**FTAA-2603-1181**

**Before the Panel Convener appointed under the Fast-track Approvals Act 2024**

| | |
|---|---|
| **Under** | the Fast-track Approvals Act 2024 |
| **In the matter of** | Mt Welcome, Pukerua Bay |
| **By** | Pukerua Property Group Limited Partnership |

---

**Response to Panel Convener Minute 3**

**4 June 2026**

---

**INTRODUCTION**

1 This memorandum responds to directions from the Panel Convener in Minute 3 (dated 27 May 2026) to provide further information to assist in appointing a Panel and confirming a decision-making timeframe.

**SUMMARY OF RESPONSE**

2 The Applicant considers that the Substantive Application is robust and has been informed by extensive engagement with relevant Councils, administering agencies, and Te Rūnanga o Toa Rangatira (collectively, 'Parties') prior to lodging the Application as set out in Appendix 2 of the Substantive Application.

3 The Applicant remains of the view that the timeframe sought by in their 19 May 2026 memorandum in response to Minute 2 from the Panel Convener[1] is reasonable considering the scale and complexity of the Application, the approvals sought, and the extensive pre-lodgement engagement. This timeframe is generally consistent with the timeframes for other similar-scale residential developments under the Fast-track process.

4 The Applicant considers that with the information provided in the Substantive Application and the additional information proved by this memorandum, that the Panel Convener can now move to appoint a Panel and set a decision-making timeframe as above. Although, it is noted that there is also a direction for Greater Wellington Regional Council (GWRC) and Porirua City Council (PCC) to respond to this memorandum.

---

[1] As outlined in the pre-conference memorandum dated 19 May 2026, an additional 10 working days beyond the default 30 working day time period is considered appropriate, this is an overall timeframe of 40 working days following receipt of comments under Section 53 of the FTAA. This would result in a decision early September 2026.

**Response to specific information requested**

5 In preparing this memorandum the Applicant has reviewed the pre-conference statements provided by the parties and reflected on the discussion at the conference itself. The Applicant has also met with both Greater Wellington Regional Council (GWRC) and Porirua City Council (PCC) following the conference. The following technical experts have also provided information to respond to matters raised by both councils including:

a. Torrey McDonnell (Incite) lead author of this response;

b. Kyle Dirse (Envelope Engineering) with regard to civil engineering, including an updated Stormwater Management Plan, Civil Infrastructure Report and a short memorandum documenting changes attached as **Appendix C**;

c. Karen Jones (ENGEO) with regard to geotechnical matters, including a memorandum attached as **Appendix D**;

d. Dr Vaughan Keesing (BlueGreen Ecology) with regard to ecological matters, including a memorandum attached as **Appendix E**;

e. Jamie Whittaker (Stantec) with regard to transport matters including a memorandum attached as **Appendix F**; and

f. Katy Grant (Paddle Delmore Partners) with regard to stormwater management and hydrology (in the form of general advice that is reflected in Appendices A and B).

6 In addition, a Construction Noise and Vibration Assessment has been prepared by Marshall Day to form part of the Application. This is attached as **Appendix G**.

7 In paragraph 25 of Minute 3, the Panel Convener directed the Applicant to:

> a. *Respond specifically to all information gaps identified by GWRC and PCC in their conference memoranda, identifying:*
>
> i. *Whether the information identified or requested is currently included in the application documentation; and*
>
> ii. *The location of that information (for example, as explained by the Applicant at the conference and summarised in paragraph 18 of this Minute in respect of some specific information sought);*
>
> b. *Confirming the Applicant's response to any previous feedback, questions or issues communicated by GWRC or PCC in their earlier pre-lodgement engagement or technical reviews, including the location of any such response within the application documents;*
>
> c. *Confirming any matter of information sufficiency raised by GWRC or PCC to which the Applicant **does not** intend to respond, and the reasons why the Applicant considers no further response is required.*

8 With regard to (a) and (c) above, these matters are set out in Appendix A and Appendix B to this memorandum in response to matters raised by PCC and GWRC in their pre-conference memoranda.

9 In all cases, the appendices either: provide additional information; identify where the information is provided in the Substantive Application; or explains that the suggested information gaps are merely differences in opinion with regards to the application itself, e.g. in relation to conditions, design or expert assessments rather than information that was required to be provided but was not.

10 The Applicant does not consider there are any information gaps precluding the establishment of the Panel or the achievement of decision-making timeframes sought by the Applicant.

11 With regard to (b) above, the Applicant's response to all matters raised during pre-lodgement by PCC and GWRC is set out in detail in Appendix 2 of the Substantive Application.

**Response to general matters raised in Minute 3**

12 In addition to the specific information request in paragraph 25 of Minute 3, there are several other matters in Minute 3 that the Applicant considers it helpful to address.

Engagement process

13 Paragraph 12 of Minute 3 states the following:

> *[12] Porirua City Council considered that there were "significant outstanding issues" that might benefit from conferencing, mediation or hearing and that the conditions submitted with the application "lack necessary detail and rigor". While PCC had had a pre-lodgement opportunity to undertake a review of some technical information, and to provide feedback on those matters including by way of a geotechnical memorandum, no response was provided to the issues identified or the further information requested. The Council was critical of the limited engagement undertaken following lodgement of the first substantive application and observed that the Applicant "effectively discontinued" consultation with PCC altogether following lodgement of the current (second) application. The approach taken has "not enabled constructive engagement and provided limited ability to narrow the issues".*

14 In addition to the engagement undertaken prior to 2026, the Applicant undertook engagement with PCC in the January to March 2026 period prior to lodgement of the current application. The proposed conditions were sent to PCC on 15 January 2026, a response from PCC was received on 5 March 2026, but this was limited to a six page outline document with headings for conditions. PCC advised that they had capacity issues that were impacting their ability to engage with the Applicant in terms of personnel leave and the overlap with the submissions process on the Planning Bill and Natural Environment Bill.

15 During this period, the Applicant also added additional information to the Substantive Application in response to PCC feedback including:

- Updated scheme plans for super lots,
- Updated engineering design and three waters servicing information;

- Expanded information on culverts including a map of existing and proposed culverts;
- A refined flood risk assessment and inclusion of a separate Flood Risk Report with pre and post development flood maps; and
- Updated SH59 roading plans (including profile views requested by PCC).

16 This was outlined in a schedule of changes provided to the EPA as part of the relodgement of the Substantive Application (**Appendix H**).

17 These updates demonstrate that the Applicant did respond to PCC feedback before lodgement.

18 It is correct that the Applicant had limited engagement with PCC following the re-lodgement of the application during the completeness check. The Applicant considered that due process should be followed with regard to a completeness check, and that any relevant matters raised by PCC or other parties were best addressed through the EPA under the section 46(2A) process as a request for further information.

19 However, the Applicant was progressing work on various matters raised by parties in April, for example the Applicant commissioned a noise assessment based on advice from PCC, and undertook a pre-clearance lizard survey that has since been provided to the EPA and DoC.

20 Going forward, to assist the Panel, the Applicant will continue to engage with GWRC, PCC and all other parties prior to the comments process to further narrow any remaining matters.

21 Overall, there has been extensive engagement with all parties as part of the project to date as set out in Appendix 2 of the Substantive Application. The Applicant's response to matters raised by parties has been recorded at length in that Appendix. For example, specific engagement with PCC included:

- 10 June 2025 - Initial meeting

- 19 June 2025 - Site visit
- 18 July 2025 - Earthworks meeting
- 18 July 2025 - Three waters meeting
- 24 July 2025 - Parks meeting
- 25 July 2025 - Transport meeting
- 8 September 2025 - Civils plans shared for feedback, as well as Master Plan and Landscape Urban Design Strategy, and design methodology statements for earthworks, roading and three waters
- 10 September 2025 - General workshop
- 17 September 2025 - Public transport workshop
- 23 September 2025 - Parks workshop
- 9 October 2025 - Roundabout workshop
- 24 October 2025 - Plans and technical reports shared for feedback
- 29 October 2025 - Rule assessment and transport report shared for feedback
- 5 November 2025 - Additional site visit
- 11 November 2025 - Proposed conditions of consent shared for feedback
- 15 December 2025 – Meeting post original application withdrawal to discuss completeness
- 17 December 2025 - Roundabout discussion
- 15 January 2026 - Updated proposed conditions of consent shared for feedback

22 In addition to the above, Envelope Engineering undertook specific engagement with Wellington Water between July and October 2025 regarding three waters servicing for the development. This engagement informed the approach outlined in Substantive Application including the Infrastructure Report (Appendix 9) and Stormwater Management Plan (Appendix 11).

23 The Applicant has reviewed pre-lodgement engagement summaries for other similar FTAA applications, and the above engagement appears to be as extensive, if not more extensive, than other approved residential projects of a similar scale.

24 Further, the Applicant engaged early with all parties, that included purposefully seeking feedback on early drafts of plans rather than on fully formed plans. The sharing of early drafts enabled more genuine and meaningful engagement, and allowed the Applicant to refine plans in response to feedback.

Identification of all consents required

25 With regard to Paragraph 13 of Minute 3 and PCC's concerns around the consents applied for, every effort has been made to identify a complete list of the correct consents required for the project. Table 7 of the Substantive Application lists 44 separate RMA consents being required, with a detailed assessment in Appendix 4.

26 The only additional consents identified to date by PCC are INF-R2.2 and NOISE-R2.2 for the potential non-compliance with construction noise standards. These were reviewed and the Applicant is now, for the avoidance of doubt, seeking these consents as set out in the 23 April 2026 response to the EPA's request for further information. This now forms part of the application and can be found at Appendix 3 of the Fast-track team's memorandum on completeness and scope.[2]

*Timeframes*

27 Paragraph 16 of Minute 3 states:

> *PCC considered that the Applicant's proposed 40 working day timeframe post-receipt of comments is unworkable given the information gaps, and that that time should potentially be doubled.*

28 The Applicant disagrees with PCC's request to double timeframes. As outlined above, there has been extensive engagement and an extended

[2] https://www.fasttrack.govt.nz/__data/assets/pdf_file/0019/25444/Memo-on-assessment-of-compliance-with-requirements-of-Fast-Track-Approvals-Act_Redacted.pdf.

period of time that all parties have now had the application. Further, the timeframe sought by the Applicant is similar to other similar scale residential developments.

29 With regard to the geotechnical review referenced in Paragraph 18D, the Applicant was unaware that this second geotechnical review was commissioned until it was referenced in a letter from PCC to the EPA as part of the s46 completeness process dated 13 April 2026. It was provided to the Applicant by PCC on 23 April 2026. This has now been reviewed by the project geotechnical experts with a response provided at **Appendix D**.

## Appendix A: Response to matters raised by PCC

| Topic | Matter raised by PCC in pre-conference memorandum | Any further information/clarification provided by PCC | Applicant response to matters raised |
|---|---|---|---|
| Urban design/subdivision matters | Provision for future transport connections at the southern site boundary. | PCC raised this matter in pre-lodgement engagement, and the Applicant's response is summarised in Appendix 2 of the Substantive Application (page 7). | While there are some departures in the proposed roading layout from the indicative roading layout shown in the Structure Plan, these have been assessed in Appendix 8 of the Substantive Application and are justified based on topographical constraints, ecological sensitivities, and engineering practicality. The proposed layout still achieves the overall connectivity and functionality intended by the Structure Plan.<br><br>The Applicant initially shared draft plans that did not provide for roading connections to the south, citing steep terrain, ecological constraints, and the presence of wetlands as reasons for not providing connections. After discussion with PCC, a future connection was provided through the upper terrace which is the least constrained of the three "fingers" of the development.<br><br>The matters raised by PCC do not identify missing information but rather reflect differences in opinion regarding the appropriateness of the proposed development with regard to the structure plan. |
| | Provision for future road and active transport connections through 'Lot 5003' which is proposed to remain in farmland | This matter was discussed with PCC on 26 May 2026 following the Panel Convener's conference. PCC is concerned that the current design of development precludes the ability of either the current owner or future owners of Lot 5003 to comply with the Structure Plan should they seek to develop this land (which is zoned Medium Density Residential). | The Applicant does not own the land where this indicative road is located. Lot 5003 will be retained by the Mount Welcome Block Trust for continued farming use. If this landowner wished to subdivide in the future, they too would be subject to the Structure Plan.<br><br>However, the development is designed in such a way in that does not preclude a future roading link in this location. This could feasibly be provided in the location marked with a red arrow in Figure 7 of Appendix 8.<br><br>The matters raised by PCC do not identify missing information but rather reflect differences in opinion. |
| | Provision of adequate pedestrian routes and cycle ways throughout the development. | N/A | The Application includes an assessment of infrastructure to support public and active transport. The application includes numerous mitigation measures for public and active transport modes that can be found in section 7.8 and 15.10.2 of the Substantive Application and the Integrated Transport Assessment (Appendix 24).<br><br>As above any differing views as between PCC and the Applicant regarding what is proposed do not amount to missing or incomplete information. |
| | The nature, location and layout of the recreational, commercial and residential land uses proposed. | From the PCC s46 completeness check:<br><br>*PCC considers that there is no assessment of the urban design effects of the application. The application includes a Master Plan and Landscape Urban Design Strategy at Appendix 22. However, this provides no assessment of the proposed activity from an urban design perspective.*<br><br>*It is noted that, as part of PCC's feedback on the proposal prior to the first 2025 application, a review from McIndoe Urban was provided, Mt Welcome Urban Design Review Memo #1, dated 2 November 2025. This is attached to the Substantive Application at Appendix 2. A subsequent review of the 2025 application found that there had been no response in the substantive application to any of the points made in urban design review memo. No changes to the 2026 application appear to have been made in response to the memo.*<br><br>*No assessment of the effects of the proposed subdivision design has been provided. There is no plan showing the location of each proposed allotment overlaying the district plan zones. There is no identification of the proposed building platforms for each residential allotment. There is no identification of specific non-compliances with standards for each proposed allotment. There is no description or assessment of provision of legal and physical access to assets proposed to be vested with Porirua City. These gaps affect the ability* | Urban design and subdivision design effects are not standalone technical disciplines but composite outcomes arising from transport, open space, landscape, infrastructure, and built form integration — all of which are comprehensively assessed within Section 15 of the Substantive Application and supporting technical reports.<br><br>The Application contains sufficient material to assess whether the proposal achieves appropriate design outcomes at a subdivision scale.<br><br>The Applicant has responded to key recommendations McIndoe Urban review as outlined on pages 10-12 of Appendix 2 of the Substantive Application including further revision of street layout, pedestrian connections and location of parks. It is noted that the McIndoe review states that "The plan is from an urban design perspective inherently positive".<br><br>The exact locations of building platforms are not known at this stage. This is a common approach for a vacant lot subdivision for development of this scale where buildings are to be designed and delivered over 15 years given the staged delivery of the development.<br><br>There is no requirement in the FTAA to show boundary allotments overlaid with zone boundaries, but this information can be provided to assist the Panel if required.<br><br>The Landscape and Urban Design Master Plan in Appendix 22 tests typical housing typologies against the proposed lot layout to ensure all residential lots can accommodate permitted residential units (refer pages 34 and 35).<br><br>The location and configuration of the Neighbourhood Centre are guided by the Development Area Structure Plan, with portions of the Neighbourhood Centre Zone necessarily accommodating supporting infrastructure, including roading, earthworks batters, and associated open space that are integral to the functioning of the centre. |

