: Prevent spread of fire.*

Only after Priority 1 has been actioned and completed will we proceed to prevent the spread of fire. *This Priority will only be undertaken by trained staff* in the event that the Fire Service is unable to attend, and a decision is made to stay and defend.

*Priority 3: Protect assets.*

Only after Priority 1 and Priority 2 have been actioned and completed will we proceed to protect the assets of the Estate. As for Priority 2, this can only follow when all life safety measures have been initiated.

## DETERMINATION OF RISK

### **FIRE DANGER RATING SYSTEM – RECOGNITION OF DANGER AND ACTIONS TO BE TAKEN**

To help assess the level of bushfire risk and action to take, it is important to understand the fire danger rating.

The rating is forecast by the Bureau of Meteorology each day and is an early indicator for you of the potential danger, should a bushfire start. **The higher the Fire Danger Rating, the more dangerous the fire conditions.**

The Fire Danger Rating chart will assist us to understand the predicted bushfire behaviour, potential impacts and recommended actions you should take for each category level. Take the time to review and understand the chart.

# Mount Lofty Golf Estate Bushfire Survival Plan

## Know your daily Fire Danger Rating

The following Chart is nationally consistent in the colours and terminology used.

<b>Fire Danger Rating</b>	<b>What does it mean?</b>	<b>What should you do?</b>
<b>MODERATE</b>	<i>Most fires can be controlled</i>	<i>Plan and prepare</i>
<b>HIGH</b>	<i>Fires can be dangerous</i>	<i>Be ready to act</i>
<b>EXTREME</b>	<i>Fires will spread quickly and be extremely dangerous</i>	<i>Take action now to protect your life and property</i>
<b>CATASTROPHIC</b>	<i>If a fire starts and takes hold, lives are likely to be lost</i>	<i>For your survival, leave bushfire risk areas</i>



The Fire Danger Rating is not a predictor of how likely a bushfire is to occur, but how dangerous it could be if it did occur. It should be used as an early indicator to trigger our plans.

### Fires can threaten suddenly • and without warning

- **Watch** for signs of fire, especially smoke and flames & in some instances planes & helicopters.
- **Know** the Fire Danger Rating in this area, be aware of local conditions and keep informed
- **Call** 000 to report a fire

### FIRE DANGER INDEX

A Forest Fire Danger Index, or FDI, is a rating system that provides a measure of the potential danger of a bushfire on a given day and location.

The FDI combines a measure of vegetation dryness with air temperature, wind speed, and humidity.

The FDR is related to the

# Mount Lofty Golf Estate Bushfire Survival Plan

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## ***AWARENESS, COMMUNICATIONS AND KEEPING INFORMED***

### ***To seek information***

There are several means of obtaining information relating to bushfires and bushfire risks:-

- listen to local radio, ABC 891 0r 5AA.  
Battery operated radios are provided in each department so that the most updated information relative to a bushfire event in our area is known and can trigger action
- go to Alert SA website [www.alert.sa.gov.au](http://www.alert.sa.gov.au)
- go to [www.cfs.sa.gov.au](http://www.cfs.sa.gov.au)
- call the Bushfire Information Hotline on 1300 362 361
- checking and following [Facebook: @CountryFireService](#) or [Twitter: @CFSAAlerts](#)

The Fire Danger Rating is issued via the CFS website at around 4.00 pm every day during the bushfire season, and the rating should be checked again at 9.00 am the morning following in case there has been any change necessary overnight.

***All staff are required to load the Alert SAS Mobile App on their mobile phones to enable immediate and up to date access to communications relating to bushfire conditions.***

The App provides information on incidents and warnings that are sourced directly from the SA Country Fire Service (CFS) and the SA Metropolitan Fire Service (SAMFS), the Alert SA App displays a map and list view – with the list prioritised by closest distance to your device's location, and allows users to create up to 10 watch zones to receive notifications for areas of interest.

Access to Wi-Fi is necessary, otherwise use of mobile data will be required.

The use of this App is not only for information relating to the Estate, but should also be used for all staff, whether residing in a fire prone area or would require entry into a bushfire zone in order to access the Estate.

Instructions on the downloading of the App, and instructions on operation and updating will be given to all staff – if you have a need to refresh without these instructions being available, please access the Alert SA website.

### ***Evacuation Triggers***

As stated below, evacuation will be initiated on days that are forecast to be Catastrophic.

On days of a Extreme rating,

### ***Closure or Partial Closure on Extreme days***

On days that are forecast to be **Extreme**, the decision to evacuate or remain at the Estate will be determined by the General Manager, or nominated Chief Warden where the General manager is not available.

In general, the [Estate](#) may continue to operate as normal, however it may be decided that the accommodation in the Pods may be closed due to their vulnerable location with respect to their location withing vegetation.

# Mount Lofty Golf Estate Bushfire Survival Plan

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## **LEAVE EARLY**

The decision to leave early is always the safest decision

Although the buildings in the estate are designed and maintained to be resistant to the radiated heat, ember attack and fire wind, there is never any guarantee that there will not be a scenario where there is extreme personal risk

There will be an allocated CHIEF WARDEN at the Estate at all times during the bushfire season – refer to the daily Staff Duty Roster located in the [Staff Lunch Room and ???](#) on arrival, and checked during your shift should staff allocations be updated.

On days that are forecast to be **Catastrophic**, the decision will be to leave at the earliest possible time. This will not be negotiable in reference to guests and staff, other than trained staff who may be rostered to remain and shelter in place in order to defend the property and provide first-attack on spot fires should the Estate be directly subjected to a fire event.

All guests will be advised the evening before in preparation for the evacuation.

## **LEAVE EARLY SURVIVAL PLAN**

### **Designated Assembly Points**

Designated assembly points will be indicated on Emergency Evacuation Plans that will be displayed throughout the main buildings, and included on a similar plan in each of the remote accommodation Pods.

Guests will be instructed that no major luggage is to be brought to an Assembly Point to reduce congestion.

All staff members evacuating are required to assist in the management of guests under the guidance and instruction provided by the Fire Warden(s)

Refer also to *Emergency Accommodation* below

### **Transportation**

Guests and staff with personal or shared transportation are expected to use that means of transportation to travel to a safer precinct, or emergency accommodation where applicable. *It is recommended that no vehicles remain at the Estate unless authorised and located where they do not provide an ignition source that may impinge on the ongoing safety of the buildings.*

Bus or other appropriate transportation will be provided for any guests without personal transportation. Arrangements will be made and confirmed on the evening prior.

### **Safer Precinct**

The nearest designated safer precinct is the **Stirling** township.

The next nearest alternative is **Mount Barker**

# Mount Lofty Golf Estate Bushfire Survival Plan

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## ***Routes to Safer Precinct***

All evacuation routes that are to be applied to reach safer places are to be verified as available for safe passage. Appropriated mapping and instructions are to be provided to guests unfamiliar to the district.

If there is any indication that the only road options available may be heavily congested it is preferable that evacuation is not actioned. Traffic congestion combined with possible smoke and reduced visibility only leads to panic that can

## ***Emergency Accommodation***

Arrangements will be made for alternative accommodation in a safer place for all guests who have ongoing bookings at the Estate.

With early notification of the need for evacuation available the day before, under most circumstances there will be overnight or ample time for guests to access their room and pack all of their belongings to take with them.

It must be recognised that with 'mass' emergency evacuation there will be congestion with the addition of luggage movements. If evacuation is required urgently and with minimal notice, guests will be instructed to only pack an emergency overnight bag.

## ***STAY AND DEFEND SURVIVAL PLAN***

Under no circumstances should any guest be permitted to stay and defend

ONLY APPROPRIATELY TRAINED AND CERTIFIED STAFF may be permitted to remain and provide pre and post attention to the bushfire event.

*THE DECISION TO ALLOW TRAINED STAFF TO STAY AND DEFEND IS THE RESPONSIBILITY OF THE DUTY WARDEN OR ON DIRECTION OF THE GENERAL MANAGER*

**( TO BE EXPANDED )**

## ***LAST RESORT REFUGE and SHELTERING***

A space has been allocated in **TBA** where any staff and guests may shelter in the event that safe evacuation to a safer place is not available.

# Mount Lofty Golf Estate Bushfire Survival Plan

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## **PREPARATION**

When a Catastrophic Fire Danger Rating day is predicted, the following preparations and actions are to be made:-

### **All Departments**

Staff briefings will be held to inform all staff of the predicted fire risk that is imminent. All staff are to review this Safety Plan with particular emphasis on evacuation requirements

### **Reservations**

- contact is to be made with guests having bookings for accommodation prior to their arrival and inform them of the fire danger situation. Make alternative arrangements for their arrival to suit the predicted danger rating for the following three (3) days
- all restaurant bookings to be contacted as soon as possible and advise that entry into the zone is not recommended and that the [Estate](#) will be closed until notification of recommencement of operations is provided.

### **Housekeeping**

- housekeepers are to inspect all rooms and ensure that all windows are fully closed, and that all external doors are also fully closed.
- Ensure that the Last Resort Refuge area is equipped with bottled water supplies and towels / face washers that can be wetted to provide relief from likely raised temperatures within the spaces

### **Functions / Conference Department**

- all functions and conference bookings to be contacted as soon as possible and advise that entry into the zone is not recommended and that the [Estate](#) will be closed until notification of recommencement of operations is provided.

### **Maintenance Department**

- Check that all fire fighting equipment is operational and on standby for immediate access when required for fire control measures
- All grounds are to be checked for any potential fuel sources such as leaf litter, and cleared.

## **EMERGENCY PROCEDURES**

The General Manager or authorised replacement will be on site to take charge of guest safety

### **Reception and Administration Department**

- All PCs to have the CFS website connected and accessible
- Assemble all Wardens and provide instruction towards an evacuation from the [Estate](#)
- Notification to be issued to all guests advising that evacuation is imminent, and to action any announcements made directing them to assemble and / or evacuate to the nominated safer place.

# Mount Lofty Golf Estate Bushfire Survival Plan

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- Advise guests that they should proceed to a safer place, and provide full directions on the route to be taken. Advise that they are not permitted to return until they receive an SMS or telephone contact from the [Estate](#).
- Arrange for appropriate transport for guests without their own transportation

## ***TRAINING***

Appropriate training is to be provided to all Fire Wardens in relation to their allocated roles.



# Mount Lofty Golf Estate Bushfire Survival Plan

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## **REGISTER OF RESPONSIBLE PERSONS**

THIS REGISTER REQUIRES VERIFICATION AND AMENDMENT ON A REGULAR BASIS TO ENSURE THAT THE STAFF MEMBERS SCHEDULED ARE CURRENT AT THE COMMENCEMENT OF, AND DURING, EACH BUSHFIRE SEASON.

<b>General Manager</b>		
<b>Chief Warden</b>		
<b>Chief Warden</b>		
<b>Chief Warden</b>		
<b>Warden</b>		
<b>Warden</b>		
<b>Warden</b>		
<b>Warden</b>		
<b>Duty Officer</b>		
<b>Duty Officer</b>		
<b>Duty Officer</b>		

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## **DOCUMENT CONTROL**

Date	Version	Purpose of Issue	Author	Reviewer
4 October 2022	P1	Preliminary Draft Issue	Peter Murton	-
				-

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## **Appendix 20**

*Appendix R of Development Report –  
Environmental noise assessment report*

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# BESTEC<sup>®</sup>

BRINGING BUILDINGS TO LIFE

MOUNT LOFTY GOLF COURSE  
REDEVELOPMENT

ENVIRONMENTAL NOISE ASSESSMENT

ACOUSTIC SERVICES

NPK:AGM  
57366/6/1  
23 February 2023

Trice - Project & Development Managers  
225 Fullarton Road  
EASTWOOD SA 5063

Attention: Ms S Mercorella

Dear Madam

**MOUNT LOFTY GOLF COURSE REDEVELOPMENT  
ENVIRONMENTAL NOISE ASSESSMENT  
ACOUSTIC SERVICES**

As requested, we enclose a copy of the report on the Acoustic Services for the above project.

We trust that the report provides sufficient information for your immediate purpose and we would be most pleased to further discuss any aspect upon your request.

Yours faithfully  
**BESTEC PTY LTD**



**NARAYANA PRASAD KUMAR  
ACOUSTIC SERVICES ENGINEER**

Encl

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**REPORT ISSUE REGISTER**

<b>REVISION</b>	<b>DATE</b>	<b>REVISION DESCRIPTION</b>
00	14.10.2022	Initial Issue
01	30.11.2022	Revised Issue
02	23.02.2023	Incorporated EPA Comments

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## **Introduction**

BESTEC Pty Ltd has been engaged to assess the environmental noise impact to the nearest noise sensitive receivers resulting from operational activities, including functions, in the proposed new development at the existing Stirling Golf Club, which includes:

- Construction of a new tourist accommodation – a new hotel (3 to 5 levels), 17 private retreats (pods) and one service pod.
- New clubhouse and pro-shop, administration areas and change rooms.
- Car parking for 200 cars in two parking areas.

This document presents a review of the proposed acoustic design criteria, the results of the conducted continuous environmental noise survey, calculated noise levels at the nearest noise sensitive receivers resulting from functions, using the venue and the results of our assessment.

## **Executive Summary**

In summary:

- A continuous noise survey was conducted over 5-day period at the boundary of the nearest noise sensitive receiver. The survey results are presented in Appendix A.
- The architectural concept drawings of the proposed development have been reviewed.
- Appropriate acoustic design criteria were nominated.
- The noise impact to the nearest residential developments associated with the operation of the proposed development has been assessed against the nominated environmental noise criteria, including:
  - Music noise resulting from functions taking place in the function area;
  - Patron noise;
  - Noise associated with the use of the carpark, deliveries and rubbish collection;
  - Acoustic design recommendations in order to comply with the selected acoustic design criteria and recommendations for construction of the building envelope were provided.

## **Acoustic Analysis**

### **References**

The following documents have been referenced within the preparation of this report: -

- [1] SA Environment Protection (Noise) Policy 2007.
- [2] SA Planning and Design Code.
- [3] Music Noise from Indoor Venues and the South Australian Planning System, EPA Guideline, July 2015.
- [4] Pearsons, Bennett and Fidel "Speech levels in various noise environments" Report EPA-600/1-77-025, Washington, D.C.: U.S. Environmental Protection Agency, May 1977.
- [5] Architectural drawings provided by R Architecture, dated December 2021.
- [6] AS ISO 140.4-2006 "Acoustics – Measurement of sound insulation in buildings and of building elements. Part 4: Field measurements of airborne sound insulation between rooms".
- [7] Laurence Nicol and Paul Johnson "Prediction of parking area noise in Australian conditions" Report, Proceedings of Acoustics, Australia, 2011.

### **Proposed Development**

The Stirling golf club is bounded by Golflinks Road, Old Carey Gully Road and Devenport Road. Adjacent to the southern-western boundary are residential properties (highlighted on Figure 1).

The proposed development is summarised as follows:

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m<sup>2</sup> function room.
  - A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace.
  - 186m<sup>2</sup> sports bar.
  - A 189m<sup>2</sup> gallery and cafe.
  - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – 'Pods'
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
  - Extension to the Per.fumery to include a covered outdoor dining area.
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a "Scent Factory".



- Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
  - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.
  - A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
  - Designated waste storage areas.
- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

### **Continuous Noise Survey**

A continuous noise survey was conducted between 01 September and 05 September 2022 with an automatic noise logger located near the boundary between The Stirling Golf Course and the property where the nearest noise sensitive receiver is located (indicated with a star on Figure 1 in order to establish the existing ambient and background noise levels. The survey was conducted using an automatic noise logger Norsonic Nor139.

The logger was set to continuously measure and average A-weighted equivalent continuous noise levels over 15-minute intervals ( $L_{Aeq,15min}$ ), A-weighted maximum noise levels ( $L_{Amax}$ ) and statistical noise descriptors ( $L_{A10}$ ,  $L_{A90}$ ) using 1/3-octave bands (25Hz – 10,000Hz) using Fast time weighting.

The detailed survey results are presented in Appendix A.



Figure 1: Site location

The analysis of the collected data revealed:

- The measured lowest background noise levels ( $L_{A90}$ ) during the proposed hours of operation is 31 dBA
- The lowest ambient noise level ( $L_{Aeq}$ ) measured during the proposed hours of operation is 34 dBA.

## Conditions

### SA Planning and Design Code

The SA Planning and Design Code [1] sets the desired outcome for developments, which might affect the sensitive receivers in adjacent areas as follows:

*DO 1 Development is located and designed to mitigate adverse effects on or from neighbouring and proximate uses.*

The following requirements (performance outcomes) of the SA Planning and Design Code are relevant to the design and siting of the proposed developments (Section Interface Between Land Uses):

*PO 1.1 Sensitive receivers are designed and sited to protect residents and occupants from adverse impacts generated by lawfully existing land uses (or lawfully approved land uses) and land uses desired in the zone.*

*PO 1.2 Development adjacent to a site containing a sensitive receiver (or lawfully approved sensitive receiver) or primarily intended to accommodate sensitive receivers is designed to minimise adverse impacts*

*PO 4.1 Development that emits noise (other than music) does not unreasonably impact the amenity of sensitive receivers (or lawfully approved) sensitive receivers.*

A non-residential development is deemed to satisfy the above requirement if the noise emissions that affect the noise sensitive receivers achieves the relevant Environment Protection (Noise) Policy criteria (DTS/DPF 4.1).

*PO 4.2 Areas for the on-site manoeuvring of service and delivery vehicles, plant and equipment, outdoor work spaces (and the like) are designed and sited to not unreasonably impact the amenity of adjacent sensitive receivers (or lawfully approved sensitive receivers) and zones primarily intended to accommodate sensitive receivers due to noise and vibration by adopting techniques including:*

- (a) locating openings of buildings and associated services away from the interface with the adjacent sensitive receivers and zones primarily intended to accommodate sensitive receivers*
- (b) when sited outdoors, locating such areas as far as practicable from adjacent sensitive receivers and zones primarily intended to accommodate sensitive receivers*
- (c) housing plant and equipment within an enclosed structure or acoustic enclosure*
- (d) providing a suitable acoustic barrier between the plant and / or equipment and the adjacent sensitive receiver boundary or zone.*

*PO 4.5 Outdoor areas associated with licensed premises (such as beer gardens or dining areas) are designed and/or sited to not cause unreasonable noise impact on existing adjacent sensitive receivers (or lawfully approved sensitive receivers).*

*PO 4.6 Development incorporating music achieves suitable acoustic amenity when measured at the boundary of an adjacent sensitive receiver (or lawfully approved sensitive receiver) or zone primarily intended to accommodate sensitive receivers.*

## **Design Criteria**

### **Environmental Noise**

The SA Planning and Design Code refers to the Environment Protection (Noise) Policy 2007 in regards to environmental noise emissions from non-residential buildings and therefore, the criteria below are derived in accordance with the Policy.

#### **Continuous Noise**

*This criterion will be relevant to noise emitted from the proposed development resulting from operational noise, including patron noise, mechanical plant, carpark movements, deliveries etc.*

- The Environment Protection (Noise) Policy 2007 [1], sets the maximum allowable continuous noise in terms of A-weighted Equivalent Continuous Noise Level ( $L_{Aeq}$ ) based on the time of day and zoning/use of land in which the noise source and receiver are located. With reference to the SA Planning and Design Code [2], we note that The Stirling Golf Club is located within a land zoned "Rural Neighbourhood" and the nearest noise sensitive receiver is located within the same zone. Therefore, the criteria derived in accordance with the Environment Protection (Noise) Policy 2007 should be based on the average of the indicative noise levels for different land categories.

Based on the "Residential" land use category, the applicable indicative noise factors for day and night times are:

- Day time (7:00 a.m. to 10:00 p.m.): 47dBA
- Night time (10:00pm to 7:00am): 40dBA

We note that for planning purposes, the predicted noise level (continuous) for a new development (in this case the proposed development) should not exceed the relevant indicative noise level, minus 5dBA. Therefore, the environmental noise criteria for assessment of the noise impact from the proposed development become:

- Day-time (7:00 a.m. to 10:00 p.m.): 42dBA
- Night-time (10:00 p.m. to 07:00 a.m.): 35dBA

Note that if noise emitted by the proposed development contains any tones, modulation, impulsive or low frequency characteristics, the continuous noise level of the noise source must be adjusted as follows:

- Noise containing 1 characteristic – 5dBA penalty added to source continuous noise level.
- Noise containing 2 characteristics – 8dBA penalty added to source continuous noise level.
- Noise containing 3 or 4 characteristics – 10dBA penalty added to source continuous noise level.

### **Intermittent Noise**

The criteria provided in the above section relate to continuous noise sources, and do not cater for intermittent noise events, such as slamming of car doors, car horns sounding, etc. We recommend the use of the World Health Organisation (WHO) Guidelines for Community Noise, which recommends a maximum A-weighted noise level  $L_{Amax}$ , of 45dBA in a bedroom, which is equivalent to approximately 55dBA to 60dBA at the façade of the residential building with windows partially open.

In addition, the EPP 2007 provides assessment criterion of  $L_{Amax}$  of 60dBA for night-time for the proposed development (for application for development authorisation), which agrees with the criterion stipulated by the WHO.

### **Music Noise to the Nearest Noise Sensitive Receivers**

*This criterion will be relevant to music noise emitted from the proposed development resulting live or pre-recorded music being played inside the function area during functions.*

The pre function and function rooms may be used to accommodate functions with live or pre-recorded music such convention events, weddings, corporate events etc. Therefore, an assessment against the EPA Guidelines for Music Noise [3] and SA Planning and Design Code requirements is warranted.

EPA provides guidelines for assessment of music emissions from entertainment venues, which is used for acoustic assessment for development approval purposes as well as for acoustic design of residential developments in the vicinity of existing entertainment venues. The criterion is set as follows:

*“The music noise ( $L_{10,15min}$ ) from an entertainment venue when assessed externally at the nearest existing noise sensitive location should be:*

- *less than 8 dB above the level of background noise ( $L_{90,15min}$ ) in any octave band of the sound spectrum”*

In addition, SA Planning and Design Code Performance Outcome 4.6 (refer Section [3] which stipulates Designated Performance Feature 4.6 as follows

*“Development incorporating music includes noise attenuation measures that will achieve the following noise levels:*

- *less than 8 dB above the level of background noise ( $L_{90,15min}$ ) in any octave band of the sound spectrum”*

Based on the above EPA Guidelines for music noise and SA Planning and Design Code, to control music noise emissions from the proposed multi-purpose function space, we derived the music noise criteria based on the lowest background noise levels ( $L_{A90}$ ) measured within the stipulated hours of operation during the most recent continuous noise survey<sup>1</sup>, presented in Table 1 below along with the calculated music noise criterion. Therefore, the calculated music noise criteria relevant to the neighbouring residential noise sensitive receivers will be as detailed below.

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<sup>1</sup> The lowest background noise level was measured at 23:45 on 04 September 2022.

	Octave band sound pressure level dB re 20µPa							
	63	125	250	500	1000	2000	4000	8000
Background noise level L <sub>90, 15min</sub>	44	38	30	29	30	26	17	15
Maximum allowable exceedance	8	8	8	8	8	8	8	8
Maximum allowable music noise level, L <sub>10,15min</sub> at the nearest noise sensitive boundary	52	46	38	37	38	34	25	23

**Table 1:** Criteria for music noise at the nearest sensitive receiver

## Building Acoustics

The level of background and transient/intermittent noise, the speech privacy rating and the intelligibility of speech define the quality of the acoustics within a building. The criteria presented in Table 2 and below are based on AS/NZS 2107:2016 “Acoustics – Recommended design sound levels and reverberation times for building interiors” as well as on our experience in acoustic design of similar facilities. Please refer to each individual section below for interpretation of the criteria.

Type of occupancy/activity	Background Noise dBA	Reverberation Time Secs	Speech Privacy Dw	Weighted Sound Reduction Index with Spectrum Adaptation Term R <sub>w</sub> +C <sub>tr</sub>
Amenities	< 55	N/A	40 – 45	
Kitchen	< 55	Minimise as practical	40 – 45	
Function spaces	35 – 40	0.7 – 1.0	45 – 50	
Restaurant	45 – 50	Minimise as practical	N/A	
Dining/Kitchen	40 – 45	Minimise as practical	N/A	
Office	40 – 45	0.4 – 0.6	40	
Hotel Suites	30 – 40			45
Admin	40 – 50	< 0.7	35 – 40	
Car park	<65	N/A	N/A	

**Table 2:** Recommended Acoustic Design Criteria for the hotel development

Type of occupancy/activity	Background Noise dBA	Reverberation Time Secs	Speech Privacy Dw
Sleeping Areas	30 – 35	N/A	N/A
Living Areas	35 – 40	N/A	N/A

**Table 3:** Recommended Acoustic Design Criteria for the accommodation pods

## Background Noise

AS 2107-2016 [6] sets out the design criteria for steady state noise such as from air-conditioning systems and road traffic depending on the type/use of the different rooms. Recommendations for each space are provided in Table 2 in terms of A-weighted equivalent continuous sound pressure level ( $L_{Aeq}$ ). Table 4 details the subjective response of individuals to the proposed sound levels for interpretation of the recommendations.

Average Sound Pressure Levels (dBA)	Subjective Rating
35 - 40	Audible but unobtrusive
40 - 45	Moderate but unobtrusive
45 - 50	Unobtrusive with low levels of surrounding activities
50 - 55	Unobtrusive with high levels of surrounding activities

**Table 4:** Subjective ratings for various average sound pressure levels.

## Sound Insulation

For enclosed spaces, the noise from activities in the adjacent rooms transmitted through walls, floors, ceilings etc. increases the background noise level similarly to the noise intrusion from any outside sources. The level of noise transmitted from the adjacent rooms and the level of sound insulation/speech privacy is controlled by the design of building elements and providing adequate level of sound attenuation through specifying appropriate construction types for walls, floors, doors, ceilings etc.

There are no recommended Australian or International Standards for sound insulation ratings for adjoining spaces. Recommendations are based on experience from previous projects, with these recommendations reflecting user expectations. The privacy rating is dependent on the sound absorption and background noise level in the adjoining space as well as the area and acoustic performance of the dividing partition.

The proposed criteria for speech privacy between the spaces separated by partitions (extending either to the ceiling level or to the roof structure above) are presented in terms of Weighted Sound Level Difference ( $D_w$ ) as defined by AS ISO 140.4-2006, which is related to the sound level difference between two spaces and are detailed in Table 2. The criteria are based on our experience in the acoustic design of similar facilities. Table 5 details the subjective response of individuals to the proposed privacy ratings for interpretation of the recommendations.

$D_w$ Rating	Subjective Rating
50-55	Confidential privacy
45-50	Very good privacy. Speech inaudible unless raised
40-45	Good privacy. Speech audible but unintelligible
35-40	Normal privacy. Neighbouring conversations are audible and may be understood
< 35	Privacy not required

**Table 5:** Subjective perceptions for various privacy ratings

## Room Acoustics

AS/NZS 2107:2016 sets out the design criteria for reverberation times within occupied spaces. The reverberation time defines the time taken for sound to decay within a space and thus the degree of intelligibility of both unassisted speech and sound reinforcement systems. The criterion for a given space depends on the volume of the space, with Table 7 outlining the subjective impression for spaces with varying volume. Criteria considered appropriate for the spaces listed in Table 2.

Reverberation Time (sec)			Subjective Rating
Small (100m3)	Medium (1,000 m3)	Large (10,000m3)	
<0.3	0.3-0.5	0.6-0.8	Dead
0.3-0.5	0.5-0.7	0.8-1.0	Medium dead
0.5-0.7	0.7-1.0	1.0-1.5	Average
0.7-1.0	1.0-1.5	1.5-2.5	Medium live
1.0-2.0	1.5-2.5	2.5-4.5	Live

Table 6: Subjective response to various reverberation times and room volumes

### Music Noise to the Hotel Suites and Accommodation Pods

As the Deemed-to-Satisfy/Designed Performance Feature (DTS/DPF 4.6) sets criteria for music noise based on the background noise levels, we propose the internal noise levels resulting from music entertainment in the function centre be based on the background noise level ( $L_{90}$ ) measured in Room 1012 of the Mayfair Hotel in Adelaide (4.5-star rating), during the commissioning of the development as a basis to determine the music noise criterion inside the proposed accommodation pods. The measured background noise level and the derived music noise criterion are presented in Table 7 below.

	Octave band sound pressure level dB re 20 $\mu$ Pa								Overall level, dBA
	63	125	250	500	1000	2000	4000	8000	
Background noise level $L_{90, 15min}$ measured in Room 1012 at The Mayfair Hotel (4.5-star) with the AC on	47	39	35	26	24	19	14	15	30
Maximum allowable exceedance	8	8	8	8	8	8	8	8	5
Maximum allowable music noise level, $L_{10, 15min}$	55	47	43	37	32	27	22	23	35

Table 7: Background noise level  $L_{90, 15min}$  measured in 4.5-star hotel room with only the air-conditioning on and the derived relevant internal criteria for music noise in the accommodation pods

### Understanding and Assumptions

We have based our assessment on the following understanding and assumptions:

- Music sound levels in the function centre – the function areas may be used for weddings, parties, corporate events etc., which might include live or pre-recorded music. Based on that, the following reverberant sound levels was used (previously measured in a similar venue):

Type of Activity	Octave band sound pressure level ( $L_{10}$ ) dB re 20 $\mu$ Pa								Overall level $L_{10}$ , dBA
	63	125	250	500	1000	2000	4000	8000	
Music	88	90	87	86	87	80	80	78	90

Table 8: Reverberant music sound level ( $L_{10}$ ) used in the assessment

- Delivery and rubbish collection vehicles will be accessing the site via Golflinks Rd;
- All deliveries and rubbish collection will be taking place during day time, i.e., after 7:00 and before 22:00.
- The functions taking place in the function centre will cease at 0:00.
- Construction of the function centre and accommodation pods building envelope elements:
  - Façade – framed construction consisting of profiled steel cladding to the external side of steel structural frame and flush plasterboard internal lining with fibrous cavity infill;
  - External glazing – laminated glass;
  - Roof/ceiling structure – conventional steel roof cladding over foil faced fibrous insulation on 150mm deep purlins with perforated plasterboard ceiling overlaid with 75mm, 32kg/m<sup>3</sup> polyester for reverberation control suspended on RONDO steel ceiling grid forming 400mm deep ceiling cavity.
- Typical function with 300 guests in total.

## **Assessment and Recommendations**

### **General Recommendations**

#### Acoustic Sealants

We note that for the acoustic integrity of building elements to be maintained, all gaps and interfaces along the junctions and joints of linings must be sealed with an appropriate acoustic grade sealant. Penetrations for mechanical or electrical services must be properly caulked and sealed around the ductwork and cabling to ensure the intended acoustic rating of the partition is retained.

Appropriate acoustic caulking products include:

- Bostik Firemastic.
- Bostik Seal-n-flex 2637.
- Pyropanel Multiflex.
- Trafalgar Fyreflex.
- Dow-Corning 790 Silicone.
- Dow-Corning 795 Silicone.
- Sika Sikaflex-11 FC.
- Fosroc Flamex 3.

#### Cavity Infill

Where a cavity infill is recommended, equivalent alternatives are:

- Fibreglass – 50mm, 12kg/m<sup>3</sup>.
- Rockwool – 50mm, 38kg/m<sup>3</sup>.
- Polyester – 900gsm.

#### Ceiling Overlay

Where a ceiling overlay is recommended, equivalent alternatives are:

- Glasswool – 100mm, 12kg/m<sup>3</sup>.
- Rockwool – 100mm, 38kg/m<sup>3</sup>.
- Polyester – 100mm, 32kg/m<sup>3</sup>.

Where higher durability and/or water resistance is required, 6mm compressed fibre cement sheeting could be used in lieu of the 13mm fire-rated plasterboard and 9mm compressed fibre cement in-lieu of 16mm fire-rated plasterboard.



## Building Envelope

### Function Centre

We calculated the music noise levels at the nearest noise sensitive receiver (approximately 200m from the function centre) resulting from music being played in the function centre under the assumptions above and considering the distance. The following constructions of the building envelope elements are required for the selected music noise criterion to be achieved (minimum requirements):

- Solid façade – the architectural drawings indicate the following façade constructions:
  - precast walls and we recommend 150mm precast concrete<sup>2</sup> panels. The sound transmission loss provided by 150mm precast concrete will be sufficient, however, internal lining and fibrous insulation might be required for thermal insulation reasons.
  - slate shingles and we recommend 15mm thick shingles installed to 1 layer of 9mm fibre cement to the external side of 92mm steel studs and 1 layer of 13mm plasterboard to the internal side with cavity infill of 75mm, 14kg/m<sup>3</sup> glasswool.
  - timber cladding and we recommend 12mm thick timber cladding installed to 1 layer of 9mm fibre cement to the external side of 92mm steel studs and 1 layer of 13mm plasterboard to the internal side with cavity infill of 75mm, 14kg/m<sup>3</sup> glasswool.
- Roof – roof steel cladding (0.48mm BMT) with Anticon 100 HP, R2.5 insulation blanket on 300mm deep purlins and 2 layers of 13mm fire rated plasterboard fixed to the underside of the purlins.
- Glazing –minimum 10.38mm laminated glass

Any operable glazing should be fitted with appropriate compressible acoustic seals (Raven or Schlegel ranges). Please note that the above glazing construction is sufficient from acoustic point of view, however it may be subject to change to satisfy structural and thermal requirements.

In order to control the music sound level inside the function centre, we recommend an automatic sound limiter be used to monitor the sound pressure levels during performance. The sound limiter should be connected to the main amplifier power and set to cut the power if the maximum sound pressure level is exceeded. To facilitate this, the following is required:

- Any performers/DJ's should use only the sound system and amplifier provided by the function centre;
- The sound system should be tuned and commissioned by an acoustic engineer once the function centre is completed and the sound limiter is installed. The measured sound level at 1m from each speaker should not exceed the C-weighted sound pressure levels detailed in Table 9 below when pink noise is fed into the system.

C-Weighted Sound Pressure Level (dB re 20µPa) from each Speaker at Octave Band Centre Frequency, Hz (measured at 1m)								Overall, dBC
63	125	250	500	1000	2000	4000	8000	
93	96	93	92	93	86	85	81	100

**Table 9:** Sound Pressure Levels measured at 1m from the speakers (based on assumed 4 speakers in the function centre)

Please note that the above sound pressure levels are based on the assumption that the function centre sound system will have four speakers and have to be re-assessed if different number of speakers is proposed.

- Once the system is tuned:

<sup>2</sup> The sound transmission loss of the construction would be sufficient from acoustic point of view; however, internal lining of 1 layer of 13mm plasterboard and fibrous insulation might be required for thermal insulation reasons.

- The noise levels at the nearest residential receivers should be measured and the sound system settings adjusted if required to ensure the noise levels at the residential properties complies with the maximum allowable music noise levels detailed in Table 1.
- The noise levels in the nearest hotel suits and accommodation pods should be measured with the windows and doors closed and the sound system settings adjusted if required to ensure the noise levels in the accommodation pod is below the maximum allowable values for music noise detailed in Table 7.

When the nominated noise levels are achieved, the sound limiter and main amplifier should be locked by the system engineer to prevent the settings being adjusted by staff of performers.

#### Hotel

- Façade:
  - precast walls and we recommend 150mm precast concrete<sup>3</sup> panels. The sound transmission loss provided by 150mm precast concrete will be sufficient, however, internal lining and fibrous insulation might be required for thermal insulation reasons.
  - timber cladding and we recommend 12mm thick timber cladding installed to 1 layer of 9mm fibre cement to the external side of 92mm steel studs and 1 layer of 13mm plasterboard to the internal side with cavity infill of 75mm, 14kg/m<sup>3</sup> glasswool.
- Glazing - minimum 6.38mm laminated glass.
- Roof - roof steel cladding (0.48mm BMT) with Anticon 100 HP, R2.5 insulation blanket on 300mm deep purlins and 1 layer of 13mm fire rated plasterboard fixed to the underside of the purlins.

#### Accommodation Pods

- Façade:
  - 0.48mm BMT profiled steel cladding to the external side of minimum 92mm deep structural steel studs and 1 layer of 13mm plasterboard to the internal side with cavity infill of 50mm 11kg/m<sup>3</sup> glasswool.
  - The architectural drawings indicates that timber cladding is proposed and we recommend 3mm thick timber cladding with a layer of fibre cement to the external side of 92mm steel studs and 1 layer of 13mm plasterboard to the internal side with cavity infill of 75mm, 14kg/m<sup>3</sup> glasswool.
- Glazing – minimum 6mm annealed glass. Operable glazing should be fitted with acoustic seals (Raven or Schlegel ranges).
- Roof – 0.48mm BMT steel roof cladding roof over Anticon 100 HP, R2.5 foil faced insulation blanket on minimum 150mm deep steel purlins and ceiling of 13mm flush plasterboard.

#### Noise associated with Mechanical Service Plant

The engineering services design is currently being developed and detailed recommendation will be provided when it is sufficiently developed, however, we note that airborne noise emissions from all plant and equipment will be assessed against the nominated environmental and internal noise criteria and engineering noise controls will be designed to ensure compliance. In order to limit vibration emissions and structure borne noise, vibrations will be designed for all plant units.

#### Noise associated with Carpark

We have calculated the noise impact to the nearest residential receiver from the development associated with the use of the carpark assuming the following activity durations and measured noise levels from similar activities [7]:

- Vehicle movement through car parking spaces

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<sup>3</sup> The sound transmission loss of the construction would be sufficient from acoustic point of view; however, internal lining of 1 layer of 13mm plasterboard and fibrous insulation might be required for thermal insulation reasons.

- Vehicle Ignition
- Vehicle door slamming
- Vehicle idle and take off from car parking and drop off zones

A time weighted averaged approach was implemented, based on the above breakdown of noise generating activities.

To calculate the noise levels from the carpark operation over a 15 minutes period, we assumed 30 vehicles either entering or exiting the carpark during the period. We note that the impact noise level at the nearest receiver is within the 47dBA limit suggested by EPA at the façade of the nearest receivers and meets the criteria for the development.

#### Noise associated with Deliveries

We note that there would be a loading bay located on level 1 on the north east side of the building and calculated the A-weighted Equivalent Continuous Noise Level over a typical 15-minute interval (LAeq,15min) assuming the following activity durations and measured noise levels from similar activities on a previous project:

- Delivery vehicle accessing the loading dock (including reverse alarm) – 30 seconds, 70dBA at 5m.
- Loading/unloading activities including noise from refrigeration unit on the delivery vehicle – 10 minutes, 76dBA at 5m.
- Delivery vehicle departing – 30 seconds, 73dBA at 5m.
- The balance of a 15-minute interval – 4 minutes, 54dBA (ambient noise level).

The calculated A-weighted Equivalent Continuous Noise Level over a typical 15-minute interval (LAeq, 15min) resulting from delivery vehicle activities, which we used in the assessment was 74dBA at 5m.

Based on the above we predicted incident noise levels of 42 dBA at the nearest residential noise sensitive receiver (residents on Golflinks Road). We note that the noise emissions due to the delivery vehicle activities achieves the day-time environmental noise criteria and would not affect the amenity of the adjacent residential area. However, it is recommended that delivery be restricted to the EPA stipulated day time only (i.e., after 7:00 am and before 10:00pm) Monday to Friday and after 9:00 am on Saturday and Sunday (if applicable).

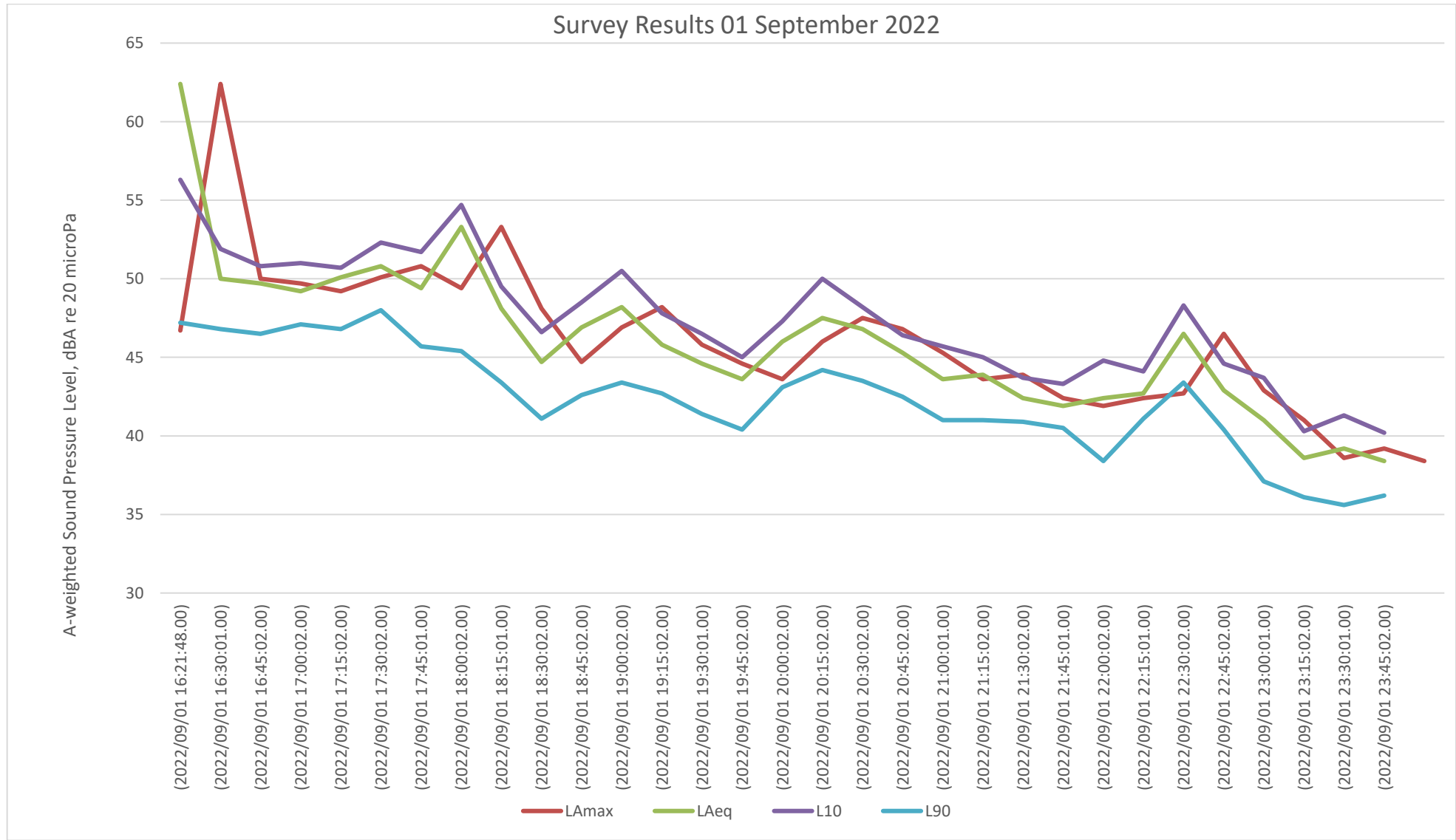
#### **Conclusion**

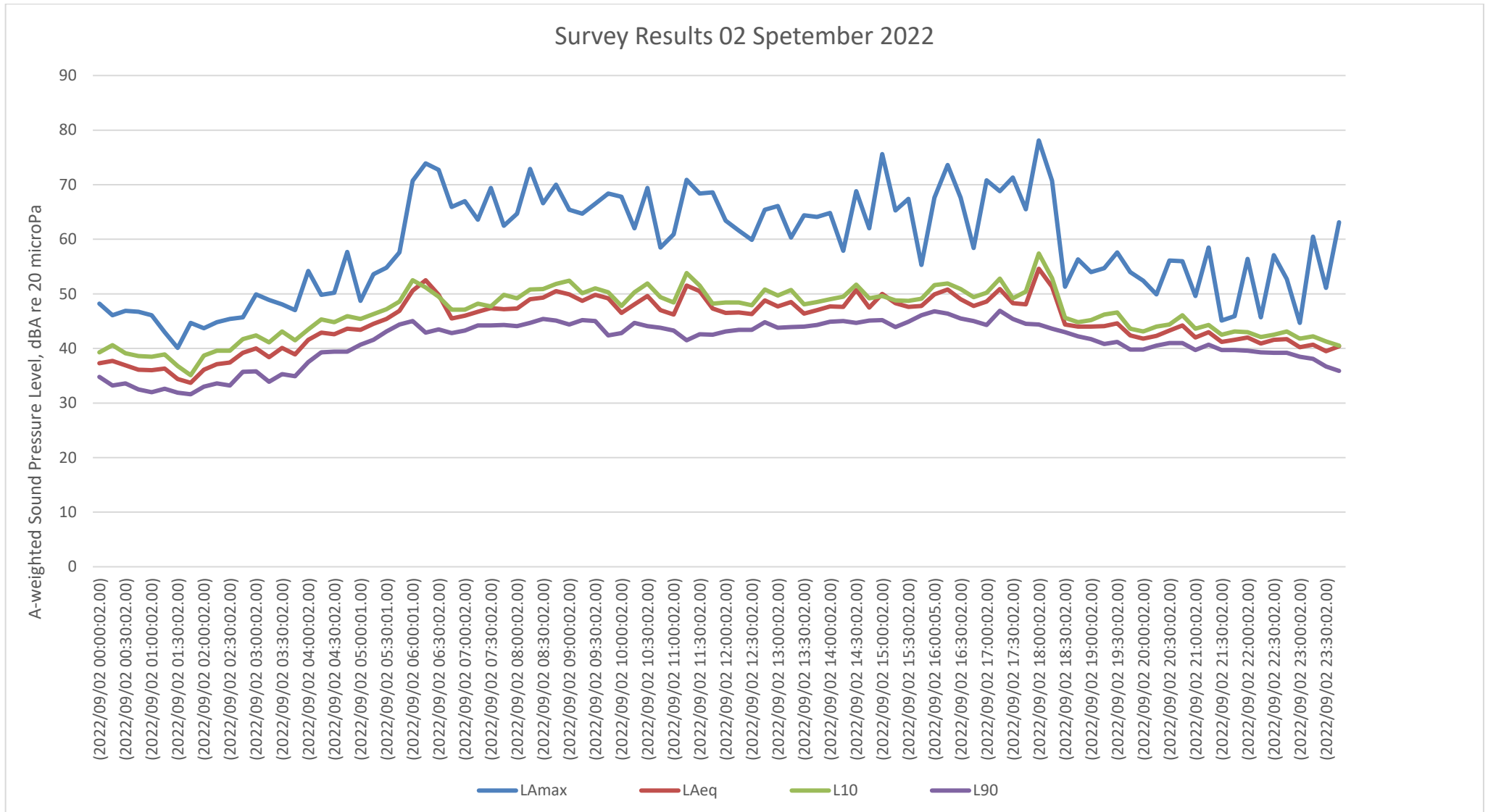
An assessment of the music and patron noise resulting from a typical function taking place at proposed development was conducted against relevant environmental noise criteria derived in accordance with the SA Planning and Design Code and SA EPA Environment Protection (Noise) Policy 2007. The results of the assessment revealed:

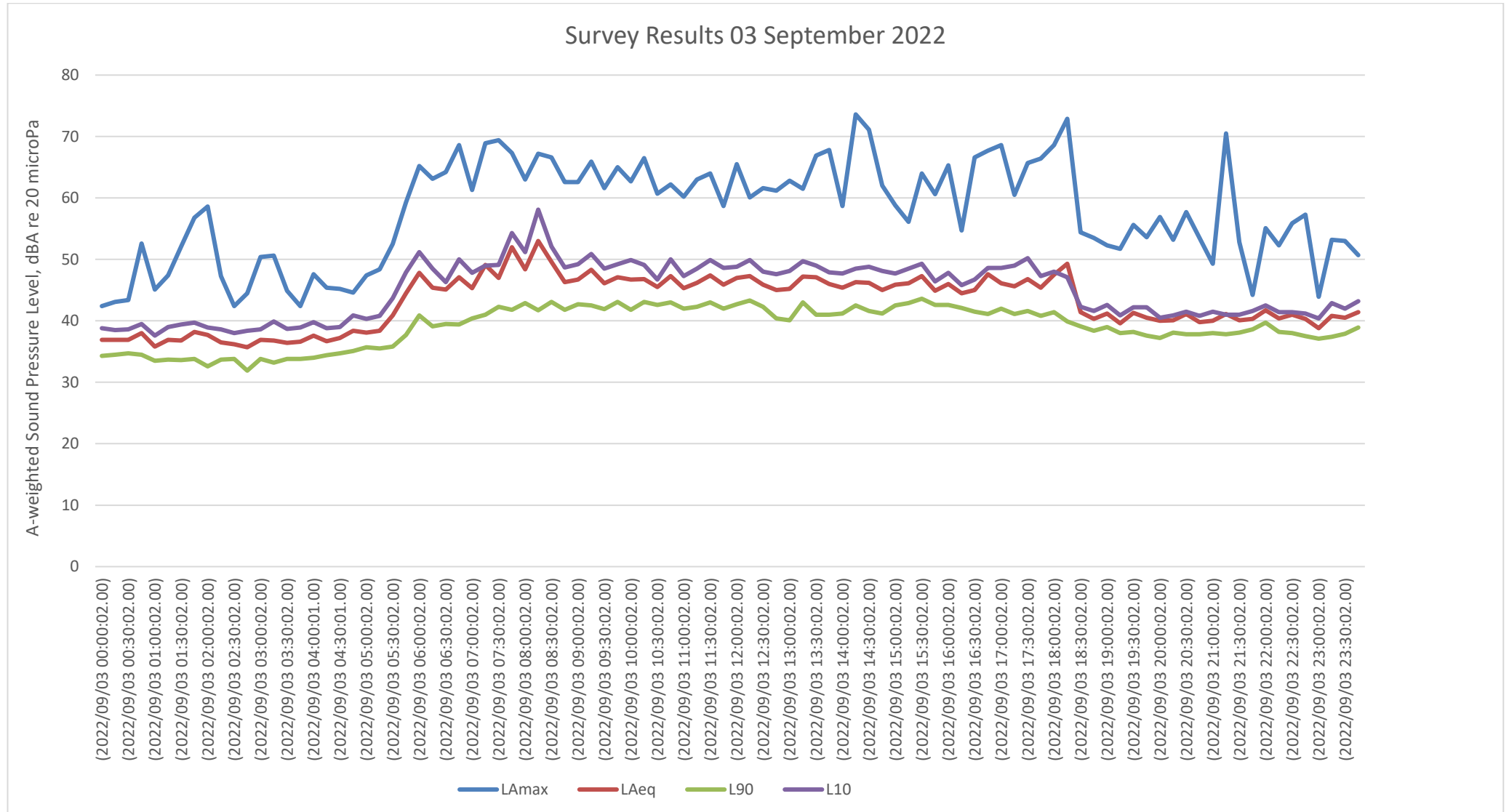
- The predicted music noise levels at the nearest noise sensitive receiver will achieve the selected criteria under worst case meteorological conditions provided the sound pressure levels from each speaker is limited to 90dBA at 1m based on 4 speakers being used.
- The continuous noise levels at the nearest noise sensitive boundary resulting from patrons at the terrace and inside the function hall will achieve the selected continuous noise criteria under worst case meteorological conditions.

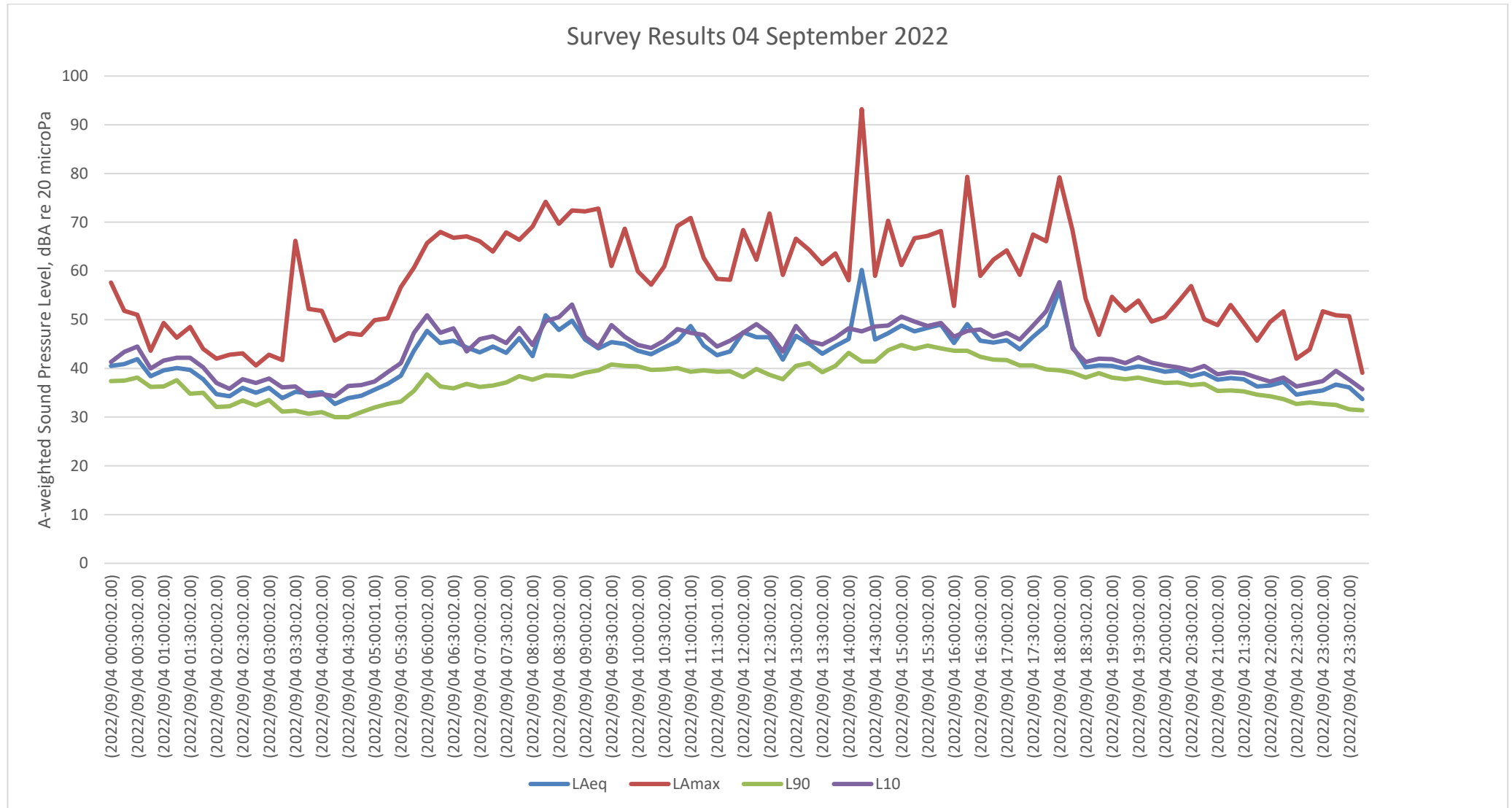
## **APPENDIX A**

### Detailed Survey Results

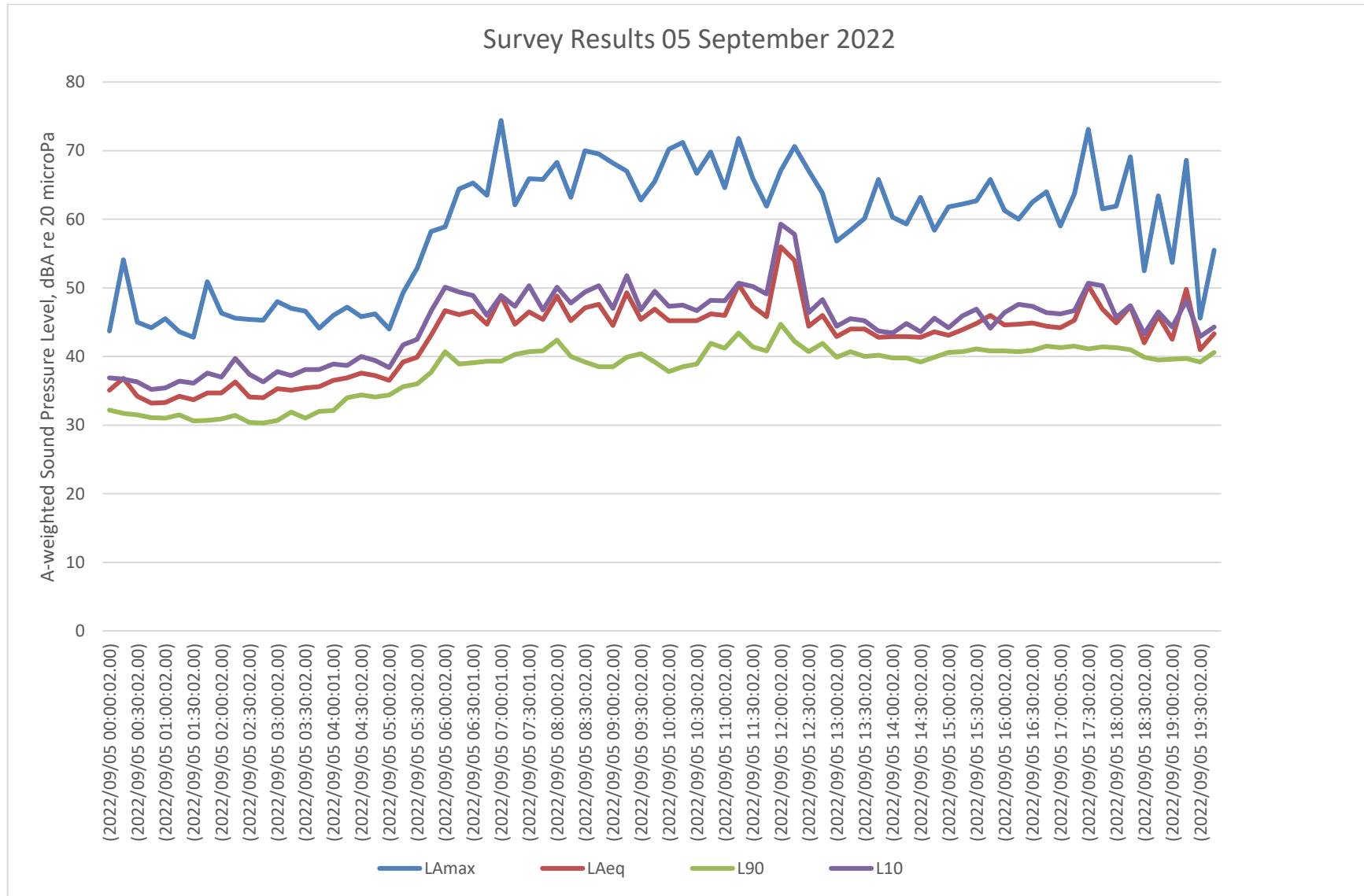




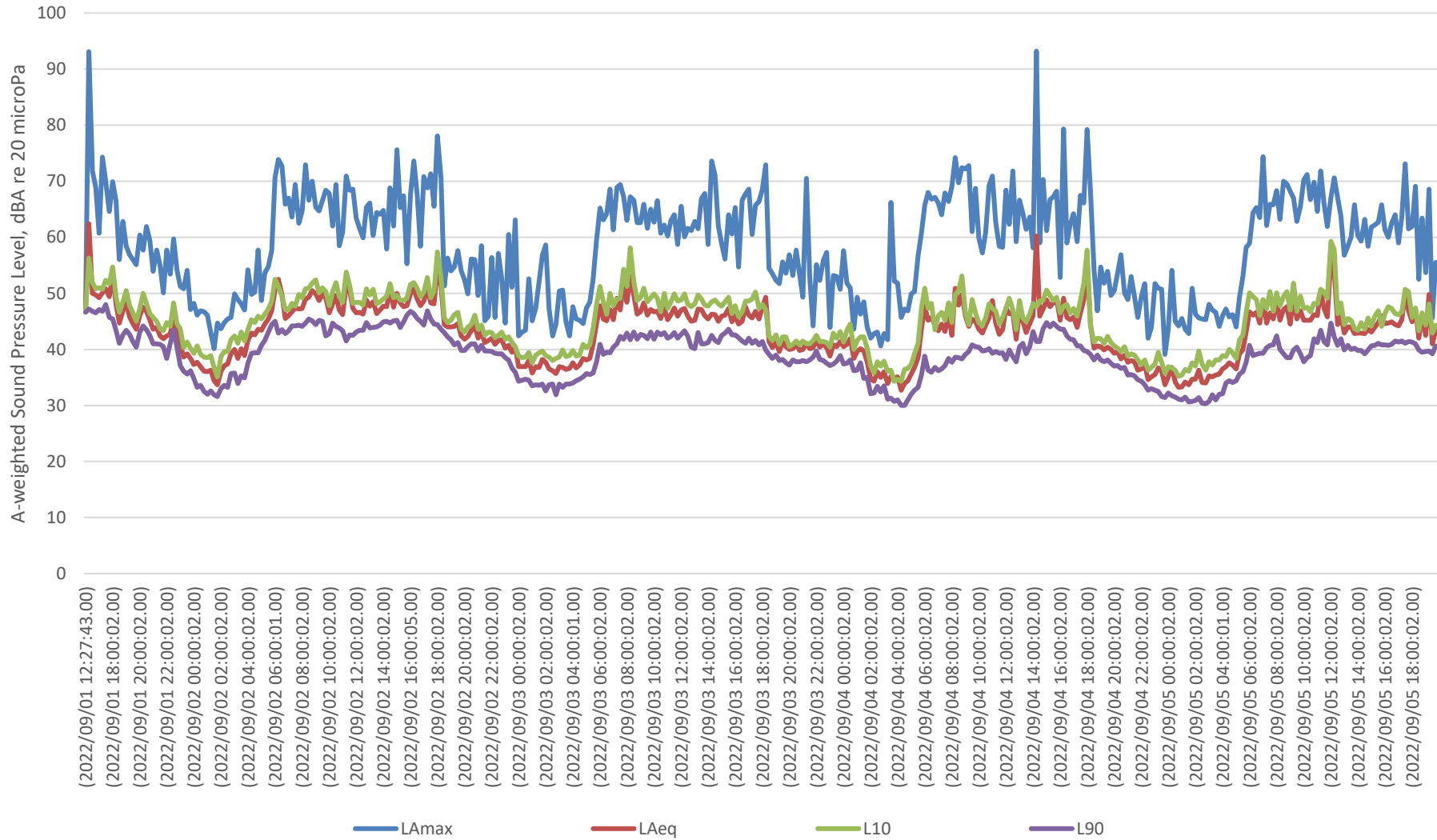








Survey Results 1-5 September 2022



## **APPENDIX B**

### Glossary of Acoustic Terminology

**dB(A)** Also referred to as dBA. A unit of measurement, decibels (A), of sound pressure level which has its frequency characteristics modified by a filter ("A-weighted") so as to more closely approximate human ear response at a loudness level of 40 phons. The table below outlines the subjective rating of different sound pressure levels.

Noise Level (dBA)	Subjective Rating
25-30	Barely audible and very unobtrusive.
30-35	Audible but very unobtrusive.
35-40	Audible but unobtrusive.
40-45	Moderate but unobtrusive.
45-50	Unobtrusive with low levels of surrounding activity.
50-55	Unobtrusive with high levels of surrounding activity.

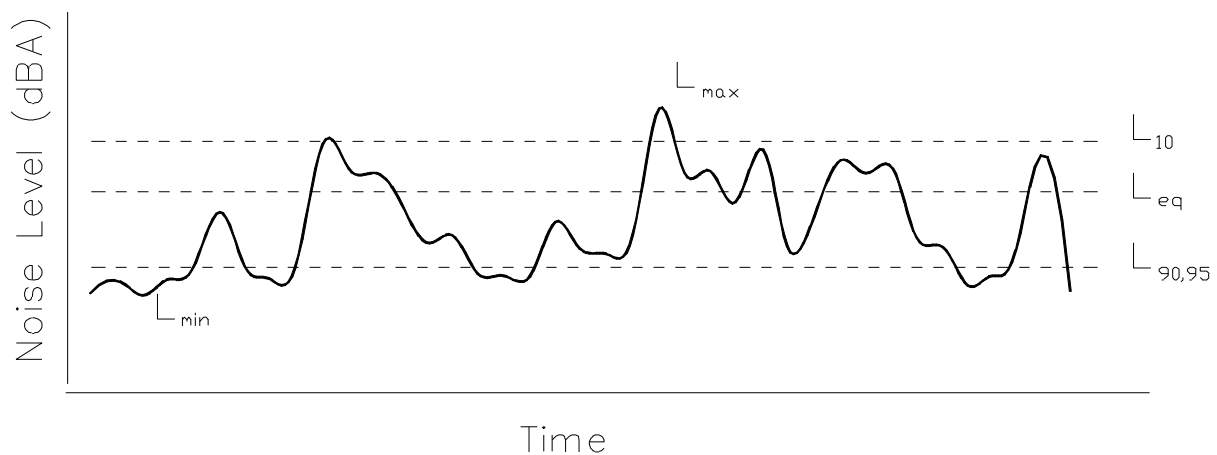
**L<sub>1</sub>** The noise level which is equalled or exceeded for 1% of the measurement period. L<sub>1</sub> is an indicator of the impulse noise level, and is used in Australia as the descriptor for intrusive noise (usually in dBA).

**L<sub>10</sub>** The noise level which is equalled or exceeded for 10% of the measurement period. L<sub>10</sub> is an indicator of the mean maximum noise level, and is used in Australia as the descriptor for intrusive noise (usually in dBA).

**L<sub>90</sub>, L<sub>95</sub>** The noise level which is equalled or exceeded for 90% of the measurement period. L<sub>90</sub> or L<sub>95</sub> is an indicator of the mean minimum noise level, and is used in Australia as the descriptor for background or ambient noise (usually in dBA).

**L<sub>eq</sub>** The equivalent continuous noise level for the measurement period. L<sub>eq</sub> is an indicator of the average noise level (usually in dBA).

**L<sub>max</sub>** The maximum noise level for the measurement period (usually in dBA).



**Note:** The subjective reaction or response to changes in noise levels can be summarised as follows: A 3dBA increase in sound pressure level is required for the average human ear to notice a change; a 5dBA increase is quite noticeable and a 10dBA increase is typically perceived as a doubling in loudness.

**STC/R<sub>w</sub>** Sound Transmission Class or Weighted Sound Reduction Index. Provides a single number rating (from the sound transmission loss or sound reduction index for each frequency band) of the sound insulation performance of a partition. The higher the value, the better the performance of the partition. The subjective impression of different ratings is shown in the table below.

Type of noise source	STC/R <sub>w</sub> Rating				
	40	45	50	55	60
Normal Speech	Audible	Just Audible	Not Audible		
Raised speech	Clearly Audible	Audible	Just Audible	Not Audible	
Shouting	Clearly Audible	Clearly Audible	Audible	Just Audible	Not Audible
Small television/small entertainment system	Clearly Audible	Clearly Audible	Audible	Just Audible	Not Audible
Large television/large hi-fi music system	Clearly Audible	Clearly Audible	Clearly Audible	Audible	Just Audible
DVD with surround sound	Clearly Audible	Clearly Audible	Clearly Audible	Audible	Audible
Digital television with surround sound	Clearly Audible	Clearly Audible	Clearly Audible	Audible	Audible

**FSTC/R<sub>w</sub>'** The equivalent of STC/R<sub>w</sub>, unit for sound insulation performance of a building element measured in the field.

**C<sub>i</sub>, C<sub>tr</sub>** The ratings (R<sub>w</sub>, D<sub>nTw</sub>, L<sub>nTw</sub>) are weighted in accordance to a spectrum suited to speech. This term modifies the overall rating to account for noise with different spectra, such as traffic (C<sub>tr</sub>) or footfalls (C<sub>i</sub>). The ratings may be written as R<sub>w</sub>+C<sub>tr</sub>, or D<sub>nTw</sub>/L<sub>nTw</sub>+C<sub>i</sub>.

**NNIC/D<sub>nTw</sub>** Normalised Noise Isolation Class, or Weighted Standardised Sound Level Difference. Provides a single number rating of the sound level difference between two spaces, and incorporates the effects of flanking noise between two spaces. This rating is generally accepted to be about 5 points less than the STC/R<sub>w</sub> rating.

**IIC/L<sub>nw</sub>** Impact Insulation Class, or Weighted Normalised Impact Sound Level. L<sub>nw</sub>=110-IIC. The higher the IIC rating, or the lower the L<sub>nw</sub> rating the better the performance of the building element at insulating impact noise. The table below gives the subjective impression of different ratings:

IIC	L <sub>nw</sub>	Subjective Rating
40	70	Clearly Audible
45	65	Clearly Audible
50	60	Audible
55	55	Audible
60	50	Just Audible
65	45	Inaudible

**FIIC/L<sub>nTw</sub>'** The equivalent of IIC/L<sub>nw</sub>, but the performance is for the building element measured in the field.

---

## **Appendix 21**

*Appendix S of Development Report – Services  
infrastructure summary*

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## MEMORANDUM

To: TRICE

From: Trevor Todd Pages: Page 1 of 5

Project: MOUNT LOFTY GOLF RESORT Reference: LCE21369-005

Date: 09 December 2022

Subject: Building Services Infrastructure Summary

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### INTRODUCTION

For the purposes of informing the projects planning application Lucid Consulting have prepared the following summary of the potential building services provisions services anticipated for the development located at Golflinks Road Stirling, South Australia. The area of the proposed new development site currently contains the existing golf course club rooms and associated buildings which are understood to be removed as part of the development. The proposed development is summarised as follows:

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m<sup>2</sup> function room.
  - A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace.
  - 186m<sup>2</sup> sports bar.
  - A 189m<sup>2</sup> gallery and cafe.
  - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – ‘Pods’
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
  - Extension to the Perfumery to include a covered outdoor dining area.
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a “Scent Factory”.
  - Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
  - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.

- Emergency vehicle access via western entry from Golflinks Road.
- Main access point via Golflinks Road.
- Designated service bay for waste collection and service vehicles.
- Porte cochere and valet area for guests and buses.
- A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
- Designated waste storage areas.
- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

Lucid consulting has been engaged to provide engineering consulting services during the planning and concept phase to assist in determination of the required Building Services; consisting of Mechanical, Electrical, Communications, Hydraulic, Fire and Vertical Transport Services, to inform the buildings design and spatial representation of major services and infrastructure. It should be noted wastewater (sewer) systems are to be designed by others.



## INFRASTRUCTURE SUMMARY

The following provides a summary of the existing and proposed services infrastructure provisions.

### SEWER SERVICES

It is understood the proposed site sewer wastewater system infrastructure is to be addressed by others (Arris).

### GAS SERVICES

There is currently no utility towns mains gas supply available within the area, as such a natural gas supply shall not be provided to the building and infrastructure systems are typically proposed to be electric. Should minor gas supplies may be required for kitchen equipment, as such if required shall be provided via local onsite external LPG cylinders.

### DOMESTIC WATER SUPPLY

The existing site is serviced via 2 off 100mm SA Water Corporation towns mains within Golflinks Road and Old Cary Gully Road. There is currently no authority recycled water mains within the local area of the site.



**Image 1 – SA Water Corporation Water Infrastructure**

Preliminary assessments undertaken to evaluate the required water demand for the proposed development, it is anticipated onsite domestic water storage tanks and pressure pumpset will be required and is intended to be incorporated within the main resort building envelope within the lower ground level plant rooms.

### BUILDING FIRE WATER

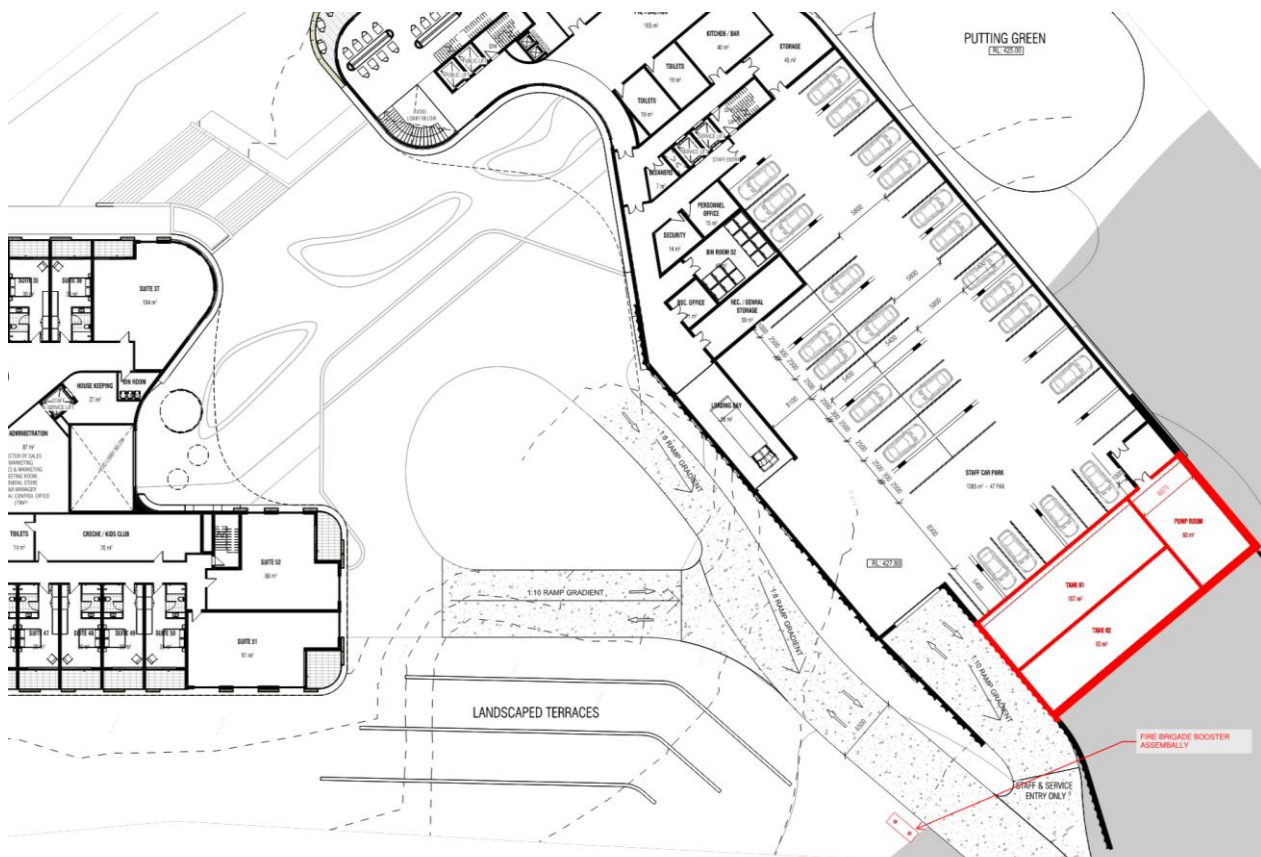
The latest architectural documents indicate the main building fire protection services will require as a minimum fire hydrants and sprinkler protection. Similar to the domestic water supply a preliminary assessment has undertaken to determine the anticipated requirements for onsite water storage and pumping systems. The anticipated building fire water demand will require on site water storage and pump systems to supplement the available capacity from the SA Water Corporation infrastructure. It is anticipated onsite fire water storage tanks and pumps consisting of 2 off tanks of approximate capacity of 150-200kL each and a fire pump facility containing 2 off fire pumps, both are required to be co-located and in close proximity to the sites main vehicle entry to facilitate the Country Fire Service operational response, as such are currently proposed to be incorporated internally within the building envelope adjacent the carpark at level 1.

In addition to the fire water storage and pumps a booster assembly is required for the attending fire brigade to connect to the system, this is to be located adjacent the main entry driveway on the approach to the buildings to facilitate the Country Fire Service operational requirements.

### BUSHFIRE FIRE WATER

It is understood the development is within a bushfire risk area and through consultation with the Country Fire Service it has been agreed in lieu of dedicated individual bushfire tanks to each building (accommodation pod and main building) a consolidated "community" bush fire water storage strategy is proposed and combine the Bushfire water storage and the Building fire water storage tanks. The current recommendations from the Country Fire Service indicate a recommended water storage quantity in the order of 400-500kL for the precinct including the main building and accommodation pods.

To provide access to the bushfire water it is proposed to provide external hydrants to the perimeter of the buildings supplied from the tanks and pumps.



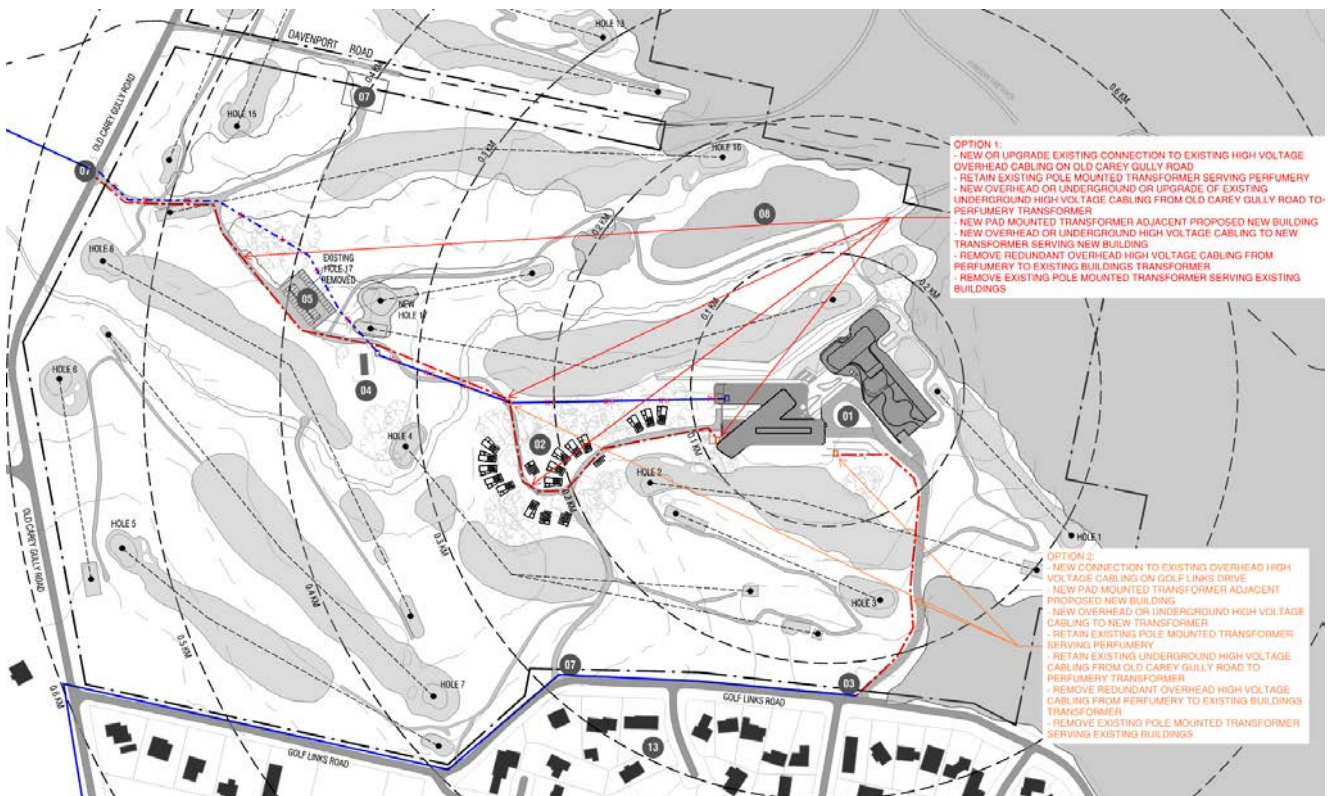
**Image 2 – Combined Building Fire and Bushfire Fire Water Infrastructure**

ELECTRICAL INFRASTRUCTURE

The development area has access to existing SA Power Networks overhead high voltage lines which currently serve the local transformer providing power to the golf course facilities. The existing supply enters the site from Old Carey Gully Road via underground high voltage cabling before transitioning to overhead high voltage cabling within the site.

