

04th October 2021,

Att: Will Muhleisen
Enlocus Landscape Architects
Ground Floor, 151 St Georges Road, Fitzroy North.
Victoria 3068 Australia

Our Ref: 21-0121
Re: Apollo Bay Waterfront Promenade
Site Stormwater Management

1.0 INTRODUCTION

OPS Engineers have been commissioned by Enlocus Landscape Architects to prepare a report on proposed design work for the stormwater drainage infrastructure for the current Apollo Bay Waterfront Promenade project.

The purpose of the report is to provide stormwater infrastructure advice and provide a proposed conceptual civil plan solution.

We were provided with a copy of the drawing numbered 2112 SD 004 REV A, prepared by Enlocus Landscape Architects, dated 01.11.2019.

The site was visited by this office on 29.07.21 & 14.10.2021.

2.0 SITE OVERVIEW

The site is generally sloping to the north towards the ocean, with buildings mostly located at the top of the slope, transitioning to grass and gardens beds, then workshops on the lower slopes nearing the ocean. Further to our site visits, we make the following comments:

- 1) A rock shelf is exposed along most of beach length at low tide in the back harbour.
- 2) Site is protected from wave and storm surge by existing substantial harbour rock walls. New works will allow for anticipated sea level rise (for 2100)
- 3) Existing beach level retaining wall made of local stone, embedded in mortar. Wall height approx. 2450. Face of wall batters back approx. 1 in 7. Capping at top of wall approx. 200 wide, rock width at top approx. 300mm. It is not known if back of wall is vertical or sloped, or which level of the wall at its base.

- 4) Wall in three basic sections.
East end generally in good condition.
Mid-section some localised deep erosion of mortar at base of wall in several locations.
Three UPVC outlet pipes from fish co-op discharge from face of wall.
Top of footing exposed below outlet pipes.
West end of wall, toward boatyard in very poor condition, partly collapsed.
Heavily rusted steel beam built into base of wall.
Wall not suitable to support new building structures over.
Wall may remain, after some remediation, as heritage structure, and maintain protection from sea.
Any new structure over is to be supported independently.
- 5) A 1.0m high vertical stone retaining wall exists behind harbor buildings, retaining the toe of the fill embankment up to Co-Op yard.
- 6) Harbour buildings appear likely to be founded at or near natural ground level.
- 7) Area behind the beach retaining wall is likely to be filled.
- 8) Fish co-op buildings likely to be founded at or near natural ground level.
- 9) Area in front of fish co-op appears to be filled ground., battered down to harbour yard below.
- 10) Ramp from upper level may need to be zig zagged to obtain adequately length and grade due to height and heavily treed adjacent ground.
- 11) East end of existing viewing deck the fill batter appears to have suffered recent landslip in the fill.
- 12) Existing upper level viewing deck timber boards with steel framing under
- 13) Boardwalk connection to the east may need to be near to the beach as the adjacent land is steeply battered and heavily treed.

4.0 METHODOLOGY

The preliminary conceptual stormwater drainage assessment focuses on managing stormwater quality and quantity being discharged from the site.

We understand that the upgraded Co-Op building, and its surrounds will be provided with a new stormwater drainage system that will discharge clear of our promenade site.

We propose a new spoon drain to the edge of upper level/ deck and AG drains behind the new retaining walls to catch the runoff from the surface at the front of the fisherman's co-op building and surrounding.

Pits, pipes are proposed and to be installed at the end point of spoon drains located in West & East side of upper-level decking to discharge and direct the rainfall toward the lower level/ deck.

Also, a few inlet pits & pipes are to be installed at the lower deck to catch the runoff from surface and to be discharge point for any downpipes from shops around the decking.

Two new junction pits to be installed over the existing discharge pipes as shown on the attached plan and they will need to be fitted with filter/litter traps and provided with cleanout capability to prevent large amounts of sediment and litter to enter to the ocean, reduce maintenance requirements over time, and improve the quality of stormwater being discharged from the site.

5.0 DETAIL

1. Existing Fisherman's Co-op

The proposal is to investigate and redirect all the existing downpipes, runoff from surface and the swale drain between golf club and breakwater road toward the proposed junction pits/ spoon drains and new discharge point located at the Trafalgar Street which is provided by SMEC. (Please refer to SMEC drainage design for more information)

2. Upper-level Decking

The proposal is to install spoon drain at the edge of decking on the surface and AG drains behind the retaining wall. This will catch any overland flow on the surface and prevent any flooding issue on the surface and minimise water build up adjacent to the footing system.

3. Lower-level Decking

Front of shops, close to the lower decking, the surface will be graded to fall and will be provided with a several inlet pits to catch the runoff from the surface on this and new junction pits to be installed over the existing outlet pipes and will be discharged into the ocean as shown on the stormwater management plan.

4. Access ramp toward the lower decking

The proposal is to install AG drains at the edge of footpath. This will catch any overland flow on the surface and prevent any flooding issue on the surface and will be discharge to underground drainage system at the lower point.

5.0 CONCLUSION

The above report describes the existing condition and the proposed approach for the management of stormwater for each area of work.

The appropriate design and specification of the new collection, treatment, detention, and controlled discharge of stormwater, particular for each location of the building, will ensure that the future discharge to ocean will be generally of better quality on site.

We trust this report is adequate for your purposes.

Kind Regards,


Davood Khalili
Senior Civil Engineer