| Topic | Matter raised by PCC in pre-conference memorandum | Any further information/clarification provided by PCC | Applicant response to matters raised |
|---|---|---|---|
| | | *to undertake assessment of the resource consents required, and subsequently the assessment of the effects of the proposal.*<br><br>*Additionally, there is no rationale for the size of the proposed commercial allotment (approximately 1.3 hectares) being significantly smaller than the Neighbourhood Centre Zone (approximately 3 hectares) which is intended to provide for the wellbeing of the future residents (noting that the proposed road allotment covers approximately 0.76 hectares of this zone).* | |
| Wastewater infrastructure | Lack of design provided for the wastewater storage/pumpstations. | This matter was discussed with PCC on 26 May 2026 following the Panel Convener's conference. PCC outlined that Wellington Water is currently undertaking a further review of the three waters elements of the proposal. PCC is concerned that there is insufficient capacity to service the future development. | The Application provides a strategic design and effects-based assessment of three waters infrastructure, with detailed design appropriately deferred to engineering approval, where Council/Tiaki Wai retains full certification control though proposed conditions of consent (refer condition 27). Designs for wastewater storage / pumpstations will be confirmed through engineering approval.<br><br>Pump station storage duration, volume, pump configuration and pump outflow have all been detailed through the detailed hydraulic modelling, as set out in the Wastewater Hydraulic Modelling Report. Pump specifications and final details will be provided at the detailed design stage through engineering approval.<br><br>The Applicant confirms that with the mitigation proposed in the Civil Infrastructure Report that the development can be appropriately serviced from a wastewater perspective.<br><br>Envelope Engineering undertook specific engagement with Wellington Water between July and October 2025 regarding three waters servicing for the development. A summary of engagement with Wellington Water is provided on page 14 of Appendix 2 to the Substantive Application. This engagement drove the proposed approach. |
| | Inadequate demonstration of avoidance of any increase in wastewater overflows. | This matter was discussed with PCC on 26 May 2026 following the Panel Convener's conference. PCC outlined that:<br><br>• Wellington Water is currently undertaking a further review of the three waters elements of the proposal. PCC is concerned that there is insufficient capacity to service the future development.<br><br>• PCC was unaware of proposed condition 80 in Appendix 7 which requires the consent holder to construct and complete the necessary upgrades to the main trunk waste water assets within the State Highway 59 prior to certification under Section 224(c) of the RMA for Stage 8 titles. PCC commented that the trigger points in the condition relates to stages rather than number of dwellings, this could be an issue if stages are not delivered in a sequential order noting the Applicant is seeking the ability to deliver stages in any order (Condition 68). | The Application provides a strategic design and effects-based assessment of three waters infrastructure, with detailed design appropriately deferred to engineering approval, where Council retains full certification control though proposed conditions of consent (refer condition 27). Designs for wastewater storage / pumpstations will be confirmed through engineering approval.<br><br>Note Table 14 of the Wastewater Hydraulic Modelling Report, which confirms that 688 $m^3$ of storage together with the bulk upgrades can service the development with no overflows at a maximum discharge rate of 28 L/s, consistent with the ICM model provided by Wellington Water.<br><br>A number of other scenarios have also been tested, demonstrating options with no overflows. These options, considered in collaboration with other Northern Growth Area (NGA) landowners to best enable NGA wastewater servicing, involve large attenuation and bulk network provisions.<br><br>The NGA has a long development programme, and Condition 68 provides hold points to confirm availability of this discharge rate over time for each stage allowing for the design to be adjusted to suit in accordance with options proposed.<br><br>After meeting with Council on 26 May 2026, the Applicant is open to working with PCC to review the trigger point for condition 80, with the trigger point potentially being expressed in terms of number of dwellings rather than stages. |
| Stormwater infrastructure | Insufficient consideration of water sensitive urban design as a process. | These matters were discussed with PCC on 26 May 2026 following the Panel Convener's conference. PCC advised that they have commissioned a stormwater engineer to review water sensitive design elements of the proposal. These comments in their memorandum are the stormwater engineer's initial views, with written feedback still to be provided to the Applicant. | These matters are covered in detail in the Stormwater Management Plan (SMP), refer Sections 7 and 8 which assess the actual and potential stormwater impacts on the receiving environment through detailed hydrological and hydraulic modelling.<br><br>Modelling results completed by Envelope Engineering and Pattle Delamore Partners (PDP) confirm that post-development discharges are hydraulically neutral, with water quality and hydrological effects mitigated through the proposed stormwater management devices.<br><br>This is noted in the Stormwater Impact Assessment within the SMP (refer Section 11). |
| | Insufficient design and assessment of the proposed retention wetland bunds. | | The design of the bunds is outlined in the plans: Appendix 30-26 - 1753-02-4300-R2-Drainage-Wetlands. Council has oversight over design through proposed conditions of consent (refer conditions 30 and 94). |

| Topic | Matter raised by PCC in pre-conference memorandum | Any further information/clarification provided by PCC | Applicant response to matters raised |
|---|---|---|---|
| | Undersized raingardens. | | Raingardens have been designed to provide water-quality treatment in accordance with GWRC Plan Change 1 (Schedule 28) and the Wellington Water Design for Stormwater: Treatment Device Design Guide, with a treatment target of ≥ 85 % MARV.<br><br>See SMP Section 6.9 and Appendix 1 for design summary and calculations including 300mm extended ponding depth. |
| | Insufficient consideration of incorporating rainwater harvesting tanks. | | Hydraulic neutrality is achieved by other means than rainwater tanks, including constructed wetlands, refer to the SMP (Appendix 11). A high level assessment of use of tanks on all lots in the Taupo Catchment was included in the Hydrology Assessment (Appendix 18). Results indicate that the inclusion of tanks will reduce the total annual post development discharge by approximately 3%, which is equivalent to a 1% reduction on annual post development discharge into the top of Taupo Swamp. The main issue being that tanks will be full most of the winter so the capacity to attenuate flows becomes very limited. Significant filtration to ground is not feasible given the geology. |
| Water supply | The applicant's assumption that the existing Pukerua Bay water reservoir has capacity to support more lots than the reservoir is able. | This matter was discussed with PCC on 26 May 2026 following the Panel Convener's conference. PCC outlined how Wellington Water is currently undertaking a further review of the three waters elements of the proposal. PCC is concerned that there is insufficient capacity to service the future development. | The Pukerua Bay reservoir has capacity for approximately 326 lots. Allowing for 46 lots planned for the Muri Road development and a 44-lot allowance for infill development within Pukerua Bay. Approximately 236 lots remain available for Mt Welcome (assuming this future growth is fully realised).<br><br>As per the approved consent for the new reservoir within the Muri Road Development (RCA24215), once surplus capacity is used from Pukerua Bay reservoir, the balance of Mt Welcome Phase 1 lots are dependent on a gravity feed with PRV from the new reservoir, with a resilience connection to Pukerua Bay (Gray Street connection) and the temporary bulk water main connection being upgraded for the new reservoir bulk supply.<br><br>Note that Section 11.5, Table 10, (263 lots + commercial) refers to the pressure zoning, rather than supply.<br><br>Final design and capacity is subject to engineering approval conditions, including hydraulic modelling under RCA24215.<br><br>Note that Section 11.6 the Civil Infrastructure Report has been updated to clarify the supply and pressure limitations (refer **Appendix C**). The consented reservoir confirms that a suitable water supply is available to service the proposed development |
| Geotechnical Engineering | Various | From the PCC s46 completeness check:<br><br>*PCC notes that a range of matters were identified by council's*<br><br>*geotechnical experts (Tonkin & Taylor) to be include in the geotechnical investigation prior to lodgement of the substantive application and provided to the applicant. That advice is attached to the substantive application at Appendix 2.*<br><br>*A further detailed review of the Geotechnical investigation report and associated information by council's geotechnical experts concludes that insufficient geotechnical and earthworks information has been provided to enable a resource consent for the proposed subdivision to be granted at this stage, and that additional information is required to enable an informed decision on the suitability of the site for residential development.*<br><br>*Porirua City would be happy to provide this review to the EPA if it would assist its consideration of the scope and completeness of the application.* | The Applicant's geotechnical experts reviewed the Tonkin and Taylor 2025 review and updated their Geotechnical Investigation accordingly. This is recorded in Appendix 2 to the Substantive Application.<br><br>The further geotechnical review referred to by Council in the s46 completeness check was subsequently provided to the Applicant following the completeness check.<br><br>ENGEO has reviewed these comments and a memo is provided in **Appendix D** addressing each matter in turn, with input from Envelope Engineering on erosion and sediment control matters. |
| Transport | Design of the roundabout and State Highway 59 interface and traffic effects. | N/A | Design of the roundabout is shown in 8000 series civil plans, and transport effects are addressed in Section 15.10.2 of the Substantive Application, and in Chapter 10 of the ITA.<br><br>The timing (i.e. staging) and form of the Roundabout access to State Highway 59 is one of the key substantial matters outlined in the Applicant's pre-conference memorandum (page 1).<br><br>The Transport Assessment outlines how an interim priority tee-intersection with a right-turn bay is suitable for accommodating traffic from up to 110 occupied dwellings and construction traffic for approximately 2-3 years |

| Topic | Matter raised by PCC in pre-conference memorandum | Any further information/clarification provided by PCC | Applicant response to matters raised |
|---|---|---|---|
| | | | before the full roundabout is required. The threshold for upgrading to a full roundabout is when traffic volumes from the site exceed approximately 1,000 vehicles per day, which aligns with the NZTA Planning Policy Manual guidance for rural highways. The full roundabout is designed to accommodate all future traffic volumes, including those from the adjacent Muri Block. Conditions of consent are proposed in Appendix 7 of the Substantive Application with an appropriate trigger (Condition 79).<br><br>However, the future form of the SH59 corridor and intersection has been discussed at length between the Applicant, PCC, Waka Kotahi and Te Rūnanga o Toa Rangatira. Te Rūnanga hosted a hui in December with the Applicant, Council and NZTA to discuss the future form and function of SH59 adjacent to the Site. Refer to meeting notes from 17 December workshop (page 304 in Appendix 2 of the Substantive Application).<br><br>The various positions of the parties were discussed, with Ngāti Toa, PCC and the Applicant envisaging a future urbanisation of the SH59 corridor which could include smaller intersections with reduced footprint that could allow for greater multi modal connectivity across the corridor, and fewer adverse cultural effects with regard to the need to reclaim the Taupō Stream. |
| | Design of public walking tracks including connecting into the existing walking and cycle path on the west of SH59. | From Appendix 2 to the Substantive Application (refer page 8):<br><br>*Council seeks that access be provided from the site across SH59 to this pathway.* | A connection to the shared path on the western side of SH59 is not considered appropriate due to NZTA's preference for a dual-lane roundabout, which limits safe crossing options. However, a future connection is not precluded with footpaths provided to the location indicated on the Structure Plan for a future connection (noting the Structure Plan does not specifically require a crossing be provided).<br><br>The Applicant notes that a connection to the west of SH59 is not provided for or required by the Structure Plan. |
| | Adequacy of active modes and shared travel pathways within the site. | N/A | The Application includes an assessment of infrastructure to support public and active transport. The application includes numerous mitigation measures for public and active transport modes, they can be found in section 7.8 and 15.10.2 of the Substantive Application and the Integrated Transport Assessment (Appendix 24). |
| | Provision of public transport including bus stops and connection to the bus network. | From the PCC s46 completeness check:<br><br>*Plans for the location of bus infrastructure are not provided. While the ITA states that "in-lane bus stops (rather than indented) have been confirmed by Metlink as appropriate" it is noted that PCC is the relevant road controlling authority rather than Metlink. In this regard, the ITA does not provide sufficient information for the purpose for which it is required.* | The precise location of bus infrastructure will be confirmed at later design stages, consistent with the staged nature of the development and subject to Council approval through proposed conditions of consent. The Application provides sufficient information to assess transport effects.<br><br>The Applicant met with Metlink and Council attended this meeting (Refer 17 September 2025 meeting minute in Appendix 2). Council has oversight of these future designs both through engineering approvals and as a Road Controlling Authority. A traffic resolution process would be required to confirm these locations if or when Metlink confirms that it will provide a bus service. |
| | Road design and engineering standards. | This matter was discussed with PCC on 26 May 2026 following the Panel Convener's conference. PCC outlined how it has concerns with the non-compliances of Jointly Owned Access Lots (JOALs) with regard to the provision of footpaths, and consider further explanation is required as to why District Plan standards cannot be complied with for all JOALs. | Road design is shown in 3000 and 8000 series civil plans.<br><br>Non-compliances with vehicle access design are set out in the ITA, with JOALs addressed in Section 8.1 (pages 36 and 37). |
| | Vehicle crossings for individual lots | From the PCC s46 completeness check:<br><br>*Locations of vehicle crossings are not identified on the roading plans. This does not provide sufficient information for the resource consent sought under rule TR-R2 of the Porirua District Plan 2025 or an assessment of the effects.*<br><br>This matter was discussed with PCC on 26 May 2026 following the Panel Convener's conference. PCC outlined that they consider that the ITA heavy on assessment of external effects, and less so with regard to internal transport effects. They seek further information on non-compliances, potential adverse effects, and mitigations including conditions. | The precise location of individual vehicle crossings and bus infrastructure will be confirmed at later design stages, consistent with the staged nature of the development and subject to Council approval through proposed conditions of consent. The Application provides sufficient information to assess transport effects.<br><br>When the application was relodged, a compliance schedule was included at PCC's request showing vehicle crossings that potentially would not comply with the intersection separation standard. This information is found in Appendix 30-23.<br><br>Stantec has provided a memorandum setting out its views on non-compliance with transport standards and necessary mitigations (refer **Appendix F** of this Memorandum). Note that there are no additional standards identified where there are non-compliances from those identified in the Substantive Application.<br><br>The Applicant is willing to review any necessary conditions with regard to vehicle crossings with PCC, with an alternative drafting proposed in **Appendix F**. |
| Electricity & telecommunications | The lack of design provided for the necessary electricity and telecommunication infrastructure | From the PCC s46 completeness check: | The Infrastructure Report outlines how electricity and telecommunications infrastructure is to be delivered (refer section 12 of Appendix 9). At this stage of the project, detailed reticulation designs have not been prepared. This is consistent with typical subdivision practice, where detailed electricity network design is undertaken following |