Preliminary consultation with SAPN indicates the existing high voltage infrastructure is required to be altered/ upgraded to service a new larger capacity transformer located local to the main building to suit the electrical demand of the proposed buildings and removing the existing transformer. Current advice from SAPN indicates the power supply is likely to enter from Old Cary Gully Road however a second option is available to enter the site from Golf Links Drive. Both Golf Links Drive and Old Cary Gully Road have existing overhead high voltage infrastructure.

Consideration is being given to diverting the existing overhead SAPN power lines below ground, however this will be resolved as part of the detailed design as the project progresses.



**Image 3 – SA Power Networks Electrical Infrastructure**  
(Refer attached full size drawing for clarity)

We trust the above is satisfactory. Please do not hesitate to contact the undersigned should you require further information.

Regards,  
**LUCID CONSULTING ENGINEERS**

**TREVOR TODD**  
Associate

---

## **Appendix 22**

*Appendix T of Development Report – Construction  
environmental management plan*

---



ENGINEERING

# Construction environmental management plan

**Mount Lofty Golf Estate SA**

**JOB NUMBER:** S53897 - 282604

**CLIENT:** Venture Capital Developments Pty Ltd

**SITE:** Mount Lofty Golf Estate, 35 Golf Links Road,  
STIRLING, SA 5152

**DATE:** 30/11/2022

**REVISION:** 1

**Engineering  
your success.**

ADELAIDE  
MELBOURNE  
SYDNEY

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## Abbreviations

<b>ACRONYM</b>	<b>DESCRIPTION</b>
CEMP	Construction and Environmental Management Plan
CMS	Construction Method Statements
CT	Certificate of Title
DP	Deposited Plan
EIN	Environmental improvement notice
EMR	Environmental Management Representative
EPA	Environment Protection Authority
ESCPs	Erosion and sediment control plans
FMG	FMG Engineering
HSE	Health, safety and environment
HSEP	Health, safety and environment plan
HSR	Health and Safety Representatives
IR	Issue Resolution
OHS	Occupational health and safety
PPE	Personal protective equipment
PM	Project Manager
SA	South Australia
SEDMP	Soil Erosion and Drainage Management Plans
SEP	Side Entry Pit
SWMA	Safe work method statement
WMP	Waste Management Plan

# Introduction

## Background

FMG Engineering was engaged by Venture Capital Developments Pty Ltd (the client), to produce a construction environmental management plan (CEMP) for the construction and redevelopment of the Mount Lofty Golf Estate, 35 Golf Links Road, STIRLING, SA 5152 (the site).

Designers, clients/superintendents and contractors involved in the project have an ongoing commitment to protect the environment. The purpose of this CEMP is to identify the environmental protection measures, systems, and tools to be implemented by the appointed construction contractors during the development and construction works. These measures are aimed at preventing or minimising potentially adverse environmental impacts arising from the redevelopment and construction activities, and achieving compliance with environmental regulatory requirements. Additionally, the CEMP demonstrates a system for hazard and risk identification and determines appropriate management strategies to be adopted by appointed construction contractors to mitigate or eliminate these risks.

This CEMP has been prepared in accordance with the Guidelines for Environmental Management of On-site Remediation (SA EPA, 2019) and Guidelines for the Preparation of a Development Report, Mount Lofty Golf Estate (State Planning Commission, Department for Trade and Investment, 2002). This CEMP may be revised as the project progresses to ensure all conditions are adequately addressed.

Throughout this CEMP, all documents (i.e. drawings, diagrams, specifications, etc.) which have been developed as part of the design process, approved by the relevant authorities and issued for construction shall be broadly referred to herein as design documentation.

## Objectives of the CEMP

The key performance objectives set by the CEMP are to ensure compliance with all environmental legislation and approvals, minimise the potential for pollution, reduce waste, and implement effective controls to mitigate environmental impacts. Table 1 below details specific environmental objectives and targets relevant to the redevelopment project.

**Table 1 - Objectives and targets**

NUMBER	OBJECTIVE	TARGET
1	To employ best management practices to ensure that the construction project meets environmental legislative requirements.	No breach of environmental legislative or regulatory requirements. No significant environmental incidents.
2	To employ best environmental management practice to ensure compliance with all planning approvals and environmental authorisations	No non-compliance with planning approvals or applicable legislative requirements.
3	To employ best environmental management practice to minimise noise and vibration impacts.	Maintain noise levels to comply with Environment Protection (Noise) Policy 2007. Maintain vibration levels within human comfort and structural damage criteria.
4	To apply best environmental management practice to soil and water (surface water and groundwater) quality management.	No breach of environmental legislative or regulatory requirements.

NUMBER	OBJECTIVE	TARGET
5	To minimise air pollution from construction and associated activities.	Levels to comply with Environment Protection Regulation 2005.
6	To protect any vegetation adjacent to the construction zone.	No impacts on trees or other native vegetation outside the construction zone.
7	To avoid pollution of the environment caused by fuels, oils or chemicals stored or used on the Project.	No major spills of fuel, oil or chemicals.

## Site details

The site currently comprises the Mount Lofty Golf Estate comprising of a golf course, multiple courtyards with open grassed areas and paved areas, and an administration building in the western portion of the site. The site details are summarised in Table 2 below.

**Table 2 - Site details**

SITE DETAIL	RESULT
Site Address	Mount Lofty Golf Estate, 35 Golflinks Road, Stirling, SA 5152
Land Parcel	Allotment 53 in Deposited Plan (DP) 59212 Hundred of Onkaparinga
Certificate of Title (CT)	CT5891/805
Land Use	Golf Course
Zoning	Recreation
Size of Project Area	Approximately 4 hectares (Ha)
Local Government Authority	Adelaide Hills Council

## Site location and surrounding land use

The site is situated approximately 13km southeast of the Central Business District of Adelaide, located in the Adelaide Hills region and is bounded by the following:

- **North:** Old Carey Gully Road and rural residential properties and vineyards beyond
- **East:** Mount George Conservation Park
- **South:** Mount George Conservation Park, Golflinks Road and residential properties, and
- **West:** Golflinks Road and residential and rural residential properties.

The regional setting and site boundaries are presented in Appendix A.

## Project description

The proposed development is summarised as follows:

- Hotel – 3 to 5 level hotel building comprising:
  - 56 hotel suites
  - 15 x two bedroom serviced apartments
  - 15 x three bedroom serviced apartments
  - 2 penthouse serviced apartments
  - Back of house, plant storage and maintenance areas
  - 537m<sup>2</sup> function room
  - 212m<sup>2</sup> restaurant with 89m<sup>2</sup> external terrace
  - 186m<sup>2</sup> sports bar
  - 189m<sup>2</sup> gallery and cafe
  - 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms
- Private retreats – ‘Pods’
  - 17 x one bedroom units

- 1 x back of house Service Pod
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions
  - Extension to the Perfumery to include a covered outdoor dining area
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a "Scent Factory"
  - Note: the perfumery building will temporarily house the golf club whilst construction is occurring
- Golf Course Facilities Building – 2 to 5 level building comprising:
  - Retention of 18-hole golf course with improvements
  - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building
  - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms
- Car parking, access and waste management
  - A total of 200 car parking spaces in two car parking areas
  - Emergency vehicle access via western entry from Golflinks Road
  - Main access point via Golflinks Road
  - Designated service bay for waste collection and service vehicles
  - Porte cochere and valet area for guests and buses
  - A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building
  - Designated waste storage areas
- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building, and
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

# Scope of works

The scope of works includes but is not limited to:

- Prior to the commencement of works, the Contractor shall submit to Council, owners and occupants of adjoining properties written notice of their intention to commence work, expected duration of the works and a description of the type and extent of work.
- Where the works are adjacent to existing properties / structures, the Contractor shall undertake a condition report (dilapidation) to record the condition of the existing structures prior to commencement of works. The report shall also include coverage of existing roads, kerbs, crossovers etc. adjacent the site, as a baseline of the condition of Council infrastructure. A copy of the condition report shall be forwarded to the client/superintendent prior to the commencement of works.
- Prepare and maintain a Waste Management Plan (WMP) to track all possible waste streams.
- Identify all existing authorities and internal services prior to commencing works. If decommissioning of an authority service is required, the decommissioning and removal shall be coordinated and allowed for by the Contractor. If a service to remain is damaged during the works, it is the responsibility of the Contractor to make good the damage to the satisfaction of the service authority at the Contractor's cost.
- Establish any Soil Erosion and Drainage Management Plans (SEDMP) measures required
- Establish an appropriate perimeter fence and signage to prevent public access to the site for the duration of the works. It is the Contractor's responsibility to safeguard and ensure the safety of any person who may enter or trespass upon any part of the works.
- Locate all existing services and if live, arrange for their decommissioning and removal. Services (structures and pipes/cables) are to be completely removed and service trench excavations shall be backfilled with existing excavated material. If there is a shortfall of material and the finished level of the trench backfill is lower than the surrounds, the edges shall be battered to make safe and remove any trip hazards. Services may include:
  - Stormwater Side Entry Pits (SEP), grates and pipes
  - Sewer structures and pipe
  - Electrical including lighting, security cameras
  - Communications, and
  - Water services and/or irrigation.
- Clearing, grubbing and levelling of the site prior to beginning construction works (i.e. removal of tree/root ball resulting in open excavation to be reinstated).
- Demolition of six existing buildings.
- Document the fate, transport and destination of any removed materials and volumes.
- General tidy/levelling post clearance/grubbing to remove any sharp elevation changes or trip hazards.
- Undertake bulk earthworks (including stormwater basins) to prepare site as outlined in the design documentation.
- Construction of concrete retaining structures and associated earthworks infrastructure as outlined in the design documentation.
- Construction of pavements, drainage and associated civil infrastructure as outlined in the design documentation.
- Construction of concrete slabs as outlined in the design documentation.
- Construction of the following and all associated infrastructure
  - 3-5 level hotel building
  - 17 private retreats (pods) and one service pod
  - New golf course facilities building incorporating a pro-shop, administration areas, gym and change rooms, and
  - Two car parking areas with a total of 200 car parking spaces.
- Conservation works and adaptive reuse of the existing perfumery, a local heritage place, to accommodate a multipurpose café, retail, and function space.

- Retention and improvements to the 18-hole golf course including relocating Hole 17's green and Hole 18's tee.
- Installation of services (i.e. electrical, communications, water, sewer) as outlined in the design documentation.

The above scope of works and the plans provided in Appendix B have been prepared with due care and identify and highlight the known works required. The contractor is to carry out a detailed site inspection in order to determine the complete scope of works, including demolition, clearing and grubbing. Any omissions to this scope that are obvious onsite shall be deemed to have been included unless they are not reasonably identifiable.

# Planning

## Method statements

Detailed work method statements will be developed where there is a significant risk to the environment. Work method statements will be provided for final approval prior to commencing work. Method statements will include the following as a minimum (but not limited to):

- Procedures for managing the environment
- Labour requirements including subcontractors
- Permit requirements
- Signs, labels and markers, and
- Storage and transport.

## South Australia’s waste strategy

South Australia’s Waste Strategy 2005–2010 sets the overall framework and aims for sustainable waste management in the State. It aims for the diversion of waste in accordance with the waste hierarchy (Figure 1) to more sustainable options. This means that the recycling and reuse of waste should be an alternative to disposal (the least preferable option) but should not be at the expense of more preferable options.

Figure 1 - The waste hierarchy



## Regulations and Legislative requirements

The proposed works to be undertaken will comply with applicable environmental regulatory and legislative requirements. The following provides a summary of the general requirements for the proposed works.

Table 3 - Applicable Legislation relevant to the development

LEGISLATION/REGULATION/POLICY	KEY PROJECT REQUIREMENTS
Occupational Health Safety and Welfare Act 1986	Clearance work notices given under the Occupational Health Safety and Welfare Act 1986 will continue to be recognised under the Work Health and Safety legislation (r711) where the work is scheduled to commence on or after 1 January 2013; and where they involve: <ul style="list-style-type: none"> <li>• A loadbearing structure (or part of) &gt; 6m in height</li> </ul>



LEGISLATION/REGULATION/POLICY	KEY PROJECT REQUIREMENTS
	<ul style="list-style-type: none"> <li>• Load shifting machinery on a suspended floor, and</li> <li>• Explosives.</li> </ul>
<p>Work Health and Safety Act 2012;</p> <p>Work Health and Safety Regulation 2012</p>	<p>All works undertaken onsite shall be undertaken in such a manner as to prevent harm to site workers and the general public.</p>
<p>Environment Protection Act 1993 (the Act) and Environment Protection Regulations 2009</p> <p>Handbook for Pollution Avoidance on Commercial and Residential Building Sites, second edition, SA EPA.</p>	<p>Undertake all activities so as to minimise harm to the environment (in particular pollution of air and water and noise emissions) and not cause an offence under the Act.</p> <p>Some transporters of waste are required to be licensed under the Act.</p> <p>Some waste disposal/processing facilities are required to be licensed under the Act.</p>
<p>EPA Guidelines for Environmental Management of On-Site Remediation (2006)</p> <p>ASC NEPM (2013) Guideline on Investigation Levels for Soil and Groundwater. National Environment Protection (Assessment of Site Contamination) Measure Schedule B(1). National Environment Protection Council.</p>	<p>Works onsite associated with any disturbance of soils shall be undertaken in such a manner as to meet the mandatory requirements and expectations of the SA EPA to ensure the ongoing protection of human health and the environment.</p>
<p>Environment Protection (Waste to Resources) Policy 2010</p> <p>Waste Disposal Information Sheet, SA EPA (2010), Current Criteria for the Classification of Waste – Including Industrial and Commercial Waste (Listed) and Waste Soil.</p> <p>SA EPA Guideline: Wastes containing asbestos – removal, transport and disposal [EPA414/14, April 2014]</p> <p>Standard for the production and use of Waste Derived Fill (WDF), dated October 2013</p>	<p>The project should aim to achieve sustainable waste management by applying the waste management hierarchy consistently with the principles of ecologically sustainable development set out in Section 10 of the Environment Protection Act 1993 (the Act).</p>
<p>ASC NEPM (1999), Schedule B(9) Guideline on Protection of Health and the Environment during the Assessment of Site Contamination</p> <p>National Environment (Ambient Air Quality) Protection Measure 1998</p> <p>enHealth (2012), Environmental Health Risk Assessment—Guidelines for assessing human health risks from environmental hazards</p>	<p>Offensive vapours / hazardous ground gases that may be encountered during the works will be managed in accordance with the stated documents.</p>
<p>Environment Protection (Water Quality) Policy 2003</p> <p>Code of Practice—Industrial, Retail and Commercial Stormwater Management (in draft at date of publication)</p>	<p>Ensure that all environmental values are protected during the development works, including:</p> <ul style="list-style-type: none"> <li>• maintenance of aquatic ecosystems</li> <li>• drinking water</li> </ul>

LEGISLATION/REGULATION/POLICY	KEY PROJECT REQUIREMENTS
	<ul style="list-style-type: none"> <li>• agriculture and aquaculture (including irrigation and livestock)</li> <li>• recreational uses (eg swimming or boating) and aesthetics (visual appearance and enjoyment)</li> <li>• industrial uses.</li> </ul>
<p>AS 2436-2010 Guide to noise and vibration control on construction, demolition and maintenance sites</p> <p>General Environmental Noise (May 2013), EPA Information Sheet 424/13</p> <p>EPA Information Sheet Handbook for Pollution Avoidance on Building Sites (2nd ed. June 2004)</p>	<p>Noise levels during construction works will be managed in accordance with the policies.</p>

## Hours of operations

Standard working hours of 7am to 7pm Monday to Saturday apply in accordance with the SA EPA regulations, unless negotiated otherwise with Council. Sundays and Public Holidays 9am-7pm (if work is essential).

## Site establishment and security

Site establishment shall include:

- Fencing the site to prevent public access and installation of shade cloth to assist with control of dust
- The establishment of site contractors' offices and mess and associated toilet facilities
- Designated car parking areas, vehicle access and vehicle loading, unloading and lay down areas, commissioning of equipment, plant and operations and establishment, and
- Maintenance of on-site work areas.

Signage, whilst important, is a relatively unsatisfactory way of communicating information to people about the Site and in general, its use would appear limited. Potential safety measures include:

- Secure fencing around the entirety of the Site to restrict view of and access by the public and provide protection from physical hazards particularly adjacent the nearby Sturt Highway and residential properties. Any unsupervised excavations (including pits) should never be left open or unfenced as they present a hazard to site personnel and unauthorised visitors.
- *Warning Deep Excavation* signs shall be placed around the external perimeter as appropriate and where any excavation works are required
- Requirement for all visitors to report to the site office to receive further instructions
- Site induction for all workers and visitors to the Site, and
- Records of those who attend the site.

# Roles and responsibilities

The responsibility and authority pertaining to environmental performance of the project is specified below.

## All personnel

All personnel (including sub-contractors) have a general environmental duty of care (as defined in the Environmental Protection Act 1993) and are responsible for their own environmental performance whilst on the project.

As a minimum, personnel are required to:

- Comply with the requirements of applicable environmental legislation and environmental authorities including the specific requirements of the project approvals and supporting documentation
- Undertake all activities in an environmentally responsible manner
- Undertake all activities in accordance with this CEMP, procedures and any subsequent work method statements
- Identify and report any non-conformances with environmental management, legislative or approvals requirements
- Ensure that they are aware of the contact person regarding environmental matters and report any activity that has resulted in, or has the potential to result in an environmental harm
- Ensure that they attend any environmental training provided relevant to their role and responsibilities, and
- Support the construction team in planning and implementing environmental requirements.

## Key personnel

### Environmental management representative (EMR)

The EMR is an individually appointed and independent third party, with experience and qualifications in environmental management. The EMR has primary responsibility for managing all aspects of environmental management and compliance for the construction phase of the Project. The key responsibilities of the EMR are to:

- Develop and implement this CEMP and provide updates/revisions to the CEMP as necessary
- Conduct (or assist the PM in) environmental briefings and toolboxes to construction staff
- Conduct environmental site inspections
- Identify and report non-conformances to the client/superintendent
- Monitor the implementation and effectiveness of the CEMP
- Complete environmental reporting requirements
- Provide advice and direction on environmental matters, incident response and corrective actions
- Review statutory compliance and ensure check all approvals are complied with, and
- Monitor and ensure compliance with all applicable legal, approvals and project environmental obligations including but not limited to this CEMP.

### Project manager (PM)

The Project Manager (PM) is responsible for delivery of the construction phase of the Project to ensure that environmental impacts are minimised, and obligations are met. The PM will be working in conjunction with the Environmental Management Representative (EMR), as required to ensure that the construction team delivers the prescribed environmental outcomes.

Key tasks include:

- Ensure compliance with all applicable legal, approval and project environmental obligations including but not limited to this CEMP

- Ensure all project staff have a clear understanding of the environmental requirements relevant to their area/scope of work
- Ensure all project staff are competent to undertake their duties including fulfilment of the general environmental duty, with regard to appropriate education, training and experience
- Ensure the necessary resources and processes are in place for implementation of required environmental controls
- Ensure all site superintendents /supervisors are familiar with environmental obligations, project approvals, CEMP and site level plans, relevant environmental management plans and associated documents, and their responsibilities within them
- Participate and provide guidance in the regular review of the CEMP and any associated documents
- Act in the event of an emergency and allocating the required resources to minimise environmental impact
- Ensure non-conformances are identified, recorded and reported and that required corrective and remedial actions are implemented, and
- Report any activity that has resulted in an environmental incident to the EMR and the client.

### Site supervisor/Foreman

Supervisors/Foreman report to the PM. They will have a direct role in the compliance with identified environmental procedures and controls. They will also be responsible for checking the site on a regular basis and ensuring that regular maintenance is undertaken to minimise environmental impacts and that personnel are provided with appropriate environmental “toolbox” training, prepared by the EMR. Where applicable the Supervisor/Foreman will be responsible for ensuring that any work performed by external parties meets with the requirements of this CEMP, including identifying and documenting the environmental risks of the proposed works.

Key tasks include:

- Ensure all personnel and subcontractors are made aware of the requirements for compliance with this CEMP, environmental obligations and site-specific environmental issues
- Implement all environmental requirements as outlined in this CEMP as required to avoid and minimise actual or potential environmental harm
- Support the Environment Management Representative in planning and implementing environmental requirements
- Ensure non-conformances are identified, recorded and reported
- Ensure implementation of preventative and corrective actions
- Co-ordinate the implementation and maintenance of environmental control measures
- Provide necessary resources required for implementation of the CEMP
- Co-ordinate action in emergency situations and allocating required resources accordingly, and
- Ensure that instructions are issued, and adequate information is provided to field-based employees that relates to environmental risks on site including via regular toolbox meetings that address environmental issues and controls including the requirements of this CEMP.

### Construction personnel

In addition to the key positions outlined above, with respect to environmental management, all staff working on the project including but not limited to construction workers, personnel involved in preparatory works for construction, surveyors, geotechnical consultants and any other persons undertaking investigations or works for preparatory works have responsibility for environmental performance of the project.

The responsibilities of these personnel include:

- Attend all environmental training required and adhere to and remain familiar with the principles covered in the training session(s)
- Undertake all activities in accordance with agreed procedures and work methods

- Ensure that they are aware of the contact person for environmental matters
- Ensure that any clearances are obtained from the EMR where required, and
- Report any activity that has resulted in an environmental incident.

## General Site Personnel

In addition to the key positions outlined above, with respect to environmental management, all staff working on the project including but not limited to clearance workers, personnel involved in bulk earthworks construction, general concrete works, pavement construction, service contractors, mechanical plant specialists, surveyors, engineers and any other persons undertaking investigations or works for the construction of the project have responsibility for environmental performance of the project. The responsibilities of these personnel include:

- Attend all environmental training required and adhere to and remain familiar with the principles covered in the training session(s)
- Undertake all activities in accordance with agreed procedures and work methods
- Ensure that they are aware of the contact person for environmental matters
- Ensure that any clearances are obtained from the EMR where required, and
- Report any activity that has resulted in an environmental incident.

## Sub-contractors

It is recognised that often sub-contractors present the greatest environmental risks to a project due to:

- Their detachment from the main construction delivery teams, and therefore the potential for poor communication regarding environmental risks
- Sub-contractors having different certification standards for quality assurance and environment
- The potential for large number of subcontractors on site, and
- Sub-contractors operating under a different management system from the rest of the construction team.

It is the PM responsibility to ensure that all persons on the Project including sub-contractors and their employees are notified on their need to comply with the relevant environmental requirements. As a minimum, sub-contractors and their employees will be required to comply with the CEMP in full.

All sub-contractors' personnel are considered equivalent to the construction team personnel in all aspects of environmental management and control, and their responsibilities in this respect mirrors those of the construction team personnel.

Sub-contractors working on the Project will be required to:

- Observe sub-contract and statutory requirements relating to environmental protection and other environmental legislation and to follow instructions issued by the Project Manager and supervisory personnel
- Nominate Site representatives to liaise with the construction team with respect to, and take responsibility for, environmental requirements for the Site activities
- Adhere to the Site management system as it applies to their operations on the site
- Co-operate fully with Site emergency incident procedures and consultative arrangements, and
- Follow procedures incorporated in this CEMP.

The PM will ensure that the work of sub-contractors is monitored through the Site inspection process. Observations will be made by relevant personnel to assess the effectiveness of the environmental protection measures being used on site by the sub-contractor and to determine compliance with the requirements of the CEMP.

# Environmental aspects, impacts and risks

Environmental aspects, as referred to in this document, are those activities associated with the project that have the potential to cause, or result in, adverse environmental impacts. Due to the nature of the development, different aspects of the Project would present different degrees of environmental risk which need to be managed accordingly.

Effective environmental management should be proactive rather than reactive. In order to facilitate a proactive style of environmental management, a risk management style of assessment has been utilised to identify and assess environmental aspects associated with the Project, and to implement appropriate mitigation strategies to minimise the likelihood of environmental risks associated with each aspect. This process involves:

- Identifying the risk/aspect
- Analysing the risk/aspect (determining likelihood and consequence)
- Evaluating the risk/aspect, and
- Treating the risk.

All identified aspects are assessed based on the risk assessment matrix displayed in Table 4. Risk assessment is based on:

- The likelihood of an impact occurring as a result of the aspect, and
- The consequences of the impact if the event occurred.

Following this assessment, each impact is assigned a risk category which range from “low” (low likelihood and consequence) to “extreme” (high likelihood and consequence). A risk category identified as having an extreme or high risk (a significant impact) may be downgraded if appropriate environmental controls and measures are implemented and maintained. Proactive planning, installation and maintenance of appropriate environmental controls and ongoing monitoring will reduce the risks associated with each environmental impact identified for the project.

**Table 4 - Risk Matrix and Qualitative Measures of Likelihood Scale**

		CONSEQUENCES				
LEVEL	LIKELIHOOD	1	2	3	4	5
		Negligible Discharge	Uncontrolled Discharges in minor quantities	Moderate breach of environmental statutes	Major breach of environmental statutes	Shutdown of project due to environmental breach
A	Almost Certain	H	H	E	E	E
B	Likely	M	H	H	E	E
C	Moderate	L	M	H	E	E
D	Unlikely	L	L	M	H	E
E	Rare	L	L	M	H	H

LEVEL	CATEGORISATION OF LIKELIHOOD	DESCRIPTION
A	Almost Certain	Is expected to occur during the project, 90% or > probability
B	Likely	Will probably occur during the project, ~50% probability
C	Moderate	Might occur at some time during the project, ~10% probability
D	Unlikely	Could occur at some time during the project, ~1% probability
E	Rare	Only occur in exceptional circumstances, < 1% probability

Table 5 details the environmental aspects identified for the Project, the initial risk category prior to appropriate management strategies, the proposed management strategy, and a revised risk category. Control measures and safeguards to minimise and manage environmental risks are also presented following in Table 5.

Table 5 - Key Aspects, Potential Impacts and Risk Analysis for the Project

ITEM	POTENTIAL IMPACT	POTENTIAL RECEPTORS / TRANSPORT MECHANISM	UNTREATED RISK CATEGORY	MITIGATION MEASURE	REVISED RISK CATEGORY
Soil and Groundwater Impact	Spills and leaks during plant maintenance / operation resulting in soil / groundwater contamination.	Future site users, all onsite workers and Biota (particularly relevant to the upper 2 m of the soil profile), / downward leaching through soils and infiltration to groundwater, exposure (dermal contact) during piling works and excavation works	(C2) Medium	The use of dangerous substances at the site should be undertaken in accordance with the requirements of the SA Dangerous Substance Act and Regulations. Refuelling of vehicles should be undertaken off-site. No fuel should be stored on site other than small jerry can-like containers used to top up portable pumps such as flex-drives. If any re-fuelling and emergency servicing is required, it is to be undertaken on a quarry rubble hardstand area created for this purpose. The quarry rubble is to be underlain by an impervious plastic membrane. At the end of the works, the hard stand is to be scraped up and disposed of in accordance with SA EPA requirements. The cleaned surface under the hardstand is to be inspected and validated by the Environmental Consultant. The potential for loss of chemical substances on site, be it through deliberate or accidental means, and the type and toxicity of the chemical substances to be used, should be considered when management procedures and emergency response plans are formulated. Chemical substances should be separated according to their respective class and should not be stored in the vicinity of sensitive structures. The storage and refuelling areas are to be equipped with emergency spill kits appropriate to the level of risk and potential volume of any potential spill. If a spill occurs it is to be responded to and cleaned up immediately. A non-conformance is to be raised. If necessary, Emergency Services shall be notified, and any required Regulatory Notifications made in consultation with the Environmental Consultant. Specified personnel will be provided with spill management and emergency response training including the location and application of spill kits and associated remediation products.	(E2) Low
	Soil contamination as a result of the importation of contaminated fill material for backfilling or site preparation		(B4) Extreme	Only fill material that meets the physical and chemical requirements of waste derived fill (WDF) in accordance with the <i>Standard for the production and use of Waste Derived Fill</i> (WDF), dated October 2013 can be imported onto the site for backfilling or site levelling purposes. The supplier of the material (virgin and waste fills) is to provide certification that material is chemically and aesthetically suitable and not contaminated prior to acceptance by the authorisation holder. Records of all imported material shall be maintained on site and made available to the EMR for review prior to delivery of the material to site. All soils intended for importation and reuse onsite must firstly be approved by the environmental consultant.	(E1) Low
	Cleaning of trucks resulting in ground contamination and/or water pollution, particularly the coastal and marine environment		(C3) High	Trucks, pumps and equipment must not be washed down in roadways, footpaths or reserves. Suppliers shall be informed that where practical, wash-down must be delayed and carried out at their respective depots. Where absolutely necessary these vehicles and equipment should be washed down within the designated contained vehicle wash-down area within the site.	(D2) Low
	Surface water/ waste water being incorrectly disposed offsite resulting in off-site contamination	Storm water, construction workers / dermal contact.	(D4) Extreme	Surplus wastewater, including that from brick cutting activities should be recycled, disposed to sewer (with SA Water Trade Waste approval) or discharged into the nominated on-site soakage area for drying by soakage. Site mixing of concrete, either by hand or by mechanical means, shall be carried out in the designated vehicle, plant and equipment cleaning area of the site which is capable of containing all excess water for disposal by a licensed contractor. If dewatering processes are required, personnel conducting dewatering activities must be provided with adequate instruction. The area dewatering processes may be controlled using a variety of sheet piles, containment berms, cut off trenches, sand bags, hay bales, clean rock, geotextile, etc. All persons carrying out dewatering activities (in any form) shall take all reasonable and practical measures to ensure: <ul style="list-style-type: none"> <li>dewatering wastewater is treated to meet requirements and is discharged or disposed in a way that does not cause environmental harm or environmental nuisance,</li> <li>all water treated offsite is done so in accordance with relevant legislation, and</li> <li>no offensive odours or nuisance noise are released as a result of dewatering.</li> </ul>	(E2) Low



ITEM	POTENTIAL IMPACT	POTENTIAL RECEPTORS / TRANSPORT MECHANISM	UNTREATED RISK CATEGORY	MITIGATION MEASURE	REVISED RISK CATEGORY
Stormwater, site erosion and sedimentation	Tracking of sediment onto public roads from fleet leaving site.	Storm water, construction workers, off-site users, biota / impact on water quality and biota due to off-site migration pathways, dermal contact, inhalation, ingestion	(B3) High	The Contractor Project Manager is to ensure that all exiting vehicles are to be inspected; where mud or debris is found, the vehicle is to be turned back for cleaning and reinspection. If there is a breakdown of the environmental management controls and excess dirt, dust, debris that may cause a nuisance is trafficked into the public roadway, the Contractor Project Manager will immediately arrange for the roadway to be cleaned using a street sweeper.  Establish appropriate sediment and erosion control onsite, which complies with applicable state and council legislative requirements, namely <i>Environment Protection (Water Quality) Policy 2003</i> and <i>Local Government Act 1999</i> .  Sediment control planning shall incorporate the usage of hay bale barriers, silt fences and side inlet pit sediment traps as per the requirements of the Stormwater Pollution Prevention, Code of Practice for the Building and Construction Industry, SA EPA, March 1999 (SA EPA, 1999). Regular inspections during construction activities and after significant rain events (>10mm/24h) to ensure they are operational and undertake maintenance repair works as required.  Stormwater Management Plans for the site will be prepared prior to commencement of works and may include site grades, temporary perimeter bunding and temporary drainage channels and retention basins.  During excavation works and as necessary, temporary drainage channels and detention pondage may be installed to appropriately manage stormwater. If required, diversion drains will be constructed to minimise runoff from rainfall flowing into the works area and the flow of waters from stockpiles. All liquids encountered on site displaying a visible sheen or odour whether they be pooled rainwater or perched groundwater must be retained on-site (unless assessed and approved for off-site disposal by appropriately licensed waste haulage personnel) or released to the stormwater system following approval from SA Water.	(D2) Low
	Increased rates of erosion and sedimentation of hardstand areas and unsealed surfaces.		(B4) Extreme		(D2) Low
	Erosion and sedimentation of potentially contaminated and natural soils resulting in pollution off site to adjacent storm water and coastal and marine environment		(A5) Extreme		(D2) Low
	Poorly maintained or inadequate erosion and sediment control measures not effectively treating construction run-off on site resulting in a pollution event.		(B5) Extreme		(D2) Low
	Inappropriate management of sediment trap discharge resulting in storm water pollution.		(B4) Extreme		(D2) Low
	Inappropriate stockpiling of material potentially resulting in a pollution event.		(C3) High		(D1) Low
Asbestos	Discovery of asbestos materials identified onsite.	Construction workers, adjacent sensitive site users / inhalation of fibres	(D5) Extreme	All asbestos containing materials must be identified and removed by a <i>Class A</i> licensed asbestos removalist contractor prior to commencement of demolition works. Under regulation 475 air monitoring must be conducted at all licensed asbestos removals by an independent licensed asbestos assessor. This requirement also applies to <i>Class B</i> removals via transitional regulation 726.	(D1) Low
Wind	Excessive dust emissions during clearance works resulting in a community complaint.	Construction workers, adjacent site users / direct dermal contact, inhalation, accidental ingestion	(B4) Extreme	Dust may cause potential health and environmental impacts if generated at unacceptable levels adjacent to sensitive receptors, with finer dust particles able to be transported offsite for considerable distances in prevailing winds. Small dust particles are respirable and thus can cause serious respiratory health problems by entering the lungs, whilst larger particle sizes are generally caught in the respiratory tract and may result in less serious conditions such as sinus congestion, sneezing or coughing. Dust dispersion may also impact the surrounding area, particularly where dust becomes wet and/or enters the stormwater system.  Construction activities, with a particular focus on demolition and earthworks exercises, will be undertaken in a manner which minimises the generation of dust emission on site. This includes utilising water carts for dust suppression, restricting vehicle speeds on site, modifying construction activities during high wind period, stabilising hardstand areas, and covering vehicle loads prior to leaving site. Stockpiles of material, if not correctly managed, can represent a considerable source of dust, due to their height and un-compacted nature. Additional information relating to the management of stockpiles is provided in Section 5.2. Dust levels during works shall be monitored (visually) by the Contractor during all external works.	(C1) Low
	Exposed areas/surfaces contributing to increased dust emissions on site.		(B4) Extreme		(C1) Low
Protection of trees and vegetation	Inadvertent removal of trees during works.	Biota	(D3) Medium	There are a small number of trees which will require demolition, particularly to facilitate the new access road, the contractor shall ensure trees to be demolished are inspected and approved with a suitably qualified arborist/representative from Council prior to demolitions. Trees to be demolished or protected are to be clearly marked prior to demolition works beginning. If damage to native vegetation occurs, the contractor on behalf of the owner of the land, will be responsible for obtaining approval for their removal if required.	(E1) Low



ITEM	POTENTIAL IMPACT	POTENTIAL RECEPTORS / TRANSPORT MECHANISM	UNTREATED RISK CATEGORY	MITIGATION MEASURE	REVISED RISK CATEGORY
Noise and Vibrations	Excessive noise and vibration construction works resulting in a community complaint.	Surrounding residents, adjacent site users, buildings, and structures	(C2) Medium	<p>Construction activities will occur in a manner which minimises the potential for noise and vibration impacts on sensitive receivers, recreational users, heritage structures etc. This includes operating during the approved weekend construction hours, turning off machinery and equipment when not in use, minimising reversing and horn signals, ensuring plant and equipment are operated and maintained in a satisfactory manner and abiding by proximity limits.</p> <p>Vibration from the use of heavy machinery at the site can cause structural damage to nearby structures. The zone that will be potentially affected by vibration shall be determined prior to the commencement of site works.</p> <p>The selection of equipment shall take account of the degree of vibration compatible with adjacent structures.</p> <p>If vibration becomes excessive, the offending machine/ work will cease operation until appropriate vibration levels can be achieved.</p> <p>Where potential for damage to occur exists, construction trials including vibration monitoring at structures at risk are to be carried out.</p> <p>Appropriate measures should be undertaken by the contractor to maintain the integrity of the surrounding infrastructure.</p> <p>In the event that public complaints are received, methodologies will be reviewed, and alternate methods implemented.</p> <p>Involvement and communication with the neighbouring residential site occupants is necessary to prevent undue concerns regarding management of the initial earthworks and risks associated with the works.</p> <p>A complaints register will be established by the Project Environmental Manager. The register will comprise a system or protocol for the receipt, recording and response to community complaints, and methods for dealing with complaints.</p> <p>Complaints about environmental matters associated with earthworks activities will be treated as non-conformances.</p>	(D2) Low

## Health, safety and environment plan (HSEP)

A detailed Health Safety and Environment Plan (HSEP), which will include a health and safety risk assessment for the planned construction works will be prepared by the Contractor for the Site.

The HSEP shall include, but not be limited to:

- Naming key personnel responsible for Site safety
- Describing the risks associated with each operation conducted
- Confirming that on-site personnel are adequately trained to perform their job responsibilities
- Describing the protective clothing and equipment (i.e. gloves, boots and hard hats) to be worn by personnel during various Site operations
- Describing the actions to be taken to mitigate existing hazards to make the work environment less hazardous
- Describing the type of emergency equipment to be available during the works, and
- Setting out a contingency plan for safe and effective response to emergencies.

The plan would include telephone numbers for emergency services and a map showing the route to the closest hospital.

## Traffic control

All traffic to and from the Site will be through the main Site entry point. Parking for Site workers and visitors will be provided on-site at a designated area.

Transportation of "over-sized" equipment will be performed outside peak hours with appropriate signage and in accordance with DPTI regulations.

In addition to the above:

- Only designated transport routes will be used over the duration of the proposed works which will be communicated to haulage contractors
- No vehicles are to arrive at the Site outside the Site working hours
- Site workers are to utilise local public transport system and car sharing wherever possible, and
- Trucks will only leave the Site when they have reached their capacity loads wherever possible.

# Project specific OHS and environmental procedures

## Occupational health safety (OHS)

The Construction Manager should prepare and administer an Occupational Health and Safety (OHS) plan in accordance with the Work Health and Safety Act 2012 and the Work Health and Safety Regulations 2012. Reference shall also be made to approved codes of practice and standards.

The plan shall take into account all potential safety issues highlighted in or arising from the General Specification, the CEMP and site specific OHS plans including the following:

- Specific OHS requirements such as vapour monitoring
- Personal protective equipment (PPE)
- Engagement of a qualified occupational hygienist, and
- Contractor responsibilities.

The following issues should be addressed as part of the development of the plan in order to ensure appropriate health and safety conditions exist for workers and the general public:

- Evaluation of hazards
- Assessment of risks
- Determination of safety equipment and procedures, and
- Determination of measures to ensure general public health.

All personnel involved in site works inducted by the site OHS representative, will read and understand the OHS requirements and sign a compliance agreement. Copies of the plan shall be available and accessible to site personnel for reference and review. The construction manager should ensure that regular OHS meetings with site workers are conducted to review safety requirements and ensure any non-conformance issues are adequately addressed.

The OHS plan would include details of:

- Site specific hazards
- Exposure risks
- Site control procedures
- Contaminants and hazard identification and precautions
- Warning symptoms from exposure to contaminants
- Protective equipment requirements and usage
- Decontamination facilities and procedures
- Prohibitions, and
- Emergency response procedures.
- Responsible persons
- Nearest medical facilities
- Appropriate supervision
- Safe operating procedures
- Procedures for confined space entry
- Safety equipment and procedures for First Aid, and
- Training and education of employees and supervision.

The Contractor will ensure that at least the minimum number of Designated First Aiders (in accordance with SafeWork SA Approved Code of Practice for First Aid in the Workplace), including the OHS representative, holds a current accredited first aid certificate and will supply a specified area (First Aid Room) for treatment/assessment purposes.

## Personal Protective Equipment

Earthmovers, contractors and others involved in the redevelopment earthworks must be equipped with safe work clothes and PPE including items such as:

- Eye protection for example, safety goggles and glasses
- Foot protection for example, safety shoes and boots
- Head protection for example, hard hats, helmets and broad brimmed hats
- Body protection for example, long-leg trousers, overalls, gloves, long-sleeved shirts and high visibility clothing
- Hearing protection for example, ear plugs and earmuffs, and
- Any substance used to protect health, for example, sunscreen.

In the event that dust is generated by the works, appropriate mitigation measures will be implemented, ensuring the risk level is mitigated to safe working levels (i.e. dust masks etc. are not required) in the first instance.

# Management strategies

## General approach

The timing of installation of control measures will be critical to ensuring that environmental obligations are met within the required timeframe and that controls are effective in achieving their purpose.

Control measures and safeguards to minimise and manage environmental risks identified in the sections below. A program of routine maintenance will be conducted on environmental controls. Daily inspections of work areas will be undertaken by PM and Site Foreman and inspections will be undertaken by the EMR as required. These inspections will provide a means for identifying maintenance requirements before they reach a critical stage.

## Vehicular access

Traffic movements from the site should be limited where possible, including allocating dedicated site vehicles/machinery (water trucks, excavators, tipper trucks etc.) that shall remain on site during the program rather than traversing to and from site each day.

The transport route should be subject to the same levels of management as the site, including hours of operation/use, dust, noise and sedimentation management.

All vehicles should have loads covered (where applicable) and should be appropriately washed-down before leaving the site to limit transport (drag-out) of material/dust off-site. The Construction Manager should provide a specified area for the wash-down and construct a "shaker" if conditions warrant.

All vehicle movements to and from the site, within the near vicinity of the site, should be strictly within site operating hours.

## Erosion and sediment control plans (ESCPs)

The PM and Superintendents will be responsible for the development and implementation of ESCPs on site as required. This will ensure that erosion and sediment management is incorporated into the planning phase of construction activities. Erosion and sediment controls are outlined in Table 6 and in the ESCP provided in Appendix C. However, it is expected that minor adjustments to ESCPs will be required on site to complement construction activities.

## Noise

Noise should be managed to ensure impacts to onsite workers and neighbouring residences are minimised. This can be achieved through selection of appropriate equipment and timing of use, noise suppression equipment (mufflers, etc.) on any excessively noisy machinery (eg. compressors, air scrubbers) and keeping machinery in good repair. Specific noise controls are outlined in Table 7.

Reference should be made by the Project Manager to the SA EPA *The Environment Protection (Noise) Policy 2007 and its impact on existing and proposed developments 2007*.

## Vibration control

The use of large excavators, rollers etc. should be kept to a minimum along boundaries to reduce the impacts of vibration on neighbouring properties.

Appropriate measures should be undertaken by the Project Manager to maintain the integrity of the surrounding infrastructure.

In the event that complaints are received methods should be reviewed by the Project Manager and alternate methods implemented.

## Air quality (dust)

Dust control measures should be implemented during any upgrade works. For the purposes of this CEMP, dust refers to particulate matter including airborne dust, and organic solids.

Dust dispersion may cause problems with impacting the surrounding area, particularly where dust becomes wet and/or enters the stormwater system.

Dust suppression, as part of all site works, should be adequate at all times during and outside of normal working hours. Dust suppression mechanisms should be applied by the Contractor when:

- Unsealed access routes and exposed ground surfaces are dry, and wind and vehicle movements result in visible dust generation
- Exposed surfaces of potential material stockpiles are dry and wind or handling activities result in dust generation
- Dust generation is visible during excavation activities on the site, and
- Dust is generated from loads in trucks.

Stockpiles are to be managed to limit the emission of and exposure to particulates (dust). Stockpiles will be managed with consideration given to the following:

- The height of a stockpile should not exceed 3m, or not exceed the average height of surrounding structures (whichever is the lesser)
- The height of a stockpile should be reduced if in close proximity to the site boundary. The height of a stockpile should be below the fence line within 5m of the boundary
- Stockpiles will be covered with an appropriate material dependent on the content of the stockpile, and
- Stockpiles/soils will contain a significant level of moisture before handling.

Specific dust controls are outlined in Table 8. A detailed dust management and monitoring procedure shall be provided by the PM prior to the commencement of works.

Water used for dust control may be sourced from on-site and of a suitable quality that it meets SA EPA irrigation quality guidelines.

## Surface water- Stormwater

The PM should implement a surface storm water management strategy that effectively controls surface runoff entering and leaving the site.

Stockpiles constructed in un-bunded areas should be lined beneath with a HDPE liner and bunded with hay bales may be used to minimise the potential for sediment run off.

During excavation works, a temporary sump/stormwater basin should be constructed at the base of the excavation to collect perched water seepage and rainfall. The location of the proposed stormwater basin at the site is presented in Appendix C. The water in this basin should be disposed of by a suitably licensed waste disposal contractor to be engaged by the PM.

## Excavations

Excavation work should be undertaken in stages to limit potential impacts and disruptions to site boundaries, in particular the shared access roads.

Where necessary, special precautions shall be undertaken to ensure safe working conditions exist and to protect neighbouring properties. These may include construction of appropriate batters to address potential soil collapse.

Where necessary the PM shall take precautionary action in order to minimise potential risk of damage to structures or vegetation on adjoining properties in close proximity to the excavation works.

The contractor should seek direction from the PM to ensure necessary action is taken to limit potential damage to any adjoining buildings, properties and services. For example, this may require the preparation of a dilapidation survey prior to commencing site works. Suitable stabilisation and retention techniques will be employed as required to manage potential collapse of material.

In addition to the sidewall treatment, other precautionary requirements may be required in some areas and shall be at the direction of the PM and may include soil stabilisation and/or underpinning.

A detailed excavation and slope stability management procedure should be provided by the Construction Manager and approved by the Superintendent prior to the commencement of works.

### Contingencies and 'discovery'

Work should cease following the identification of any unanticipated areas of contamination and the Environmental Consultant should be contacted.

The unanticipated areas of contamination will be subject to further environmental investigation to confirm the remediation strategy and validation required of the remediated area. This could be as simple as excavating out contaminated material and validating the excavated area.

## Waste management

Various waste streams will be generated during the upgrade works. The PM shall prepare a Waste Management Plan (WMP).

The waste management hierarchy of reduce, reuse and recycle is to be adopted for waste management at the site. No burial or burning of wastes is to occur on site.

Waste management controls are outlined in Table 13. The PM is responsible for monitoring and enforcing the site WMP. General waste resulting from site development works (ie. domestic wastes) will be collected in bins and disposed of off-site.

Litter is to be controlled and regularly picked up from site and prevented from entering surrounding areas and stormwater systems.

Waste receptacles (bins) must be provided at the site and marked to show their expected contents (recyclables, general waste). All site workers are to be made aware of the location of site bins.

Waste storage areas will be protected from wind and rain to minimise impact to the surrounding environment.

### Transport and disposal to licensed landfill

Prior to the offsite disposal of any surplus material, it must be classified in accordance with SA EPA requirements.

The Construction Manager will engage an Environmental Consultant to undertake the waste classification works.



Surplus soil intended for transport and offsite disposal including 'Waste Fill' will then be disposed of at a licensed landfill in accordance with its classification and SA EPA requirements.

Transporters carrying the surplus material will be appropriately licensed by the EPA. Licensed transporters will comply with all of their conditions of licence including transporting the material to a licensed waste depot and completing 'Waste Transporters Certificates' in accordance with EPA Regulations.

The load must be wetted down and covered to ensure dust suppression.

Any fill materials removed from site for the full duration of the construction works will be tracked, identifying areas of origin and disposal locations.

All loads (including 'Waste Fill') will be tracked, and the quantities tallied by the PM.

# Specific project control

## Erosion and sediment control

### Objective:

To minimise the potential for soil erosion on-site and the off-site transport of sediment.

### Target:

No erosion and/or sedimentation impacts during the construction phase.

**Table 6 - Erosion and sediment controls**

EROSION & SEDIMENT CONTROL			
MANAGEMENT REQUIREMENT	ACTION	RESPONSIBILITY	TIMING
Minimise Erosion	<ul style="list-style-type: none"> <li>• Areas of land cleared and the period of time that they remain cleared will be kept to a minimum.</li> <li>• As appropriate, works will be undertaken in phases designed to minimise land disturbance.</li> <li>• Upstream stormwater run-off will be directed around the site where practical.</li> <li>• All vehicles will be kept to well defined access roads where possible. Areas where ground cover is not to be disturbed will be identified and enclosed by bunting, therefore prohibiting construction traffic.</li> <li>• A stabilised entry/exit point will be constructed to minimise the tracking of sand, soil and clay off site. If required, regular clean-ups will occur throughout the construction phase.</li> <li>• Sediment control measures will be installed along identified natural and constructed drainage lines before construction commences where applicable.</li> <li>• Sediment control devices will be installed downstream of areas of disturbed soils when applicable.</li> <li>• Disturbed topsoil will be stockpiled and maintained for use in rehabilitation if suitable.</li> <li>• Stockpiles will be located at least 10 metres from drainage lines and natural waterways.</li> <li>• The number of stockpiles, areas and time stockpiles that are exposed will be minimised.</li> <li>• Stockpiles and batters that remain bare for more than 30 days shall be stabilised by whatever means.</li> <li>• Sediment controls will be established around excavations and stockpiles as per the ESCP and as necessary.</li> </ul>	Contractor	During construction



<b>EROSION &amp; SEDIMENT CONTROL</b>			
<b>MANAGEMENT REQUIREMENT</b>	<b>ACTION</b>	<b>RESPONSIBILITY</b>	<b>TIMING</b>
Monitoring	<ul style="list-style-type: none"> <li>All construction activities will be monitored for compliance with the CEMP.</li> <li>The effectiveness of the CEMP will be reviewed on a regular basis.</li> </ul>	Contractor	During construction
	<ul style="list-style-type: none"> <li>All erosion and sediment control devices shall be visually inspected on a regular basis.</li> <li>Adjoining roadways shall be visually inspected on a regular basis for evidence of sediment carted from the site.</li> </ul>	Contractor	Daily and during and after heavy rainfall events
Reporting	<ul style="list-style-type: none"> <li>A log of the effectiveness of the erosion and sediment control devices will be prepared, including recommended improvements to the system where appropriate.</li> </ul>	Contractor	During construction
Corrective Action	<ul style="list-style-type: none"> <li>Erosion and sediment control devices will be cleared, repaired or replaced whenever inspections show signs of non-compliance or ineffective capability or capacity.</li> <li>Where erosion and sediment control devices are found to not be in accordance with the CEMP, work in the affected area will cease and corrective actions taken prior to recommencing works.</li> </ul>	Contractor	During construction

## Noise

### Objective:

To minimise nuisance noise emissions during construction activities.

### Target:

Zero noise complaints for the duration of the construction phase.

**Table 7 - Noise controls**

NOISE			
MANAGEMENT REQUIREMENT	ACTION	RESPONSIBILITY	TIMING
Minimise impact on surrounding environment	<ul style="list-style-type: none"> <li>The hours of operation should not detract from the amenity of any residential zone. Work hours shall be restricted to those stated in <i>Hours of Operation</i></li> <li>Approval shall be sought from the Administering Authority for all works that are proposed outside of these hours.</li> <li>Fit and maintain appropriate noise attenuation equipment to on-site plant in accordance with manufacturer's specifications.</li> <li>Noise generated from construction should not exceed 75 dB(A), at the site of a sensitive receptor – Reg 2.02 s (Environment Protection) Regulations 1997</li> </ul>	Contractor	During construction
Monitoring	<ul style="list-style-type: none"> <li>No routine qualitative noise monitoring is required. However, if noise complaints are received, qualitative or quantitative monitoring may be required to confirm complaint.</li> </ul>	Contractor	If required
Reporting	<ul style="list-style-type: none"> <li>Non-conformances and complaints shall be logged and include the date, time, name and contact number (where relevant) subject of complaint or non-compliance and weather conditions.</li> <li>The date, time and nature of high noise activities shall be logged.</li> </ul>	Contractor	Weekly
	<ul style="list-style-type: none"> <li>Non-conformance and complaint details shall be forwarded to the Administering Authority as soon as practicable.</li> </ul>	Contractor	During construction
	<ul style="list-style-type: none"> <li>In the event that qualitative noise monitoring is required, the results shall be kept in the office of the Project Manager and available for inspection at any time during normal working hours.</li> </ul>	Contractor	As required
Corrective Action	<ul style="list-style-type: none"> <li>In the event that nuisance noise becomes the basis for consistent complaints that are not considered frivolous or vexatious, strategies for noise abatement as outlined in the Guide to Noise Control on Construction, Maintenance and Demolition Sites (AS 2436-2010) shall be considered and implemented where practicable.</li> </ul>	Contractor	During construction
	<ul style="list-style-type: none"> <li>AS 1055 to be utilised in determining the amount of noise generated from construction, maintenance or demolition of a building or other structure at an – Reg 4.01 (Environment Protection) Regulations 1997.</li> </ul>		

## Dust

### Objective:

To minimise dust during construction activities.

### Target:

Zero dust complaints for the duration of the construction phase.

**Table 8 - Dust controls**

<b>DUST</b>			
<b>MANAGEMENT REQUIREMENT</b>	<b>ACTION</b>	<b>RESPONSIBILITY</b>	<b>TIMING</b>
Minimise impact on surrounding environment	<ul style="list-style-type: none"> <li>Lining of chain mesh fences around portions of the site to help shield surrounding properties from dust</li> <li>All dust generating areas shall be watered as required to suppress dust throughout the construction phase.</li> <li>Watering equipment shall be readily available and used on-site as required during construction. Other dust suppressants such as chemical foams, resins and polymers if considered necessary</li> <li>Pre-wet material to limit dust generation</li> <li>Sealing of all associated roadways, site entrances and main traffic area to minimise adverse effects of dust on the amenity of an area.</li> <li>Dust generating activities shall be avoided or minimised, wherever practical, during windy conditions.</li> <li>Drivers are to obey the on-site speed limit and adopt a driving practice where dust generation is minimised.</li> <li>Cover loose excavation faces at the end of each day or as required on high wind days with suitable cover material.</li> <li>Locate and manage stockpiles with consideration to prevailing wind directions, and</li> <li>Traffic speeds kept below 15 km/hour to minimise dust generation.</li> </ul>	Contractor	During construction
Monitoring	Dust emissions and potential dust generating activities and areas shall be monitored visually during construction activities.	Contractor	Daily during construction
	Monitor and review activities for non-compliances or complaints.	Contractor	During construction
Reporting	<ul style="list-style-type: none"> <li>Non-conformances and complaints shall be logged and include the date, time, name and contact number (where relevant) subject of complaint or non-compliance and weather conditions.</li> <li>The date, time and nature of dust suppression activities shall be logged.</li> </ul>	Contractor	Weekly



<b>DUST</b>			
<b>MANAGEMENT REQUIREMENT</b>	<b>ACTION</b>	<b>RESPONSIBILITY</b>	<b>TIMING</b>
	<ul style="list-style-type: none"> <li>Non-conformance and complaint details shall be forwarded to the Contractor as soon as practicable.</li> </ul>	Contractor	As soon as practicable during construction
Corrective Action	<ul style="list-style-type: none"> <li>Dust generating areas shall be watered to achieve compliance targets.</li> <li>If necessary, dust generating activities shall cease until corrective actions result in achievement of targets or wind conditions are such that targets are achieved.</li> </ul>	Contractor	During construction

## Water Quality Management

### Objective:

To ensure that the quality of surface water leaving the site is acceptable during the construction phase.

### Target:

Maintain or improve pre-construction surface water quality.

**Table 9 - Water quality management controls**

WATER QUALITY MANAGEMENT			
MANAGEMENT REQUIREMENT	ACTION	RESPONSIBILITY	TIMING
Minimise impact on surrounding waterways	<ul style="list-style-type: none"> <li>Construction should not commence until adequate and coordinated drainage of the land is assured.</li> <li>Stormwater shall be diverted around the site wherever practical.</li> <li>Stormwater generated within the development should be managed by a minor system and a major system for the gap flows between the minor system.</li> </ul>	Contractor	Prior to construction.
	<ul style="list-style-type: none"> <li>The volume of stormwater run-off flowing from the site to the adjacent drainage lines and waterways shall be minimised, as far as practical.</li> </ul>	Contractor	During construction
	<ul style="list-style-type: none"> <li>Groundwater from dewatering activities will not be directed to stormwater drains. Contractor to obtain all necessary approvals/permits prior to the commencement of dewatering/pumped groundwater activities.</li> </ul>	Contractor	As required
	<ul style="list-style-type: none"> <li>Treated stormwater to be discharged either:                             <ul style="list-style-type: none"> <li>Into grass swales, vegetation strips adjacent to carparks</li> <li>Into stone filled trenches either open to surface or underground</li> <li>By a method approved by a hydrological specialist</li> </ul> </li> <li>Plant (including concrete trucks) shall not be washed down within 15 metres of drainage networks/watercourses.</li> <li>Refuelling of vehicles shall not be undertaken on-site.</li> <li>All fuel, oil, chemicals, and hazardous chemicals generated or used during the construction process shall be stored and ultimately disposed of off-site in accordance with current regulatory requirements.</li> <li>Safety precautions and contingency plans shall be developed and maintained to ensure accidental spills will not escape into groundwater, stormwater, and waterways.</li> </ul>	Contractor	During construction



<b>WATER QUALITY MANAGEMENT</b>			
<b>MANAGEMENT REQUIREMENT</b>	<b>ACTION</b>	<b>RESPONSIBILITY</b>	<b>TIMING</b>
Monitoring	<ul style="list-style-type: none"> <li>No routine water quality monitoring is proposed. However, if complaints are received or the client/superintendent believes that the stormwater quality is being affected by construction activities, qualitative monitoring may be required to confirm any impact.</li> </ul>	Contractor	If required
Reporting	<ul style="list-style-type: none"> <li>Should monitoring be required a suitably qualified person/organisation shall review the water quality data as it becomes available and advise the Contractor regarding compliance with quality targets.</li> </ul>	Contractor	As required
Corrective Action	<ul style="list-style-type: none"> <li>Corrective action shall be undertaken in accordance with the outcomes and recommendations of the water quality-monitoring program (if required).</li> </ul>	Contractor	As required



## Flora

### Objective:

To minimise negative impacts on significant, protected or natural areas of vegetation on or adjacent to the site.

### Targets:

To ensure that the significant and protected area of vegetation that has been identified, is retained and not adversely affected by the construction works.

**Table 10 - Flora protection controls**

FLORA			
MANAGEMENT REQUIREMENT	ACTION	RESPONSIBILITY	TIMING
Minimise impact on flora and surrounding environment	Areas of significant and protected vegetation, if present, shall be identified prior to the commencement of works. <ul style="list-style-type: none"> <li>The area identified as significant and protected shall be surrounded by bunting to ensure that there is no access to this area.</li> <li>All construction traffic shall be confined to designated access roadways.</li> <li>No vehicle or pedestrian traffic shall be permitted beyond the boundary of the construction site unless along approved roadways or authorised to do so.</li> <li>Stockpiles shall be located no closer than 10 metres from designated or constructed drainage lines</li> </ul>	Contractor	Prior to construction.
Monitoring	<ul style="list-style-type: none"> <li>Routine monitoring shall be undertaken to check the integrity and positioning of the bunting surrounding any protected vegetation.</li> </ul>	Contractor	Weekly
Reporting	<ul style="list-style-type: none"> <li>Non-conformance and complaint details shall be forwarded to the Project Manager as soon as practicable.</li> </ul>	Contractor	During construction
Corrective Action	<ul style="list-style-type: none"> <li>Corrective action shall be undertaken in accordance with the outcomes of the inspections or notification by other project personnel.</li> </ul>	Contractor	During construction

## Fauna

### Objective:

To minimise the negative impacts on fauna during construction.

### Targets:

Carry out construction activities with no disruption to wildlife corridors or destruction of native species.

Zero fauna injuries or deaths during construction.

**Table 11 - Fauna protection controls**

FAUNA			
MANAGEMENT REQUIREMENT	ACTION	RESPONSIBILITY	TIMING
Minimise impact on fauna and surrounding environment	<ul style="list-style-type: none"> <li>Restrict work to standard working hours.</li> <li>The Project Manager will be contacted in the unlikely event that sick, injured or orphaned fauna are found during construction.</li> </ul>	Contractor	During construction
Monitoring	<ul style="list-style-type: none"> <li>Spotting of fauna shall occur during vegetation clearance works.</li> </ul>	Contractor	During vegetation clearance
Reporting	<ul style="list-style-type: none"> <li>A record shall be made of all species injured or killed during construction works.</li> <li>The Project Manager, HSE Advisors shall be contacted regarding all fauna related incidents.</li> </ul>	Contractor	As required during construction
Corrective Action	<ul style="list-style-type: none"> <li>Corrective action shall be in accordance with advice from the Project Manager, HSE Advisors and Regulatory Agencies.</li> </ul>	Contractor	On advice

## Land contamination

### Objective:

To minimise the potential for the contamination of the site.

### Targets:

No contamination of the site during the construction phase.

The containment, collection, and appropriate disposal of all solid, chemical and fuel wastes generated on the site.

**Table 12 - Contamination controls**

LAND CONTAMINATION			
MANAGEMENT REQUIREMENT	ACTION	RESPONSIBILITY	TIMING
Minimise impact on surrounding environment	<ul style="list-style-type: none"> <li>• Proof that all fill is free of contamination must be provided prior to the fill being brought onto site.</li> <li>• No waste products shall be disposed of on-site other than selected soil, rock and cleared vegetation that has come from the site.</li> <li>• If any known or suspected contaminated soil or waste is encountered, contact the PM and cease work until instructed otherwise by the PM and HSE Advisors.</li> <li>• All equipment maintenance and cleaning shall preferably be carried out at an off-site location. Where this is not practical, equipment maintenance and cleaning shall be carried out on a bunded low permeability surface to ensure soil contamination does not occur.</li> <li>• Emergency or breakdown maintenance will be conducted in such a manner as to minimise the potential for spills.</li> <li>• Leaking vehicles or containers (fuel, chemical) will not be allowed on site, and if found will be removed or repaired immediately.</li> <li>• All necessary spill response materials shall be made available and readily accessible.</li> <li>• All staff shall be made aware of the location, composition and use of spill response materials.</li> </ul>	Contractor	During construction
Monitoring	<ul style="list-style-type: none"> <li>• All vehicles shall be serviced and maintained to the manufacturer's specifications.</li> </ul>	Contractor	During construction
Reporting	<ul style="list-style-type: none"> <li>• All vehicle maintenance activities, inspection logs, spills, outcomes of clean-up activities and any emergency or incidents involving spills or land contamination shall be logged by the Contractor.</li> <li>• In the event of a chemical/fuel spill, the Contractor will notify the PM as soon as possible.</li> </ul>	Contractor	During construction



<b>LAND CONTAMINATION</b>			
<b>MANAGEMENT REQUIREMENT</b>	<b>ACTION</b>	<b>RESPONSIBILITY</b>	<b>TIMING</b>
	<ul style="list-style-type: none"> <li>Non-conformance and complaint details shall be forwarded to the HSQE Department as soon as practicable.</li> </ul>	Contractor	As soon as practicable during construction
Corrective Action	<ul style="list-style-type: none"> <li>In the event of a chemical/fuel spill, containment and clean up action will be undertaken immediately.</li> <li>Negatively impacted areas shall be remediated to pre-spill or incident conditions, in accordance with the Environment Protection Regulations 1997 and other relevant regulations.</li> </ul>	Contractor	During construction

## Waste management

### Objective:

To minimise the potential for environmental impact of wastes generated on site.

### Targets:

No contamination or environmental impact of the site by waste during the construction phase.

**Table 13 - Waste management controls**

WASTE MANAGEMENT			
MANAGEMENT REQUIREMENT	ACTION	RESPONSIBILITY	TIMING
Minimise impact on surrounding environment	<ul style="list-style-type: none"> <li>No waste products shall be disposed of on-site other than selected soil, rock and cleared vegetation originating from the site.</li> </ul>	Contractor	During construction.
	<ul style="list-style-type: none"> <li>Designated waste bins will be on-site to ensure no litter is on site. All bins will have a secure fitted lid, capable of receiving all waste from building and construction activities.</li> <li>Bins are to be emptied regularly to ensure waste does not overflow the provided skips.</li> </ul>	Contractor	During construction, emptied as required.
	<ul style="list-style-type: none"> <li>All waste materials from the construction phase shall be regularly cleaned from the site and disposed of off-site in accordance with current regulatory requirements.</li> </ul>	Contractor	During construction, once per week as a minimum
	<ul style="list-style-type: none"> <li>All waste materials to be removed off-site shall be contained on-site prior to disposal, using appropriate storage containers or facilities until removed off-site, including the covering of containers/facilities to prevent litter escaping from the site. Waste containers shall be kept screened from the public's view to the reasonable satisfaction of Council.</li> <li>Maintain a high quality of housekeeping and ensure that materials are not left where they can be washed or blown away to become litter.</li> </ul>	Contractor	During construction
	<ul style="list-style-type: none"> <li>Provide bins for construction workers and staff at locations where they consume food.</li> <li>Regular inspection of the property boundary shall be undertaken to ensure litter or waste does not escape from the site into neighbouring properties.</li> </ul>	Contractor	Weekly during construction and daily during windy conditions

<b>WASTE MANAGEMENT</b>			
<b>MANAGEMENT REQUIREMENT</b>	<b>ACTION</b>	<b>RESPONSIBILITY</b>	<b>TIMING</b>
	<ul style="list-style-type: none"> <li>All staff shall be trained in waste clean-up procedures.</li> </ul>	Contractor	During construction
Monitoring	<ul style="list-style-type: none"> <li>Property boundaries shall be inspected regularly.</li> </ul>	Contractor	Weekly during construction and daily during windy conditions
	<ul style="list-style-type: none"> <li>All waste containment and disposal activities shall be logged, including type and volumes of materials and location of licensed receiving facility.</li> </ul>	Contractor	As required during construction
Reporting	<ul style="list-style-type: none"> <li>Non-conformance and complaint details shall be forwarded to the Project Manager as soon as practicable.</li> </ul>	Contractor	During construction
Corrective Action	<ul style="list-style-type: none"> <li>In the event of a non-conformance, containment and clean up action will be undertaken as soon as practicable.</li> <li>If litter has escaped from the site or is negatively impacting the boundary, the litter shall be immediately collected and appropriately contained for disposal off-site.</li> </ul>	Contractor	During construction

## Cultural heritage

### Objective:

To minimise impacts arising from site activities on items or areas of cultural heritage significance.

### Targets:

No impact from site activities on areas of cultural heritage significance identified during the course of the project.

**Table 14 - Cultural protection controls**

CULTURAL HERITAGE			
MANAGEMENT REQUIREMENT	ACTION	RESPONSIBILITY	TIMING
Minimise impact on areas of cultural heritage significance	<ul style="list-style-type: none"> <li>Where artefacts or areas of potential cultural heritage significance are found or suspected, works shall cease until further investigation or assessment is conducted.</li> </ul>	Contractor	During construction.
Monitoring	<ul style="list-style-type: none"> <li>Operational staff shall remain vigilant during excavation and treatment operations.</li> </ul>	Contractor	During construction
Reporting	<ul style="list-style-type: none"> <li>The Contractor shall notify the Project Officer of finds or potential finds immediately and stop all work until the area has been inspected.</li> <li>The AEM shall be contacted for management advice immediately.</li> </ul>	Contractor Contractor	Immediately on discovery Immediately
Corrective Action	<ul style="list-style-type: none"> <li>Corrective action shall be in accordance with advice from the Project Manager, HSE Advisors and relevant Regulatory Agencies.</li> </ul>	Contractor	On advice

# Training, awareness, and competence

## General

Three main forms of training will be provided on site:

- Site induction
- Environmental management training, and
- “Toolbox” training.

## Site induction

Prior to working on site, all personnel and sub-contractors will undertake an induction incorporating Environmental and OHS requirements. The induction will address a range of environmental awareness issues including, but not limited to:

- The CEMP (purpose, objectives and key issues)
- Legal requirements including due diligence, duty of care and potential consequences of infringements
- Environmental responsibilities under State and Federal legislation
- Conditions of licences, permits and approvals
- Significant environmental issues and areas of the Site including identification of boundaries for location of refuse bins, washing, refuelling and maintenance of vehicles, plant and equipment
- Incident management and emergency plans, and
- Reporting process for environmental harm/ incidents.

All ‘one-off’ visitors (unlikely to return) to the workplace are accompanied at all times by a person that has undertaken the workplace induction. All visitors sign a Daily Pre-Start Meeting form which shall include the visitor sign in record upon arrival and departure (including time of entry and exit).

## “Toolbox” Training

“Toolbox” training will help to ensure that relevant information is communicated to the workforce and that feedback can be provided on issues of interest or concern. “Toolbox” training will generally be prepared and delivered by the EMR or by their delegate. These toolboxes can be integrated into Construction Method Statements (CMSs) delivered to personnel prior to commencing specific high-risk activities or can be used as a stand-alone training tool.

“Toolbox” training topics may include:

- Efficient use of plant and materials
- Waste management, minimisation and recycling
- Noise and vibration minimisation
- Dust control
- Wastewater control
- Installation and maintenance of erosion and sediment control devices
- Storm management procedures, and
- Other general site issues.



## Consultation, communication and reporting

Consultation and issue resolution are managed in accordance with the relative contractors and project contract Consultation and Issue Resolution (IR) documentation. The consultation procedure and relevant OHS/IR legislation requires project personnel to consult, share and supply project information with all workers or their representatives and provide the opportunity for workers to respond and contribute to Environmental issues that affect them through the workplace toolbox meetings, health, safety and environment (HSE) Committee and/or Health and Safety Representatives (HSR).

The meetings which shall communicate environmental matters at this workplace are listed below:

- Pre-start and Toolbox meetings
- Site Meetings, and
- Client/Superintendent meetings.

The Site Manager or nominated representative retains a record that demonstrates workers, including employees and subcontractors, were consulted on the method of environmental consultation agreed at the workplace consultation includes the requirement for all employees, subcontractors and other workers to report hazards and incidents.

Workers and their supervisors conduct toolbox talk meetings, pre-start talks or other consultative arrangements with those employees or workers under their direct supervision and record the meetings on the relevant forms.

Each workplace/subcontractor supervisor are to discuss environmental matters from the previous day, the current day's activities, interfacing trade activities, changes to emergency access and related control measures, conducts the pre-start talk daily.

Other HSE related meetings are recorded formally where required, e.g., where discussing a HSEP, safe work method statement (SWMS) for high-risk construction work or equivalent for a specific work task or other relevant HSE matters. Toolbox talks are undertaken at intervals that keep employees and other workers informed of conditions and changes to the workplace and recorded.

Consultation includes the requirement for all employees, subcontractors and other workers to report environmental hazards and incidents as follows:

- Report hazards by speaking directly to their supervisor, and
- Report all incidents immediately on becoming aware of the incident and not later than 24 hours after the incident.

Further details on HSE consultation, communication and reporting shall be outlined in the contractor's HSE Management System.

# Incident and emergency planning, preparedness, and response

Any environmental or health and safety issues that arise should be reported immediately to the PM so that specific management measures can be implemented.

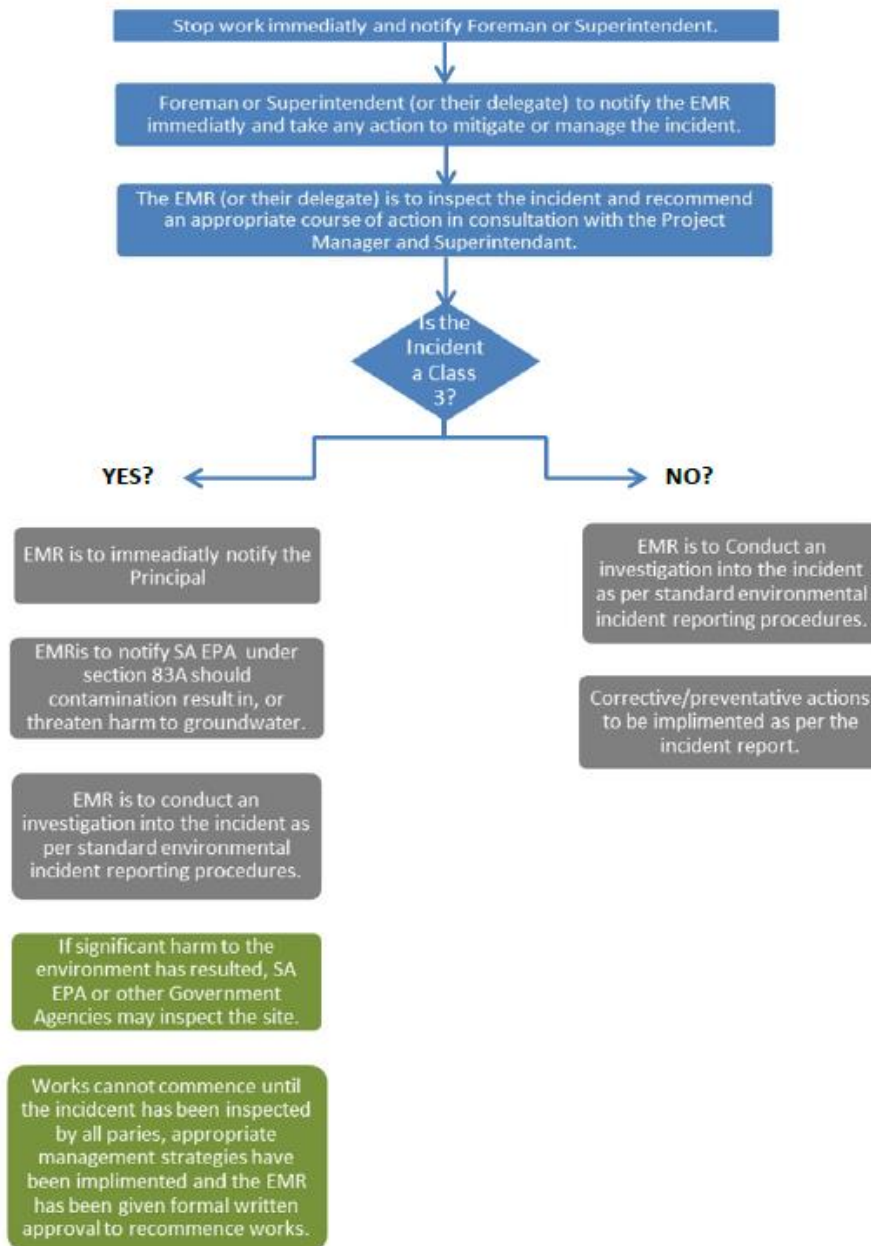
## Emergency planning

Emergency planning and incident management procedures are included in Table 15, Table 16 and Table 17. Included is a list of emergency contact details and various specific management procedures for potential emergencies. Prior to any action, identify materials involved and obtain appropriate PPE.

Figure 2 refers to environmental incident classes. The classes are defined as follows:

- Class 1 – Causes or has the potential to cause permanent environmental damage and results in remediation costs of >\$100,000
- Class 2 – Causes or has the potential to cause damage to the environment which can be rectified and in results in remediation costs of >\$5,000 to \$100,000
- Class 3 – Causes or has the potential to cause damage to the environment which can be easily rectified and results in remediation costs of <\$5,000.

**Figure 2 - Procedures in dealing with environmental incidents**



**Notes:**

- \*An unexpected event may result in harm to the environment and requires some action to minimise the impact or restore the environment.
- \* All site complaints/incidents shall be reported to the superintendent in the first instance. Following this, all escalation of complaints shall be directed to the respective contractor’s executive.

Although the potential exists for a number of minor incidents to occur onsite, the following three generalised examples of potential minor incidents details the procedures that should be implemented and the responsibilities of the reporting person.

**Table 15 - Environmental incident management procedure for minor chemical spills**

	<b>ACTION</b>	<b>RESPONSIBILITIES</b>	<b>COMMENTS</b>
1	Stop further leak	Person causing/ finding leak	If leak from drum take action to stop the leak. For example, roll drum so that leak area is uppermost. If leak from pipe close valve.

	<b>ACTION</b>	<b>RESPONSIBILITIES</b>	<b>COMMENTS</b>
2	Inform Project/Supervisor	Project Manager/ Supervisor	Stop human and vehicular traffic and isolate area.
3	Determine the magnitude and destination of the leak	Supervisor	For major spills on site or If spill has escaped off site contact the EMR immediately.
4	Form a barrier around leak/spill to contain	Project Manager/ Supervisor	Soil or sand can be utilized. Absorbent booms (usually provided within spill kits) are effective.
5	Empty the spill source	Project Manager/ Supervisor	Transfer fuel/ oil from failed container into another drum etc.
6	Place barriers around drains and outlets	Project Manager/ Supervisor	Seal drain entry points by blocking with sandbags or other available material.
7	Obtain oil spill kit and apply absorbent material	Project Manager/ Supervisor	Use 'absorbent' or equivalent.
8	Clean up and remove absorbent material to waste bin	Project Manager/ Supervisor	Either shovel or use bob cat loader for larger quantities.
9	Clean up surface soil by excavating	Project Manager/ Supervisor	Stockpile contaminated material in designated area. Validate remediation by sampling.
10	Inform EMR and complete incident log	Project Manager/ Supervisor	Record incident and investigate.

**Table 16 - Environmental incident management procedure for impending wet weather**

	<b>ACTION</b>	<b>RESPONSIBILITIES</b>	<b>COMMENTS</b>
1	Keep aware of weather conditions and impending significant storm events and inform all supervisors.	Project Manager/ Supervisor	Forecasts from Weather Bureau
2	Inspections to be undertaken of sediment control devices in critical areas	Supervisor	Assessment of their condition or status
3	Ensure silt fences/hay bales/ sandbagging repairs performed	Supervisor	Sediment build-up removed, controls in good condition.
4	Sumps to be able to function at full capacity and diversion drains are in place.	Supervisor	It should be assumed all surface water is contaminated. Onsite storage and removal of waters must be by licensed waste transport company.
5	Ensure stockpiles are in a state of stability and not in a position to impact on public thoroughfares/watercourses	Supervisor	Sealed/covered with plastic, surrounded on low side with sediment fencing.
6	Ensure that hazardous substances storage areas/ bunds are in order	Supervisor	Stored appropriately

	<b>ACTION</b>	<b>RESPONSIBILITIES</b>	<b>COMMENTS</b>
7	Ensure adequate supplies of control devices are on hand	Supervisor	Supplies sediment fencing/sandbags/hay bales.
8	Personnel to be on hand for emergency work during storm event	Supervisor	Pumping of excavations, handling of excess potentially contaminated surface water.

