

13 January 2020

Project No. 1523677-010-L-Rev0

Mr Bernard Stewart

ATI No. 5 Pty Ltd c/o Beveridge Williams
1 Glenferrie Road
Malvern VIC 3144

LANDSLIDE RISK ASSESSMENT, DEVELOPMENT PLAN VERSION 36, 6230-6280 GREAT OCEAN ROAD, APOLLO BAY, VICTORIA

Dear Bernard,

Engagement

Australian Tourism Investments No.5 Pty Ltd (ATI No.5) are planning to submit a revised development application to Colac Otway Shire Council (COS) for a residential development at 6230 – 6280 Great Ocean Road, Apollo Bay, Victoria (the development). The revised application will be based on Version 36 of the development plan. The revised development application is due to a ruling by the Victorian Civil and Administrative Tribunal (VCAT), based on a previous version (Version 28) of the development plan.

The previous development application included landslide risk mitigation advice from Golder Associates Pty Ltd (Golder), including preliminary design advice for a debris flow catch bund. Golder has been requested by Beveridge Williams, acting on behalf of ATI No.5, to provide a revised assessment of the landslide risk to the development based on Version 36 of the development plan.

The revised advice has been provided in general accordance with Golder's proposal dated 8 August 2019 (ref. 1523677-009-L-Rev0). Approval to proceed was provided by email from Beveridge Williams on 6 December 2019.

Scope of work

Golder has undertaken a review of the revised development plan (Version 36, dated 28 October 2019) and compared it to the development on which the previous landslide risk advice was based (Version 28).

This letter sets out the differences between the Version 28 and Version 36 development plans from a landslide risk perspective and provides revised advice on landslide risk and mitigation based on Version 36 of the development plan. A site visit was not undertaken to assess the current conditions at the site.

Previous advice on landslide risk mitigation measures

In Golder's report dated 10 August 2016 (Golder reference 1523677-001-R-Rev3), four landslide mechanisms were identified at the site:

- Regression of existing landslides

- Initiation of a new landslide
- Creep movement of soils on the upper part of the hillside
- Rockfall from the steeper parts of the hillside

The risk to life and property in the proposed development from each of the above landslide mechanisms was assessed against Version 10 of the Overall Development Plan, dated 20 July 2016. The risk assessment was undertaken to the Australian Geomechanics Society Landslide Risk Management Guidelines (2007). The landslide mechanism 'Initiation of a new landslide' was assessed to have a 'not tolerable' risk to life and a 'moderate' risk to property.

Golder was subsequently requested by Beveridge Williams to provide conceptual details for an earth bund to mitigate the risk posed by the initiation of a new landslide on the hillside above the proposed development. Conceptual details for the earth bund were provided by Golder to Beveridge Williams in a letter dated 18 December 2017 (Golder reference: 1523677-004-L-Rev0). The advice provided was based on the Beveridge Williams Overall Development Plan Version 22, dated 20 November 2017. The advice included indicative cross section dimensions of an earth bund which would act to divert a debris flow landslide travelling down the hillside, away from the development. A sketch showing a potential configuration of the earth bund running approximately parallel to the north-west edge of the site was provided.

Subsequent to the development of the bund concept, the development plan was the subject of a VCAT hearing, which was based on Version 28 of the development plan, which included the bund as a landslide risk mitigation measure. Based on the outcomes of the hearing, the development plan has been revised to Version 36, for submission to COS.

Overall Development Plan Version 36

Overall Development Plan Version 36 has been provided by Beveridge Williams. The location and configuration of the residential lots within Version 36 appears to be similar to Version 28, which was assessed by Golder previously. There appears to be an increase in open space/drainage reserve on the southeast boundary (Great Ocean Road frontage) of the development site, with an associated reduction in the extent of the residential lots in that area. Those changes on the southeast side of the proposed development do not change our previous assessment of landslide risk for the development.

The configuration of the earth bunds in Version 36 also appears to be similar to Version 28.

Opinion on landslide risk to the development, Overall Development Plan Version 36

Golder has been requested by Beveridge Williams to provide an assessment on landslide risk mitigation issues arising from the Overall Development Plan Version 36.

The intent of the indicative location of the earth bund is to divert landslide material travelling down the hill slope, away from the proposed residential development lots. Although it is unlikely that landslide material would travel far, the intent of the bund is to intercept and retain mobile landslide material along the uphill side of the bund and potentially under extreme conditions to direct run out into open space below the bund such as drainage or road reserves (lower risk locations than the residential lots), with channel flow breakers in gaps between the bunds to assist with the dissipation of the landslide energy.