| Topic | Matter raised by PCC in pre-conference memorandum | Any further information/clarification provided by PCC | Applicant response to matters raised |
|---|---|---|---|
| | despite the assessment stating that it will meet the PDP standards. | *…there appears to be no supporting letter provided by Wellington Electricity, as stated in the Civil Infrastructure Report, and no plans provided in the substantive application for the proposed electricity or telecommunications infrastructure. Appendix 31-30 states under 'Service Notes' that, "[power, gas and telecommunications] utilities will be shown upon receiving their specific utility design plans and incorporated into Envelopes plan set". This does not provide information that is sufficiently detailed to satisfy the purpose for which it is required.* | consent approval, once staging, load assessments and network servicing requirements have been confirmed with the electricity network operator.<br><br>The Applicant is continuing engagement with Wellington Electricity regarding servicing requirements for the development and the wider growth in the Northern Growth Area. This engagement includes consideration of network capacity, future load demands and any upstream reinforcement works that may be required to service the development. To confirm such matters, a High-Level Report (HLR) is in the process of being commissioned by the Applicant.<br><br>Informed by the HLR, detailed reticulation design and the layout of network infrastructure are matters that can be addressed through subsequent detailed engineering design and approval processes undertaken in consultation with Wellington Electricity.<br><br>Accordingly, the Applicant considers that detailed design is more appropriately addressed as a post-approval engineering matter. |
| Natural hazard effects | Particularly assessment of, and conditions relating to, natural hazard risk from flooding, liquefaction, and landslides. | From the PCC s46 completeness check:<br><br>*Information on flood hazard effects is provided in the Flood Risk Assessment provided in Part B of Appendix 11.*<br><br>*information on geohazards is provided in the Geotechnical investigation report provided at Appendix 26. It is noted however, that council's geotechnical experts have identified areas where further information is required.* | Natural hazard risk is addressed in Section 15.15 of the Substantive Application, which relies on:<br><br>• A Geotechnical Assessment has been prepared by ENGEO and is attached as Appendix 26; and<br>• An assessment of flood risk has been undertaken in the Infrastructure Report attached as Appendix 9.<br><br>In response to PCC feedback on the original application, the Substantive Application was updated for relodgement to include a refined flood risk assessment and inclusion of a separate Flood Risk Report with pre and post development flood maps.<br><br>ENGEO's response to Council's geotechnical review is attached as **Appendix D**. |
| Parks & Reserves | There is a lack of detailed plans provided showing what is proposed within the areas of parks and reserves. | From the PCC s46 completeness check:<br><br>*No assessment of the proposed parks and reserves has been provided. The designs provided in the 'Landscape and Ecology Plans' at Appendix 23 are insufficiently detailed, as these refer to the 'Strategy'. The figures included in the 'Master Plan and Landscape Urban Design Strategy' at Appendix 22 are perspective drawings that do not provide sufficient detail or certainty for a resource consent process.*<br><br>This matter was discussed with PCC on 26 May 2026 following the Panel Convener's conference. PCC outlined how it would like the Applicant to provide a "recreational demand strategy" similar to what was provided for the Plimmerton Farm application to inform the form and function of recreational spaces. | The size and design of parks and reserves is addressed in the substantive application as follows:<br><br>• The lots to be vested are shown on the scheme plan: Appendix 30-04 - 1753-02-1010-R2-Scheme-ProposedDevelopment. Drainage reserves are identified in blue, recreation reserves in green.<br>• The Landscape and Ecology Plans outline location and extents of features such as planting, trails, boardwalks, play areas etc at a detailed scale (1:5000).<br>• There are several elements to be determined at detailed design, such as the final form and location of parks furniture. The Masterplan and Landscape Urban Design Strategy in Appendix 22 provides conceptual outlines of these features, and a proposed condition of consent to give PCC oversight of the final design through engineering approval (see condition 27 in Appendix 7).<br><br>PCC is seeking a level of detail similar to that which was provided as part of the Plimmerton Farms application. Plimmerton Farm was approved under different legislation (COVID-19 Recovery (Fast-track Consenting) Act 2020). The consent was approved with a short two-year lapse period for the consents which meant that more detailed design and had to be undertaken up front.<br><br>It is considered that the level of detail provided is sufficient and commensurate with the scale of the development. It is understood that the PCC Parks team has the ability to provide input into detailed design through consent condition. Leaving final design of green space/planting/recreation facilities to detailed design through consent conditions is a common approach in a resource consent process.<br><br>It was agreed following the 26 May 2026 meeting that PCC would seek further advice from their Parks Team, and the consent conditions could be reviewed accordingly. |
| Terrestrial ecology | The ecological assessment is incomplete and does not support the proposed mitigation. | From the PCC s46 completeness check:<br><br>*PCC notes that a range of matters were identified by council's ecological exerts (Wildlands) prior to lodgement of the substantive application and provided to the applicant. That advice is attached to the substantive application at Appendix 2. This advice concluded that, overall, the ecological assessments are incomplete. It does not appear that any changes have been made to the substantive application to address the matters raised in the advice provided by council's ecological experts.* | Ecological effects are outlined in section 15.11 of the Substantive Application, which was informed by technical assessments including the Ecological Assessment in Appendix 15, the Lizard Management Plan in Appendix 16, the Masterplan and Landscape Urban Design Strategy in Appendix 22, and the Landscape and Ecology Plans in Appendix 23.<br><br>Wildland's assessment was considered by the Applicant's ecologist and no changes were considered necessary to the proposed approach as outlined in Appendix 2 (refer page 15).<br><br>The matters raised by PCC do not identify missing information but rather reflect differences in professional opinion regarding the appropriateness of the proposed development with regard to ecology. |

| Topic | Matter raised by PCC in pre-conference memorandum | Any further information/clarification provided by PCC | Applicant response to matters raised |
|---|---|---|---|
| | | PCC provided an additional review of the Applicant's Ecological Assessment to the Applicant at 1pm on 4 June 2026. This has been prepared by Wildlands Ecological Consultants and is dated May 2026. There has not been enough time to review and respond to any matters raised in this document by the 5pm 4 June 2026 due date for this memorandum. | |
| Noise effects | The management of construction noise during the various stages of the development and the effects of existing rural activities on new urban development. | From the PCC s46 completeness check:<br>*…the assessment of INF-R2 relating to noise from construction of new infrastructure is stated as being complied with as the matters are addressed by way of proposed conditions of consent. However, the rule requires that relevant noise limits in Tables 2 and 3 of NZS 6803:1999 Acoustics - Construction noise are met. There is no analysis of those limits and whether they can be achieved through construction management. The proposed condition (Condition 22) anticipates that construction activities may not be able to achieve full compliance with the standard. If this is the case, then INF-R2 would not be complied with.* | The Application adopts a conservative and effects focused approach by addressing construction noise through consent conditions and a Construction Noise and Vibration Management Plan (CNVMP). This approach ensures no permitted activity reliance is assumed where compliance is uncertain and does not give rise to any information insufficiency.<br>In relation to INF R2, it is accepted that if construction noise cannot achieve compliance with NZS 6803:1999, resource consent would be required. While the Applicant intends to comply with INF-R2 and NOISE-R2, given the scale of the site, topography, and the nature of bulk earthworks and infrastructure construction, strict compliance with the permitted construction noise standards in INF R2 and NOISE R2 may not be practicable at all times considering the 15 year construction period and the fact that residents will progressively be moving into completed stages.<br>The Applicant therefore seeks consent under INF-R2.2 and NOISE-R2.2 for the potential non-compliance with construction noise standards. The Applicant notes that the activity itself has not changed but rather the identification of rules that resource consent is applied for under.<br>The relevant policy NOISE-P3 which forms a matter of discretion for both rules was provided in the RFI response to the EPA, and the effects assessment in the Substantive application associated with construction noise is considered to still stand (refer section 15.14), in that with the proposed mitigations including the CNVMP and associated proposed conditions of consent, adverse effects will be less than minor. A Construction Noise and Vibration has now been completed by Marshall Day and is attached as **Appendix G**. |
| Consents conditions | PCC is yet to finalise a position on draft conditions, with many conditions relying on input from technical expert reporting currently being undertaken. However, the draft conditions proposed by the applicant are not considered to be sufficient or appropriate to manage the effects. As noted above, PCC anticipates preparing conditions may be an extensive and potentially time-consuming exercise. | From the PCC s46 completeness check:<br>*The proposed conditions of consent are outlined in section 14 and contained in Appendix 7 of the substantive application.*<br>*It is noted that, while proposed conditions have been provided, PCC considers that the proposed conditions are insufficiently detailed to satisfy the purpose for which the information is required. For example, the proposed conditions for engineering approvals from Porirua City for infrastructure that is proposed to be vested do not provide the required level of detail for that process to be efficiently or effectively undertaken.* | The proposed conditions provide a comprehensive framework for managing and monitoring effects, including certification, compliance monitoring, and enforcement mechanisms. It is noted that PCC has only provided high level comments on their preferred structure, and it is unclear why PCC considers the proposed set of conditions are insufficient.<br>The level of detail sought by Council is typically refined through post-lodgement condition drafting in conjunction with technical reviewers and the decision-maker, as contemplated by the Panel Convener's Guidance.<br>Both PCC and GWRC have stated that they are seeking a set of conditions similar to those imposed on the Plimmerton Farm development. However, the Applicant is seeking a much clearer, concise and less repetitive set of conditions for Mt Welcome. This will aid the consent holder and their contractors to comply with conditions, and assist both councils to effectively and efficiently monitor and enforce them.<br>The Plimmerton Farm site is different to Mt Welcome, and the proposed development is different. For example, the Plimmerton Farm site is much more ecologically sensitive as it contains areas of remnant native bush and high value wetland systems. The Applicant considers that the Mt Welcome development needs to be assessed on its own merits.<br>Further, Plimmerton Farm was approved under different legislation (COVID-19 Recovery (Fast-track Consenting) Act 2020). The consent was approved with a short two-year lapse period for the consents which meant that more detailed design and had to be undertaken up front.<br>The Applicant has also attempted to align the conditions with approaches taken for similar scale residential developments approved under the FTAA. These approved developments contain far fewer conditions and management plans than those imposed on the Plimmerton Farm development. |

## Appendix B: Response to matters raised by GWRC

| Topic | Matter raised by GWRC in pre-conference memorandum | Any further information/clarification provided by GWRC | Applicant response to matters raised |
|---|---|---|---|
| Ecology | The adverse effects of the proposal on stream ecology, including an absence of Stream Ecological Valuation (SEV) assessment to determine the ecological value of streams that will be directly affected by reclamation or the placement of culverts. | This matter was discussed with GWRC and their consultant ecologist on 28 May 2026 following the Panel Convener's conference.<br>GWRC outlined how:<br>• While there is an estimate of an SEV for the potion of the Kakaho stream that is being reclaimed, there is not an assessment in accordance with the methodology to demonstrate how that estimate was arrived at.<br>• The ecological assessment and then the offsetting package that that flows from that is based on an estimated SEV, not a calculated one.<br>• Not having the rationale behind the data sheet doesn't enable the reviewer to understand of sort of what are the factors that lead to that number | This matter is addressed in the memorandum from BlueGreen Ecology attached as Appendix E. The project ecologist has provided additional information on SEV values for existing rivers and required offsetting. |
| | Proposed approach to offsetting or compensation for the loss of natural inland wetland and stream bed extent and values, and the alignment of the offsetting or compensation conditions with the principles for offsetting or compensation set out in the Natural Resources Plan. | • N/A | The proposed approach to offsetting is outlined in Section 15.11, the requirements of the NES-F are specifically addressed in Appendix 6 with regard to works in waterways. This assessment was based on the Ecological Assessment in Appendix 15. |
| | The proposal to use constructed stormwater management devices (identified in the application as "retention wetlands") as a means of partially remediating or offsetting the loss of extent and values of natural inland wetlands and stream beds. | This matter was discussed with GWRC and their consultant ecologist on 28 May 2026 following the Panel Convener's conference.<br>GWRC outlined how<br>• Is it not clear from the drawings which parts of the retention wetlands are stormwater management devices and which are being ring fenced as restoration wetlands that will function as natural inland wetlands.<br>• In order for these wetlands to work as natural inland wetlands, the expectation would be that they will not receive sediment discharges from the storm water system so that they do not need to be periodically cleaned out like a stormwater management retention wetland would need to be.<br>• Whoever gets the stormwater management system (PCC, Wellington Water) would effectively not be able to maintain it without consent to use a digger in a natural inland wetland. | There is a minor error in the Stormwater Management Plan in terms of maintenance. To correct this, an updated Stormwater Management Plan is provided as **Appendix C** with the changes recorded in the associated memorandum from Envelope.<br>The areas to be set aside for natural inland wetlands are shown in plans with covenants. Raingardens are proposed which have the ability to remove 90% sediment from the stormwater system.<br>The project ecologist has confirmed that there will be some natural load from undeveloped areas of the site into retention wetlands, but this will be less than is occurring at present and wetlands will be able to receive the sediment without needing to be cleaned out. |
| Stormwater | Sufficiency of information/evidence in relation to the design of culverts (as noted above), including their ability to convey flows, mitigate stream erosion and scour, and provide for fish passage. | This matter was discussed with GWRC and their consultant ecologist on 28 May 2026 following the Panel Convener's conference.<br>GWRC outlined how they would like more information on design scenarios for culverts depending on the receiving environment, including the typical detail of the inlet and the inlet and outlet. The exact dimensions will be subject to a detailed design process through the conditions<br>GWRC's culvert team also cannot find information about flows that culverts can convey, and where they over top at a certain flow. | The Stormwater Management Plan (SMP) contains calculations for the sizing of all culverts. In addition, post development flood hazard modelling has been undertaken, including testing blockages. Envelope has updated the SMP with some further details as follows:<br>• 6.14 Scour and Erosion - Updated reference to design manuals.<br>• 1753-02-4904-Typical Stormwater Outlet Details Sheet 5 of 5 - R2 - Added culvert outlet details.<br>• Appendix 2 – Culvert Calculations - Maximum flows and velocities for the proposed culverts under the 10- and 100-year scenarios have been added, sourced from the ICM Cut-off model |

| Topic | Matter raised by GWRC in pre-conference memorandum | Any further information/clarification provided by GWRC | Applicant response to matters raised |
|---|---|---|---|
| | | | |
| | Evidence (including drawings or calculations) showing how hydrological control of stormwater discharge volumes from the proposal will be achieved.<br><br>Sufficiency of information/evidence in relation to the hydrological control of stormwater discharge volumes.<br><br>Design of the stormwater management system (and associated operation and maintenance requirements) to appropriately treat contaminants and control hydrological flows before discharging to downstream water bodies. From Greater Wellington's perspective, it is uncertain whether the proposed design can adequately treat stormwater contaminants or control hydrological flows, and it may be that alterations to the proposed design are necessary in order to achieve these outcomes. | This matter was discussed with GWRC and their consultant ecologist on 28 May 2026 following the Panel Convener's conference. GWRC cannot see how hydrological control objectives have been achieved. | Pattle Delamore Partners completed a Hydrology Assessment of the catchment to assess the scale and potential mitigations associated with changes in hydrology due to the increased impervious surfaces. This is attached to the Substantive Application as Appendix 18.<br><br>A high level assessment of use of tanks on all lots in the Taupo Catchment was included in the hydrology assessment. Results indicate that the inclusion of tanks will reduce the total annual post development discharge by approximately 3%, which is equivalent to a 1% reduction on annual post development discharge into the top of Taupo Swamp. The main issue being that tanks will be full most of the winter so the capacity to attenuate flows becomes very limited. Significant filtration to ground is not feasible given the geology.<br><br>Raingardens are designed to treat water to a sufficiently high level before discharging into retention wetlands. This is covered in the stormwater design.<br><br>Additional natural removal will occur during flow from the discharge locations across the ephemeral catchments before discharging into on site wetlands.<br><br>The Water Quality Assessment (Appendix 19) indicates an improvement from the current discharge, due to the removal of cattle and deer from the majority of the catchment and the treatment of stormwater prior to discharge.<br><br>Flows will be controlled by retention mechanisms on site, reducing maximum discharge rates within the streams. This will lower erosional potential and sediment remobilisation risk within streams during high intensity events. |
| Proposed conditions of consent | The structure and content of regional resource consent conditions to appropriately manage the adverse effects of the proposal in relation to the matters set out in paragraph 12(a) above. | N/A | GWRC have provided detailed responses to proposed conditions[3]. The Applicant has assessed these and considers there is substantial alignment, but note the Applicant seeks a more concise and less repetitive format than that proposed by GWRC[4].<br><br>As outlined in Appendix A above, both PCC and GWRC have stated that they are seeking a set of conditions similar to those imposed on the Plimmerton Farm development. However, the Applicant is seeking a much clearer, concise and less repetitive set of conditions for Mt Welcome. This will aid the consent holder and their contractors to comply with conditions, and assist both councils to effectively and efficiently monitor and enforce them.<br><br>The Plimmerton Farm site is different to Mt Welcome, and the proposed development is different. For example, the Plimmerton Farm site is much more ecologically sensitive as it contains areas of remnant native bush and high value wetland systems. The Applicant considers that the Mt Welcome development needs to be assessed on its own merits.<br><br>Further, Plimmerton Farm was approved under different legislation (COVID-19 Recovery (Fast-track Consenting) Act 2020). The consent was approved with a short two-year lapse period for the consents which meant that more detailed design and had to be undertaken up front. |

[3] Refer pages 137 to 180 of Appendix 2 of the Substantive Application.