**Table 17 - Environmental incident management procedure for finding asbestos containing materials**

	<b>ACTION</b>	<b>RESPONSIBILITIES</b>	<b>COMMENTS</b>
1	All activities in the area should cease	Person finding asbestos containing material	
2	Inform Project Manager /Supervisor	Project Manager/ Supervisor	Stop human and vehicular traffic and isolate area.
3	A suitably qualified Environmental Consultant or Occupational Hygienist requested to attend site to provide guidance and sample the material to confirm the presence of asbestos (otherwise the material must be assumed to contain asbestos).	Supervisor	Where adjacent works have the potential to be affected by the presence of asbestos, these works shall cease and continue in unaffected areas until the Environmental Consultant or Occupational Hygienist details the conditions under which works can recommence
4	Erection of temporary barricades to isolate the hazardous area(s) and to restrict access by unauthorized personnel	Project Manager/ Supervisor	this may be physical barriers, bunting or flagging that provides a continuous physical barrier
5	Installation of signage along the barriers in accordance with AS 1319-1994 Safety Signs for the Occupational Environment, clearly identifying the area as a danger zone accessible by authorized personnel only	Project Manager/ Supervisor	
6	Minimize dust generation by covering or wetting excavations or stockpiles containing exposed ACM fragments	Project Manager/ Supervisor	
7	Notify all site personnel and instructing them to remain clear of the area until further notice	Project Manager/ Supervisor	
8	Implement a permit to work system to prevent unnecessary or uncontrolled access by unauthorized persons and therefore minimise the exposure risk.	Project Manager/ Supervisor	

## Notification

In the event that an incident has caused, is causing, or is likely to cause material or serious environmental harm, whether the harm occurs on or off the site, the construction team will follow the procedure in dealing with environmental incidents (Figure 2).

In addition to notifying key government agencies in accordance with the procedure detailed in Table 15 to Table 17 the Construction/ Project Manager and Environmental Consultant will also liaise closely to ensure the EPA and any other responsible agencies are kept well informed.

Emergency contact details are presented in Table 18.

**Table 18 - Emergency contact list**

ORGANISATION	NAME	NUMBER
Project Manager	Trice: <ul style="list-style-type: none"> <li>• Sonia Mercorella, and</li> <li>• Tiana Della Putta</li> </ul>	TBA
Site Foreman	TBA	
SA EPA/Emergency (After Hours)	Pollution Line	1800 623 445
SA Police		000 Mobile 112
Adelaide Metropolitan Fire Brigade		000 Mobile 112
SA Ambulance Services		000 Mobile 112
Poisons Information		131 126
Nearest Hospital	Stirling Hospital	(08) 8339 0200
Local contractor services (eg. waste collection, spill clean-up)	TBA	

## Incident investigation and reporting

All incidents will be documented, investigations conducted, and action plans established in order that the event does not occur again.

Where lessons are learnt from the investigation or current procedures are identified as being ineffective, the CEMP, and any associated documentation, will be revised, to include the improved procedures or requirement.

In complying with EPA’s expectations regarding incident reporting, an environmental investigation report is expected to include the following basic elements:

- Incident or activity that has caused contamination or environmental harm
- Nature of contamination and chemicals of concern
- Area affected (on or off site)
- Aspects of the environment affected, and
- Any other relevant information.

Further to this, an environmental investigation will also include:

- Identifying and implementing the necessary corrective action
- Identifying the personnel responsible for carrying out the corrective action
- Implementing or modifying controls necessary to avoid a repeat occurrence of the incident, and
- Recording any changes in written procedures required.

All Incident Investigation Reports and associated documentation will be forwarded to the client and the Project Manager. The findings, outcomes and corrective actions required will be communicated back to the construction team as to the outcomes of lessons learnt.

# Compliance

## Environmental monitoring, inspections and auditing

### Site checklists

The site Foremen and/or Superintendents will be required to track activities on the construction site. Information recorded will include, but not be limited to:

- The general conditions on the Site including weather conditions and status of environmental controls, and
- Activities carried out on the Site.

### Environmental site inspection checklist

The effectiveness of environmental protection measures will be assessed from time to time by Superintendents, or their nominated delegate, unless otherwise specified. The purpose of the checklist is to:

- Provide a surveillance tool to ensure that safeguards are being implemented
- Identify where issues might be occurring and
- Facilitate the early resolution and action of issues.

Any actions that are identified in these site inspections and recorded on these checklists are prioritised. The checklist will remain "open" until:

- The issue has been resolved / closed out
- A new or revised procedure has been established and implemented, and
- Training has been provided to relevant personnel/ sub-contractors.

### Environmental monitoring

Environmental monitoring will involve monitoring the CEMP to assist in the auditing of safeguard measures to ensure they achieve their objectives and to facilitate modification where necessary.

Monitoring would address the following aspects:

- Air quality monitoring (if and when required)
- Water quality
- Erosion and sediment control
- Implementation of Construction Method Statements (CMS)
- Wastes and hazardous substances, and
- Marine environment.

### Monitoring technique and frequency

Irrespective of the type of monitoring conducted, the results will be used to identify potential or actual problems arising from construction processes. Where monitoring methods permit, results will be obtained at the time of the assessment and analysed by the EMR.

Generally, monitoring by the EMR will be undertaken on an as needs basis, and may include but not be limited to the following specific tasks/events:

- Prior to off-site disposal of any surplus soils (stockpiled or direct loaded), and
- After any significant rain events (surface water and erosion control).

### Monitoring non-conformances

Where a non-conformance is detected, or monitoring results are outside of the expected range:

- The results will be analysed by the EMR in more detail with the view of determining possible causes for the non-conformance
- A site inspection will be undertaken by the Project Manager or EMR
- Relevant personnel will be contacted and advised of the situation, and
- An agreed action plan will be identified, or an action will be implemented to rectify the problem.



An environmental incident report (EIR) or an environmental improvement notice (EIN) may be issued by the Project Manager/ EMR to the non-conforming party in response to the problem if it is found to be construction related. The timing for any improvement will be agreed between the Project Manager and the EMR based on the level of risk. For example, a significant risk will require immediate action.

# Review and improvement of CEMP

The CEMP, its operation and implementation should be reviewed from time to time. Between the reviews, a register of issues will be maintained to ensure that any issue raised are recorded for later inclusion into the CEMP. The purpose of the review is to ensure that the system is meeting the requirements of the standards, policies and objectives and, if not, to amend the CEMP to facilitate continuous improvement. The review will consider:

- Client/Superintendent comments
- Site personnel comments
- Authority comments
- Audit findings
- Environmental monitoring records
- Complaints
- Details of corrective and preventative actions taken
- Environmental non-conformances
- Incident reports
- Changes in organisation structures and responsibilities
- The extent of compliance with objectives and targets, and
- The effect of changes in Standards and Legislation.

## Limitations

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It has been prepared to meet the objectives of the client and associated sub-contractors with reference to the proposed earthworks, services and infrastructure construction as understood by FMG Engineering. Those objectives may not necessarily be the objectives desired by any other third party.

This report relies on Principal-supplied information and information gather by The Principal and relayed to FMG.

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Standards Australia (2009) *Confined Spaces*, AS/NZ 2865-2009

Client: Venture Capital Developments Pty Ltd  
Site: Mount Lofty Golf Estate, 35 Golf Links Road, STIRLING, SA 5152



Standards Australia (2007) *Temporary fencing and hoardings*, AS 4687-2007



# Appendix A

Regional setting and site location plan





Data Layer ✕

**CADASTRE DETAILS**

---

**Address**

Golflinks Road Stirling SA 5152  
Australia

**Details**

Area 402734.18 m<sup>2</sup>  
 Parcel Status Registered  
 Parcel Type Lot Parcel  
 Plan Number D59212  
 Lot Number A53  
 Locality Stirling  
 State SA


[SETTINGS](#)

REV	DESCRIPTION	DATE	INIT	APP

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 P 08 8132 6600 | 67 Greenhill Rd, Wayville SA 5034

**ABN 58 083 071 185**  
 Quality Management Systems ISO 9001 Certified



CLIENT	Venture Capital Developments Pty Ltd
TITLE	CEMP
SITE ADDRESS	Mount Lofty Estate, 35 Golflinks Road, STIRLING, SA 5152
DRAWING TITLE	Regional setting and site location plan

DESIGNED K.A.	DRAWN K.A.
CHECKED D.G.	No. OF SHEETS
SCALE NTS @ A4	DATE STARTED
SITE ID & JOB No.	REV.
DRAWING No. Figure 1	



# **Appendix B**

Civil work plans



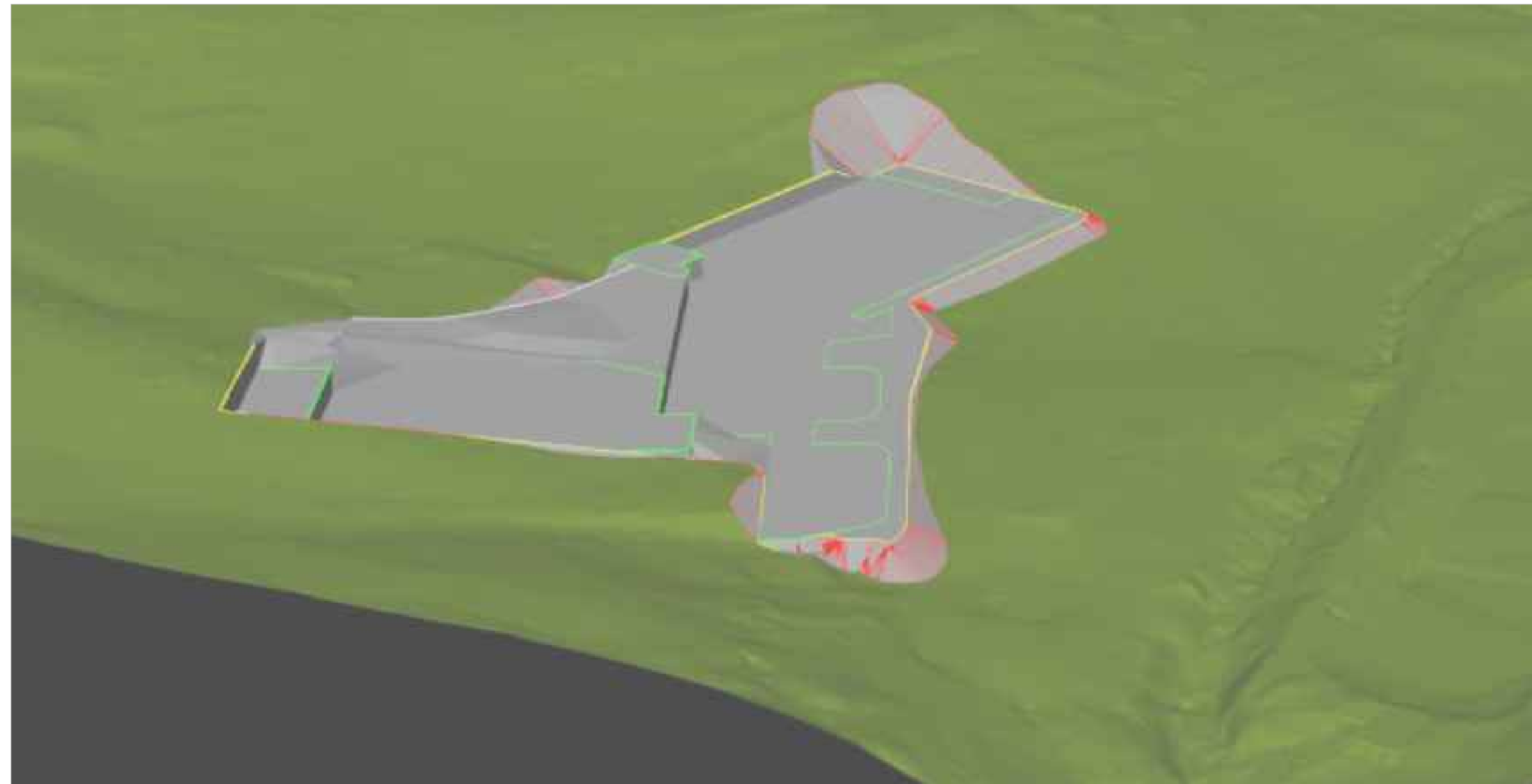




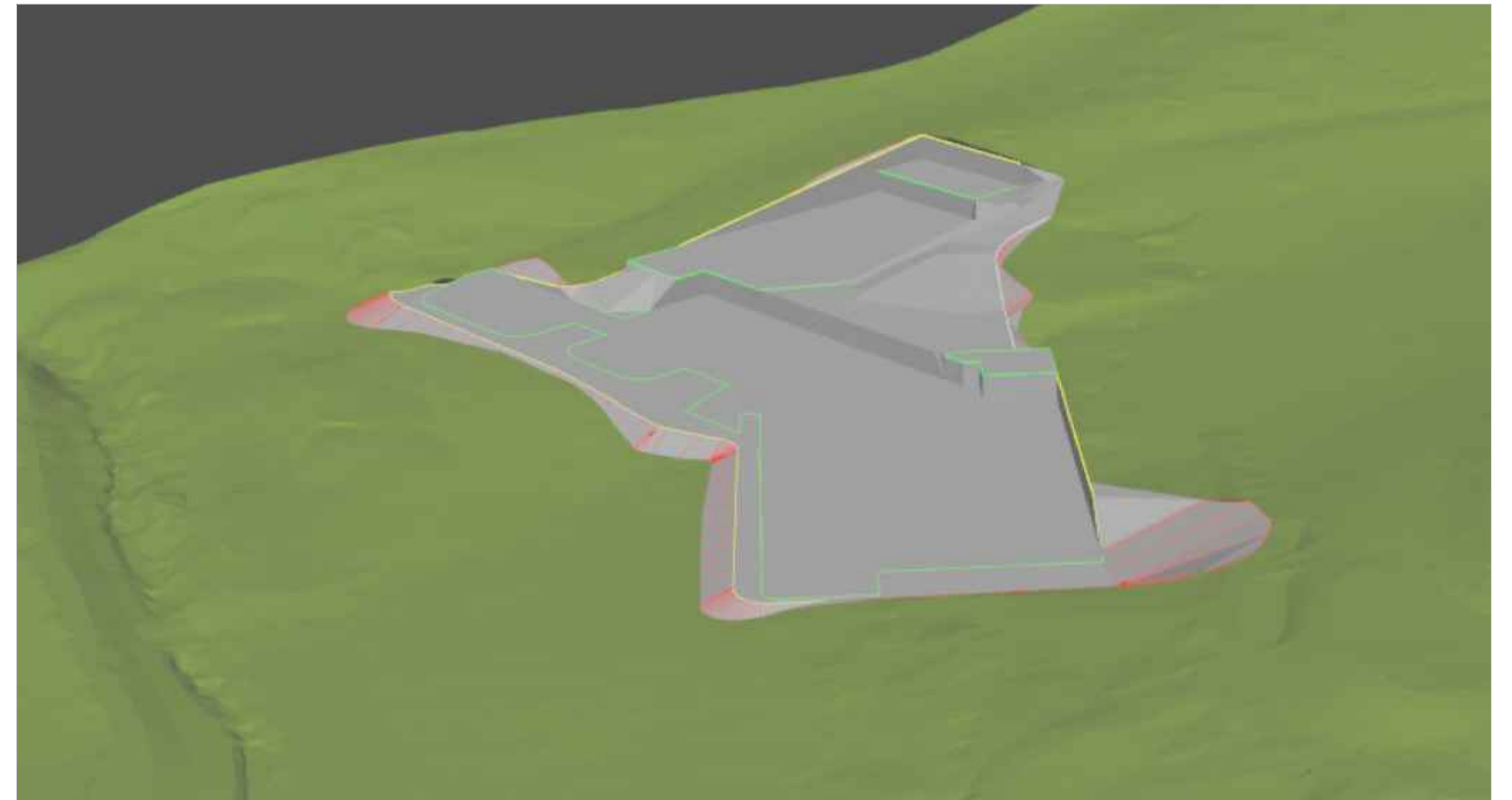
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SCALE NTS



**SOUTH ELEVATION**  
SCALE NTS



**EAST ELEVATION**  
SCALE NTS



**WEST ELEVATION**  
SCALE NTS

**PRELIMINARY ISSUE**  
NOT FOR CONSTRUCTION

DRAWING BY: FVG; DATE: 23.09.2022; TIME: 11:44:34 AM; FILED ON: 21.09.2022 11:44:34 AM; PLOTTED ON: 21.09.2022 12:05:59 PM; BY: JASON SEABE

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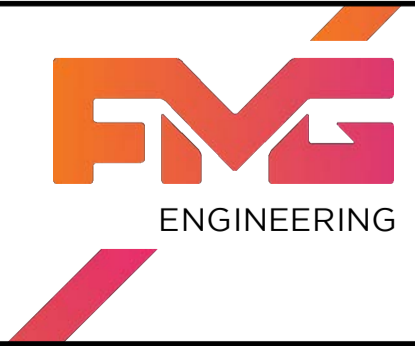
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CLIENT: VENTURE CAPITAL DEVELOPMENTS PTY LTD  
PROJECT TITLE: MOUNT LOFTY GOLF ESTATE  
SITE ADDRESS: 35 GOLFLINKS RD, STIRLING SA

DRAWING TITLE: PERSPECTIVE IMAGES

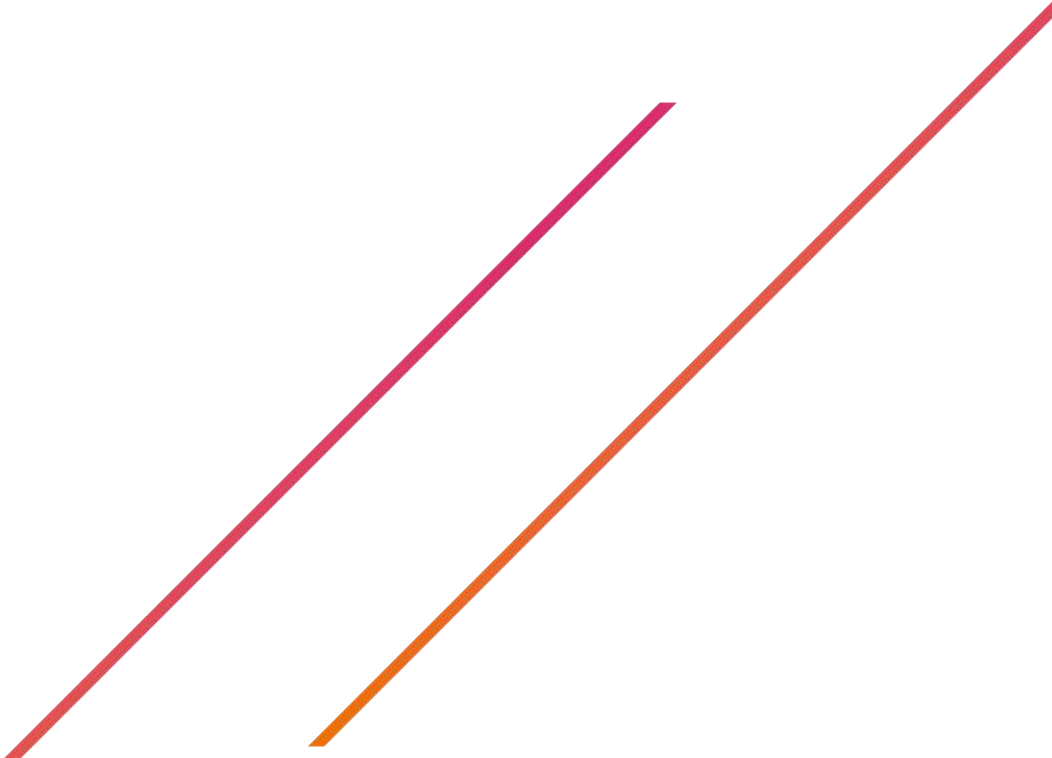
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CHECKED	JC	NO. OF SHEETS	-
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SITE ID & JOB No.	S53897	REV.	
DRAWING No.	282604		
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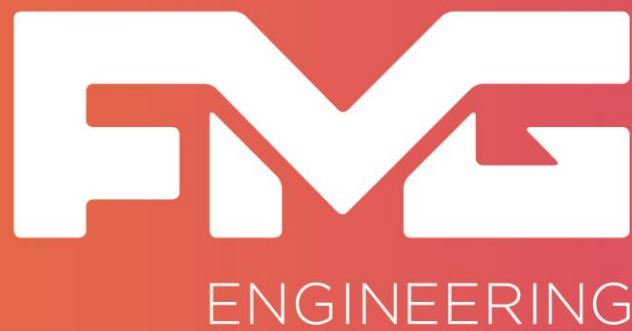


# **Appendix C**

Soil erosion and sediment control plan (SECP)





The logo for F&M G Engineering features the letters 'F&M G' in a large, bold, white, stylized font. Below this, the word 'ENGINEERING' is written in a smaller, white, sans-serif font. The background is a gradient of orange and pink, with diagonal stripes in the corners.

# F&M G

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## **Appendix 23**

*Appendix U of Development Report – Stormwater  
management plan*

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ENGINEERING

# Stirling Golf Course

## Stormwater Management Plan

**JOB NUMBER:** S53897 - 275203; 282604  
**CLIENT:** Venture Capital Developments Pty Ltd  
**SITE:** Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152  
**DATE:** 1/12/2022  
**REVISION:** C

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Document Status

REV NO.	STATUS	AUTHOR	REVIEWER			APPROVED FOR ISSUE		
			NAME	SIGNATURE	DATE	NAME	SIGNATURE	DATE
0	For Lodgement	J Colbert	Jeremy Clapp	JHC	28.11.2021	Jordan Colbert	JTC	28.11.2021
1	For Approval	J Colbert	Jeremy Clapp	JHC	24.11.2022	Jordan Colbert	JTC	24.11.2022
2	For Approval	J Colbert	Jeremy Clapp	JHC	1.12.2022	Jordan Colbert	JTC	1.12.2022



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- Stormwater Assessment .....9
  - Proposed Development Drainage .....9
  - Pod accommodation.....10
  - Music modelling results .....10
  - Cox Creek Preliminary Drain Model .....11
- Conclusion .....12

# Introduction

FMG Engineering has been engaged by Venture Capital Developments Pty Ltd to undertake a preliminary stormwater assessment and develop a preliminary Stormwater Management Plan for a proposed development of the Stirling Golf Club. The Stirling Golf Course is located in the Adelaide Hills approximately 18km south east of the Adelaide CBD between Stirling and Bridgewater and is situated on the north side of the South Eastern Freeway. T

This preliminary Stormwater Management Plan describes the assessment undertaken and addresses the requirements provided by Adelaide Hills Council's engineering and planning departments.

# Site Description

The site is located at 35 Golflinks Rd, Stirling SA 5152 as shown in Figure 1. The site is bounded by Old Carey Gully Rd to the North West, Golflinks Rd to the South West and Mount George Conservation Park to the East and South East. The Golf Course is surrounded by several land use zones including Country Living, Watershed (Primary Production) and Public Purpose zones.

The Cox Creek runs through the site in a south easterly direction. The site is undulating with a general downwards slope towards the south east. The catchment area of the Cox Creek upstream of the Golf Course has been estimated using local contour data available in NatureMaps.

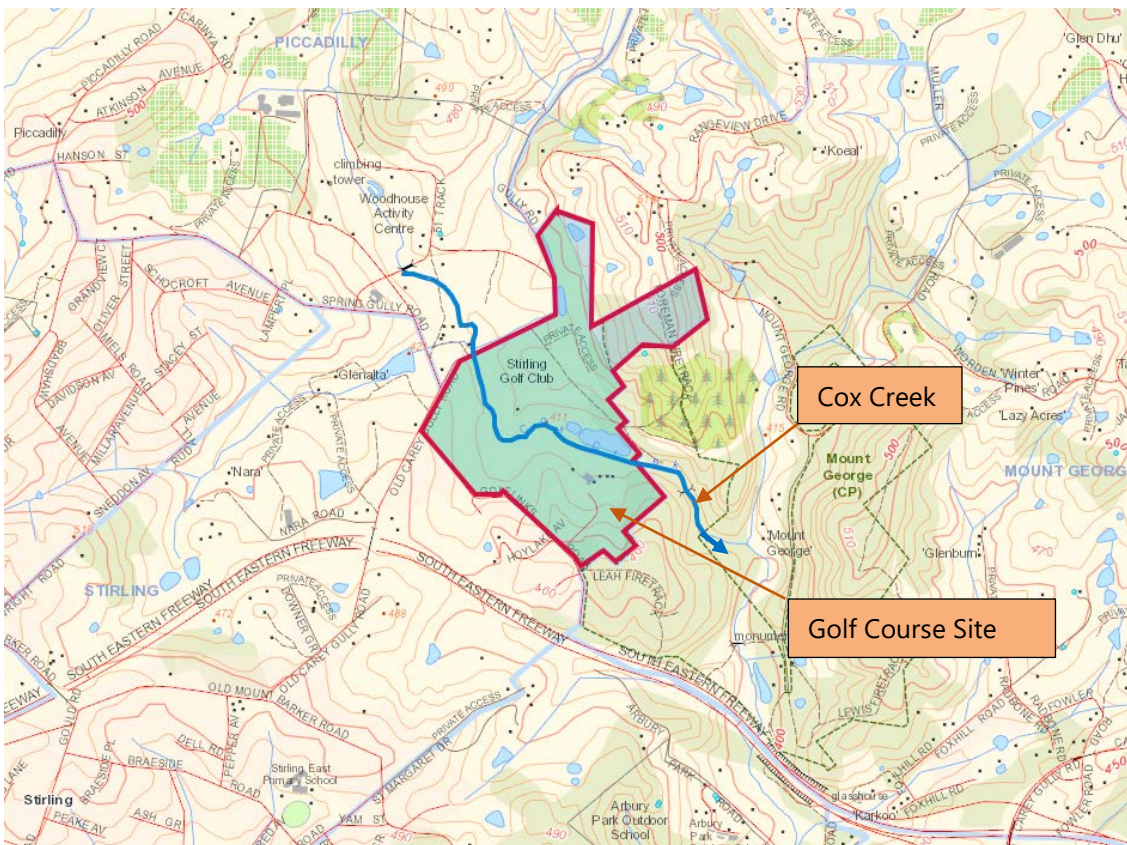
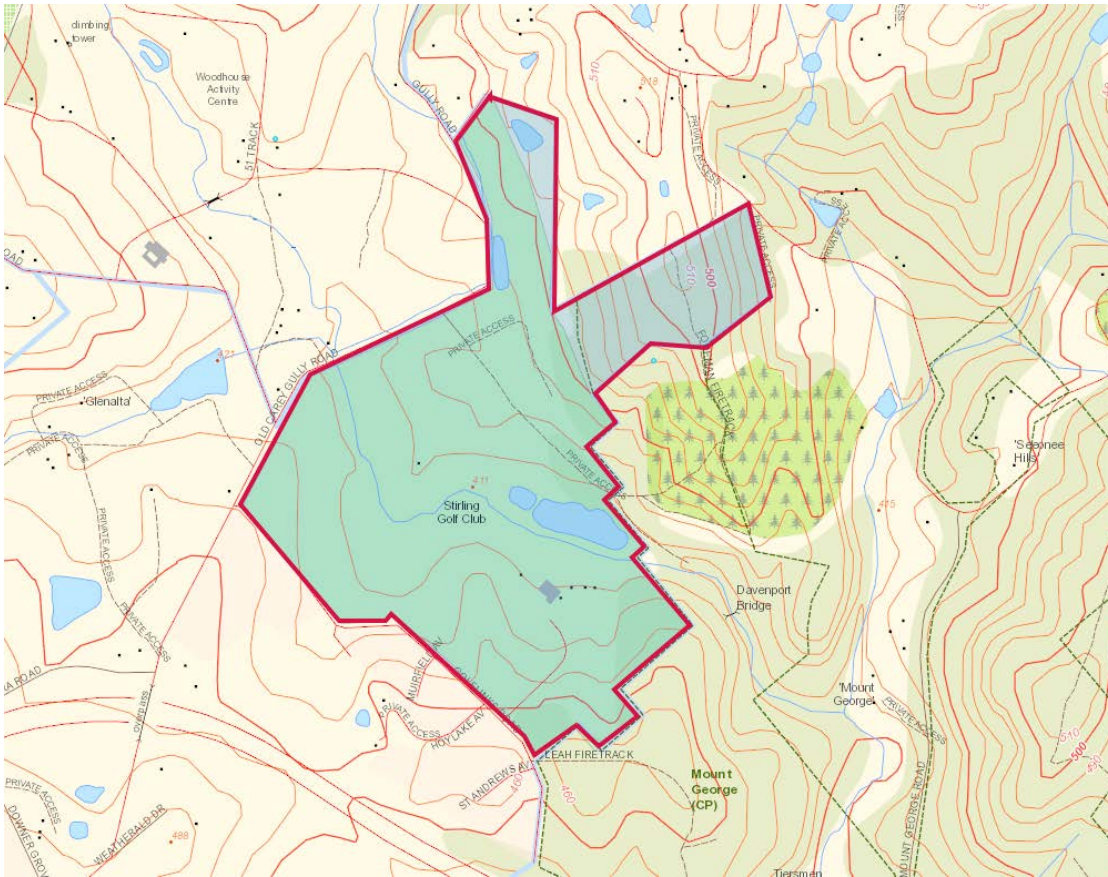


Figure 1 - Site locality plan (Nature Maps)



**Figure 2 – Golf Course site plan (Nature Maps)**

## Proposed Development

The proposed development plan for this site includes ;

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m<sup>2</sup> function room.
  - A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace.
  - 186m<sup>2</sup> sports bar.
  - A 189m<sup>2</sup> gallery and cafe.
  - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – ‘Pods’
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:

- Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
- Extension to the Perfumery to include a covered outdoor dining area.
- Orchard and perfumery garden plantings to reimagine the former use of the building as a "Scent Factory".
- Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
  - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.
  - A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
- Designated waste storage areas.
  - Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

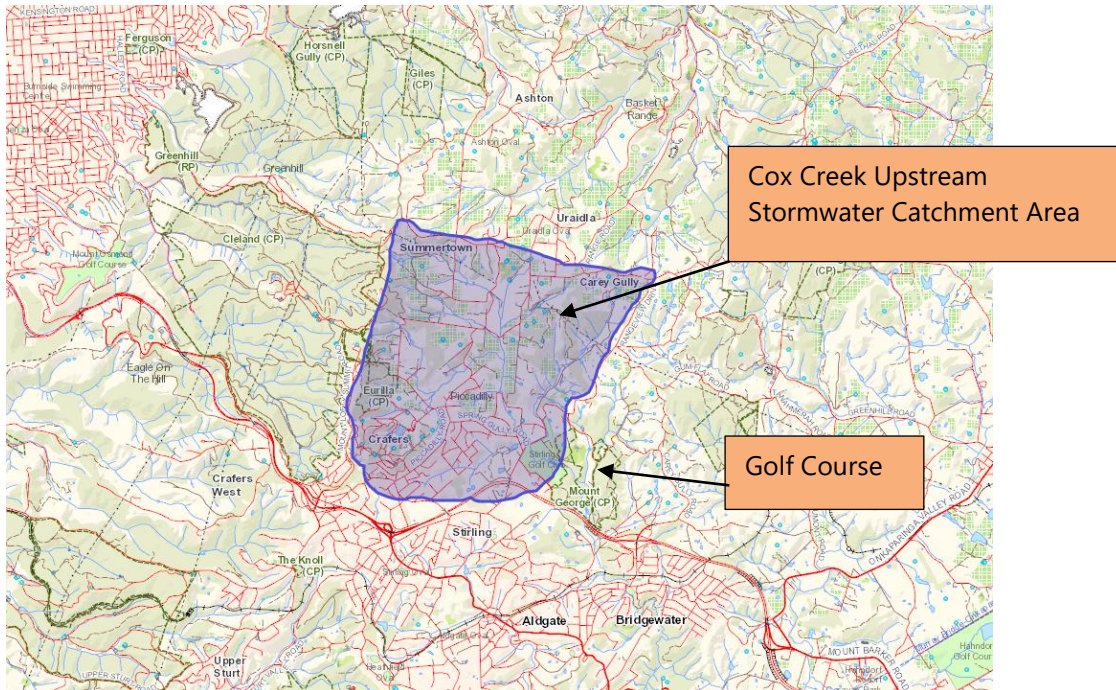
The current building and carpark facilities situated up the hill and to the south west of the lake have a total hard surface area of approximately 5,000m<sup>2</sup>. Preliminary measurements indicate that the proposed development buildings and carparks have a total hard surface area of approximately 8,300m<sup>2</sup>. This increased hard surface area of 3,300m<sup>2</sup> represents <1% of the golf course area.

# Stormwater Management

## Current Site Drainage

Cox Creek enters the golf course site from the north as it passes under Old Carey Gully Road and runs through the site in a south easterly direction. The creek exits the site to the east, continues in a south easterly direction and passes under the South Eastern Freeway approximately 1,250m downstream of the site.

Preliminary investigations indicate the catchment area of Cox Creek upstream of the site exit point is approximately 2,000Ha. This catchment area includes sections of Summertown, Carey Gully, Crafrers and Piccadilly and includes residential, primary production and public purpose land use areas. The approximate catchment area of Cox Creek upstream of the golf course site is shown in Figure 3.



**Figure 3 – Approximate Upstream Catchment Area of Cox Creek (Nature Maps)**

BOM Rainfall data for Piccadilly Station 23891 indicates an average annual rainfall of 1068mm with the highest rainfalls occurring in the winter months as expected. A summary of the previous 20 years of data is provided in Table 1.

**Table 1 – Piccadilly Rainfall Data Summary**

Month	Mean (mm)	5 <sup>th</sup> percentile (mm)	95 <sup>th</sup> percentile (mm)
Jan	37.5	11.2	81
Feb	34.6	1.3	83.9
Mar	38.6	11.7	80.3
Apr	68.9	6.6	167.2
May	133.3	68.3	191.1
June	149	19.2	226.1
July	160.6	66.6	276.6
Aug	147.9	43.6	243
Sep	119.4	48.5	222.8
Oct	68.1	2.8	179.4
Nov	51.5	13.8	120.7
Dec	53.3	20.1	141.5
Annual	1068.6	933.1	1227.4

Source: BOM Rainfall Data 2001 – 2020 Piccadilly Station 23891

# Stormwater Management Requirements

This stormwater management plan will address the following State Planning Commission requirements (with other items within the specialist reporting provided by others);

- Integrated Water Management Plan (IWMP);
  - Infrastructure for the storage and treatment of stormwater
  - Predicted stormwater generation volumes and details of stormwater quality improvements, including the location and sizing of the bio-retention swales and basins, anticipated quality improvements and details of any other proposed stormwater quality treatment features.
  - Whole site, upstream catchment and downstream stormwater discharge point
  - (balance of IWMP provided by others reporting)
- Demonstration of no stormwater nuisance or flooding to occur on downstream properties due to the development
- Compliance with Council and Natural Resource Management Board requirements

It is noted that a surface water management plan has been included within the Construction Environmental Management Plan (CEMP) prepared by FMG as a separate report.

Adelaide Hills Council Stormwater Drainage Design Guidelines for Submission of Engineering Plans for New Developments require the following to be considered;

- The designer ensure that the proposed development within the drainage reserves such as fences of facilities shall not obstruct the path of flows from major storm events
- The major drainage network shall have the capacity to control stormwater flows under normal and minor system blockage (50% blockage) conditions for an ARI 1 in 100 years
- The drainage system shall be designed to ensure that the landform of watercourses is stabilised and that erosion is minimised
- All dwellings must be protected from inundation during a flood of 1 in 100 years ARI
- The drainage system shall be designed to ensure that flows downstream of the site are restricted to pre-development levels, unless council approves increased flows
- Underground stormwater systems designed to convey the minor 1 in 10 year ARI storm event
- Minimum 300mm freeboard to the 100 year ARI flood / ponding level

Further to the above, FMG recognises the sensitive urban environment the proposed development is located within, and following feedback from the EPA during pre-lodgment meetings, understand there to be a need for a tertiary level stormwater quality system to be implemented on site which fully complies with the South Australian EPA water quality reduction targets for runoff generated by the development;

- 80% retention of the typical urban annual load for Total Suspended Solids (TSS)
- 60% retention of the typical urban annual load for Total Phosphorus (TP)
- 45% retention of the typical urban annual load for Total Nitrogen (TN)
- 100% retention of the typical urban annual load for Gross Pollutants (litter)

# Stormwater Assessment

## Proposed Development Drainage

Stormwater drainage of the golf course facilities situated to the south west and uphill of both Cox Creek and the existing dam / lake observed on site. Lake levels are managed through pumping of stormwater local storage ponds throughout the golf course, and is utilised for irrigation. Peak levels within the lake are managed via a weir which spills into Cox Creek when full.

Surface run off from the subject development area, and further upstream catchments drains into open drains associated with the carpark retaining wall and runs into entry pits and underground stormwater pipes. This runoff is currently diverted towards Cox Creek.

It is envisaged that where possible, existing drainage pits and pipes will be retained to minimise the construction impact of the development. Generally, the new stormwater pit and pipework will be laid within the building footprint and collect all rainwater runoff for storm events up to the minor storm event (10 year ARI) into a below ground drainage pipe. Major storm events which exceed the drainage pipe capacity will travel overland towards the north. Roof runoff will be collected into downpipes and conveyed into a rainwater retention tank (designed and documented by others with water balance calculations to support) with 100 year ARI overflows connected into the below ground outlet drain.

Discharge from the underground drain, and major storm overland flow will be conveyed into a new detention and water quality improvement stormwater basin located adjacent Cox's creek. The stormwater basin will be sized during detailed design to achieve the following performance requirements;

- Approximately 150m<sup>3</sup> detention storage with a staged flow control (i.e. dual orifice control or similar) over the outfall to Cox's creek to limit post-development flow rates to pre-development flow rates. Detention volume will be calculated and adjusted as necessary to ensure peak outflows do not exceed pre-development flow rates for the minor and major storm events respectively.
- Minimum 300mm freeboard from peak 1% AEP storm event basin water level, to emergency overflow weir to Cox creek
- Provision of 300mm of extended duration detention depth, sized to capture and treat the 3mo ARI (4EY AEP) storm event for all runoff from the ground surface areas of the basin.
- Provision of 200micron stormwater filter baskets within all stormwater inlet pits within the development to remove
- Basin floor to be planted with effective nutrient removal native vegetation, deep filter media, transition layers and drainage layers in accordance with EPA / Water Sensitive SA best practice guidelines.
- Provision of a emergency overflow to Cox creek via a rock lined weir or similar approved to mitigate erosion and protect the existing watercourse in the event of a blockage.

Internal drainage pipe capacity requirements will be determined during detailed design of the proposed development, however as a minimum requirement all below ground pipes will be designed to ensure conveyance of the 10% AEP (10 year ARI) storm event, and a minimum pipe diameter of 225mm to mitigate the likelihood of blockages in this environment.

A plan showing the stormwater concept, with bulk elevation estimates and earthworks renders is included as an appendices to this report.

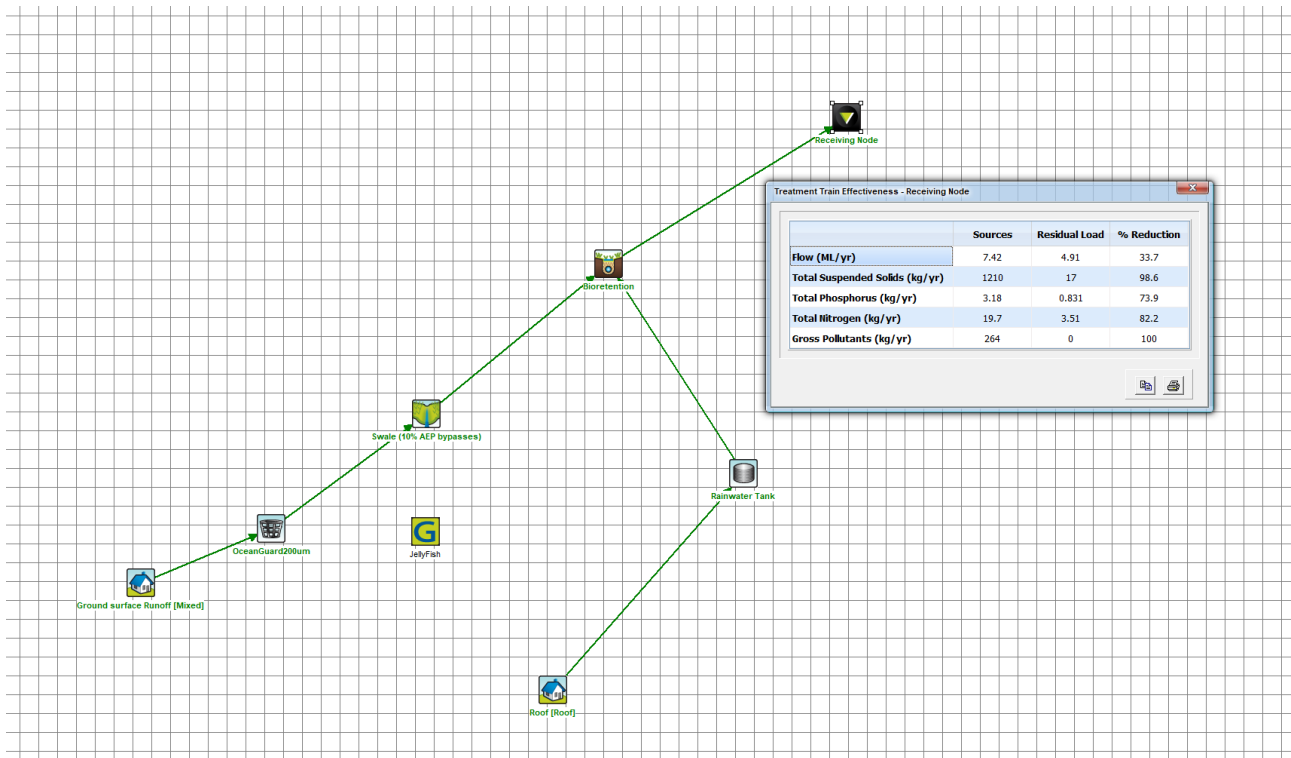
## Pod accommodation

Individual pod accommodation will adopt a similar stormwater drainage scheme, with retention / detention tanks provided to each individual pod as a self sufficient unit. Discharge from these tanks will be managed via either a main collector pipe, or individual discrete outlets to the bushland which will be suitably controlled via orifice and erosion protection elements.

Roof areas approximate 70m<sup>2</sup> resulting in the need for 1-1.5m<sup>3</sup> of stormwater detention volume per pod to restrict post-development runoff to pre-development runoff.

## Music modelling results

A Music model was developed to assess the reduction in pollutants based on the proposed treatment train consisting of bioretention raingardens and grassed roadside swales. This assessment was undertaken in accordance with the Water Sensitive SA MUSIC modelling guidelines. The results of the model can be seen in Figure 9 with a summary of reductions shown in Table 1. A filter cartridge based device (Jellyfish) however was not necessary to achieve adequate water quality improvements.



Pollutant	Water Sensitive SA Target	Reduction achieved
<b>Total Suspended Solids</b>	80%	98.6%
<b>Total Phosphorous</b>	60%	73.9%
<b>Total Nitrogen</b>	45%	82.2%
<b>Gross Pollutants</b>	90%	94.1%

Table 1 – Summary of MUSIC model results

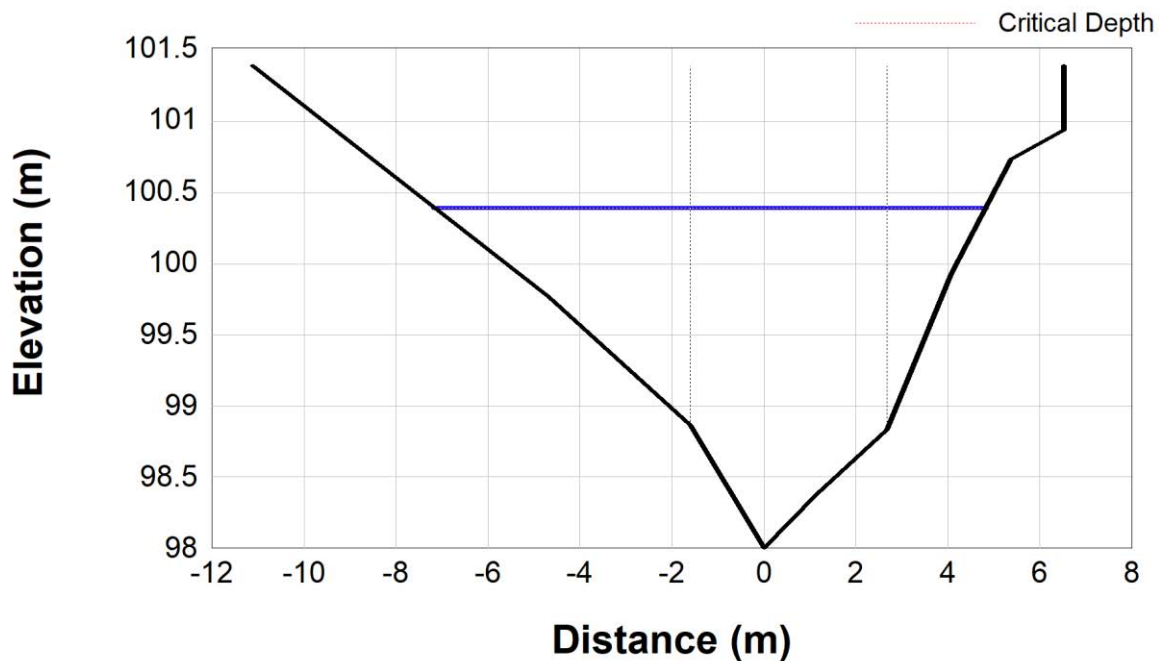


# Cox Creek Preliminary Drain Model

A preliminary stormwater assessment was undertaken to assess required floor levels for the proposed development. The following parameters were used to develop a preliminary Drain Model using an extended rational model.

- Upstream catchment area of 2,115Ha
- Impervious area 10%, pervious area 90%
- Flow in 1% AEP major storm event of approximately 47.5m<sup>3</sup>/s
- Irregular channel cross section based on contour data

Calculations indicate the water depth in Cox Creek and the associated lake may approach 2.5m increase in height with a maximum velocity of 5m/s during a 1% AEP major storm event. According to contour plans, Cox Creek is at an elevation of approximately 412m AHD at the location directly downhill from the proposed development. The proposed development area is at an elevation between 418m – 420m AHD which is 6m-8m above the creek. An increase in creek level of 2.5m would not impact the floor level of the proposed development. The preliminary creek cross section showing an increased water level of 2.5m is provided in Figure 4.



Note that the creek invert on the model is an arbitrary datum. Elevation 98 equates approximately to the Cox Creek invert level of 412m AHD (from contour plans)

**Figure 4 – Cox Creek Cross Section Preliminary Stormwater Assessment**

## Conclusion

This Preliminary Stormwater Management Plan has been prepared prior to detailed design and outlines the general intent for managing stormwater runoff from the site. The requirements set out in this document should be adhered to within final detailed design to ensure compliance with the requirements of the Adelaide Hills Council and EPA.

Specifically, site stormwater should be retained and detained on site to ensure post development peak flows do not exceed pre-development peak flows for an equivalent storm event. Furthermore, management and reduction of pollutants within stormwater runoff is of high importance within this sensitive environment, and EPA water quality targets must be adhered to.

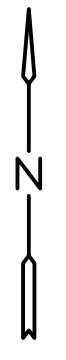
Minimum finished floor levels shall be 300mm above the maximum flood level within Cox Creek, which is estimated at 414.5m AHD. Concept site plans suggest this will be easily incorporated with all structures sited around the existing development at 419-420m AHD.

Detailed stormwater design including MUSIC and DRAINS modelling will be completed to verify the performance of the drainage network in meeting the retention/detention and water quality parameters in line with Adelaide Hills Council and EPA requirements.

Appended;

- C110 Perspective Images
- C120 Earthworks Plan
- C130 Stormwater Management Plan





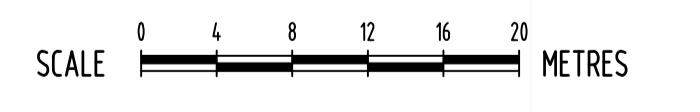
INDICATIVE EARTHWORKS VOLUMES:  
 CUT = -15871m<sup>3</sup>  
 FILL = 2978m<sup>3</sup>  
 NET = 12892m<sup>3</sup> EXCESS OF CUT OVER FILL

ASSUMPTIONS:  
 - 100mm TOPSOIL STRIP  
 - COMPACTION/EXPANSION FACTORS IGNORED  
 - VOLUMES TO FINISHED LEVELS, NO ALLOWANCE FOR SLAB, FOOTINGS OR BENCHING AT THIS TIME.

NOTE:  
 CUT/FILL VOLUMES ARE UNRELIABLE & CONTRACTOR SHALL UNDERTAKE THEIR OWN DUE DILIGENCE TO DETERMINE SUITABLE EARTHWORKS ALLOWANCES.

**EARTHWORKS LEGEND**

- EXTENT OF EARTHWORKS CUT
- EXTENT OF EARTHWORKS FILL



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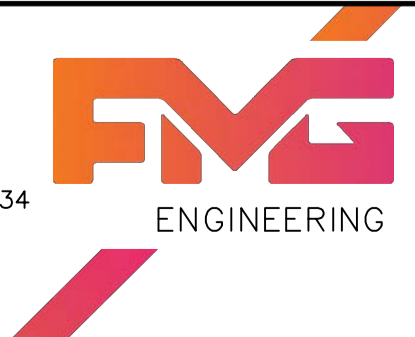
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CLIENT: VENTURE CAPITAL DEVELOPMENTS PTY LTD  
 PROJECT TITLE: MOUNT LOFTY GOLF ESTATE  
 SITE ADDRESS: 35 GOLFLINKS RD, STIRLING SA

DRAWING TITLE: EARTHWORKS PLAN

DESIGNED	JS	DRAWN	JS
CHECKED	JC	NO. OF SHEETS	-
SCALE	1:400 AT A1	DATE STARTED	23.09.2022
SITE ID & JOB No.	S53897 282604	REV.	
DRAWING No.	C120		A

REV	DESCRIPTION	DATE	INT	APP
A	PRELIMINARY ISSUE	23.09.2022	JS	JC





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## **Appendix 24**

*Appendix V of Development Report – Bushfire  
attack level (BAL) assessment*

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# BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT

Mount Lofty Golf Estate  
35 Golf Links Road  
STIRLING SA 5152



**Owners :** Mount Lofty Golf Estate Pty Ltd

**Client :** Mount Lofty Golf Estate Pty Ltd

**Architect :** R Architecture

## Document Status

Date	Version	Purpose of Issue	Author	Reviewer
7 December 2022	V1	Preliminary Issue for Review	Peter Murton	-

**Prepared by :** Peter Murton  
MIEAust CPEng NER APEC Engineer IntPE(Aus)  
BTech (Elect) GradDipFireSafeEng GradCertBfireProt

## ***B.S.P. Design Pty. Ltd.***

CONSULTING ENGINEERS  
FIRE & LIFE SAFETY ENGINEERS  
BUSH FIRE SAFETY PLANNING and DESIGN  
**37 THE ANNIE WATT CIRCUIT**  
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Email [peter@bspdesign.net](mailto:peter@bspdesign.net)

**REPORT No 1684.BPS.01**



Date: 7 December 2022

Page 2 of 8

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## EXECUTIVE SUMMARY

B.S.P. Design Pty Ltd has been engaged to assess the Bushfire Attack Levels appropriate to the construction of the Mount Lofty Golf Estate development at Stirling, South Australia.

In consideration of all factors associated with the development location, the exposure to bushfire attack varies as a result of the new buildings relationship with vegetation, and, with the acceptance that non-native vegetation can be removed and non-significant native vegetation can be either removed or lessened to reduce the fire load that can eventuate in a bushfire event. With such application and management an achievable result for the development reducing concerns for the safety of guests and staff.

Regardless of any considerations relative to radiation from flames, attack from embers must always be considered to be a major concern for any development within a bushfire prone location.

The outcome and conclusion of this assessment in determining the minimum attack levels is based on the *specified minimum clearances to predominant vegetation* to be achieved prior to construction, and *maintained at this minimum distance* with confirmation verified prior to each bushfire season.

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## **BUSH FIRE RISK ASSESSMENT**

The property is located within the Adelaide Hills Council in the Hundred of Onkaparinga, and in order to assess the risk to the property there are reference documents that need to be considered.

### *Bushfire Protection Area – Bushfire Risk*

With reference to the South Australian Property & Planning Atlas ( SAPPA ) within the Planning and Design Code ( PDC ), the property is located within a district with a *High Bushfire Risk*

### *Adelaide Mount Lofty Ranges Bushfire Management Committee - Area Plan*

Under the Adelaide Mount Lofty Ranges Bushfire Management Area plan, the area of the property is rated Extreme.

Although this assessment is in conflict with the SAPPA, the Risk Rating as assessed by SAPPA is accepted for the purposes of the proposed development on the property as referenced in the PDC.

## **ADDITIONAL REQUIREMENTS OF THE PLANNING and DESIGN CODE**

The PDC requires that developments within bushfire prone areas must additionally comply with the requirements of the Ministerial Building Standard MBS 008 *Designated bushfire prone areas – additional requirements*.

Additional requirements under the Standard are related to the Bushfire Attack Level ( BAL ) determined for the development calculated in accordance with AS 3959 – *Construction of Buildings in bush-fire prone areas*.

## **CONSEQUENCE OF A BUSH FIRE**

The consequence of a bush fire relates to various elements that are identified by a measurement of radiant heat that can be imposed in a bush fire event, and either the susceptibility of occupants in human settlement assets or susceptibility of built structures.

The determination of a Bushfire Attack Level, or BAL rating, for a property, assesses the possible radiant heat that can be possible generated from the burning of surrounding vegetation and impingement of strong, hot and ember-laden fire winds. The construction of the asset, in this case the form, methods and materials used to construct the buildings, taking into account the recommendations of the associated Australian Standard, *reduces* the susceptibility of the structure to a bush fire event (*not eliminate, as although a structure may be fully compliant with the recommendations of a Standard, there can never be a guarantee that a structure will not be affected by any bush fire event*).

## **BUSHFIRE ATTACK LEVEL ASSESSMENT**

### ***Introduction***

The determination of a measure of a level of attack on a structure is provided by a method of measurement and reference to tabulated data contained within the Australian Standard AS 3959 *Construction of buildings in bushfire-prone areas*.

The Standard provides two methods of calculation of BALs – a simplified procedure that is only useable where the downslope under vegetation is less than 20 degrees, and a detailed method that considers more deeply parameters that affect the intensity of a bushfire attack. The detailed method has limitations in that the effective slope under the classified vegetation can be no greater than 30 degrees downslope or 15 degrees upslope, and the slope of the land between the site and the classified vegetation is no more than 20 degrees upslope or downslope. It is also of note that the calculations for Forest and Woodland, as applicable to this site, use a combined or total fuel load for calculating, and the vegetation height is not a requirement entering into the calculation models.

The calculations and assessments are based on 'continuous' vegetation zones, however where the vegetation is 'discontinuous' and / or areas are small such that there is reduced risk from a bushfire due to the availability of only short fire runs or restricted fuel load, dispensations are available reducing the effect on the buildings.

The buildings at the Mount Lofty Golf Estate can be summarised as:

- Golf Club
- Hotel
- Tourist Accommodation Pods

The Golf Club and Hotel are co-joined, with the pods separately positioned within the vegetated area to the West of the main buildings.

In analysis of the risk to each of the sections of the Estate, the following is recorded:

The main buildings are located within a band between the Second and Eighteenth fairways of the Golf Course, with the fairways providing a buffer from major vegetation to the North and South. To the East there is an area of forestation that presents the major area of concern to the Golf Club due to the relationship between the building and vegetation.

For the Hotel, there will be only minor vegetation in the form of a 'clump' of established trees adjacent to the building when completed.

The tourist accommodation pods are situated within an area of natural vegetation that will be partially cleared to provide adequate clearance from the elevated vegetation with the understorey cleared to reduce fuel loads.

Refer below for more detailed descriptions.

### ***Parameters for BAL Assessments***

#### ***Relevant Fire Danger Index (FDI)***

The FDI for South Australia is scheduled in AS3959-2018 as **80**. The FDI has since been upgraded to **100**. For Grasslands, the Grassland Fire Danger Index (GFDI), used in the detailed method only, is **130**

#### ***Vegetation Classification***

The current existing natural vegetation can be best described as *Forest*, with trees in the range of 30m height and a dense understorey of low trees and shrubs along with infestation of blackberry bushes and other non-native species.

With the removal of the non-native vegetation in areas that have an impact of the fuel loading for assessments of attack, with possible retention of isolated shrubs, these 'cleared' areas can then be classified as *Woodland* for the purposes of BAL assessments.

To the West of the accommodation pods, the general vegetation can be considered to be grassland. This spans down to a creek and can be considered as managed vegetation although not to an extent where the height would be maintained below 100 mm so that it can be excluded from any assessments.

Refer to Table 2.3 in AS 3959 for additional description and explanations.

#### ***Distance from classified vegetation***

The distances of structures from classified vegetation are considered as detailed in Table T1.

**TABLE T1 Distances from buildings to Classified Vegetation**

LOCATION	VEGETATION	DETAILS
Golf Club	East of the building	<p>The existing vegetation is Forest extending from the lower level rising on an upslope. The current vegetation is nominally 18m from the eastern face of the cart storage building.</p> <p>The understorey will be cleared to a distance of 35m from the face of the new Clubhouse building allowing the reduction in fuel load to that of a <i>Woodland</i> classification A <i>Forest</i> classification will remain outside the 35m zone.</p> <p>The proposed location of the new Clubhouse building relates to the vegetation as <b>13m</b> from the Cart Storage section at the Lower Level. and <b>22m</b> from the set-back upper levels</p>
Hotel	North West	<p>The trees remaining following the development will be limited in number and lie between the Hotel wing and the 2<sup>nd</sup> fairway and green. A band of trees will remain to the West flanked by the 2<sup>nd</sup> and 18<sup>th</sup> holes.</p> <p>The significant tree to remain adjacent to the West (Tree 5) has a height &lt;20m and a spread of &lt;5m and positioned <b>15m</b> from the lower level of the Hotel Wing and <b>21m</b> from the upper level. The tree will not overhang the building.</p>
Tourist Accommodation Pods	West / Surrounding / South East	<p>The pods sit within an area that is generally classified as Forest with the western-most pods open to the managed vegetation area of the golf course to the West. Placement of the pods amongst the trees with clearance of non-significant trees and dense understorey, and the minimum clearance of pods from trees is <b>5m</b>. Trees do not overhang the pods. Vegetation in the APZ will be controlled for minimum flammability.</p>

***Effective slope of land under the classified vegetation***

With reference to Figure 2.2 of AS 3959, and survey plans and topographical maps, the effective slope under classified vegetation is determined as below.

Golf Club	East	Upslope	15 degrees (Woodland), 26 degrees (Forest)
Hotel	North West	Flat	
Pods	South East	Upslope	9 degrees
	West	Downslope	15 degrees

*Slope of land from site to classified vegetation* \* used in the Detailed Method of Calculation only

The slope of the land from the building line to the classified vegetation is assessed as follows:-

Golf Club	East	Flat ( Lower Level ), Downslope 11 degrees ( Ground Floor )
Hotel	North West	Flat ( Lower Level ), Downslope 8 degrees ( Level 2 )
Pods	South East	Upslope 9 degrees
	West	Downslope 15 degrees

### **Determination of Bushfire Attack Level (BAL)**

#### *Assessment Methodology*

As noted above there are two methods that can be adopted in the calculation of BALs, a simplified method ( Method 1 - conservative ), or a detailed method ( Method 2 ) that takes into account several additional factors relating to parameters such as the slope of the land between the site and the classified vegetation, and fuel loads.

As noted in the Introduction to this section of the report, there are limitations relating to slopes that need to be considered in determining the method selected to perform a BAL calculation. The slopes encountered on the site are varied, resulting in the possibility that one of the calculation methods may not be suitable / applicable.

With comparative reference to the calculated slopes above, the range is close to being outside the limitations for Method 2 calculations, and one considerably outside the range.

Where a fuel load assessment can normally be conducted as presented by a site evaluation, this site in particular does not lend to assessment readily. and with the additional knowledge that fuel reduction will be undertaken during the course of the development.

For the purposes of the development assessment, with the understanding that with design and documentation there will be the opportunity of closer assessment, BAL determinations are currently determined under the Method 1.

#### *Assessment Determination*

With reference to Table 2.4 in AS3959 for Method 1, and FireCode Australia program for Method 2, the assessed BAL values for each of the determined locations are :-

**TABLE T2 CALCULATED BUSHFIRE ATTACK LEVELS**

LOCATION	ZONE	AS3959 CALCULATION METHOD	
		METHOD 1	METHOD 2
Golf Club	East	<b>BAL 40</b> (Lower Level), <b>BAL 29</b> (Upper Levels)	<b>BAL 12.5</b> (Lower Level), <b>BAL 12.5</b> (Upper Levels)
Hotel	North West	<b>BAL 40</b> (Lower Level), <b>BAL 29</b> (Upper Levels)	<b>BAL 29</b> (Lower Level), <b>BAL 12.5</b> (Upper Levels)
Pods	South East	<b>BAL FZ</b>	<b>BAL 29</b>
	West	<b>BAL 40</b>	<b>BAL 40</b>

Note is made that considering the Forest beyond 35 metres from the East face of the new Clubhouse, Method 1 indicates a BAL of 19 from the Forest.

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## **DISCUSSION and CONCLUSION**

The Mount Lofty Golf Estate is located in a high risk bushfire prone area.

The Estate comprises three areas that can be seen to be prone to direct attack from a bushfire event, with other areas mainly affected by embers and smoke. These main areas can be generally identified as a Golf Club, a Hotel, and Tourist Pod Accommodation.

The Golf Club and Hotel are multi-storey and co-joined, with the individual Pods located in a group separated from the other buildings.

The location of the Golf Club and Hotel positioned between two fairways of the golf club results in little exposure to a bushfire attack from the North and South. At the eastern end the Golf Club is close to a native vegetation forest that presents a high risk for bushfire attack, but it has been determined that this risk may be lessened by reduction of the understorey vegetation and thus reducing the degree of attack. This reduction in vegetation is only permitted within 35 metres of the East face of the new building. Beyond this distance the existing Forest with dense understorey must remain.

The Hotel building has exposure only at the western end where it nears the existing trees.

The positioning of the accommodation pods amongst the trees to the West presents the need for reduction of the fuel load presented by the vegetation. With the permitted removal of trees and understorey vegetation and the maintaining of clearance from significant trees, the bushfire attack level can be reduced from a very high to a more manageable level. Under the Bushfire Management Strategy, the ground cover and understorey vegetation around and under the pods is of extreme importance in reducing the risk from a bushfire event.

As can be seen from the Table T2, the methodology of assessment of Bushfire Attack Levels is at variance and as a integral part of the any further development and in the design and documentation of the buildings it is extremely necessary to accurately assess each aspect of the vegetation and the resistance to bushfire attack. As can be seen, the simplified method of AS 3959 is very conservative resulting in higher BALs than the results achieved using the more detailed calculations adopted in Method 2.

As part of the development there are other considerations that can be made, such as application of shading from the flame front. Additionally, it is the writer's opinion, and principle previously accepted, that building sections only need to be constructed to withstand the radiation levels imposed on the structure and that the whole building does not need to be constructed to the highest BAL level that is applied to only a section.

It would be recommended that a full re-assessment be conducted once the site has been firmed during documentation.

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## REFERENCES

Government of South Australia, Adelaide Mount Lofty Ranges *Bushfire Management Area Plan*, July 2016

Government of South Australia, *Bushfire Management Zone Standard and Guidance for Use*, State Bushfire Coordination Committee, Approval Date June 2017

Government of South Australia, Department for Environment and Water, *Nature Maps*

Government of South Australia, Planning, Development and Infrastructure (General) Regulations 2017 Version 12.5.2021

Nearmaps, High Resolution Aerial Map, accessed November 2022

Standards Australia Limited, Australian Standard AS 3959 – 2018 *Construction of buildings in bushfire-prone areas*.

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## **Appendix 25**

*Appendix W of Development Report – Letters of support*

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OFFICIAL



28 September 2022

Mr. Sam Jayathilaka  
Mount Lofty Golf Estate PTY LTD  
35 Golf Link Drive  
Stirling SA 5152

Dear Mr. Jayathilaka,

**Re: Mount Lofty Golf Estate development plan.**

The South Australian Tourism Commission (SATC) writes in strong support of the proposed development plan for the Mount Lofty Golf Estate (MLGE) – currently known as the Stirling Golf Club – and the plans to develop the property into boutique hotel style accommodation.

The MLGE proposed development boasts 80 spacious hotel rooms and 20 chalets, which will take advantage of the pristine Mount George views and premium local food and wine experiences and offer unique ‘on course’ accommodation to cater for all travellers including golfing groups, leveraging the regions demand for sporting and recreational event-style accommodation.

The MLGE development will create a new opportunity for visitors to experience what will be a significant regional catalyst for economic growth, bringing great benefit to local businesses and increased employment both within the Adelaide Hills region and surrounding towns.

The SATC exists to promote the state as a desirable tourism destination, and new and enhanced South Australian accommodation is necessary to add variety and compete with international locations. The Regional Visitor Strategy 2025 (RVS2025) identifies Experience and Supply Development as a priority and acknowledges that encouragement of experiential accommodation development linked to an appealing landscape or activity, including golfing, is critical to support the development of additional regional accommodation.

The RVS2025 also identifies it a priority for the Adelaide Hills region to develop and expand overnight visitation from intrastate, interstate, and international markets, focusing on experiences around touring routes that appeal to the self-drive markets. The offering of the proposed MLGE development will be a key draw card for self-drive groups.

The MLGE development delivers an important tourism asset of scale to improve visitor amenity and access, enhance visitor experience, and create opportunity for the self-drive market. This development has the potential to drive more consumer spend, increase the number of night stays in the region and maximise its proximity to Adelaide.

SATC supports this development which will deliver significant tourism and economic outcomes.

Yours Sincerely

A handwritten signature in black ink, appearing to read 'Nick Jones'.

Nick Jones  
Executive Director, Destination Development  
South Australian Tourism Commission

South Australian Tourism Commission

Level 9, 250 Victoria Square, Adelaide South Australia 5000 | GPO Box 1972 Adelaide SA 5001

T 08 8463 4500 | F 08 7421 0200 | E [tourism@sa.gov.au](mailto:tourism@sa.gov.au) | [southaustralia.com](http://southaustralia.com) | ABN 80 485 623 691





To Whom It May Concern,

**RE: GOLF CLUB & MEMBER LETTER OF SUPPORT**

*I, Andy Moritz, President of the Mount Lofty Golf Club also referred to as the Stirling Golf Club, can confirm that URPS and the developer have met with Club executive members (General Manager, President and Captain) and socialised the proposed development and an engagement process with members and neighbours.*

*The Stirling Golf Club was founded by five members of the Royal Adelaide Golf Club in 1925 and was originally named Mount Lofty Golf Estate. The club has a small but loyal membership base who are excited to see a commitment from the developer to recognise the potential of the unique Golf Course by creating a destination venue.*

*This project will ensure that Mount Lofty Golf Estate joins an exclusive group of golf clubs that have reached a centenary in 2025, marking its 100th year in operation. Our club has had various obstacles, with lack of facilities, unlike the other nearby Golf Courses namely Blackwood, Aston Hills and Mt Osmond, which offer better facilities. The opportunity to redevelop the site will provide a competitive edge to MLGE, attracting national and international guests, increasing memberships and in turn providing for greater capex and maintenance budgets.*

*We are recognised as a challenging course due to the undulating terrain which will only further attract skilled payers to our Club upon completion of the Hotel and accommodation offerings. The realised development will reimagine the accommodation and tourism support facilities in the Adelaide Hills to build on the retention of the golf offering at the site. It will also see the adaptive reuse and reinvigoration of the deteriorating heritage listed Perfumery Building, allowing the community to re-engage with this piece of local history.*

*The vision is to revitalise the club and upgrade the property to a world class resort whilst bringing back the original name preserving its cultural and historic importance for the future. We are proud to be affiliated with the proposed eco-friendly sustainable design solution which will not only contribute to the economic health of our club but the broader Adelaide Hills region, in particular the township of Stirling.*

Yours Sincerely

A handwritten signature in black ink, appearing to read 'Andy Moritz', is written over a light blue horizontal line.

Andy Moritz

President – Stirling Golf Club

To whom it may concern,

## **MT LOFTY GOLF ESTATE REDEVELOPMENT LETTER OF SUPPORT**

As a PGA Golf Professional and representative of the PGA of Australia based in SA, I would like to register my support for the proposed redevelopment of the Mount Lofty Golf Estate located at 35 Golf Links Rd, Stirling SA.

There is a rich history attached to the Golf Club in South Australia, first founded in 1926 as a 9-hole golf course. The Golf Club still follows the same values since its conception of being inclusive, family friendly and welcoming to visitors, with the course the only Golf Club in or surrounding areas that currently offer accommodation.

For South Australia, accommodation on and near golf courses are truly limited. There are only 6 resorts or accommodation currently for golfing tourists. These are based in the areas of Barossa, the Riverland and The Fleurieu.

Based on the National Golf Report 2020-21, in South Australia participation levels have increased 21% and members member increase of 7.2% based on 1,204,000 participants (15+ years old). Golf is a dynamic and growing activity for tourists globally and is proven as a very successful and profitable tourism product around Australia.

South Australia's golf tourism industry is a key economic growth opportunity for Adelaide and regional South Australia. Golf courses are an attraction for tourist destinations, as proven in all other states around the nation. Golf tourism attracts investment, improves employment and regional competitiveness, and compensate for the seasonality of traditional tourism. On average from statistics from SA Tourism, the golf tourist spends 75% more than the average tourist and stays longer, (up to 3 more days on average).

The location of the Mt Lofty Golf Estate redevelopment in the township of Stirling and being only 20mins from the Adelaide CBD, is an ideal destination for Golfers and their families.

South Australia's golf tourism industry is a key economic growth opportunity for Adelaide and regional South Australia and in my belief, untapped. With the inclusion of the world class accommodation facilities, MLGE could be recognised as a one of the great golf courses of Australia collection and seen a pinnacle of Australian golf venues, offering a remarkable layout, as well as first-class facilities and hospitality.

The proposed redevelopment of the Mt Lofty Golf Course will improve the state's competitive standing as a golf tourism destination. Broader investment in the Adelaide Hills will improve the capacity of the region to be marketed as a year-round golf destination, especially to domestic markets. I strongly believe that the MLGE estate location and offering of complimentary tourism experiences will attract golf visitors and to encourage them to stay longer, in turn contributing positively to the local economy as well as raise the profile of South Australia as a Golf destination.

Yours Sincerely,

Warwick Hazel  
SA PGA MSO  
0403 213 992 [whazel@pga.org.au](mailto:whazel@pga.org.au)



Adelaide Hills

Sam Jayathilaka  
Director - Mount Lofty Golf Estate Pty Ltd  
35 Golf Link Drive  
Stirling  
South Australia

12 September 2021

Dear Sam,

I write on behalf of Adelaide Hills Tourism to express support for the initiative proposed by Mount Lofty Golf Estate Pty Ltd to undertake considered improvements and expansions to tourism and events infrastructure at its existing site in Stirling.

In the Adelaide Hills, the visitor economy is critical to the ongoing health, wellbeing, harmony, and prosperity of the community. As our region continues its recovery from the devastating 2019 bushfires, and then COVID-19, it is essential that we continue to enhance and develop infrastructure that drives increased visitation to the region, whilst also best supporting the local environment and community.

Of particular importance is accommodation capacity. If the region is better equipped to accommodate larger overnight groups, then it will be able to grow tourism contribution to the local economy by attracting more people to stay for longer.

Adelaide Hills Tourism understands the proposed development will drive the following benefits for the region.

- Significant contribution to the local economy by driving approximately 20,000 annual visitor room nights for the region, in addition to significant other expenditure linked to events, golf, wellness activities, and food & beverage attractions.
- Generate new jobs for locals, both during construction and once the development is fully operational.
- Much-needed improvements to a 100-year-old golf course, that is central to local community and heritage.
- Achieve the optimum green rating, ensuring responsible and sustainable use of the site in the short and long term. This includes sensitive care of surrounding vegetation, landscapes, and wildlife.
- Generate profile for the Adelaide Hills Region, for example by attracting professional golf events.
- Support surrounding local businesses, with visitors likely to spend time exploring surrounding wineries, attractions, main street precincts etc.

Adelaide Hills Tourism respects the thorough and important development approval processes of state and local government, and has every confidence that the proposed development has fully considered the surrounding environment, community and heritage, so as to ensure beneficial outcomes for all concerned.

Should this development be approved, Adelaide Hills Tourism looks forward to working closely with Mount Lofty Golf Estate Pty Ltd, to maximise the benefits for the Adelaide Hills region, whilst also supporting long term sustainability and success of another local business.

Yours sincerely

A handwritten signature in black ink, appearing to read 'M Radcliffe', is positioned above the printed name.

**Martin Radcliffe**

Chair - Adelaide Hills Tourism

[martin@visitadelaidehills.com.au](mailto:martin@visitadelaidehills.com.au)

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## **Appendix 26**

*Appendix X of Development Report – Operational  
environment management plan*

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# Operational Environment Management Plan

Mount Lofty Golf Estate

5 December 2022



## Document Control

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Site Location

### **Appendix B**

Environmental Performance Management

## 1. INTRODUCTION

An Operational Environment Management Plan (OEMP) is required as part of Development Application conditions, to address obligations for management of the potential environmental impacts of Mt Lofty Golf Estate and associated amenities on the surrounding environment.

### 1.1 Purpose of this OEMP

The purpose of this OEMP is to document the controls that will be applied to activities associated with the proposed golf course and tourist accommodation use of the Mt Lofty Golf Estate.

The key objective of the OEMP is to ensure that Mt Lofty Golf Estate onsite activities do not cause environmental nuisance or harm or impact on the environmental values for the site and its surrounds by:

- conducting all activities in accordance with applicable legislation
- conserving and protecting the natural environment through protection of ecosystems and promoting efficient use of all resources
- minimising negative environmental outcomes through reducing wastes, potential impact sources, emissions and other pollutants, whilst minimising energy usage
- clearly identifying the environmental roles and responsibilities of staff and contractors
- providing appropriate resources and environmental training commensurate with the roles and responsibilities of staff, workforce and persons undertaking activities
- communicating the company's environmental objectives and performance indicators to employees, contractors, clients and the community.

### 1.2 Design Statement

The Design Statement for the proposed redevelopment offers the following key principles:

- Minimise impact to existing site topography
- Preserve and enhance native flora and fauna
- Preserve and enhance the original publicly accessible golf course
- Respect for Traditional Owners
- Reflect the history and character of the Adelaide Hills
- Optimise the views
- Showcase environmentally sustainable design
- Showcase local produce

- Preserve and enhance local amenity
- Grow regional tourism and make a positive economic contribution
- Restore the heritage building usage (perfumery) and gardens.

The OEMP is designed to align with these key principles.

## 2. PROPOSED SITE DEVELOPMENT

The proposed development is summarised as follows:

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m<sup>2</sup> function room.
  - A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace.
  - 186m<sup>2</sup> sports bar.
  - A 189m<sup>2</sup> gallery and cafe.
  - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – ‘Pods’
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
  - Extension to the Perfumery to include a covered outdoor dining area.
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a “Scent Factory”.
  - Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
  - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management

- A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.
  - A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
  - Designated waste storage areas.
- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
    - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods.
    - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building.
    - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

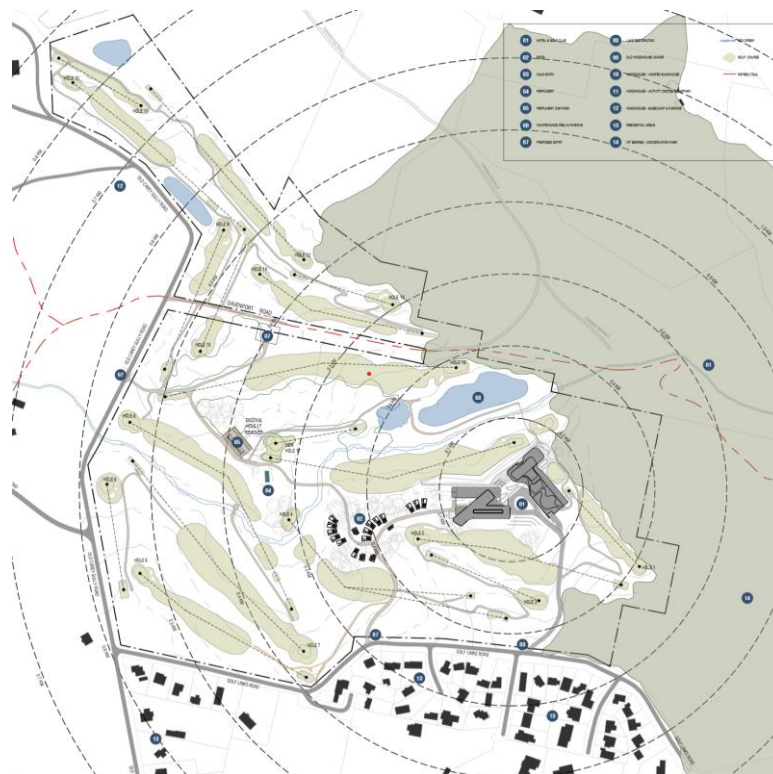


Figure 1 Development Plan

### 3. EXISTING ENVIRONMENT

#### 3.1 Development site

Mount Lofty Golf Estate will redevelop the Stirling Golf Course, located at 35 Golflinks Road, Stirling, South Australia.

An ecological flora and fauna assessment (EBS Ecology 2022) identified pockets of remnant native vegetation, scattered trees and landscape vegetation associated with the golf course. Few patches of native remnant vegetation remain on the site, and they are generally impacted by weeds and lack understorey. EBS however considers vegetation on the golf course to have high habitat value as it provides corridors for movement of fauna to better quality vegetation. The remaining trees were observed to contain a large number of hollows which might be used by birds and other fauna.

#### 3.2 Surrounding land use and sensitive receptors

Surrounding land uses consisted primarily of rural residential dwellings and agricultural use.

Sensitive receptors to potential environmental impacts from the proposed development include:

- nearby residents, in relation to nuisance issues associated with visual amenity and noise
- Mount George Conservation Park to the east, which reportedly is “supporting a large assembly of both nationally and state listed flora and fauna”, (DEH 2006).