In our opinion, the bunds/channel flow breakers located as shown in Overall Development Plan Version 36 are consistent with the bunds/channel flow breakers located as shown in Overall Development Plan Version 28 and the risk to life or property in the proposed development would be similar.

Reference

Australian Geomechanics Society (2007). Practice Note Guidelines for Landslide Risk Management, Australian Geomechanics, Volume 42 No.1, March 2007.

Important information

Your attention is drawn to the document titled - "Important Information Relating to this Report", which is attached to this letter. The statements presented in that document are intended to inform a reader of the report about its proper use. There are important limitations as to who can use the report and how it can be used. It is important that a reader of the report understands and has realistic expectations about those matters. The Important Information document does not alter the obligations Golder has under the contract between it and its client.

We trust the information provided above meets your current requirements. Should you have any queries regarding the information above, please do not hesitate to contact the undersigned.

Yours Sincerely,

Golder Associates Pty Ltd



Glenn Meyer
Senior Engineering Geologist

GEM/SC/gem

Attachments: Overall Development Plan, The Beach, Apollo Bay, Version No. 36
Important information relating to this report

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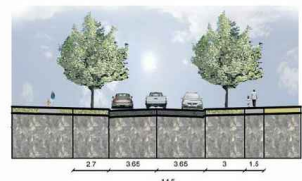
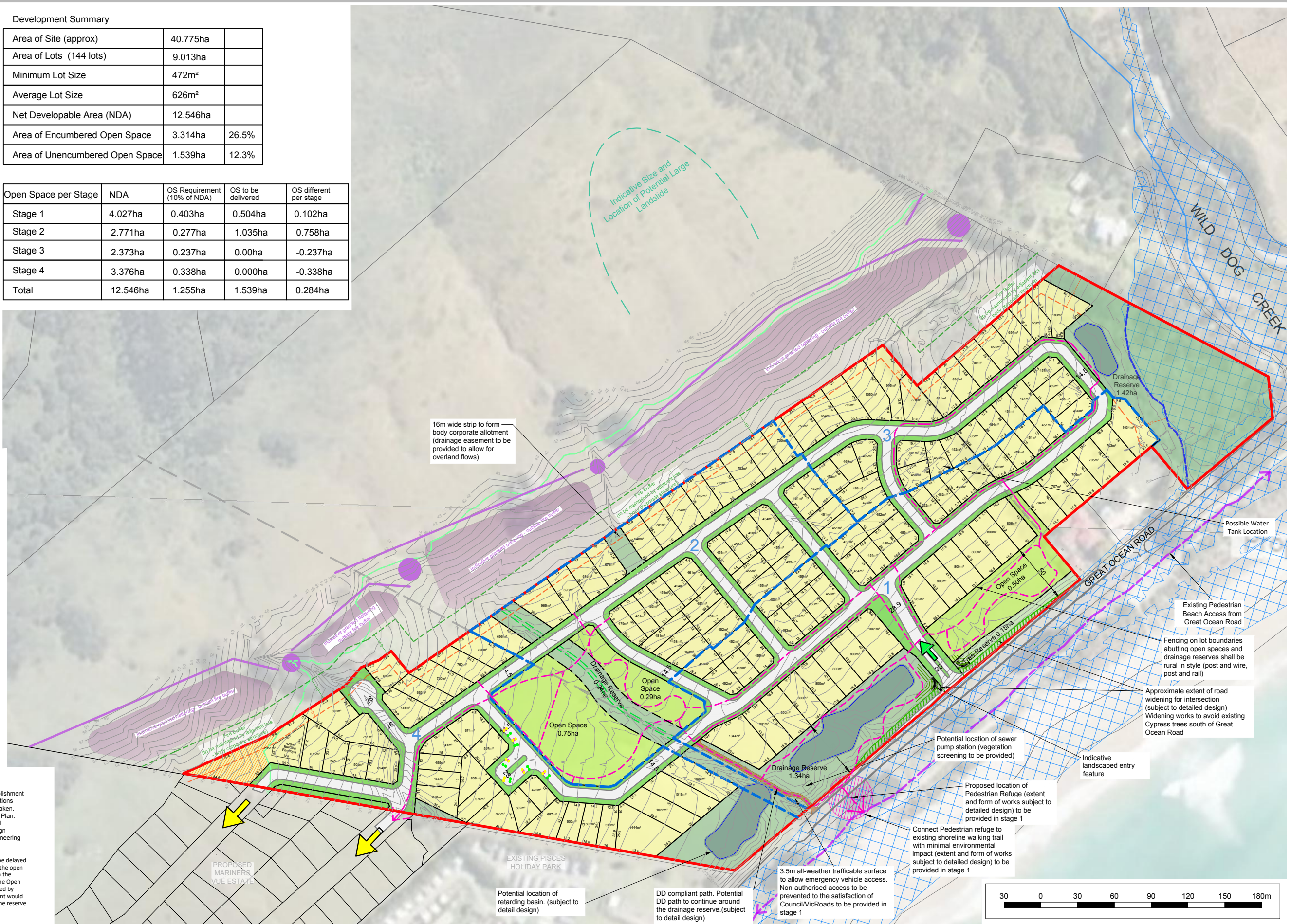
LEGEND