[4] Refer pages 21 to 23 (items 10 and 11 in Table 4) for Applicant response to GWRC feedback on conditions.

| Topic | Matter raised by GWRC in pre-conference memorandum | Any further information/clarification provided by GWRC | Applicant response to matters raised |
|---|---|---|---|
| | | | The Applicant has also attempted to align the conditions with approaches taken for similar scale residential developments approved under the FTAA. These approved developments contain far fewer conditions and management plans than those imposed on the Plimmerton Farm development. |
| Transport | Potential impacts of the proposal on existing public transport services and facilities, and alignment of the proposal with the Regional Land Transport Plan. | N/A | The Applicant met with Metlink to discuss the potential for future public transport provision (Refer 17 September 2025 meeting minute in Appendix 2). Feedback from Metlink has informed the design of the development including road typologies, and proposed conditions of consent (refer PCC Condition 32). The precise location of bus infrastructure will be confirmed at later design stages, consistent with the staged nature of the development and subject to Council approval through proposed conditions of consent. The Application provides sufficient information to assess transport effects. |
| Cumulative effects | The cumulative effects of the proposal on top of the effects of existing authorised development within the catchment are a matter that the Panel may need to consider. | At the Panel Convener's conference GWRC commented that this information is required, although not necessarily missing. | The Mt Welcome development (and others in the catchment) are designed to reduce the peak run-off and ensure that the current issues within the catchments are reduced.<br><br>Mt Welcome is part of the upper Taupō catchment, but the hydrology modelling includes the upstream catchments for the Kakaho stream within its assessment.<br><br>Consideration has also been given into sediment inflow into the site from these catchments and how to control these. At present the existing pond effectively acts as a sediment sink for the upper catchment. This feature will be retained and act in a similar function post development. |

## Appendix C: Engineering Advice

# RESPONSE TO PANEL CONVENER MINUTE 3

## MT WELCOME, PUKERUA BAY

| | | | |
|---|---|---|---|
| **TO** | Pukerua Property Group LP | **DATE** | 4 June 2026 |
| **PROJECT NAME** | Mt Welcome | **ENVELOPE REF** | 1753-02 |
| **ATTENTION** | William Dorset | **FROM** | Kyle Dirse |
| **EMAIL ADDRESS** | william.dorset@classicdevelopments.co.nz | | |

This memorandum has been prepared by Envelope Engineering in response to the directions issued by the Panel Convener in Minute 3 (dated 27 May 2026), providing the further infrastructure information requested to assist in appointing a Panel and confirming a decision-making timeframe.

The following documents have been updated or added.

**R003v3-1753-02 - Stormwater Management Plan**

- **6.14 Scour and Erosion -** Updated reference to design manuals.
- **8.3 Operations & Maintenance Manuals -** Updated for clarity, including device specific maintenance activities.
- **1753-02-4904-Typical Stormwater Outlet Details Sheet 5 of 5 - R2 -** Added culvert outlet details.
- **Appendix 2 – Culvert Calculations -** Maximum flows and velocities for the proposed culverts under the 10- and 100-year scenarios have been added, sourced from the ICM Cut-off model

**R001v3-1753-02 - Infrastructure Report**

- **11.6 Lower Zone -** Updated this section to clarify the supply and pressure limitations. The consented reservoir confirms that a suitable water supply is available to service the proposed development

**ENVELOPE**
James Smith Building, Level 1, 65 Cuba Street
Te Aro, Wellington 6010

ENVELOPE

# CIVIL INFRASTRUCTURE REPORT

Mt Welcome

# DOCUMENT CONTROL RECORD

| | |
|---|---|
| **CLIENT** | Pukerua Property Group LP |
| **PROJECT** | Mt Welcome |
| **PROJECT NO.** | 1753-02 |
| **DOCUMENT TYPE** | R001v3-1753-02 Infrastructure Report - DRAFT |
| **DATE ISSUED** | 4 June 2026 |
| **ADDRESS FOR SERVICE** | Envelope Engineering Limited<br>Level 1, 65 Cuba Street, Te Aro,<br>Wellington |
| **CONTACT** | Kyle Dirse, Director<br>kyle.dirse@envelope-eng.co.nz<br>+64 27 568 2788 |

# ISSUE AND REVISION RECORD

| | |
|---|---|
| **DATE OF ISSUE** | 4 June 2026 |
| **STATUS** | Final v3 |
| **ORIGINATOR** |  <br>Kyle Dirse – Director, Senior Civil Engineer |
| **REVIEWED** |  <br>Andrew Jackson – Director, Civil |
| **APPROVED FOR ISSUE** |  <br>Kyle Dirse – Director, Senior Civil Engineer |

# 1.0 EXECUTIVE SUMMARY

## INTRODUCTION

This Infrastructure Report is intended to support a Fast-Track Approvals Act 2024 application for the Mt Welcome development within the Porirua Northern Growth Area (NGA). It outlines the key infrastructure requirements, opportunities, and constraints to enable the construction of 949 new homes and a 1.3-hectare commercial centre. While Envelope has led the civil and servicing design, the report draws on specialist inputs from ENGEO (geotechnical), BlueGreen Ecology (ecology), Pattle Delamore Partners – PDP (hydrology, contamination, water quality), Heritage & Archaeology Services Ltd (archaeology), BLAC (landscape and urban design), and Stantec (transport), and is intended to be read alongside their respective reports to demonstrate compliance with Porirua City Council, Greater Wellington Regional Council, and Wellington Water requirements.

## EARTHWORKS

The development requires significant earthworks to form stable, buildable platforms across moderately steep and undulating terrain. The design approach achieves a cut-fill balance, minimises off-site disposal, and avoids ecologically sensitive areas. Erosion and sediment control will follow Greater Wellington Regional Council (GWRC) guidelines, with measures such as sediment ponds and staged construction utilised to manage runoff. A draft Earthworks and Construction Management Plan (ECMP) is appended to this report and outlines the proposed earthworks methodology and environmental controls.

## ROADING

The proposed primary road network generally follows the Northern Growth Area (NGA) Structure Plan and has been designed to suit the site's varied topography. It establishes a connected, safe, and efficient local network that provides access throughout the development and integrates with State Highway 59 via a new roundabout at the main entry to the development. The internal roads include collector routes, local streets, and shared access lanes designed to support low-speed residential traffic and provide for walking and cycling. Pedestrian paths, on-road cycle lanes, and recreational trails connect homes, open spaces, and the commercial centre, ensuring a well-linked and accessible neighbourhood.

## STORMWATER

Stormwater management focuses on protecting sensitive downstream environments, including Taupō Swamp and Te Awarua-o-Porirua Harbour. The strategy uses a combination of underground networks, raingardens, four large retention wetlands, and smaller basin to manage post development discharge and water quality. These systems will ensure post-development discharges match pre-development levels, achieving hydraulic neutrality and meeting the requirements of Wellington Water (WWL) and GWRC.

## WASTEWATER

A primarily gravity-based wastewater system will service the development, with several small pump stations and low-pressure systems in areas where gravity is not feasible. The network has been designed to integrate with the neighbouring Muri Road development and connect to the existing SH59 trunk main. Some upgrades to the downstream wastewater network are required to improve capacity to cater for this development. These consist of three discrete sections of pipe upgrades which are proposed to remedy the downstream constraints. Ongoing coordination with Wellington Water to confirm the timing of these upgrades and the operation of the new infrastructure will ensure network performance and future resilience.

## WATER SUPPLY

The site will be supplied by both the existing Pukerua Bay reservoir and a new 3.7 ML shared reservoir located on the Muri Road block. A new DN225 bulk main and pump station will transfer water from the existing bulk main in SH59 to the new reservoir, which will in turn supply the elevated areas within Mt Welcome. The reservoir is currently being consented under a separate application. The reticulation network has been designed in accordance with Wellington Water RSWS and ensures adequate pressure, fire-fighting capacity, and network redundancy.

## UTILITIES

Telecommunications providers (Tuatahi First Fibre and Chorus) have confirmed that they have infrastructure in the SH59 corridor available to service the proposed development.

Wellington Electricity (WE) have advised that some reinforcement of their existing network will be required to enable power supply to the site. Wellington Electricity are currently preparing an assessment to identify the necessary network upgrades.

No gas network is proposed for the residential or commercial areas.

## SUMMARY

The proposed infrastructure provides a coordinated and practical servicing solution for Mt Welcome, enabling staged delivery of 949 homes and a commercial centre. The design meets regional and local standards, integrates with adjoining land, and supports the long-term vision for the Porirua Northern Growth Area.

# CONTENTS



## APPENDICES

# FIGURES



# TABLES

# 2.0 INTRODUCTION

## 2.1 BACKGROUND

The proposed development is located south of Pukerua Bay, within the Porirua Northern Growth Area. This land was rezoned as part of Council-led Plan Variation 1 to Plan Change 19 (PC19), which was notified in 2022 and is now operative.

This report addresses the civil engineering components of the project to support a Fast-track application under the Fast-track Approvals Act 2024.

## 2.2 LOCATION

The site is located at 422, 422A and 422B State Highway 59, Pukerua Bay, and encompasses a total area of 205.60 hectares. It formally comprises the following land parcels:

- Part Lot 1 DP 89102 (4.38 ha)
- Lot 2 DP 891020 (5.64 ha)
- Lot 1 DP 534864 (55.33 ha)
- Lot 2 DP 534864 (140.25 ha)
- Lot 1 DP 608433, Lot 1000 DP 608433 (34 Muri Road)
- Road Reserve (SH59 Corridor)

References to "the site" within this report refer collectively to all seven allotments, unless stated otherwise.

The site is situated in a rural area south of Pukerua Bay and north of Plimmerton, within the Porirua City boundaries in the Wellington region. It is bounded by State Highway 59 to the west and three adjoining land blocks to the north, east, and south.

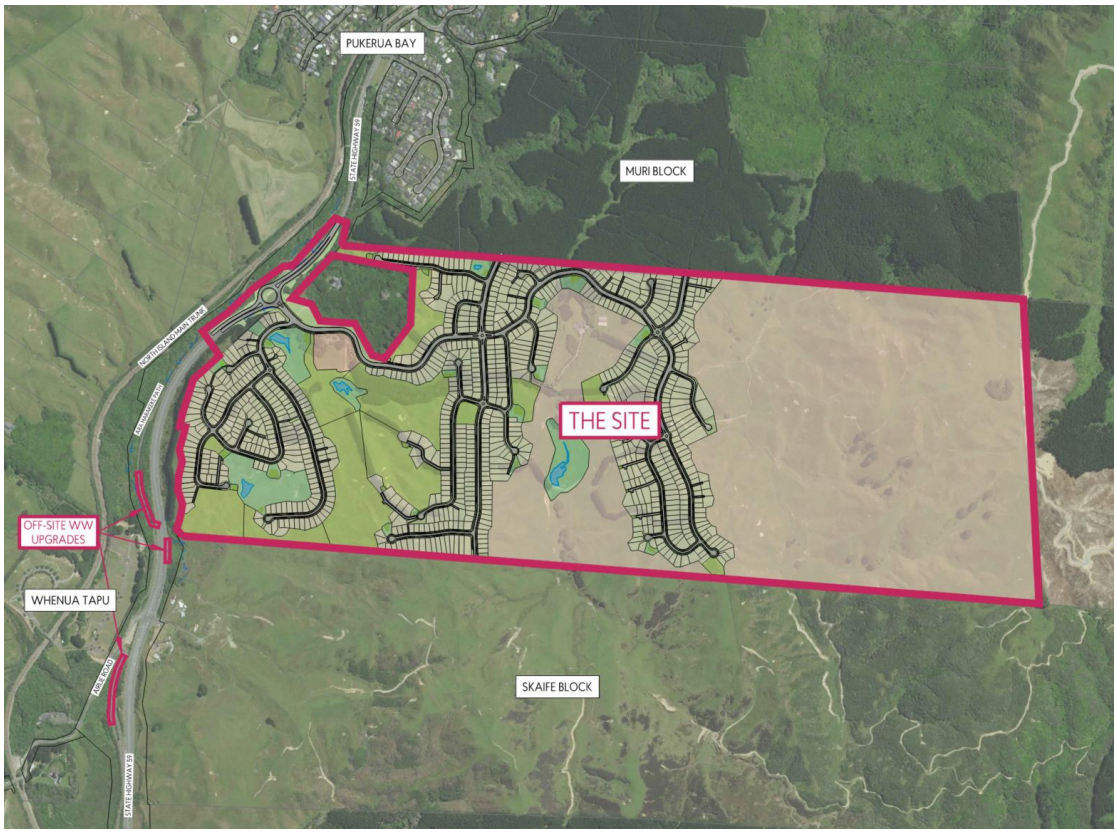



**Figure 1.** Site Extents Plan – Entire Site.

## 2.3 SCOPE

The scope of works includes:

- Earthworks and Erosion & Sediment Control – Bulk earthworks design including cut/fill balance, retaining structures, and management of unsuitable material. Incorporates erosion and sediment control measures consistent with the GWRC Erosion and Sediment Control Guide.
- Roading –Design of the internal road network, intersections, and connections to the external transport network. The design includes geometric and cross-sectional design, provision for walking, cycling, and public transport, and integration of a new intersection with State Highway 59 (SH59).
- Stormwater – Design of the primary and secondary stormwater systems, including piped reticulation and centralised treatment, retention, and detention devices. The system is designed to achieve hydraulic neutrality, provide effective water-quality treatment, and ensure protection of downstream environments.
- Wastewater – Gravity and pumped wastewater reticulation including upgrades to the SH59 bulk main. Design scope includes capacity assessments, modelling and coordination with the adjacent Muri Road development for shared infrastructure.
- Water Supply – Design of the potable water network, including reticulation, service connections, and to meet requirements for flow, pressure, and fire-fighting capacity.
- Utilities Servicing – Provision for underground power, telecommunications, and fibre services. project objectives

## 2.4 PROJECT OBJECTIVES

The Mt Welcome development seeks to deliver safe, efficient, and sustainable infrastructure to support 949 homes and a commercial area. The project will carry out earthworks to provide a stable landform, provide a connected roading network, manage stormwater through wetlands and raingardens, and deliver resilient wastewater and water supply systems. All works will meet council and regional standards, be staged to support growth, and protect the natural environment.

# 3.0 PLANNING CONTEXT

## 3.1 COUNCIL-LED PLAN CHANGE

Porirua City Council (PCC) initiated Variation 1 to the District Plan to rezone land within the Northern Growth Area for residential development. This variation has now been made operative. As part of the plan change process, a series of technical reports were prepared to support the rezoning. From a civil infrastructure perspective, these reports assessed the bulk servicing requirements needed to service future development.

## 3.2 STRUCTURE PLAN

The Northern Growth Area (NGA) Structure Plan establishes the framework for coordinated development across the Mt Welcome and Muri Road block, ensuring integrated land use, transport, and infrastructure outcomes. The Structure Plan defines the layout of key roading corridors, pedestrian and cycle connections, open space networks, and the sequencing of bulk infrastructure required to support urban development.

The Structure Plan encompasses both the Mt Welcome and Muri Road developments, ensuring a coordinated and consistent approach to urban form, transport, and servicing across the wider catchment. The Muri Road block, located immediately north of Mt Welcome and under separate ownership, is integrated within the overall framework. Both developments will share key infrastructure, including transport connections, pedestrian links, wastewater storage and a water reservoir site. Collaborative discussions between the landowners are ongoing to coordinate the design and delivery of infrastructure across the shared boundary.