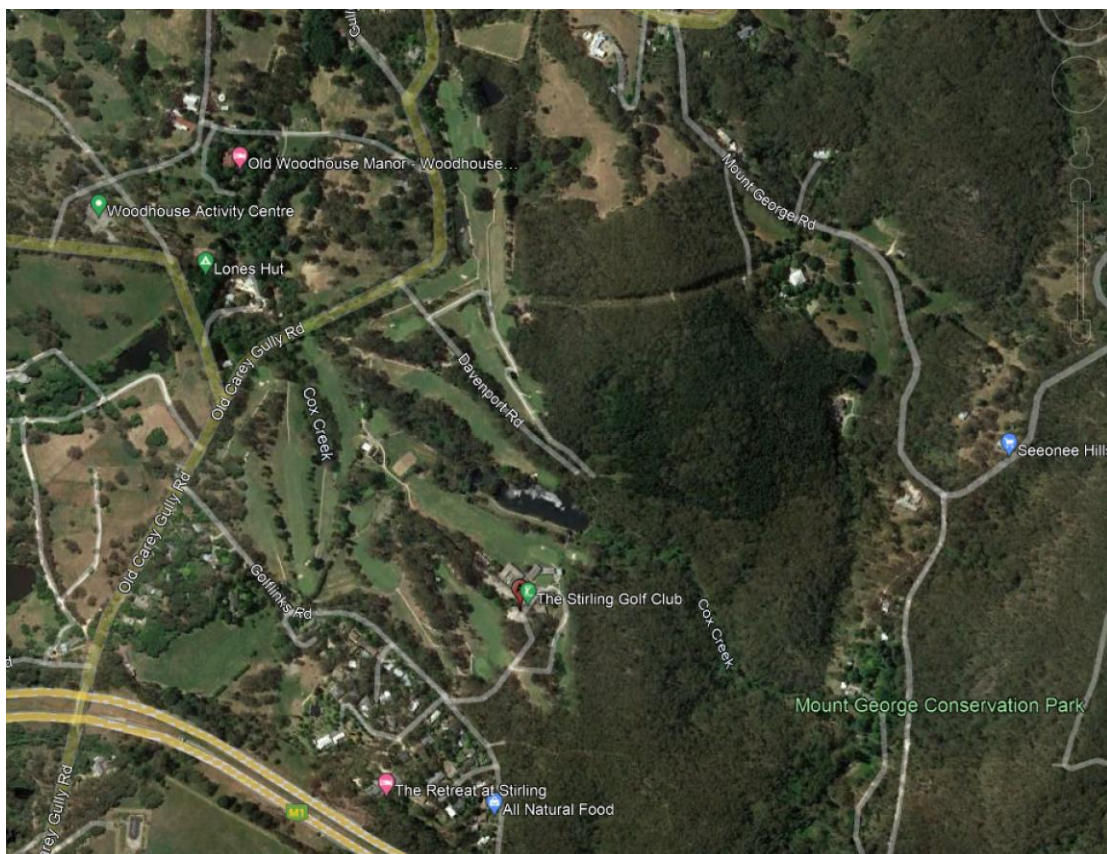


Figure 2 Site Setting

See Section 7 for the identified environmental aspects and associated impacts of this project.

## 4. DEVELOPMENT DESIGN

Specifications have been incorporated into the design to minimise environmental impact.

### 4.1 Waste management

Waste management design is detailed in:

- Mount Lofty Golf Estate Golflinks Road, Stirling, Waste Management and Minimisation Plan, CIRQA.

The Waste Management and Minimisation Plan (WMMP) states that operational activities relevant to waste will relate to:

- the continued use of the golfing facilities
- accommodation of tourists
- operation of the food, beverage and hospitality uses
- various servicing and maintenance activities associated with the various facilities within the site. This will include the collection, segregation, reuse, recycling, and removal of waste materials generated by the site's uses in line with the WMMP.

It is expected that waste management and minimisation will be undertaken in accordance with industry standards and the WMMP. Hence the only environmental aspect of waste disposal to be considered in this OEMP is appropriate storage prior to collection by licensed contractors for off-site re-use, recycling or disposal.

### 4.2 Stormwater management

Water management is detailed in:

- Mount Lofty Golf Estate Sustainability Strategy Report (DSquared).

A rainwater capture and reuse system will provide rainwater for landscape irrigation, laundry services, and washdown of golf carts/waste storage rooms.

A 50 kL rainwater storage tank will contribute 13 per cent of the development's total water demand and 25 per cent of non-potable water demand.

Landscaping comprises native and drought-tolerant planting species which have low irrigation water demands.

The stormwater system is designed such that pre-development peak stormwater outflows will not be exceeded, and all stormwater run-off will be appropriately treated before discharge to the local waterways. The use of stormwater detention tanks will contribute to meeting these outcomes.



## 5. REGULATORY REQUIREMENTS AND GUIDANCE DOCUMENTS

Mt Lofty Golf Estate are required to implement and maintain an OEMP to manage potential environmental impacts during operation.

### 5.1 Environment protection and pollution prevention

Management of the environment and any pollution from this project must comply with:

- *Environment Protection Act 1993*
- Environment Protection Regulations 2009
- Environment Protection (Water Quality) Policy 2003 and 2015
- Environment Protection (Noise) Policy 2007.

### 5.2 Flora and fauna management

Management of flora and fauna from this project must comply with:

- *Environment Protection and Biodiversity Conservation Act 1999* – Commonwealth
- *Native Vegetation Act 1991*
- *National Parks and Wildlife Act 1972*
- *Landscape South Australia Act 2019*
- *Planning Development and Infrastructure Act 2016*.

### 5.3 Waste management

Management of waste must comply with:

- *Environment Protection Act 1993*
- South Australia's Waste Strategy 2020-2025

Management of waste soils at the site must comply with:

- EPA Guidelines 416/07 Waste Tracking Form and 415/10 Waste Transport Certificate
- Standard for the Production and Use of Waste Derived Fill 2013
- Current criteria for the classification of waste – including Industrial and Commercial Waste (Listed) and Waste Soil, SA EPA 889/10 2010.

## 6. ROLES AND RESPONSIBILITIES

The Site Manager assumes the responsibility for environmental matters and is advised by the Director, generally located at head office. Specialist advice may be sought from an appropriately qualified and experienced environmental consultant from time to time, as required.

Site personnel must report all environmental matters to the Site Manager, who is responsible for development and implementation of the OEMP, incident response, cessation of works order, communication of environmental issues, record keeping, training and other matters to satisfy the requirements of the OEMP. Should the Site Manager be off-site, responsibility for environmental matters is delegated to an appropriately trained and experienced person or the Director. Table 6-1 summarises the key areas and responsibilities under the OEMP.

**Table 6-1: Roles and responsibilities**

Key Tasks	Director	Site Manager	Employees
Annual review of OEMP including objectives, impacts, risks and controls	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Allocation of resources to meet environmental objectives	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Development and maintenance of the environmental management system, incorporating any changes to legislation, regulations or guideline documents		<input checked="" type="checkbox"/>	
Disseminate environmental management information to all staff		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Adherence to environmental management policies and procedures	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Completing environmental risk assessments as necessary		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Periodic internal monitoring and environmental compliance inspections		<input checked="" type="checkbox"/>	
Raising environmental non-conformance where required, implementing preventative and corrective actions		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Emergency response and notification of incidents		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Annual summary report on environmental compliance		<input checked="" type="checkbox"/>	

## 7. ENVIRONMENTAL PERFORMANCE REVIEW

Environmental aspects are defined as the elements of the organisation’s activities, products or services that could interact with the environment. A significant environmental aspect has, or could have, a significant environmental impact (AS/NZS ISO 14001:2016).

A range of significant operational environmental aspects have been identified and are shown in Table 7-1: Significant environmental aspects, as well as the potential impacts and risk ratings for each aspect.

**Table 7-1: Significant environmental aspects**

Aspect	Potential impact	Risk level	Key control mechanisms
Vehicle traffic and parking	Generation of dust and emissions Damage to ecology by off-designated road traffic Spread of weeds from vehicle tyres	Low	Speed limits to slow down traffic movements reducing dust generation Designated and maintained roads and parking areas Sealed roads and parking areas Signage to discourage off road traffic
Pedestrian traffic in hotel area and golfers across greens	Spread of weeds Litter	Low	No un-authorised access to revegetation areas Marked access tracks
Pedestrian or buggy access into revegetation areas	Damage to vegetation and regrowth potential Disturbance to fauna Habitat disruption	Moderate	No un-authorised access to revegetation areas Marked access tracks
Inappropriate waste management	Increase of abundance or diversity of pest and vermin i.e. mice, rats, mosquitos Litter	Moderate	All general waste will be removed through council commercial waste collection services CIRQA 2022 WMMP Section 4.2
Grounds maintenance – mowing, slashing and weed control	Damage to plants and revegetation potential Disturbance and injury to fauna Habitat disruption Noise impacts to neighbours	High	No unplanned slashing of vegetation where native vegetation is present Areas of revegetation clearly identified Managed vegetation areas – development of specific SOPs Good communications with neighbours to notify of potentially noisy activities
Importation of soil for golf course	Importation of contaminated fill Spread of weeds	Moderate	All soil to be imported to site to be of known provenance (for weed propagation control) and tested to ensure it meets SA EPA Waste Fill criteria
Application of herbicides and pesticides	Damage to plants and revegetation potential Injury to fauna	Moderate	Experienced weed management contractors appointed to ensure appropriate measures are

Aspect	Potential impact	Risk level	Key control mechanisms
			adopted for weed management in areas of native vegetation
Workshops – equipment maintenance	Potential for spills/leaks (from vehicles, equipment and hazardous materials storage and use) to ground causing on and off-site contamination	Low	All vehicle servicing and maintenance will occur at licensed mechanics premises or in designated workshops onsite Any onsite workshops will be fitted out with appropriate controls for any potential risks identified for environmental impacts
Vehicle and equipment use on site	Potential for spills/leaks (from vehicles, equipment and hazardous materials storage and use) to ground causing on and off-site contamination	Low	There will be minimal pieces of plant/equipment onsite at all times Spill kits are located onsite and contain relevant quantities of collection materials. All contaminated materials to be disposed of by licensed contractors Staff will be trained in spill response
Waste generation-house keeping	Litter and storage of waste materials causing impacts to land, habitat, flora and fauna, aesthetics, or becomes a nuisance issue	Low	All general waste will be removed through council commercial waste collection services. CIRQA 2022 WMMP Section 4.2
Site Contamination	Spread of contaminated soil	Low	Testing of soil prior to movement or reuse to ensure it is suitable for the proposed use
Water management	Surface water runoff contaminated by site activities		Onsite surface water detention capacity shall be designed to cater for expected runoff from hardstand and rooves

## 7.1 Environmental Elements and Objectives

The key objective of this OEMP is to review the likely environmental performance of the proposed development from a design perspective (with further improvements such as energy efficiency to be developed with final design).

**Table 7-2: Design Environmental Element and Objectives**

Design environmental element	Objectives
Soil Management	Minimise disturbance of ground surfaces and implement sediment, erosion and drainage management. Design to minimise erosion and sediment transport.
Stormwater Quality	Minimise the effect on water quality/stormwater runoff by minimising disturbance to ground surfaces and implementing effective erosion controls where required.

Design environmental element	Objectives
	<p>Minimise increased surface water runoff by adopting infiltration designs for large areas such as car parks.</p> <p>Contain and reuse stormwater where possible.</p> <p>Minimise increased or uncontrolled runoff onto adjoining land and into council stormwater system.</p> <p>Treat stormwater runoff to remove debris and sediment.</p>
Waste Management (including wastewater)	<p>Apply the waste management hierarchy: Avoid/Minimise, Re-use/Recycle, Recover, Treat, Dispose.</p> <p>Minimise pollution by employing appropriate waste storage, handling and disposal methods.</p>
Biodiversity and Nature Conservation	<p>Minimise the impact of the development on native flora and fauna by confining activities to public areas and roads.</p> <p>Protect significant trees.</p> <p>Maintain established exclusion zones around existing vegetation areas.</p> <p>Protect and regenerate native vegetation areas.</p>
Social Values / Health	<p>Minimise aesthetic impact to neighbouring residents.</p> <p>Minimise impact of vine spraying drift on guests or restriction on vine management caused by presence of building.</p> <p>Minimise energy usage.</p>
Cultural Heritage	<p>Avoid harm to cultural heritage by developing plans for management of any known heritage sites.</p>

## 7.2 Environmental performance review

Environmental performance reviews have been undertaken for the specific design elements identified in Table 5-1.

Reviews (attached as **Appendix B**) have been developed for the following:

- soil management
- stormwater management
- waste management
- vegetation management
- social and cultural value.

## 7.3 Environmental performance summary

Application and improvement of the OEMP will ensure that the proposed development will have minimal negative environmental impact on surrounding land.

The site layout allows management of environmental aspects to enhance opportunities for improvement of ecological value, such as increased planting of higher quality native vegetation.

## 8. REFERENCES

The OEMP framework uses several reports, which form part of the OEMP framework. Reports include:

- R Architecture - Design Statement
- Mount Lofty Golf Estate Architecture- DA Further Info DRAFT
- EBS Heritage\_GX220701 Heritage Impact Statement DRAFT 220908
- Mount Lofty Golf Estate Hazard Management Plan\_V.02
- Support Letter - Mount Lofty Golf Course - September 2022
- CIRQA Mount Lofty Golf Estate Waste Management and Minimisation Plan 15Sep22 Draft
- CIRQA Traffic and Access Impact Statement
- DSquared - 2623\_Mount Lofty Golf Estate Sustainability Strategy Report
- EBS Ecology GX220701\_Mt Lofty Golf Course EHIAR Draft V1 20220909
- EBS Heritage CHMP Framework
- EBS Ecology - Fauna and Flora Mt Lofty Estate Eco Assessment\_Draft\_V1\_20220909
- EBS Heritage - Heritage Impact Statement DRAFT 220908

## 9. LIMITATIONS

### **Scope of Services**

This environmental site assessment report (“the report”) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and Environmental Projects (EP) (“scope of services”). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

### **Reliance on Data**

In preparing the report, EP has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (“the data”). Except as otherwise stated in the report, EP has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (“conclusions”) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. EP will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to EP.

### **Environmental Conclusions**

Preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

### **Report for Benefit of the client**

The report has been prepared for the benefit of the client for the specific purpose of this project. EP assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of EP or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

### **Other Limitations**

EP will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

## Appendix A

### Site Location





## Appendix B

### Environmental Performance Management

## B1– Soil Management

<b>Outcome:</b>	<b>No negative impacts on soil quality on and off-site</b>
Performance Indicator	<p>Site erosion is minimised and soil condition protected.</p> <p>Sediment transport onto adjoining properties or waterbodies is minimised.</p> <p>Off-site soil quality is not compromised.</p>
	<b>Details</b>
Management Measures	<p>The proposed development design includes landscaping post-construction to reinstate vegetation and grasses surrounding the building to minimise exposed soil.</p> <p>Exposed soil will be stabilised</p> <p>Formal entry and exit point will be established for all vehicle traffic to minimise soil disturbance.</p> <p>If not hard paved, any traffic areas will be constructed of compacted sub-grade, covered with a 200 mm layer of 40 mm aggregate.</p> <p>Cars will only be parked in designated parking areas so as to prevent unnecessary disturbance of soils.</p>
Performance Review:	The proposed development design minimises impact on site soils.

## B2 – Stormwater Management

<b>Outcome:</b>	<b>No negative impacts on stormwater quality and quantity on and off-site</b>
Performance Indicator	<p>Erosion and sediment transport, and adverse impacts to water quality are minimised, on and off-site.</p> <p>Sediment transport into council stormwater system is prevented.</p> <p>The volume of water running off the site will not change significantly.</p> <p>Water is captured for reuse.</p> <p>Water quality not affected by development activities such as car parking.</p>
	<b>Details</b>
Management Measures	<p>The proposed design includes open grassed land to allow stormwater infiltration.</p> <p>Stormwater discharge to the municipal stormwater system minimised.</p> <p>Swales will be installed to capture, direct and treat stormwater runoff.</p> <p>Sediment traps will be installed where erosive affects could potentially be enhanced and sediment run-off likely.</p> <p>A detailed inspection of the drainage pattern across the site will be undertaken and any drainage lines that are in the area of development will be redirected to maintain natural flow across the site.</p> <p>Stormwater runoff will be captured and stored in a retention basin and tanks. Where possible water will be used for irrigation and other uses.</p>
Performance Review	The proposed development design minimises impact on stormwater runoff.

## B3 – Solid Waste Management

<b>Outcome:</b>	<b>No impacts to the environment as a result of the generation and management of waste</b>
Performance Indicator	<p>No spills or leaks to ground from storage or handling of waste.</p> <p>Minimisation of waste generation and no loss of waste from storage areas.</p> <p>No contaminated material used as site fill.</p> <p>No off-site movement of soils or waste without classification and receipt by an approved facility.</p>
	<b>Details</b>
Management Measures	<p>Storage, handling and management of wastes are to be in accordance with relevant guidelines. Wastes likely to be generated that will require management and disposal include:</p> <ul style="list-style-type: none"> <li>• domestic waste</li> <li>• recyclable materials</li> <li>• waste oils/chemicals (controlled waste)</li> </ul> <p>The hierarchy of reduce, reuse and recycle for waste will be implemented.</p> <p>Wastes will be segregated and stored appropriately to ensure spills, leaks and odour is avoided. Clear labelling of waste storage areas/bins will be maintained.</p> <p>Any off-site movement of waste will be in accordance with EPA and council requirements, including the use of appropriately licensed vehicles and completion of appropriate documentation.</p> <p>Housekeeping activities will include daily litter pick up and will ensure waste storage areas are neat and tidy.</p> <p>A suitably qualified contractor must be engaged to remove all waste,</p>
Performance Review	The proposed development design minimises impact on receiving environment.

## B4 – Biodiversity and Nature Conservation

<b>Outcome:</b>	<b>Improvement to onsite existing vegetation and no harm to vegetation in the surrounding environment</b>
Performance Indicator	<p>No unauthorised clearance or damage to native vegetation during golf course maintenance activity.</p> <p>No damage from application of herbicides and pesticides.</p> <p>Retention of significant trees.</p> <p>Enhancement of native vegetation areas for aesthetic and ecological value.</p> <p>Protection of areas with habitat value.</p> <p>No importation of plant pathogens or weeds.</p> <p>No impacts on nearby sensitive receptors.</p>
	<b>Details</b>
Management Measures	<p>No native significant vegetation to be disturbed by maintenance activity.</p> <p>No new access roads or tracks to be developed.</p> <p>'No – go' zones will be flagged off for any identified vegetation protection areas.</p> <p>Significant trees will be identified and protected.</p> <p>Tree understorey will be planted out with endemic native species to improve ecological value.</p> <p>Proposed new vegetation areas will be populated with endemic species and will include planting of the understorey, creating a revegetation area.</p>
Performance Review	The proposed development design minimises impact on vegetation and provides good environmental management.

## B5 – Social and Cultural Values

<b>Outcome:</b>	<p><b>No nuisance issues to neighbours as a result of operation.</b></p> <p><b>Retention of heritage value.</b></p> <p><b>Management of discovered heritage items.</b></p>
Performance Indicator	<p>Noise criteria are met.</p> <p>Visual amenity is maintained at highest standard.</p> <p>No complaints are received in relation to noise, odour, lighting, vibration or dust.</p> <p>Highest energy management standards are met.</p> <p>Protection of recognised “perfumery” European heritage value.</p> <p>No damage to cultural heritage values.</p>
	<b>Details</b>
Management Measures - Social	<p>Energy usage will be minimised operationally however solar panels will be fitted to augment power supply to the building.</p> <p>Any discoveries of cultural heritage will be managed appropriately and protected during and after development.</p>
Management Measures - Cultural	Any discoveries of cultural heritage will be reported, managed appropriately and protected.
Performance Review	The proposed development design minimises impact on receiving environment.

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## **Appendix 27**

*Appendix Y of Development Report – Bushfire  
management strategy*

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# BUSHFIRE MANAGEMENT STRATEGY

Mount Lofty Golf Estate  
35 Golf Links Road  
STIRLING SA 5152



## Document Status

Date	Version	Purpose of Issue	Author	Reviewer
2 December 2022	V1	DRAFT Issue for Preliminary Review	Peter Murton	-

Prepared for Mount Lofty Golf Estate by:

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# Mount Lofty Golf Estate Bushfire Management Strategy

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# Mount Lofty Golf Estate Bushfire Management Strategy

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# Mount Lofty Golf Estate

## Bushfire Management Strategy

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### INTRODUCTION

This document has been prepared to set the guidelines for the processes and procedures in the preparation for bushfires, particular responses and the actions required in the recovery following any bushfire event.

The Management Strategy ( Plan ) is a fluid document and must be reviewed on a regular basis and amended / upgraded as necessary, particularly prior to any bushfire season.

During significant bushfires, there will be conflicting demands on fire brigade resources and reliance should not be placed on fire brigade intervention to protect any specific property. It should therefore be assumed that there will be no fire brigade intervention with respect to protecting a specific property, and it is therefore the duty and responsibility for the Estate to be fully committed to providing the resources and appropriate actions in their duty of care to prepare for, prevent, mitigate, respond to, and support recovery from bushfire. There can be no absolute guarantee that the safety of all guests, staff and associated persons from bushfire.

All bushfires are different. Bushfires are complex and dynamic events. Safe responses will always depend on specific circumstances, so there is a need to plan for a variety of situations.

Bushfire safety depends on people having access to a range of safety options. All options other than being out of the fire area involve varying degrees of danger. Not all options will afford the same degree of protection from a bushfire

Bushfire safety involves effective planning and preparation prior to a fire, making informed decisions during the event, and having access to a range of safety options, in particular places to shelter from the effects of the fire.

Many of the actions required by this Management Plan are encompassed within the *Bushfire Survival Plan* for the Estate. This is a separate stand-alone document that should be read, referenced, and taken as an integral part of this Management Strategy.

### OBJECTIVES

The objectives of this Management Strategy ('Plan') is to provide the detail necessary for the framework of measures to be considered.

The principal object of the Plan is to ensure such measures are taken towards the protection of human life, be it persons associated with a facility or the fire-fighting personnel that will attend during and following any bushfire event.

Bushfire management comprises three planks: *preparation, response and recovery*.

**Preparation** involves managing fuel loads and vegetation, maintaining access to tracks and fire breaks, planning fire response and ensuring sufficient human capacity and resources to respond to worst-case scenarios

Activities undertaken in advance of the occurrence of an incident decreases the impact, extent and severity of the incident and to ensure more effective response activities. Arrangements to ensure that, should an event occur, all those resources and services which are needed to cope with the effects can be efficiently mobilised and deployed.

Measures are to be taken to ensure that resources and services are capable of coping with the effects.

# Mount Lofty Golf Estate

## Bushfire Management Strategy

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**Response** encompasses actions taken in anticipation of, during, and immediately after an event to ensure that its effects are minimised, and that people affected are given immediate relief and support.

**Recovery** is the restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities affected, aligning with the principles of sustainable development and “build back better”, to avoid or reduce future disaster risk.

### ROLES and RESPONSIBILITIES

#### Emergency Planning Committee

The first step is to establish an Emergency Planning Committee (EPC) if one has not yet been established. An EPC is most likely convened as an integral part of the management of the Estate.

The EPC is a consultative group made up of a representation of those who may work, live or otherwise are occupants at the premises. The group normally consists of senior management, tenants, staff, chief and deputy chief wardens.

The role of the EPC is to actively participate in the planning process and identifies the roles and likely participants who will be responsible for the implementation of the plan and its procedures during an emergency.

The role of the EPC is to:

- Establish and implement emergency plans and procedures;
- Identify duties and responsibilities of positions;
- Formulate emergency procedures;
- Educate & train employees and other occupants;
- Make all occupants aware of the emergency procedures for the development; and
- Conduct an annual exercise of emergency procedures for the development prior to the Bushfire Season.

Roles and responsibilities are required to be assigned to staff such as:

- Co-ordination and arranging transport;
- Physically relocating occupants from one place to another;
- Ensuring all buildings are properly secured to limit the impact of a bushfire;
- Initiating any bushfire protection measures such as sprinkler systems; and
- Liaising with emergency services.

REFERENCE : refer to the Bushfire Survival Plan

#### Examples of Roles and Responsibilities

##### Chief Warden

The Chief Warden is the person who is responsible for coordinating the emergency procedures and may also include:

- Managing and overseeing of any emergency procedures;

# Mount Lofty Golf Estate

## Bushfire Management Strategy

---

- Arranging training of employees in emergency procedure;
- Reviewing the effectiveness of emergency procedure exercises and arrange for procedure improvements; and
- Accounting for all persons during the emergency procedures.

### Wardens / Employees

The wardens/employees are responsible for;

- Maintaining a calm atmosphere among the occupants;
- Following established procedures;
- Following the direction of the Chief Warden;
- Assisting with moving of occupants; and
- May be required to act as Chief Warden.

**Note:** The number of Wardens is dependent on the number of discrete business units, areas or buildings within which occupants may need to be supported during a bushfire event, including the possibility of evacuation.

# Mount Lofty Golf Estate Bushfire Management Strategy

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## FIRE FIGHTING PROVISIONS

[ DETAILS TO BE ADDED FOLLOWING DESIGN AND DOCUMENTATION ]

## MITIGATING THE BUSHFIRE RISK

### Vegetation Management

Fire Management Zones are to be established and maintained in order to control the fuel loading created by the varying vegetation types.

The topography of the site and the large areas of native vegetation leads to the increased reliance of vegetation management to protect native vegetation in addition to retention of radiant heat that may be impinged on the assets ( Bushfire Attack Level ).

Appendix A provides a description of the types of vegetation management zones and there intended application.

Figure A1 in Appendix A indicates the planned areas of management and details the maximum levels of fuel loads that need to maintained.

# Mount Lofty Golf Estate

## Bushfire Management Strategy

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### **ASSET MANAGEMENT and RECORDS**

As a facility located within a High Bushfire Prone area, there are minimum requirements set for materials used and construction methods adopted for the Estate in compliance with Australian Standard AS 3959 – 2018 *Construction of buildings in bushfire prone areas*

The details of construction including approved 'as constructed' documentation will be assembled within a manual for ongoing reference throughout the life of the facility, including critical advice for any subsequent owners and occupiers.

It is a part of this Bushfire Management Strategy that these records identifying the construction details as baseline data be maintained, with this Bushfire Maintenance Strategy and the associated Bushfire Survival Plan, included with copies maintained at the property.

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# Mount Lofty Golf Estate Bushfire Management Strategy

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## APPENDIX A

### VEGETATION MANAGEMENT

#### FIRE MANAGEMENT ZONES

Fire Management Zones (FMZ) provide a coordinated and consistent approach to bushfire risk mitigation and land management, and support the relevant fire and land manager/s by defining the minimum requirements an area must meet to comply with the relevant FMZ category. FMZs also determine the type of treatment activities that are permissible.

Where significant risks, either from bushfire or inappropriate fire regimes, are identified in an approved fire management plan, FMZs may be applied as a strategy to identify where fire management activities are considered a priority to mitigate the identified risk/s.

Fire Management Zones comprise the following categories:

- Asset Protection Zone (A-zone)
- Bushfire Buffer Zone (B-zone)
- Strategic Fuel Management Zone (S-zone)
- Conservation Zones (C-zones)
- Exclusion Zones (X-zone)

If fire management activities occur in areas that are not zoned the land manager must conduct the activities in accordance with the principles and regulation of the *Fire and Emergency Services Act 2005* (FES Act), and the *Native Vegetation Act 1991* (NV Act), and the Ecological Fire Management Guidelines (EFMG).

#### ASSET PROTECTION ZONE

##### Definition

An A-zone is an actively managed fuel reduced area that surrounds or is adjacent to assets for the purpose of minimising risks to life, property, and environmental assets, particularly aimed at stopping the spread of fire and preventing direct flame contact, intense radiant heat, and reducing short distance ember attack from the immediate environment.

The distance from the asset and the width has been determined by the Australian Standard 3959.

Fine fuel levels in the A-zone shall be maintained to keep surface and shrub level fine fuels at Moderate or lower (as an average across the zone) as defined in the Department for Environment and Water's *Overall Fuel Hazard Guide for South Australia*.

A-zones can include the 20 m Native Vegetation Council defensible space around dwellings<sup>6</sup>. A-zones can extend beyond this width, when identified in an approved fire management plan:

- to protect multiple dwellings, settlements, larger civil infrastructure, major road corridors, and defined environmental assets
- where slopes occur downhill from the asset or where vegetation types have High fuel levels (refer to AS3959 2018)

An A-zone may similarly be less than 20 m where the ground slopes uphill from assets or where vegetation fuel levels are low.

# Mount Lofty Golf Estate

## Bushfire Management Strategy

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### Managing Asset Protection Zones

A-zones should be maintained so that the overall fuel hazard (as an average throughout the zone) does not exceed Moderate.

- Dry grass in an A-zone should be maintained at 10 cm or less.
- A-zone incorporate existing cleared areas, roads, paths, fairways and tees which already have low fuel levels, rather than clearing further land. ,

### Asset Protection Zone Vegetation management

Available fine fuels (fuel particles less than 6 mm in diameter – such as leaves, twigs, and small sticks up to pencil size) within an A-zone are to be reduced and maintained so that:

- fine fuel levels close to the asset are significantly lowered to reduce fire intensity and flame contact with assets
- fine fuel levels in surface, shrub, and canopy are significantly reduced and continuity (spread across the area) interrupted.

Note that mature trees are not fine fuel. Loose bark and dead leaf litter from mature trees are included in fine fuel assessment.

Fuel levels should be modified and maintained to keep the zone at Moderate or lower overall fuel hazard levels for the duration of the fire danger season. This may be achieved by utilising the methods identified below. Appropriateness of individual actions is dependent on land use and vegetation type.

Tree canopies within the A-zone should be separated by at least 2 m <sup>s</sup>. Keep the lower branches on mature trees pruned to a minimum of 2 m above the ground.

- Manage understorey plants in the A-zone so that the leaf area of the vegetation is not vertically or horizontally continuous. A disconnected 'clumping' of shrubs is more desirable than even connected coverage. Separate shrubs and trees to minimise vertical fuel 'ladders'.
- Dead shrubs/understorey plants within the A-zone should be removed.
- Grasses within the A-zone should be reduced to an average height of 10 cm.
- No heath or shrub understorey species are to be within 2 m of the asset to be protected.
- Vegetation clearance can be undertaken within 20 m of an approved dwelling (apart from large trees with a trunk circumference of 2 m or greater (measured 1m from the base of the tree) (NV Act).
- Where the asset is a building, tree branches overhanging the roof should be removed or trimmed to at least 2m clear of the roof.
- Where approved, prescribed burning can achieve the desired fuel reduction outcome
- Fine fuel levels in the A-zone should be maintained to keep surface and shrub level fine fuels at Moderate or lower (as an average across the zone) as defined in the *Overall Fuel Hazard Guide for South Australia*.

# Mount Lofty Golf Estate

## Bushfire Management Strategy

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### **BUFFER ZONES**

#### **Definition**

A B-zone is an area maintained to not exceed High overall fuel hazard levels (as an average throughout the zone) aimed at minimising risks by slowing the fire's rate of spread, reducing its intensity, and minimising fire spotting potential over short to medium distances.

#### **Purpose of Bushfire Buffer Zones**

A B-zone may be created beyond an A-zone to provide additional fuel management to reduce the risk of bushfire and is often best utilised to complement an A-zone around a significant asset or settlement. However, it is not intended that B-zones will be created for single dwellings in rural areas.

- A B-zone is designed to:
  - reduce fire spread, intensity, and short-medium distance spotting
  - increase the area of reduced fire behaviour near significant assets
  - provide an area of potential advantage for firefighters to suppress a larger bushfire
  - reduce the impact of bushfire burning a whole large block of native vegetation or several adjacent smaller areas of native vegetation
  - reduce the potential for a bushfire to burn out of vegetated land into surrounding land.

#### **Managing Bushfire Buffer Zones**

B-zones should be maintained to ensure that the overall fuel hazard does not exceed High (as an average throughout the zone).

#### **Specification for Bushfire Buffer Zones**

##### **General design principles of Bushfire Buffer Zones**

- B-zones may complement an A-zone, where necessary or to replace an A-zone where keeping fuel levels below High is sufficient to protect the asset and may result in a lower environmental impact.
- The location of a B-zone should incorporate existing fuel reduced areas such as cleared areas, roads, golf courses, and ovals where available.
- A B-zone should be wide enough that a majority of short-medium distance spotting will not occur beyond the zone. Recommended zone width is:
  - Grassland – up to 20 m
  - Grassland with scattered trees – up to 20 m or 2x tree height (whichever is greater)
  - Heathland/Coastal Scrub/Shrubland – up to 100 m
  - Mallee – up to 1000 m
  - Forest/Woodland (no stringybark trees present) – up to 500 m
  - Forest/Woodland (stringybark trees present) – up to 1000 m
- The width of a B-zone can vary between 20 m and 1000 m depending on the vegetation type, fuel hazard levels, expected fire behaviour, and available control lines. Other factors influencing width may include topography (aspect and slope), the size and extent of native vegetation and environmental assets, known or expected fire paths or fire behaviour, and the level of risk to assets (including human settlement, cultural, or biodiversity).

# Mount Lofty Golf Estate

## Bushfire Management Strategy

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### Bushfire Buffer Zone Vegetation management

Fuel levels within a B-zone are to be managed so that:

- overall fuel hazard does not exceed High (as an average throughout the zone)
- potential spotting and fire intensity in the zone is reduced to provide a suppression advantage to assist in containing bushfires within defined areas
- spotting, fire intensity, and spread in the zone is reduced for safer access for firefighters
- spotting, fire intensity, and spread in the zone is reduced to provide strategic fuel reduction for a landscape, reserve, or large vegetation block
- by implementing B-zones, a range of activities could achieve the required fuel reduction, including but not limited to, prescribed burning, targeted woody weed control, selective thinning, or mechanical treatment. The selection of treatment method will be influenced by the effectiveness of the technique, the environmental impact of the activity, and cost of the operation.

( SITE PLAN WITH FIRE MANAGEMENT ZONES IDENTIFIED TO BE INSERTED )

**FIGURE A1 – FIRE MANAGEMENT ZONES**

# Mount Lofty Golf Estate Bushfire Management Strategy

## APPENDIX B

### FIRE FIGHTING PROVISIONS

#### Fire Water Storage

[ DETAILS TO BE ADDED FOLLOWING DESIGN AND DOCUMENTATION ]

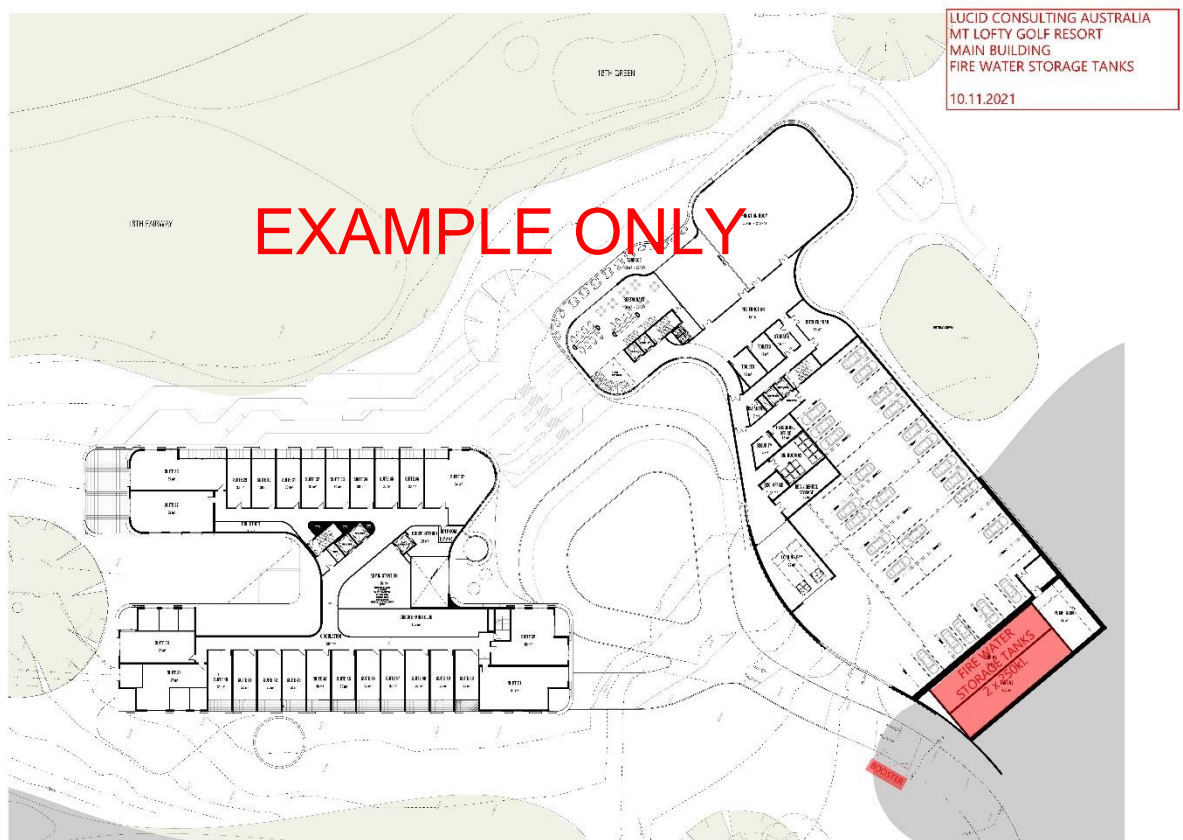
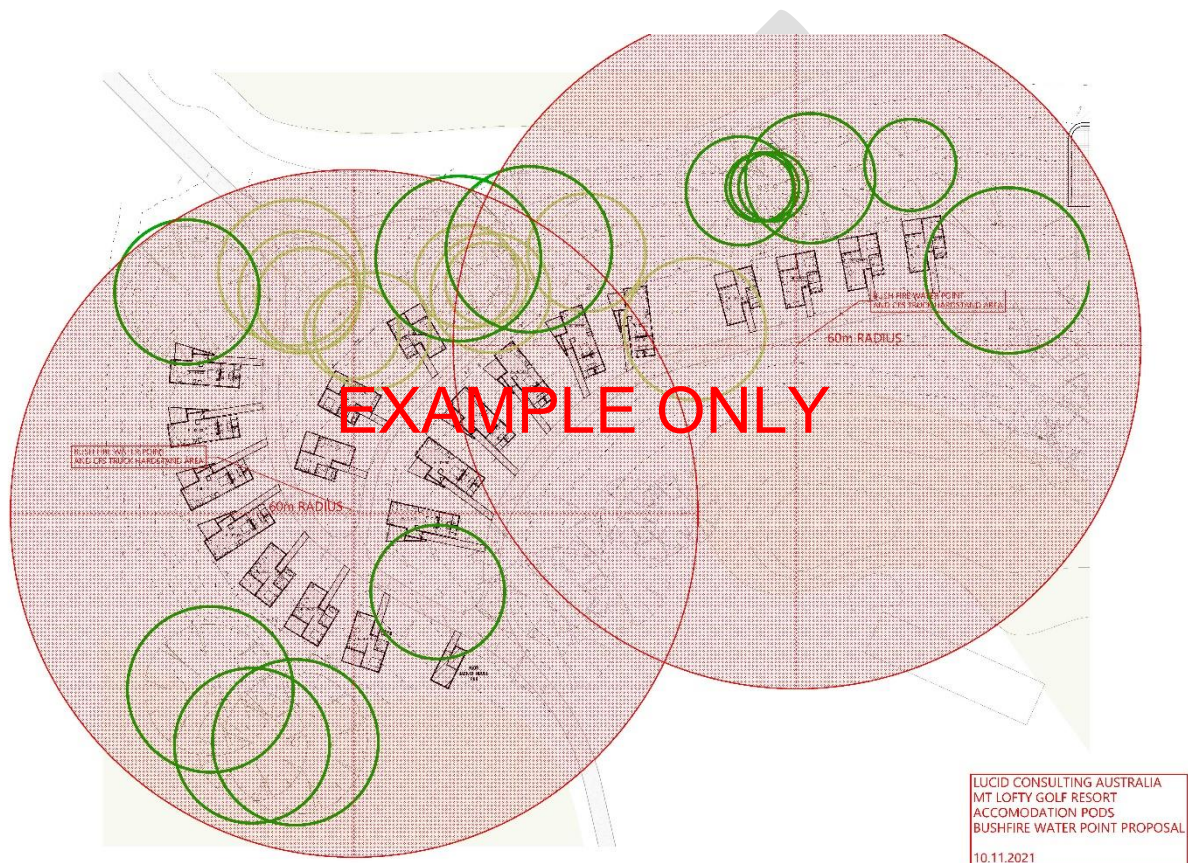


FIGURE B1 – FIRE WATER STORAGE

# Mount Lofty Golf Estate Bushfire Management Strategy

## Fire -fighter External Hosereels

External hosereels are provided at strategic locations in accommodation areas for the prime use of bushfire fighters. Hosereels are located that they can be used for pre-wetting vegetation prior to arrival of any fire front, and for post-fire use in clean-up, extinction of spot fires, and ongoing extinction of flareups in the days following the fire.



**FIGURE B2 – BUSHFIRE FIRE-FIGHTING PROVISIONS AT PODS**

# Mount Lofty Golf Estate Bushfire Management Strategy

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## FIRE EQUIPMENT REGISTER and CHECK LIST

[ DETAILS TO BE ADDED FOLLOWING DESIGN AND DOCUMENTATION, AS WELL AS ADDITIONAL MOBILE FIREFIGHTING EQUIPMENT THAT MAY BE ACQUIRED FOR USE ONCE AN OPERATOR HAS BEEN APPOINTED ]

## FIRE EQUIPMENT TRAINING REGISTER

[ ESTABLISH A REGISTER RELATIVE TO FIRE EQUIPMENT TO RECORD STAFF WHO HAVE UNDERTAKING TRAINING IN THE OPERATION AND USE OF ANY FIRE EQUIPMENT]

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## **Appendix 28**

*Appendix Z of Development Report – Native  
vegetation clearance data report*

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# Native Vegetation Clearance

## Mount Lofty Golf Estate

### Data Report

Clearance under the *Native Vegetation Regulations 2017*

9 May 2023

Prepared by Dr. M Louter and A. Carpenter (NVC Accredited Consultants) – EBS Ecology



# Native Vegetation Clearance Mount Lofty Golf Estate Data Report

9 May 2023

Version 5 – Final (Updated)

Prepared by EBS Ecology for Mount Lofty Estate Pty Ltd

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Cover photograph: VA A1a – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon*.

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# Glossary and abbreviations

ALA	Atlas of Living Australia
BAM	Bushland Assessment Method
BDBSA	Biological Databases of South Australia
Clearance	The killing, destruction, removal or damage of vegetation including pruning.
DA	Development Application
DAWE	Department of Agriculture, Water and the Environment (Commonwealth) (now DCCEEW)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth) (previously DAWE)
DEH	Department for Environment and Heritage
DEW	Department for Environment and Water
EBS Ecology	Environmental and Biodiversity Services Pty Ltd, trading as EBS Ecology
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ha	hectare(s)
IBRA	Interim Bio-regionalisation of Australia
km(s)	kilometre(s)
LSA Act	<i>Landscape South Australia Act 2019</i>
m(s)	metre(s)
MGCP	Mount George Conservation Park
Mount Lofty Estate	Mount Lofty Golf Estate Pty Ltd
MNES	Matters of National Environmental Significance, as defined under the EPBC Act
mm(s)	Millimetre(s)
Native vegetation	A plant or plants of a species indigenous to South Australia (including dead trees >600mm diameter, and planted vegetation protected under the Native Vegetation Act such as SEB's or Heritage Agreements)
NPW Act	<i>National Parks and Wildlife Act 1972</i>
NV Act	<i>Native Vegetation Act 1991</i>
NV Regs	<i>Native Vegetation Regulations 2017</i>
NVC	Native Vegetation Council
PDI Act	<i>Planning, Development and Infrastructure Act 2016</i>
PMST	Protected Matters Search Tool
the Project	The proposed redevelopment of the Stirling Golf Course at the Stirling Golf Club consisting of a redeveloped golf course, hotel, hotel pods and associated infrastructure.

the Project Area	Proposed development at the Stirling Golf Club, 35 Golflinks Road, Stirling South Australia 5152
SA	South Australia / South Australian
Search Area	5 km buffer of the Project Area considered in the desktop assessment database searches.
SEB	Significant Environmental Benefit
ssp.	Subspecies
sp.	Species (singular)
SSCC	SA Seed Conservation Centre
STAM	Scattered Tree Assessment Method
TEC	Threatened Ecological Communities
Trice	Trice – Project & Development Managers
TSSC	Threatened Species Scientific Committee
UBS	Unit Biodiversity Score
VA(s)	Vegetation Association(s)
var.	variety
%	Percent

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## **Attachments**

Attachment 1 – Preliminary Design Plans of the Project

Attachment 2 – Bushland Assessment Method Scoresheet (A1a)

Attachment 3 – Bushland Assessment Method Scoresheet (A1b)

Attachment 4 – Bushland Assessment Method Scoresheet (A1c)

Attachment 5 – Bushland Assessment Method Scoresheet (A2)

Attachment 6 – Bushland Assessment Method Scoresheet (A3)

Attachment 7 – Scattered Tree Assessment Method Scoresheet

Attachment 8 – Scattered Tree Photo File

Attachment 9 – Design Iterations

Attachment 10 – NVC Correspondence 35m Buffer



# 1. Application information

**Table 1. Application details.**

<b>Applicant:</b>	Mount Lofty Estate Pty Ltd		
<b>Key contact:</b>	David Bills, Trice – URPS E: dbills@urps.com.au M: 0404 056 648		
<b>Landowner:</b>	<i>If the applicant is not the landowner, written permission must be provided</i>		
<b>Site Address:</b>	Stirling Golf Club, 35 Golflinks Road, Stirling South Australia 5152		
<b>Local Government Area:</b>	Adelaide Hills Council	<b>Hundred:</b>	Onkaparinga
<b>Title ID:</b>	CT/5891/805	<b>Parcel ID</b>	D59212 A53

**Table 2. Summary of the proposed clearance.**

<b>Purpose of clearance:</b>	Clearance required for the construction of a new hotel, hotel pods and associated infrastructure.
<b>Native Vegetation Regulation:</b>	Regulation 12, Schedule 1; clause 27, <i>Impact assessed development</i>
<b>Description of the vegetation under application:</b>	<p>VA A1a – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> and <i>Eucalyptus obliqua</i> over <i>Acacia melanoxylon</i> and degraded understorey;</p> <p>VA A1b – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> and <i>Eucalyptus obliqua</i> over <i>Acacia melanoxylon</i> and degraded understorey;</p> <p>VA A1c – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> +- <i>Eucalyptus obliqua</i> over exotic understorey;</p> <p>VA A2 – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> +- <i>Eucalyptus obliqua</i> over <i>Pultenaea daphnoides</i>; and</p> <p>VA A3 – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> +- <i>Eucalyptus obliqua</i> +- <i>Acacia Melanoxylon</i> over exotics.</p> <p>A total of 151 scattered trees, including 16 <i>Acacia melanoxylon</i> (Blackwood), 52 <i>Eucalyptus obliqua</i> (Messmate Stringybark), one <i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i> (Rough-bark Manna Gum), 76 State Rare <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and six <i>Exocarpos cupressiformis</i> (Native Cherry) from poor to excellent in health.</p>
<b>Total proposed clearance – area (ha) and/or number of trees:</b>	<p>A total of 1.716 ha of native vegetation is proposed for clearance, including:</p> <p>0.261 ha of VA A1a – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> and <i>Eucalyptus obliqua</i> over <i>Acacia melanoxylon</i> and degraded understorey.</p> <p>1.307 ha of VA A1b – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> and <i>Eucalyptus obliqua</i> over <i>Acacia melanoxylon</i> and degraded understorey;</p> <p>0.048 ha of VA A1c – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> +- <i>Eucalyptus obliqua</i> over exotic understorey;</p>

0.013 ha of VA A2 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over *Pultenaea daphnoides*.

0.087 ha of VA A3 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* +- *Acacia Melanoxylon* over exotics

A total of 106 scattered trees are proposed for removal within the Project Area, which includes 10 *Acacia melanoxylon* (Blackwood), 44 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), 48 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and three *Exocarpos cupressiformis* (Native Cherry) from poor to excellent in health.

**Level of clearance:** Level 4

**Overlay (Planning and Design Code):** Native Vegetation Overlay and State Significant Native Vegetation Overlay

**Map of proposed clearance area:**



**Mitigation Hierarchy:** **Avoidance**  
 The area in which the 18 pods are proposed to be constructed will impact on several scattered trees and an extensive amount of vegetation association A1b.

	<p>scattered trees are planned for retention in this area and will be avoided. These trees will still be accounted for as a result of applicable CFS Buffers (see Section 5).</p> <p>The proposed new vehicle access in the southern part of the Project Area utilises an existing partially cleared, albeit unofficial walking entrance and avoids better quality vegetation adjacent to this area. The proposed area for the carpark adjacent to the Scent Factory redevelopment also avoids direct impacts to vegetation associations A1b and A3 (see Figure 4) See <a href="#">Section 4.1.5</a> for photos of the areas proposed for the new vehicle access and car park.</p> <p><b>Minimization</b></p> <p>The proposed footprint of the main hotel building was selected based on the existing site footprint, minimising additional impact to surrounding vegetation despite the proposed footprint being larger.</p> <p>Efforts to minimise the extent, duration and intensity of impacts on the clearance of native vegetation around the pods has been considered at multiple stages of the planning process. A total of 13 iterations (as of 30/08/2022) have been documented which include a reduction in the number of pods, and relocation of where these pods are proposed to be located. Initial designs included plans for up to 50 pods to be constructed in the northern extent of the Project Area requiring clearance of a substantial amount of native vegetation. Further detail on these iterations is provided in Attachment 9.</p> <p>Where applicable, reasonable and feasible measures to prevent pollution of waterways and drainage lines in the area downstream of the proposed works during and post construction will be implemented.</p> <p>Installation of exclusion fencing and signage to delineate the limits of clearing and vegetation to be retained will be installed in order to minimise disturbance in the Project Area.</p> <p>Furthermore, clearing of vegetation, including the clearing of native vegetation and fauna habitat, will be minimised to the greatest extent practicable through the selection of plant (machinery) that will avoid impact on retained trees.</p> <p><b>Rehabilitation or restoration</b></p> <p>The rehabilitation or restoration of some areas that are impacted by the clearance of native vegetation will be achieved through revegetation, with a preference for species local to the Adelaide Hills. Some areas will not be able to be rehabilitated due to CFS constraints and the need to maintain specific bushfire attack level ratings.</p>
<b>SEB Offset proposal</b>	Payment of <b>\$615,436.80</b> which includes a <b>\$32,084.39</b> administration fee into the NV fund.

# 2. Purpose of clearance

## 2.1. Description

Trice – Project & Development Managers (Trice) on behalf of Mount Lofty Estate Pty Ltd (Mount Lofty Estate) have engaged EBS Ecology (EBS) to undertake a native vegetation clearance assessment for the clearance associated with the proposed redevelopment of the Stirling Golf Course at the Stirling Golf Club, consisting of a redeveloped golf course, hotel, hotel pods and associated infrastructure (The Project), located in Stirling, South Australia (SA).

### Objectives

The objectives of the native vegetation assessment were to:

- Undertake a desktop assessment of the likelihood of occurrence and status of threatened flora and fauna protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and State *National Parks and Wildlife Act 1972* (NPW Act);
- Assess native vegetation within the Project Area for clearance using the Native Vegetation Council (NVC) endorsed Bushland Assessment Method (BAM) and Scattered Tree Assessment Method (STAM); and
- Calculate the Significant Environmental Benefit (SEB) offset requirements based on the impact footprint.

## 2.2. Background

### Current and surrounding land use

The Project Area is located at the Stirling Golf Club at 35 Golflinks Road, Stirling, which is located approximately 2.5 kilometres (km) northwest of Bridgewater and 15 km south east of Adelaide (Figure 1). The area is adjacent to Mount George Conservation Park (MGCP). Cox Creek runs through the Project Area from the adjacent MGCP. There are also three artificially constructed lakes or dams to the north of the Stirling Golf Club clubhouse and in the northern section of the Project Area (see Figure 1 pg. 11).

Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. Five vegetation associations (VAs) were recorded within the Project Area. The understorey in these associations was heavily degraded and introduced flora species such as *Fumaria capreolata* (White-flower Fumitory), *Iris* sp. (Iris) and *Rubus fruticosus aggregate* (Blackberry) were dominant in areas.

A total of 151 native scattered trees were also recorded within the Project Area. All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species.

### Administrative boundaries

This Project is located within the Adelaide Hills Council Local Government Area and the Hills and Fleurieu Landscape Management Region (DEW 2022a).

## **Bioregions**

The Interim Biogeographical Regionalisation of Australia (IBRA) identifies geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The Project Area occurs in the Mount Lofty Ranges subregion of the Flinders Lofty Block Bioregion. At a local scale, the IBRA subregions are further categorised by Environmental Associations and the Project Area falls within the Uraidla Environmental Association.

Approximately 15% (46,342 ha) of the Mount Lofty Ranges IBRA Subregion and approximately 26% (3,674 ha) of the Uraidla IBRA Environmental Association is mapped as remnant vegetation. Of this, 27% (12,706 ha) and 20% (749 ha) is formerly conserved and protected, respectively (DCCEE 2022a).

## 2.3. General location map



Figure 1. The Project Area at the Stirling Golf Club.

## 2.4. Details of the proposal

A clearance report is required for the proposed redevelopment of the Stirling Golf Course at the Stirling Golf Club.

The proposed Mount Lofty Golf Estate's new development is summarised as follows:

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m<sup>2</sup> function room.
  - A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace.
  - 186m<sup>2</sup> sports bar.
  - A 189m<sup>2</sup> gallery and cafe.
  - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – 'Pods'
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
  - Extension to the Perfumery to include a covered outdoor dining area.
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a "Scent Factory".
  - Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
  - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.

- A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
- Designated waste storage areas.
- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

The proponents additionally intend to rebrand the development as the Mount Lofty Golf Estate which was the original name of the course when it opened in 1925. The aim of the development will be to improve access to tourists and capitalise on the growing tourism market.

The development has been declared a major project by the Minister for Planning and Local Government (the South Australian Government Gazette 2020, p. 5848) and will be assessed by a state-run process. At the time of preparing this report, the development design has not been finalised and layout will be guided by the reports of numerous specialists. Preliminary design drawings of the Project Area (as provided to EBS on 07/03/2023) are provided in Attachment 1.

## 2.5. Approvals required or obtained

- *Environment Protection and Biodiversity Conservation Act 1999* – Not required.
- *Native Vegetation Act 1991* – this data report.
- *National Parks and Wildlife Act 1972* – EBS has the required flora collection permit (K25613-22).
- *Landscape South Australia Act 2019* – A Water Affecting Activity Permit is not required for this Project; A permit to transport declared weeds on a public road may be required for this Project.
- *Planning, Development and Infrastructure Act 2016* – Approval is required for this Project.
- *Aboriginal Heritage Act 1988* – Approval will be required if any sites, objects or remains are uncovered during the works.

## 2.6. Native Vegetation Regulation

The Project is in accordance with Division 5 of the *Native Vegetation Regulations 2017*, which allows for the clearance of native vegetation in relation to specific activities as set out in Schedule 1, Parts 4, 5 or 6 of the Regulations. The Project is considered to be permitted under the following regulation:

### **Regulation 12(27) — Impact assessed development**

- (1) Clearance of vegetation that is incidental to a proposed development to which section 115 of the *Planning, Development and Infrastructure Act 2016* applies, provided that—



- (a) an environmental impact statement and an Assessment Report relating to the development have been prepared under the *Planning, Development and Infrastructure Act 2016*; and
- (b) the Minister responsible for the administration of the *Planning, Development and Infrastructure Act 2016* referred the environmental impact statement to the Council for comment and report and—
  - (i) the Council provided comments that were included (wholly or substantially) in the relevant Assessment Report; or
  - (ii) the Council failed to provide comments within 30 business days after receiving the Minister's invitation for comment and report; and
- (c) the Minister has granted a development authorisation for the proposed development under section 115 of the *Planning, Development and Infrastructure Act 2016*.

## **2.7. Development Application information**

The Project falls within the Recreation – Rec Zone and both the Native Vegetation and State Significant Native Vegetation Overlays apply.

# 3. Method

## 3.1. Desktop assessment

A desktop assessment was undertaken to determine the potential for any threatened fauna species, and Threatened Ecological Communities (TECs) (both Commonwealth and State listed) to occur within the Project Area. This was achieved by undertaking database searches using a 5 km buffer of the Project Area (Search Area).

### 3.1.1. PMST report

A Protected Matters Search Tool (PMST) report was generated on 30/03/2023 to identify nationally threatened flora and fauna, migratory fauna and TECs under the EPBC Act relevant to the Project Area (DCCEEW 2023). Only species and TECs identified in the PMST report that are likely or known to occur within the Search Area were assessed for their likelihood of occurrence within the Project Area. Marine species were removed from this list as the vegetation under assessment is terrestrial.

### 3.1.2. BDBSA data extract

A Biological Databases of South Australia (BDBSA) search was obtained from the Department for Environment and Water (DEW) to identify flora and fauna species that have been recorded within 5 km of the Project Area (data extracted 16/08/2022; DEW 2022b, Recordset number: DEWNRBDBSA220816-1). The BDBSA is comprised of an integrated collection of species records from the South Australian Museum, conservation organisations, private consultancies, Birds SA, Birdlife Australia and the Australasian Wader Study Group, which meet DEW's standards for data quality, integrity and maintenance. Only species with records since 1995 and a spatial reliability of less than 1 km were assessed for their likelihood of occurrence.

### 3.1.3. Likelihood of occurrence

The criteria for the likelihood of occurrence of threatened species within the Project Area are described in Table 3.

**Table 3. Criteria for the likelihood of occurrence of threatened species within the Project Area.**

Likelihood	Criteria
Highly Likely/Known	Recorded in the last 10 years, the species does not have highly specific niche requirements, the habitat is present and falls within the known range of the species distribution or; The species was recorded as part of field surveys.
Likely	Recorded within the previous 20 years, the area falls within the known distribution of the species and the area provides habitat or feeding resources for the species.
Possible	Recorded within the previous 20 years, the area falls inside the known distribution of the species, but the area provides limited habitat or feeding resources for the species. Recorded within 20 -40 years, survey effort is considered adequate, habitat and feeding resources present, and species of similar habitat needs have been recorded in the area.
Unlikely	Recorded within the previous 20 years, but the area provides no habitat or feeding resources for the species, including perching, roosting or nesting opportunities, corridor for movement or shelter. Recorded within 20 -40 years; however, suitable habitat does not occur, and species of similar habitat requirements have not been recorded in the area. No records despite adequate survey effort.

## 3.2. Field assessment

The initial field assessment was undertaken by NVC Accredited Consultant J. Skewes and N. Piscioneri on 26 August 2022. An additional field assessment was undertaken on 30 September 2022. Both field assessments were undertaken on foot and were in accordance with the Bushland Assessment Method (BAM) (NVC 2020a) and Scattered Tree Assessment Method (STAM) (NVC, 2020b). Each tree was identified to species, photographed, measured at 1 m for diameter, height, dieback and the number and size of hollows were recorded. Species lists of both native and exotic understorey species were compiled.

### 3.2.1. Bushland Assessment Method

The BAM is derived from the Nature Conservation Society of South Australia's Bushland Condition Monitoring methodology (Croft *et al.* 2008). The BAM used to assess areas of native vegetation requiring clearance and calculate the SEB requirements.

Details of site selection/stratification and assessment protocols, and the biodiversity value components assessed and the factors that influence these components are outlined in the *Bushland Assessment Manual* (NVC 2020a).

The Conservation Significance Scores were calculated from direct observations of flora and direct and historical observations of fauna species of conservation significance. All fauna identified as known to occur in the PMST, and fauna with BDBSA records since 1995 and with a spatial reliability of less than 1 km, within 5 km of the Project Area, were included in the BAM scoresheets. Species determined as unlikely to occur within the Project Area will be removed by the Native Vegetation Branch if the finding is supported. Marine and/or wetland species were omitted from the scoresheets given the Project Area is terrestrial.

### 3.2.2. Scattered Tree Assessment Method

The STAM is derived from the *Scattered Tree Clearance Assessment in South Australia: Streamlining, Guidelines for Assessment and Rural Industry Extension* report (Cutten and Hodder 2002). The STAM is suitable for assessing scattered trees in the following instances:

- Individual scattered trees (i.e. canopy does not overlap). The spatial distribution of trees may vary from approaching what would be considered their original distribution (pre-European) through to single isolated trees in the middle of a paddock; or
- Dead trees (when a dead tree is considered native vegetation); or
- Clumps of trees (contiguous overlapping canopies) if the clump is small (approximately <0.1 ha); and
- For both scattered trees and clumps:
  - The ground layer comprises wholly or largely of introduced species;
  - Some scattered colonising native species may be present, but represent <5% of the ground cover; and
  - The area around the trees consists of introduced pasture or crops.

Details of the scattered tree Point Scoring System are outlined in the *Scattered Tree Assessment Manual* (NVC 2020b).

The numbers of uncommon and threatened scattered tree using fauna species entered into the Scattered Tree Scoresheet were calculated by cross-referring the BDBSA data extract (see [Section 3.1.2](#)) and the lists of scattered tree using fauna in the *Scattered Tree Assessment Manual* (NVC 2020b). The resource use of each species identified was considered when determining each tree's suitability for threatened fauna species (e.g. species that only use hollows in scattered trees were only assigned to scattered trees containing hollows).

### **3.2.3. Field survey**

Fauna surveys were conducted in conjunction with the flora assessments along the site. All native and exotic fauna species opportunistically encountered (directly observed, or tracks, scats, burrows, nests and other signs of presence) during the native vegetation assessment were recorded. Potential fauna refuge sites, such as hollows, were noted as an indication of availability of suitable habitat. Particular attention was paid to identifying habitat for threatened species. For each opportunistic fauna observation, the species, number of individuals, GPS location, detection methodology (sight, sound or sign) and habitat were recorded.

## **3.3. Limitations**

### **3.3.1. Desktop assessment**

The desktop assessment was based on existing datasets and references from a range of sources. EBS has not attempted to verify the accuracy of any such information. The findings and conclusions expressed by EBS are based solely upon information in existence at the time of the assessment.

Flora and fauna records were sourced from the PMST and BDBSA. The BDBSA only includes verified flora and fauna records submitted to DEW or partner organisations. It is recognised that knowledge is poorly captured, and it is possible that significant species occur that are not reflected by database records. Although much of the BDBSA data has been through a variety of validation processes, the lists may contain errors and should be used with caution. DEW give no warranty that the data is accurate or fit for any particular purpose of the user or any person to whom the user discloses the information.

The EPBC Act protected matters report and BDBSA flora and fauna records were limited to a 5 km buffer around the Project Area. Fauna species, in particular birds can traverse distances in excess of 20 km. It is also acknowledged that the presence of species may not be adequately represented by database records. Hence the EPBC and BDBSA results may not highlight all potential threatened flora and fauna species that may occur in the area, within a 5 km radius. A precautionary approach has therefore been adopted, with reference to existing EPBC and BDBSA records and native vegetation cover. The combination of database records and background research have provided a solid baseline foundation for determining the flora and fauna that are likely to, or are known to, occur within the Project Area.

### **3.3.2. Flora**

The ecological assessment was conducted just before spring. Threatened orchid species and numerous forbs, herbs and grasses are only just beginning to flower at this time of year, and therefore it is possible that species were present that were undetectable at the time of the field survey.

# 4. Assessment outcomes

## 4.1. Vegetation assessment

### 4.1.1. General description of the vegetation, the site and matters of significance

Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. The understorey in areas of native vegetation not directly associated with the golf course were heavily degraded and introduced flora species such as *Fumaria capreolata* (White-flower Fumitory), *Iris* sp. (Iris) and *Rubus fruticosus aggregate* (Blackberry) were dominant in these areas. MGCP is directly adjacent (to the east and southeast) of the Project Area (see Figure 1, pg. 14) and supports a large assemblage of both nationally and State listed flora and fauna (DEH 2006). Five VAs were recorded within the Project Area:

- VA A1a – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxyton* and degraded understorey;
- VA A1b – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxyton* and degraded understorey;
- VA A1c – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over exotic understorey;
- VA A2 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over *Pultenaea daphnoides*; and
- VA A3 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* +- *Acacia Melanoxyton* over exotics.

A map of the VAs within the Project Area is provided in Figure 2 (on page 23). Any fairways and greens associated with the golf course are classified as exotic vegetation but are not mapped.

A total of 151 scattered trees, including 16 *Acacia melanoxyton* (Blackwood), 52 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), 76 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and six *Exocarpos cupressiformis* (Native Cherry) were recorded within the Project Area.

A map of all scattered trees recorded in the Project Area is provided in Figure 3 (on page 24). All trees were categorised based on their Unit Biodiversity Score (UBS). A tree with a UBS of less than 4 was categorised as low in quality and should be retained as much as possible but may be removed. A tree with a UBS between 4 and 7 was categorised as moderate in quality and should be retained where possible and a tree with a UBS of greater than 7 was categorised as high in quality and should be avoided. All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species.

No flora species listed under the EPBC Act were recorded within the Project Area.

One flora species listed under the NPW Act as Rare was recorded in the Project Area:

- *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum).

This species was present in large numbers throughout the Project Area in remnant patches of native vegetation and as scattered trees.

A total of 89 flora species, including 41 introduced species were recorded within the Project Area. Timing of the survey likely influenced this result, with spring annual forbs and grasses only just beginning to flower or appear. Flora species recorded during the survey are provided in [Appendix 1](#).

No fauna species listed under the EPBC Act were recorded within the Project Area.

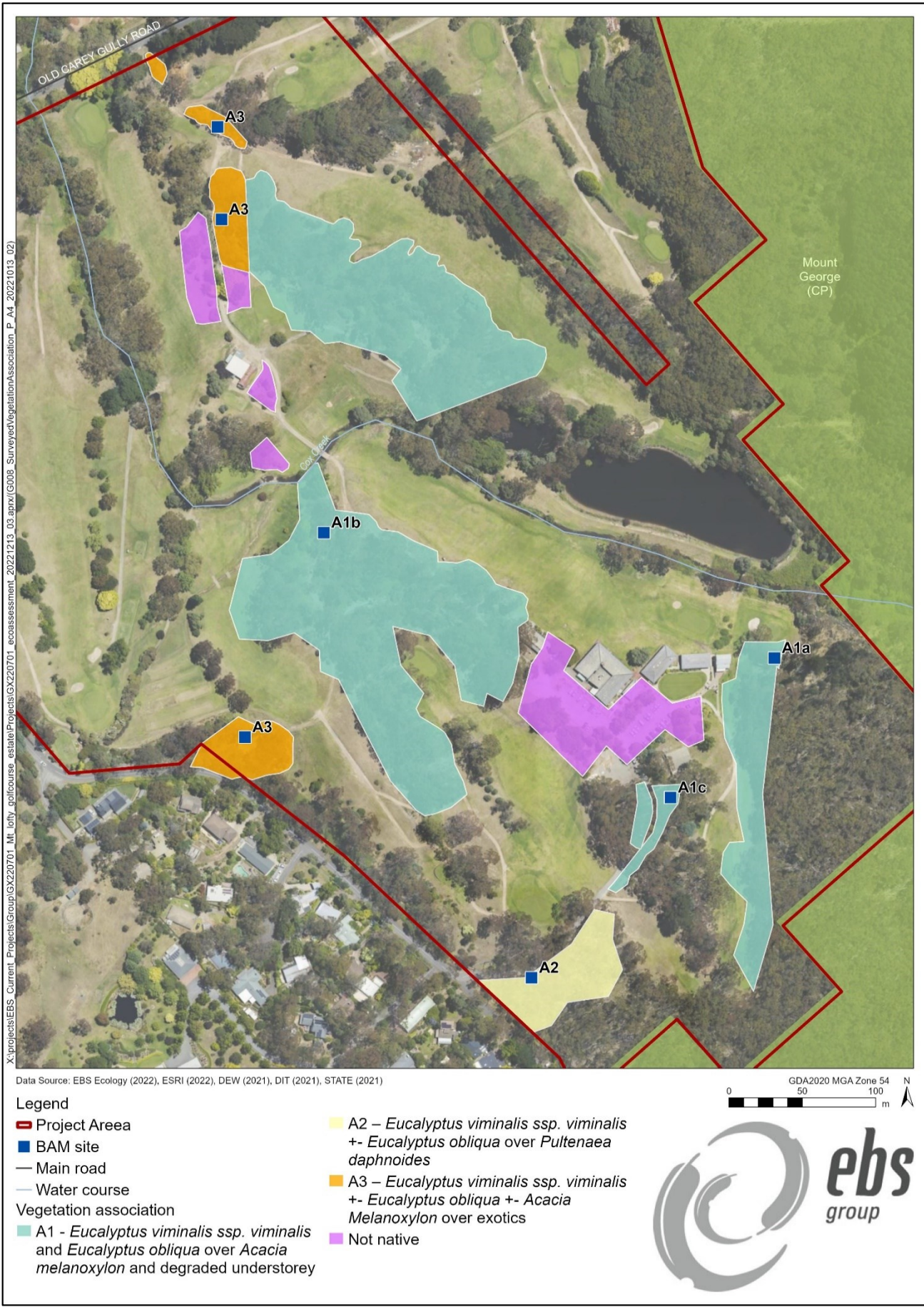
Two fauna species listed under the NPW Act were recorded in the Project Area:

- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable.

The scat of the Common Brushtail Possum was observed in VA A1a directly adjacent to the main building of the Golf Club.

Four Yellow-tailed Black Cockatoo were observed flying over the Project Area and later perched in native vegetation within VA A1a.

A total of 26 fauna species were recorded within the Project Area, 23 were birds and three were mammals. Two of these species are introduced fauna. Fauna species observed during the survey are provided in [Appendix 2](#).



**Figure 2. VAs and non-native vegetation recorded within the Project Area. Any fairways and greens associated with the golf course are classified as exotic vegetation but are not mapped.**



Figure 3. Scattered trees recorded within the Project Area, categorised according to Unit Biodiversity Score (UBS).




#### 4.1.2. Details of the vegetation associations proposed to be impacted

All five VAs within the Project Area are proposed to be impacted:

- VA A1a – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey (Table 4);
- VA A1b – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey (Table 5);
- VA A1c – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over exotic understorey (Table 6);
- VA A2 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over *Pultenaea daphnoides* (Table 7); and
- VA A3 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* +- *Acacia Melanoxylon* over exotics (Table 8).

The five impacted VAs in the Project Area are detailed in Table 4 to Table 8.

Table 4. Summary of VA A1a.

<b>Vegetation Association</b>	A1a – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> and <i>Eucalyptus obliqua</i> over <i>Acacia melanoxylon</i>
	<p>Photo direction and location: south (easting: 294303, northing: 6125455)</p>
<b>General description</b>	<p>Woodland dominated by an overstorey of <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and <i>Eucalyptus obliqua</i> (Messmate Stringybark). Mid storey species include <i>Acacia melanoxylon</i> (Blackwood) and <i>Leptospermum continentale</i> (prickly Tea-tree). The ground cover was dominated by <i>Acrotriche serrulata</i> (Cushion Ground-berry) and <i>Lepidosperma semiteres</i> (Wire Rapier-sedge). Vegetation was in very good condition with some weed incursions particularly on the edge of the VA closest to the golf course fairway. Weed species that were dominant include <i>Iris</i> sp. (Iris), <i>Rubus fruticosus aggregate</i> (Blackberry) and <i>Cytisus scoparius</i> (English Broom).</p>
<b>Threatened species or community</b>	<p>No EPBC Act flora species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat.</p> <p>The following flora species listed under the NPW Act were determined as likely to occur in the Project Area:</p> <ul style="list-style-type: none"> <li>• <i>Acacia gunnii</i> (Ploughshare Wattle) – State Rare;</li> <li>• <i>Deyeuxia densa</i> (Heath Bent-grass) – State Rare;</li> <li>• <i>Deyeuxia minor</i> (Small Bent-grass) – State Vulnerable;</li> <li>• <i>Dianella longifolia</i> var. <i>grandis</i> (Pale Flax-lily) – State Rare;</li> <li>• <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) – State Rare and observed within the Project Area;</li> <li>• <i>Gastrodia sesamoides</i> (Potato Orchid) – State Rare;</li> </ul>

- *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare.

An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat (see [Appendix 4](#)).


A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, suitable habitat and recent records:

- Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare;
- Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare;
- Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered;
- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area;
- Elegant Parrot (*Neophema elegans elegans*) – State Rare;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and
- Jacky Winter (*Microeca fascinans fascinans*) – State Rare;
- Little Eagle (*Hieraetus morphnoides*) – State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Scarlet Robin (*Petroica boodang boodang*) – State Rare;
- Southern Brown Bandicoot (*Isodon obesulus obesulus*) – nationally Endangered and State Vulnerable.
- Square-tailed Kite (*Lophoictinia isura*) – State Endangered;
- White-winged Chough (*Corcorax melanorhamphos*) – State Rare;
- Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area.

An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records (see [Appendix 6](#) and [Appendix 7](#)).

<b>Landscape context score</b>	1.17	<b>Vegetation Condition Score</b>	14.10	<b>Conservation significance score</b>	1.10
<b>Unit biodiversity Score</b>	18.15	<b>Area (ha)</b>	0.261	<b>Total biodiversity Score</b>	4.74

Table 5. Summary of VA A1b.

<p><b>Vegetation Association</b></p>	<p>A1b – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> and <i>Eucalyptus obliqua</i> over <i>Acacia melanoxylon</i> and degraded understorey.</p>
	
<p>Photo direction and location: west (easting: 293995, northing: 6125540)</p>	
<p><b>General description</b></p>	<p>Woodland dominated by an overstorey of <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and <i>Eucalyptus obliqua</i> (Messmate Stringybark). Mid storey species include <i>Acacia melanoxylon</i> (Blackwood) and <i>Pultenaea daphnoides</i> (Large-leaf Bush Pea). The ground cover was dominated <i>Pteridium esculentum</i> ssp. <i>esculentum</i> (Bracken Fern) and introduced flora species. Vegetation was in poor to moderate condition with substantial weed incursions. Weed species that were dominant include <i>Iris</i> sp. (Iris) <i>Fumaria capreolata</i> (White-flower fumitory) and <i>Rubus fruticosus aggregate</i> (Blackberry) amongst others.</p>
<p><b>Threatened species or community</b></p>	<p>No EPBC Act flora species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat.</p> <p>The following flora species listed under the NPW Act were determined as likely to occur in the Project Area:</p> <ul style="list-style-type: none"> <li>• <i>Acacia gunnii</i> (Ploughshare Wattle) – State Rare;</li> <li>• <i>Deyeuxia densa</i> (Heath Bent-grass) – State Rare;</li> <li>• <i>Deyeuxia minor</i> (Small Bent-grass) – State Vulnerable;</li> <li>• <i>Dianella longifolia</i> var. <i>grandis</i> (Pale Flax-lily) – State Rare;</li> <li>• <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) – State Rare and observed within the Project Area;</li> <li>• <i>Gastrodia sesamoides</i> (Potato Orchid) – State Rare;</li> </ul>

- *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare.

An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat (see [Appendix 4](#)).


A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, suitable habitat and recent records:

- Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare;
- Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare;
- Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered;
- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area;
- Elegant Parrot (*Neophema elegans elegans*) – State Rare;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and
- Jacky Winter (*Microeca fascinans fascinans*) – State Rare;
- Little Eagle (*Hieraetus morphnoides*) – State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Scarlet Robin (*Petroica boodang boodang*) – State Rare;
- Southern Brown Bandicoot (*Isodon obesulus obesulus*) – nationally Endangered and State Vulnerable.
- Square-tailed Kite (*Lophoictinia isura*) – State Endangered;
- White-winged Chough (*Corcorax melanorhamphos*) – State Rare;
- Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area.

An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records (see [Appendix 6](#) and [Appendix 7](#)).

<b>Landscape context score</b>	1.15	<b>Vegetation Condition Score</b>	13.92	<b>Conservation significance score</b>	1.10
<b>Unit biodiversity Score</b>	17.61	<b>Area (ha)</b>	1.307	<b>Total biodiversity Score</b>	23.01

Table 6. Summary of VA A1c.

<b>Vegetation Association</b>	A1c – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> +- <i>Eucalyptus obliqua</i> over exotic understorey
	
<p>Photo direction and location: south (easting: 294232, northing: 6125361)</p>	
<b>General description</b>	<p>Woodland dominated by an overstorey of <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and <i>Eucalyptus obliqua</i> (Messmate Stringybark). Mid storey species include <i>Acacia melanoxylon</i> (Blackwood) and <i>Pultenaea daphnoides</i> (Large-leaf Bush Pea). Vegetation was in poor condition with several weed incursions particularly on the edge of the VA closest to the main driveway. Weed species that were dominant include <i>Vinca major</i> (Blue Periwinkle), <i>Allium triquetrum</i> (Three-cornered Garlic) and <i>Ulex europaeus</i> (Gorse) amongst others.</p>
<b>Threatened species or community</b>	<p>No EPBC Act flora species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat.</p> <p>The following flora species listed under the NPW Act were determined as likely to occur in the Project Area:</p> <ul style="list-style-type: none"> <li>• <i>Acacia gunnii</i> (Ploughshare Wattle) – State Rare;</li> <li>• <i>Deyeuxia densa</i> (Heath Bent-grass) – State Rare;</li> <li>• <i>Deyeuxia minor</i> (Small Bent-grass) – State Vulnerable;</li> <li>• <i>Dianella longifolia</i> var. <i>grandis</i> (Pale Flax-lily) – State Rare;</li> <li>• <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) – State Rare and observed within the Project Area;</li> <li>• <i>Gastrodia sesamoides</i> (Potato Orchid) – State Rare;</li> </ul>

- *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare.

An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat (see [Appendix 4](#)).


A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, suitable habitat and recent records:

- Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare;
- Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare;
- Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered;
- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area;
- Elegant Parrot (*Neophema elegans elegans*) – State Rare;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and
- Jacky Winter (*Microeca fascinans fascinans*) – State Rare;
- Little Eagle (*Hieraetus morphnoides*) – State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Scarlet Robin (*Petroica boodang boodang*) – State Rare;
- Southern Brown Bandicoot (*Isodon obesulus obesulus*) – nationally Endangered and State Vulnerable.
- Square-tailed Kite (*Lophoictinia isura*) – State Endangered;
- White-winged Chough (*Corcorax melanorhamphos*) – State Rare;
- Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area.

An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records (see [Appendix 6](#) and [Appendix 7](#)).

<b>Landscape context score</b>	1.18	<b>Vegetation Condition Score</b>	11.39	<b>Conservation significance score</b>	1.10
<b>Unit biodiversity Score</b>	14.79	<b>Area (ha)</b>	0.048	<b>Total biodiversity Score</b>	0.71

Table 7. Summary of VA A2.

<b>Vegetation Association</b>	A2 – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> +- <i>Eucalyptus obliqua</i> over <i>Pultenaea daphnoides</i>
	
	<p>Photo direction and location: southwest (easting: 294138, northing: 6125237)</p>
<b>General description</b>	<p>Woodland dominated by an overstorey of <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and <i>Eucalyptus obliqua</i> (Messmate Stringybark). Mid storey species include <i>Acacia melanoxylon</i> (Blackwood) and <i>Pultenaea daphnoides</i> (Large-leaf Bush Pea). The ground cover was dominated by <i>Ixodia achillaeoides</i> ssp. <i>alata</i> (Hills Daisy) and <i>Lepidosperma semiteres</i> (Wire Rapier-sedge). Vegetation was in very good condition with some weed incursions particularly on the edge of the VA closest to the main driveway. Weed species that were present include <i>Allium triquetrum</i> (Three-cornered Garlic), <i>Pittosporum undulatum</i> (Sweet Pittosporum) and <i>Cytisus scoparius</i> (English Broom).</p>
<b>Threatened species or community</b>	<p>No EPBC Act flora species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat.</p> <p>The following flora species listed under the NPW Act were determined as likely to occur in the Project Area:</p> <ul style="list-style-type: none"> <li>• <i>Acacia gunnii</i> (Ploughshare Wattle) – State Rare;</li> <li>• <i>Deyeuxia densa</i> (Heath Bent-grass) – State Rare;</li> <li>• <i>Deyeuxia minor</i> (Small Bent-grass) – State Vulnerable;</li> <li>• <i>Dianella longifolia</i> var. <i>grandis</i> (Pale Flax-lily) – State Rare;</li> <li>• <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) – State Rare and observed within the Project Area;</li> <li>• <i>Gastrodia sesamoides</i> (Potato Orchid) – State Rare;</li> <li>• <i>Rytidosperma tenuius</i> (Short-awn Wallaby-grass) – State Rare.</li> </ul>



An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat (see [Appendix 4](#)).


