Technical Memorandum for NZTA Notice of Requirement for Bombay Commercial Vehicle Safety Centre: Flooding Assessment

(April 2024)

To: Vanessa Leddra, Policy Planner, Plans and Places

From: Lee Te, Senior Healthy Waters Specialist, Healthy Waters

Carmel O'Sullivan, Senior Healthy Waters Specialist, Healthy Waters

Subject: NZTA Bombay Commercial Vehicle Safety Centre, 253 Mill Road, Bombay

1. Introduction

1.1 Waka Kotahi NZ Transport Agency (NZTA) as Requiring Authorities have lodged a Notice of Requirement (NoR) and resource consent for a commercial vehicle safety centre (CVSC) at 253 Mill Road, Bombay.

1.2 The purpose of the proposed designation is to construct, operate, maintain, and improve a vehicle safety centre as part of the operation of the state highway network.

1.3 I am a Senior Healthy Waters Specialist in the resource management team of Auckland Council Healthy Waters. I hold a Master of Urban Planning (Professional) and Urban Design (Hons) from the University of Auckland. I am an intermediate member of the New Zealand Planning Institute. Ms Carmel O'Sullivan is a Senior Healthy Waters Specialist in the catchment planning team of Auckland Council Healthy Waters. Ms O'Sullivan holds a Bachelor of Engineering from Cork Institute of Technology (Ireland) and has been a Chartered Engineer since 2006.

1.4 We have undertaken a review of the NoR, on behalf of Auckland Council in relation to flood effects.

1.5 In writing this memorandum, we have reviewed the following documents:

- Part C – Assessment of Effects on the Environment Waka Kotahi NZ Transport Agency Bombay Commercial Vehicle Safety Centre, WSP New Zealand Ltd, 24 October 2023, Fima; Rev D
- Notice of Requirement for a Designation of Land, 24 October 2023, Waka Kotahi NZ Transport Agency Bombay Commercial Vehicle Safety Centre
- Appendix I-5-C4353.04 Bombay Flood Assessment, 10 February 2023, WSP
- Bombay Commercial Vehicle Safety Centre – Response to Section 92 RMA Request for Further Information, Waka Kotahi NZ Transport Agency, 5C4353-WRP-04-MM-PL_1001, 26 January 2024, WSP
- Appendix 13 Flood Assessment Report
- Bombay Commercial Vehicle Safety Centre – Response to Section 92 RMA Request for Further Information, Waka Kotahi NZ Transport Agency, 1-C1875.08, 5C4353-WRP-04-MM-PL_1002z_Rev C, 18 March 2024, WSP

2 NZTA Assessment of Flood Effects

2.1 The flood assessment by WSP stated that flood assessments were carried out for two scenarios, existing development case (ED) and future development case (MPD) for a 2yr, 5yr, 10yr and 100yr Average Recurrences Interval (ARI). Two different modelling assessments were carried out, volumetric floodplain assessments and 2D hydraulic model.

2.2 The volumetric floodplain assessment assessed the flood prone area upstream of State Highway 1. The assessment indicated an increase in flood depth of 25.8mm for ED and 27.6mm for MPD for a 100yr ARI.

2.3 A 2D hydraulic model was used to assess the peak water levels at Culvert 1 (at a private accessway by the site) and Culvert 2 (on Great South Road by the site). The model indicated that both culverts would overtop in a 100yr ARI event for both ED and MPD scenarios. The maximum modelled increase in peak water level due to the proposed development across this accessway (in the vicinity of Culvert 1) was 10mm for the 100yr ARI (ED scenario) event. The modelled increase in peak water level (in the vicinity of Culvert 2) due to the proposed development is 14mm for the 100yr ARI (ED scenario) event with no measurable increase predicted for the MPD scenario. The onsite stormwater management is expected to result in a predicted reduction in peak water level upstream of Culvert 1 for frequent events (2yr, 5yr and 10yr ARI), but the model indicates an approximate 10mm increase in peak water level for a 10yr ARI MPD event for Culvert 2, however, there is sufficient freeboard, and the increase is contained within the stream channel.

3 Healthy Waters Assessment

3.1 The volumetric floodplain assessment assessed the flood prone area upstream of State Highway 1. The assessment indicated an increase in flood depth of 25.8mm for ED and 27.6mm for MPD for a 100yr ARI. Given the flood prone area has relatively steep contours an increase in flood depth does not significantly increase the flood extent in this area, it will be constrained by the topography of the flood prone area, see Figure 1. It is noted that there are buildings in the flood prone area, however, any flood depth change as a result of the proposed development is unlikely to worsen the current flood effects.

Figure 1. Permanent Stream, overland flow paths, flood prone, flood plains, NoR and contours at 253 Mill Road Bombay and surrounding environment, Auckland Council GeoMaps, April 2024

3.2 The 2D hydraulic model results indicate that flood levels in the area will not be significantly impacted by the proposed development.

3.3 The flood level change for the 2yr, 5yr and 10yr ARI events will be contained within the stream channel upstream of Great South Road (Culvert 2). The modelling indicates that Great South Road currently overtops by 80mm in a 100yr ARI event, when the proposed development is considered the depth of flooding over Great South Road increases to 100mm, given the modelling indicates that the road will only overtop in a 100yr ARI event and the change in flood level is 20mm, this increase in flood depth is considered not significant.

3.4 The model indicates that Culvert 1 currently overtops in a 100yr ARI event with the proposed development the peak water level across the accessway will increase by 10mm

with existing rainfall, this is considered not significant. When future rainfall event is considered the accessway will not overtop for the 2yr, 5yr, 10yr and 100yr ARI events.

4 Conclusion and Recommendations

4.1 The flood analysis provided is considered to be acceptable for the NoR assessment. We consider that there will be no significant adverse flood effects and no new parties have been identified to be affected by the proposed CVSC.

4.2 However, to ensure there is no increase in flood effects during construction the following conditions are recommended for the proposed designation.

- Construction Management Plan
    - Procedures for controlling sediment run-off, dust and the removal of soil, debris, demolition and construction materials from public roads, places adjacent to the work site and from Ngakoroa Stream and nearby wetland.
    - Measures to manage any flood hazard effects during construction, such as siting construction materials out of floodplains where possible, maintaining overland flow paths, and actions to respond to warnings of heavy rain.