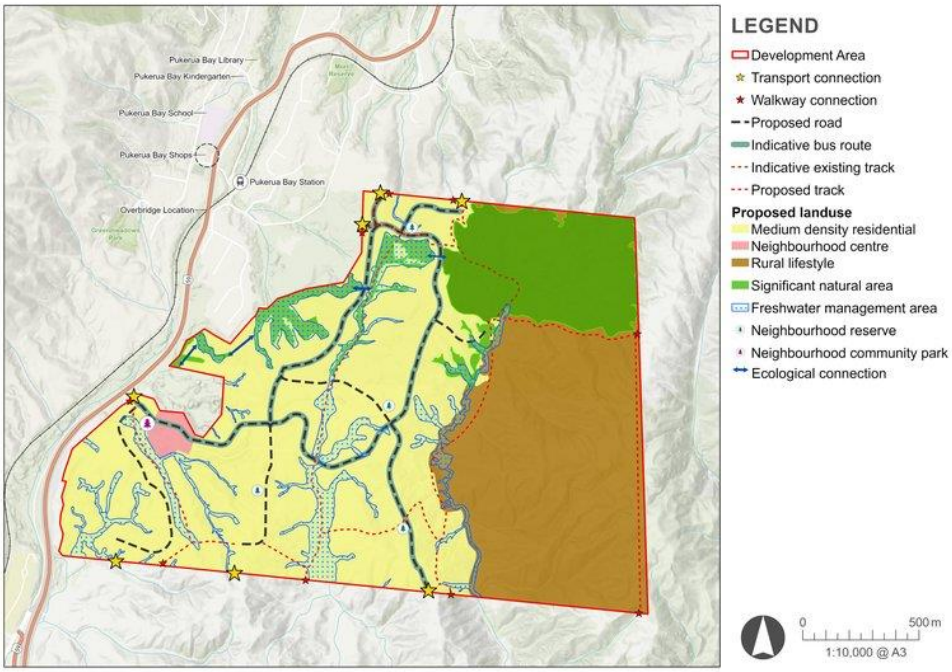



**Figure 2.** Northern Growth Area Structure Plan

# 4.0 THE SITE

## 4.1.1 EXISTING LAND USE & TOPOGRAPHY

The site is currently used as a deer farm, comprising predominantly pastoral grassland with several existing homesteads, farm sheds, and associated agricultural infrastructure. Historical aerial imagery dating back to 1942 shows the land as open pasture, and it has remained pasture since that time, with no significant changes in land use or built development.

The topography is varied and includes some land that is moderately steep and undulating, with elevations ranging from approximately RL 50 m near the western boundary (adjacent to SH59) to RL 300 m at the eastern extent of the site. The landform includes three prominent high points separated by two gullies. The western portion of the site comprises of rolling hills and shallow gullies, while the central and eastern areas are steeper, with slopes typically between 26° and 45°, and locally exceeding 45° in areas.

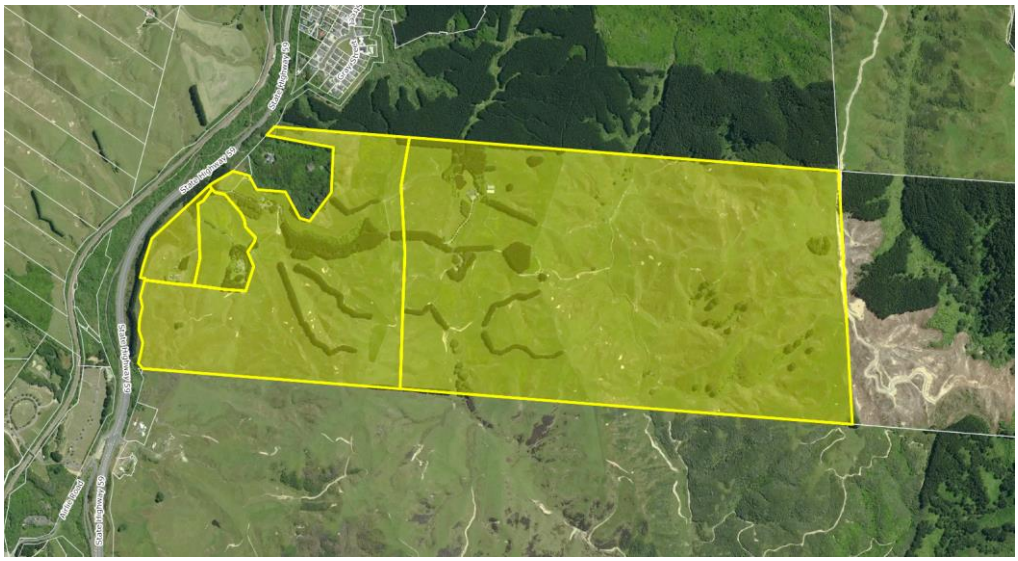


**Figure 3.** Existing Site Plan

## 4.2 PROPOSED DEVELOPMENT

The proposed development comprises 949 residential allotments ranging in size from 316m² to 2,386m², enabling the construction of 949 future dwellings with an average lot size of around 523m². The development also includes a commercial centre to serve the new local community, together with associated three-waters infrastructure (wastewater, including storage facilities; stormwater management systems; and water reticulation), roading, and a connected network of pedestrian and cycling trails.

Earthworks will be undertaken to establish suitable finished surface levels for building platforms, roads, parks, and drainage systems. The proposal will also incorporate extensive landscaping and public open spaces, including recreation and drainage reserves for stormwater attenuation and conveyance. A new intersection with State Highway 59 will provide primary access to the site and integrate the development with the wider transport network.

## 4.3 COMMERCIAL AREA

A 1.3-hectare commercial centre is proposed on the main entry road to the development, nearby the new SH59 intersection. It is located within the neighbourhood centre zone identified in the Structure Plan. It is currently intended as mixed-use centre with a small supermarket, early childcare centre, and retail and hospitality spaces. This proposed land-use has been incorporated into all relevant infrastructure design calculations presented in this report, including impervious surface allowances for stormwater management, commercial wastewater flows, and water-demand assessments.

At the detailed design stage, once the commercial area layouts are confirmed, secondary earthworks and civil works will be undertaken to finalise site levels, drainage, and service connections in accordance with the development design.

## 4.4 RESERVES AND OPEN SPACE

The development incorporates a network of reserves and open spaces that provide both ecological and recreational functions. The layout follows the *Mt Welcome Landscape and Urban Design Strategy* (BLAC, 2025), which establishes green corridors linking residential areas, reserves, wetlands, and the neighbourhood centre.

This network includes existing landform, gullies, and wetlands, with improvements designed to enhance biodiversity and visual amenity. Stormwater management has been considered, and a variety of stormwater design measures have been integrated into this open space network. Steeper slopes are retained as natural open space, with walking tracks, parks, and playgrounds positioned along ridges and valleys to connect key areas. The reserve system also strengthens links from the site to Pukerua Bay and the Muri Road block.

## 4.5 DEVELOPMENT STAGING

Staging of the development will be undertaken to enable a progressive delivery of housing. Indicative staging is shown on the scheme plans in Appendix 1 and summarised in Table 1 below. A total of 24 stages are proposed. It is recommended that conditions provide for flexible staging to occur, provided that appropriate infrastructure is in place for each stage.

**Table 1.** Development Staging

| Stage | Lots | Stage | Lots |
|---|---|---|---|
| Stage 1 | 54 | 9 | 55 |
| Stage 2 | 57 | 10 | 42 |
| Stage 2b | 19 | 11 | 48 |
| Stage 3a | 37 | 12 | 56 |
| Stage 3b | 22 | 13 | 43 |
| Stage 4a | 32 | 14 | 47 |

| Stage | Lots | Stage | Lots |
|---|---|---|---|
| Stage 4b | 32 | 15 | 21 |
| Stage 5a | Commercial | 16a | 43 |
| Stage 5b | 62 | 16b | 23 |
| Stage 6 | 48 | 17 | 48 |
| Stage 7 | 37 | 18 | 39 |
| Stage 8 | 44 | 19 | 40 |

Prior to the subdivision of the final individual lots, four super lots will be created to facilitate staging of the development. These super lots will subsequently be further subdivided into the individual residential lots as each stage progresses. This approach enables more efficient delivery of infrastructure, supports commercial flexibility, and allows for continued interim agricultural use of undeveloped areas.

# 5.0 MANA WHENUA VALUES

## 5.1.1 GENERAL

This Infrastructure Report has been prepared to manage freshwater values in a manner consistent with Te Mana o te Wai and the principles of the National Policy Statement for Freshwater Management.

Mana whenua values, as expressed by Ngāti Toa Rangatirathe iwi with mana whenua status over the Porirua catchment—have been recognised across all infrastructure components, including earthworks, stormwater, wastewater, water supply, transport, and open space planning.

## 5.1.2 CONSULTATION

Engagement with Ngāti Toa Rangatira has been ongoing throughout the design and development process, ensuring iwi values and cultural considerations are incorporated into the design and implementation of the project. A summary of engagement is outlined below:

- 10 June 2025 – Initial meeting: Project overview, timeframes, process, and discussion of key issues to work through.
- 19 June 2025 – Site visit: Initial site orientation and walkover of the Lower Terrace to familiarise iwi representatives with the project area.
- 25 September 2025 – Hui: Progress update in response to further information sought on Structure Plan compliance, stormwater management, ecology, and works in waterways.
- 13 October 2025 – Site visit: Follow-up visit to discuss key areas of interest including the design of the roundabout, approach to ecology and archaeology, attended by the applicant's planning, ecology, archaeology, and engineering experts.
- 05 November 2025 – CVA: A Cultural Values Assessment was received and reviewed by the project team, which provided several comments on the development proposal and highlighted a number of matters. A follow-up meeting was subsequently scheduled, and these matters will be addressed through the AEE.

# 6.0 SAFETY IN DESIGN

## 6.1.1 GENERAL

A Safety in Design (SiD) process has been initiated for the Mt Welcome infrastructure works in accordance with the Health and Safety at Work Act 2015 and standard industry practice. The purpose is to identify and address potential health and safety risks throughout the design, construction, and operational stages of the development.

### 6.2 RISK IDENTIFICATION

Preliminary risk identification has been undertaken during the design phase to consider hazards associated with key civil and servicing activities. These include excavation and trenching for drainage systems, installation of underground utilities, construction around raingardens and other stormwater treatment devices, roading alignment and sightlines, and interactions between construction plant and the public. No specific items have yet been recorded in the SiD register; however, the register will be developed and populated as the detailed design advances toward construction.

### 6.3 MITIGATION MEASURES

The design seeks to eliminate or reduce risks through the design process in consultation with the wider team. Measures include minimising excavation depths where practicable, maintaining clear sightlines for vehicles and pedestrians, providing adequate edge protection around open structures and stormwater devices, and ensuring utilities and crossings are located to avoid conflicts with traffic and pedestrians. Residual risks identified during later design stages will be documented in the SiD register and communicated to the contractor for inclusion in construction safety planning.

## 7.0 EARTHWORKS

### 7.1 OVERVIEW AND DESIGN OBJECTIVES

The earthworks design aims to achieve a balanced, and environmentally conscious outcome that supports the overall development. Key objectives include:

- Comply with Greater Wellington Regional Council (GWRC)'s Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region.
- Ensure geotechnical compliance in accordance with geotechnical engineer (ENGEO) recommendations.
- Incorporate ecological requirements in line with ecologist (Blue Green Ecology) and hydrological (PDP) advice.
- Achieving a practical cut–fill balance and minimising material disposal off-site.
- Eliminate the need for future secondary earthworks.
- Incorporate ecological and environmental constraints into the design.
- Stage works to enable progressive development and minimise exposed areas.
- Apply Safety in Design principles and identify project specific risks

#### 7.1.1 DESIGN STANDARDS & COMPLIANCE

The following documents and standards have been adopted for the design and assessment of earthworks:

- GWRC Erosion and Sediment Control Guide for Land-Disturbing Activities in the Wellington Region (2021)
- ENGEO Geotechnical Report
- Blue Green Ecology Report
- PDP Hydrological Advice
- PDP Preliminary Site Investigation Report
- Heritage & Archaeology Services Ltd Archaeological Report

### 7.2 GEOTECHNICAL CONSIDERATIONS

ENGEO have completed a geotechnical report for the Mt Welcome development, which should be read in conjunction with this report. The key points relevant to the proposed civil works are summarised below:

- The site is located approximately 500 m from the mapped trace of the Pukerua Fault, within a seismically active area that also includes the Ohariu and Wellington Faults. While the site is not

directly traversed by a known fault, ground rupture and regional subsidence could occur during a major seismic event on nearby or unmapped faults.

- Liquefaction risk is considered low within the developable areas but may occur locally in low-lying gullies and valley floors.
- Groundwater was recorded between approximately 0.4 m and 3.8 m below ground level, varying seasonally and by location. Continued groundwater monitoring is recommended to inform the detailed design of earthworks, retention wetlands, and slope stability assessments.
- Slopes steeper than 25 degrees require specific engineering assessment and mitigation where development is proposed above or below them. Specifically Engineered Design (SED) zones should be applied in these areas.
- Most surficial soils and Greywacke rock are suitable for reuse as engineered fill, subject to verification and field compaction testing.
- Detailed design of the proposed stormwater retention wetlands and adjacent embankments is required by a chartered professional engineer.
- Installation of piezometers for ongoing groundwater monitoring for a minimum of four months prior to major earthworks is recommended to support final design and construction staging.

## 7.3 CONTAMINATION ASSESSMENT & REMEDIATION

Pattle Delamore Partners (PDP) have been engaged to carry out a Preliminary Site Investigation (PSI) to assess the risk of any previous land activities on the health of future residents. The investigation identified potential contamination sources from historical sheep dip/spray race operations and from older buildings that may have contributed asbestos and lead residues to surrounding soils.

PDP recommend that areas associated with these potential HAIL activities are subject to a Detailed Site Investigation (DSI) to confirm the extent of contamination and whether the National Environmental Standard for Assessing and Managing Contaminants in Soil (NESCS) will be triggered. An asbestos survey will also be required prior to demolition of existing buildings, with shallow soil testing undertaken around building footprints.

A Soil Management Plan (SMP) will be required for the duration of the earthworks to manage the potential discovery of contaminated soils and to set out safe handling and disposal requirements. Any soils to be removed from site will require testing against landfill acceptance criteria before disposal to an approved facility.

Following remediation and development works, a Site Validation Report (SVR) will be required to confirm that all remediation has been undertaken in accordance with the SMP and NESCS requirements.

## 7.4 ECOLOGY AND ENVIRONMENTAL

BlueGreen Ecology have prepared the ecological assessment for the site. Their investigations identified that the existing streams, wetlands, and terrestrial habitats are of low ecological value, being largely exotic and modified by historic farming activities.

Ecological enhancement measures have been integrated into the earthworks design, including riparian planting and sediment treatment feature

## 7.5 ARCHAEOLOGICAL ASSESSMENT

The Archaeological Assessment found no recorded sites within the project area but noted a possibility of uncovering unrecorded remains during earthworks. An Archaeological Authority is recommended, along with archaeological monitoring, recording, and information recovery if discoveries occur. Any demolition or modification of pre-1900 buildings will also require assessment and recording by a built heritage specialist.

### 7.5.1 BULK EARTHWORKS

This section summarises the extent and purpose of proposed bulk earthworks and the design approach adopted to achieve a balanced and stable landform.