A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, suitable habitat and recent records:

- Bassian Thrush (*Zoothra lunulata halmaturina*) – nationally Endangered and State Rare;
- Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare;
- Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered;
- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area;
- Elegant Parrot (*Neophema elegans elegans*) – State Rare;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and
- Jacky Winter (*Microeca fascinans fascinans*) – State Rare;
- Little Eagle (*Hieraetus morphnoides*) – State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Scarlet Robin (*Petroica boodang boodang*) – State Rare;
- Southern Brown Bandicoot (*Isodon obesulus obesulus*) – nationally Endangered and State Vulnerable.
- Square-tailed Kite (*Lophoictinia isura*) – State Endangered;
- White-winged Chough (*Corcorax melanorhamphos*) – State Rare;
- Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area.

An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records (see [Appendix 6](#) and [Appendix 7](#)).

<b>Landscape context score</b>	1.18	<b>Vegetation Condition Score</b>	25.73	<b>Conservation significance score</b>	1.10
<b>Unit biodiversity Score</b>	33.39	<b>Area (ha)</b>	0.013	<b>Total biodiversity Score</b>	0.44

**Table 8. Summary of VA A3.**

<p><b>Vegetation Association</b></p>	<p>A3 – <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> +- <i>Eucalyptus obliqua</i> +- <i>Acacia Melanoxylon</i> over exotics.</p>
	
<p>Photo direction and location: southwest (easting: 293942, northing: 6125402)</p>	
<p><b>General description</b></p>	<p>Woodland dominated by an overstorey of <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and <i>Eucalyptus obliqua</i> (Messmate Stringybark). Mid storey species include <i>Acacia melanoxylon</i> (Blackwood) and <i>Pteridium esculentum</i> ssp. <i>esculentum</i> (Bracken Fern). Vegetation was in very poor condition with multiple introduced species recorded. Weed species that were dominant include but are not limited to <i>Allium triquetrum</i> (Three-cornered Garlic), <i>Ulex europaeus</i> (Gorse), <i>Rubus fruticosus aggregate</i> (Blackberry) and <i>Watsonia</i> sp. (Watsonia).</p>
<p><b>Threatened species or community</b></p>	<p>No EPBC Act flora species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat.</p> <p>The following flora species listed under the NPW Act were determined as likely to occur in the Project Area:</p> <ul style="list-style-type: none"> <li>• <i>Acacia gunnii</i> (Ploughshare Wattle) – State Rare;</li> <li>• <i>Deyeuxia densa</i> (Heath Bent-grass) – State Rare;</li> <li>• <i>Deyeuxia minor</i> (Small Bent-grass) – State Vulnerable;</li> <li>• <i>Dianella longifolia</i> var. <i>grandis</i> (Pale Flax-lily) – State Rare;</li> <li>• <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) – State Rare and observed within the Project Area;</li> <li>• <i>Gastrodia sesamoides</i> (Potato Orchid) – State Rare;</li> <li>• <i>Rytidosperma tenuius</i> (Short-awn Wallaby-grass) – State Rare.</li> </ul>

An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat (see [Appendix 4](#)).

A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, suitable habitat and recent records:

- Bassian Thrush (*Zoothra lunulata halmaturina*) – nationally Endangered and State Rare;
- Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare;
- Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered;
- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area;
- Elegant Parrot (*Neophema elegans elegans*) – State Rare;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and
- Jacky Winter (*Microeca fascinans fascinans*) – State Rare;
- Little Eagle (*Hieraetus morphnoides*) – State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Scarlet Robin (*Petroica boodang boodang*) – State Rare;
- Southern Brown Bandicoot (*Isodon obesulus obesulus*) – nationally Endangered and State Vulnerable.
- Square-tailed Kite (*Lophoictinia isura*) – State Endangered;
- White-winged Chough (*Corcorax melanorhamphos*) – State Rare;
- Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area.

An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records (see [Appendix 6](#) and [Appendix 7](#)).

<b>Landscape context score</b>	1.18	<b>Vegetation Condition Score</b>	1.38	<b>Conservation significance score</b>	1.10
<b>Unit biodiversity Score</b>	1.79	<b>Area (ha)</b>	0.087	<b>Total biodiversity Score</b>	0.16

Bushland Assessment Method Scoresheets for all VAs are provided in Attachment 2 to Attachment 6.

#### 4.1.3. Details of the scattered trees proposed to be impacted

A total of 106 scattered trees are proposed for removal within the Project Area, which includes 10 *Acacia melanoxylon* (Blackwood), 44 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), 48 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and three *Exocarpos cupressiformis* (Native Cherry) from poor to excellent in health. (Table 9).

Further detail on scattered trees is provided in the Scattered Tree Assessment scoresheet (Attachment 7).

Scattered tree using fauna species in the Project Area are provided in [Appendix 3](#).

Photographs of scattered trees are provided in the Scattered Tree Photo File (Attachment 8).

**Table 9. Details of the 106 scattered trees proposed to be impacted.**

Tree or Cluster ID	Tree species	# Trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Fauna Habitat Score
6	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	2	20.0	0	50.5	0	3.67	1.8
7	<i>Eucalyptus obliqua</i>	1	12.5	0	37	10	1.23	1.8
8	<i>Acacia melanoxylon</i>	1	9.0	1 medium	44	10	2.54	1.8
9	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	23.0	1 small	148	10	8.58	1.8
10	<i>Eucalyptus obliqua</i>	1	16.0	1 small	89	15	4.35	1.8
11	<i>Eucalyptus obliqua</i>	1	8.0	0	24	20	0.42	1.8
12	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	17.0	0	60	40	2.13	1.8
13	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	25.0	1 small 1 medium	111	15	8.71	1.8
14	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	24.0	0	93	25	5.95	1.8
15	<i>Eucalyptus obliqua</i>	1	11.0	1 small	96	40	2.42	1.8
16	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	18.0	0	71	5	3.91	1.8
17	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	16.0	0	45	5	2.27	1.8
18	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	16.0	0	62.5	15	2.50	1.8
19	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	17.0	2 small 2 medium	112	5	7.03	1.8
20	<i>Eucalyptus obliqua</i>	1	14.0	0	49	80	0.59	1.8
21	<i>Eucalyptus obliqua</i>	1	14.0	0	110	75	2.02	1.8

Tree or Cluster ID	Tree species	# Trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Fauna Habitat Score
22	<i>Eucalyptus obliqua</i>	1	12.0	0	53	80	0.54	1.8
23	<i>Eucalyptus obliqua</i>	1	13.0	0	54	15	1.99	1.8
24	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	26.0	1 small 3 medium 1 large	160	3	11.25	1.8
26	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	11.0	0	97	85	1.13	1.8
27	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	10.0	0	70	10	2.12	1.8
28	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	23.0	1 medium	164	10	9.08	1.8
29	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	20.0	1 small	99	20	6.09	1.8
30	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	20.0	1 small	120.5	10	7.01	1.8
31	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	13.0	1 large	70	75	2.03	1.8
32	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	16.0	0	86	25	3.51	1.8
33	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	17.0	1 medium	91	20	4.39	1.8
34	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	24.0	1 small	98	20	7.01	1.8
35	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	14.0	1 large	75	20	4.05	1.8
36	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	18.0	0	112	15	4.53	1.8
37	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	18.0	2 small	106	20	4.84	1.8
41	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	21.0	0	96	3	6.14	1.8
42	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	18.0	0	76.5	3	4.15	1.8
43	<i>Eucalyptus obliqua</i>	1	16.0	0	72	5	3.66	1.8
44	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	12.0	0	45	5	1.42	1.8
45	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	14.0	0	58	0	2.43	1.8
46	<i>Eucalyptus obliqua</i>	1	17.0	0	53	10	2.50	1.8

Tree or Cluster ID	Tree species	# Trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Fauna Habitat Score
47	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	17.0	0	89	3	4.27	1.8
48	<i>Eucalyptus obliqua</i>	1	16.0	0	55	5	2.51	1.8
49	<i>Eucalyptus obliqua</i>	1	15.0	0	60	5	2.51	1.8
50	<i>Eucalyptus obliqua</i>	1	20.0	4 small	101	10	6.66	1.8
51	<i>Acacia melanoxylon</i>	1	13.0	0	44	3	4.07	1.8
52	<i>Eucalyptus obliqua</i>	1	16.0	1 small	90.5	10	4.51	1.8
53	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	23.0	1 small 1 medium	140	3	9.60	1.8
54	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	19.0	0	95	5	4.67	1.8
55	<i>Eucalyptus obliqua</i>	1	16.0	0	62	10	2.59	1.8
56	<i>Eucalyptus obliqua</i>	1	18.0	0	87	3	4.47	1.8
57	<i>Eucalyptus obliqua</i>	1	12.0	0	76	15	2.35	1.8
58	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	25.0	0	116	3	7.63	1.8
59	<i>Eucalyptus obliqua</i>	1	17.0	0	69	10	3.61	1.8
60	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	20.0	1 small 1 medium	90	10	7.00	1.8
61	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	17.0	1 small	70	3	4.29	1.8
62	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	13.0	0	69	65	1.19	1.8
63	<i>Eucalyptus obliqua</i>	1	12.0	0	57	90	0.52	1.8
64	<i>Eucalyptus obliqua</i>	1	21.0	0	48	75	1.36	1.8
65	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	24.0	0	57	35	3.64	1.8
66	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	17.0	2 small	56	10	3.64	1.8
67	<i>Eucalyptus obliqua</i>	1	20.0	0	53	15	3.48	1.8
68	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	15.0	0	60	10	2.42	1.8
69	<i>Eucalyptus obliqua</i>	1	15.0	0	51	40	1.33	1.8
70	<i>Eucalyptus obliqua</i>	1	16.0	0	60	3	3.34	1.8
71	<i>Exocarpos cupressiformis</i>	1	6.0	0	9	0	1.11	1.8

Tree or Cluster ID	Tree species	# Trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Fauna Habitat Score
72	<i>Exocarpos cupressiformis</i>	1	6.5	0	19	0	2.00	1.8
73	<i>Exocarpos cupressiformis</i>	1	8.0	0	11	0	1.93	1.8
74	<i>Eucalyptus obliqua</i>	1	18.0	1 small	74	10	4.48	1.8
75	<i>Eucalyptus obliqua</i>	1	18.0	0	69	30	3.31	1.8
76	<i>Eucalyptus obliqua</i>	1	18.5	0	64	5	3.83	1.8
77	<i>Eucalyptus obliqua</i>	1	16.0	0	49	60	1.18	1.8
78	<i>Eucalyptus obliqua</i>	1	16.5	1 small	71	5	4.23	1.8
79	<i>Acacia melanoxylon</i>	1	9.0	0	20	20	0.96	1.8
80	<i>Acacia melanoxylon</i>	6	5.0	0	6	0	0.33	1.8
81	<i>Eucalyptus obliqua</i>	1	17.0	0	66	5	3.64	1.8
82	<i>Eucalyptus obliqua</i>	1	18.0	0	113	40	3.95	1.8
83	<i>Eucalyptus obliqua</i>	1	19.0	2 small	105	10	6.49	1.8
84	<i>Eucalyptus obliqua</i>	1	19.0	1 small	97	20	5.93	1.8
85	<i>Eucalyptus obliqua</i>	1	19.5	1 small	117	20	6.55	1.8
86	<i>Eucalyptus obliqua</i>	1	17.0	1 small	52.5	10	3.57	1.8
87	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	20.0	1 small	94	10	6.33	1.8
88	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	19.0	0	50	15	2.53	1.8
89	<i>Eucalyptus obliqua</i>	1	19.5	0	67	20	3.73	1.8
96	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	20.5	2 small 1 medium	115	20	7.39	1.8
100	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	13.5	0	29.5	10	1.11	1.8
104	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	18	1 small	73	10	4.38	1.8
105	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	20	2 small 1 medium	144	15	8.30	1.8
120	<i>Eucalyptus obliqua</i>	1	17.0	1 small	84.5	15	4.45	1.8
121	<i>Eucalyptus obliqua</i>	1	16.0	1 small	81	5	4.47	1.8
122	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	22.0	2 small	166	5	9.08	1.8
123	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	23.0	3 small	143	15	8.21	1.8

Tree or Cluster ID	Tree species	# Trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Fauna Habitat Score
124	<i>Acacia melanoxylon</i>	1	7.0	0	5	0	0.42	1.8
125	<i>Eucalyptus obliqua</i>	1	16.0	3 small 1 medium 1 large	123	5	7.12	1.8
126	<i>Eucalyptus obliqua</i>	1	18.0	2 small	83.5	20	4.49	1.8
127	<i>Eucalyptus obliqua</i>	1	18.5	1 small	82	10	4.84	1.8
131	<i>Eucalyptus obliqua</i>	1	16.0	0	74	70	1.41	1.8
132	<i>Eucalyptus obliqua</i>	1	17.0	2 medium 1 large	76	40	4.10	1.8
133	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	19.5	2 small 2 medium	95	10	7.01	1.8
134	<i>Eucalyptus obliqua</i>	1	18.5	0	106	15	4.59	1.8
135	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	20.0	2 small 3 medium	103	5	7.55	1.8
139	<i>Eucalyptus obliqua</i>	1	19.0	3 small	100	5	6.56	1.8
144	<i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i>	1	17.0	5 small	110	25	7.31	1.8
145	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	1	19.5	0	78	5	4.40	1.8

#### 4.1.4. Site map showing areas of proposed impact

A map of the impacted vegetation associations in the Project Area is provided in Figure 4. Any fairways and greens associated with the golf course are classified as exotic vegetation but are not mapped.

A map of the impacted scattered trees in the Project Area is provided in Figure 5. All trees were categorised based on their Unit Biodiversity Score (UBS). For more information on this categorisation see [Section 4.1.1](#).

Any clearance figures presented in [Section 5](#) are calculated by considering a 20 m buffer due to CFS constraints with the exception of a 35m clearance buffer from the eastern most building face.





Figure 4. Vegetation associations impacted within the Project Area.



Figure 5. Scattered trees impacted within the Project Area categorised according to UBS.

#### 4.1.5. Photo log

General photos of the Project Area are provided in Figure 6 to Figure 9.



**Figure 6. Non-native vegetation surrounding the Scent factory redevelopment.**



**Figure 7. Location of the proposed car park to the north of the Scent factory.**



**Figure 8. The proposed new vehicle access in the southern part of the Project Area that is currently an unofficial walking entrance.**



**Figure 9. Remnant scattered trees adjacent the main access road in the southeast of the Project Area.**

## 4.2. Threatened species assessment

### 4.2.1. Matters of National Environmental Significance

The EPBC Act PMST report identified 37 threatened species and 13 migratory species protected under the EPBC Act, which may be relevant to the Project Area. Table 10 summarises the results of the PMST report and the relevant MNES are discussed further below.

The assessment of likelihood of national and state listed threatened flora and fauna (identified by the PMST) to occur in the Project Area is summarised in Table 11 to Table 13.

Note that some of these matters are not impacted by, or relevant to, the Project (e.g., Fish and listed marine species which are afforded specific protection within Commonwealth marine areas), and these matters are therefore not discussed further.

**Table 10. Summary of the EPBC Act Protected Matters Search Tool results (5 km buffer).**

Matters of National Environment Significance under EPBC Act 1999	Identified within the search area
World Heritage Properties	None
National Heritage Properties	None
Wetlands of International Importance	None
Great Barrier Reef Marine Park	None
Commonwealth Marine Areas	None
Listed Threatened Ecological Communities	None
Listed Threatened Species	37 (18 flora and 19 fauna)
Listed Migratory Species	13

### 4.2.2. Listed Threatened Ecological Communities (TEC)

No TECs will be impacted by the proposed project as there are no TECs located within 5 kilometres of the Project Area.

### 4.2.3. Threatened flora

The PMST (DCCEEW 2023) identified 11 flora species listed as threatened under the EPBC Act as known or likely to occur within 5 km of the Project Area (Table 11). None of the species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat. A BDBSA search identified 73 additional State listed flora species, that have records within 5 km of the Project Area, with <1 km reliability (Table 11) (DEW 2022b). A total of seven of the species were assessed as known / highly likely or likely to occur within the Project Area based on survey effort, recent records and suitable habitat:

- *Acacia gunnii* (Ploughshare Wattle) – State Rare;
- *Deyeuxia densa* (Heath Bent-grass) – State Rare;
- *Deyeuxia minor* (Small Bent-grass) – State Vulnerable;
- *Dianella longifolia* var. *grandis* (Pale Flax-lily) – State Rare;

- *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) – State Rare and observed within the Project Area;
- *Gastrodia sesamoides* (Potato Orchid) – State Rare;
- *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare.

An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat.

BDBSA flora records located within 5 km of the Project Area are provided in [Appendix 4](#).

A detailed likelihood assessment of threatened flora species information including distribution and preferred habitat information for the Project Area is provided in [Appendix 5](#).

**Table 11. Threatened flora identified by the PMST and/or BDBSA search in the Project Area (green shading = known / highly likely or likely to occur, orange shading = possible to occur) (DCCEEW 2023; DEW 2022b).**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Acacia gunnii</i>	Ploughshare Wattle		R	2	2022	Likely
<i>Acacia iteaphylla</i>	Flinders Ranges Wattle		R	2	2022	Possible
<i>Acacia stricta</i>	Hop Wattle		R	2	2005	Unlikely
<i>Amphibromus archeri</i>	Pointed Swamp Wallaby-grass		R	2	2018	Possible
<i>Austrostipa tenuifolia</i>			R	2	2018	Possible
<i>Baloskion tetraphyllum</i> ssp. <i>tetraphyllum</i>	Tassel Cord-rush		V	2	2012	Unlikely
<i>Bauera rubioides</i>	Wiry Bauera		R	2	2011	Unlikely
<i>Blechnum nudum</i>	Fishbone Water-fern		R	2	2022	Unlikely
<i>Blechnum wattsii</i>	Hard Water-fern		R	2	2010	Unlikely
<i>Boronia nana</i> var. <i>hyssopifolia</i>	Dwarf Boronia		R	2	2022	Possible
<i>Boronia parviflora</i>	Swamp Boronia		R	2	2018	Unlikely
<i>Caladenia argocalla</i>	White-beauty Spider-orchid	EN	E	1	Likely	Unlikely
<i>Caladenia behrii</i>	Pink-lipped Spider-orchid	EN	E	1	Likely	Unlikely
<i>Caladenia gladiolata</i>	Bayonet Spider-orchid	EN	E	1	Likely	Unlikely
<i>Caladenia leptochila</i> ssp. <i>leptochila</i>	Narrow-lip Spider-orchid		R	2	2020	Possible
<i>Caladenia necrophylla</i>	Late Spider-orchid		R	2	2008	Unlikely
<i>Caladenia pusilla</i>	Pigmy Caladenia		R	2	2013	Possible
<i>Caladenia rigida</i>	Stiff White Spider-orchid	EN	E	1	Likely	Unlikely

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Caleana major</i>	Large Duck-orchid		V	2	2000	Unlikely
<i>Callistemon brachyandrus</i>	Prickly Bottlebrush		R	2	2019	Unlikely
<i>Cardamine paucijuga</i>	Annual Bitter-cress		R	2	2011	Possible
<i>Coronidium gunnianum</i>	Pale Everlasting		E	2	2006	Possible
<i>Deyeuxia densa</i>	Heath Bent-grass		R	2	2021	Likely
<i>Deyeuxia minor</i>	Small Bent-grass		V	2	2020	Likely
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily		R	2	2019	Likely
<i>Dicksonia antarctica</i>	Soft Tree-fern		E	2	2020	Unlikely
<i>Dipodium pardalinum</i>	Leopard Hyacinth-orchid		V	2	2012	Possible
<i>Diuris behrii</i>	Behr's Cowslip Orchid		V	2	2015	Possible
<i>Diuris chryseopsis</i>	Cowslip Orchid		E	2	1998	Unlikely
<i>Drosera binata</i>	Forked Sundew		R	2	2017	Possible
<i>Drosera stricticaulis</i>	Erect Sundew		V	2	1998	Unlikely
<i>Eryngium ovinum</i>	Blue Devil		V	2	2013	Possible
<i>Eryngium vesiculosum</i>	Prostrate Blue Devil		R	2	2010	Possible
<i>Eucalyptus dalrympleana</i> ssp. <i>dalrympleana</i>	Candlebark Gum		R	2	2022	Possible
<i>Eucalyptus fasciculosa</i>	Pink Gum		R	2	2021	Possible
<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	Manna Gum		R	2	2022	Known/Highly Likely
<i>Euphrasia collina</i> ssp. <i>osbornii</i>	Osborn's Eyebright	EN	E	1	Known	Unlikely
<i>Gastrodia sesamoides</i>	Potato Orchid		R	2	2021	Likely
<i>Gleichenia microphylla</i>	Coral Fern		R	2	2022	Unlikely
<i>Glycine latrobeana</i>	Clover Glycine	VU	V	1	Likely	Unlikely
<i>Gonocarpus micranthus</i> ssp. <i>micranthus</i>	Creeping Raspwort		R	2	2018	Possible
<i>Goodenia brunnea</i>			R	2	2018	Unlikely
<i>Grevillea aquifolium</i>	Prickly Grevillea		R	2	1997	Unlikely
<i>Hypolepis rugosula</i>	Ruddy Ground-fern		R	2	2022	Unlikely
<i>Juncus amabilis</i>			V	2	2009	Unlikely

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Lagenophora sublyrata</i>	Slender Bottle-daisy		V	2	2019	Possible
<i>Leionema hillebrandii</i>	Mount Lofty Phebalium		R	2	2022	Possible
<i>Logania saxatilis</i>	Rock Logania		R	2	1996	Unlikely
<i>Luzula flaccida</i>	Pale Wood-rush		V	2	2020	Possible
<i>Lycopodiella lateralis</i>	Slender Clubmoss		R	2	2017	Unlikely
<i>Lycopodium deuterodensum</i>	Bushy Clubmoss		E	2	2009	Unlikely
<i>Machaerina gunnii</i>	Slender Twig-rush		R	2	2018	Unlikely
<i>Melaleuca armillaris</i> ssp. <i>akineta</i>	Needle-leaf Honey-myrtle		R	2	2008	Unlikely
<i>Mentha diemenica</i>	Slender Mint		R	2	2011	Possible
<i>Nymphoides crenata</i>	Wavy Marshwort		R	2	1995	Unlikely
<i>Poa umbricola</i>	Shade Tussock-grass		R	2	2018	Unlikely
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	VU	R	1	Likely	Unlikely
<i>Prasophyllum pruinatum</i>	Plum Leek-orchid	EN	E	1	Known	Unlikely
<i>Pterostylis cucullata</i>	Leafy Greenhood	VU	E	1	Likely	Unlikely
<i>Pterostylis setifera</i>	Bristly Greenhood		E	2	2018	Unlikely
<i>Pultenaea graveolens</i>	Scented Bush-pea		R	2	2022	Possible
<i>Pultenaea kraehenbuehlii</i>	Tothill Bush-pea		R	2	2018	Unlikely
<i>Ranunculus glabrifolius</i>	Shining Buttercup		V	2	2000	Possible
<i>Rytidosperma laeve</i>	Smooth Wallaby-grass		R	2	2017	Possible
<i>Rytidosperma tenuius</i>	Short-awn Wallaby-grass		R	2	2022	Likely
<i>Schizaea fistulosa</i>	Narrow Comb-fern		V	2	2008	Unlikely
<i>Schoenus latelaminatus</i>	Medusa Bog-rush		V	2	2012	Unlikely
<i>Schoenus lepidosperma</i> ssp. <i>lepidosperma</i>	Slender Bog-rush		R	2	2018	Unlikely
<i>Scutellaria humilis</i>	Dwarf Skullcap		R	2	2021	Unlikely
<i>Senecio pinnatifolius</i> var. <i>pinnatifolius</i>			R	2	2015	Possible
<i>Sphaerolobium minus</i>	Leafless Globe-pea		R	2	2008	Unlikely
<i>Sprengelia incarnata</i>	Pink Swamp-heath		R	2	2017	Unlikely

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Thelymitra aristata</i>	Great Sun-orchid		E	2	2008	Possible
<i>Thelymitra batesii</i>			R	2	2021	Possible
<i>Thelymitra circumsepta</i>	Naked Sun-orchid		E	2	2018	Unlikely
<i>Thelymitra grandiflora</i>	Great Sun-orchid		R	2	2019	Possible
<i>Thelymitra ixioides</i>	Spotted Sun-orchid		E	2	2013	Possible
<i>Thelymitra latifolia</i>	Blue Star Sun-orchid		V	2	2004	Possible
<i>Thelymitra matthewsii</i>	Spiral Sun-orchid	VU	E	1	Likely	Unlikely
<i>Thysanotus tenellus</i>	Grassy Fringe-lily		R	2	2015	Unlikely
<i>Todea barbara</i>	King Fern		E	2	2018	Unlikely
<i>Veronica derwentiana</i> ssp. <i>homalodonta</i>	Mount Lofty Speedwell	CE	E	1	Likely	Unlikely
<i>Xanthosia tasmanica</i>	Southern Xanthosia		R	2	2015	Possible
<i>Xyris operculata</i>	Tall Yellow-eye		R	2	2008	Unlikely

**Conservation status:** Aus: Australia (EPBC Act). SA: South Australia (NPW Act).

**Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;

2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area.



#### 4.2.4. Threatened fauna

The PMST (DCCEE 2023) identified 11 nationally listed threatened fauna species as known or likely to occur within 5 km of the Project Area, consisting of eight birds and two mammals. A BDBSA search identified two additional nationally listed threatened fauna species that have records within 5 km of the Project Area (Table 12), which did not appear on the PMST (DEW 2022b). In total, five threatened fauna species were assessed as likely to occur within the Project Area based on survey effort, suitable habitat and recent records:

- Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare;
- Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare;
- Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and
- Southern Brown Bandicoot (*Isodon obesulus obesulus*) – nationally Endangered and State Vulnerable.

One additional nationally listed threatened species was assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- White-throated Needletail (*Hirundapus caudacutus*) – nationally Vulnerable and migratory and State Vulnerable.

A BDBSA search identified 29 additional State listed fauna species that have records within 5 km of the Project Area (Table 12) (DEW 2022b). A total of 10 of these species were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, recent records and suitable habitat:

- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area;
- Elegant Parrot (*Neophema elegans elegans*) – State Rare;
- Jacky Winter (*Microeca fascinans fascinans*) – State Rare;
- Little Eagle (*Hieraetus morphnoides*) – State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Scarlet Robin (*Petroica boodang boodang*) – State Rare;
- Square-tailed Kite (*Lophoictinia isura*) – State Endangered;
- White-winged Chough (*Corcorax melanorhamphos*) – State Rare;
- Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area.

An additional 16 species were assessed as possible to occur within the Project Area based on recent records and suitable habitat.

BDBSA fauna records located within 5 km of the Project Area are provided in [Appendix 6](#).

Birdlife Australia fauna records located within 5 km of the Project Area are provided in [Appendix 7](#).

A detailed likelihood assessment of threatened fauna species information including distribution and preferred habitat information for the Project Area is provided in [Appendix 8](#).

**Table 12. Threatened fauna and migratory species, identified by the PMST and/or BDBSA search in the Project Area (green shading = known / highly likely or likely to occur, orange shading = possible to occur) (DCCEEW 2023; DEW 2022b).**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<b>AMPHIBIA</b>						
<i>Pseudophryne bibronii</i>	Brown Toadlet		R	2	2009	Possible
<b>AVES</b>						
<i>Anhinga novaehollandiae novaehollandiae</i>	Australasian Darter		R	2, 3	2018 / 2018	Possible
<i>Biziura lobata menziesi</i>	Musk Duck		R	2, 3	2015 / 2002	Possible
<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN	E	1	Known	Unlikely
<i>Cereopsis novaehollandiae novaehollandiae</i>	Cape Barren Goose		R	3	2009	Possible
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN	E	3	2002	Unlikely
<i>Climacteris affinis</i>	White-browed Treecreeper		R	2	2021	Possible
<i>Corcorax melanorhamphos</i>	White-winged Chough		R	2, 3	2020 / 2020	Likely
<i>Falco hypoleucos</i>	Grey Falcon	VU	R	1	Likely	Unlikely
<i>Falco peregrinus macropus</i>	Peregrine Falcon		R	2, 3	2015 / 2020	Likely
<i>Falcunculus frontatus frontatus</i>	Eastern Shriketit		R	2, 3	2006 / 2006	Possible
<i>Grantiella picta</i>	Painted Honeyeater	VU	R	1	Likely	Unlikely
<i>Hieraetus morphnoides</i>	Little Eagle		V	2	2019	Likely
<i>Hirundapus caudacutus</i>	White-throated Needletail	VU, Mi (T)	V	1	Likely	Possible
<i>Hylacola cauta cauta</i>	Shy Heathwren		R	3	1998	Possible
<i>Hylacola pyrrhopygia parkeri</i>	Chestnut-rumped Heathwren	EN	E	1, 2, 3	Known / 2020 / 2020	Likely

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Leipoa ocellata</i>	Malleefowl	VU	V	1	Likely	<b>Unlikely</b>
<i>Lewinia pectoralis pectoralis</i>	Lewin's Rail		V	2	2010	<b>Possible</b>
<i>Lophoictinia isura</i>	Square-tailed Kite		E	2	2019	<b>Likely</b>
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater		V	2, 3	2002 / 2000	<b>Possible</b>
<i>Microeca fascinans fascinans</i>	Jacky Winter		R	2, 3	2018 / 2001	<b>Likely</b>
<i>Neophema elegans elegans</i>	Elegant Parrot		R	2	2021	<b>Likely</b>
<i>Oxyura australis</i>	Blue-billed Duck		R	3	2018	<b>Possible</b>
<i>Pachycephala inornata</i>	Gilbert's Whistler		R	3	2007	<b>Possible</b>
<i>Petroica boodang boodang</i>	Scarlet Robin		R	2, 3	2022 / 2020	<b>Likely</b>
<i>Petroica phoenicea</i>	Flame Robin		V	3	2003	<b>Possible</b>
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater		R	2	2020	<b>Possible</b>
<i>Polytelis anthopeplus monarchoides</i>	Regent Parrot	VU	V	2	1996	<b>Unlikely</b>
<i>Rostratula australis</i>	Australian Painted Snipe	EN	E	1	Likely	<b>Unlikely</b>
<i>Stagonopleura bella samueli</i>	Beautiful Firetail	EN	R	1, 3	2020	<b>Likely</b>
<i>Turnix varius varius</i>	Painted Buttonquail		R	2	2012	<b>Possible</b>
<i>Zanda funerea whiteae</i>	Yellow-tailed Black Cockatoo		V	2, 3	2022 / 2020	<b>Highly Likely / Known</b>
<i>Zapornia tabuensis</i>	Spotless Crane		R	2	2010	<b>Possible</b>
<i>Zoothera lunulata halmaturina</i>	Bassian Thrush	EN	R	1, 2, 3	Known / 2022 / 2018	<b>Likely</b>
<b>MAMMALIA</b>						
<i>Antechinus agilis</i>	Agile Antechinus		E	2	2021	<b>Possible</b>
<i>Antechinus flavipes</i>	Yellow-footed Antechinus		V	2	2021	<b>Likely</b>
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot	EN	V	1, 2	Known / 2021	<b>Likely</b>

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	R	1, 2	Likely / 2020	<b>Likely</b>
<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R	2	2022	<b>Highly Likely / Known</b>
<b>REPTILIA</b>						
<i>Egernia cunninghami</i>	Cunningham's Skink		E	2	2022	<b>Unlikely</b>
<i>Varanus rosenbergi</i>	Heath Goanna		V	2	2014	<b>Unlikely</b>
<i>Varanus varius</i>	Lace Monitor		R	2	2013	<b>Unlikely</b>

**Conservation status:** Aus: Australia (EPBC Act). SA: South Australia (NPW Act).

**Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

- 1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;
- 2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;
- 3: Birdlife Australia (DEW 2022b) – 5 km buffer applied to Project Area.

#### 4.2.5. Migratory fauna

The PMST (DCCEEW 2023) identified five nationally listed migratory species as known or likely to occur within 5 km of the Project Area (Table 13). In total, two nationally listed migratory species were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- Fork-tailed Swift (*Apus pacificus*) – nationally migratory;
- Satin Flycatcher (*Myiagra cyanoleuca*) – nationally migratory and State Endangered.

BDBSA fauna records indicate that the Satin Flycatcher (*Myiagra cyanoleuca*) has been previously recorded within 5 km of the Project Area. BDBSA fauna records located within 5 km of the Project Area are provided in [Appendix 6](#).

A detailed likelihood assessment of nationally listed migratory species information including distribution and preferred habitat information for the Project Area is provided in [Appendix 9](#).

**Table 13. Migratory species, identified by the PMST and/or BDBSA search in the Project Area (orange shading = possible to occur) (DCCEEW 2023; DEW 2022b).**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
<i>Apus pacificus</i>	Fork-tailed Swift	Mi (Ma)		1	Likely	Possible
<i>Gallinago hardwickii</i>	Latham's Snipe	Mi (W)	R	1	Likely	Unlikely
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Mi (T)	E	1, 2	Likely / 2005	Possible
<i>Rhipidura rufifrons</i>	Rufous Fantail	Mi (T)		1	Known	Unlikely
<i>Tringa nebularia</i>	Common Greenshank	Mi (T)		1	Likely	Unlikely

**Conservation status:** Aus: Australia (EPBC Act). SA: South Australia (NPW Act).

**Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;

2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;

### 4.3. Cumulative impacts

*When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must consider the potential cumulative impact, both direct and indirect, that is reasonably likely to result from a proposed clearance activity.*

Direct impacts of the proposal include the complete removal of 1.716 ha of native vegetation and 62 scattered trees.

All construction access and earthworks fall within the works extent of the Project Area.

Potential indirect impacts of the proposal include:

- Any clearance required by the SA Country Fire Service such as fuel reduced zones around the hotel and hotel pods, but also any clearance for fire mitigation measures such as fire breaks, fire access tracks and turn around points;
- Any altered hydrology (raised or lowered water table, flooding, impounding water or reduced water supply) that will impact on the condition or health of native vegetation;
- Any possible impacts from temporary dust generation during construction works, including smothering of vegetation;
- Any potential impacts on the root zone of vegetation, such as adding fill to adjust ground level, compaction of soils, severing of roots through trenching for infrastructure, and the construction of hard surfaces which may reduce the infiltration of water; and
- Any vegetation that will be significantly reduced in size and isolated from other vegetation such that it will potentially compromise its long-term ecological function and viability.

### 4.4. Addressing the Mitigation Hierarchy

*When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must have regard to the mitigation hierarchy. The NVC will also consider, with the aim to minimize, impacts on biological diversity, soil, water and other natural resources, threatened species or ecological communities under the EPBC Act or listed species under the NP&W Act.*

#### **a) Avoidance – outline measures taken to avoid clearance of native vegetation**

The area in which the 18 pods are proposed to be constructed will impact on several scattered trees and an extensive amount of vegetation association A1b. scattered trees are planned for retention in this area and will be avoided. These trees will still be accounted for as a result of applicable CFS Buffers (see Section 5).

The proposed new vehicle access in the southern part of the Project Area utilises an existing partially cleared, albeit unofficial walking entrance and avoids better quality vegetation adjacent to this area. The proposed area for the carpark adjacent to the Scent Factory redevelopment also avoids direct impacts to vegetation associations A1b and A3 (see Figure 4) See [Section 4.1.5](#) for photos of the areas proposed for the new vehicle access and car park.

**b) Minimization – if clearance cannot be avoided, outline measures taken to minimize the extent, duration and intensity of impacts of the clearance on biodiversity to the fullest possible extent (whether the impact is direct, indirect or cumulative).**

The proposed footprint of the main hotel building was selected based on the existing site footprint, minimising additional impact to surrounding vegetation despite the proposed footprint being larger.

Efforts to minimise the extent, duration and intensity of impacts on the clearance of native vegetation around the pods has been considered at multiple stages of the planning process. A total of 13 iterations (as of 30/08/2022) have been documented which include a reduction in the number of pods, and relocation of where these pods are proposed to be located. Initial designs included plans for up to 50 pods to be constructed in the northern extent of the Project Area requiring clearance of a substantial amount of native vegetation. Further detail on these iterations is provided in Attachment 9.

Where applicable, reasonable and feasible measures to prevent pollution of waterways and drainage lines in the area downstream of the proposed works during and post construction will be implemented.

Installation of exclusion fencing and signage to delineate the limits of clearing and vegetation to be retained will be installed in order to minimise disturbance in the Project Area.

Furthermore, clearing of vegetation, including the clearing of native vegetation and fauna habitat, will be minimised to the greatest extent practicable through the selection of plant (machinery) that will avoid impact on retained trees.

**c) Rehabilitation or restoration – outline measures taken to rehabilitate ecosystems that have been degraded, and to restore ecosystems that have been degraded, or destroyed by the impact of clearance that cannot be avoided or further minimized, such as allowing for the re-establishment of the vegetation.**

The rehabilitation or restoration of some areas that are impacted by the clearance of native vegetation will be achieved through revegetation, with a preference for species local to the Adelaide Hills. Some areas will not be able to be rehabilitated due to CFS constraints and the need to maintain specific bushfire attack level ratings.

**d) Offset – any adverse impact on native vegetation that cannot be avoided or further minimized should be offset by the achievement of a significant environmental benefit that outweighs that impact.**

*The NVC will only consider an offset once avoidance, minimization and restoration have been documented and fulfilled. The SEB Policy explains the biodiversity offsetting principles that must be met.*

An offset in the form of a payment into the native vegetation fund is the preferred option for Mount Lofty Estate Pty Ltd.

## 4.5. Principles of Clearance (Schedule 1, Native Vegetation Act 1991)

Table 14. Assessment against the Principles of Clearance.

Principle of clearance	Considerations
<b>Principle 1(a)</b> – it comprises a high level of diversity of plant species	<p><u>Relevant information</u></p> <p>A total of 89 flora species (48 native and 41 introduced) were observed within the Project Area during the field assessment:</p> <ul style="list-style-type: none"> <li>• A1a – 28 flora species (11 native and 17 introduced species);</li> <li>• A1b – 40 flora species (21 native and 19 introduced species);</li> <li>• A1c – 27 flora species (14 native and 13 introduced species);</li> <li>• A2 – 40 flora species (27 native and 13 introduced species); and</li> <li>• A3 – 15 flora species (2 native and 13 introduced species).</li> </ul> <p>Native Plant Species Diversity Scores:</p> <p>A1a – 8                      A1b – 16                      A1c – 12                      A2 – 14                      A3 – 2</p>
	<p><u>Assessment against the principles</u></p> <p><u>At Variance</u>                      A1b, A1c and A2</p> <p><u>Not at Variance</u>                      A1a and A3</p>
	<p><u>Moderating factors that may be considered by the NVC</u></p> <p>There is a substantial amount of native vegetation within the Project Area and or local vicinity comprising a number of native species.</p>
<b>Principle 1(b)</b> – significance as a habitat for wildlife	<p><u>Relevant information</u></p> <p>Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. The understorey in areas of native vegetation not directly associated with the golf course was heavily degraded and introduced flora species such as <i>Fumaria capreolata</i> (White-flower Fumitory), <i>Iris</i> sp. (Iris) and <i>Rubus fruticosus aggregate</i> (Blackberry) were dominant in these areas. Five vegetation associations and 151 scattered trees, including 16 <i>Acacia melanoxylon</i> (Blackwood), 52 <i>Eucalyptus obliqua</i> (Messmate Stringybark), one <i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i> (Rough-bark Manna Gum), 76 State Rare <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and six <i>Exocarpos cupressiformis</i> (Native Cherry) were recorded within the Project Area.</p> <p>A total of 106 scattered trees, which includes 10 <i>Acacia melanoxylon</i> (Blackwood), 44 <i>Eucalyptus obliqua</i> (Messmate Stringybark), one <i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i> (Rough-bark Manna</p>



Principle of clearance	Considerations
	<p>Gum), 48 State Rare <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum), three <i>Exocarpos cupressiformis</i> (Native Cherry) from poor to excellent in health.</p> <p>Vegetation associations were heavily degraded and introduced flora species were present in large numbers (particularly in A3). All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species.</p> <p>A total of 26 fauna species were recorded within the Project Area, 23 were birds and three were mammals. Two of these species are introduced fauna.</p> <p>No fauna species listed under the EPBC Act were recorded within the Project Area.</p> <p>Two fauna species listed under the NPW Act were recorded in the Project Area:</p> <ul style="list-style-type: none"> <li>• Common Brushtail Possum (<i>Trichosurus vulpecula</i>) – State Rare; and</li> <li>• Yellow-tailed Black Cockatoo (<i>Zanda funerea whiteae</i>) – State Vulnerable.</li> </ul> <p>A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known to occur within the Project Area based on survey effort, suitable habitat and recent records:</p> <ul style="list-style-type: none"> <li>• Bassian Thrush (<i>Zoothera lunulata halmaturina</i>) – nationally Endangered and State Rare;</li> <li>• Beautiful Firetail (<i>Stagonopleura bella samueli</i>) – nationally Endangered and State Rare;</li> <li>• Chestnut-rumped Heathwren (<i>Hylacola pyrrhopygia parkeri</i>) – nationally Endangered and State Endangered;</li> <li>• Common Brushtail Possum (<i>Trichosurus vulpecula</i>) – State Rare and observed within the Project Area;</li> <li>• Elegant Parrot (<i>Neophema elegans elegans</i>) – State Rare;</li> <li>• Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>) – nationally Vulnerable and State Rare; and</li> <li>• Jacky Winter (<i>Microeca fascinans fascinans</i>) – State Rare;</li> <li>• Little Eagle (<i>Hieraaetus morphnoides</i>) – State Vulnerable;</li> <li>• Peregrine Falcon (<i>Falco peregrinus macropus</i>) – State Rare;</li> <li>• Scarlet Robin (<i>Petroica boodang boodang</i>) – State Rare;</li> <li>• Southern Brown Bandicoot (<i>Isodon obesulus obesulus</i>) – nationally Endangered and State Vulnerable.</li> <li>• Square-tailed Kite (<i>Lophoictinia isura</i>) – State Endangered;</li> <li>• White-winged Chough (<i>Corcorax melanorhamphos</i>) – State Rare;</li> <li>• Yellow-footed Antechinus (<i>Antechinus flavipes</i>) – State Vulnerable; and</li> <li>• Yellow-tailed Black Cockatoo (<i>Zanda funerea whiteae</i>) – State Vulnerable and observed within the Project Area.</li> </ul> <p>An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records.</p> <p>Vegetation Associations Threatened Fauna Score – 0.1 (All VAs)</p>

Principle of clearance	Considerations
	<p>Unit biodiversity Score:  A1a – 18.15  A1b – 17.61  A1c – 14.79  A2 – 33.39  A3 – 1.79</p> <p>Trees;  Fauna Habitat Score – 1.8 (all trees)  Biodiversity Score – from 0.33 to 11.25</p> <hr/> <p><u>Assessment against the principles</u></p> <p><u>Seriously at Variance</u>  A1a, Alb, A1c, A2, A3 and all trees</p> <hr/> <p><u>Moderating factors that may be considered by the NVC</u></p> <p>Two threatened fauna species listed under the NPW Act were recorded in the Project Area and many other threatened fauna species were assessed as likely or possible to occur within the Project Area. Pockets of remnant native vegetation were often degraded by the presence of introduced flora species and fragmented from more intact remnant native vegetation but may be used by fauna as wildlife corridors to more intact and better quality native vegetation, particularly to the surrounding areas in MGCP. Similarly, a total of 52 of the 106 scattered trees that area proposed to be cleared within the Project Area contain hollows which could provide suitable breeding habitat for fauna species. Moreover, all these scattered trees provide suitable perching and foraging habitat for a number of fauna species within the Project Area.</p> <p>Given there are areas of better quality bushland surrounding the Project Area, in MGCP for instance, the clearance of 1.716 ha and 106 scattered trees is unlikely to lead to a long-term decrease in the population size of threatened fauna species or reduce their occupancy. Clearance is however likely to further fragment pockets of remnant native vegetation that provide wildlife corridors to better quality habitat surrounding the Project Area. The habitat is not considered to be critical to the survival of threatened fauna species and clearance is unlikely to lead to a decline in species or interfere with the recovery of any species.</p> <p>Introduced fauna species are present within the Project Area. Clearance of native vegetation is unlikely to introduce more invasive fauna species into the Project Area.</p>
<b>Principle 1(c)  – plants of a rare, vulnerable or endangered species</b>	<p><u>Relevant information</u></p> <p>Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. The understorey in areas of native vegetation not directly associated with the golf course was heavily degraded and introduced flora species such as <i>Fumaria capreolata</i> (White-flower Fumitory), <i>Iris</i> sp. (Iris) and <i>Rubus fruticosus aggregate</i> (Blackberry) were dominant in these areas. Five vegetation associations and 151 scattered trees, including 16 <i>Acacia melanoxylon</i> (Blackwood), 52</p>

Principle of clearance	Considerations
	<p><i>Eucalyptus obliqua</i> (Messmate Stringybark), one <i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i> (Rough-bark Manna Gum), 76 State Rare <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and six <i>Exocarpos cupressiformis</i> (Native Cherry) were recorded within the Project Area.</p> <p>A total of 106 scattered trees, which includes 10 <i>Acacia melanoxylon</i> (Blackwood), 44 <i>Eucalyptus obliqua</i> (Messmate Stringybark), one <i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i> (Rough-bark Manna Gum), 48 State Rare <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and three <i>Exocarpos cupressiformis</i> (Native Cherry) from poor to excellent in health. Vegetation associations were heavily degraded and introduced flora species were present in large numbers (particularly in A3). All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species.</p> <p>No flora species listed under the EPBC Act were recorded within the Project Area.</p> <p>One flora species listed under the NPW Act as Rare was recorded in the Project Area:</p> <ul style="list-style-type: none"> <li>• <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum).</li> </ul> <p>This species was present in large numbers throughout the Project area in remnant patches of native vegetation and as scattered trees.</p> <p>The following flora species listed under the NPW Act were determined as likely to occur in the Project Area:</p> <ul style="list-style-type: none"> <li>• <i>Acacia gunnii</i> (Ploughshare Wattle) – State Rare;</li> <li>• <i>Deyeuxia densa</i> (Heath Bent-grass) – State Rare;</li> <li>• <i>Deyeuxia minor</i> (Small Bent-grass) – State Vulnerable;</li> <li>• <i>Dianella longifolia</i> var. <i>grandis</i> (Pale Flax-lily) – State Rare;</li> <li>• <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) – State Rare and observed within the Project Area;</li> <li>• <i>Gastrodia sesamoides</i> (Potato Orchid) – State Rare;</li> <li>• <i>Rytidosperma tenuius</i> (Short-awn Wallaby-grass) – State Rare.</li> </ul> <p>An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat.</p> <p>Threatened Flora Score(s) –  All VAs – 0  All trees of species <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (0.3)  All other trees (0)</p> <hr/> <p><u>Assessment against the principles</u></p> <p><u>At Variance</u>  All trees of species <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i></p>

Principle of clearance	Considerations
	<p><u>Not at Variance</u> All VAs All other tree species</p> <hr/> <p><u>Moderating factors that may be considered by the NVC</u></p> <p>One flora species listed under the NPW Act as Rare was recorded in the Project Area and many other threatened flora species were assessed as likely or possible to occur within the Project Area. The understorey in some areas of native vegetation not directly associated with the golf course was heavily degraded and introduced flora species were abundant, particularly in VA A3. However, some vegetation associations, such as A2 had a high presence of native species including spring flowering species such as <i>Pterostylis spp.</i> and <i>Bulbine bulbosa</i> for example. A total of 25 of the 62 scattered trees proposed for clearance are of the species <i>Eucalyptus viminalis ssp. viminalis</i> which is currently listed as Rare under the NPW Act. Many of these trees including those not listed under the NPW Act provide suitable perching, foraging, and breeding habitat for a number of fauna species within the Project Area.</p> <p>Given there are areas of better-quality bushland surrounding the Project Area, in MGCP for instance, the clearance of 1.716 ha and 106 scattered trees is unlikely to lead to a long-term decrease in the population size of threatened flora species or reduce their occupancy. Clearance is however likely to further fragment pockets of remnant native vegetation and fragment interconnecting pockets of scattered trees, such as the State Rare <i>Eucalyptus viminalis ssp. viminalis</i>. The habitat is not considered to be critical to the survival of threatened flora species and clearance is unlikely to lead to a decline in species or interfere with the recovery of any species. Introduced flora species are present in large numbers within the Project Area. Clearance of native vegetation is unlikely to introduce more invasive flora species into the Project Area.</p>
<p><b>Principle 1(d)</b> – the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered</p>	<p><u>Relevant information</u></p> <p>No threatened communities under the EPBC Act or threatened ecosystems under the DEW Provisional list of threatened ecosystems are considered present within the clearance area.</p> <p>Threatened Community Score: 1</p> <hr/> <p><u>Assessment against the principles</u></p> <p>Not at Variance</p> <hr/> <p><u>Moderating factors that may be considered by the NVC</u></p> <p>N/A</p>
<p><b>Principle 1(e)</b> – it is significant as a remnant of vegetation in an area which has been</p>	<p><u>Relevant information</u></p> <p>Uraidla IBRA Association remnancy – 26% Mount Lofty Ranges IBRA Subregion remnancy – 15%</p> <p>Five vegetation associations and 151 scattered trees, including 16 <i>Acacia melanoxylon</i> (Blackwood), 52 <i>Eucalyptus obliqua</i> (Messmate Stringybark), one <i>Eucalyptus viminalis ssp. cygnetensis</i> (Rough-</p>

Principle of clearance	Considerations
<b>extensively cleared</b>	<p>bark Manna Gum), 76 State Rare <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and six <i>Exocarpos cupressiformis</i> (Native Cherry) were recorded within the Project Area. All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species.</p> <p>Total Biodiversity Score – 447.54</p> <p><u>Assessment against the principles</u></p> <p><u>Seriously at Variance</u></p> <p><u>Moderating factors that may be considered by the NVC</u></p> <p>Native vegetation within the Uraidla IBRA Association has been extensively cleared in some areas. The Project Area is directly adjacent to MGCP and vegetation associations and scattered trees within the Project Area represent some of the vegetation that has not been cleared in this area. Areas within the Project Area have been cleared for the construction of the golf course but species within the Project Area have not been selectively removed within the Uraidla IBRA Association. Remnants that remain within the Project Area are in moderate condition but weed incursions are present, particularly on the edge of VA A1a.</p>
<b>Principle 1(f) – it is growing in, or in association with, a wetland environment</b>	<p><u>Relevant information</u></p> <p>Cox Creek runs through the Project Area from the adjacent MGCP. There are also three artificially constructed lakes or dams to the north of the Stirling Golf Club clubhouse and in the northern section of the Project Area. The areas of impact within the Project Area are not located within Cox Creek or any of the three artificially constructed lakes or dams.</p> <p><u>Assessment against the principles</u></p> <p><u>Not at Variance</u></p> <p><u>Moderating factors that may be considered by the NVC</u></p> <p>N/A</p>
<b>Principle 1(g) – it contributes significantly to the amenity of the area in which it is growing or is situated</b>	<p><u>Relevant information</u></p> <p>Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. Five vegetation associations and 151 scattered trees of species <i>Acacia melanoxylon</i> (Blackwood), <i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i> (Rough-bark Manna Gum), <i>Eucalyptus obliqua</i> (Messmate Stringybark), <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> (Manna Gum) and <i>Exocarpos cupressiformis</i> (Native Cherry). All trees were of a mature age and ranged from poor to excellent in health. Vegetation associations were heavily degraded and introduced flora species were present in large numbers</p>

Principle of clearance	Considerations
	(particularly in A3). Some trees contain hollows which could provide suitable habitat for fauna species. As such, any vegetation within the area would likely contribute to the amenity of the area.
	N/A
	<u>Moderating factors that may be considered by the NVC</u>
	N/A

[Principles of Clearance](#) (h-m) will be considered by comments provided by the local NRM Board or relevant Minister. The Data Report should contain information on these principles where relevant and where sufficient information or expertise is available.

## 4.6. Risk assessment

The level of risk associated with the application

Table 15. Summary of the level of risk associated with the application.

<b>Total clearance</b>	No. of trees	106
	Area (ha)	1.716
	Total biodiversity Score	447.54
<b>Seriously at variance with principle 1(b), 1(c) or 1 (d)</b>		1 (b)
<b>Risk assessment outcome</b>		Level 4

## 4.7. NVC guidelines

Other information that demonstrates that the clearance complies with any relevant NVC guidelines related to the activity

N/A

# 5. Clearance summary

A 35m clearance buffer from the eastern building face as a result of CFS constraints is applied. This applies to BAM A1a. A 20m CFS buffer is applicable elsewhere.

All BAM scoresheets have a loss factor of 1.0 applied and do not contain any trees. This is to reflect the clearance of understorey only.

Details of correspondence with NVC regarding the 35m buffer to the eastern most point of the hotel, and details on applicable loss factors is provided in Attachment 10.

## Clearance Area(s) Summary table

### BAMS

Block	Site	Species diversity score	Threatened Ecological community	Threatened plant score	Threatened fauna score	UBS	Area (ha)	Total Biodiversity score	Loss factor	Loadings	Reductions	SEB Points required	SEB payment	Admin Fee
A	1a	8	1	0	0.1	18.15	0.261	4.74	1	0	0	4.98	\$6,352.72	\$349.40
A	1b	16	1	0	0.1	17.61	1.307	23.01	1	0	0	24.16	\$31,055.06	\$1,708.03
A	1c	12	1	0	0.1	14.79	0.048	0.71	1	0	0	0.75	\$951.78	\$52.35
A	2	14	1	0	0.1	33.39	0.013	0.44	1	0	0	0.46	\$593.02	\$32.62
A	3	2	1	0	0.1	1.79	0.087	0.16	1	0	0	0.16	\$207.78	\$11.43
						<b>Total</b>	<b>1.716</b>	<b>29.06</b>				<b>30.51</b>	<b>\$39,160.36</b>	<b>\$2,153.83</b>

**Scattered trees Summary table**

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment (inclusive of admin and GST)
6	2	1.8	0.3	7.34	1.0	7.71	\$10,067.76
7	1	1.8	0	1.23	1.0	1.29	\$1,688.57
8	1	1.8	0	2.54	1.0	2.67	\$3,490.97
9	1	1.8	0.3	8.58	1.0	9.01	\$11,775.36
10	1	1.8	0	4.35	1.0	4.56	\$5,963.30
11	1	1.8	0	0.42	1.0	0.44	\$571.03
12	1	1.8	0.3	2.13	1.0	2.24	\$2,923.52
13	1	1.8	0.3	8.71	1.0	9.15	\$11,952.29
14	1	1.8	0.3	5.95	1.0	6.25	\$8,160.51
15	1	1.8	0	2.42	1.0	2.54	\$3,314.38
16	1	1.8	0.3	3.91	1.0	4.11	\$5,367.26
17	1	1.8	0.3	2.27	1.0	2.38	\$3,115.17
18	1	1.8	0.3	2.50	1.0	2.62	\$3,423.04
19	1	1.8	0.3	7.03	1.0	7.39	\$9,649.96
20	1	1.8	0	0.59	1.0	0.62	\$805.50
21	1	1.8	0	2.02	1.0	2.12	\$2,768.51
22	1	1.8	0	0.54	1.0	0.57	\$745.41
23	1	1.8	0	1.99	1.0	2.09	\$2,735.33
24	1	1.8	0.3	11.25	1.0	11.82	\$15,440.72
26	1	1.8	0.3	1.13	1.0	1.19	\$1,552.06
27	1	1.8	0.3	2.12	1.0	2.23	\$2,914.60
28	1	1.8	0.3	9.08	1.0	9.53	\$12,450.63
29	1	1.8	0.3	6.09	1.0	6.40	\$8,356.70
30	1	1.8	0.3	7.01	1.0	7.36	\$9,618.26
31	1	1.8	0.3	2.03	1.0	2.13	\$2,782.90
32	1	1.8	0.3	3.51	1.0	3.69	\$4,815.90
33	1	1.8	0.3	4.39	1.0	4.61	\$6,018.15
34	1	1.8	0.3	7.01	1.0	7.36	\$9,618.26
35	1	1.8	0.3	4.05	1.0	4.25	\$5,554.08



Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment (inclusive of admin and GST)
36	1	1.8	0.3	4.53	1.0	4.76	\$6,216.52
37	1	1.8	0.3	4.84	1.0	5.09	\$6,646.17
41	1	1.8	0.3	6.14	1.0	6.44	\$8,418.64
42	1	1.8	0.3	4.15	1.0	4.36	\$5,697.00
43	1	1.8	0	3.66	1.0	3.85	\$5,026.51
44	1	1.8	0.3	1.42	1.0	1.49	\$1,941.57
45	1	1.8	0.3	2.43	1.0	2.56	\$3,340.35
46	1	1.8	0	2.50	1.0	2.63	\$3,432.31
47	1	1.8	0.3	4.27	1.0	4.48	\$5,857.64
48	1	1.8	0	2.51	1.0	2.64	\$3,449.57
49	1	1.8	0	2.51	1.0	2.64	\$3,442.93
50	1	1.8	0	6.66	1.0	6.99	\$9,132.02
51	1	1.8	0	4.07	1.0	4.27	\$5,577.73
52	1	1.8	0	4.51	1.0	4.74	\$6,188.97
53	1	1.8	0.3	9.60	1.0	10.08	\$13,173.55
54	1	1.8	0.3	4.67	1.0	4.90	\$6,406.20
55	1	1.8	0	2.59	1.0	2.72	\$3,554.36
56	1	1.8	0	4.47	1.0	4.69	\$6,134.13
57	1	1.8	0	2.35	1.0	2.47	\$3,220.73
58	1	1.8	0.3	7.63	1.0	8.01	\$10,470.21
59	1	1.8	0	3.61	1.0	3.80	\$4,958.68
60	1	1.8	0.3	7.00	1.0	7.35	\$9,600.17
61	1	1.8	0.3	4.29	1.0	4.50	\$5,882.15
62	1	1.8	0.3	1.19	1.0	1.25	\$1,636.57
63	1	1.8	0	0.52	1.0	0.55	\$713.93
64	1	1.8	0	1.36	1.0	1.43	\$1,865.96
65	1	1.8	0.3	3.64	1.0	3.82	\$4,989.77
66	1	1.8	0.3	3.64	1.0	3.82	\$4,987.02
67	1	1.8	0	3.48	1.0	3.66	\$4,780.19
68	1	1.8	0.3	2.42	1.0	2.54	\$3,315.03

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment (inclusive of admin and GST)
69	1	1.8	0	1.33	1.0	1.40	\$1,827.71
70	1	1.8	0	3.34	1.0	3.50	\$4,576.57
71	1	1.8	0	1.11	1.0	1.17	\$1,524.20
72	1	1.8	0	2.00	1.0	2.10	\$2,745.98
73	1	1.8	0	1.93	1.0	2.02	\$2,641.84
74	1	1.8	0	4.48	1.0	4.70	\$6,146.76
75	1	1.8	0	3.31	1.0	3.48	\$4,542.06
76	1	1.8	0	3.83	1.0	4.02	\$5,251.70
77	1	1.8	0	1.18	1.0	1.23	\$1,612.80
78	1	1.8	0	4.23	1.0	4.44	\$5,796.67
79	1	1.8	0	0.96	1.0	1.01	\$1,318.95
80	6	1.8	0	2.01	1.0	2.11	\$2,752.18
81	1	1.8	0	3.64	1.0	3.82	\$4,991.60
82	1	1.8	0	3.95	1.0	4.15	\$5,419.37
83	1	1.8	0	6.49	1.0	6.82	\$8,909.50
84	1	1.8	0	5.93	1.0	6.23	\$8,141.61
85	1	1.8	0	6.55	1.0	6.88	\$8,985.67
86	1	1.8	0	3.57	1.0	3.75	\$4,893.27
87	1	1.8	0.3	6.33	1.0	6.65	\$8,690.62
88	1	1.8	0.3	2.53	1.0	2.66	\$3,472.90
89	1	1.8	0	3.73	1.0	3.91	\$5,114.49
96	1	1.8	0.3	7.39	1.0	7.76	\$10,140.97
100	1	1.8	0.3	1.11	1.0	1.17	\$1,526.13
104	1	1.8	0.3	4.38	1.0	4.59	\$6,002.59
105	1	1.8	0.3	8.30	1.0	8.71	\$11,381.15
120	1	1.8	0	4.45	1.0	4.68	\$6,111.03
121	1	1.8	0	4.47	1.0	4.70	\$6,138.34
122	1	1.8	0.3	9.08	1.0	9.53	\$12,456.01
123	1	1.8	0.3	8.21	1.0	8.62	\$11,265.13
124	1	1.8	0	0.42	1.0	0.44	\$578.38

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment (inclusive of admin and GST)
125	1	1.8	0	7.12	1.0	7.48	\$9,769.86
126	1	1.8	0	4.49	1.0	4.71	\$6,159.40
127	1	1.8	0	4.84	1.0	5.09	\$6,645.06
131	1	1.8	0	1.41	1.0	1.48	\$1,938.28
132	1	1.8	0	4.10	1.0	4.30	\$5,621.27
133	1	1.8	0.3	7.01	1.0	7.36	\$9,611.47
134	1	1.8	0	4.59	1.0	4.82	\$6,292.15
135	1	1.8	0.3	7.55	1.0	7.93	\$10,360.47
139	1	1.8	0	6.56	1.0	6.88	\$8,995.76
144	1	1.8	0	7.31	1.0	7.69	\$10,034.45
145	1	1.8	0.3	4.40	1.0	4.62	\$6,041.54
<b>Total</b>	<b>106</b>			<b>418.48</b>		<b>439.41</b>	<b>\$574,122.61</b>

**Totals summary table**

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
<b>Application</b>	447.54	469.92	583,352.41	\$32,084.39	\$615,436.80

<b>Economies of Scale Factor</b>	0.5
<b>Rainfall (mm)</b>	917 - 926

# 6. Significant Environmental Benefit

A Significant Environmental Benefit (SEB) is required for approval to clear under Division 5 of the *Native Vegetation Regulations 2017*. The NVC must be satisfied that as a result of the loss of vegetation from the clearance that an SEB will result in a positive impact on the environment that is over and above the negative impact of the clearance.

## ACHIEVING AN SEB

Indicate how the SEB will be achieved by ticking the appropriate box and providing the associated information:

- Establish a new SEB Area on land owned by the proponent.
- Use SEB Credit that the proponent has established.
- Apply to have SEB Credit assigned from another person or body.
- Apply to have an SEB to be delivered by a Third Party.
- Pay into the Native Vegetation Fund.

## PAYMENT SEB

If a proponent proposes to achieve the SEB by paying into the Native Vegetation Fund, summary information must be provided on the amount required to be paid and the manner of payment:

The total SEB offset required for the clearance of 1.716 ha and 106 scattered trees is **\$615,436.80**, which includes a **\$32,084.39** administration fee.

# 7. References

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# 8. Appendices

## Appendix 1. List of flora species observed in the Project Area

Scientific Name	Common Name	EPBC Act	NPW Act
<i>Acacia mearnsii</i> *	Black Wattle		
<i>Acacia melanoxylon</i>	Blackwood		
<i>Acaena echinata</i>	Sheep's Burr		
<i>Acrotriche serrulata</i>	Cushion Ground-berry		
<i>Agapanthus praecox</i> ssp. <i>Orientalis</i> *			
<i>Allium triquetrum</i> *	Three-cornered Garlic		
<i>Anagallis</i> sp.*			
<i>Arthropodium</i> sp.	Vanilla-lily		
<i>Banksia marginata</i>	Silver Banksia		
<i>Briza maxima</i> *	Large Quaking-grass		
<i>Bulbine bulbosa</i>	Bulbine-lily		
<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	Sweet Bursaria		
<i>Caesia calliantha</i>	Blue Grass-lily		
<i>Callitris gracilis</i>	Southern Cypress Pine		
<i>Cassytha</i> sp.	Dodder-laurel		
<i>Cenchrus clandestinus</i> *	Kikuyu		
<i>Craspedia variabilis</i>	Billy-buttons		
<i>Cytisus scoparius</i> *	English Broom		
<i>Dactylis glomerata</i> *	Cocksfoot		
<i>Daviesia leptophylla</i>	Narrow-leaf Bitter-pea		
<i>Dianella revoluta</i> var. <i>revoluta</i>	Black-anther Flax-lily		
<i>Dichondra repens</i>	Kidney Weed		
<i>Dillwynia hispida</i>	Red Parrot-pea		
<i>Diuris pardina</i>	Spotted Donkey-orchid		
<i>Drosera whittakeri</i>	Scented Sundew		
<i>Epacris impressa</i>	Common Heath		
<i>Eucalyptus obliqua</i>	Messmate Stringybark		
<i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i>	Rough-bark Manna Gum		
<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	Manna Gum		R
<i>Exocarpos cupressiformis</i>	Native Cherry		
<i>Freesia cultivar</i> *	Freesia		
<i>Fumaria capreolata</i> *	White-flower Fumitory		
<i>Galium aparine</i> *	Cleavers		
<i>Genista monspessulana</i> *	Montpellier Broom		
<i>Geranium</i> sp.	Geranium		

Scientific Name	Common Name	EPBC Act	NPW Act
<i>Gonocarpus</i> sp.	Raspwort		
<i>Hakea</i> sp.	Hakea/Needlewood		
<i>Hedera helix</i> *	English Ivy		
<i>Hibbertia</i> sp.	Guinea-flower		
<i>Hypochaeris glabra</i> *	Smooth Cat's Ear		
<i>Iris</i> sp.*	Iris		
<i>Ixodia achillaeoides</i> ssp. <i>alata</i>	Hills Daisy		
<i>Kennedia prostrata</i>	Scarlet Runner		
<i>Lepidosperma semiteres</i>	Wire Rapier-sedge		
<i>Leptospermum continentale</i>	Prickly Tea-tree		
<i>Leptospermum myrsinoides</i>	Heath Tea-tree		
<i>Lomandra densiflora</i>	Soft Tussock Mat-rush		
<i>Lomandra juncea</i>	Desert Mat-rush		
<i>Lomandra micrantha</i> ssp. <i>micrantha</i>	Small-flower Mat-rush		
<i>Lomandra multiflora</i> ssp.	Many-flower Mat-rush		
<i>Luzula meridionalis</i>	Common Wood-rush		
<i>Moraea flaccida</i> *	One-leaf Cape Tulip		
<i>Moraea setifolia</i> *	Thread Iris		
<i>Narcissus</i> sp.*			
<i>Onopordum acanthium</i> *	Scotch Thistle		
<i>Oxalis perennans</i>	Native Sorrel		
<i>Oxalis pes-caprae</i> *	Soursob		
<i>Oxalis purpurea</i> *	One-o'clock		
<i>Pentameris pallida</i> *	Pussy Tail		
<i>Phalaris aquatica</i> *	Phalaris		
<i>Pinus radiata</i> *	Radiata Pine		
<i>Pittosporum undulatum</i> *	Sweet Pittosporum		
<i>Plantago lanceolata</i> var.*	Ribwort		
<i>Platylobium obtusangulum</i>	Holly Flat-pea		
<i>Pteridium esculentum</i> ssp. <i>esculentum</i>	Bracken Fern		
<i>Pterostylis nana</i>	Dwarf Greenhood		
<i>Pterostylis nutans</i>	Nodding Greenhood		
<i>Pterostylis pedunculata</i>	Maroon-hood		
<i>Pultenaea daphnoides</i>	Large-leaf Bush Pea		
<i>Quercus ilex</i> *			
<i>Ranunculus arvensis</i> *			
<i>Rhamnus alaternus</i> *	Blowfly Bush		
<i>Romulea</i> sp.*	Onion-grass		
<i>Rosa canina</i> *	Dog Rose		
<i>Rubus fruticosus aggregate</i> *	Blackberry		
<i>Rumex</i> sp.*	Dock		

Scientific Name	Common Name	EPBC Act	NPW Act
<i>Senecio hypoleucus</i>	Pale Groundsel		
<i>Senecio pterophorus</i> *	African Daisy		
<i>Sonchus sp.</i> *	Sow-thistle		
<i>Sporobolus africanus</i> *	Rat-tail Grass		
<i>Stackhousia monogyna</i>	Creamy Candles		
<i>Styphelia humifusa</i>	Cranberry Heath		
<i>Tetradlea pilosa</i>	Hairy Pink-bells		
<i>Themeda triandra</i>	Kangaroo Grass		
<i>Ulex europaeus</i> *	Gorse		
<i>Viburnum tinus</i> *	Laurestinus		
<i>Vicia sativa ssp.</i> *	Common Vetch		
<i>Vinca major</i> *	Blue Periwinkle		
<i>Watsonia sp.</i> *	Watsonia		

**Conservation status:**

**Aus:** Australia (EPBC Act). **SA:** South Australia (NPW Act). **Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. **ssp.:** the conservation status applies at the sub-species level. **Mi:** listed as migratory under the EPBC Act. **Mi (W):** listed as a Migratory Wetland species under the EPBC Act. **Mi (T):** listed as a Migratory Terrestrial species under the EPBC Act. **Mi (Ma):** listed as a Migratory Marine species under the EPBC Act.

\* indicates an introduced species.

## Appendix 2. List of fauna species observed in the Project Area

Scientific Name	Common Name	EPBC Act	NPW Act	Number of individuals
<b>AVES</b>				
<i>Acanthiza lineata</i>	Striated Thornbill			3
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill			2
<i>Anthochaera carunculata</i>	Red Wattlebird			1
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo			1+
<i>Cacatua sanguinea gymnopsis</i>	Little Corella			1+
<i>Caligavis chrysops</i>	Yellow-faced Honeyeater			2
<i>Chenonetta jubata</i>	Maned Duck			1+
<i>Colluricincla harmonica</i>	Grey Shrikethrush			1
<i>Cormobates leucophaea</i>	White-throated Treecreeper			2
<i>Corvus mellori</i>	Little Raven			1
<i>Dacelo novaeguineae novaeguineae</i>	Laughing Kookaburra			3
<i>Dicaeum hirundinaceum hirundinaceum</i>	Mistletoebird			1
<i>Egretta novaehollandiae</i>	White-faced Heron			1 (flying over)
<i>Gymnorhina tibicen</i>	Australian Magpie			1+
<i>Malurus cyaneus</i>	Superb Fairywren			1+
<i>Phaps chalcoptera</i>	Common Bronzewing			1
<i>Platycercus elegans</i>	Crimson Rosella			2
<i>Rhipidura albiscapa</i>	Grey Fantail			1
<i>Smicronis brevirostris</i>	Weebill			1+
<i>Strepera versicolor</i>	Grey Currawong			1
<i>Trichoglossus moluccanus moluccanus</i>	Rainbow Lorikeet			2
<i>Turdus merula merula*</i>	Common Blackbird			1+
<i>Zanda funerea whiteae</i>	Yellow-tailed Black Cockatoo		V	4
<b>MAMMLIA</b>				
<i>MACROPODIDAE</i>	Kangaroos			1
<i>Oryctolagus cuniculus*</i>	European Rabbit			1+
<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R	scat observed only

### Conservation status:

Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (T): listed as a Migratory Terrestrial species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

\* indicates an introduced species.

### Appendix 3. Scattered tree using fauna species in the Project Area

Scientific name	Common name	EPBC Act	NPW Act	MLR	Resource use	Habitat / status
<b>AVES</b>	<b>Birds</b>					
<i>Ninox boobook</i>	Australian Boobook			NT	P, H	w
<i>Aegotheles cristatus cristatus</i>	Australian Owlet-nightjar			RA	H	w
<i>Daphoenositta chrysoptera pileata</i>	Black-capped Sittella/Varied Sittella			VU	F	w
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater		V	CR	P, F	w
<i>Climacteris picumnus picumnus</i>	Brown Treecreeper			VU	P, H	w
<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater			NT	P, F	w
<i>Melopsittacus undulatus</i>	Budgerigar			RA	P, H	s
<i>Nymphicus hollandicus</i>	Cockatiel			RA	P, H	s
<i>Artamus cyanopterus</i>	Dusky Woodswallow			RA	P	w
<i>Neophema elegans elegans</i>	Elegant Parrot		R	VU	P, H	w
<i>Chalcites basalis</i>	Horsfield's Bronze Cuckoo			NT	P	s
<i>Microeca fascinans fascinans</i>	Jacky Winter		R	CR	P	w
<i>Hieraaetus morphnoides</i>	Little Eagle		V	EN	P	w
<i>Anas superciliosa</i>	Pacific Black Duck			RA	H	s
<i>Geopelia placida placida</i>	Peaceful Dove			VU	P	w
<i>Falco peregrinus macropus</i>	Peregrine Falcon		R	RA	P, H, N	w/r
<i>Parvipsitta porphyrocephala</i>	Purple-crowned Lorikeet			NT	P, H, F	w/s
<i>Merops ornatus</i>	Rainbow Bee-eater			VU	P	s
<i>Psephotus haematonotus haematonotus</i>	Red-rumped Parrot			NT	P, H	w/r
<i>Pachycephala rufiventris</i>	Rufous Whistler			NT	P, F	w/s
<i>Todiramphus sanctus sanctus</i>	Sacred Kingfisher			NT	P, H	w
<i>Petroica boodang boodang</i>	Scarlet Robin		R	VU	P	w
<i>Zosterops lateralis</i>	Silvereye			NT	P, F	w/s
<i>Pardalotus punctatus</i>	Spotted Pardalote			NT	P, F	w/s

Scientific name	Common name	EPBC Act	NPW Act	MLR	Resource use	Habitat / status
<i>Lophoictinia isura</i>	Square-tailed Kite		E	EN	P	s
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater		R	EX	P, F	w
<i>Petrochelidon nigricans</i>	Tree Martin			NT	P, H	w/s
<i>Artamus superciliosus</i>	White-browed Woodswallow			RA	P	s
<i>Melithreptus lunatus</i>	White-naped Honeyeater			NT	P, F	w
<i>Ardea pacifica</i>	White-necked Heron			VU	P, N	s
<i>Rhipidura leucophrys leucophrys</i>	Willie Wagtail			NT	P, N, F	w/r
<i>Acanthiza nana</i>	Yellow Thornbill			NT	P, F	w
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill			NT	P, N	w/r
<i>Zanda funerea whiteae</i>	Yellow-tailed Black Cockatoo		V	VU	P, H	w
<b>MAMMALIA</b>	<b>Mammals</b>					
<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R	LC	H, N, F	w/r
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum			RA	H, N, F	w/r
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	R	RA	P, F	r
<p><b>EPBC Act:</b> Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable</p> <p><b>NPW Act:</b> CE = Critically endangered, E = Endangered, V = Vulnerable, R = Rare</p> <p><b>MLR:</b> LC = Least Concern (Common), NT = Near Threatened (Uncommon), RA = Rare, VU = Vulnerable, EN = Endangered, CR = Critically Endangered</p> <p><b>Resource use:</b> P = perching/roosting, N = nesting, H = using hollow for nesting/roosting, F = feeding</p> <p><b>Habitat/status:</b> s = seasonal (includes waterbirds using trees near seasonal wetlands, seasonal and nomadic species), w = woodland birds that occasionally use adjacent scattered trees, r=species that can reside in scattered trees.</p> <p><b>Sources:</b> BSBSA records within 5 km of the Project Area (DEW 2022b), Scattered Tree Assessment Manual (NVC 2020b).</p>						

## Appendix 4. BDBSA flora recorded within 5 km of the Project Area

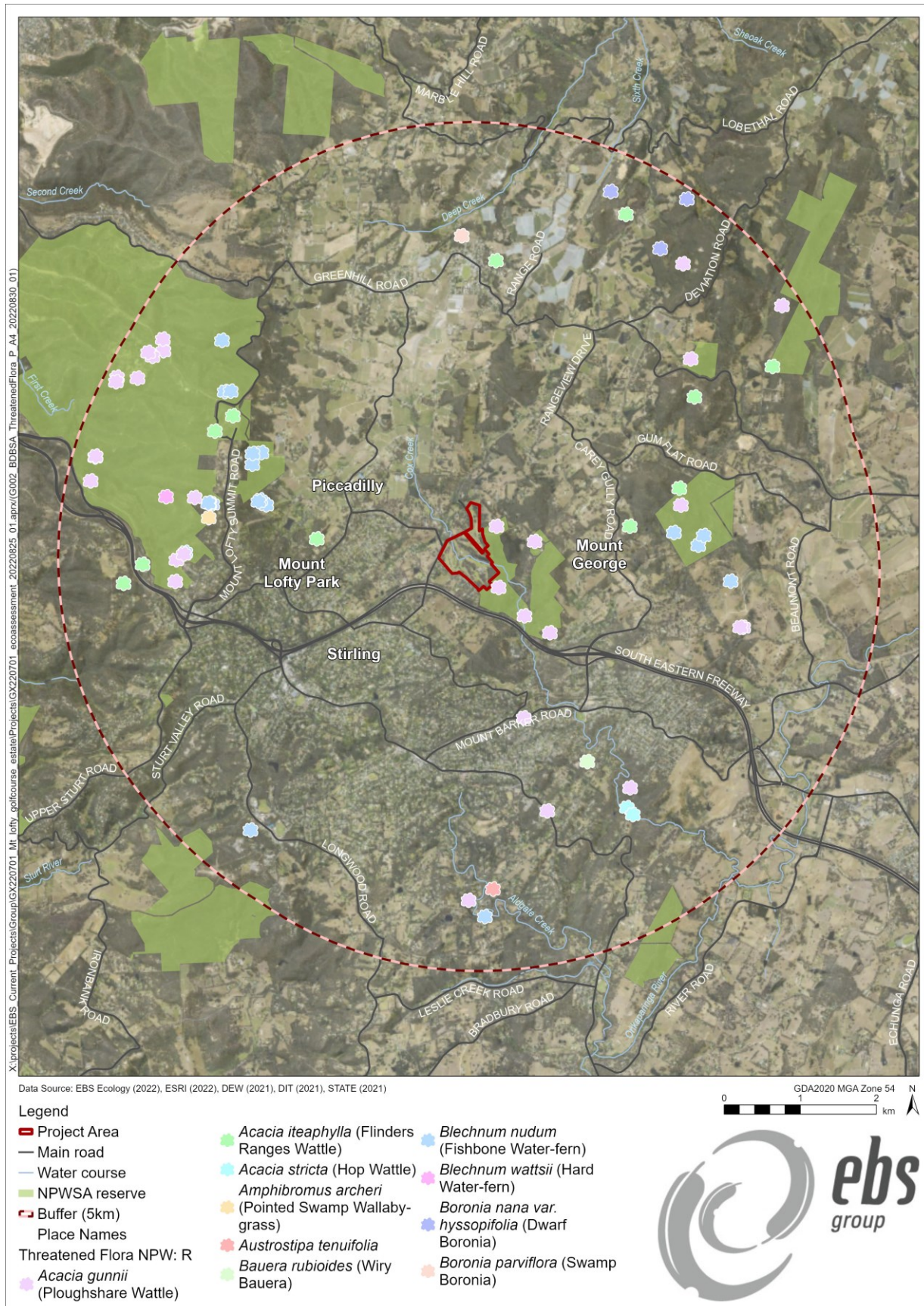


Figure 10. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 1 of 5).