- Site boundary
- Internal title boundaries
- Existing contours (1m interval)
- 40m contour
- Neighbourhood residential zone boundary as provided by DELWP
- Existing shoreline walking trail
- Road reserve
- Main pedestrian circulation
- Drainage reserve
- Tree reserve/ Landscape buffer
- Open space reserve
- Lots
- Building exclusion zone (above 40m contour)
- Fire buffer (defendable space to forest)
- Fire buffer (defendable space to grassland)
- Road connections to adjacent land
- Proposed entrance point from Great Ocean Road
- Land subject to inundation (year 2100 1 in 100 ARI event)
- Indicative landslip protection measures
- Indicative landslip debris channel flow breakers

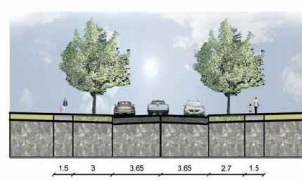
Development Summary

Area of Site (approx)	40.775ha	
Area of Lots (144 lots)	9.013ha	
Minimum Lot Size	472m ²	
Average Lot Size	626m ²	
Net Developable Area (NDA)	12.546ha	
Area of Encumbered Open Space	3.314ha	26.5%
Area of Unencumbered Open Space	1.539ha	12.3%

Open Space per Stage	NDA	OS Requirement (10% of NDA)	OS to be delivered	OS different per stage
Stage 1	4.027ha	0.403ha	0.504ha	0.102ha
Stage 2	2.771ha	0.277ha	1.035ha	0.758ha
Stage 3	2.373ha	0.237ha	0.00ha	-0.237ha
Stage 4	3.376ha	0.338ha	0.000ha	-0.338ha
Total	12.546ha	1.255ha	1.539ha	0.284ha



Typical Section - Local Access Street Adjacent to Open Space (NTS)



Typical Section - Local Access Street (NTS)

- Notes:**
- This plan is subject to council approval
 - All roads are 16m in width unless noted otherwise
 - Title boundaries are approximate only and subject to title re-establishment
 - All dimensions and areas are subject to survey and final computations
 - The majority of the Aboriginal Archaeology work has been undertaken. Additional work is required prior to finalising the Cultural Heritage Plan.
 - Access/egress to the site is subject to Council / Vicroads approval
 - Road pavement is indicative only and subject to engineering design
 - Drainage areas are approximate only and subject to detailed engineering design
 - Contour interval 1m
 - *To assuage Council's concerns that the remaining Open Space may be delayed by the long-term leasehold that exists on the land on which much of the open space is situated, the developer will provide a signed agreement with the Leaseholder of the land, allowing the developer to locate and build the Open Space and any required associated infrastructure, if and when required by Council (in this case, with Stage 2 of the development). The Agreement would also allow for the subdivision of the land and the transfer of title of the reserve to Council.*

Version	Date	Description	Drafted	Approved	Version	Date	Description	Drafted	Approved
32	22.11.18	Client Requested Amendments	LN	LN	27	26.02.18	Front row lots amended to suit fire requirements	LN	LN
33	13.02.19	Pedestrian Links Amended	LN	LN	28	27.02.18	Front Row Lots amended to suit Client Comments	LN	LN
34	15.08.19	Amended to Council comments	WB	WB	29	13.07.18	Design Amended Following VCAT Decision	LN	LN
35	20.08.19	Amended to Council and client comments	WB	WB	30	22.08.18	Client Requested Amendments	LN	LN
36	28.10.19	Amended open space table	WB	WB	31	17.11.18	Amendments in response to Council Comments	LN	LN

Date: 28.10.19
 Version No: 36
 Job No: 3313
 Scale (A1): 1:1500
 (A3): 1:3000

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