Bulk earthworks will need to facilitate a balanced approach between cut and fill, ensuring there is no excess material requiring removal from site or additional material import, achieve compliant road gradients, and produce flat buildable house sites. This will also minimise the need for secondary earthworks, retaining requirements and encourage batter slopes to be designed at grades to minimise the time required for rehabilitation and revegetation post earthworks. The methodology for the earthworks is outlined within the ECMP. Autodesk Civil 3D 2025 was used for overall 3D model design and plan production. A complete set of plans can be found in Appendix 1. The earthworks proposed on the site consist of:

- Total earthworks area: 81.46 ha.
- Topsoil stripping is estimated at 128,000m³, assuming an average depth of 300 mm.
- Subgrade preparation is assumed to extend 200mm below finished ground level (FGL).
- Maximum cut height is approximately 21m, and maximum fill depth is approximately 24m.
- Total earthworks area: 81.46 ha.
- Total cut volume: 1,905,000m³.
- Total fill volume: 1,806,000m³.
- Approximately 135,000m³ of unsuitable material allowance

These volumes are solid volumes and make no allowances for bulking as advised by the geotechnical engineer based on field experience in similar ground conditions.

A cut/fill balance has generally been achieved meaning no earthworks are intended to be removed from the site, subject to detailed geotechnical testing and civil design. Ground material that is unsuitable has been accounted for and will generally be disposed of on site in the designated unsuitable fill area, as detailed below.

To achieve a cut/fill balance, certain gullies and low-lying areas will be utilized for placement of fill material. Through close collaboration with the ecology team, we have identified areas of lower ecological value that can accommodate earthworks, alongside areas that have higher ecological sensitivity and should be protected or enhanced. Is it expected these gullies will contain material unsuitable for fill, and fill be disposed of within the fill site as detailed below.

Excess topsoil material will be managed in accordance with the ECMP and placed within the designated unsuitable material stockpile. Topsoil identified for reuse will be stockpiled around the perimeter of the earthworks area for later reinstatement within lots and berms upon completion of civil works. All topsoil stockpile locations and management measures will be shown on the certified Erosion and Sediment Control Plans.

### 7.5.2 EARTHWORKS STAGING

The earthworks will be carried out in a staged approach. These stages have been designed to enable the civil works to be carried out as outlines in the development staging and to balance earthworks. They have also been designed to be carried out in an earthworks season. Prior to the commencement of each stage of earthworks a detailed ECMP will be submitted for certification prior to commencement.

**Table 2.** Earthwork Staging

| Stage | Area (ha) | Cut (m³) | Fill (m³) | Unsuitable (m³) | Enables Civil |
|---|---|---|---|---|---|
| Stage 1 | 10.2ha | 195,000 | 167,500 | 27,500 | Stage 1, 5A |
| Stage 2A | 8.2 | 230,000 | 75,000 | 10,000 | Stage 2A, 2B, 3A, 3B |
| Stage 2B | 4.7 | 50,000 | 187,500 | 2,500 | Stage 4A, 4B |
| Stage 2C | 15.9 | 7,500 | 10,000 | 2,500 | SH59 |
| Stage 3 | 11.6 | 250,000 | 220,000 | 30,000 | Stage 5B |
| Stage 4 | 12.4 | 320,000 | 31,0000 | 10,000 | Stage 6, 7, 8, 9 |

| Stage | Area (ha) | Cut (m³) | Fill (m³) | Unsuitable (m³) | Enables Civil |
|---|---|---|---|---|---|
| Stage 5 | 2.8 | 32,500 | 30,000 | 2,500 | Stage 10 |
| Stage 6A | 11.7 | 257,500 | 182,500 | 15,000 | Stage 11, 13, 14 |
| Stage 6B | 2.2 | 15,000 | 95,000 | 7,500 | Stage 12 |
| Stage 7 | 10.5 | 380,000 | 360,000 | 20,000 | Stage 15, 16A, 16B, 17 |
| Stage 8 | 6.0 | 177,500 | 170,00 | 7,500 | Stage 18, 19 |
| **Total** | **81.46** | **1,905,000** | **1,806,000** | **130,000** | |

Detailed earthworks plans, including existing and proposed contours, cut–fill layouts, and staging plans, are provided in the 2000-series Civil Design Drawings in Appendix 1.

### 7.5.3 FILL SITE

A dedicated fill area has been incorporated into the development to minimise the need for off-site disposal of unsuitable material. The 2ha area has capacity for approximately 135,000 m³ of surplus material and will be contained by a structural bund, with finished grades designed at flatter slopes to ensure stability. Primarily clean, uncontaminated material will be placed within this area; however, if material with minor or localised contamination is encountered, it may be blended or encapsulated in accordance with a site-specific management plan.

### 7.5.4 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures have been developed in accordance with the Greater Wellington Regional Council (GWRC) Erosion and Sediment Control Guide for Land-Disturbing Activities in the Wellington Region (2021).

A preliminary Erosion and Sediment Control Plan (ESCP) has been prepared to demonstrate the feasibility of the proposed controls and forms part of this application. The plan includes catchment layouts, sediment retention pond (SRP) and decanting earth bund (DEB) sizing, and outlines the proposed methodology for gully filling and early-stage earthworks. Given the requirement for early fill placement, a temporary DEB will be utilised prior to SRP construction.

Ongoing monitoring will be undertaken in accordance with the Erosion and Construction Management Plan (ECMP), developed in collaboration with PDP, to address water quality testing and outflow monitoring requirements. The preliminary ESCP is provided on sheets 2300, with the detailed Stage 1 ESCP provided on sheets 2400, which also sets the standard for subsequent stages.

- SRP and DEB detailed sizing
- Construction methodology and staging
- Stabilized construction entrance will be utilised at the existing site entrance
- Silt fence installed along the site boundary
- Stormwater culvert sizing

## 7.6 EARTHWORKS AND CONSTRUCTION MANAGEMENT

Envelope have prepared a draft Earthworks and Construction Management Plan (ECMP) for works at the site, which should be read in conjunction with this report.

This plan is intended to provide the information required to establish a framework for the safe and environmentally conscious completion of earthworks and civil construction proposed to be undertaken for the project.

The intention of this document is to set out the key parameters and likely site conditions that are required to be considered to assist the contractor in preparing their site-specific ECMP, for which they will be contractually responsible.

It is not intended to be prescriptive, and the contractor will be free to propose alternative measures if they meet the minimum performance standards as outlined in this document and in accordance with the GWRC document "Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region – Issued Feb 2021" and if compliance is still achieved with the relevant conditions of consent.

It is our view that the erosion and sediment control design can be adequately addressed to ensure that potential adverse effects are managed and mitigated to an acceptable level. We consider that subject to employing the measures outlined above, there will be no significant adverse effects relating to the proposed earthworks. We propose finalising the ECMP as a condition of consent prior to the commencement of earthworks for each relevant stage.

### 7.7 FLOCCULATION MANAGMENET PLAN (FMP)

It is likely that control of sediment on this site will require the use of a flocculant and the use of this would be controlled a Flocculation Management Plan (FMP). We propose developing this as a condition of consent, to be certified by GWRC prior to commencing earthworks for each relevant stage.

### 7.8 WATER QUALITY

As large-scale earthworks progress, careful management of erosion and sediment generation will be essential, reinforcing the need for robust erosion and sediment control measures to maintain water-quality standards during and after construction.

Baseline water-quality monitoring is currently underway to establish existing conditions across the site. This provides a reliable pre-development benchmark against which future changes can be measured. While this dataset is still being finalised, baseline water-quality conditions will be confirmed prior to construction commencing for each stage. Testing locations are described in the PDP Hydrological Assessment.

## 8.0 ROADING AND ACCESS

### 8.1 OVERVIEW AND DESIGN OBJECTIVES

- Deliver a clear and connected road hierarchy suited to the site's topography.
- Achieve compliant road geometry, grades, and sight distances.
- Integrate pedestrian, cycle, and recreational paths to support multimodal travel.
- Design for future public transport within collector roads.
- Apply Safety in Design principles to reduce risks and promote safe operation.
- Provide resilient and attractive streetscapes with capacity for long-term growth.

### 8.2 DESIGN STANDARDS & COMPLIANCE

- Porirua City Council District Plan
- Porirua City Council: Code of Land Development and Subdivision Engineering, (2010)
- Porirua City Council: Track Standards Manual Version 1.2 – May 2014
- Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling
- Austroads Guide to Road Design Part 3: Geometric Design
- Austroads – Guide to Road Design, Part 4A

### 8.3 EXISTING ROADING

The Mt Welcome site has sole frontage and legal access to State Highway 59 (formerly State Highway 1), immediately south of Pukerua Bay. The existing driveway currently provides access to lifestyle blocks within the property.

SH59 in this location is a regional route, operating as a two-lane highway with a posted speed limit of 100 km/h, reducing to 50 km/h at the northern edge of Pukerua Bay. Daily traffic volumes adjacent to the site are around 9,000–10,000 vehicles per day.

There are currently no footpaths or cycle facilities within the SH59 corridor, however the Ara Harakeke shared path runs parallel on the western side of the highway, providing an off-road walking and cycling link between Plimmerton and Pukerua Bay, and connecting to nearby rail stations. Public transport in the area is served by the Kapiti Line rail service at Pukerua Bay Station to the north and local Metlink bus services from Pukerua Bay.

This significant reduction in highway traffic volumes at the site, associated with the opening of the Transmission Gully motorway (SH1), has created capacity within the SH59 corridor, enabling new growth and subdivision development without requiring major roading upgrades.

## 8.4 PROPOSED ROAD NETWORK

The roading layout and geometric design have been informed by earthworks and traffic modelling, with an emphasis on connectivity and compliant road grades. The primary network follows the Northern Growth Area (NGA) Structure Plan, linking to both SH59 and the Muri Road block. Two southern connections have not been included due to engineering and ecological constraints, as detailed in this report and within the AEE.

The roading design plans are provided in the 3000-series Civil Design Drawings in Appendix 1.

### 8.4.1 PARKING

On-street parking will be provided throughout the development via designated parking bays. Provision of parking bays will be alternate with grassed berms or landscape areas. The total number of spaces proposed has been determined in consultation with the traffic engineer. Given the high frequency of driveway crossings, some parking bays overlap with driveways. These bays have been designed with increased crossfall to minimise kerb lips and ensure smooth vehicle access, reducing the likelihood of future rework or non-compliant alterations by property owners. No-parking restrictions will be applied across driveways, and bays have been sized to ensure adequate parking without encroaching into private accessways.

The development layout has been designed to provide an appropriate balance of on-street and off-street parking, sufficient to meet the anticipated parking demands associated with the scale and nature of the proposed activities. Off-street parking spaces will comply with the *Porirua District Plan* requirements, providing a minimum width of 2.1m and a length of 5.0–6.6m, depending on adjacent obstructions.

### 8.4.2 PEDESTRIAN, CYCLING AND MULTI MODAL TRANSPORT

Pedestrian footpaths have been designed at varying widths across the development. Along collector roads, footpaths will generally be 2.5m wide on one side and 2.0m on the other, providing shared space for pedestrians and non-commuter cyclists. On local roads, 1.8 m footpaths will typically be provided on both sides, with single-sided footpaths applied to smaller road classifications in accordance with the PCC Code of Practice.

### 8.4.3 CYCLE AND COMMUTER PATHS

Commuter cycle lanes are incorporated within the collector roads across the development, each 1.8 m wide and located within the carriageway, consistent with the Northern Growth Area (NGA) Structure Plan provisions. These routes will connect to the northern block, providing future access to the Pukerua Bay train station while avoiding direct reliance on SH59.

### 8.4.4 RECREATIONAL TRACKS & TRAILS

Recreational tracks have been designed in collaboration with the landscape architect to create walking routes through otherwise inaccessible terrain. These routes will strategically link key features of the development, including recreational reserves, commercial areas, and connections to both the Muri Road block to the north and to the southern boundary of the site.

### 8.4.5 STREETSCAPE

Drainage services have been designed within the carriageways to allow for tree planting within berms and the integration of other landscape elements, while avoiding conflicts with drainage infrastructure. The Landscape and Urban Design has been prepared by Blac as part of the Landscape and Urban Design Strategy.

## 8.5 ROAD CLASSIFICATIONS

The proposed roading network comprises six primary road typologies across three road classifications. A map illustrating these is provided in Figure 4 below. Each classification is discussed in further detail below in this report, with the detailed proposed roading plans included in the 3000-series Civil Design Drawings within Appendix 1.


**Figure 4.**: Road Classification

### 8.5.1 COLLECTOR ROADS (21.7M–18.6M)

Collector roads have been designed to accommodate public transport, shared paths, and dedicated cycle lanes, forming the primary connection to the proposed SH59 roundabout. Vertical grades and turning radii have been developed to support future bus operations, with bus stop locations to be confirmed in consultation with GWRC. 5 primary cross-section types are proposed:

- **Type A & B:** Standard Collector Road, 7m carriageway, 1.8m on-road cycle lanes, 2.5m kerbside parking or berms on both sides, a 2.5m shared path on one side, and a 2m footpath on the other. This road type will continue into the Muri block to the north
- **Type C**: Collector Road adjacent to steep topography (entry to site), 7m carriageway, 1.8m on-road cycle lanes on both sides, 2.5m kerbside parking or berm on one side, a 2.5m shared path, and a 3.5m berm on the opposing side.
- **Type D & E**: Collector Road specifically for Road 2, 7m carriageway, 2.5m kerbside parking or berms on both sides, a 2.5m shared path on one side, and a 2m footpath on the other. This road type provides access to the Skaiffe block to the south.