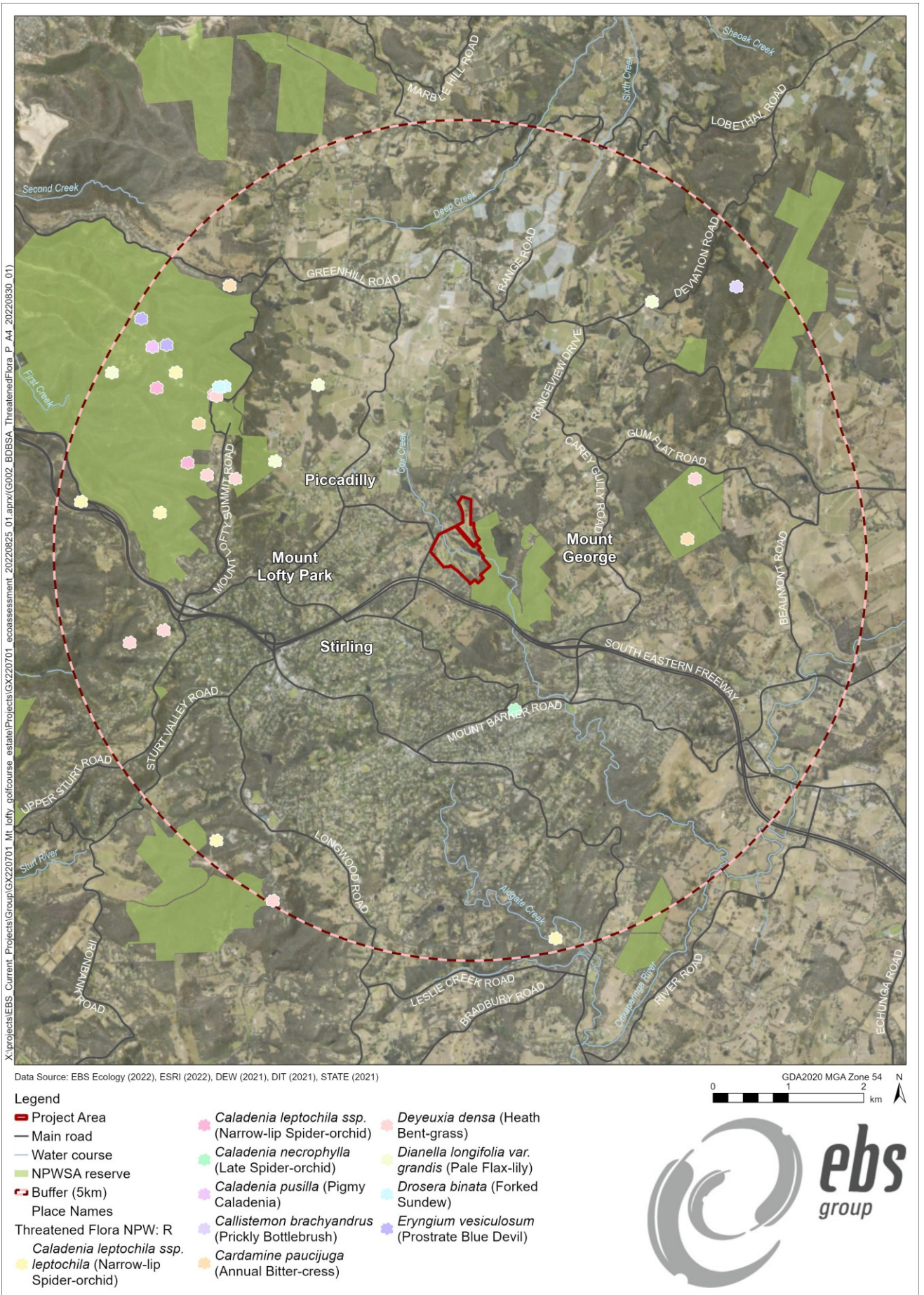


Figure 11. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 2 of 5).

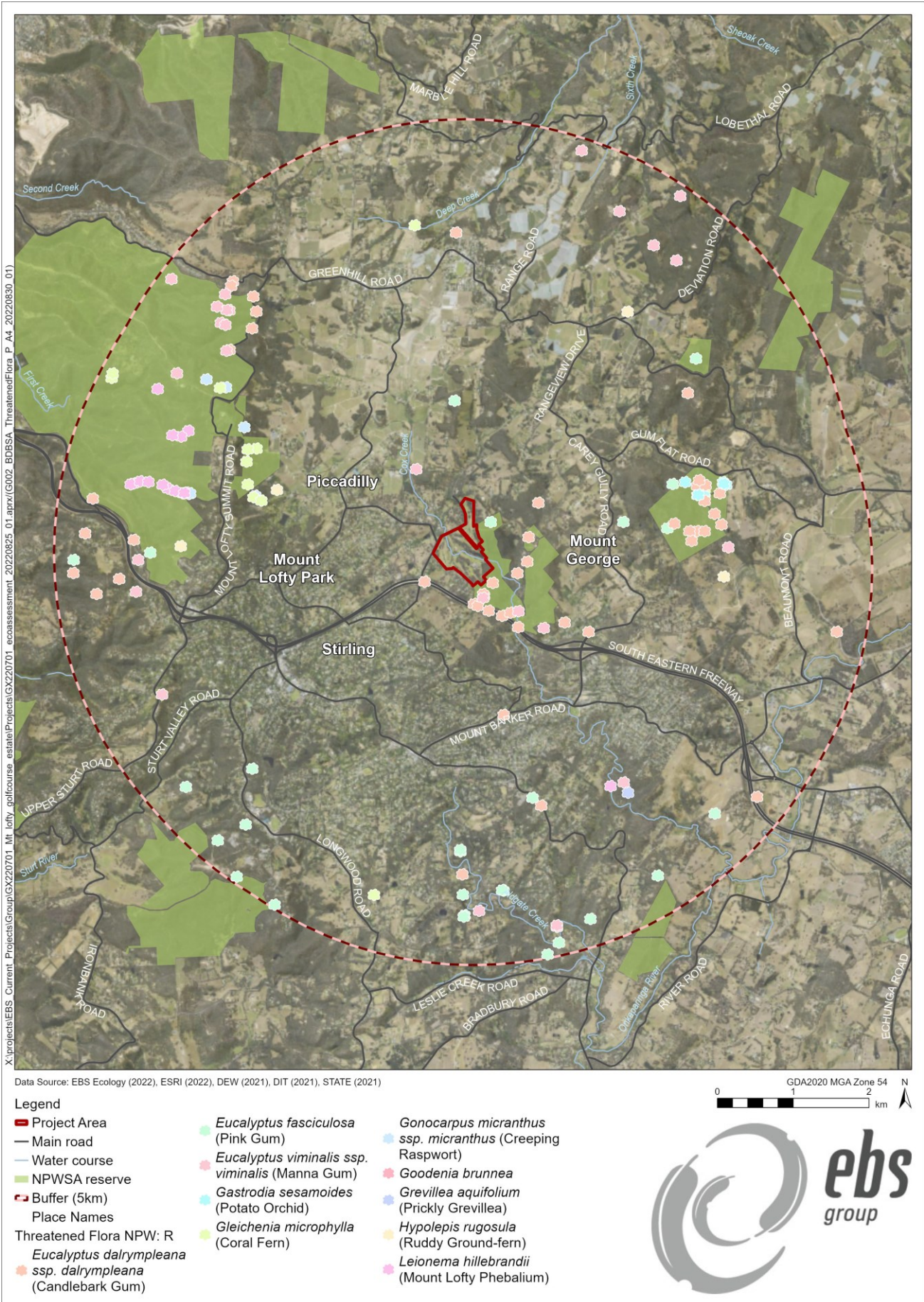
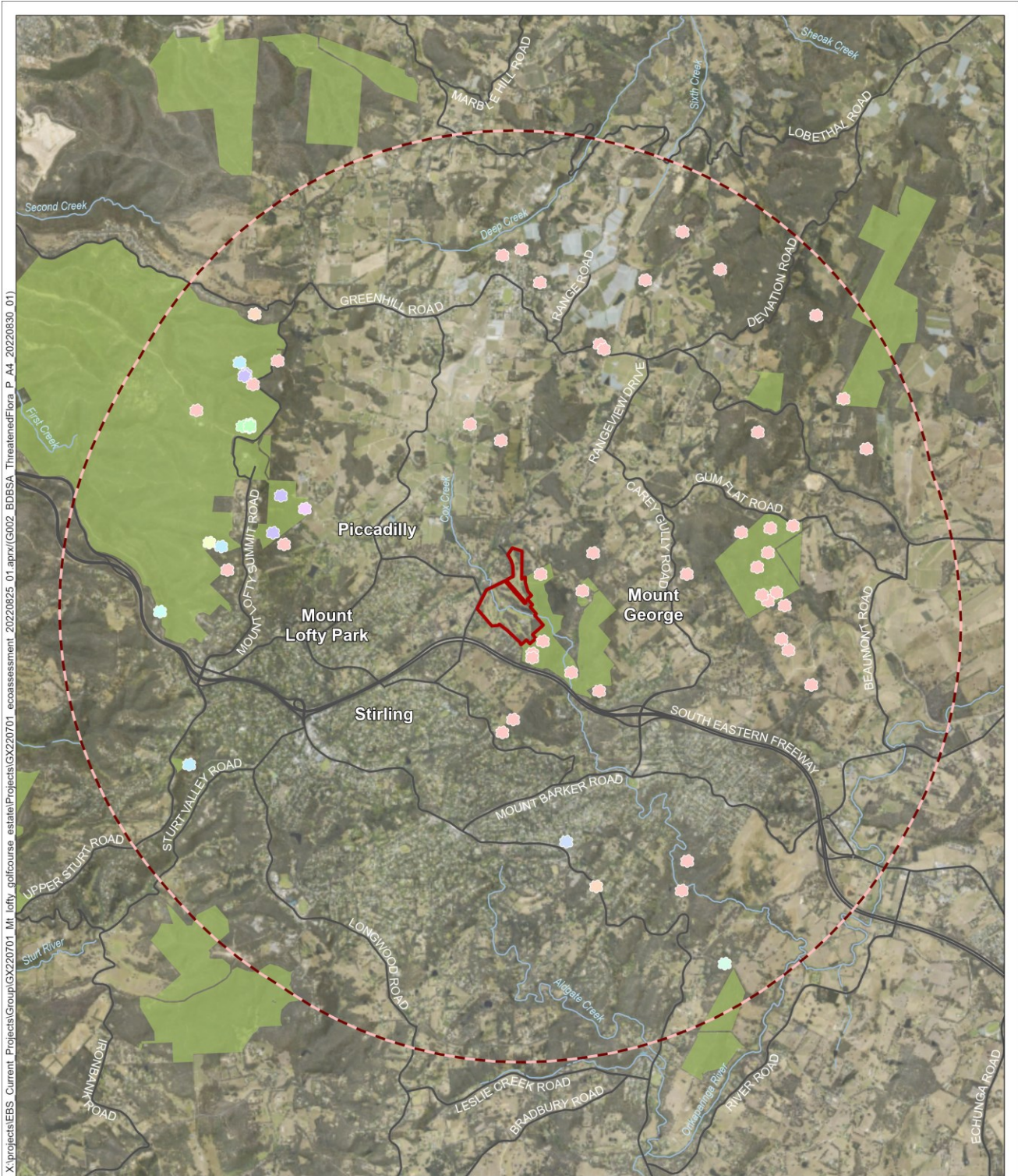


Figure 12. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 3 of 5).



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Data Source: EBS Ecology (2022), ESRI (2022), DEW (2021), DIT (2021), STATE (2021)

**Legend**

- ▬ Project Area
- Main road
- Water course
- NPWSA reserve
- Buffer (5km)
- Place Names
- Threatened Flora NPW: R
- Logania saxatilis* (Rock Logania)

- Lycopodiella lateralis* (Slender Clubmoss)
- Machaerina gunnii* (Slender Twig-rush)
- Melaleuca armillaris* ssp. *akineta* (Needle-leaf Honey-myrtle)
- Mentha diemenica* (Slender Mint)

- Nymphoides crenata* (Wavy Marshwort)
- Poa umbricola* (Shade Tussock-grass)
- Pultenaea graveolens* (Scented Bush-pea)
- Pultenaea kraehenbuehlii* (Tothill Bush-pea)
- Rytidosperma laeve* (Smooth Wallaby-grass)

GDA2020 MGA Zone 54  
 0 1 2 km



**Figure 13. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 4 of 5).**

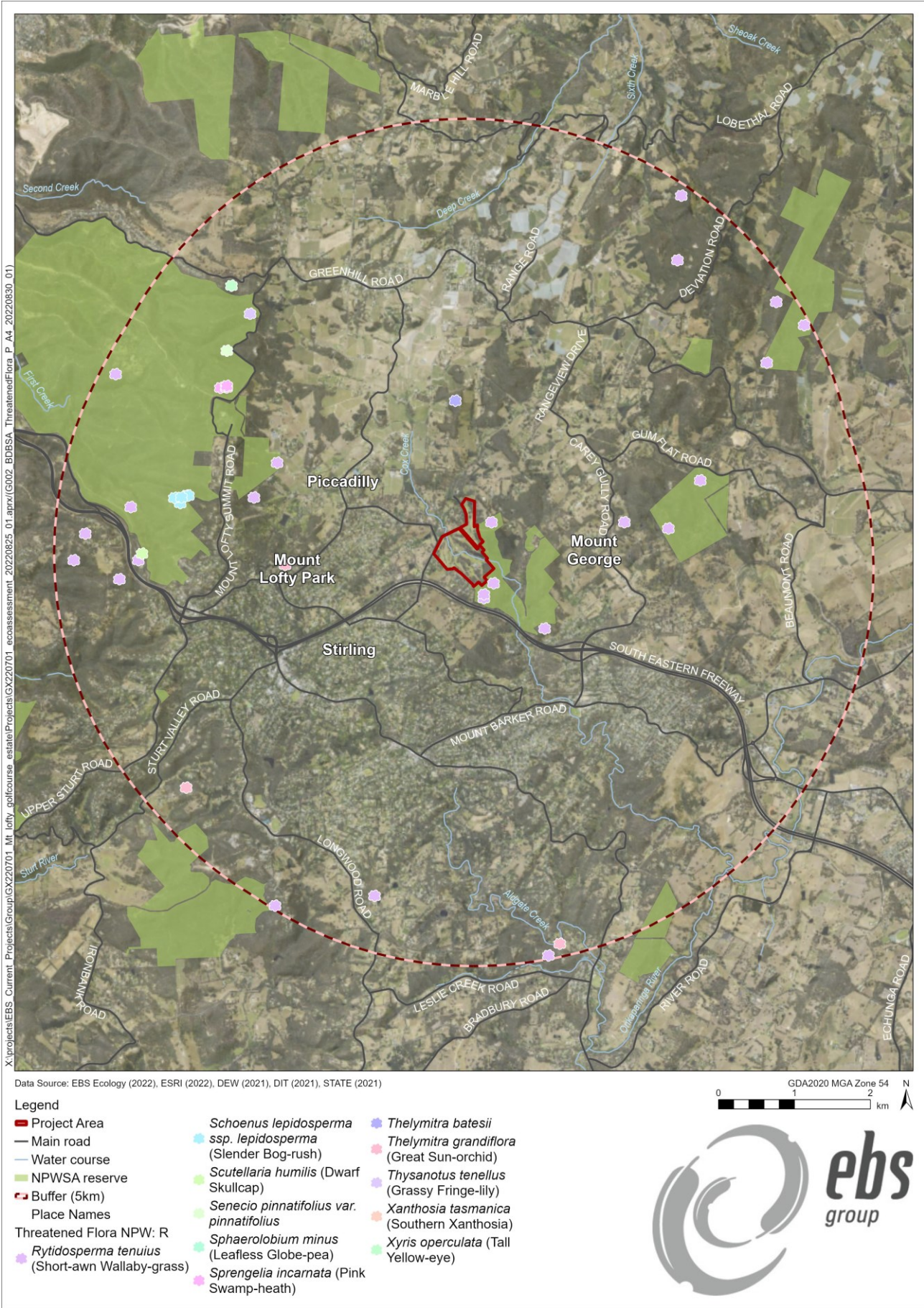


Figure 14. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 5 of 5).

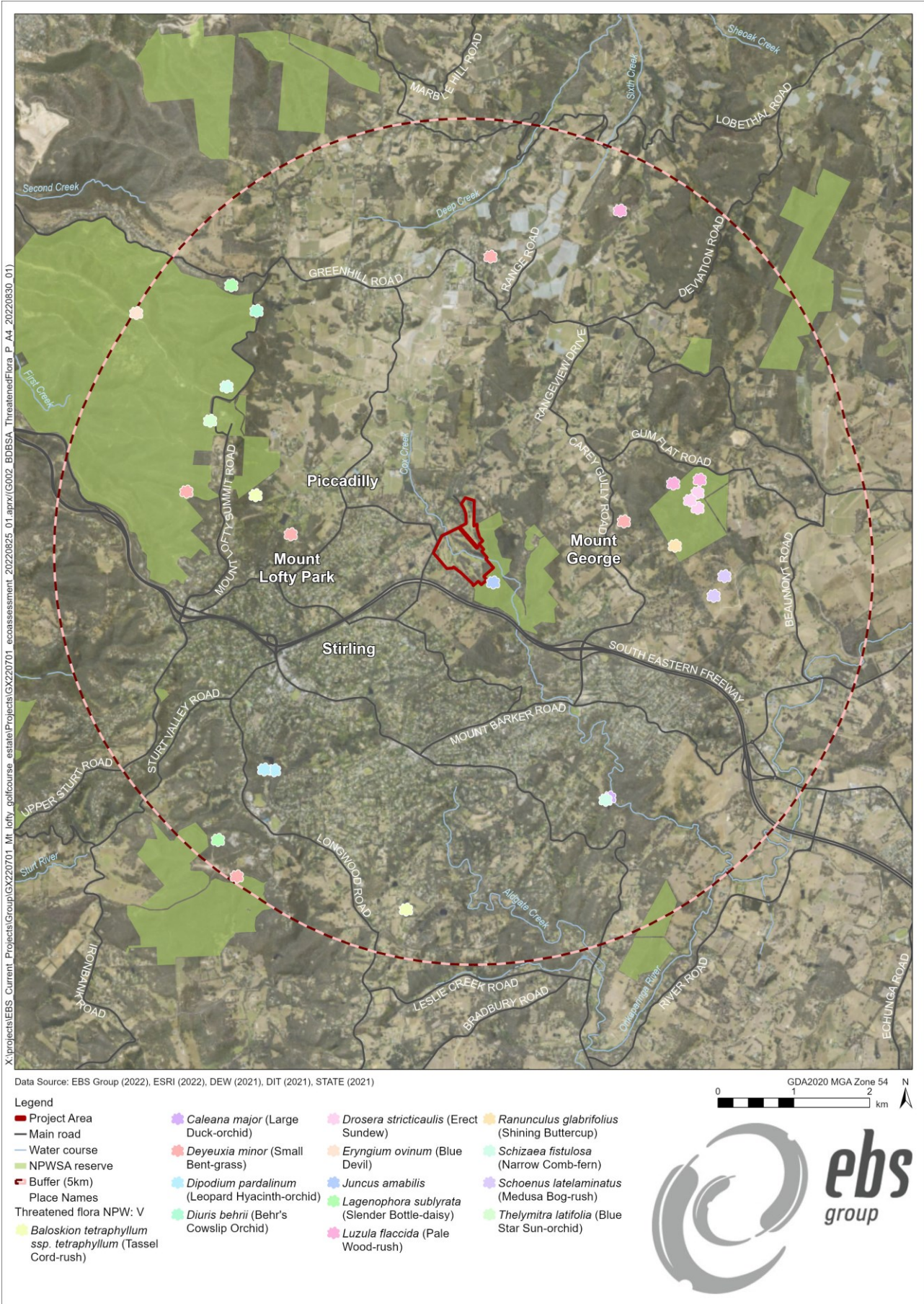


Figure 15. BDBSA flora record for State listed Vulnerable species, located within 5 km of the Project Area.

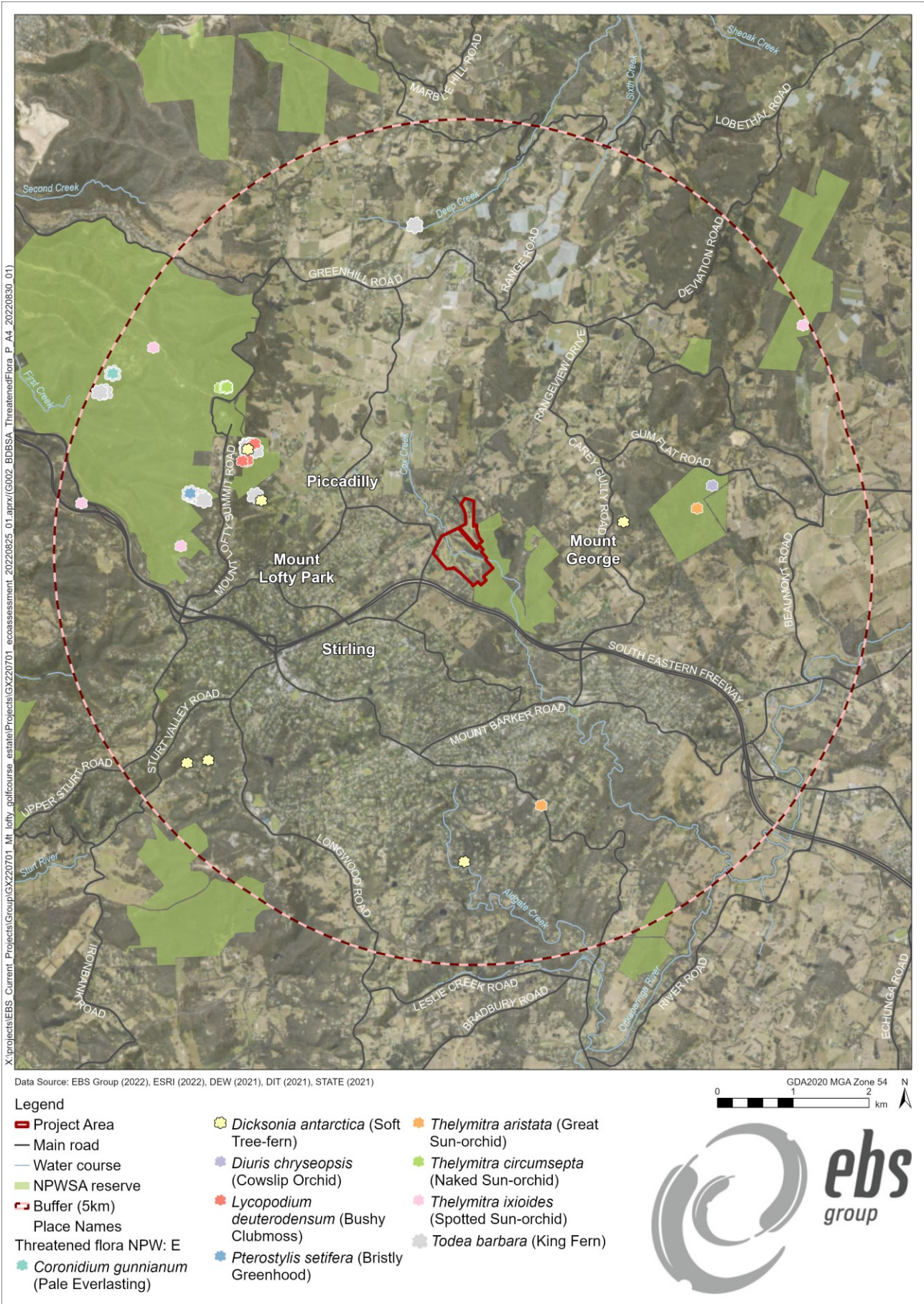


Figure 16. BDBSA flora record for State listed Endangered species, located within 5 km of the Project Area.

**Appendix 5. Assessment of likelihood of national (EPBC Act) and State (NPW Act) listed threatened flora identified by the PMST (DCCEEW 2023) and BDBSA (DEW 2022b) to occur in the Project Area (green shading = known / highly likely or likely to occur, orange shading = possible to occur).**

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Acacia gunnii</i>	Ploughshare Wattle		R	2	2022	Usually on rocky hillsides and amongst rocky outcrops in open forest, associated with <i>Eucalyptus obliqua</i> and <i>Eucalyptus baxteri</i> (SSCC 2018).	<b>Likely</b> – Some suitable habitat within the Project Area and <i>E obliqua</i> observed during the field survey.
<i>Acacia iteaphylla</i>	Flinders Ranges Wattle		R	2	2022	Naturally occurs in the Flinders Ranges, across to the Gawler Ranges, and on the Eyre Peninsula. Naturalised beyond its native range in some parts of south-eastern and southern SA (SSCC 2018).	<b>Possible</b> – Some suitable within the Project Area. Although widely planted, regeneration of this species is likely.
<i>Acacia stricta</i>	Hop Wattle		R	2	2005	Found primarily in small, localised areas in the southeast of SA between Millicent and Mount Gambier in association with <i>Eucalyptus baxteri</i> over a heathy understorey, often in damp areas (SSCC 2018).	<b>Unlikely</b> – Despite recent records, this species is generally confined to the southeast of SA.
<i>Amphibromus archeri</i>	Pointed Swamp Wallaby-grass		R	2	2018	Grows in damp areas such as lagoons, waterholes, and swamps, often on predominantly sandy soils. Found in KI, in the Mount Lofty Ranges and in the southeast of SA (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat including water sources are present in the Project Area, though not within proposed areas of impact.
<i>Austrostipa tenuifolia</i>			R	2	2018	Found on the Eyre Peninsula, Mount Lofty Ranges, the Murray, and the upper South-east in South Australia, growing sandy soils in grassland or grassy woodland associated with <i>Callitris</i> or <i>Allocasuarina</i> (SSCC 2018).	<b>Possible</b> – Recent records, though associated vegetation community is not present in Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Baloskion tetraphyllum</i> ssp. <i>tetraphyllum</i>	Tassel Cord-rush		V	2	2012	Very limited occurrences in the lower South-east of South Australia, between Millicent and Mount Gambier, usually in swamping areas (SSCC 2018).	<b>Unlikely</b> – Despite recent records, this species is generally confined to the southeast of SA.
<i>Bauera rubioides</i>	Wiry Bauera		R	2	2011	Found on Kangaroo Island and in the southern Mount Lofty Ranges in South Australia, growing in damp heathland and heathy forests (SSCC 2018).	<b>Unlikely</b> – Despite recent records, this species is generally confined to Kangaroo Island.
<i>Blechnum nudum</i>	Fishbone Water-fern		R	2	2022	Found on Kangaroo Island and southern Mount Lofty Ranges in South Australia, growing along stream banks in shaded gullies (SSCC 2018).	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Blechnum wattsii</i>	Hard Water-fern		R	2	2010	SA: SL KI SE. The habitat of this species is usually identical to those of <i>Blechnum minus</i> and <i>Blechnum nudum</i> . These three species always co-occur and are often intermingled within the same clump. Grows in wet forest types such as rainforest, wet eucalypt forest and riparian vegetation where it can form the dominant groundcover. Grows in great profusion in permanently damp areas and is most abundant on stream banks and near waterfalls. It can sometimes form extensive colonies on flatter sites or in gully bottoms.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Boronia nana</i> var. <i>hyssopifolia</i>	Dwarf Boronia		R	2	2022	Occurs in the SE region of SA. Growing in sandy heath with <i>Eucalyptus obliqua</i> , <i>Leptospermum continentale</i> , <i>Stylidium graminifolium</i> , <i>Thelionema caespitosum</i> and dune crests with <i>Eucalyptus baxteri</i> association.	<b>Possible</b> – Some suitable habitat within the Project Area including <i>Eucalyptus</i> spp.
<i>Boronia parviflora</i>	Swamp Boronia		R	2	2018	Found on the western end of Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia growing in wet heath and swampy areas (SSCC 2018).	<b>Unlikely</b> – Minimal suitable swampy habitat in Project Area. Isolated nearby record not positively identified.



Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Caladenia argocalla</i>	White-beauty Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Endemic to the Mount Lofty Ranges Region of SA. Occurs in intact grassy woodlands often with <i>E. leucoxyton</i> (South Australian Blue Gum) and <i>Allocasuarina verticillata</i> (Drooping Sheoak). Usually grows on a gentle slope with a southerly aspect and in clay loam soils. Flowering from late September to October (Quarmby 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Caladenia behrii</i>	Pink-lipped Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Occurs on the Fleurieu Peninsula of SA. Grows in fertile, shallow loams, amongst <i>Eucalyptus gonicalyx</i> / <i>E. fasciculosa</i> woodland and amongst <i>E. obliqua</i> / <i>E. microcarpa</i> / <i>E. leucoxyton</i> woodland. The understorey is usually open and shrubby. Also recorded amongst <i>E. fasciculosa</i> & <i>Xanthorrhoea semiplana</i> . Generally found in quartzite-derived soils on steep south facing slopes but also on ridge tops and occasionally near creek beds. Often grows alongside bushwalking paths, vehicle tracks or roads due to the openness of these locations (TSSC 2021).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Caladenia gladiolata</i>	Bayonet Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Occurs singly or in small groups in shrubby or grassy woodland and forest in well-drained soils dominated by <i>Eucalyptus leucoxyton</i> , <i>Eucalyptus cladocalyx</i> or <i>Eucalyptus fasciculosa</i> . Only known from a few populations (Quarmby 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Caladenia leptochila</i> ssp. <i>leptochila</i>	Narrow-lip Spider-orchid		R	2	2020	Found growing in clay or gravelly soils in shrubby forest in the Mount Lofty Ranges (Jones, 2006).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Caladenia necrophylla</i>	Late Spider-orchid		R	2	2008	Mainly occurs in the south-east region of SA but has also been found in EP, KI, MU regions. Grows in heathy open forest, coastal shrub, heathland, tea-tree scrub.	<b>Unlikely</b> – Despite recent records, this species is generally confined to the southeast of SA.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Caladenia pusilla</i>	Pigmy Caladenia		R	2	2013	SA: FR EP SL KI SE. Within the Eyre Peninsula region grows in Koppio Hills and Blue gum woodland. On KI, grows on mounds near river, sandy clay in heath. Within the Southern Lofty region, grows in stringybark scrub.	<b>Possible</b> – Some suitable habitat within the Project Area including stringybark scrub.
<i>Caladenia rigida</i>	Stiff White Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Inhabits ridge tops and hillslopes in grey-brown loam often associated with coarse quartzite gravel or sandstone pebbles. Vegetation is usually an open-forest with a relatively open understorey of low shrubs and sedges (Quarmby 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Caleana major</i>	Large Duck-orchid		V	2	2000	Usually found in Eucalyptus woodland, coastal or swampy shrubland and heathland. Forms small colonies in white sands in open <i>Eucalyptus baxteri</i> forest and often associated with <i>Banksia ornata</i> (ALA 2022).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Callistemon brachyandrus</i>	Prickly Bottlebrush		R	2	2019	Found along the Murray River in South Australia mainly between Swan Reach and Waikerie growing in the sandy soils of alluvial flats (SSCC 2018).	<b>Unlikely</b> – Despite recent records, this species is generally confined to the mid-Murray region of SA.
<i>Cardamine paucijuga</i>	Annual Bitter-cress		R	2	2011	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in rich soils in moist to dry habitats (SSCC 2018).	<b>Possible</b> – Some suitable habitat within the Project Area.
<i>Coronidium gunnianum</i>	Pale Everlasting		E	2	2006	Found in the southern Mount Lofty Ranges, Burra Gorge and a single record from the lower South-east in South Australia, growing in grasslands and riverine woodlands on soils that are prone to inundation (SSCC 2018).	<b>Possible</b> – Some suitable habitat within the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Deyeuxia densa</i>	Heath Bent-grass		R	2	2021	Commonly in heaths, sedgelands and in stream banks in damp, open to lightly shaded sites.	<b>Likely</b> – Some suitable habitat within the Project Area and recent records.
<i>Deyeuxia minor</i>	Small Bent-grass		V	2	2020	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower-South-east growing in damp areas under light eucalypt cover or margins of wet sclerophyll forest (SSCC 2018).	<b>Likely</b> – Some suitable habitat within the Project Area and recent records.
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily		R	2	2019	Occurs under a variety of overstorey Eucalypt species but is a grassy woodland specialist, e.g., Blue Gum, Candlebark, Manna Gum, Stringybark and Grey Box.	<b>Likely</b> – Some suitable habitat within the Project Area and recent records.
<i>Dicksonia antarctica</i>	Soft Tree-fern		E	2	2020	SA: SL SE. Grows in numerous types of plant communities and is particularly abundant in wet forest communities. It occurs in forest types ranging from rainforest to sheltered gullies within dry sclerophyll forest and subalpine forest.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Dipodium pardalinum</i>	Leopard Hyacinth-orchid		V	2	2012	Occurs from Naracoorte on the Victorian border to the Mount Lofty Ranges. In the Adelaide-Mount Lofty region the species is found in <i>Eucalyptus obliqua</i> woodland growing in association with <i>Acacia myrtifolia</i> , <i>Xanthorrhoea semiplana</i> ssp. <i>tateana</i> and <i>Pteridium esculentum</i> (Willson and Bignall 2009).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area including <i>Eucalyptus obliqua</i> , though associated understorey species not present.
<i>Diuris behrii</i>	Behr's Cowslip Orchid		V	2	2015	Found in the southern Flinders Ranges and the Mount Lofty Ranges with a few records from Eyre Peninsula growing in native grassland, open woodland and grassy forest; grows on more fertile soils, especially amongst <i>Themeda</i> sp. (Kangaroo Grass) and <i>Triodia</i> on gentle slopes and flats (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Diuris chryseopsis</i>	Cowslip Orchid		E	2	1998	Presumed extinct in the Mt Lofty Ranges (but may have been rediscovered in Kuitpo Native Forest Reserve) and found only between Naracoorte and Mount Gambier in South Australia, growing in damper grassy patches in woodland around waterholes, along creeks, on cooler slopes in rich, moist soils (SSCC 2018).	<b>Unlikely</b> – No recent records and this species is generally confined to the southeast of SA.
<i>Drosera binata</i>	Forked Sundew		R	2	2017	Found in the southern Mount Lofty Ranges, on the western end on Kangaroo Island and in the lower South-east in South Australia, growing in wet sand and sandy peat in swamps, on creek banks and seepage lines in rock-faces (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Drosera stricticaulis</i>	Erect Sundew		V	2	1998	Found on southern Eyre Peninsula and on Dutchmans Stern in the Flinders Ranges in South Australia, growing on sandy clay-loam along watercourses and granite outcrops (SSCC 2018).	<b>Unlikely</b> – No recent records and this species is generally confined to the Eyre Peninsula in SA.
<i>Eryngium ovinum</i>	Blue Devil		V	2	2013	Found in the wetter parts of the Mount Lofty Ranges and a few sites in the lower South-East in South Australia, growing in open woodland on damp clay and sandy soils (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Eryngium vesiculosum</i>	Prostrate Blue Devil		R	2	2010	Found scattered in South Australia, from the Lake Eyre region to the lower South-east, growing in sandy flats in low-lying damp areas (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Eucalyptus dalrympleana</i> ssp. <i>dalrympleana</i>	Candlebark Gum		R	2	2022	Often in poorer sandy soils, in woodland or as an emergent in low shrublands. Commonly associated with <i>E. baxteri</i> , <i>E. cosmophylla</i> , <i>E. diversifolia</i> , <i>E. leptophylla</i> and <i>E. leucoxydon</i> (Nicolle, 2013).	<b>Possible</b> – Very recent records, some suitable habitat and associated species are present within the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Eucalyptus fasciculosa</i>	Pink Gum		R	2	2021	Grows on moist, well-drained alluvial soils near watercourses but also grows on drier sites at higher altitudes. Tolerates snow and some flooding (Nicolle, 2013).	<b>Possible</b> – Very recent records and some suitable habitat is present within the Project Area.
<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	Manna Gum		R	2	2022	Generally recorded as growing in mallee scrubland but has also been found growing in coastal heathlands, sclerophyll forests and woodlands. It is also found in heathy openings in wet sclerophyll forest and in a swamp at Mt Compass (Nicolle, 2013).	<b>Known / Highly Likely</b> – Recorded within the Project Area.
<i>Euphrasia collina</i> ssp. <i>osbornii</i>	Osborn's Eyebright	EN	E	1	Species or species habitat known to occur within area	Confined to SA. Has been collected in the Upper SE (Yumali-Meningie Road), on eastern KI. (Dudley Peninsula-W of Cape Willoughby), Eyre Peninsula (Venus Bay), Yorke Peninsula, Northern Lofty region (Clare, Burra), Southern Lofty region (inc. Fleurieu Peninsula and Mt Compass) and the Flinders Ranges. Generally recorded as growing in mallee scrubland but has also been found growing in coastal heathlands, sclerophyll forests and woodlands. It is also found in heathy openings in wet sclerophyll forest and in a swamp at Mt Compass (Moritz and Bickerton 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Gastrodia sesamoides</i>	Potato Orchid		R	2	2021	Found in the southern Mount Lofty Ranges, Kangaroo Island and the lower South-east in South Australia, growing in areas of high rainfall in wet sclerophyll forests, dry sclerophyll forests, woodlands and riparian areas (SSCC 2018).	<b>Likely</b> – Some suitable habitat within the Project Area and recent records.
<i>Gleichenia microphylla</i>	Coral Fern		R	2	2022	Found southern Mount Lofty and the lower South- East in South Australia, growing in sunny damp sites around swamps and at bases of cliffs in open forest (SSCC 2018).	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Glycine latrobeana</i>	Clover Glycine	VU	V	1	Species or species habitat likely to occur within area	Inhabits native grasslands, dry sclerophyll forests, woodlands and low open woodlands, typically with a grassy ground layer, and growing on undulating plains. Prefers gentle south-west facing ridge slopes and lower south facing river valley slopes (Carter and Sutter 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Gonocarpus micranthus</i> ssp. <i>micranthus</i>	Creeping Raspwort		R	2	2018	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing on wet, peaty soils and is generally confined to damp or boggy situations (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Goodenia brunnea</i>			R	2	2018	This goodenia grows in rocky situations and near watercourses primarily in the far north-west of South Australia.	<b>Unlikely</b> – No recent records and this species is generally confined to the far northwest of SA.
<i>Grevillea aquifolium</i>	Prickly Grevillea		R	2	1997	On calcareous sand in sclerophyllous woodland, and in heath on sands, limestone pavements and sandstone outcrops.	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Hypolepis rugosula</i>	Ruddy Ground-fern		R	2	2022	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing along shady streams or open wetter areas. Where it forms dense thickets. It is frequently in ditches or on embankments beside tracks (SSCC 2018).	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Juncus amabilis</i>			V	2	2009	Found in the southern Mount Lofty Ranges and the South-east in South Australia, growing damp sites.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Lagenophora sublyrata</i>	Slender Bottle-daisy		V	2	2019	Found on Kangaroo Island, southern Mount Lofty Ranges and lower South-east in South Australia, growing in moist gullies and near water (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Leionema hillebrandii</i>	Mount Lofty Phebalium		R	2	2022	Found in heathy woodland and forest gullies. Often in open rocky habitat along steep gullies.	<b>Possible</b> – Very recent records and some suitable habitat is present in the Project Area.
<i>Logania saxatilis</i>	Rock Logania		R	2	1996	Occurs in the FR, NL, MU, SL regions of SA. Associated with Grassy Woodlands in the foothills and hills face of the Southern Lofty Ranges.	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Luzula flaccida</i>	Pale Wood-rush		V	2	2020	Found in the southern Mount Lofty Ranges and the lower South-east in South Australia, growing in moist rather shady sites in grassy woodland or open grassland (SSCC 2018).	<b>Possible</b> – Very recent records and some suitable habitat is present in the Project Area.
<i>Lycopodiella lateralis</i>	Slender Clubmoss		R	2	2017	The species occurs in scattered swampy places in the vicinity of Mt Compass, Mt Lofty and on KI.	<b>Unlikely</b> – Recent records nearby and some suitable habitat within the Project Area but Project impact area does not incorporate creek / watercourse.
<i>Lycopodium deuterodensum</i>	Bushy Clubmoss		E	2	2009	Found in one location in the southern Mount Lofty Ranges in South Australia, growing on steep hill slopes over sandstone and quartzite on the edge of a gully swamp within open stringybark forest with a dense understorey of bracken, sedges, shrubs, herbs and grasses (SSCC 2018).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Machaerina gunnii</i>	Slender Twig-rush		R	2	2018	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in wet heathlands and swampy woodlands (SSCC 2018).	<b>Unlikely</b> – No recent records nearby despite some suitable habitat within the Project Area.
<i>Melaleuca armillaris</i> ssp. <i>akineta</i>	Needle-leaf Honey-myrtle		R	2	2008	Found primarily in the Gawler Ranges of South Australia, where it grows on ridges and granite outcrops (Brophy et al. 2013).	<b>Unlikely</b> – No very recent records and this species is generally confined to the Gawler Ranges in SA.
<i>Mentha diemenica</i>	Slender Mint		R	2	2011	This species is scattered throughout <i>Eucalyptus ovata</i> dominated woodland.	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Nymphoides crenata</i>	Wavy Marshwort		R	2	1995	Fresh water to 1.5 m deep in swamps, lagoons, channels and streams; also frequent in temporarily inundated depressions.	<b>Unlikely</b> – No recent records nearby despite some suitable habitat within the Project Area.
<i>Poa umbricola</i>	Shade Tussock-grass		R	2	2018	Associated with woodland communities where it is often straggling among rocks.	<b>Unlikely</b> – Despite recent records, rocky outcrops in which this species requires are not present.
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	VU	R	1	Species or species habitat likely to occur within area	Pale Leek-orchid is known singly or in groups in better soils of woodland and grassy open forest. Recorded in woodlands and forests dominated by <i>Eucalyptus leucoxyton</i> , <i>E. goniocalyx</i> , <i>E. fasciculosa</i> , <i>E. microcarpa</i> , <i>Callitris gracilis</i> / <i>Eucalyptus fasciculosa</i> , and <i>Allocasuarina verticillata</i> (Bates 2009).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.



Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Prasophyllum pruinosum</i>	Plum Leek-orchid	EN	E	1	Species or species habitat known to occur within area	It has been recorded in the Adelaide and MLR region from eight geographically isolated and distinct locations, which extend from the Barossa Valley to Belair NP. Preferred habitat includes open woodland and grassy forest, in the open or in the shelter of broom-like shrub growing in fertile loams, usually with other leek-orchids (Bates, 2009).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Pterostylis cucullata</i>	Leafy Greenhood	VU	E	1	Species or species habitat likely to occur within area	There are two subspecies of <i>Pterostylis cucullata</i> . One is a coastal ssp. that occurs in stabilised coastal sand dunes, on open ground but under a scrub layer. The other ssp. is a montane variety which occurs on riverbanks or protected alluvial flood plains (TSSC 2016a).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Pterostylis setifera</i>	Bristly Greenhood		E	2	2018	Found in a variety of habitats, in SA in open areas of mallee type vegetation and small red sand dune areas covered with <i>Callitris</i> .	<b>Unlikely</b> – Despite recent records no mallee habitat is present within the Project Area.
<i>Pultenaea graveolens</i>	Scented Bush-pea		R	2	2022	Found in the southern Flinders Range and the southern Mount Lofty Ranges in South Australia, with a single record from Kangaroo Island, growing in dry sclerophyll woodland (SSCC 2018).	<b>Possible</b> – Very recent record and some suitable habitat within the Project Area.
<i>Pultenaea kraehenbuehlii</i>	Tothill Bush-pea		R	2	2018	Endemic to South Australia and found only in the Tothill Range except for one record from Cleland National Park, growing in open grassland to open low woodland sometime dominated by <i>Allocasuarina verticillata</i> (SSCC 2018).	<b>Unlikely</b> – Project Area not within known isolated population, and no suitable habitat occurs.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Ranunculus glabrifolius</i>	Shining Buttercup		V	2	2000	Found only in Mount George Conservation Park in SA where it occurs in damp ground in depressions or beside watercourses.	<b>Possible</b> – Recent records and only found in Mount George Conservation Park which is adjacent to the Project Area. Project impact area does not incorporate creek / watercourse.
<i>Rytidosperma laeve</i>	Smooth Wallaby-grass		R	2	2017	Ecologically variable, from alpine moorland to open grassland or light woodland, often in seasonally damp habitats (Sharp and Simon 2022).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Rytidosperma tenuius</i>	Short-awn Wallaby-grass		R	2	2022	Grows in altitudes between 5–750 m, on Tablelands usually in somewhat damp habitats, rarely dominant; along the coastal shelf a very common constituent of disturbed road verges.	<b>Likely</b> – Very recent records and some suitable habitat is present in the Project Area.
<i>Schizaea fistulosa</i>	Narrow Comb-fern		V	2	2008	In SA, this species is usually found on raised soil mounds in swamps or under scrub in moist situations. It is often found associated with <i>S. bifida</i> . There appear to be intermediate forms between these two species in SA.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Schoenus latelaminatus</i>	Medusa Bog-rush		V	2	2012	Grows in seasonally wet areas along creek beds and in marshy paddocks.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Schoenus lepidosperma</i> ssp. <i>lepidosperma</i>	Slender Bog-rush		R	2	2018	Grows in damp areas in heath or woodland in sandy soils.	<b>Unlikely</b> – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
<i>Scutellaria humilis</i>	Dwarf Skullcap		R	2	2021	Grows in various habitats, often in moist sheltered areas, particularly along creeks or gullies; widespread from coastal to inland districts. Single isolated record from Cleland National Park, most records further south on Fleurieu Peninsula.	<b>Unlikely</b> – Despite recent records the Project Area is outside of its typical distribution.
<i>Senecio pinnatifolius</i> var. <i>pinnatifolius</i>			R	2	2015	Commonly found in moist gullies where they are locally widespread. Predominantly occurs in areas of moderate to high rainfall.	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Sphaerolobium minus</i>	Leafless Globe-pea		R	2	2008	Scattered mainly across higher rainfall areas in sclerophyll forests, woodlands and heathlands.	<b>Unlikely</b> – No recent records nearby despite some suitable habitat within the Project Area.
<i>Sprengelia incarnata</i>	Pink Swamp-heath		R	2	2017	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in wet heathland, sedgeland and other swampy vegetation on peaty or sandy soils (SSCC 2018).	<b>Unlikely</b> – Despite recent records, Cleland National Park is the closest area that this species occurs in. It is unlikely to occur in the Project Area.
<i>Thelymitra aristata</i>	Great Sun-orchid		E	2	2008	Found primarily in the south-east in South Australia, north of Mt Gambier, growing in clay or gravel soils in forest or scrubland around swamp margins in damp sands (SSCC 2018). Past records from Mount George Conservation Park adjacent the Project Area.	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Thelymitra batesii</i>			R	2	2021	Endemic to South Australia and found in the southern Flinders Ranges and the Mount Lofty Ranges, growing in heathy woodlands and heathy open forest on sandy and gravelly clay loam soils (SSCC 2018).	<b>Possible</b> – Very recent records and some suitable habitat is present in the Project Area.
<i>Thelymitra circumsepta</i>	Naked Sun-orchid		E	2	2018	Occurs in the SL region of SA. Found among low shrubs in open forest or in open rocky sites on well-drained and moisture retentive soils.	<b>Unlikely</b> – despite recent records, no suitable rocky or open forest sites occur in Project Area.
<i>Thelymitra grandiflora</i>	Great Sun-orchid		R	2	2019	Occurs singly or as small clumps of plants in forest clearings, woodland and scrub in well drained gravelly clay soils which may be laterite or podsols, or mixed with sand, extending to dry rocky ridges in better soils (Bates 2009).	<b>Possible</b> – Very recent records and some suitable habitat is present in the Project Area.
<i>Thelymitra ixioides</i>	Spotted Sun-orchid		E	2	2013	Found in the southern Mount Lofty Ranges and the lower South-east in South Australia, growing in woodland or swampy ground (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.
<i>Thelymitra latifolia</i>	Blue Star Sun-orchid		V	2	2004	In SA found from the southern Flinders Ranges southward through the Mount Lofty Ranges to the South-east. Found in woodlands in various soil types from leached pale sands to yellow gravelly clays and may occur near swamps.	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Thelymitra matthewsii</i>	Spiral Sun-orchid	VU	E	1	Species or species habitat likely to occur within area	Currently known to occur in Vic., SA and NZ. Favours open forests and woodlands in well-drained sand and clay loams. It is a post-disturbance coloniser that is usually found in open areas around old quarries and gravel pits, on road verges, disused tracks and animal trails. In SA, it is known from three fairly old collections from KI and SW of Keith. It has recently been found to occur south of Meningie, and on western KI. Widely but sporadically distributed in Vic and SA. Grows in heathy open forest and woodlands on well-drained sand, gravel and clay loams, especially where there has been soil disturbance. Open ground layer is common (Duncan 2010).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Thysanotus tenellus</i>	Grassy Fringe-lily		R	2	2015	Perennial Fringed lily species located in SA where it prefers <i>Eucalyptus</i> woodlands, <i>Lomandra effusa</i> Open Sedgelands, <i>Dodonaea lobulata</i> shrublands and Bluebush shrublands (Sirisena 2010).	<b>Unlikely</b> – No recent records nearby despite some suitable habitat within the Project Area.
<i>Todea barbara</i>	King Fern		E	2	2018	Occurs in the MLR where it occurs in swamps, swampy gullies and creek beds. All extant populations occur adjacent to permanent water, springs or soaks.	<b>Unlikely</b> – Recent records nearby and some suitable habitat within the Project Area but Project impact area does not incorporate creek / watercourse.
<i>Veronica derwentiana</i> ssp. <i>homalodonta</i>	Mount Lofty Speedwell	CE	E	1	Species or species habitat likely to occur within area	Occurs in moist areas, gullies, creeklines and high rainfall areas. Largely occurs in <i>Eucalyptus obliqua</i> Forests with or without additional overstorey species (such as <i>Eucalyptus fasciculosa</i> , <i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i> & <i>Eucalyptus leucoxylon</i> ) (TSSC 2009).	<b>Unlikely</b> – No recent records despite some suitable habitat within the Project Area.
<i>Xanthosia tasmanica</i>	Southern Xanthosia		R	2	2015	Found on Kangaroo Island and the southern Mount Lofty Ranges in South Australia, growing in shallow sand on rocky coastal heath and in woodland (SSCC 2018).	<b>Possible</b> – Recent records and some suitable habitat is present in the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Xyris operculata</i>	Tall Yellow-eye		R	2	2008	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in wet heathlands and swampy areas (SSCC 2018).	<b>Unlikely</b> – No recent records and this species is generally confined to the areas around Mount Compass and on Kangaroo Island.

**Conservation status:**

**Aus:** Australia (EPBC Act). **SA:** South Australia (NPW Act). **Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. **ssp.:** the conservation status applies at the sub-species level. **Mi:** listed as migratory under the EPBC Act. **Mi (W):** listed as a Migratory Wetland species under the EPBC Act. **Mi (Ma):** listed as a Migratory Marine species under the EPBC Act.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

**1:** PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;

**2:** BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;

**Abbreviations within Distribution and preferred habitat:**

**EP:** Eyre Peninsula; **FP:** Fleurieu Peninsula; **FR:** Flinders Ranges; **KI:** Kangaroo Island; **MLR:** Mount Lofty Ranges; **MU:** Murraylands; **NL:** Northern Lofty; **NP:** National Park; **NSW:** New South Wales; **QLD:** Queensland; **SL:** Southern Lofty; **SE:** Southeast / South-Eastern; **SW:** South-Western; **Tas:** Tasmania; **Vic:** Victoria; **WA:** Western Australia; **YP:** Yorke Peninsula.

## Appendix 6. BDBSA fauna recorded within 5 km of the Project Area

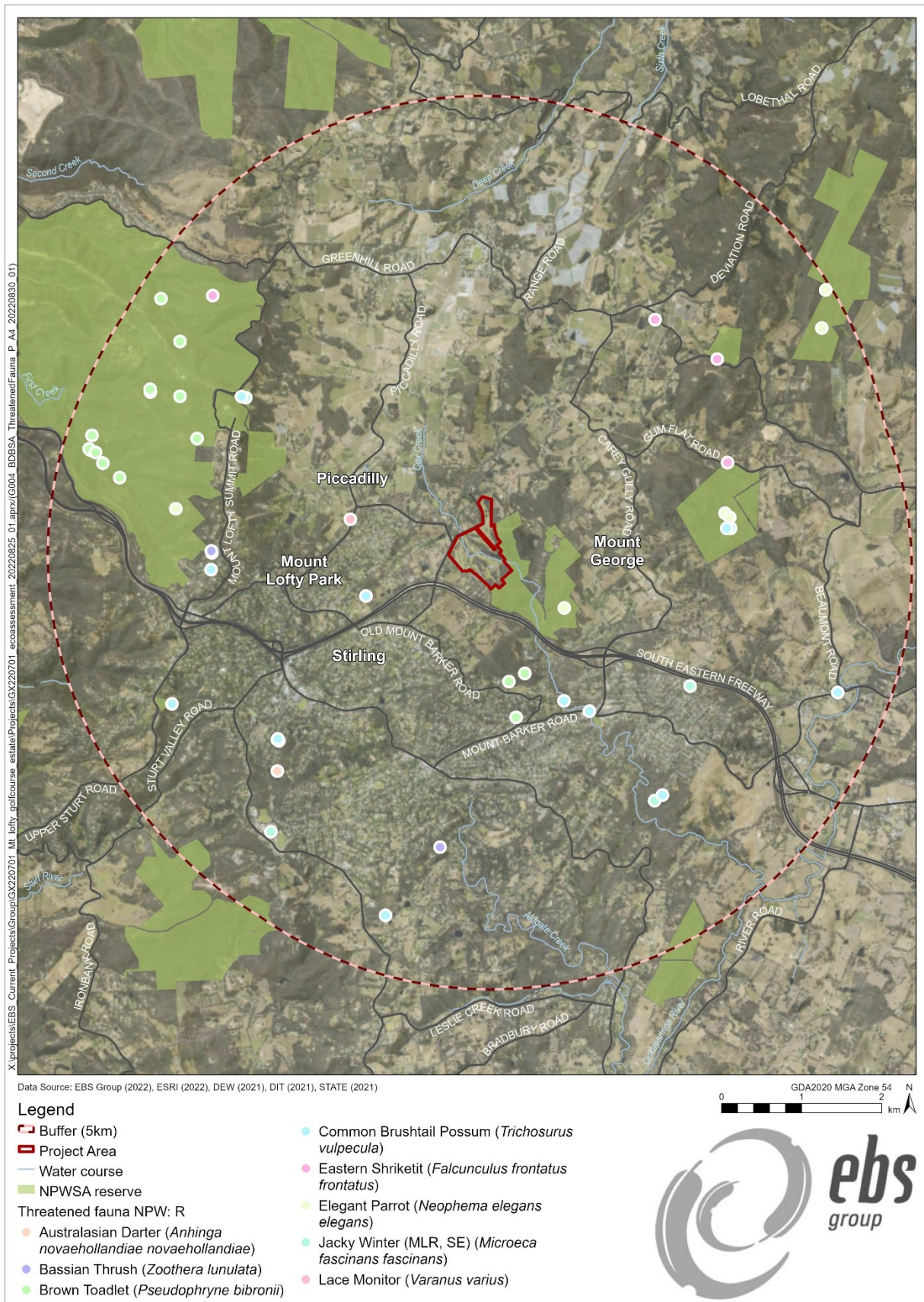


Figure 17. BDBSA fauna record for State listed Rare species, located within 5 km of the Project Area (Map 1 of 2).

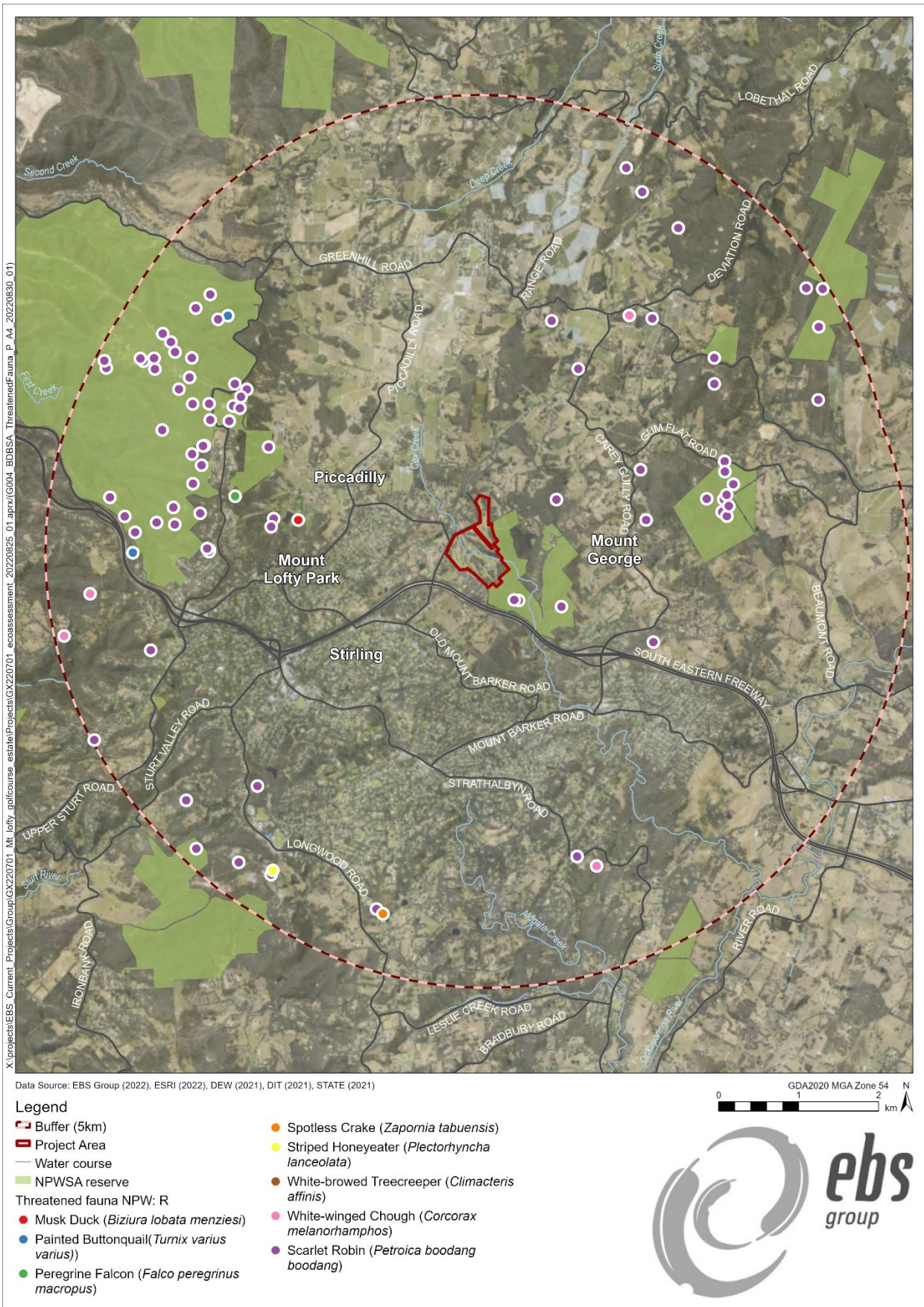
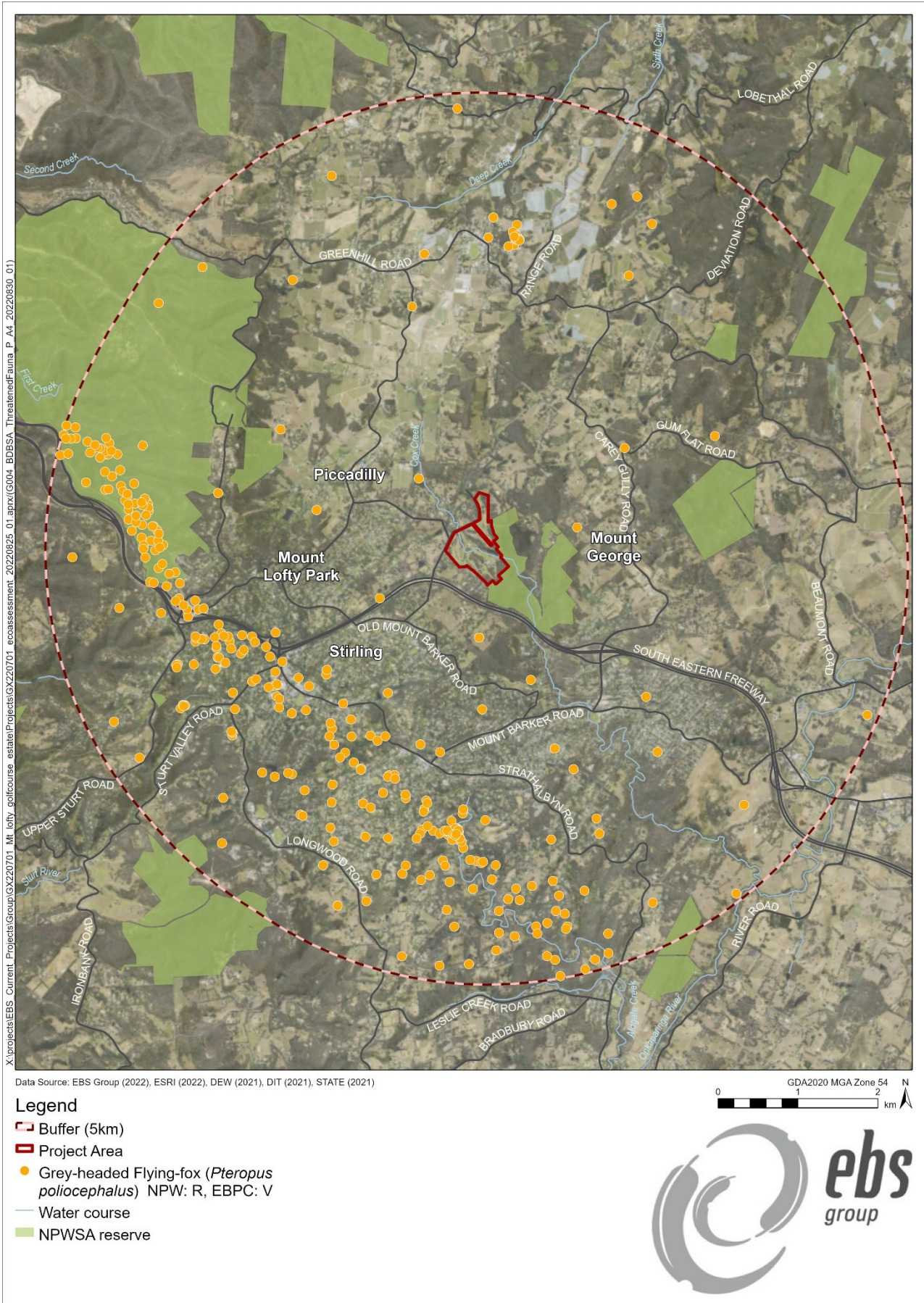


Figure 18. BDBSA fauna record for State listed Rare species, located within 5 km of the Project Area (Map 2 of 2).





**Figure 19. BDBSA fauna record for *Pteropus poliocephalus* (Grey-headed Flying-fox), located within 5 km of the Project Area.**

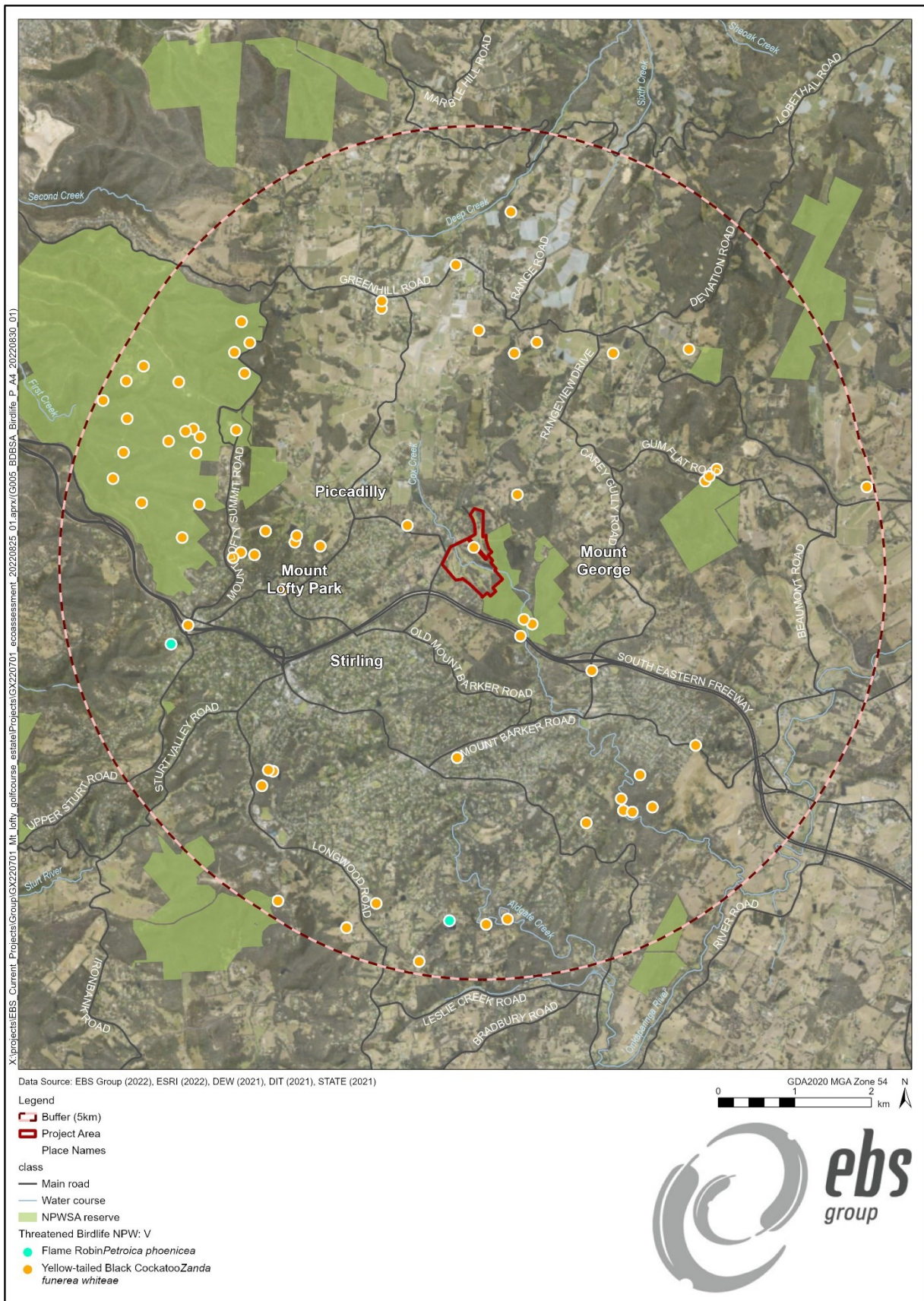


Figure 20. BDBSA fauna record for State listed Vulnerable species, located within 5 km of the Project Area.



Figure 21. BDBSA fauna record for State listed Endangered species, located within 5 km of the Project Area.

# Appendix 7. BDBSA Birdlife recorded within 5 km of the Project Area

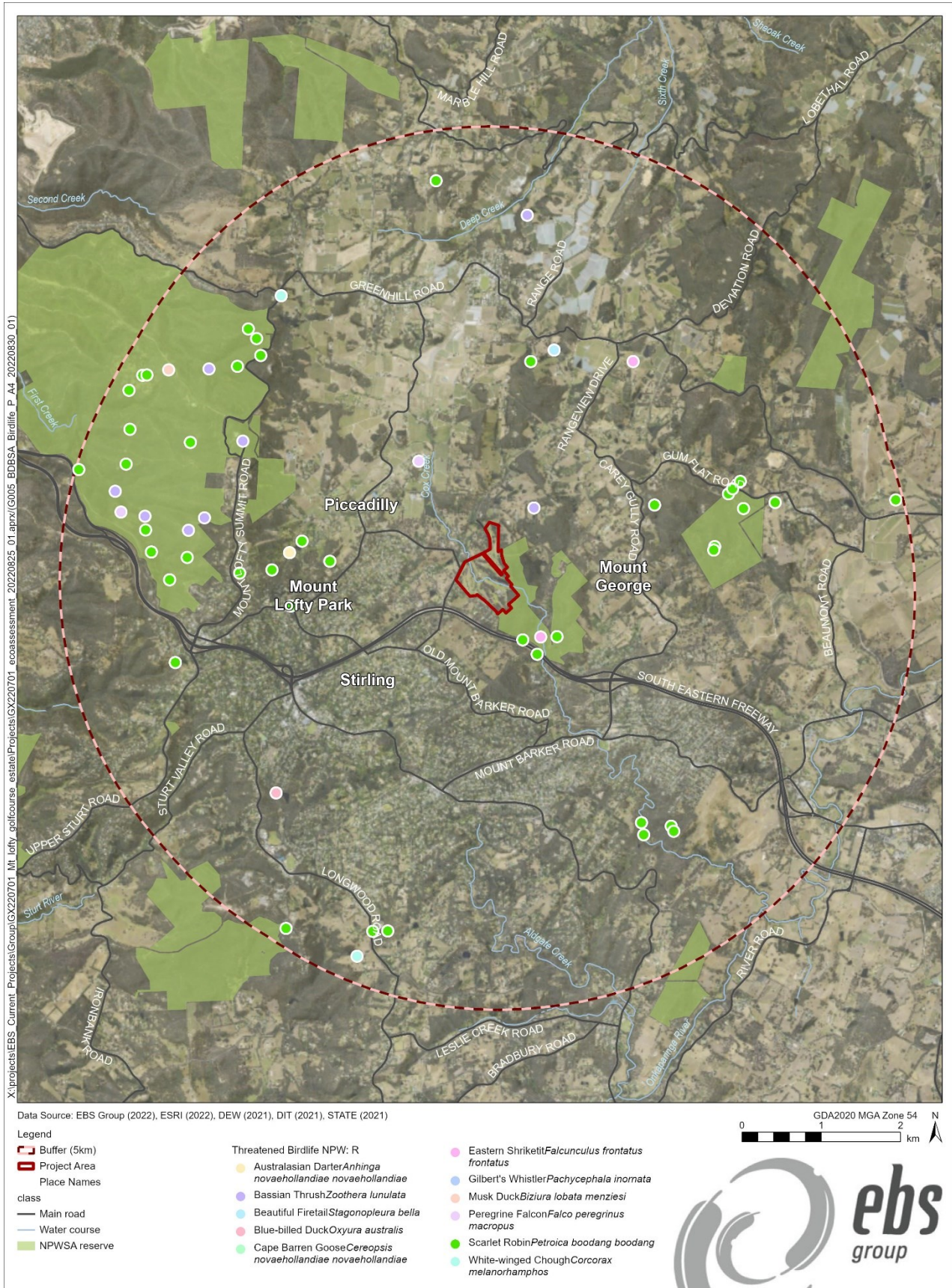


Figure 22. BDBSA Birdlife record for State listed Rare species, located within 5 km of the Project Area.

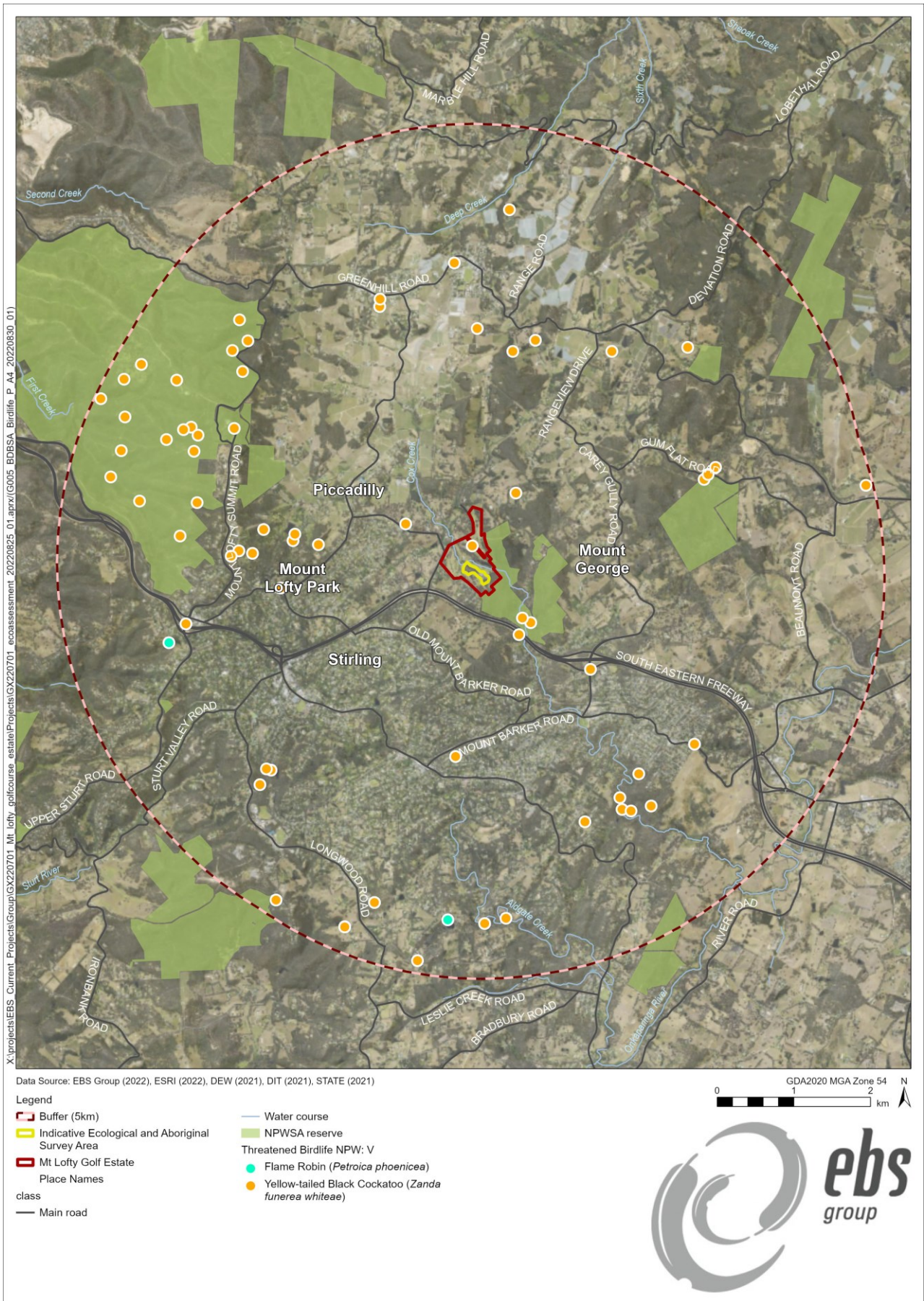


Figure 23. BDBSA Birdlife record for State listed Vulnerable species, located within 5 km of the Project Area.

**Appendix 8. Assessment of likelihood of national (EPBC Act) and State (NPW Act) listed threatened fauna identified by the PMST (DCCEEW 2023) and BDBSA (DEW 2022b) to occur in the Project Area (exclusively marine species have been omitted) (green shading = known / highly likely or likely to occur, orange shading = possible to occur).**

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<b>AMPHIBIA (AMPHIBIANS)</b>							
<i>Pseudophryne bibronii</i>	Brown Toadlet		R	2	2009	In SA, it occurs in the SE, KI, MLR and FR regions. Found in damp areas with cover provided by logs and stones. Occupies forests, heathlands and grasslands. Occasionally utilizes small temporary dams and vegetated roadside drainage lines and ditches which are characterized by leaf litter and grassy debris (Wilson and Bignall 2009).	<b>Possible</b> – Some suitable habitat within the Project Area including water sources, most recent nearby record over 10 years old.
<b>AVES (BIRDS)</b>							
<i>Anhinga novaehollandiae novaehollandiae</i>	Australasian Darter		R	2, 3	2018 / 2018	Habitat is lakes, rivers, swamps; rarely coastal (Pizzey and Knight 2013).	<b>Possible</b> – Some suitable habitat within the Project Area including water sources.
<i>Biziura lobata menziesi</i>	Musk Duck		R	2, 3	2015 / 2002	Lakes, reservoirs and wetlands including well-vegetated swamps and fresh and brackish habitats (Pizzey and Knight 2013).	<b>Possible</b> – Some suitable habitat within the Project Area including permanent water sources.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN	E	1	Species or species habitat known to occur within area	Freshwater wetlands and rarely in estuaries or tidal wetlands, favouring wetlands dominated by sedges, rushes and reeds growing over a muddy or peaty substrate (Pizzey and Knight 2013).	<b>Unlikely</b> – No recent records despite suitable habitat present.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Cereopsis novaehollandiae novaehollandiae</i>	Cape Barren Goose		R	3	2009	Mostly inhabits small, windswept and generally uninhabited offshore islands, but ventures to adjacent mainland farming areas in search of food in summer (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area including water sources and open grassy areas.
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN	E	3	2002	Likes tidal mudflats, sand flats and shelly beaches, salt marshes and mangroves (Pizzey and Knight 2013).	<b>Unlikely</b> – No suitable habitat, migratory species which does not depend on vegetation present in the Project Area
<i>Climacteris affinis</i>	White-browed Treecreeper		R	2	2021	Distributed across southern arid and semi-arid areas of Australia, from Western Australia, through South Australia, New South Wales and into north-western Victoria. Habitat is Acacia woodlands, belah and Callitris.	<b>Possible</b> – Some suitable habitat within the Project Area but vagrant species to general area.
<i>Corcorax melanorhamphos</i>	White-winged Chough		R	2, 3	2020 / 2020	Prefers drier forests, woodlands of <i>Eucalyptus</i> sp., crops and pastures (Pizzey and Knight 2013).	<b>Likely</b> – Some suitable habitat within the Project Area and recent records.
<i>Falco hypoleucos</i>	Grey Falcon	VU	R	1	Species or species habitat likely to occur within area	The species is mainly found where annual rainfall is less than 500 mm and is essentially always confined to the arid and semi-arid zones. The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (Schoenjahn et al. 2020).	<b>Unlikely</b> – No recent records and habitat within the Project Area is unsuitable.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Falco peregrinus macropus</i>	Peregrine Falcon		R	2, 3	2015 / 2020	Found everywhere from woodlands to open grasslands and coastal cliffs – though less frequently in desert regions. This species prefers open habitats such as grasslands, tundra and meadows and nests on cliff faces and in crevices (Pizzey and Knight 2013).	<b>Likely</b> – Some suitable habitat within the Project Area. Likely to occur as flyover only.
<i>Falcunculus frontatus frontatus</i>	Eastern Shrike-tit		R	2, 3	2006 / 2006	Eucalyptus woodlands and forest, within a wide range of woodland/forest communities. Prefers dense grasslands, often on the edges of open forests, and bracken (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area, most recent nearby record over 15 years old.
<i>Grantiella picta</i>	Painted Honeyeater	VU	R	1	Species or species habitat likely to occur within area	Forest, woodland, dry scrub, often with abundant mistletoe. Dependent on mistletoe berries (DAWE 2021a).	<b>Unlikely</b> – No recent records despite some suitable habitat.
<i>Hieraetus morphnoides</i>	Little Eagle		V	2	2019	Occurs in sparse populations in eastern South Australia where it prefers grasslands and grassy woodlands but will inhabit a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones (Birdlife Australia 2022).	<b>Likely</b> – Some suitable habitat within the Project Area. Likely to occur as flyover only.
<i>Hirundapus caudacutus</i>	White-throated Needle-tail	VU, Mi (T)	V	1	Species or species habitat likely to occur within area	Almost exclusively aerial in Australia, recorded most commonly above wooded areas (Pizzey and Knight 2013).	<b>Possible</b> – Some suitable habitat present. Possible to occur as flyover only.
<i>Hylacola cauta cauta</i>	Shy Heathwren		R	3	1998	Prefers dense shrubby or heath understorey in mallee woodland, mallee shrubland or mallee heath in coastal and semi-arid regions, often where spinifex ( <i>Triodia</i> ) occurs and with dense shrubs such as Banksia, Hakea and Grevillea, also tea-tree ( <i>Leptospermum</i> ) and cypress pine ( <i>Callitris</i> ) (Gregory, 2020).	<b>Possible</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.



Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Hylacola pyrrhopygia parkeri</i>	Chestnut-rumped Heathwren	EN	E	1, 2, 3	Species or species habitat known to occur within area / 2020 / 2020	Inhabits heaths of coastal, mountain and hinterland areas, dense undergrowth of forests and woodlands. Found in South-eastern Australia. In SA occurs in the SE, Adelaide Mount Lofty Ranges and Northern Yorke districts (Wilson and Bignall 2009).	<b>Likely</b> – known to occur in adjacent Mount Gorge CP, may utilise Project Area fringe from time to time, though unlikely to be core habitat as the understorey vegetation was open, disturbed and weedy in most places.
<i>Leipoa ocellata</i>	Malleefowl	VU	V	1	Species or species habitat likely to occur within area	In South Australia, the Malleefowl is distributed from the south-east, north to the Murray-Mallee region and west to Streaky Bay, south of 32°S. The species also occurs west of the Eyre Peninsula. Occupies shrublands and low woodlands that are dominated by mallee vegetation. It also occurs in other habitat types including eucalypt or native pine Callitris woodlands, acacia shrublands, Broombush Melaleuca uncinata vegetation or coastal heathlands (Benshemesh 2007).	<b>Unlikely</b> – No recent records and no mallee habitat within the Project Area.
<i>Lewinia pectoralis pectoralis</i>	Lewin's Rail		V	2	2010	Swamp woodlands; rushes, reeds, rank grass in swamps, creeks paddocks; wet heaths, tree ferns; samphire in saltmarsh.	<b>Possible</b> – Some suitable habitat within the Project Area including water sources.
<i>Lophoictinia isura</i>	Square-tailed Kite		E	2	2019	The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses (Pizzey and Knight 2013).	<b>Likely</b> – Some suitable habitat within the Project Area. Likely to occur as flyover only.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater		V	2, 3	2002 / 2000	The Black-chinned Honeyeater is found in the upper levels of open eucalypt forests and woodlands dominated by box and ironbark eucalypts. It is often found along waterways, especially in arid and semi-arid areas and in northern Australia. It is occasionally seen in gardens and street trees (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area.
<i>Microeca fascinans fascinans</i>	Jacky Winter		R	2, 3	2018 / 2001	Widely distributed throughout mainland Australia. Prefer open woodland (Eucalypt and mallee) with an open shrub layer and bare ground. Often seen in farmland and parks (Morcombe, 2021).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<i>Neophema elegans elegans</i>	Elegant Parrot		R	2	2021	Wide variety of habitats, including grasslands, shrublands, mallee, woodlands and thickets, bluebush plains, heathlands, saltmarsh and farmland (Pizzey and Knight 2013).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<i>Oxyura australis</i>	Blue-billed Duck		R	3	2018	Habitat is permanent swamps with dense vegetation. Large open lakes, tidal inlets and bays (Pizzey and Knight 2013).	<b>Possible</b> – Some suitable habitat within the Project Area including permanent water sources.
<i>Pachycephala inornata</i>	Gilbert's Whistler		R	3	2007	Usually inhabit semi-arid mallee or box-ironbark eucalypt, acacia, cypress-pine or Belah shrublands and woodlands (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Petroica boodang boodang</i>	Scarlet Robin		R	2, 3	2022 / 2020	This species occurs in foothill forests, woodlands and watercourses. In autumn-winter, they occur in more open habitats such as river red gum woodlands, golf courses, parks, orchards and gardens (Birdlife Australia 2022).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<i>Petroica phoenicea</i>	Flame Robin		V	3	2003	Endemic to south-eastern Australia, and ranges from near the Queensland border to southeast South Australia and also in Tasmania. Breeds in eucalypt forests and woodlands, with access to open areas, such as subalpine woodland, recently burnt forest, recently logged forest and pine plantations (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area.
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater		R	2	2020	The Striped Honeyeater is found in eastern Australia, mainly inland, from the Yorke Peninsula, South Australia to the coast of New South Wales, around Toukley, and north to Charters Towers, Queensland. The Striped Honeyeater is found in forests and woodlands, often along rivers, as well as mangroves and in urban gardens (Birdlife Australia 2022).	<b>Possible</b> – Some suitable habitat within the Project Area but vagrant species to general area.
<i>Polytelis anthopeplus monarchoides</i>	Regent Parrot	VU	V	2	1996	The Regent Parrot (eastern) is confined primarily to the semi-arid interior of south-eastern mainland Australia. It inhabits riparian or littoral River Red Gum ( <i>Eucalyptus camaldulensis</i> ) forests or woodlands and adjacent Black Box ( <i>E. largiflorens</i> ) woodlands (Baker-Gabb and Hurley 2011).	<b>Unlikely</b> – No very recent records despite some suitable habitat.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Rostratula australis</i>	Australian Painted Snipe	EN	E	1	Species or species habitat likely to occur within area	The Australian Painted Snipe inhabits many different types of shallow, brackish or freshwater terrestrial wetlands, especially temporary ones which have muddy margins and small, low-lying islands. Suitable wetlands usually support a mosaic of low, patchy vegetation, as well as lignum and Canegrass (Birdlife Australia 2022).	<b>Unlikely</b> – No recent records despite some suitable habitat.
<i>Stagonopleura bella samueli</i>	Beautiful Firetail	EN	R	1, 3	2020	Occurs in the AMLR/Eyre Peninsula region of SA where it resides in a wide range of Eucalypt dominated vegetation communities that have a grassy understorey, including woodland, forest and mallee. Only small pockets have been observed near the coast (Birdlife Australia 2022).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<i>Turnix varius varius</i>	Painted Buttonquail		R	2	2012	These birds range almost continuously, in appropriate habitat, from about the Atherton Tableland in Qld, round the coast to the EP and north to the southern Flinders Ranges in SA, avoiding only the driest regions of Qld and NSW. Temperate and eastern tropical forests and woodlands form the habitats of this species (Morcombe 2021).	<b>Possible</b> – Some suitable habitat within the Project Area.
<i>Zanda funerea whiteae</i>	Yellow-tailed Black Cockatoo		V	2, 3	2022 / 2020	Eucalyptus forests and woodlands. Plantations of Eucalyptus and introduced Pinus sp. (Pizzey and Knight 2013)	<b>Highly Likely / Known</b> – Observed during the field survey and some suitable habitat is present in the Project Area.
<i>Zapornia tabuensis</i>	Spotless Crane		R	2	2010	Mostly found in well vegetated freshwater wetlands with rushes and reeds. Will also frequent muddy areas, reedbeds or wetlands.	<b>Possible</b> – Some suitable habitat within the Project Area including water sources.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Zoothera lunulata halmaturina</i>	Bassian Thrush	EN	R	1, 2, 3	Species or species habitat known to occur within area / 2022 / 2018	Damp, densely forested areas and gullies are favoured by the Bassian Thrush, usually with a thick canopy overhead and leaf-litter below (DAWE 2022).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<b>MAMMALIA (MAMMALS)</b>							
<i>Antechinus agilis</i>	Agile Antechinus		E	2	2021	Forests in the south-eastern corner of Australia. Prefers areas with dense ground cover and hiding places such as fallen logs.	<b>Possible</b> – Some suitable habitat within the Project Area generally confined to the far southeast of SA.
<i>Antechinus flavipes</i>	Yellow-footed Antechinus		V	2	2021	Inhabits dry forests on the inland side of the Great Dividing Range, Australia (Kelly et al. 2008).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot	EN	V	1, 2	Species or species habitat known to occur within area / 2021	This species prefers dense ground cover, tall grass and low shrubbery. They live near swamps and rivers as well as in thick scrub in drier areas. They make their nests on the ground and in logs. The nests consist of sticks, leaves, grass, and soil (TSSC 2016b).	<b>Likely</b> – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	R	1, 2	Foraging, feeding or related behaviour likely to occur within area / 2020	Grey-headed Flying-foxes forage up to 40 km from their roost at Botanic Park each night. Food plants are typically planted trees, both native and exotic, that provide fruit or a rich source of nectar (DAWE 2021b). This species may occur within the Project Area; however, they would only be expected to visit for short periods if suitable flower or fruit resources are available.	<b>Likely</b> – Some suitable foraging habitat within the Project Area. Project Area is less than 50 km from nearest camp at Botanic Park in Adelaide
<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R	2	2022	Utilises various woodland habitats and suburban environs. Feeds on flowers, fruit, buds and leaves of native vegetation. Requires hollows (within dead or alive tree) or on ground for daytime nesting (Strahan & van Dyck 2008).	<b>Highly Likely / Known</b> – Some suitable habitat including hollows within the Project Area. Scat from this species was observed within the Project Area.
<b>REPTILIA (REPTILES)</b>							
<i>Egernia cunninghami</i>	Cunningham's Skink		E	2	2022	Occurs in forests and rock outcrops where they bask on top of outcrops and will scurry between rock ledges to shelter.	<b>Unlikely</b> – despite very recent records, no rock outcrops are present in the Project Area for shelter.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Varanus rosenbergi</i>	Heath Goanna		V	2	2014	Habitat across southern Australia includes coastal heaths, humid woodlands, and wet and dry sclerophyll forests (Cogger 2014).	<b>Possible</b> – recent records within 10 years. Species occupies large ranges which incorporate heath, wet and dry forest, and woodlands, such as those found in the Project Area. No termite mounds observed in Project Area but may occur nearby.
<i>Varanus varius</i>	Lace Monitor		R	2	2013	This species is a large arboreal lizard which is found in eastern and south-eastern Australia from Cape York Peninsula (Queensland) to south-eastern South Australia. Lace Monitors occur in well-timbered areas from dry woodlands to cool temperate forests in southern Australia (Cogger, 2014). Restricted distribution in SA, occurring in upper reaches of the SA Murray Darling Basin and isolated population in the southern Flinders Ranges.	<b>Unlikely</b> – outside of known distribution. Nearby record is isolated and thought to be escapee from Cleland Wildlife Park.

**Conservation status:**

**Aus:** Australia (EPBC Act). **SA:** South Australia (NPW Act). **Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. **ssp.:** the conservation status applies at the sub-species level. **Mi:** listed as migratory under the EPBC Act. **Mi (W):** listed as a Migratory Wetland species under the EPBC Act. **Mi (Ma):** listed as a Migratory Marine species under the EPBC Act.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;

2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;

3: Birdlife Australia (DEW 2022b) – 5 km buffer applied to Project Area.

**Abbreviations within Distribution and preferred habitat:**

**EP:** Eyre Peninsula; **FP:** Fleurieu Peninsula; **FR:** Flinders Ranges; **KI:** Kangaroo Island; **MLR:** Mount Lofty Ranges; **MU:** Murraylands; **NL:** Northern Lofty; **NP:** National Park; **NSW:** New South Wales; **QLD:** Queensland; **SL:** Southern Lofty; **SE:** Southeast / South-Eastern; **SW:** South-Western; **Tas:** Tasmania; **Vic:** Victoria; **WA:** Western Australia; **YP:** Yorke Peninsula.

**Appendix 9. Assessment of likelihood of nationally (EPBC Act) listed migratory species identified by the PMST (DCCEEW 2023) and BDBSA (DEW 2022b) to occur in the Project Area (exclusively marine species have been omitted) (orange shading = possible to occur).**

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<b>AVES (BIRDS)</b>							
<i>Apus pacificus</i>	Fork-tailed Swift	Mi (Ma)		1	Species or species habitat likely to occur within area	Widespread but almost exclusively aerial. Mostly occur over inland plains and dry or open habitats.	<b>Possible</b> – Some suitable habitat present. Possible to occur as flyover only.
<i>Gallinago hardwickii</i>	Latham's Snipe	Mi (W)	R	1	Species or species habitat likely to occur within area	This is a wetland species which prefers shallow water dominated by tussocks, sedges, rushes and reeds (Pizzey and Knight 2013).	<b>Unlikely</b> – No recent records despite some suitable habitat.
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Mi (T)	E	1, 2	Species or species habitat likely to occur within area / 2005	Known inhabitant of forest, woodland, mangroves and coastal heath scrub. Prefers dense, wet gullies of heavy eucalypt forest in breeding season (Morcombe, 2021).	<b>Possible</b> – Some suitable habitat within the Project Area.
<i>Rhipidura rufifrons</i>	Rufous Fantail	Mi (T)		1	Species or species habitat known to occur within area	Occur in moist eucalypt forests and rainforests, where they usually inhabit the dense, shady undergrowth of gullies (Birdlife Australia 2022).	<b>Unlikely</b> – No recent records and habitat within the Project Area is unsuitable.
<i>Tringa nebularia</i>	Common Greenshank	Mi (T)		1	Species or species habitat likely to occur within area	Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass (Morcombe 2021).	<b>Unlikely</b> – No recent records despite some suitable habitat.

Conservation status:



-  
Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (T): listed as a Migratory Terrestrial species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

PMST result: Likelihood of species or species habitat to occur within 5 km of the Project Area.

Source of Information:

1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;

2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;

Abbreviations within Distribution and preferred habitat:

EP: Eyre Peninsula; FP: Fleurieu Peninsula; FR: Flinders Ranges; KI: Kangaroo Island; MLR: Mount Lofty Ranges; MU: Murraylands; NL: Northern Lofty; NP: National Park; NSW: New South Wales  
QLD: Queensland; SL: Southern Lofty; SE: Southeast / South-Eastern; SW: South-Western; Tas: Tasmania; Vic: Victoria; WA: Western Australia; YP: Yorke Peninsula.



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## **Appendix 29**

*Appendix AA of Development Report – Renders of  
the proposed development*

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VIEW 1



VIEW 2















VIEW 8

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## **Appendix 30**

*Appendix BB of Development Report – Heritage  
impact statement*

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**Mount Lofty Golf Estate -  
Former Scent Factory Heritage Impact Statement**

# Mount Lofty Golf Estate - Former Scent Factory Heritage Impact Statement

31 March 2023

Final

Prepared by EBS Heritage for Mount Lofty Golf Estate Pty Ltd

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Cover photograph: The Former Scent Factory in 2020. © 2021 URPS.

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## GLOSSARY AND ABBREVIATION OF TERMS

Burra Charter	<i>Australian ICOMOS Burra Charter, 2013</i>
HIS	Heritage Impact Statement
HP Act	<i>Heritage Places Act 1994</i>
ICOMOS	International Council on Monuments and Sites
m	meter(s)
Mount Lofty Golf Estate	Mount Lofty Golf Estate Pty Ltd
PDI Act	<i>Planning, Development and Infrastructure Act 2016</i>
PDC	Planning and Design Code
SA	South Australia
the Council	South Australian Heritage Council
the Guidelines	Guidelines for the Preparation of a Development Report, Mount Lofty Golf Estate



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# 1 INTRODUCTION

## 1.1 Project description

Mount Lofty Golf Estate is proposing to redevelop the Stirling Golf Course. The current golf course site contains a local heritage place (former Scent Factory, ID 15127) and partial demolition, restoration, conservation, reuse, and new built form elements adjacent the local heritage place, are proposed. The existing perfumery will be adaptively reused as part of the redevelopment and will entail:

- Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
- Extension to the Perfumery to include a covered outdoor dining area.
- Orchard and perfumery garden plantings to reimagine the former use of the building as a “Scent Factory”.
- The perfumery building will temporarily house the golf club whilst construction is occurring.

## 1.2 Project location

The Stirling Golf Club is located at 35 Golflinks Road, Stirling SA in the Hundred of Onkaparinga, within the Local Government Area of the Adelaide Hills Council and the Landscape Management Region of the Hills and Fleurieu.

The proposed redevelopment is situated on Certificate of Title 5891, Folio 805 (Allotment 53 in Deposited Plan 59212) and is bounded to the east by the Mount George Conservation Park and to the west by Old Carey Gully Road. Refer to Appendix 1 for a map of the project area.

The local heritage place is located 300 metres (m) to the east of the intersection of Old Carey Gully and Golflinks Road intersection, and 320 m west of golf club rooms. Refer to Appendix 2 for a map of the local heritage place.

## 1.3 Purpose of this report

EBS Heritage have been engaged by Mount Lofty Golf Estate Pty Ltd (Mt Lofty Golf Estate) to provide a Heritage Impact Statement (HIS) for a local heritage place located at the Stirling Golf Club, Stirling South Australia (SA). As the local heritage place will be adapted for use as part of the Mt Lofty Golf Estate development, the *Guidelines for the Preparation of a Development Report, Mount Lofty Golf Estate* (the Guidelines) (State Planning Commission 2022) stipulate that a HIS is required for the works affecting the heritage place, and associated plans and documentation is to be submitted prior to any approval for this component of works.

## 2 SA STATE LEGISLATION

### 2.1 Heritage Places Act 1993

The *Heritage Places Act 1993* (HP Act) makes provision for the identification, recording and conservation of places and objects of historical heritage significance in SA and the SA Heritage Register documents places that are protected.

The HP Act is governed by the South Australian Department for Environment and Water and the South Australian Heritage Council (the Council).

It is an offence to carry out the following without a permit from the Council:

Section 26 - Excavate or disturb a State Heritage Place designated as a place of archaeological significance; or remove archaeological artefacts from such a place.

Section 27 - Excavate or disturb any land (not designated as a place of archaeological significance) for the purpose of searching for or recovering archaeological artefacts of heritage significance; or excavate or disturb any land (not designated as a place of archaeological significance) knowing or having reasonable cause to suspect that the excavation or disturbance will or is likely to result in an archaeological artefact of heritage significance being discovered, exposed, moved, damaged or destroyed.

Section 28 - Damage, destroy or dispose of an archaeological artefact removed from a State Heritage Place designated as a place of archaeological significance (whether removed before or after the entry of that place in the Register) and to damage, destroy or dispose of an object entered in the Register (either as a provisional or confirmed entry).

The Act further stipulates that:

Section 36 - A person who intentionally or recklessly damages a heritage place or engages in conduct knowing that it will or might destroy or reduce the significance to a State Heritage Place can be fined. There is no penalty if damage results from an action authorised by an approval or authorisation under the *Planning, Development and Infrastructure Act 2016*.

### 2.2 Planning, Development and Infrastructure Act 2016

The South Australian *Planning, Development and Infrastructure Act 2016* (PDI Act), used in conjunction with the *Planning, Development and Infrastructure (General) Regulations 2017* and the Planning and Design Code (PDC), provides for matters that are relevant to the use, development and management of land and buildings, by providing a planning system to regulate development within the State, rules with respect to the design, construction and use of buildings, and other initiatives to facilitate the development of infrastructure, facilities and environments that will benefit the community.

The PDC replaces South Australia's 72 Development Plans previously used by councils, to become the single source of planning policy for assessing development applications across the state and the PDC implements the requirements of Section 66 of the PDI Act. Contained within the Code are overlays which

are layers in the Code under the Act that identify areas where specific planning and design policies are applicable, or where an area may be subject to referrals.

### **2.2.1 Local heritage place 15127 overlay**

There is one local heritage place overlay for the Stirling Golf course which specifies that the heritage and cultural values of local heritage places are to be maintained through conservation, ongoing use and adaptive reuse.

## **2.3 International Council on Monuments and Sites (ICOMOS) Burra Charter**

The *Australian ICOMOS Burra Charter 2013* (Burra Charter) is used as the standard of practice for managing cultural heritage places within Australia. The term adaptive reuse can be found in the Burra Charter as follows:

- 1.9 Adaptation means changing a place to suit the existing use or a proposed use.
- 21.1 Adaptation is acceptable only where the adaptation has minimal impact on the cultural significance of the place.
- 21.2 Adaptation should involve minimal change to significant fabric, achieved only after considering alternatives.

The following provide best practice guidelines for new work which is undertaken as part of the adaptive reuse process:

- Practice Note: Burra Charter Article 22 – New Work 2013, and
- Practice Note: Heritage Sustainability 1: Built Heritage 2019.

## **2.4 Declared major project**

If a project is of economic, social or environmental importance to South Australia it can be declared as a major project by the Minister for Planning and Local Government. Major Projects are assessed by a state-run process that differs from other development applications. The proposal is referred to the State Planning Commission and the detailed assessment documents are released to the public for comment. The Mount Lofty Golf Estate development was declared a major project on 17<sup>th</sup> December 2020 (Government Gazette 2020, p. 5848) and development application guidelines were issued in March 2022.

As per the Guidelines, a HIS and plans, elevations and materials schedule will be required for development approval.

### 3 CULTURAL HERITAGE SIGNIFICANCE

#### 3.1 Local heritage place description

The former scent factory is a stone building with brick quoins and surrounds. The building has a gabled roof clad with galvanised corrugated iron, and both double hung sash and casement windows. The building is currently being used as the site maintenance building and office, and there is a maintenance shed currently abutting the building. In 1985 it was noted that the building was in a dilapidated condition (Danvers Architects 1985). In 1997 it was noted during the Stirling District Heritage Survey, that the building was extensively covered with the introduced plant Ivy (*Hedera* sp.), the entrance to the cellar has been covered and the windows were barred (Weidenhofer & Laurence 1997:408). By 2020 the building was in even poorer condition with a large crack in one wall which was also separating from the roof and ivy still covered large parts of the building. Refer to Appendix 3 for historical photos taken of the former scent factory over different time periods. Refer to Appendix 4 for an Existing Conditions Report on the building.

#### 3.2 Statement of significance

The former Scent Factory is significant as it is all that remains of a scent making industry which is an unusual manufacturing and horticultural business for the Mount Lofty area. The HP Act, Section 23 information states that the place meets the following criteria:

- (a) it displays historical, economic or social themes that are of importance to the local area.

Click Heritage No for Details	Address	LGA	Details	Class	Council Reference
<a href="#">15127</a>	Old Carey Gully Road STIRLING	Adelaide Hills	Cottage, Mount Lofty Golf Club; Former Scent Factory, 'Le Chateau', 'Le Chateau a la Pong'	Local	19444

#### 3.3 Historical land use

In 1889 James Cowan established the Mount Lofty Flower Farm and Scent Factory on a small portion of the Hundred of Onkaparinga, in association with M. Renaud's perfumery business in Adelaide (Danvers Architects 1985). The farm was used for growing plants whose various essences were extracted to produce perfume used in eau de cologne and handkerchief scents, hair washes, pomades, vaseline, and perfume cases and sachets. The perfumes were known as 'Le Chateau' or 'Le Chataeu a la pong', part of a common practice at the time to trick consumers by imitating names of their European counterparts (Lowenthal 2022).

In 1893 The Adelaide Observer mentions two very fair samples of perfumes distilled by Mr John D. Feraud for the Agricultural Bureau, one of which was made from an extract of heliotrope and tuberose from flowers obtained from the Mount Lofty Flower Farm and the Botanic Garden (Adelaide Observer 1893, p.13). By late 1896 the perfumery was closed, and the property was put on the market. It was purchased in 1925 by the Mount Lofty Golf Estate Incorporated and used as a residence for the groundskeeper, and later it was tenanted (Danvers Architects 1985, Weidenhofer & Laurence 1997:408).

## 4 HERITAGE IMPACT ASSESSMENT

The local heritage place (Former Scent Factory) is currently used by the Stirling Golf Course as a site maintenance building and office. It is the intention of Mount Lofty Golf Estates to refurbish the building for use as a gift shop / café with an alfresco patio. Additionally, the local heritage place will be utilised as the golf course pro-shop during the construction of the new Stirling Golf Estate buildings. The design intent is to restore the heritage building to its original state, or as close as possible. The interior of the heritage building is to have minimal work done so as to showcase the stone structure and exposed timber trusses, and the inclusion of a scent garden will help to establish a continued connection to its previous use as a local perfumery.

The adaptive reuse of the local heritage place aims to preserve the values of the heritage building while adapting it for use in the present. Adaptive reuse of the local heritage place will additionally help to preserve and protect it. Reusing the building will have long term benefits for the community; the local heritage place is dilapidated and if the building cannot be incorporated into the golf course redevelopment, it will continue to deteriorate.

The proposed redesign for the grounds of the heritage place includes a new modern glass, sandstone and metal building situated adjacent to the local heritage place that will provide additional amenity and dining spaces, a paved outdoor dining space with pergola or canopy, carparking for 20 vehicles, and a perfumery garden (R Architecture 2023). The garden and orchard are planned to compliment the overall atmosphere and significance of the site.

The materiality of the new structures will consist of mainly glass and metal to provide a contrast and clear modern addition to the existing stone building. The intent is to have a modern pavilion in juxtaposition, providing a clear timeline of architectural styles. The new pavilion will touch lightly on the ground and will not impose on the surroundings. Plans and materials schedule are provided in Appendix 4 –5 .

EBS Heritage has concluded that the proposed work will not have an adverse impact on the current heritage values of the building but will rather enhance the heritage values; this includes the removal of the maintenance shed which can be considered an unsympathetic alteration to the existing site. Reuse of the local heritage place will also ensure that the current dilapidated building is restored and maintained.

### 4.1 Proposed changes and mitigation impacts

#### 4.1.1 Major alterations and additions

*External:*

- A large modern shed that currently abuts the heritage building will be demolished.
- A small wooden lean-to at the rear of the building will be demolished.
- Three doors which are located at the front, rear and western side of the building will be replaced with new black steel and glass doors.
- All existing windows are to be replaced with new black steel windows.
- Existing cellar access stair to be refurbished.

- The current metal roof sheeting will be removed and replaced to match existing.
- New half round steel gutter to be installed and replace existing.
- Existing external walls to be sandblasted, refurbished and repointed.
- Paving to be laid around existing building.

*Internal:*

- New Hardwood timber roof trusses to replace existing,
- Internal timber lining to underside of trussed plus insulation.
- Internal door to be removed and opening retained,
- Existing brick walls to be sandblasted and refurbished,
- Plastered walls to be repaired where cracking occurs,
- Fire place bricks to be sandblasted to expose brick,
- Existing concrete slab to be removed and flooring to be replaced with polished concrete floor.
- The existing ceiling in the rear room (southern end of building) will be removed and replaced with raked ceiling and new trusses which will be exposed.

*Structural repairs:*

- The roof will be retained with the replacement of some purlins
- The walls do not appear to require structural repairs other than repairs to cracking.

**4.1.2 Construction of new buildings or car parking, within the grounds of a heritage place**

A new function pavilion with seating for 50 persons will be constructed approximately 700 centimetres (cm) to the west of the local heritage building. The pavilion will be constructed from sandstone, glass and metal. The pavilion will be approximately 140 m square, and the height of the pavilion will be 2280 cm.

Parking for 20 vehicles will be constructed to the west of the heritage building adjacent to the scent factory on the opposite side of the access road. A retaining wall will be required and the carpark will be bitumen (Appendix 5).

**4.1.3 Painting**

Painting of the exterior of the building will be dependent on the roof colour as the fascias, gutters and downpipes are to match. Potential roof colours are:

Red - Current roof is red corrugated iron. EBS has determined that this is most likely the original roofing material as early galvanised corrugated iron came in standard lengths (feet and inches), typically 2'6 x 6'0 and where often red (Heritage SA 1999). Painting the exterior woodwork red would match the red brick accents and existing roof colour.

Grey - The architectural design plan is to replace the roof with grey Colourbond steel. If this colour choice was to be approved, then the external woodwork will be painted grey to match.



#### **4.1.4 Reroofing or recladding**

Repair or replacement of the roof is crucial to help preserve and conserve the remainder of the historic building. The building is currently rooved with red corrugated iron and all research by EBS Heritage suggests that this was the original roofing material. The roof is lifting in many places where ivy has grown through but overall, the existing roof appears to be in poor to fair condition (Refer Appendix 4).

The architectural design plan is to replace the roof with grey Colourbond steel, the architects however are amenable to keeping the roof red, which is sympathetic to the original building, should that be a condition of development approval.

#### **4.1.5 New services**

No new services will be required for the adaptive reuse of the local heritage listed place as power and water are already servicing the building. The existing services however will require upgrading. It is proposed to:

- remove the external power pole and services to go underground to the main building instead.
- internal services will need to be upgraded. There is potential for both power and water to come up from under the floor through the cellar and avoiding additional damage to the walls.

#### **4.1.6 Fire protection and services upgrades**

There are no known existing fire protection services in the building, therefore fire protection and services will need to be installed. Most protection will be for ember attack and preventing any embers into the internal structure. These will include:

- ember mesh guards between roof and walls and openings as required.
- gutters to have ember guards installed.
- internal smoke alarms to be fitted

#### **4.1.7 New landscape works**

- An alfresco outdoor dining space 7.0 metres (m) x 14.0 m will be constructed adjacent to the heritage listed building whilst a timber arbour will be constructed between the new function pavilion and the heritage listed building. The outdoor dining space will be paved using stone pavers whilst the timber arbour will be constructed from natural timbers (Appendix 5).
- The establishment of a perfumery garden and orchard next to the former Scent Factory will improve the area's heritage significance through its connection back to its original purpose as a perfumery. As the original design of the flower gardens and other landscaping around the heritage building is unknown; the creation of a new perfumery garden will not be attempting to reinstate original gardens and plants but instead creating a visual link to the past.
- The garden and orchard will be located at the southern end of the heritage building, an existing retaining wall and Tee Box will need to be demolished to make room for the garden.

- The existing retaining wall and Tee Box for Hole 18 is to be demolished and Hole 17 green is to be removed to allow for the construction of a new carpark. A new Hole 18 Tee Box and Hole 17 Green will be constructed immediately north of the local heritage place.
- Hole 4 is to be removed and relocated.
- Vegetation to the east and west of the heritage building will be removed and new vegetation will be planted around the new area.

#### **4.1.8 Change of use**

The building has not been used as a perfumery since 1896 and is currently being used as a maintenance shed and office. The building has fallen into considerable disrepair and does not currently contribute to the significance of the site as a perfumery and Former Scent Factory. (Danvers Architects 1985). The change in use is part of a plan to redevelop and improve the heritage values of the building. The site will be repurposed firstly into the Mount Lofty Golf Clubrooms while other building work takes place on the existing clubroom site, and then later into a café and gift shop.

The adaptive reuse of the site will result in changes to the building, as required to meet current building codes and structural upgrades but the exterior and interior of the heritage building are to have minimal work done, so the stone structure and exposed timber trusses are showcased.

#### **4.1.9 New signage**

All signage will be designed to be sympathetic to the surroundings and not impinge on the heritage values of the local heritage place. Examples of the types of signage that will provide wayfinding from the various locations throughout the development to the new café / gift shop, which will be located in the local heritage place, are provided in Figure 1.

No signage will be mounted directly to the local heritage place.

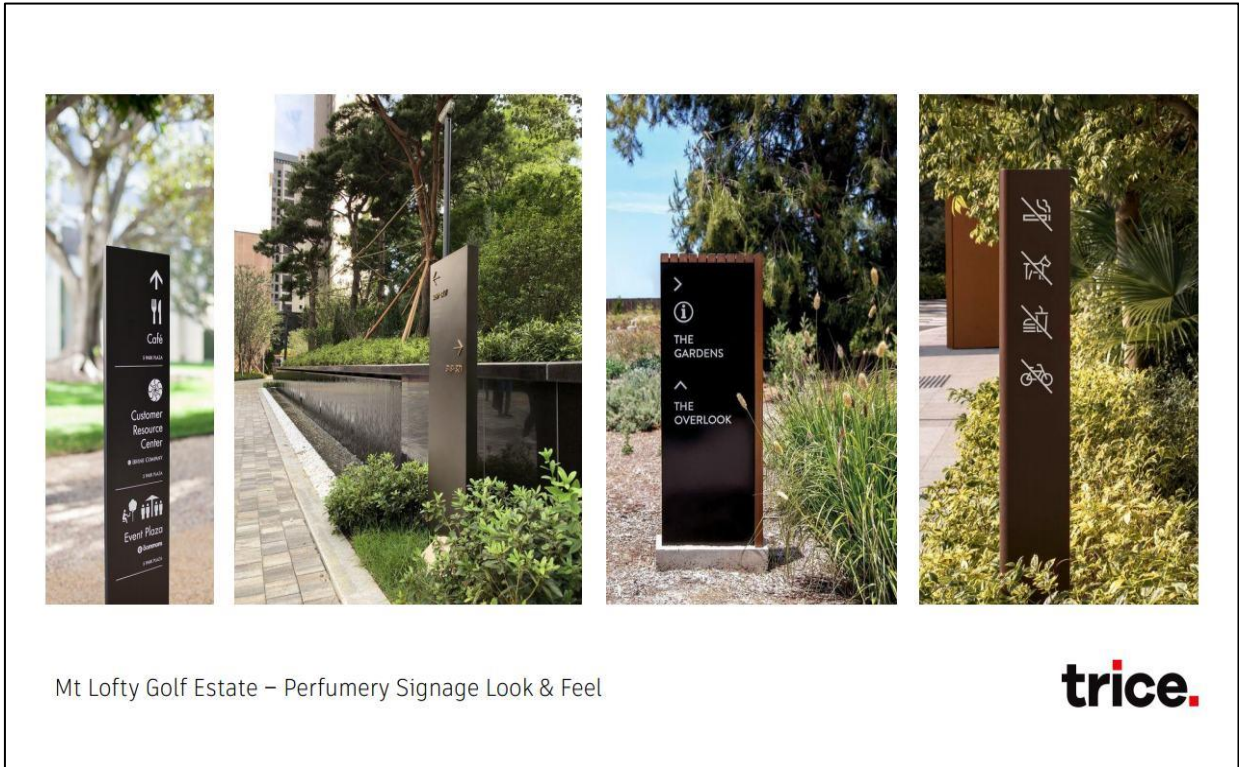


Figure 1. Examples of signage proposed for the Perfumery (Trice 2023).

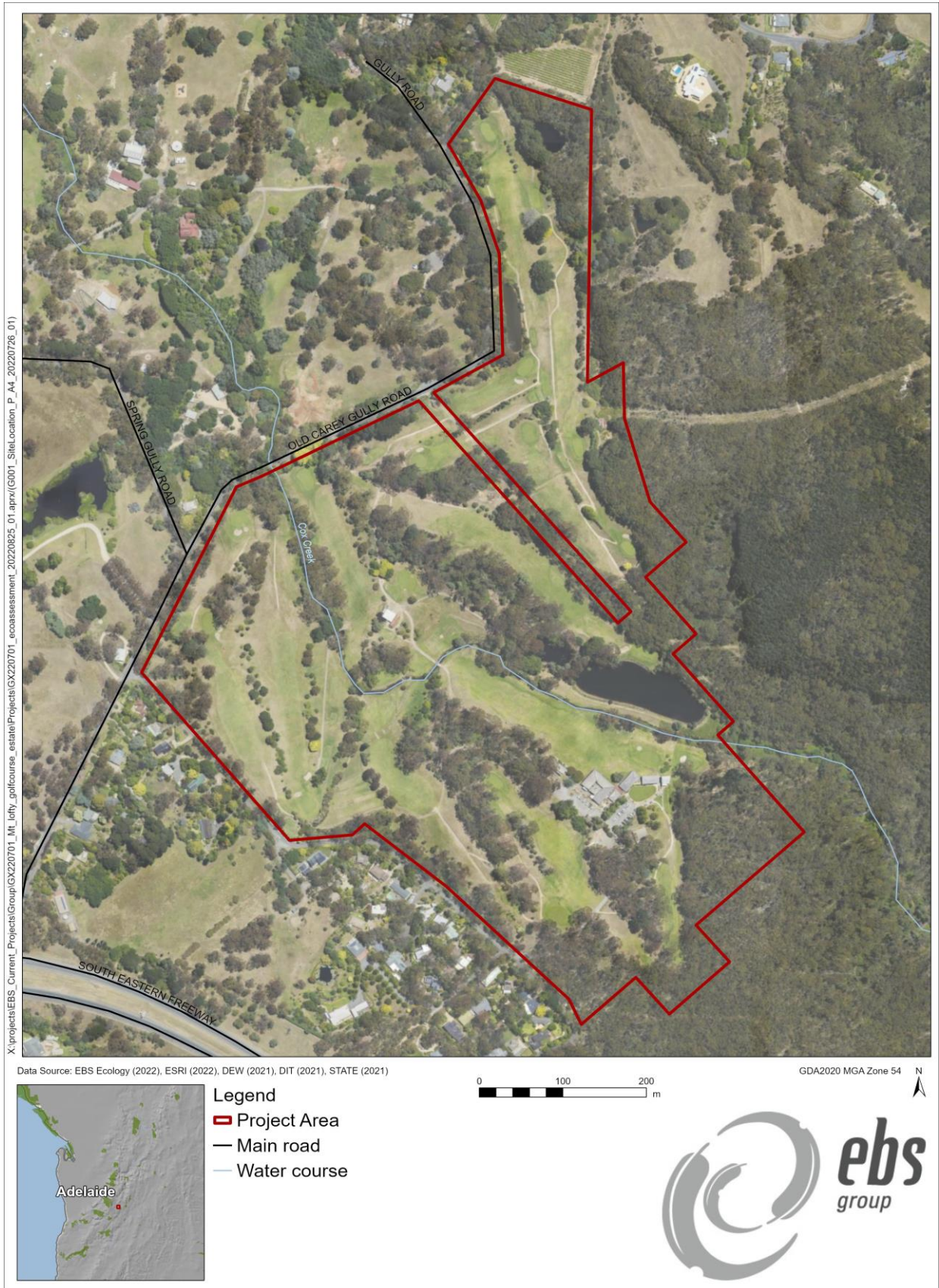
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# 6 APPENDICES

## Appendix 1 – Location of the project area.



## Appendix 2 – Location of the local heritage place.



**Appendix 3 – Photographs of the local heritage place.**



Figure 2. Scent Factory Historic Photo, date unknown (source: Mount Lofty Golf Estate 2022).

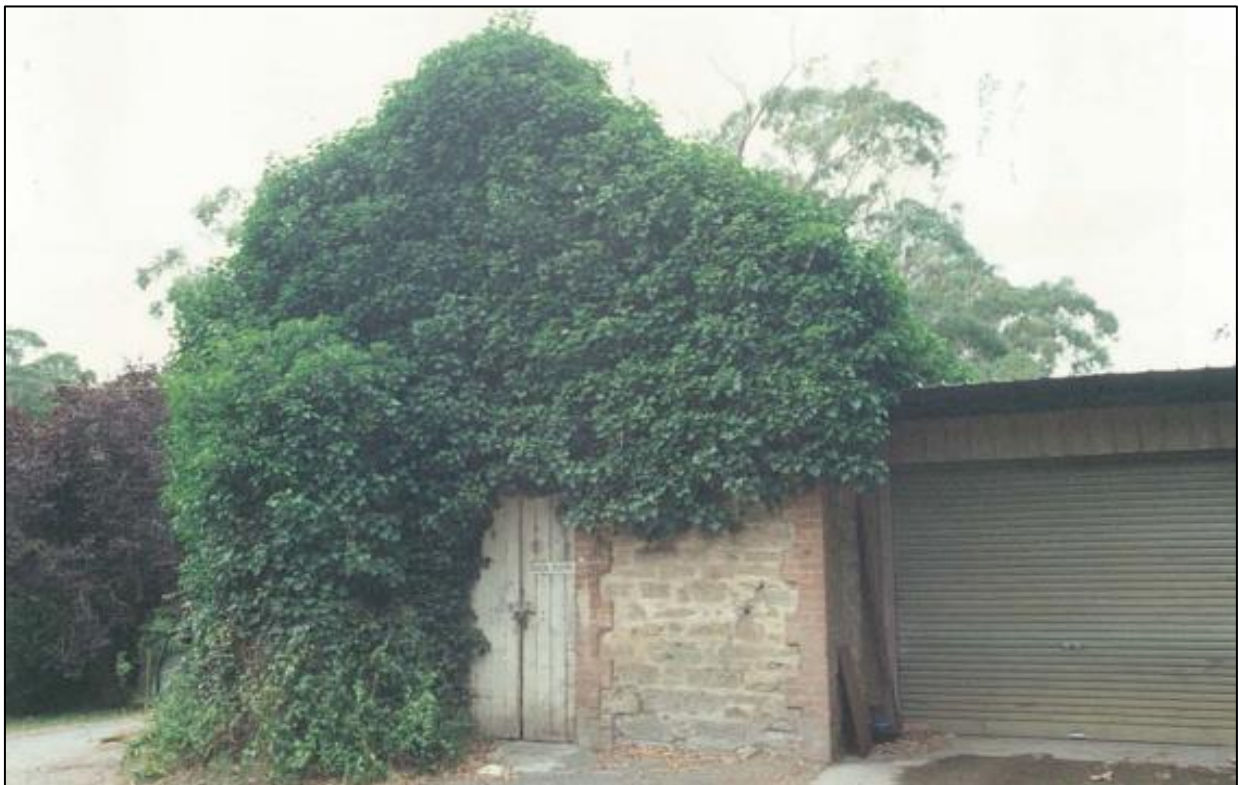


Figure 3. Scent Factory in 1997 (source: Weidenhofer & Laurence 1997:407).





Figure 4. Scent Factory in 2020 (source: URPS 2021).



Figure 5. Architect Impression of completed renovation (source: Oxigen 2021).

## Appendix 4 – Existing Conditions Report

## Appendix 5 – Perfumery Concept Plan



*EBS Heritage*  
112 Hayward Avenue  
Torrensville, SA 5031  
[www.ebsecology.com.au](http://www.ebsecology.com.au)  
t. 08 7127 5607



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## **Appendix 31**

*Appendix CC of Development Report – Certificate of  
Title*

---



The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.



## Certificate of Title - Volume 5891 Folio 805

**Parent Title(s)** CT 5463/301, CT 5481/560, CT 5530/104, CT 5584/817 AND OTHERS  
**Creating Dealing(s)** VE 9441825, TG 9441828, TG 9441829  
**Title Issued** 26/03/2003      **Edition** 5      **Edition Issued** 06/07/2021

## Estate Type

FEE SIMPLE

## Registered Proprietor

THE MOUNT LOFTY GOLF ESTATE PTY. LTD. (ACN: 625 359 837)  
OF L 2 12-24 GILLES STREET ADELAIDE SA 5000

## Description of Land

ALLOTMENT 53 DEPOSITED PLAN 59212  
IN THE AREA NAMED STIRLING  
HUNDRED OF ONKAPARINGA

## Conditions

PORTION DECLARED OPEN SPACE VIDE PROCLAMATION IN GOVERNMENT GAZETTE DATED 10.7.1975 PAGE 147

## Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED G TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (T 2520855)

SUBJECT TO FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED K

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED B ON FP 44044 FOR WATER SUPPLY PURPOSES (TG 9441828)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED F ON FP 44044 FOR THE TRANSMISSION OF ELECTRICITY BY UNDERGROUND CABLE (TG 9441829)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED A AND B ON DP 36802 APPURTENANT ONLY TO THE LAND MARKED V (T 2449260 AND T 3235955 RESPECTIVELY)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED D ON FP 44044 FOR WATER SUPPLY PURPOSES (TG 9441828 AND TG 9441829)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED C AND E ON FP 44044 (T 4787180 AND TG 9441829 RESPECTIVELY)

TOGETHER WITH FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED J ON FP 44044

## Schedule of Dealings

Dealing Number	Description
11908672	CAVEAT BY MOUNT LOFTY GOLF CLUB INC.
13305776	LEASE TO MOUNT LOFTY GOLF CLUB INC. COMMENCING ON 07/08/2019 AND EXPIRING ON 06/08/2024

13551455

MORTGAGE TO NATIONAL AUSTRALIA BANK LTD. (ACN: 004 044 937)

## Notations

**Dealings Affecting Title** NIL

**Priority Notices** NIL

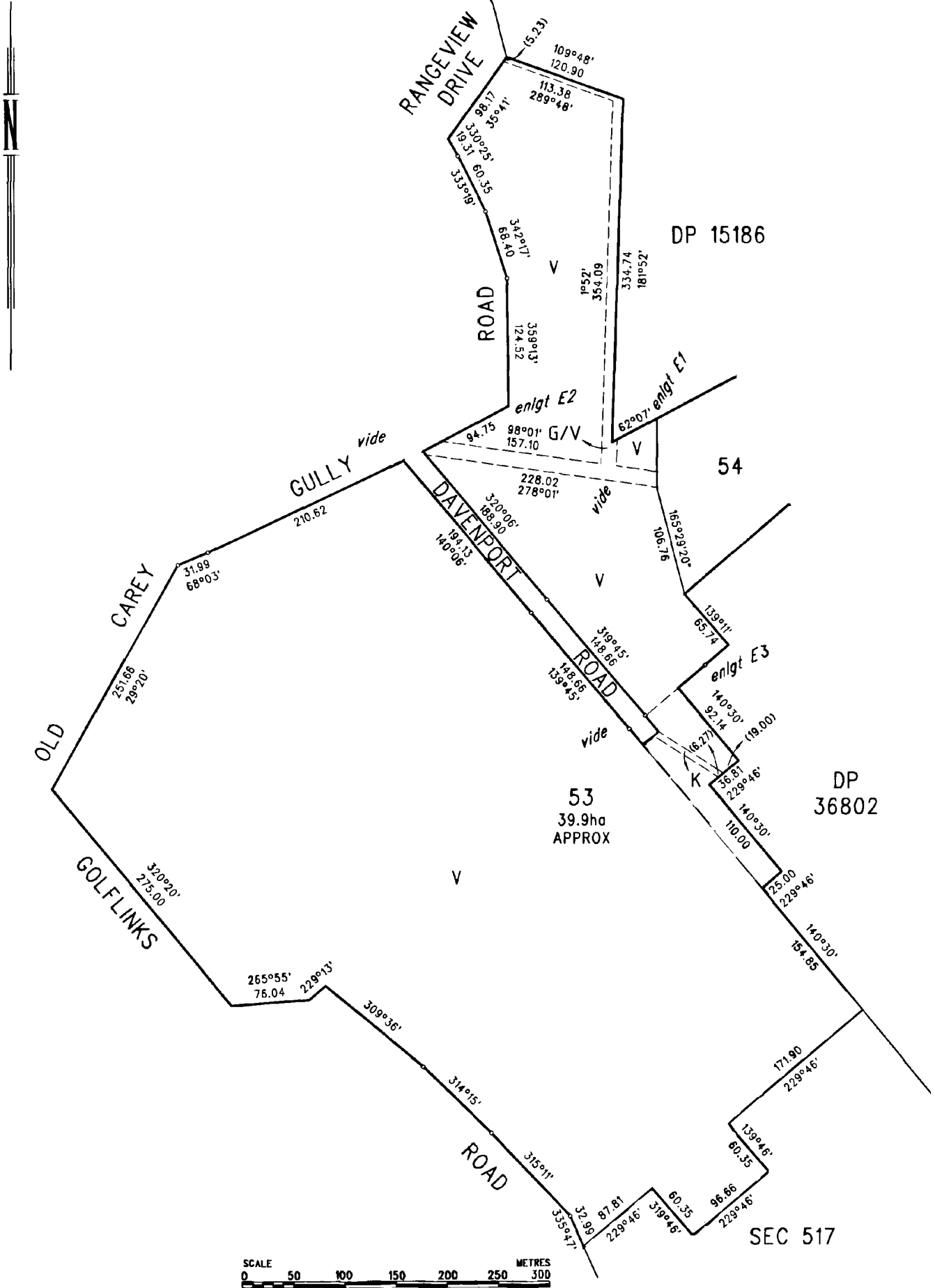
**Notations on Plan** NIL

### Registrar-General's Notes

SUBJECT TO OPEN SPACE PROCLAIMED VIDE GAZETTE DATED 10/07/1975  
AMENDMENT TO DIAGRAM VIDE 33/2003

### Administrative Interests

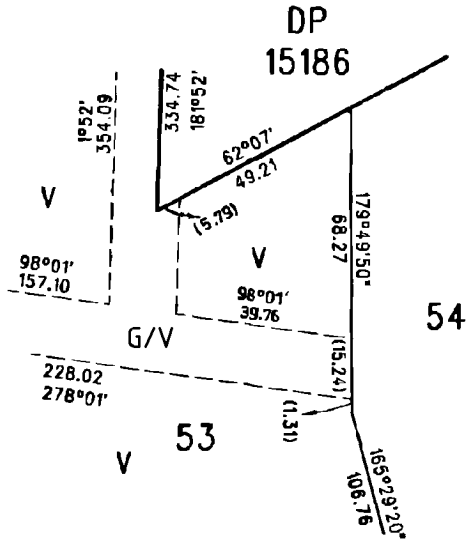
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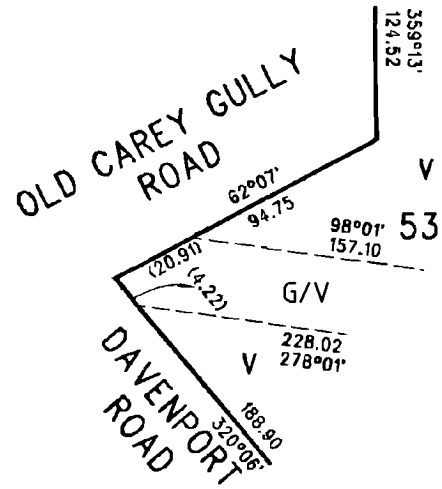




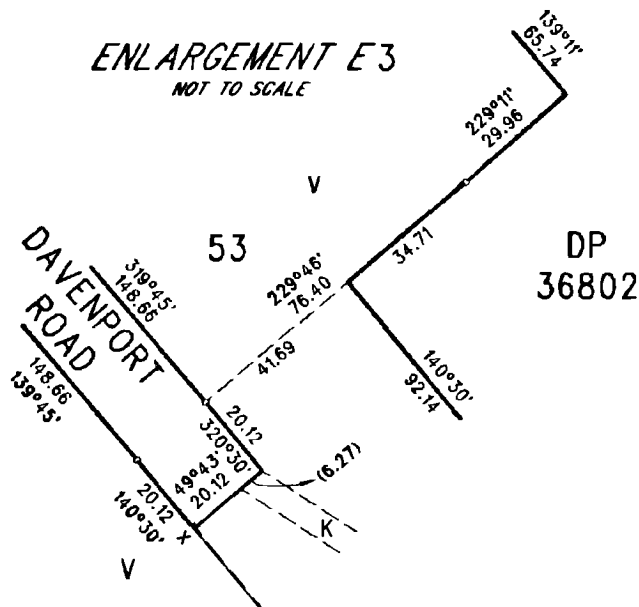
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**ENLARGEMENT E2**  
 NOT TO SCALE



**ENLARGEMENT E3**  
 NOT TO SCALE



## Certificate of Title

**Title Reference:** CT 5891/805  
**Status:** CURRENT  
**Parent Title(s):** CT 5463/301, CT 5481/560, CT 5530/104, CT 5584/817 AND OTHERS  
**Dealing(s) Creating Title:** VE 9441825, TG 9441828, TG 9441829  
**Title Issued:** 26/03/2003  
**Edition:** 5

## Dealings

Lodgement Date	Completion Date	Dealing Number	Dealing Type	Dealing Status	Details
18/06/2021	06/07/2021	13551455	MORTGAGE	REGISTERED	NATIONAL AUSTRALIA BANK LTD. (ACN: 004 044 937)
18/06/2021	06/07/2021	13551454	TRANSFER	REGISTERED	THE MOUNT LOFTY GOLF ESTATE PTY. LTD. (ACN: 625 359 837)
22/05/2020	02/06/2020	13305776	LEASE	REGISTERED	MOUNT LOFTY GOLF CLUB INC.
07/08/2019	22/08/2019	13155180	TRANSFER	REGISTERED	G & J WILLIAMS PROPERTY (VIC) PTY. LTD. (ACN: 163 171 515)
20/03/2013	22/03/2013	11908672	CAVEAT	REGISTERED	MOUNT LOFTY GOLF CLUB INC.
29/01/2007	16/02/2007	10631492	LEASE	REGISTERED	MOUNT LOFTY GOLF CLUB INC.
29/01/2007	16/02/2007	10631491	TRANSFER	REGISTERED	KRALINGEN PTY. LTD. (ACN: 008 129 388)
29/01/2007	16/02/2007	10631490	DISCHARGE OF MORTGAGE	REGISTERED	9754560
15/03/2005	18/03/2005	10185740	TRANSFER OF MORTGAGE	REGISTERED	JOHN WILLIAM WILLIAMS, ROSEMARY ANNE WILLIAMS 9754560
22/12/2003	19/01/2004	9754560	MORTGAGE	REGISTERED	GEOFFREY HUGH STEWART
22/12/2003	19/01/2004	9754559	DISCHARGE OF MORTGAGE	REGISTERED	5087153 7479859 9441830
09/10/2002	27/03/2003	9441830	MORTGAGE	REGISTERED	AUSTRALIA & NEW ZEALAND BANKING GROUP LTD.
07/04/1993	26/11/1993	7479859	MORTGAGE	REGISTERED	AUSTRALIA & NEW ZEALAND BANKING GROUP LTD.
05/08/1983	05/09/1983	5087153	MORTGAGE	REGISTERED	

Lodgement Date	Completion Date	Dealing Number	Dealing Type	Dealing Status	Details
				D	

DEPOSITED 23/7/2002  
ACCEPTED FOR FILING PRO REGISTRAR GENERAL  
MAP REF. 6628-48-k.q DEV. No.  
TITLE SYSTEM REAL PROPERTY ACT  
TITLE REFERENCE CT 5156 / 869

O.B./LAST PLAN REF. TOTAL AREA  
DOCKET No.  
FIELD BOOK No.

CLOSURE CHECKED	PLAN EXAMINED	PLAN APPROVED	P.M.S. APPROVED
A.D.	G.M.W.	31/10/02 for G.W.	3/4/02

IRRIGATION AREA  
HUNDRED ONKAPARINGA  
AREAS ~~MOUNT GEORGE & STIRLING~~  
COUNCIL THE ADELAIDE HILLS COUNCIL

PLAN OF DIVISION  
**ALLOTMENT 51 IN DP 36802  
OF PART SECTIONS 1118, 1132 & 1133  
AND PART BLOCKS 337, 338 & 339**

SCALE 0 50 100 150 200 250 300 METRES

STATEMENTS CONCERNING EASEMENTS ANNOTATIONS AND AMENDMENTS

PORTION OF ALLOTMENTS 53 & 54 MARKED C ARE SUBJECT TO AN EASEMENT TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (T 2520855).

PORTION OF ALLOTMENT 53 MARKED D IS SUBJECT TO A FREE AND UNRESTRICTED RIGHT OF WAY.

PORTION OF ALLOTMENT 53 MARKED V IS TOGETHER WITH EASEMENTS OVER THE LAND MARKED A & B ON DP 36802 (T 2449260 & T 3235955 RESPECTIVELY).

THE EASEMENTS OVER THE LAND MARKED A & B ON DP 36802 (T 2449260 & T 3235955 RESPECTIVELY) ARE TO BE EXTINGUISHED AS REGARDS THE LAND NOW IN ALLOTMENT 54.

AREA NAME VIDE DKT 7/2002  
PRO R.G. 28/4/2003

NO OCCUPATION EXISTS ON SURVEYED BOUNDARIES OF SUBJECT LAND UNLESS SHOWN OTHERWISE.

PCPLANS

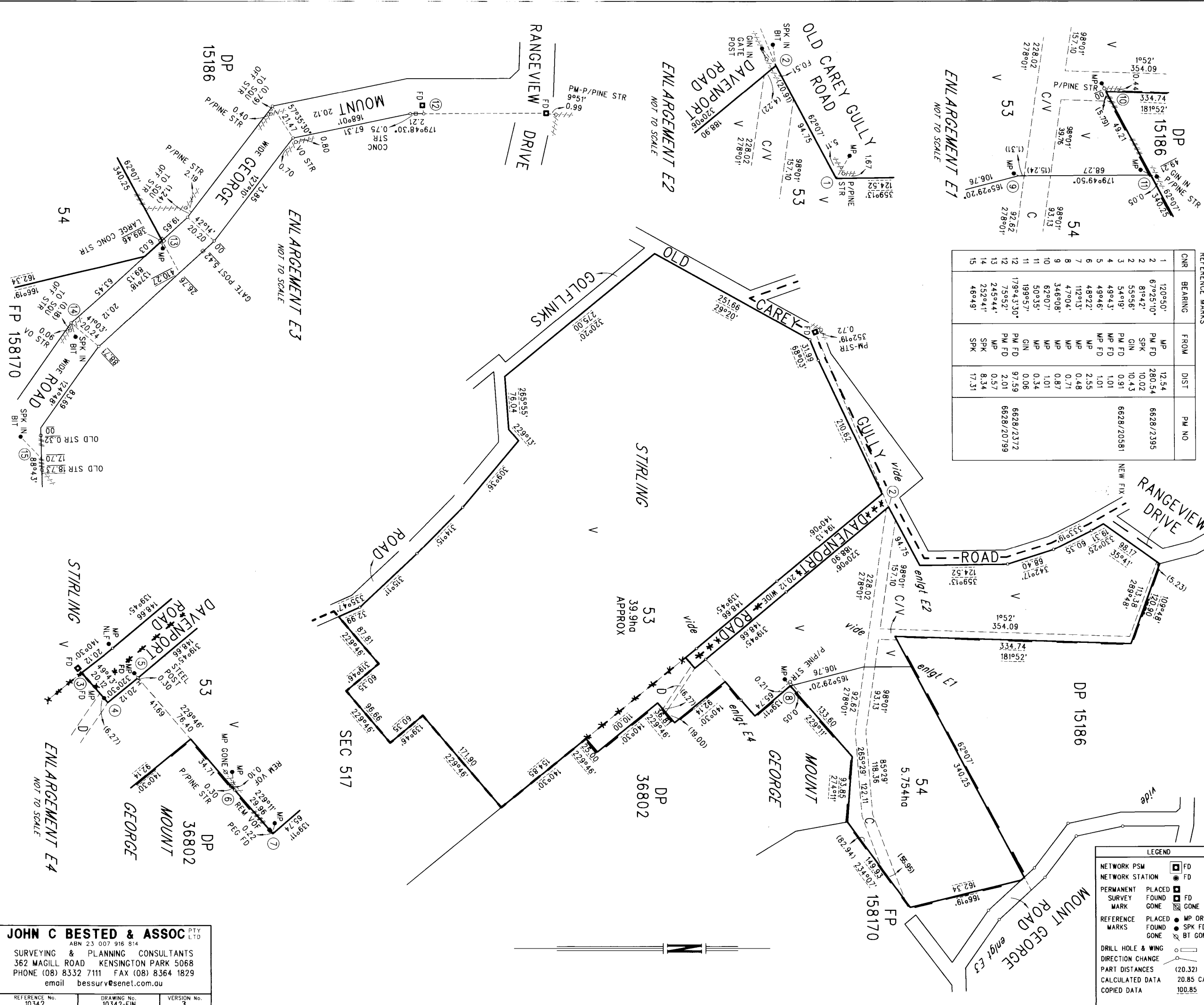
ALL DISTANCES ARE GROUND DISTANCES  
COMBINED SCALE FACTOR ZONE MGA  
BEARING DATUM: ⑩ - ⑬ 62°07' DISTANCE  
DERIVED FROM DP 36802 ADOPTED

I, GARY WILLIAM NICHOLS  
licensed surveyor of South Australia do hereby certify -  
(1) That this plan has been made from surveys carried out by me or under my personal supervision and in accordance with the Survey Act, 1992  
(2) That the field work was completed on the 30th day of OCTOBER 2001  
excepting for the final placement of survey marks.  
(strike out if not applicable)

Date 9/11/01 *[Signature]* Licensed Surveyor

REFERENCE MARKS

CNR	BEARING	FROM	DIST	PM NO
1	120°50'	MP	12.54	6628/2395
2	67°25'10"	PM FD	280.54	
2	81°42'	SPK	10.02	
2	55°56'	GIN	10.43	
3	54°19'	PM FD	0.91	6628/20581
4	49°43'	MP FD	1.01	
5	48°22'	MP FD	1.01	
6	48°22'	MP	2.55	
7	112°13'	MP	0.48	
8	47°04'	MP	0.71	
9	346°08'	MP	1.01	
10	62°07'	MP	0.87	
11	199°57'	GIN	0.34	
12	179°43'30"	PM FD	97.59	6628/2372
12	75°52'	PM FD	2.01	6628/20799
13	245°44'	MP	0.57	
14	252°41'	SPK	8.34	
15	46°49'	SPK	17.31	



**JOHN C BESTED & ASSOC** PTY LTD  
ABN 23 007 916 814  
SURVEYING & PLANNING CONSULTANTS  
362 MAGILL ROAD KENSINGTON PARK 5068  
PHONE (08) 8332 7111 FAX (08) 8364 1829  
email bessurv@senet.com.au

REFERENCE No. 10342 DRAWING No. 10342-FIN VERSION No. 3

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## **Appendix 32**

*Appendix DD of Development Report – Integrated  
water management plan*

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ENGINEERING

# Integrated Water Management Plan

**IWMP for Mount Lofty Golf Estate**

**JOB NUMBER:** S53897 - 282604  
**CLIENT:** Venture Capital Developments Pty Ltd  
**SITE:** Stirling Golf Club, 35 Golflinks Road,  
STIRLING, SA 5152  
**DATE:** 28/03/2023  
**REVISION:** 1

**Engineering  
your success.**

ADELAIDE  
MELBOURNE  
SYDNEY

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The work carried out in the preparation of this report has been performed in accordance with the requirements of FMG Engineering's Quality Management System which is certified by a third party accredited auditor to comply with the requirements of ISO9001.

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Document Status

<b>Rev No.</b>	<b>Status</b>	<b>Author</b>	<b>Reviewed by</b>	<b>Reviewed Date</b>
0	For Approval	J Colbert	J Clapp	21.03.2023
1	For Approval	J Colbert	J Clapp	28.03.2023

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**Water Balance assessments** ..... 5

**Wastewater Management** ..... 6

**Stormwater** ..... 6

Conclusion ..... 7

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Appendix B ..... 9

    Preliminary Wastewater Management Plan ..... 9

Appendix C ..... 10

    Stormwater Assessment Report ..... 10



# Introduction and scope

An Integrated Water Management Plan (IWMP) is a comprehensive approach to managing water resources, namely water supply, rainwater harvesting, stormwater, wastewater, and groundwater resources. The aim of an IWMP is to promote sustainable water use, minimize the impact of development on water resources, and ensure the long-term availability and quality of water resources. This report outlines an IWMP for the proposed development at Mount Lofty Golf Estate, situated within the Adelaide Hills Council. The plan is designed to comply with best practice guidelines and requirements, namely the South Australian Environmental Protection Authority (EPA) and the SA Public Health wastewater requirements.

The Guidelines for the preparation of a Development Report for Mount Lofty Golf Estate, supplied by the State Planning Commission outline the significance of the site, surrounding environment and the risk level surrounding the environmental sustainability, flooding and water quality, surface water and waste management considerations.

Mount Lofty Golf Estate is located within a sensitive watershed catchment, and it is essential to ensure that its water management practices are sustainable and environmentally responsible. This report will provide a roadmap for the implementation of best-practice water management practices that will ensure the long-term viability of the development while protecting the environment and meeting regulatory requirements.

## Proposed works

The proposed development plan for this site includes ;

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites, 15 x two bedroom serviced apartments, 15 x three bedroom serviced apartments, 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m<sup>2</sup> function room, A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace, 186m<sup>2</sup> sports bar, A 189m<sup>2</sup> gallery and cafe.
  - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – ‘Pods’
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
  - Extension to the Perfumery to include a covered outdoor dining area.
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a “Scent Factory”.
  - Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
  - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.
  - A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.

- Designated waste storage areas.
  - Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

A site plan and or supporting documentation has been provided within the appendices displaying all water related features and infrastructure for each section of this report as applicable.

## Water Balance assessments

DSquared Consulting has undertaken a water balance assessment of the proposed development, summarising the findings below;

*The development will achieve at least a 10% reduction in potable water use when compared to a reference building in accordance with the Green Star Buildings v1 rating tool requirements.*

*Preliminary water balance modelling indicates the development will achieve a 33% reduction in potable water demand when compared with a 'standard practice' reference case as defined by the Green Building Council of Australia. This exceeds Green Star Water Use requirements under the Buildings v1 rating tool.*

*A 50 kL rainwater storage tank will be provided and harvest rainwater for landscape irrigation, laundry services, and washdown of bin rooms and golf carts, which will contribute 13% of the buildings' total annual water demands, or 25% of the buildings' non-potable water demands.*

	<b>Standard practice</b>	<b>Mount Lofty Golf Estate</b>
Total water demand (kL p.a.)	6,380	4,884
Rainwater contribution (kL p.a.)	Nil	639 (13% of demand)
Resultant potable water demand (kL p.a.)	6,380	4,245 (33% reduction over standard practice)

Table 1 - Water Balance summary

A copy of the sustainability assessment has been included in Appendix A.

# Wastewater Management

FMG Engineering has undertaken an analysis of the wastewater which will be generated from the proposed development (including the Hotel, private retreats, perfumery and Golf Course facilities) in accordance with the SA Health and WSAA code requirements. This analysis has assessed the volume of sludge accumulated on an annual basis, and the maximum daily effluent flow during a full capacity event such as a function. This value is currently estimated as 51,630 L per day, conservatively taken as 60,000L per day for the purpose of sizing balance tanks and pumping arrangements.

The wastewater generated from the development will be stored within a balance tank with sufficient storage to cater for a power failure period of 1 day, totalling 120,000 L. Effluent from this balance tank will be pumped towards an existing Adelaide Hills Council pump station (Stirling Catchment PS2) which is located within the Golflinks Road Reserve, which shares a boundary adjacent the subject site to the south. This pump station elevates wastewater to ultimately discharge into the SA Water Heathfield Wastewater Treatment Plant (WWTP).

FMG has liaised with Adelaide Hills Council who have advised the existing capacity and pump sizes of the PS2 pump station. Using this information FMG has nominated a new pump flow rate specification (2.6 L/s) to replace the existing pumps (1.5L /s) and provide supplementary emergency storage which will ensure the pump station remains compliant with WSA-04 Sewage Pumping Station Code of Australia. The proposed peak flow within the rising main will remain under 1.5m/s and hence an upgrade of the rising main itself is not necessary.

This approach has been reviewed by the Adelaide Hills Council and preliminary endorsement has been provided by written email which has been included as an appendix to this report. SA Water will be consulted as the end receiver of these flows for final approval.

Full design calculations, and correspondence with Adelaide Hills Council has been included in Appendix B.

## Stormwater

The majority of existing buildings which affect water on site consists of a number of small golf facility buildings (referred to here within as the clubhouse), associated asphalt hardstand for carparking and deliveries, and the perfumery, which is located discretely away from the clubhouse. These buildings are generally located in the location of future development on the site.

To the north and north-east of the existing clubhouse (which coincides with the future hotel location), Cox's Creek can be observed, along with a man made dam which harvests runoff from the northern side of the Cox's Creek and is used for irrigation of the golf course. No works or modifications are proposed to the existing dam or golf course irrigation methods.

1% AEP flood levels within Cox's Creek have been estimated on a high level basis, with results indicating a maximum flow depth of 2.5m from the invert of Cox's Creek. The lowest Finished Floor Level (FFL) within the development is located approximately 5.5m above the invert of the adjacent watercourse, ensuring a minimum freeboard in the order of 3m. This freeboard is sufficiently large enough to mitigate the need for further studies of the watercourse or flooding. No anecdotal reports of flooding of the current clubhouse buildings were reported by the asset owners.

Cox's Creek runs through the site, flowing in a south easterly direction. Generally, this is located at the low point of the entire golf course site, with smaller tributaries flowing into Cox's Creek. All runoff from the existing buildings flow into Cox's Creek, through a series of formal and informal flow paths. Drainage for the minor system consists of roof drainage, stormwater inlet pits and pipes which can be observed on site and in

aerial imagery, but condition, capacity and alignment are not well documented, and assumed to be beyond useful life. To the south of the existing buildings, an upstream catchment of approximately 6ha is observed, and is generally funnelled around the east and west of the clubhouse buildings informally under current conditions.

Under the proposed development, runoff from upstream catchments will be safely routed around the east and west of the proposed building, mimicking existing conditions and protecting the development from inundation. Runoff intercepted by the roof area will be harvested for reuse as outlined within the Water Balance section of this report. Runoff captured at surface level within the hotel will be collected into a minor stormwater pit and pipe network fitted with gross pollutant intercepting baskets, or conveyed via overland flow during a major storm event, towards a stormwater basin located adjacent Cox's Creek. Within this basin a tertiary level water quality improvement will be achieved through use of a bioretention raingarden capable of treating at least the volume of runoff generated by the 4EY ARI in accordance with the EPA and Water Sensitive SA best practice guidelines.

Stormwater collected into the basin will also be detained to ensure post-development peak runoff does not exceed the pre-development peak runoff figures for the minor and major storm respectively. The detention volume held within this basin during the 1% AEP storm event is estimated to be in the order of 150m<sup>3</sup>. Should further investigations determine this basin is required to be enlarged, sufficient room exists along the length of Cox's creek to increase the basin size. The basin is likely to be nominated beyond the 1% AEP flood level, however could be designed to be adequately protected within the floodway if required.

All wastewater infrastructure, general waste infrastructure and equipment storage facilities will be nominated within the footprint of the proposed hotel facility, which will be at or above the minimum FFL of 419.80mAHD, and adequately protected from upstream catchments which will be safely diverted around or away from the building along existing overland flow routes.

The detailed stormwater management plan can be found within Appendix C where further calculations are provided.

A review of SARIG mapping suggests a depth to groundwater in the order of 5-10m throughout the subject site. No works are proposed which will affect groundwater, however groundwater may be encountered during construction depending on proposed footing systems.

## **Conclusion**

It is the conclusion of this report that the proposed works can be suitably designed and developed to holistically manage water both on site and within the surrounding catchment to mitigate negative effects on the environment. This assessment has been undertaken with consideration to the EPA, SA Health and WSAA code requirements, along with best practices for stormwater management.

This report will be updated upon receipt of final approvals for proposed wastewater management solutions when received from authorities.



# Appendix A

Dsquared Sustainability Report

# Mount Lofty Golf Estate

## Sustainability Strategy Report

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Project Number: 2623





Issue	Date	Change	Checked	Approved
01	07/09/2022	Development Report Issue	JB	DD

Our vision is to think beyond the square.

Our mission is to reduce the impact on the environment of our client's actions by providing innovative solutions, challenging perceived thinking, and pushing the boundaries of achievement whilst using all resources in a sustainable way.

We confirm that all work has been undertaken in accordance with our ISO 9001 accredited quality management system.

**Acknowledgement of country**

The dsquared team wish to acknowledge the Traditional Custodians of all country throughout Australia, and their cultural, spiritual, physical, and emotional connection with their land, waters, and community. We pay our respects to all Elders past, present, and emerging.

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# 1 Introduction

## 1.1 Introduction

This report presents the Sustainability Strategies and Ecologically Sustainable Design (ESD) initiatives proposed for the Mount Lofty Golf Estate development, which will reduce the development’s impact on the environment in both construction and operation.

The proposed development has been designed with a holistic approach to ESD, creating an exemplar environment for all users including visitors, guests, and staff, while minimising energy use and greenhouse gas emissions.

This report follows the development of the master plan and building designs by the design team led by R-Architecture. Computer building simulation design techniques have been employed to inform the design initiatives and to assess the sustainability performance of the built form.

## 1.2 Strategy

The sustainability strategy and outcomes proposed are summarised as follows:



## 2 Performance

### 2.1 Green Star certification

The project will obtain a certified Green Star As-Built rating using the Green Building Council of Australia's new rating tool 'Buildings v1', which is the GBCA's next-generation rating tool replacing the previous 'Design and As-Built' tool.

The project is targeting a 5 Star outcome under the GBCA's new Buildings v1 rating tool. The GBCA defines 5 Stars as 'Australian Excellence' in sustainable building design.

The project will also obtain a Green Star Design Certification prior to the construction stage commencing.

Obtaining a third-party certified Green Star rating acts as a verification method for the project's ESD design initiatives and modelled performance outcomes. This approach will ensure ESD remains a core part of the project scope throughout the detailed design and construction phases.

### 2.2 Energy

The development is being designed and will be constructed to meet the energy efficiency requirements of the Green Building Council of Australia's Green Star Buildings v1 rating tool, which are as follows:

- The development will achieve at least 10% better energy and greenhouse gas emissions performance compared with a NCC / BCA 2019 deemed-to-satisfy reference case; and
- The façade and building fabric will exceed the NCC / BCA 2019 deemed-to-satisfy requirements for energy efficiency and thermal performance.

Preliminary modelling of the proposed concept design indicates that the development's **energy consumption will be 24% lower** than a NCC 2019 deemed-to-satisfy reference case, and its **carbon emissions from energy use will be 18% lower**. Refer to section 3 for a list of energy efficiency initiatives which will contribute to achieving these outcomes.

	Reference Building (NCC 2019 code compliant)			Mount Lofty Golf Estate		
	Electricity	Gas	CO <sub>2</sub> emissions	Electricity	Gas	CO <sub>2</sub> emissions
	kWh p.a.	MJ p.a.	kg CO <sub>2</sub> e p.a.	kWh p.a.	MJ p.a.	kg CO <sub>2</sub> e p.a.
Hotel	375,681	443,790	185,390	387,452	0	162,730
Facilities Building	404,465	159,948	179,824	323,067	0	135,688
Accommodation Pods	132,145	91,440	61,188	124,262	0	52,190
<b>Total</b>	<b>912,291</b>	<b>695,178</b>	<b>426,402</b>	<b>834,781</b>	<b>0</b>	<b>350,608</b>

Energy modelled performance results

	Reference Building (NCC 2019 code compliant)	Mount Lofty Golf Estate	Improvement
Energy use (MJ p.a.)	3,979,426	3,005,212	24%
CO <sub>2</sub> emissions (kg CO <sub>2</sub> e p.a.)	426,402	350,608	18%

Energy modelled performance summary

### 2.3 Carbon emissions

The development will be all-electric and will not use fossil fuels (natural gas) for heating, cooling, or hot water services, promoting the transition to 100% renewable energy from off-site and on-site sources.

20% of the development's annual electrical demand will be supplied by on-site renewable energy via a rooftop solar PV system.

A Zero Carbon Action Plan will be prepared and will include strategies for how the project will achieve net zero carbon emissions in operation. This includes strategies for phasing-out and eliminating all fossil fuels from the development and transitioning away from petrol- and diesel-powered golf carts and grounds maintenance vehicles and equipment.

### 2.4 Daylight

All hotel suites and public facilities (golf club, restaurant, and function rooms) have access to daylight in accordance with Green Star standards.

The daylight access has been verified using IES Virtual Environment building computer simulation software, with modelled results as follows. Sample plots from the daylight modelling are provided in Appendix A.

	Occupied floor area (sqm)	Compliant area (sqm) <i>(Note 1)</i>	Compliant % <i>(Note 2)</i>	Green Star result
Facilities Building	1,802	993	55%	Complies
Hotel Building	3,084	1,488	48%	Complies
Accommodation Pods	651	433	66%	Complies
<b>Whole development</b>	<b>5,538</b>	<b>2,913</b>	<b>53%</b>	<b>1 out of 2 points achieved</b>

Daylight modelling results

Note 1: Compliance target is a minimum of 160 lux of daylight achieved during >80% of daytime hours.

Note 2: Green Star targets are 40% compliant area for 1 point, or 60% for 2 points.

Refer also to Appendix A for sample daylight modelling plots.

## 2.5 Water

The development will achieve at least a 10% reduction in potable water use when compared to a reference building in accordance with the Green Star Buildings v1 rating tool requirements.

Preliminary water balance modelling indicates the development will achieve a 33% reduction in potable water demand when compared with a 'standard practice' reference case as defined by the Green Building Council of Australia. This exceeds Green Star Water Use requirements under the Buildings v1 rating tool.

A 50 kL rainwater storage tank will be provided and harvest rainwater for landscape irrigation, laundry services, and washdown of bin rooms and golf carts, which will contribute 13% of the buildings' total annual water demands, or 25% of the buildings' non-potable water demands.

	Standard practice	Mount Lofty Golf Estate
Total water demand (kL p.a.)	6,380	4,884
Rainwater contribution (kL p.a.)	Nil	639 (13% of demand)
Resultant potable water demand (kL p.a.)	6,380	4,245
Improvement achieved	-	33%

Water modelling results

### 3 Initiatives

#### 3.1 Passive Design

The following passive design features are included:

1. Buildings are oriented north which captures free heating from the winter sun. External shade elements and balconies provide shade protection from the summer sun.
2. The building form, façade shading elements, and glazing system specifications have been informed by energy performance modelling and computer simulation techniques.
3. High performance double-glazed facades are provided throughout the development. Glass systems' solar heat gain coefficients (SHGCs) have been optimised for each building type depending on solar exposure, to provide an optimum balance between summer and winter comfort.

Façade glazing systems will meet the following performance specifications.

