

1. Summary of stormwater/flooding evidence

- 1.1 **Request Figure 1 on screen.** The Pōhara township and surrounding areas have a history of flooding during heavy/extreme rainfall events. Notably, the extreme rainfall event of December 2011 event led to caused significant, widespread flooding, landslips and debris flows, including extensive flooding of the Pōhara township and immediate environs.
- 1.2 The area of interest for this project is low-lying and flat. During extreme rainfall events, this topography results in significant storage of floodwaters arising from the upper hill catchments in the lower floodplain before draining to the coast. This can – and has led to the flooding of building floors across the floodplain, particularly along Abel Tasman Drive and Selwyn Street.
- 1.3 In response to ongoing flooding complaints of flooding, the Tasman District Council (the **applicant**) commissioned the development of a flood model of the area.
- 1.4 This model has been used to understand the existing flooding mechanisms, extents and number of potentially floodable floors and properties, and to assess options for reducing the number of floors and properties that could be expected to be flooded in up to the present day 1% annual exceedance probability (AEP) event.
- 1.5 At the applicant's request, I have undertaken modelling of design flows that are estimated based on existing land use. That is, the modelling makes no explicit allowance for any development within the catchment that might increase runoff, and therefore assumes that any development within the catchment will be required to include mitigation of any effects of the development on stormwater runoff, as is consistent with the NTLDM.
- 1.6 Through a workscope including modelling assessment and discussions with land-owners, the applicant has selected a set of flood mitigation measures that when combined, yields the greatest benefit to cost ratio of all option sets considered, in terms of a reduction in the number of flooded floors in the design 10% and 1% AEP events.
- 1.7 In the current situation, overland flows from the Bartlett Creek catchment during heavy rainfall events reach the farmland behind Abel Tasman Drive properties

and are then conveyed in shallow drains both east and west to coastal outlets. Broadly speaking, the mitigation measures are designed to change the balance of flows preferentially to the west. This has the expected benefit of significantly reduced flood hazard to existing residential property, particularly to those residential properties east of the Totally Roasted Café at 734 Abel Tasman Drive.

1.8 In total, 59 properties are expected to experience a reduction in flooding on their property, with about ten of these properties expected to no longer experience flooded floors in the 1% AEP event. In the western part of the floodplain, an increase of up to 140 mm is expected across the floodplain, resulting in an increase in flooding depths within 34 properties, though nowhere so as to trigger additional flooding to floors.

1.9 These benefits to Pōhara residents are to be achieved through a proposed combination of mitigation measures as follows:

- An up to 1.4m high earth bund with a typical height of around 1m along the true right bank of Bartlett Creek upstream of Abel Tasman Drive, preventing flows in up to the present day 1% AEP event from affecting Abel Tasman Drive and Kohikiko Place properties.
- An upsized culvert taking Bartlett Creek flows through Abel Tasman Drive from a 1350mm dia pipe to a 4m x 1.3m box culvert, significantly increasing flood flow capacity, and helping to reduce the required bund height upstream.
- A second bund immediately downstream of Abel Tasman Drive, improving the level of service provided to selected Selwyn Street properties.
- Minor recontouring of the Lansdowne Road paper road corridor to divert a portion of Ellis Creek flows south-west into Clifton Creek, to reduce flood flows and levels along Ellis Creek immediately behind Selwyn Street properties.
- A combination earth and timber wall bund protecting properties at 59b and 59c Selwyn Street

- Upgrade of Boyle Street culverts with an additional two 1200mm diameter culverts to improve flood flows through Boyle Street and reduce upstream flood levels.

1.10 Figure 1 shows areas with reduced flooding in green, most notably in the eastern part of the floodplain and at 59b and 59c Selwyn Street. Areas expected to experience increased flooding are shown in the “hotter” colours. I note that while flood depths are increased in these areas, this is not expected to result in an increase in the number of flooded floors in these areas, in the present day 1% AEP event.

1.11 Taken together, the proposed set of measures was found to deliver the greatest benefit (in terms of reduction in flooded sections and floors) and the lowest cost to benefit ratio of the improvement sets assessed.

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