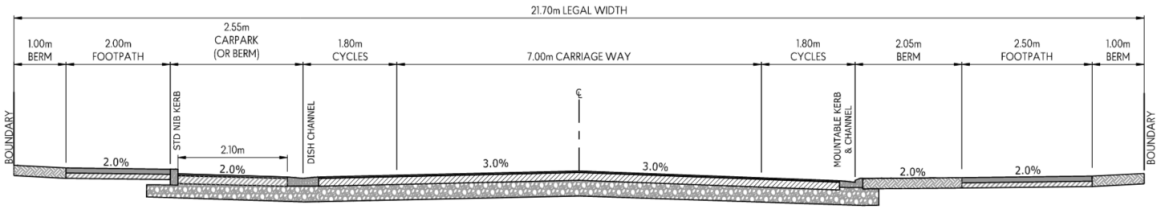



**Figure 5.**: Typical Cross-Section **(A)** Collector – 21.7m With Cycleway and Carpark

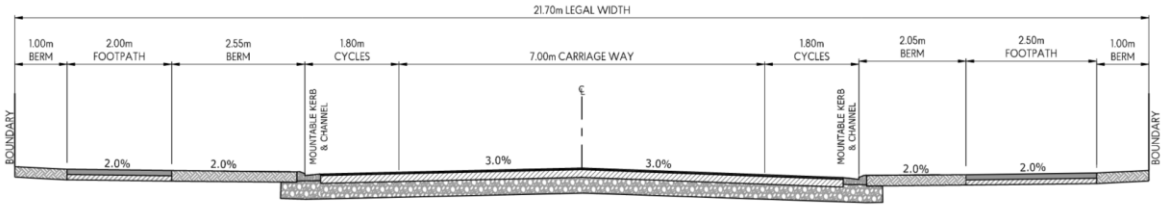



**Figure 6.** Typical Cross-Section **(B)** Collector - 21.7mwith Cycleway and Berm

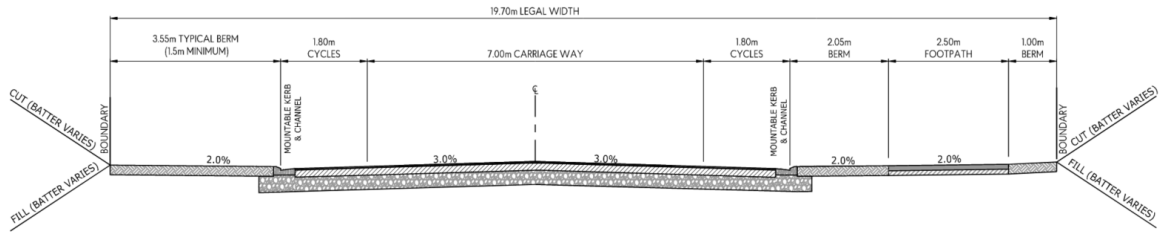



**Figure 7.**: Typical Cross-Section **(C)** Collector – 19.7m with Cycleway

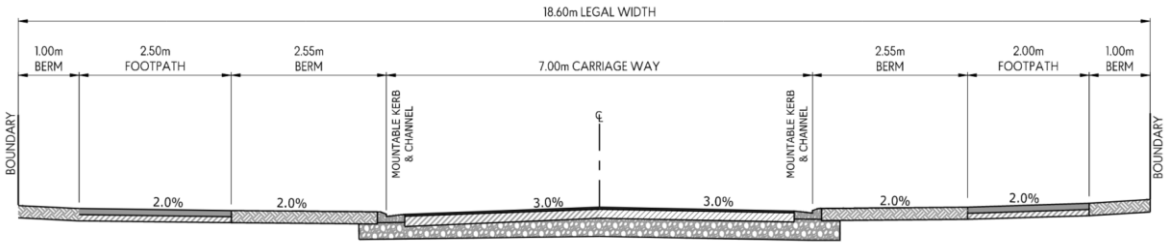



**Figure 8.**: Typical Cross-Section **(D)** Collector – 18.6m with Berm

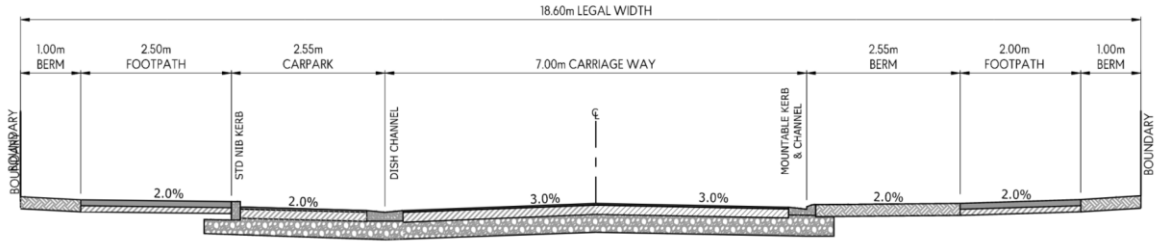



**Figure 9.**: Typical Cross-Section **(E)** Collector – 18.6m with Berm & Carpark

### 8.5.2 LOCAL / ACCESS ROADS (16.7M–14.5 M)

Access roads are designed as residential streets featuring indented parking bays and 1.8m footpaths, providing direct property access while maintaining safe and efficient traffic movement. In constrained locations where lots front only one side of the road, a reduced total width of 14.5m is adopted, with a single footpath provided.

- **Type F:** Standard Access Road, 6m carriageway with indented 2.5m kerbside parking lanes or berms on both sides, 1.8m footpaths on both sides, and rear berms.
- **Type G & H:** Access Road adjoining steep topography or single-sided development, 6m carriageway with a 2.5m indented kerbside parking lane or berm on one side, a 1.8m footpath on one side, and a 3m berm on the opposite side.

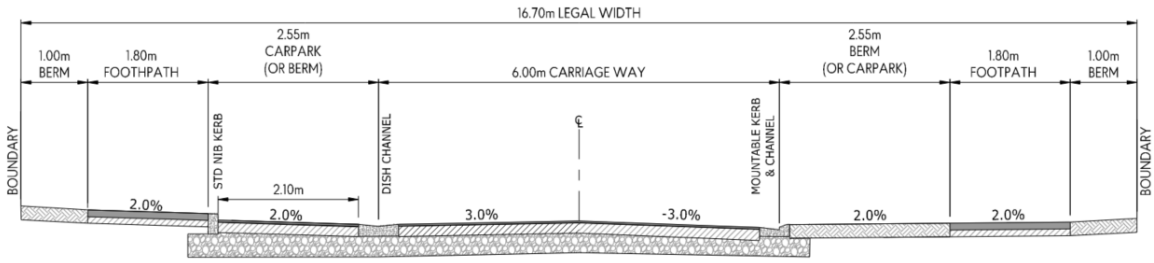



**Figure 10.**: Typical Cross-Section **(F)** Local Road - 16.7m with Carpark and Berm

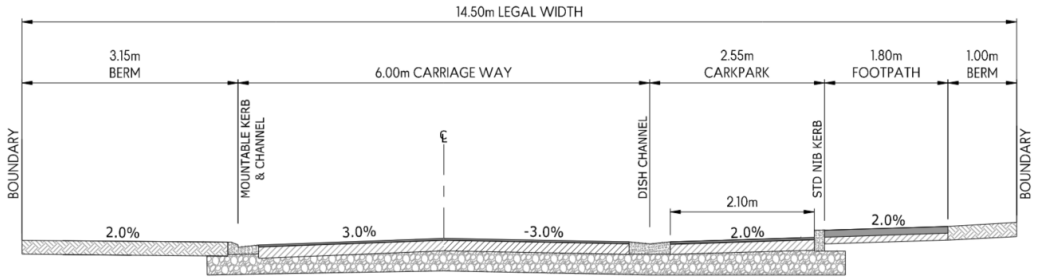



**Figure 11.**: Typical Cross-Section **(G)** Local Road - 14.5m With Carpark

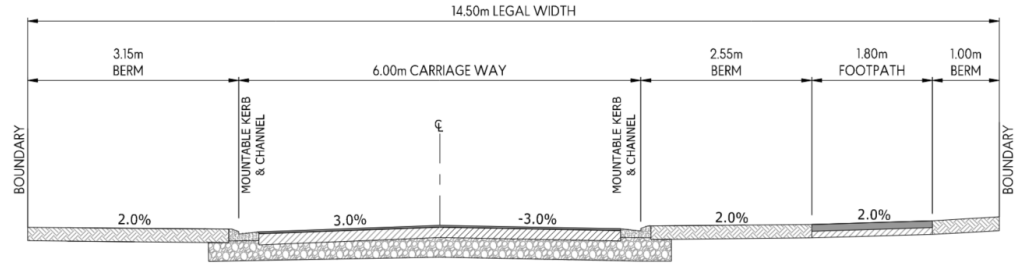



**Figure 12.**: Typical Cross-Section **(H)** Local Road - 14.5m With Berm

### 8.5.3 PRIVATE JOALS (5.5M–9M)

Short, low-speed access lanes are proposed to serve small clusters of dwellings (typically ten or fewer). These lanes are designed as shared spaces for both vehicles and pedestrians, featuring narrow carriageways (3.5m–5.5m) with berms on either side. Each Jointly Owned Access Lot (JOAL) has been designed to suit its specific use and layout, resulting in more variable widths than standard public roads. The three primary JOAL types are illustrated below, showing the minimum legal widths

and typical configurations that reflect their intended functions.

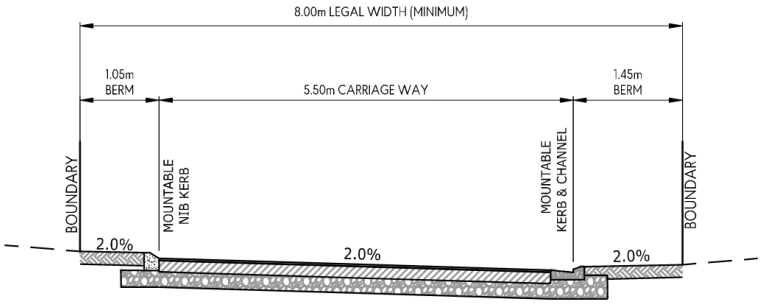



**Figure 13.**: Typical JOAL Cross-Section **(1)** - 8.0m Minimum with Berms

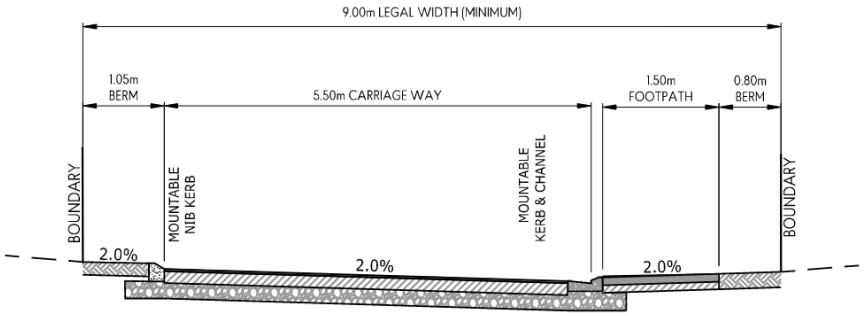



**Figure 14.**: Typical JOAL Cross-Section **(1)** - 9.0m Minimum with Footpath

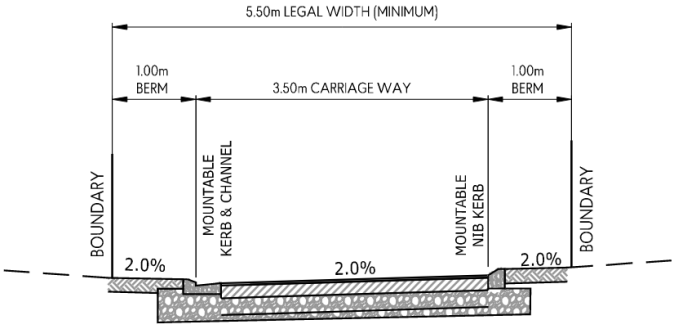



**Figure 15.**: Typical JOAL Cross-Section **(3)** – 5.5m Minimum

## 8.6 PAVEMENT DESIGN

Pavement design will be undertaken during the detailed design stage and will be informed by the fully developed traffic volumes and ground conditions.

## 8.7 SH59 INTERSECTION

A new roundabout is proposed on SH59 to provide the main site access. The design is being coordinated between Stantec and Envelope. The roundabout has been conceptually designed to accommodate full traffic demands from both the Mt Welcome and the adjacent Muri Road block. Two-lane approaches and circulating lanes have been included to provide sufficient capacity and to future-proof the intersection for expected traffic growth. The roundabout can operate at the current 100km/h speed limit but also has been designed with the potential to operate at a reduced 60km/h

speed environment. The roundabout will also reduce operating speeds along this section of SH59, improving safety outcomes compared to the existing highway environment. The design is further detailed in Stantec's ITA and integrated into the 8000-series Civil Design Plans in Appendix 1.

A number of intersection options were assessed for this intersection, including alternative layouts and locations; however, NZTA design and safety requirements limit flexibility in the design. The options summarised below were explored during the design process but were not progressed, as they were not supported by NZTA and are therefore not considered suitable. Table 3 below provides a brief summary of the options assessment.

**Table 3:** SH59 Options Assessment

| Option | Assessment | Suitability |
|---|---|---|
| Change Location | The proposed location aligns with the Northern Growth Area Structure Plan.<br>Relocating east would move SH59 through-lanes outside the legal NZTA corridor.<br>Due to the existing topography, this shift would require additional earthworks and result in greater stream impacts on the eastern side of the highway<br>It would also create issues with horizontal and vertical geometry relative to the existing highway alignment. The current location represents the easternmost alignment within NZTA design tolerances. | No |
| Change Size | The roundabout diameter and approach geometry are governed by NZTA geometric design standards for a 100km/h highway. Reducing the size would compromise safety and operational performance and is non-negotiable with NZTA | No |
| Change Intersection Type | A signalised intersection was considered; however, NZTA has confirmed that only a dual-lane roundabout is acceptable at this location given the speed environment and traffic volumes. | No |

## 8.8 TEMPORARY TURN LANE

Prior to construction of the roundabout, an interim access arrangement will be implemented at the existing site driveway. This will involve upgrading the current priority T-intersection to include a dedicated right-turn bay for northbound SH59 traffic, shifting the existing northbound merge taper further south, and realigning the site access to a 90-degree approach to improve sightlines and vehicle tracking. The temporary right-turn lane is proposed to operate until 110 dwellings are occupied.

## 8.9 INTEGRATED TRANSPORT ASSESSMENT

Stantec have prepared an Integrated Transport Assessment (ITA) for the Mt Welcome development, which should be read in conjunction with this report. The ITA confirms that the proposed subdivision, with its planned access via SH59 and internal road hierarchy, can be accommodated within the surrounding transport network without compromising safety, function, or capacity. The assessment demonstrates that the development provides suitable provision for vehicles, pedestrians, and cyclists, integrates with the Northern Growth Area structure plan, and achieves appropriate outcomes for all transport modes and users.

## 8.10 STRUCTURE PLAN TRANSPORT CONNECTIONS.

The Northern Growth Area (NGA) Structure Plan identifies key transport connections extending both north and south of the Mt Welcome site. To the south, three potential connection points were originally identified to the adjoining Skaife Block. Preliminary investigations into these options have been undertaken; however, opportunities to establish practical and meaningful connections are limited due to topographical and environmental constraints. The potential southern connections are discussed in more detail below.

### 8.10.1 ASSESSMENT

The primary road network within Mt Welcome generally aligns with the NGA Structure Plan, providing strategic connections to State Highway 59 and the Muri Road block. However, the three suggested southern connections have been found to offer limited feasibility or practical connectivity. Our desktop engineering assessment indicates that only the central southern alignment is technically viable, primarily due to steep topography and ecological constraints within the Skaife Block. Accordingly, only the central route has been retained as the provisional southern link toward the Skaife Block.

It is also important to note that the Skaife Block remains zoned rural, with no current development plans. We understand that no ecological or geotechnical field investigations have been undertaken, and any assessment to date have been at a desktop level only. If development of the Skaife Block proceeds in the future, the site already benefits from direct access to SH59. Together with the provisional upper-terrace connection through Mt Welcome, this would provide sufficient transport connectivity. The feasibility of extending this provisional central connection further south within the NGA remains uncertain, as such works would likely involve significant earthworks that may not be practical or feasible.

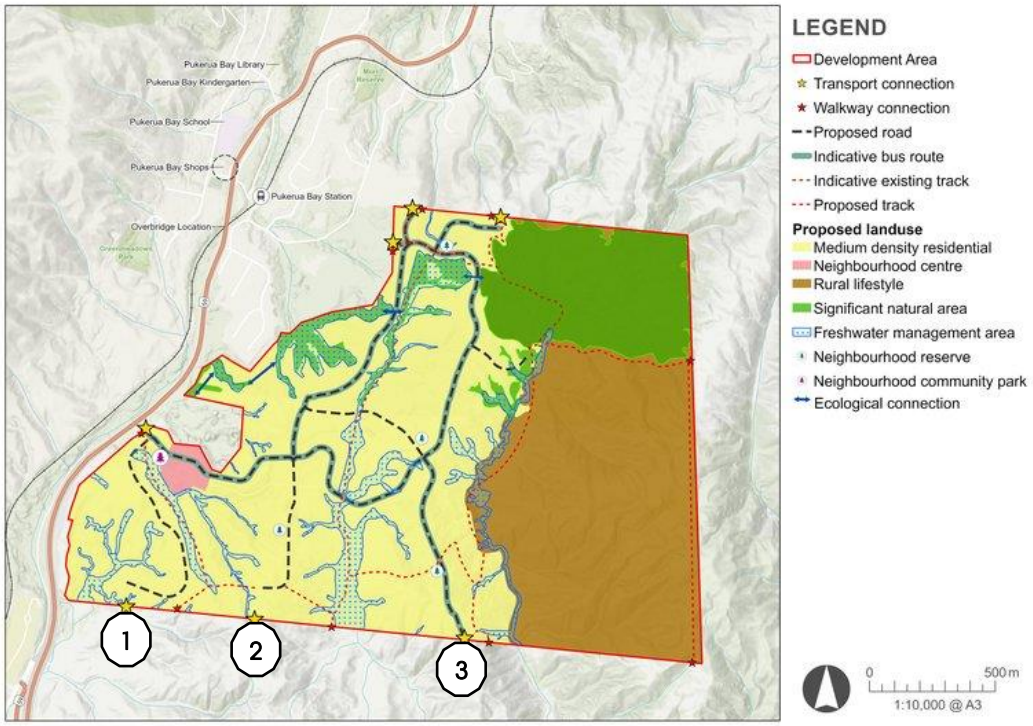



**Figure 16.** Northern Growth Area Structure Plan

The following section summarises the outcomes of the engineering assessment for the three key transport connections identified within the Structure Plan. These connections numbered 1–3, correspond to the annotations presented in Figure 16 of the Structure Plan above.