	U-value Whole of system W/m <sup>2</sup> .K	Solar Heat Gain Coefficient (SHGC)	Visible Light Transmittance (VLT)	Glazing system type
Hotel Building	3.2 or less	0.40 or less	45% or higher	Double-glazed Neutral glass with low-E performance coating
Facilities Building	3.2 or less	0.40 or less	45% or higher	Double-glazed Neutral glass with low-E performance coating
Eco Pods	3.5 or less	0.50 or less	50% or higher	Double-glazed Neutral or clear glass

Façade glazing performance specifications

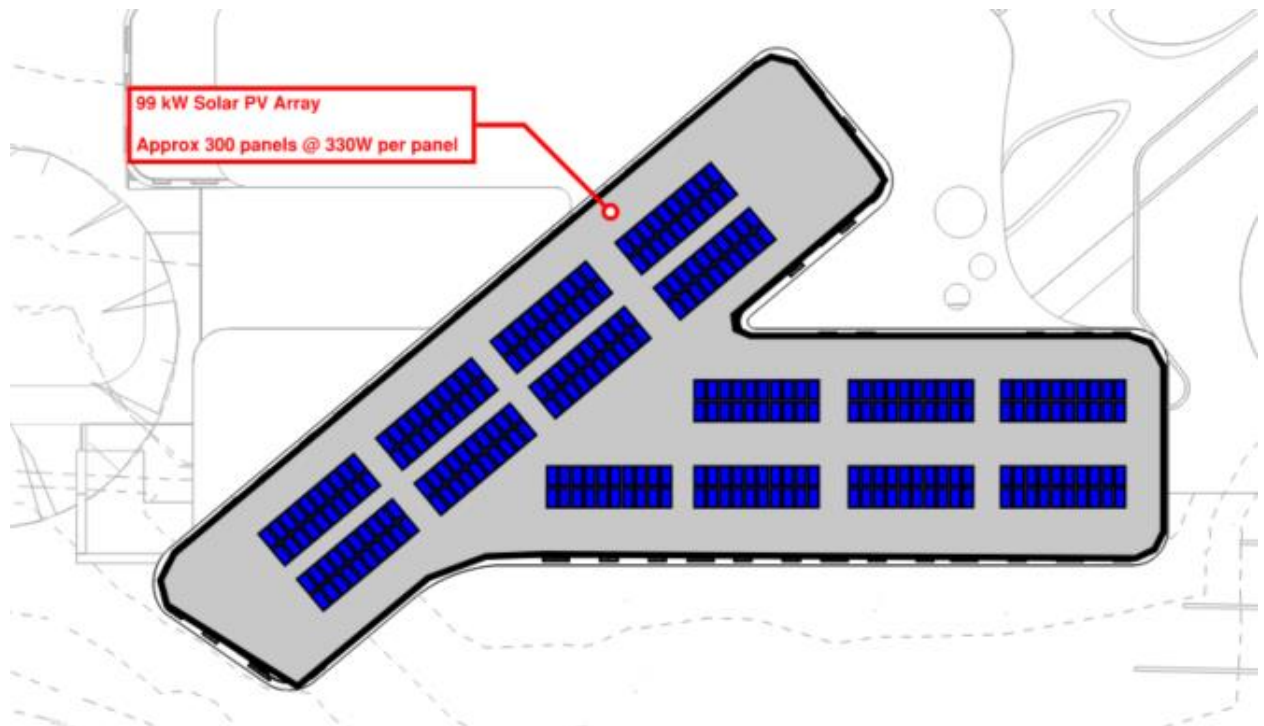
4. Natural ventilation is available in all hotel rooms and the gallery/café space, thereby reducing mechanical cooling demands.
5. The external façade will be subject to air leakage pressure testing to ATTMA standards, and the façade supplier required to meet prescribed air leakage rates as per GBCA / Green Star Standards. As well as significantly reducing the air conditioning energy consumption, this will also improve the indoor air quality, particularly during high external air pressure conditions.
6. Passive cooling from green roof, façade planters, and green landscaping around the buildings. Water transpiration from the plants and landscaping provides a natural cooling effect.
7. Light-coloured roof finishes and landscaping finishes will minimise heat absorption and reduce the heat island effect in accordance with Green Star standards. Roof finishes will have a solar reflective index (SRI) of minimum 82 and hardscaping elements at ground level will have a solar reflective index (SRI) of minimum 39.
8. Daylight is provided to all hotel rooms and indoor public spaces (Restaurant, Function Room, Golf Club and Sports Bar) which reduces artificial lighting demand.

### 3.2 Energy

The following Energy initiatives are included:

1. The building is fully electrified including cooling, heating, hot water, and cooking (no fossil fuels / natural gas).
2. A rooftop solar PV array provides renewable energy to power the building. Energy balance modelling demonstrates the system will provide at least 20% of the site's annual energy demand.

A solar PV layout sketch is shown as follows (refer also to Appendix B).



Proposed solar PV array

3. HVAC systems comprise high-efficiency air-cooled heat pump thermal plant for heat rejection and heat injection. All central plant is contained within distinct plant enclosures which minimises acoustic impacts and visual obtrusiveness of plant equipment.
  - A ground-loop heat exchange system is being explored as an alternative heat rejection strategy, in collaboration with specialist consultants GeoExchange. This option will further improve heating and cooling system efficiencies and will provide a natural and renewable source of thermal energy from the ground.
4. A shared condenser water loop system will provide heating and cooling energy to the Hotel and Facilities buildings using an efficient centralised approach.
5. Heat recovery between HVAC and domestic hot water systems via the shared condenser water loop system. In summer when HVAC systems are in cooling mode and rejecting heat from the occupied spaces into the condenser water loop, the rejected heat energy will be recovered and used to heat water for showering and other domestic hot water uses.
6. High-efficiency electric heat pump domestic hot water plant. System efficiency rating (Coefficient of Performance) will be in excess of 300% efficient.

7. All hotel rooms have access to natural ventilation via private balconies. Air-conditioning will shut down automatically whenever the balcony door is left open, to save energy when guests choose to open up their room and allow natural ventilation and external breezes to enter.
8. Air-conditioning and lighting in hotel rooms will switch off automatically when rooms are unoccupied.
9. Economy cycle HVAC mode provides free-cooling in public spaces (Restaurant, Function Room, Golf Club and Sports Bar).
10. Demand-controlled ventilation including indoor CO<sub>2</sub> monitoring will reduce thermal loads in public spaces (Restaurant, Function Room, Golf Club and Sports Bar) whilst maintaining a high indoor air quality at all times.
11. Automatic BMS controls for retail and commercial HVAC systems with distinct thermal zoning to suit the comfort needs of individual areas.
12. Energy efficient LED lighting throughout.
13. Energy metering and sub-metering of distinct load centres, connected to a fully integrated BMS.

### 3.3 Water

The following Water initiatives are included:

1. A rainwater capture and reuse system will provide rainwater for landscape irrigation, laundry services, and washdown of golf carts/waste storage rooms. A 50 kL rainwater storage tank will contribute 13% of the development's total water demand / 25% of non-potable water demand.
2. Landscaping comprises native and drought-tolerant planting species which have low irrigation water demands.
3. Water efficient fittings with the following minimum WELS ratings:
  - Taps 6 Stars
  - WCs 4 Stars
  - Urinals 4 Stars
  - Showers 4 Stars
4. Selecting water-efficient washing machines and dishwashers which are within one Star of the highest available water rating.
5. No water will be consumed for HVAC heat rejection purposes, i.e. no cooling towers. All HVAC heat rejection will be air-cooled or via ground heat exchange.
6. Stormwater systems designed such that pre-development peak stormwater outflows will not be exceeded, and all stormwater run-off will be appropriately treated before discharge to the local waterways. The use of stormwater detention tanks will contribute to meeting these outcomes.

### 3.4 Waste

The following Waste initiatives are included:

1. Construction waste will be minimised through efficient design techniques including standardisation and off-site pre-fabrication wherever practicable. A minimum 90% diversion from landfill rate will be targeted.
2. Separate bins will be provided for organic waste, recyclable waste, and general waste, to encourage and facilitate diversion of waste from landfill.

3. Waste storage facilities for the collection and disposal of general, recyclable, organic waste, and bulky waste, which will be separated on site to facilitate ease of disposal for recycling.
4. A site-specific Operational Waste Management Plan will be developed in accordance with Green Building Council of Australia guidelines for best practice waste management. The Plan will inform the design of waste storage and handling facilities, waste bin provisions, and signage requirements.

### 3.5 Indoor Environment Quality

The following Indoor Environment Quality initiatives are included:

1. All hotel suites and accommodation pods have access to natural ventilation via private balconies.
2. Mechanical ventilation will be provided to hotel rooms when balcony doors are closed, and to all public spaces. Outside air supplies will be in accordance with Green Star and AS1668.2 minimum requirements.
3. Daylight access is provided in all hotel suites, accommodation pods, and public spaces (Restaurant, Function Room, Golf Club and Sports Bar) in accordance with Green Star criteria (minimum 160 lux of daylight during at least 80% of daytime hours).
4. Glare from sunlight is managed through a combination of external shade elements, internal blinds, and building orientation (north-facing aspect).
5. Views to the surrounding natural landscapes are available in all occupied spaces.
6. The use of low VOC and low formaldehyde paints, sealants, adhesives, carpets, coverings, and furniture.
7. Acoustic performance in occupied spaces will be in accordance with Green Star and AS 2107 standards. Façade systems, acoustic treatments to internal ceilings and walls, and services plant will be designed to meet Green Star acoustic standards. This includes background noise levels, reverberation levels, and acoustic privacy requirements.
8. Air conditioning systems will be centralised, concealed, and located in acoustically sheltered plant areas, such that external noise will not impact on the amenity of guests, customers, or staff.

### 3.6 Construction

The following Construction initiatives are included:

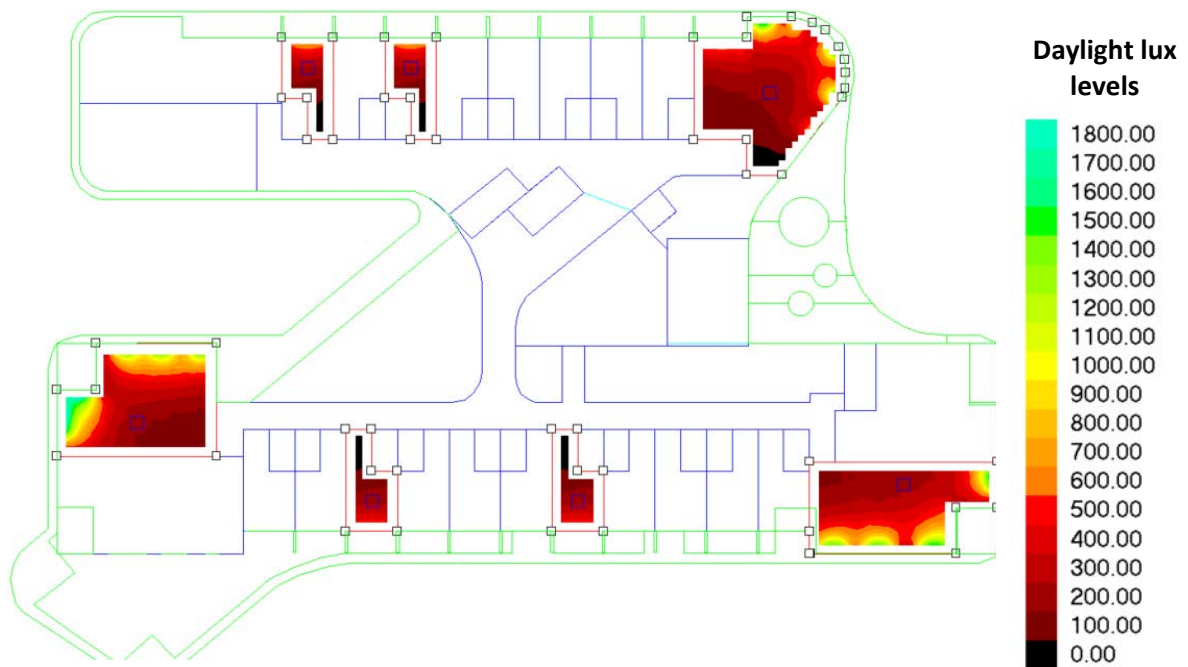
1. Embodied carbon of construction (i.e. 'upfront emissions') will be at least 10% lower than a reference case, in line with Green Star requirements.
2. Refrigerants with low Global Warming Potential (GWP) ratings will be specified for central thermal plant and hot water plant.
3. Building materials which are made from recycled materials e.g. fly ash in concrete, reinforcement bar, recycled content floor coverings, and recycled insulation products, wherever viable.
4. Head contractor will be required to implement an Environmental Management Plan compliant with Green Star standards.
5. Using off site pre-fabrication techniques to reduce on site construction time, waste, and greenhouse gas emissions, wherever practicable.
6. Locally sourced materials and labour will be sought wherever viable.
7. Using Building Information Modelling (BIM) as a design and construction management tool to minimise on-site clashes and abortive/wasteful work.



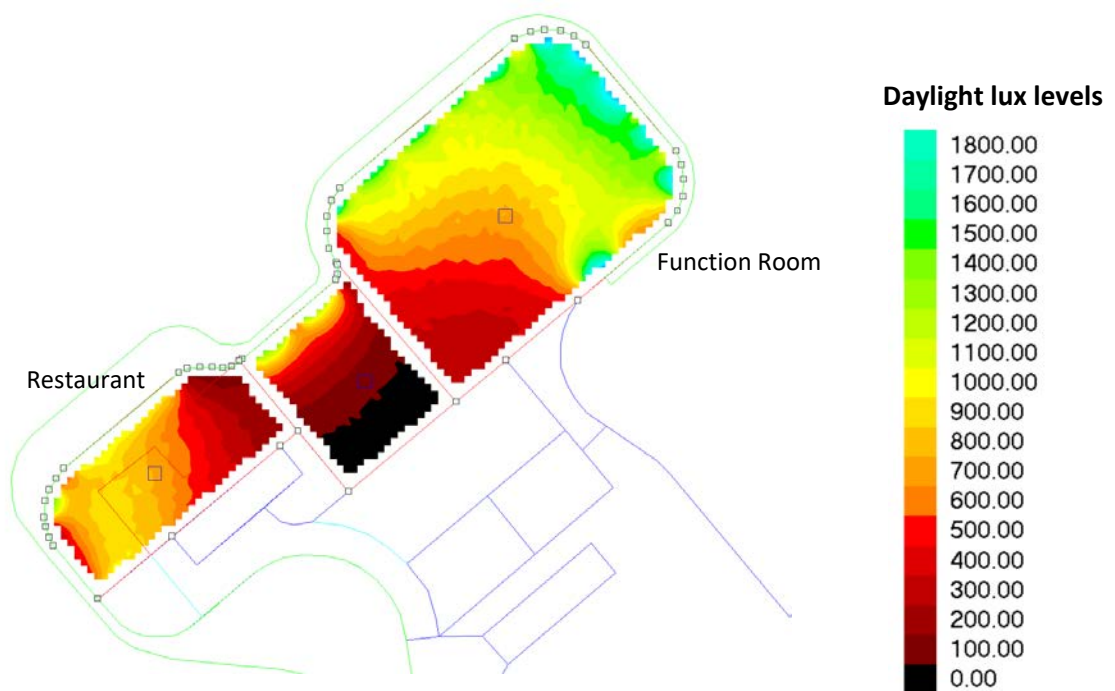
### 3.7 Community and Social Sustainability

The following social sustainability initiatives are included:

1. The development includes a Wellness Centre, Gym, and extensive common outdoor amenity space.
2. The Facilities building is designed and located as a shared gathering point for various users and visitors including golf players, hotel patrons, restaurant customers, gym users, and Function Room guests. Shared outdoor terraces encourage interaction and community between the various user groups.
3. A communal creche / childcare is provided in the Hotel building.
4. All public spaces have good access to daylight, ventilation, and views to the surrounding landscapes.
5. Heritage listed Scent Factory building from the historic Mount Lofty Flower Farm will be restored as part of the development works, and incorporated as an attraction feature for guests and visitors to the development.
6. Local ecology and vegetation will be featured and integrated into the development.



Daylight modelling plots – Hotel building, Level 1



Daylight modelling plots – Facilities building, Level 1

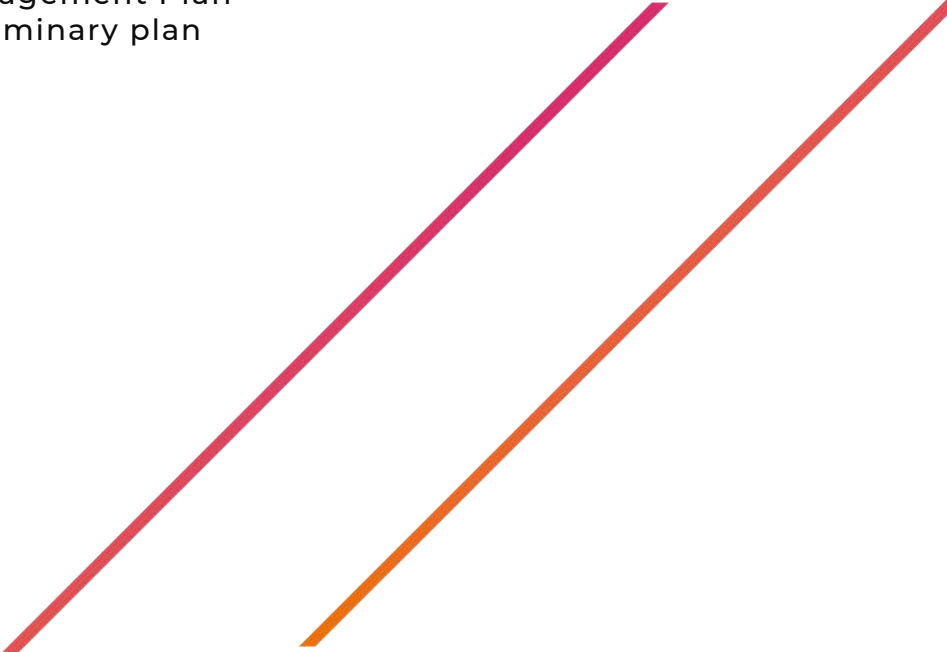






## **Appendix B**

Preliminary Wastewater Management Plan  
Council Endorsement of preliminary plan



Ref: 282604 / S53897  
28/03/2023

**Re: Wastewater proposal at Mount Lofty Golf Estate**

FMG Engineering has been engaged to prepare a plan for managing wastewater generated by the proposed development at Mount Lofty Golf Estate.

The subject site is located within the Adelaide Hills Council (Council), which operates and maintains a number of community waste management schemes (CWMS) to service areas which cannot drain sewer via gravity to SA Water infrastructure, as is the case with the subject development site. Adjacent to the site, no SA Water infrastructure is present, however a Council owned and operated pump station is present on the corner of Old Carey Gully Road, and Spring Gully Road.

FMG Engineering has presented a preliminary wastewater management plan to Council that has been endorsed and supported which can be summarised as;

- Collection of wastewater from all wastewater generating facilities into septic tanks which are desludged on a yearly basis
- Residual effluent from the septic collection will be conveyed into a holding tank, and pumped to the existing Council pump station on Golflinks Road at nominally 1.4 L/s.
- Council's existing pump station will be upgraded from the current 1.5L/s capacity, to a new pump capacity of 2.6L/s within the existing rising main. Additionally, a further 20m<sup>3</sup> of emergency storage will be provided below ground at the Council pump station.

On the above in principal support, FMG has prepared preliminary wastewater calculations in accordance with SA Health and WSAA code requirements which provides indicative minimum sizing of septic tanks. Final details will be confirmed to the satisfaction of Adelaide Hills Council and SA Water during detailed design. A schematic has also been attached for reference.

This letter outlines a feasible plan for managing wastewater which can be assessed for planning purposes, with final details to be confirmed and approved by SA Health and referred to Adelaide Hills Council as the approving authorities.

Yours sincerely

**Jordan Colbert**

National Civil Manager  
FMG Engineering

Attached:      Wastewater calculations  
                    Schematic plan

**Desludge Rate**

1 years

**Accommodation**

Sludge/Scum Rate (S)

48 L/person/year

Daily Flow (DF):

100 L/person/day

**Non-resident staff**

Sludge/Scum Rate (S)

25 L/person/year

Daily Flow (DF):

30 L/person/day

**Function centre (Seminar/Conference)**

Sludge/Scum Rate (S)

35 L/person/year

Daily Flow (DF):

40 L/person/day

**Restaurant**

Sludge/Scum Rate (S)

35 L/person/year

Daily Flow (DF):

20 L/person/day

**Sports Bar**

Sludge/Scum Rate (S)

5 L/person/year

Daily Flow (DF):

10 L/person/day

**Gallery Café**

Sludge/Scum Rate (S)

30 L/person/year

Daily Flow (DF):

10 L/person/day

**Perfumery Restaurant**

Sludge/Scum Rate (S)

35 L/person/year

Daily Flow (DF):

20 L/person/day

**Golf course facilities included in numbers above**

Fmg Engineering

<b>Number of single bed equivalents (P1)</b>	<b>Number of single bed equivalents (P2)</b>	
305	305	45140 L
<b>Number of staff per shift x number of shifts (P1)</b>	<b>Number of staff per shift x number of shifts (P2)</b>	
101	101	5555 L
<b>Total seating capacity (P1)</b>	<b>Total seating capacity (P2)</b>	
270	270	20250 L
<b>Average daily number over 7 days (P1)</b>	<b>Highest daily number over 7 days (P2)</b>	
50	100	3750 L
<b>Average daily number over 7 days (P1)</b>	<b>Highest daily number over 7 days (P2)</b>	
80	160	2000 L
<b>Average daily number over 7 days (P1)</b>	<b>Highest daily number over 7 days (P2)</b>	
85	170	4250 L
<b>Average daily number over 7 days (P1)</b>	<b>Highest daily number over 7 days (P2)</b>	
50	100	3750 L

<b>Sludge</b>	39515 L/year		
<b>Total Daily Flow</b>	51630 L	<b>Tank Size</b>	<b>84695 L</b>
		<b>(SxP1xY) + (PSxDF)</b>	

All commercial kitchens are to have grease arrestors fitted and sized using SA Water guidelines

Desluge rate to be every 1 years





Project Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152				Job Ref. 282604 - S53897	
Section Balance Tank Calculations				Sheet no./rev. 1 / D	
Calc. by Jarrad Barford	Date 23/03/2023	Chk'd by Jordan Colbert	Date 23/03/2023	App'd by	Date

### **Internal wastewater pump and holding tank design**

As per Wastewater Calculations total maximum daily effluent flow is 51,630L.

To allow for an additional buffer round this volume up to 60,000L.

Due to the size of the development it is assumed that backup generators will be installed on site. Allow for a worst-case power failure period of 1 day.

### **Balance tank to be 120,000L in size.**

This volume is to be completely emptied before the next peak cycle occurs. This is assumed to be the following day, i.e. subsequent events. On this basis the total tank volume must be emptied within 24 hrs.

$$120000 \text{ L} / (24 \times 60 \times 60) = 1.389 \text{ L/s} \approx 1.4 \text{ L/s}$$

**Two pumps of pump rate 1.4L/s shall be provided, the two pumps shall be configured to automatically alternate as the duty pump.**

### **Downstream receiving pump station capacity**

Adelaide Hills Council has provided a series of calculations outlining the current capacity of the Stirling STEDS network;

- We understand there are two pump stations as part of the Stirling STEDS network;
  - o PS1 on Golf Links Road (at the eastern end of Golflinks Road) which pumps effluent towards PS2
  - o PS2 at the intersection of Golf Links Road, and Golf Links Close, which receives flow from PS1, and is then assumed to pump onwards to SA Water infrastructure outside of AHC's control.
- To mitigate upgrading two pump stations, we have revised our proposal to show the rising main to be connected to PS2
- Due to the increased inflow rate (an additional 1.4 L/s as per the attached balance tank sizing calculations sheet, the pumps within PS2 will need to be upgraded. Our review of the calculations package suggests a new pump capacity of 2.6L/s may be appropriate, as this keeps velocities within the 50mm rising main to <1.5m/s and approximately 80m of head loss.
- The increased inflow results in a deficiency in emergency storage at PS2. As a result, an additional 20m<sup>3</sup> of supplementary emergency storage is proposed to augment to the existing pump station. This will take the form of a concrete chamber below ground adjacent the pump station which will be linked. All storage will be provided between the invert and high level alarm elevation. Provision of this additional storage ensures an emergency storage % of ADF of 50.7% is achieved, aligning with the WSAA requirements for >50% emergency storage.



Project Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152				Job Ref. 282604 - S53897	
Section Balance Tank Calculations				Sheet no./rev. 2 / D	
Calc. by Jarrad Barford	Date 23/03/2023	Chk'd by Jordan Colbert	Date 23/03/2023	App'd by	Date

**Stirling STEDS - Pump Stations Summary**

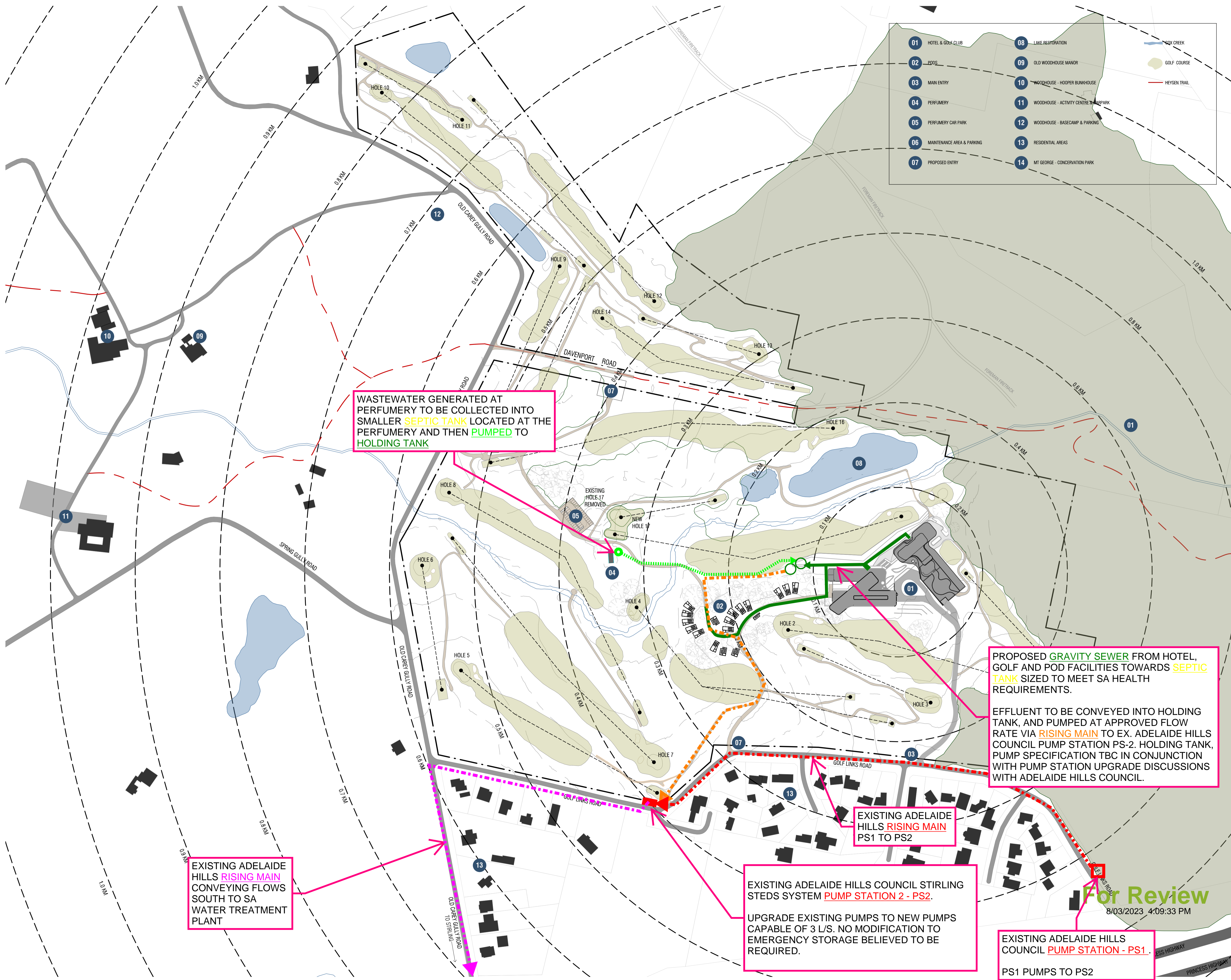
Pump Station	Location	Pump discharge (L/s)	Peak Inflow (L/s)	Pump Rate > Peak Inflow	Pump rate achieves % of peak inflow	Entire Network power failure				Local station failure			Comment
						Storage above HLA (m <sup>3</sup> )	Storage at ADF (hours)	> 5 hours (20%) storage @ ADF?	emergency storage % of ADF	Storage at ADF (hours)	> 5 hours (20%) storage @ ADF?	emergency storage % of ADF	
PS1	End of Golf Links Road	1.000	0.221	Yes	452%	6.795	25.60	Yes	106.7%	25.60	Yes	106.7%	
PS2	Golf Links Road near Golf Links Close	1.500	0.953	Yes	157%	14.379	16.38	Yes	68.2%	12.58	Yes	52.4%	

Council capacity summary under Existing Conditions at the Stirling STEDS pump network

**Stirling STEDS - Pump Stations Summary**

Pump Station	Location	Pump discharge (L/s)	Peak Inflow (L/s)	Pump Rate > Peak Inflow	Pump rate achieves % of peak inflow	Entire Network power failure				Local station failure			Comment
						Storage above HLA (m <sup>3</sup> )	Storage at ADF (hours)	> 5 hours (20%) storage @ ADF?	emergency storage % of ADF	Storage at ADF (hours)	> 5 hours (20%) storage @ ADF?	emergency storage % of ADF	
PS1	End of Golf Links Road	1.000	0.221	Yes	452%	6.795	25.60	Yes	106.7%	25.60	Yes	106.7%	
PS2	Golf Links Road near Golf Links Close	2.600	2.353	Yes	111%	34.379	39.16	Yes	163.2%	12.18	Yes	50.7%	Additional 1.4L/s inflow, accordingly pump discharge has been increased to 2.6 L/s. Additional 20m <sup>3</sup> of storage volume also to be provided at PS2 to achieve a minimum 50% emergency storage volume

Council capacity summary following connection of proposed 1.4 L/s additional inflow.



- |                               |   |
|-------------------------------|---|
| 01 HOTEL & GOLF CLUB          | 08 LAKE RESTORATION                       |
| 02 PODS                       | 09 OLD WOODHOUSE MANOR                    |
| 03 MAIN ENTRY                 | 10 WOODHOUSE - HOOPER BUNKHOUSE           |
| 04 PERFUMERY                  | 11 WOODHOUSE - ACTIVITY CENTRE & BAR/PARK |
| 05 PERFUMERY CAR PARK         | 12 WOODHOUSE - BASECAMP & PARKING         |
| 06 MAINTENANCE AREA & PARKING | 13 RESIDENTIAL AREAS                      |
| 07 PROPOSED ENTRY             | 14 MT GEORGE - CONSERVATION PARK          |
- BOY CREEK  
 GOLF COURSE  
 HEYSEN TRAIL

WASTEWATER GENERATED AT PERFUMERY TO BE COLLECTED INTO SMALLER SEPTIC TANK LOCATED AT THE PERFUMERY AND THEN PUMPED TO HOLDING TANK

PROPOSED GRAVITY SEWER FROM HOTEL, GOLF AND POD FACILITIES TOWARDS SEPTIC TANK SIZED TO MEET SA HEALTH REQUIREMENTS.

EFFLUENT TO BE CONVEYED INTO HOLDING TANK, AND PUMPED AT APPROVED FLOW RATE VIA RISING MAIN TO EX. ADELAIDE HILLS COUNCIL PUMP STATION PS-2. HOLDING TANK, PUMP SPECIFICATION TBC IN CONJUNCTION WITH PUMP STATION UPGRADE DISCUSSIONS WITH ADELAIDE HILLS COUNCIL.

EXISTING ADELAIDE HILLS RISING MAIN PS1 TO PS2

EXISTING ADELAIDE HILLS RISING MAIN CONVEYING FLOWS SOUTH TO SA WATER TREATMENT PLANT

EXISTING ADELAIDE HILLS COUNCIL STIRLING STEDS SYSTEM PUMP STATION 2 - PS2.

UPGRADE EXISTING PUMPS TO NEW PUMPS CAPABLE OF 3 L/S. NO MODIFICATION TO EMERGENCY STORAGE BELIEVED TO BE REQUIRED.

EXISTING ADELAIDE HILLS COUNCIL PUMP STATION - PS1.

PS1 PUMPS TO PS2

**For Review**  
8/03/2023 4:09:33 PM

## Jordan Colbert

---

**From:** Kim Krieg <kkrieg@ahc.sa.gov.au>  
**Sent:** Friday, 24 March 2023 7:13 AM  
**To:** Jordan Colbert  
**Cc:** Ari Mudugamuwa  
**Subject:** Stirling Golf Course Development  
**Attachments:** RE\_ MLGE - Preliminary Wastewater discussions current proposal.eml

Hi Jordan,

Thanks for the chat yesterday regarding the above development. I can confirm that Council has in principle support for the proposed development including upgrade to Council's Golflinks Rd CWMS pump station 2 infrastructure located opposite Golflinks Court, Stirling. The developer will be responsible for all augmentation charges associated with the proposed pump station 2 upgrade and must seek approval from SA Water to discharge into their infrastructure.

Once the application is lodged further discussions can take place regarding the necessary upgrade.

Kind regards

Kim

**Kim Krieg (Pearson)**  
**Community Wastewater Management System (CWMS) Technical Officer**  
**Adelaide Hills Council**

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# Appendix C

Stormwater Assessment Report



ENGINEERING

# Stirling Golf Course

## Stormwater Management Plan

**JOB NUMBER:** S53897 - 275203; 282604  
**CLIENT:** Venture Capital Developments Pty Ltd  
**SITE:** Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152  
**DATE:** 1/12/2022  
**REVISION:** C

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your success.**

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Document Status

REV NO.	STATUS	AUTHOR	REVIEWER			APPROVED FOR ISSUE		
			NAME	SIGNATURE	DATE	NAME	SIGNATURE	DATE
0	For Lodgement	J Colbert	Jeremy Clapp	JHC	28.11.2021	Jordan Colbert	JTC	28.11.2021
1	For Approval	J Colbert	Jeremy Clapp	JHC	24.11.2022	Jordan Colbert	JTC	24.11.2022
2	For Approval	J Colbert	Jeremy Clapp	JHC	1.12.2022	Jordan Colbert	JTC	1.12.2022

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  - Music modelling results .....10
  - Cox Creek Preliminary Drain Model .....11
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# Introduction

FMG Engineering has been engaged by Venture Capital Developments Pty Ltd to undertake a preliminary stormwater assessment and develop a preliminary Stormwater Management Plan for a proposed development of the Stirling Golf Club. The Stirling Golf Course is located in the Adelaide Hills approximately 18km south east of the Adelaide CBD between Stirling and Bridgewater and is situated on the north side of the South Eastern Freeway. T

This preliminary Stormwater Management Plan describes the assessment undertaken and addresses the requirements provided by Adelaide Hills Council's engineering and planning departments.

# Site Description

The site is located at 35 Golflinks Rd, Stirling SA 5152 as shown in Figure 1. The site is bounded by Old Carey Gully Rd to the North West, Golflinks Rd to the South West and Mount George Conservation Park to the East and South East. The Golf Course is surrounded by several land use zones including Country Living, Watershed (Primary Production) and Public Purpose zones.

The Cox Creek runs through the site in a south easterly direction. The site is undulating with a general downwards slope towards the south east. The catchment area of the Cox Creek upstream of the Golf Course has been estimated using local contour data available in NatureMaps.

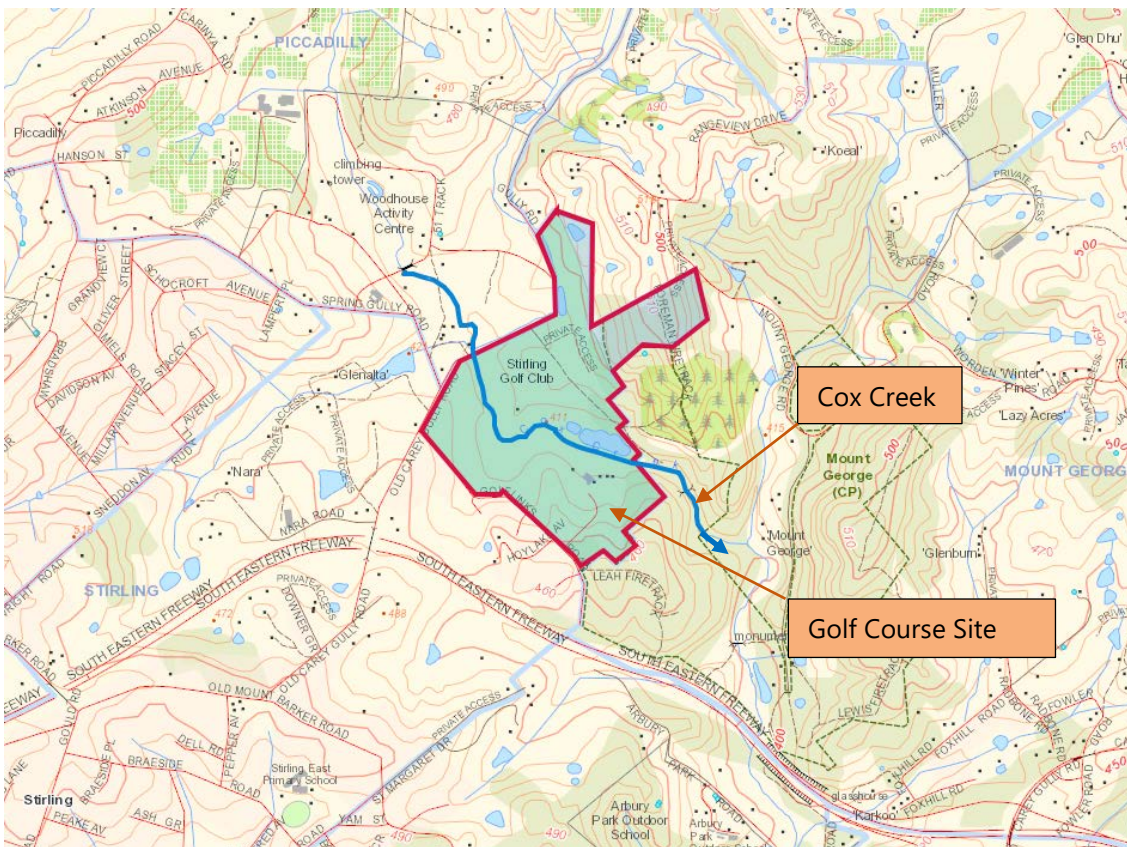
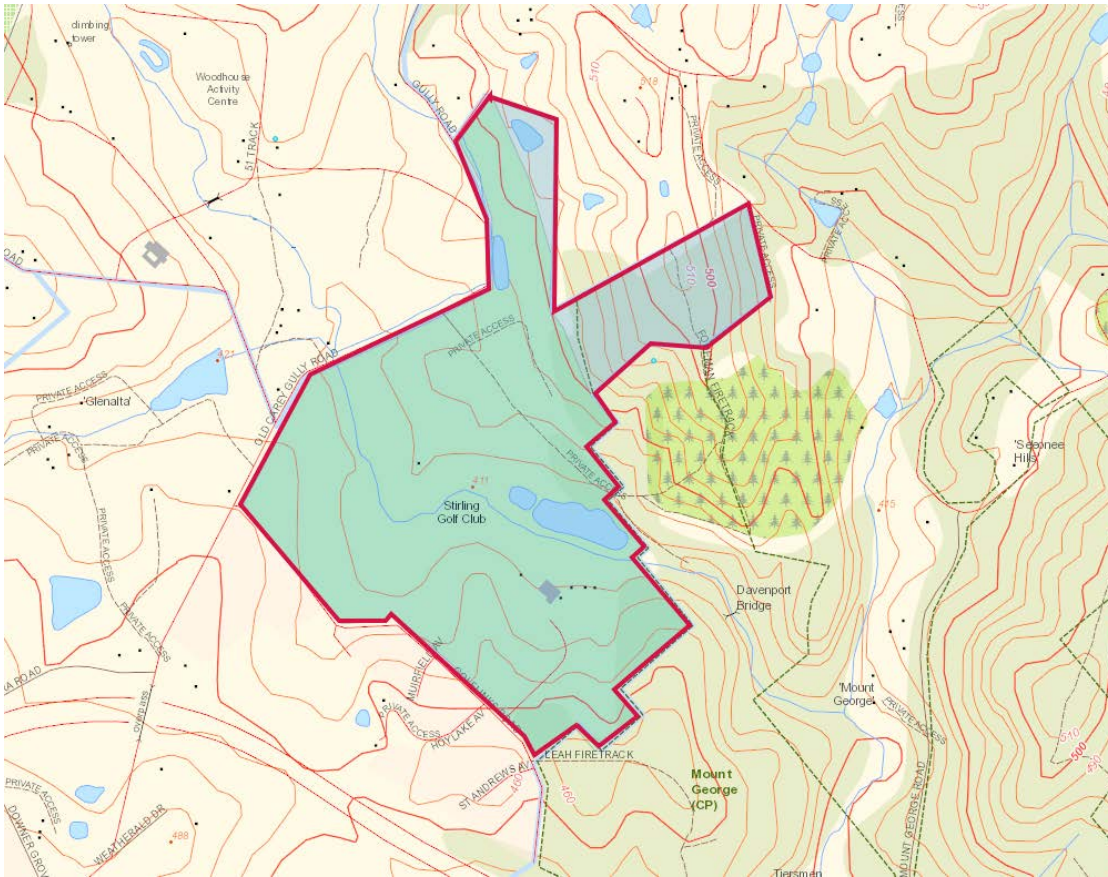


Figure 1 - Site locality plan (Nature Maps)



**Figure 2 – Golf Course site plan (Nature Maps)**

## Proposed Development

The proposed development plan for this site includes ;

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m<sup>2</sup> function room.
  - A 212m<sup>2</sup> restaurant with 89 m<sup>2</sup> external terrace.
  - 186m<sup>2</sup> sports bar.
  - A 189m<sup>2</sup> gallery and cafe.
  - A 94m<sup>2</sup> wellness centre with 125m<sup>2</sup> gym and spa/massage treatment rooms.
- Private retreats – ‘Pods’
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:

- Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
- Extension to the Perfumery to include a covered outdoor dining area.
- Orchard and perfumery garden plantings to reimagine the former use of the building as a "Scent Factory".
- Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m<sup>2</sup> clubhouse in new building.
  - New 97m<sup>2</sup> pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.
  - A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
- Designated waste storage areas.
  - Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m<sup>2</sup> together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m<sup>2</sup> together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

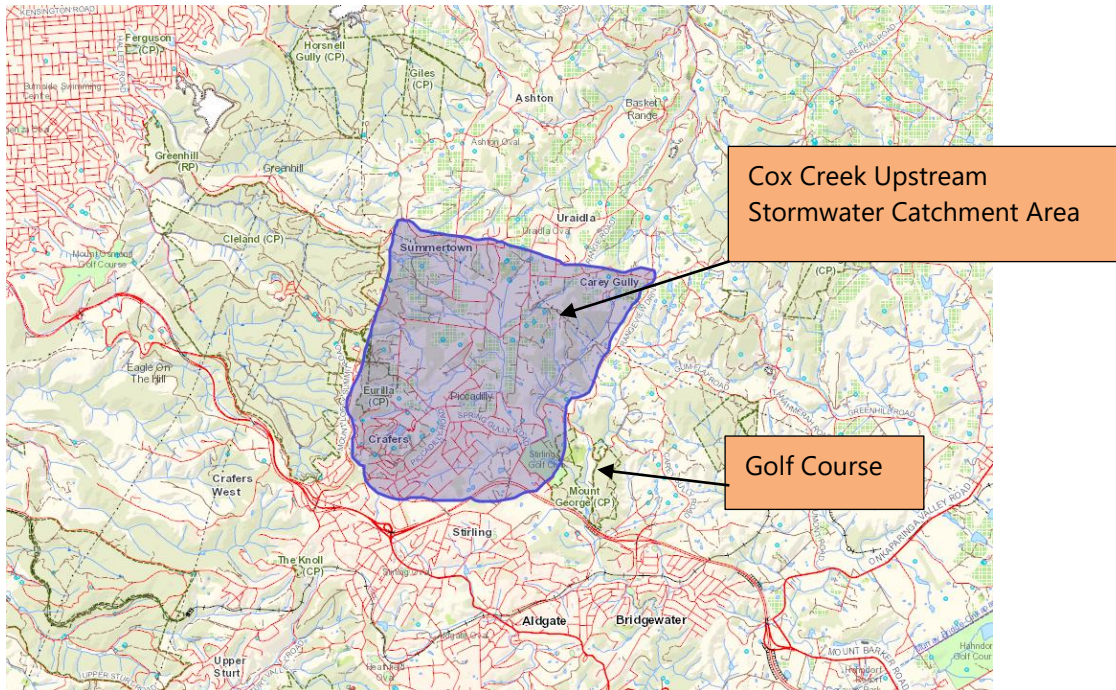
The current building and carpark facilities situated up the hill and to the south west of the lake have a total hard surface area of approximately 5,000m<sup>2</sup>. Preliminary measurements indicate that the proposed development buildings and carparks have a total hard surface area of approximately 8,300m<sup>2</sup>. This increased hard surface area of 3,300m<sup>2</sup> represents <1% of the golf course area.

# Stormwater Management

## Current Site Drainage

Cox Creek enters the golf course site from the north as it passes under Old Carey Gully Road and runs through the site in a south easterly direction. The creek exits the site to the east, continues in a south easterly direction and passes under the South Eastern Freeway approximately 1,250m downstream of the site.

Preliminary investigations indicate the catchment area of Cox Creek upstream of the site exit point is approximately 2,000Ha. This catchment area includes sections of Summertown, Carey Gully, Crafrers and Piccadilly and includes residential, primary production and public purpose land use areas. The approximate catchment area of Cox Creek upstream of the golf course site is shown in Figure 3.



**Figure 3 – Approximate Upstream Catchment Area of Cox Creek (Nature Maps)**

BOM Rainfall data for Piccadilly Station 23891 indicates an average annual rainfall of 1068mm with the highest rainfalls occurring in the winter months as expected. A summary of the previous 20 years of data is provided in Table 1.

**Table 1 – Piccadilly Rainfall Data Summary**

Month	Mean (mm)	5 <sup>th</sup> percentile (mm)	95 <sup>th</sup> percentile (mm)
Jan	37.5	11.2	81
Feb	34.6	1.3	83.9
Mar	38.6	11.7	80.3
Apr	68.9	6.6	167.2
May	133.3	68.3	191.1
June	149	19.2	226.1
July	160.6	66.6	276.6
Aug	147.9	43.6	243
Sep	119.4	48.5	222.8
Oct	68.1	2.8	179.4
Nov	51.5	13.8	120.7
Dec	53.3	20.1	141.5
Annual	1068.6	933.1	1227.4

Source: BOM Rainfall Data 2001 – 2020 Piccadilly Station 23891

# Stormwater Management Requirements

This stormwater management plan will address the following State Planning Commission requirements (with other items within the specialist reporting provided by others);

- Integrated Water Management Plan (IWMP);
  - Infrastructure for the storage and treatment of stormwater
  - Predicted stormwater generation volumes and details of stormwater quality improvements, including the location and sizing of the bio-retention swales and basins, anticipated quality improvements and details of any other proposed stormwater quality treatment features.
  - Whole site, upstream catchment and downstream stormwater discharge point
  - (balance of IWMP provided by others reporting)
- Demonstration of no stormwater nuisance or flooding to occur on downstream properties due to the development
- Compliance with Council and Natural Resource Management Board requirements

It is noted that a surface water management plan has been included within the Construction Environmental Management Plan (CEMP) prepared by FMG as a separate report.

Adelaide Hills Council Stormwater Drainage Design Guidelines for Submission of Engineering Plans for New Developments require the following to be considered;

- The designer ensure that the proposed development within the drainage reserves such as fences of facilities shall not obstruct the path of flows from major storm events
- The major drainage network shall have the capacity to control stormwater flows under normal and minor system blockage (50% blockage) conditions for an ARI 1 in 100 years
- The drainage system shall be designed to ensure that the landform of watercourses is stabilised and that erosion is minimised
- All dwellings must be protected from inundation during a flood of 1 in 100 years ARI
- The drainage system shall be designed to ensure that flows downstream of the site are restricted to pre-development levels, unless council approves increased flows
- Underground stormwater systems designed to convey the minor 1 in 10 year ARI storm event
- Minimum 300mm freeboard to the 100 year ARI flood / ponding level

Further to the above, FMG recognises the sensitive urban environment the proposed development is located within, and following feedback from the EPA during pre-lodgment meetings, understand there to be a need for a tertiary level stormwater quality system to be implemented on site which fully complies with the South Australian EPA water quality reduction targets for runoff generated by the development;

- 80% retention of the typical urban annual load for Total Suspended Solids (TSS)
- 60% retention of the typical urban annual load for Total Phosphorus (TP)
- 45% retention of the typical urban annual load for Total Nitrogen (TN)
- 100% retention of the typical urban annual load for Gross Pollutants (litter)

# Stormwater Assessment

## Proposed Development Drainage

Stormwater drainage of the golf course facilities situated to the south west and uphill of both Cox Creek and the existing dam / lake observed on site. Lake levels are managed through pumping of stormwater local storage ponds throughout the golf course, and is utilised for irrigation. Peak levels within the lake are managed via a weir which spills into Cox Creek when full.

Surface run off from the subject development area, and further upstream catchments drains into open drains associated with the carpark retaining wall and runs into entry pits and underground stormwater pipes. This runoff is currently diverted towards Cox Creek.

It is envisaged that where possible, existing drainage pits and pipes will be retained to minimise the construction impact of the development. Generally, the new stormwater pit and pipework will be laid within the building footprint and collect all rainwater runoff for storm events up to the minor storm event (10 year ARI) into a below ground drainage pipe. Major storm events which exceed the drainage pipe capacity will travel overland towards the north. Roof runoff will be collected into downpipes and conveyed into a rainwater retention tank (designed and documented by others with water balance calculations to support) with 100 year ARI overflows connected into the below ground outlet drain.

Discharge from the underground drain, and major storm overland flow will be conveyed into a new detention and water quality improvement stormwater basin located adjacent Cox's creek. The stormwater basin will be sized during detailed design to achieve the following performance requirements;

- Approximately 150m<sup>3</sup> detention storage with a staged flow control (i.e. dual orifice control or similar) over the outfall to Cox's creek to limit post-development flow rates to pre-development flow rates. Detention volume will be calculated and adjusted as necessary to ensure peak outflows do not exceed pre-development flow rates for the minor and major storm events respectively.
- Minimum 300mm freeboard from peak 1% AEP storm event basin water level, to emergency overflow weir to Cox creek
- Provision of 300mm of extended duration detention depth, sized to capture and treat the 3mo ARI (4EY AEP) storm event for all runoff from the ground surface areas of the basin.
- Provision of 200micron stormwater filter baskets within all stormwater inlet pits within the development to remove
- Basin floor to be planted with effective nutrient removal native vegetation, deep filter media, transition layers and drainage layers in accordance with EPA / Water Sensitive SA best practice guidelines.
- Provision of a emergency overflow to Cox creek via a rock lined weir or similar approved to mitigate erosion and protect the existing watercourse in the event of a blockage.

Internal drainage pipe capacity requirements will be determined during detailed design of the proposed development, however as a minimum requirement all below ground pipes will be designed to ensure conveyance of the 10% AEP (10 year ARI) storm event, and a minimum pipe diameter of 225mm to mitigate the likelihood of blockages in this environment.

A plan showing the stormwater concept, with bulk elevation estimates and earthworks renders is included as an appendices to this report.

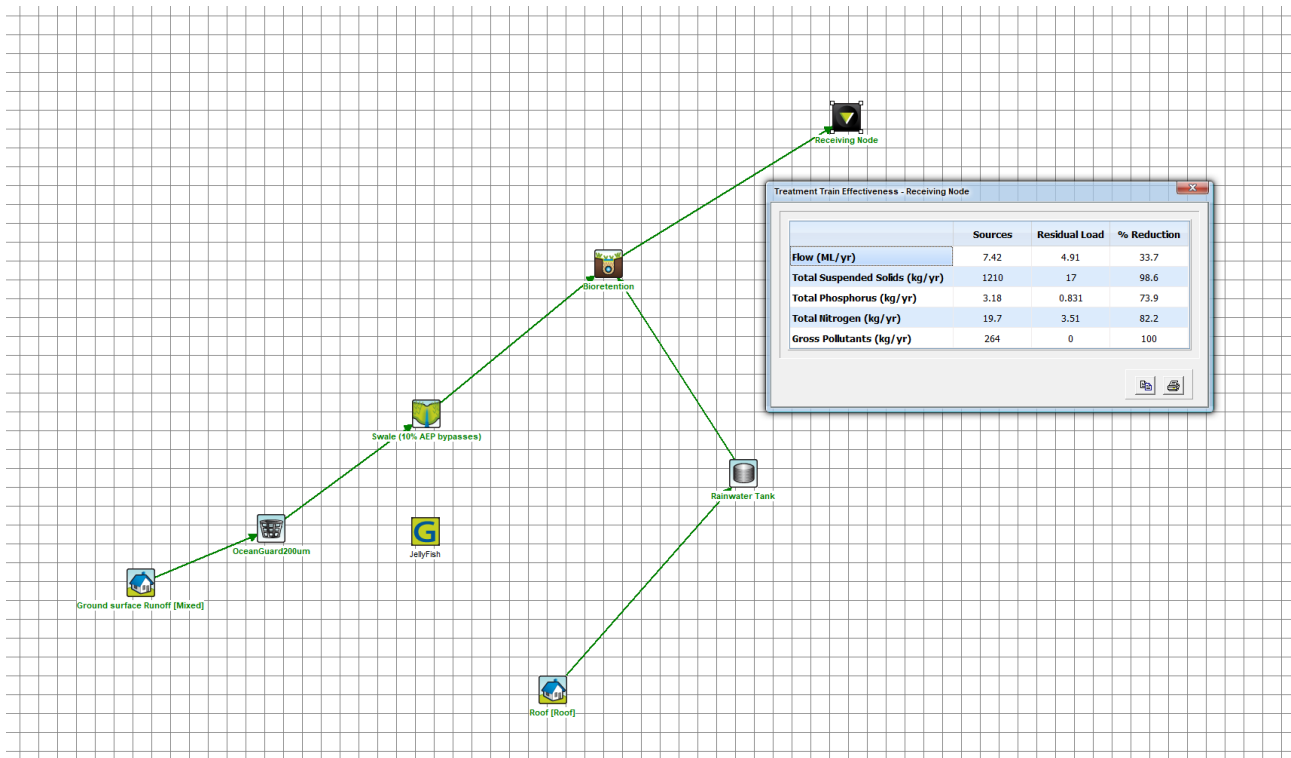
## Pod accommodation

Individual pod accommodation will adopt a similar stormwater drainage scheme, with retention / detention tanks provided to each individual pod as a self sufficient unit. Discharge from these tanks will be managed via either a main collector pipe, or individual discrete outlets to the bushland which will be suitably controlled via orifice and erosion protection elements.

Roof areas approximate 70m<sup>2</sup> resulting in the need for 1-1.5m<sup>3</sup> of stormwater detention volume per pod to restrict post-development runoff to pre-development runoff.

## Music modelling results

A Music model was developed to assess the reduction in pollutants based on the proposed treatment train consisting of bioretention raingardens and grassed roadside swales. This assessment was undertaken in accordance with the Water Sensitive SA MUSIC modelling guidelines. The results of the model can be seen in Figure 9 with a summary of reductions shown in Table 1. A filter cartridge based device (Jellyfish) however was not necessary to achieve adequate water quality improvements.



Pollutant	Water Sensitive SA Target	Reduction achieved
<b>Total Suspended Solids</b>	80%	98.6%
<b>Total Phosphorous</b>	60%	73.9%
<b>Total Nitrogen</b>	45%	82.2%
<b>Gross Pollutants</b>	90%	94.1%

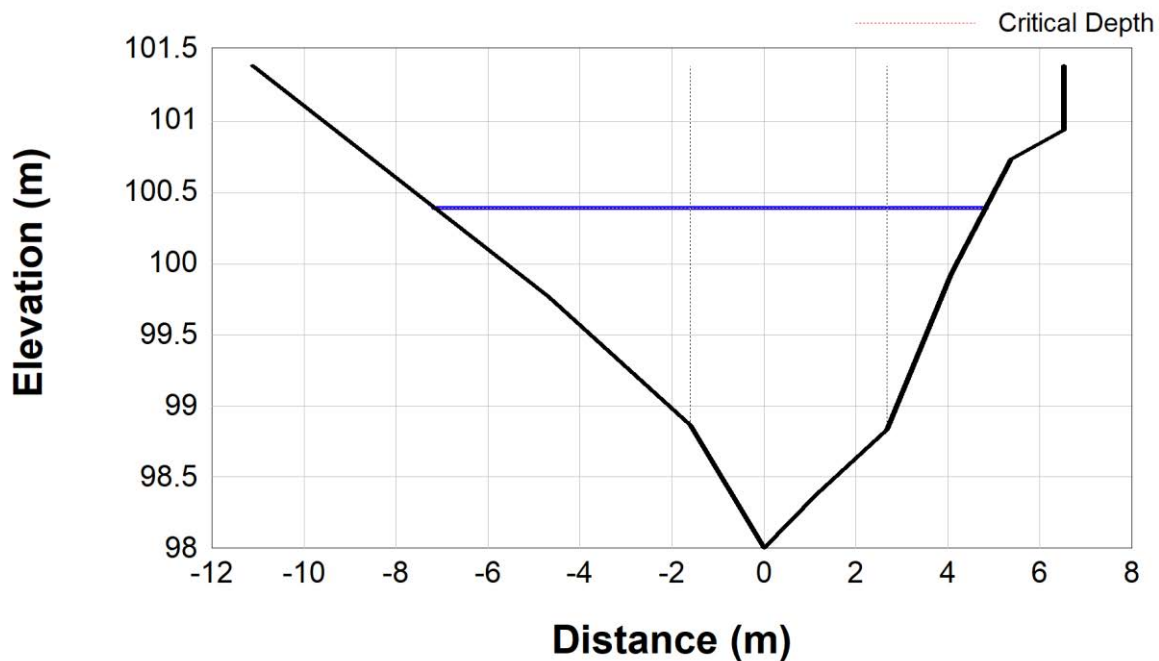
Table 1 – Summary of MUSIC model results

# Cox Creek Preliminary Drain Model

A preliminary stormwater assessment was undertaken to assess required floor levels for the proposed development. The following parameters were used to develop a preliminary Drain Model using an extended rational model.

- Upstream catchment area of 2,115Ha
- Impervious area 10%, pervious area 90%
- Flow in 1% AEP major storm event of approximately 47.5m<sup>3</sup>/s
- Irregular channel cross section based on contour data

Calculations indicate the water depth in Cox Creek and the associated lake may approach 2.5m increase in height with a maximum velocity of 5m/s during a 1% AEP major storm event. According to contour plans, Cox Creek is at an elevation of approximately 412m AHD at the location directly downhill from the proposed development. The proposed development area is at an elevation between 418m – 420m AHD which is 6m-8m above the creek. An increase in creek level of 2.5m would not impact the floor level of the proposed development. The preliminary creek cross section showing an increased water level of 2.5m is provided in Figure 4.



Note that the creek invert on the model is an arbitrary datum. Elevation 98 equates approximately to the Cox Creek invert level of 412m AHD (from contour plans)

**Figure 4 – Cox Creek Cross Section Preliminary Stormwater Assessment**



## Conclusion

This Preliminary Stormwater Management Plan has been prepared prior to detailed design and outlines the general intent for managing stormwater runoff from the site. The requirements set out in this document should be adhered to within final detailed design to ensure compliance with the requirements of the Adelaide Hills Council and EPA.

Specifically, site stormwater should be retained and detained on site to ensure post development peak flows do not exceed pre-development peak flows for an equivalent storm event. Furthermore, management and reduction of pollutants within stormwater runoff is of high importance within this sensitive environment, and EPA water quality targets must be adhered to.

Minimum finished floor levels shall be 300mm above the maximum flood level within Cox Creek, which is estimated at 414.5m AHD. Concept site plans suggest this will be easily incorporated with all structures sited around the existing development at 419-420m AHD.

Detailed stormwater design including MUSIC and DRAINS modelling will be completed to verify the performance of the drainage network in meeting the retention/detention and water quality parameters in line with Adelaide Hills Council and EPA requirements.

Appended;

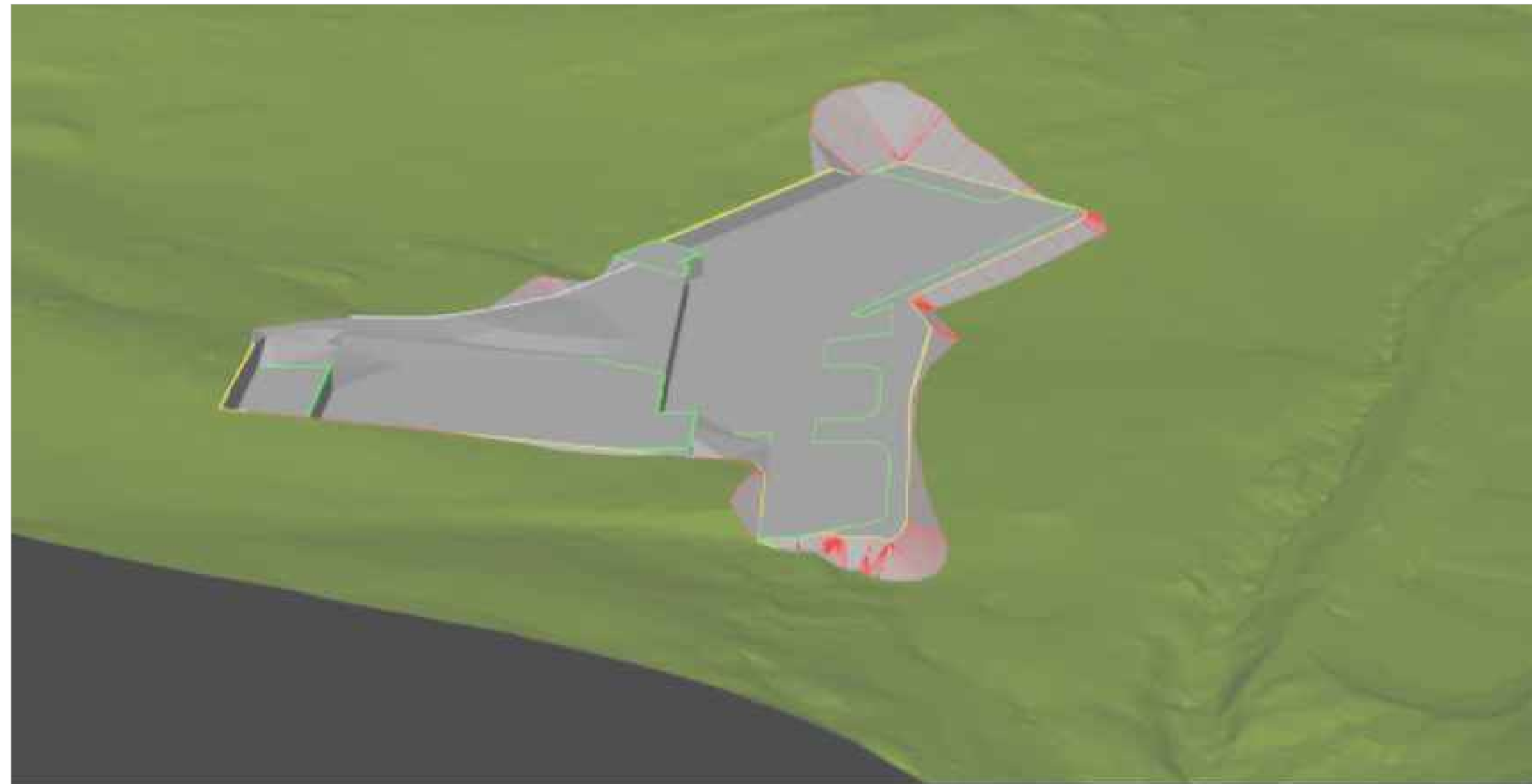
- C110 Perspective Images
- C120 Earthworks Plan
- C130 Stormwater Management Plan



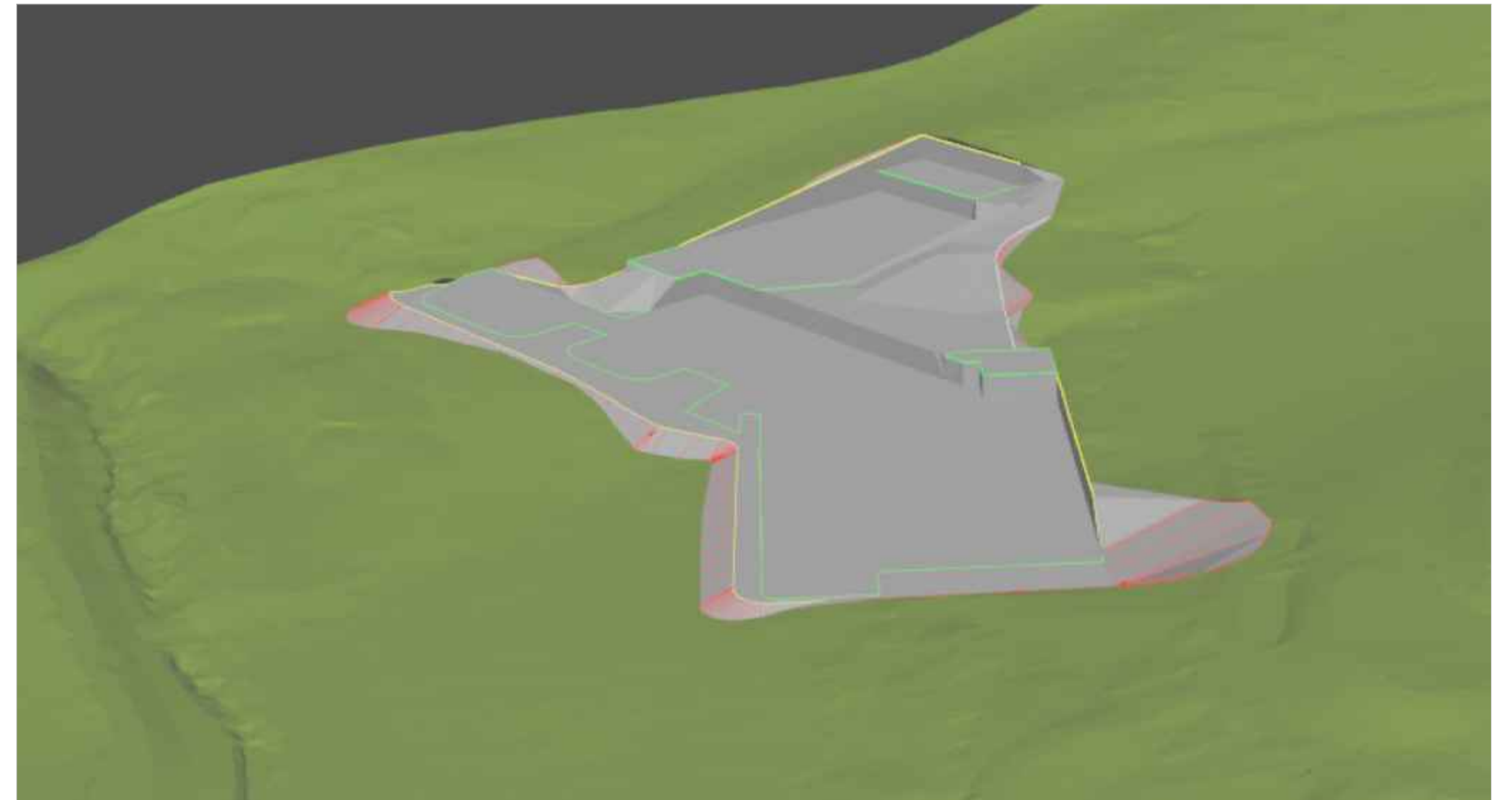
**NORTH ELEVATION**  
SCALE NTS



**SOUTH ELEVATION**  
SCALE NTS



**EAST ELEVATION**  
SCALE NTS



**WEST ELEVATION**  
SCALE NTS

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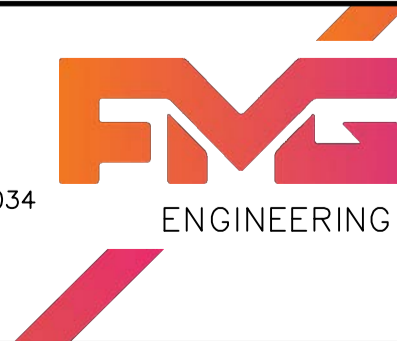
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CLIENT: VENTURE CAPITAL DEVELOPMENTS PTY LTD  
PROJECT TITLE: MOUNT LOFTY GOLF ESTATE  
SITE ADDRESS: 35 GOLFLINKS RD, STIRLING SA


DRAWING TITLE: PERSPECTIVE IMAGES

DESIGNED	JS	DRAWN	JS
CHECKED	JC	NO. OF SHEETS	-
SCALE	NTS	DATE STARTED	23.09.2022
SITE ID & JOB No.	S53897 282604	REV.	
DRAWING No.	C110		A

REV	DESCRIPTION	DATE	INT	APP
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## **Appendix 33**

*Appendix EE of Development Report – Perfumery  
landscape plans*

---

# PERFUMERY SITE



## KEY ELEMENTS

- 1 Outdoor dining space
- 2 Timber Arbour
- 3 Perfumery Garden
- 4 Citrus Orchard
- 5 Sealed Carpark (20 spaces)
- 6 Terraced ornamental Garden  
(Low level planting)
- 7 Legacy Oaks - *Quercus palustris*
- 8 Feature planter pots



# PERFUMERY SITE



## KEY ELEMENTS

- 1 Outdoor dining space
- 2 Timber Arbour
- 3 Perfumery Garden
- 4 Citrus Orchard
- 5 Sealed Carpark (20 spaces)
- 6 Terraced ornamental Garden (Low level planting)
- 7 Legacy Oaks - *Quercus palustris*
- 8 Feature planter pots





PERFUMERY  
ELEMENTS + MATERIALS

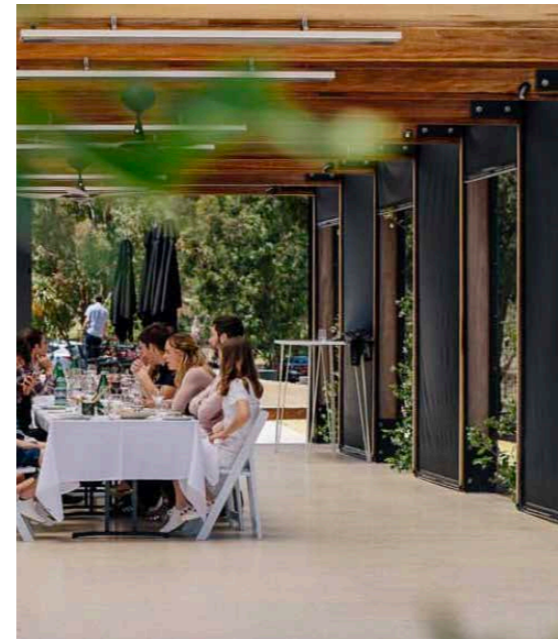


**Key Elements**

- Stone Paving
- Perfumery Garden
- Feature trees
- Orchard
- Surrounding ornamental planting

**Outdoor Dining**

- Timber abour
- Connecting heritage perfumery building and new architecture



**Perfumery**

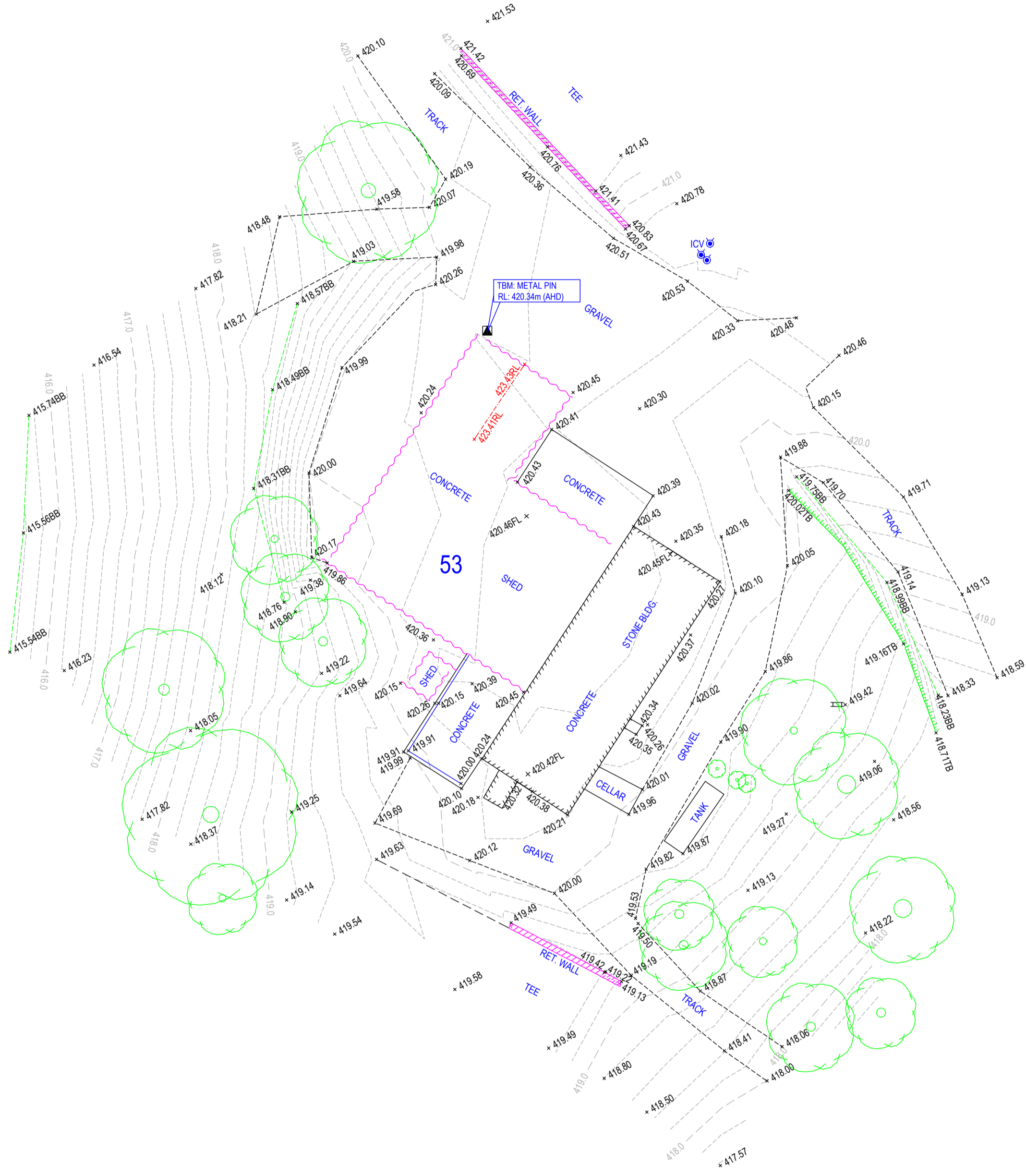
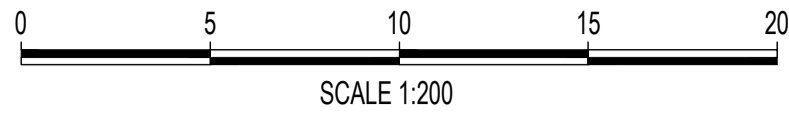
- Compacted rubble
- Fragrant plantings
- Terraced stone walls



SITE  
EXISTING BUILT FORM

EXISTING





PRINTED: DEC. 20, 2022 FILE: 221220 PL13151 STIRLING DET.DWG

LEGEND			
<ul style="list-style-type: none"> <li>■ SURVEY MARK</li> <li>○ G1 NAIL</li> <li>● BOLLARD</li> <li>⊙ E.T.S.A. CONN</li> <li>⊙ SIP</li> <li>⊙ FIRE HYDRANT</li> <li>⊙ FIRE PLUG / STOP VALVE</li> <li>■ GRATING</li> </ul>	<ul style="list-style-type: none"> <li>BRICK PAVERS</li> <li>WALL</li> <li>BUILDING</li> <li>CENTRE OF CORNICE</li> <li>BANK TOP</li> <li>BANK BOT</li> <li>EDGE BITUMEN</li> <li>EDGE TRACK</li> </ul>	<ul style="list-style-type: none"> <li>■ GRATING</li> <li>○ TREE</li> <li>▲ CABLE MARKER</li> <li>○ TELCO PIT</li> <li>⊙ GM GAS METER</li> <li>⊙ ICV IRRIGATION</li> <li>⊙ TAP</li> <li>○ SHRUB</li> <li>⊙ SHRUB</li> </ul>	<ul style="list-style-type: none"> <li>EDGE TRACK</li> <li>EDGE CONC</li> <li>VERANDAH</li> <li>ROOF LINE</li> <li>WALL</li> <li>EDGE VEGETATION</li> <li>BUILDING GI</li> <li>EDGE GARDEN</li> </ul>
<ul style="list-style-type: none"> <li>○ S SIGN POST</li> <li>⊙ WM WATER METER</li> <li>⊙ ROAD SIGN</li> <li>⊙ LP LIGHT POLE</li> <li>⊙ FP FUSE PIT</li> <li>⊙ SW IP</li> <li>⊙ DP DOWNPIPE</li> <li>⊙ DO DOMESTIC OUTLET</li> </ul>	<ul style="list-style-type: none"> <li>FENCE (POST &amp; WIRE)</li> <li>FENCE (GI)</li> <li>UNKNOWN</li> <li>STORMWATER PIPE</li> <li>SEWER</li> <li>WATER</li> <li>ELECTRICAL</li> <li>TELSTRA</li> <li>GAS</li> <li>COMMUNICATIONS</li> </ul>	<ul style="list-style-type: none"> <li>EC EDGE OF CONCRETE</li> <li>WT WATERTABLE</li> <li>TK TOP OF KERB</li> <li>EB EDGE OF BITUMEN</li> <li>RL ROOF LEVEL</li> <li>FL FLOOR LEVEL</li> <li>GL ROOF GUTTER LEVEL</li> <li>EL EAVE LEVEL</li> <li>TW TOP OF WALL</li> <li>BW BOTTOM OF WALL</li> <li>OH OVERHEAD WIRES</li> </ul>	

**PyperLeaker**  
surveying services  
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**LEGEND**

**NOTES**

ONLY VISIBLE SERVICES HAVE BEEN LOCATED AND PYPYER LEAKER SURVEYING SERVICES TAKE NO RESPONSIBILITY FOR THE ACCURACY OF THE SERVICE TYPES SHOWN ON THIS PLAN.

**INFO**

SCALE: 1:200  
 SURVEY DATE: 19/12/2022  
 SURVEYED BY: ML  
 COORDS BASED ON: MGA2020  
 PSM 6628/52827 RL: 427.476m  
 HEIGHT DATUM: AHD  
 CONTOUR INTERVAL: 0.20m

**PROJECT**

DETAIL & LEVELS SURVEY  
 STIRLING GOLF CLUB  
 35 GOLFLINKS ROAD  
 STIRLING

PROJECT REF: PL 13151 SHT: 1 OF 1 REV: 0