1. **Lower Route:**
   The proposed transport connection traverses the lower terrace of the development. As identified within the technical assessments, this part of the site is constrained by streams, wetlands, and freshwater management areas. The wetland and gully system identified within Mt Welcome appears to extend along the site boundary. Even if the ecological constraints could be mitigated, the topography would soon force any potential road alignment westward toward SH59. Given that the Skaiffe Block already has a direct intersection with SH59, this connection would effectively create a short loop between the existing Skaiffe Block intersection and the new Mt Welcome roundabout, providing access only to a single local road within the lower terrace of Mt Welcome.

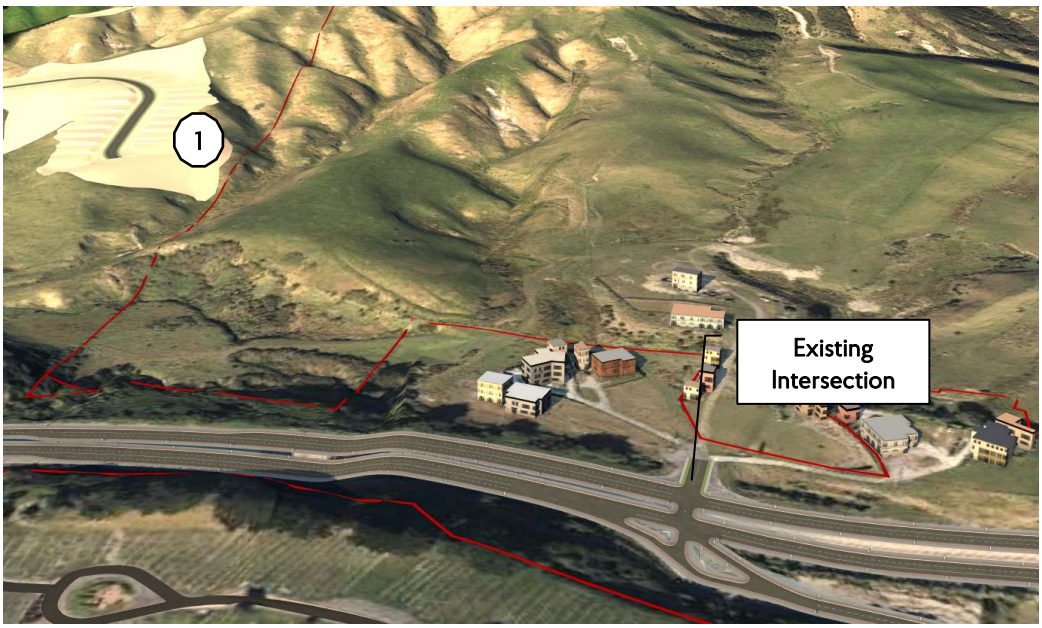



**Figure 17.** Lower Route

In summary, this potential connection is significantly constrained both ecologically and topographically and would offer limited additional connectivity or value to the wider transport network within the Northern Growth Area. For this purpose, no transport link has been provided within our civil design.

2. **Central Route:**
This option provides the most viable connection, linking directly to the upper terrace of Mt Welcome, which is suitable for development. However, any continuation further south is limited by steep terrain and would require substantial earthworks. While it could potentially support future development within the Skaife Block, its feasibility remains dependent on future land-use decisions. A further extension south into Plimmerton Farms is considered unlikely to be feasible. Provision has nevertheless been made for a possible connection should development of the Skaife Block proceed in the future.

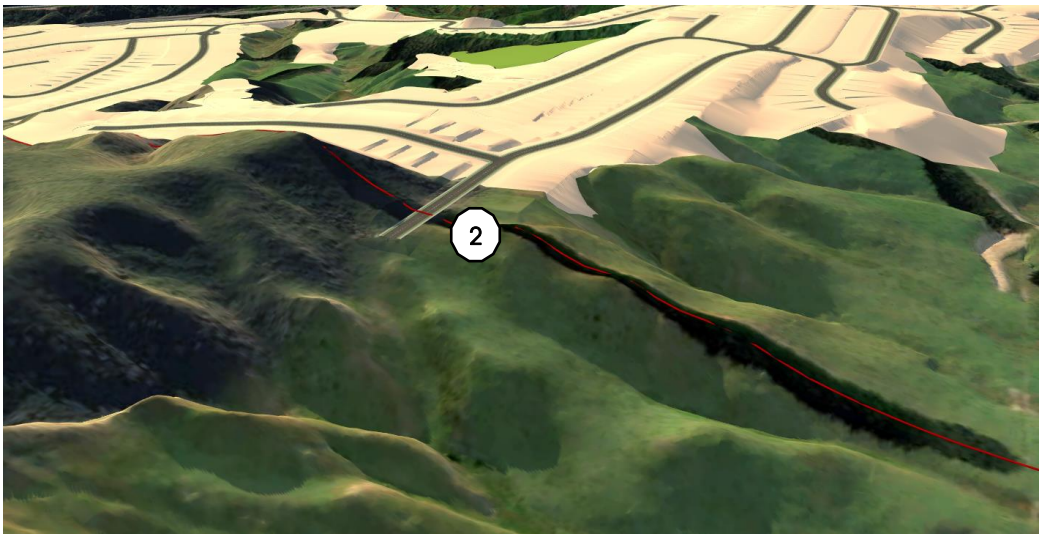



**Figure 18.** Central Route

3. **Upper Route:**
Follows a steep ridgeline and terminates soon after the development boundary. Refer to figure 19 below with the portion of this road that would be inside the Skaife block. The alignment is flanked by steep embankments and stream corridors, limiting any practical extension south. No

meaningful connectivity or development opportunity would result from this option. For this reason, no transport link has been provided within our civil design.

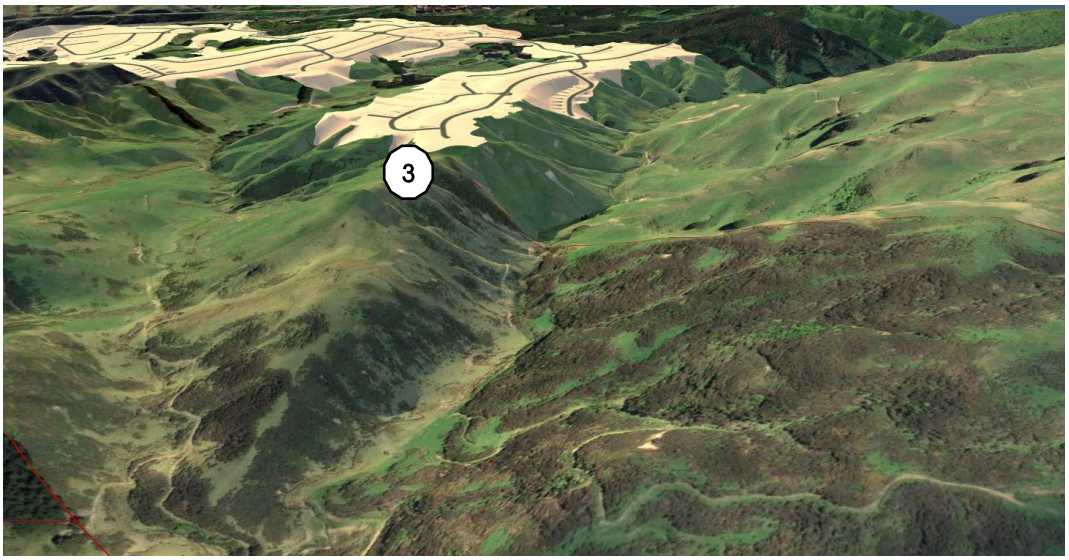



**Figure 19**: Upper Route

# 9.0 STORMWATER

## 9.1 PRINCIPLES OF STORMWATER MANAGEMENT

The stormwater management approach for the Mt Welcome development has been guided by the principles of integrated catchment management, water-sensitive urban design, and hydraulic neutrality, consistent with the Wellington Water RSWS v3.0 and GWRC Plan Change 1. These principles ensure that stormwater is managed in a way that protects downstream environments, enhances ecological and cultural values, and supports long-term asset resilience and maintainability.

Key principles applied to this development include:

- Stormwater treatment and attenuation are centralised, minimising the use of on-lot devices and reducing operation and maintenance costs.
- Post-development catchments are aligned with pre-development catchments to maintain existing discharges and downstream receiving environments
- Apply Safety in Design principles and identify project specific risks
- Support of development staging to ensure the network can be constructed and commission progressively
- Recognise and protect the natural environment with low impact and water sensitive design
- Incorporate cultural values through engagement with mana whenua

## 9.2 STORMWATER MANAGEMENT PLAN

Envelope Engineering has prepared a Stormwater Management Plan, which should be read in conjunction with this report. The Stormwater Management Plan makes a range of recommendations on items including water sensitive urban design and hydraulic neutrality. This also contains details to meet stormwater impact assessment and requirements under PC1.

## 9.3 STORMWATER IMPACT ASSESSMENT

A Stormwater Impact Assessment has been prepared and is submitted as part of the application, in accordance with Schedule 29 of the NRP-PC1. This will include detailed assessment of stormwater and hydrological controls, prepared with input from the specialist team, including hydrology (PDP) and ecology (Blue Green Ecology).

## 9.4 EXISTING STORMWATER INFRASTRUCTURE

There is no existing public stormwater infrastructure within site. However, there are a number of existing culverts as well as areas identified as freshwater management areas within the structure plan.

## 9.5 PROPOSED STORMWATER NETWORK

The proposed stormwater management system has been designed to collect, convey, treat, and attenuate runoff from all developed areas in accordance with Wellington Water RSWS v3.0, GWRC Plan Change 1, and the Porirua District Plan.

Detailed modelling is provided within the Stormwater Management Plan (SMP).

### 9.5.1 PRIMARY NETWORK

Stormwater from lots and road surfaces during the 10 % AEP event is collected via downpipes, catchpits, and a piped network discharging to centralised treatment and attenuation devices. The primary network has been designed for the 10 % AEP storm (with climate-change allowance) and includes sufficient capacity for larger events given the site's steep topography.

Catchpits are positioned at low points and along road corridors to efficiently capture runoff, with all residential lots connected via laterals. Network layouts are shown on the 4000-series Civil Design Drawings.

Flows from the piped network discharge to centralised raingardens which provide water-quality treatment. Each raingarden is sized to treat at least 85% of the Mean Annual Runoff Volume from its contributing impervious area. High-flow bypasses convey larger events directly to downstream attenuation devices to maintain treatment efficiency.

### 9.5.2 SECONDARY NETWORK

For the 1 % AEP event, overland flow will be safely conveyed via the road corridors toward the retention wetlands. The road profiles have been designed to form defined secondary flow paths, ensuring surface water is directed away from dwellings and toward designated outlet locations These larger rain events will bypass the rain gardens. No low-lying or flood-prone areas have been identified, and no additional freeboard controls are required.

Where overland flow descends steep embankments, energy-dissipation measures such as rock armouring and vegetation will be provided to protect slope stability and receiving environments.

### 9.5.3 ATTENUATION AND RETENTION

Four primary retention wetlands (A, B, C and E) and one smaller attenuation basin (D) are proposed within the site's gullies to provide both peak-flow control and hydrological retention. These wetlands temporarily detain and release stormwater to match pre-development discharge rates, achieving hydraulic neutrality across all design storms up to the 1 % AEP event.

Each wetland includes a permanent water level for extended detention storage for frequent rainfall events, and multi-stage outlets to control peak flows.

Together, these devices provide flow control across the site, ensuring the protection of downstream waterways.

### 9.5.4 STORMWATER TREATMENT

Water-quality treatment is provided through a network of centralised raingardens. These systems are designed in accordance with the Wellington Water Design for Stormwater: Treatment Device Design Guide and GWRC PC1.

Treated flows from the raingardens are conveyed to the downstream retention wetlands, which provide retention functionality before discharging to existing natural watercourses.

These combined systems achieve both hydrological control and water-quality treatment targets required under the RSWS and GWRC Plan Change 1.

Detailed modelling is provided within the Stormwater Management Plan (SMP).

### 9.6 ASSET OWNERSHIP, OPERATION & MAINTENANCE

All public stormwater infrastructure—including pipes, manholes, raingardens, wetlands, and attenuation basins—will be vested in Porirua City Council and managed under Wellington Water's asset-management framework, with private laterals remaining the responsibility of lot owners. Shared access lots will include vested underground networks protected by easements, while catchpits within private driveways will be privately maintained. Dedicated maintenance and inspection access will be provided to all stormwater infrastructure.

## 10.0 WASTEWATER

### 10.1 OVERVIEW AND DESIGN OBJECTIVES

- Utilise a gravity system wherever practicable.
- Centralise and minimise the number of pump stations.
- Adopt low-pressure systems only where no other option is practicable.
- Support of development staging to ensure the network can be constructed and commissioned progressively.
- Apply Safety in Design principles and identify project specific risks.
- Recognise and protect the natural environment with low impact design.
- Incorporate cultural values and engagement with mana whenua.

### 10.2 DESIGN STANDARDS & COMPLIANCE

The following guidance documents were used in the design of the proposed reticulated gravity and low-pressure wastewater networks:

- Regional Standard for Water Services, RSWS, Version 3.0
- Wellington Water Pressure Sewer Design Guide and Water Services Association of Australia WSA 0716.

Additional references and models were used to inform network modelling and storage assessments:

- Regional Wastewater Model Specification: Modelling Specifications – Draft 2020
- InfoWorks ICM Model - System Performance 2024 Porirua D (SP.2024.POR.D)
- InfoWorks ICM Model - System Performance 2024 Porirua S (SP.2024.POR.S (interim))

All wastewater modelling and analysis were based on the SP.2016.POR.D model provided by Wellington Water Ltd (WWL) in May 2024. existing network

A Wastewater Hydraulic Modelling Report has been prepared by Envelope and is included in Appendix 2. This report provides detailed modelling inputs, outputs, and the range of options assessed to inform the final design.

### 10.3 EXISTING NETWORK

There is currently no reticulated wastewater network within the Mt Welcome site, with existing rural dwellings relying on on-site septic disposal systems.

The nearest Council-owned network comprises a DN250 gravity trunk main that conveys flows from Pukerua Bay southwards along State Highway 59 to Plimmerton. Wastewater is then pumped via Pump Station 13 (PS13) to the Porirua Wastewater Treatment Plant (WWTP), where it is treated and ultimately discharged to the sea west of Titahi Bay.

Much of the downstream network is already operating near or beyond its design capacity, with overflows observed during storm events with return periods of less than 1 year ARI.

Hydraulic modelling of the existing network confirms the following:

- The existing wastewater trunk main along the Pukerua Bay section has been assessed for flow capacity within the three identified upgrade sections. The current capacities are summarised below:

    - **Upgrade 1:** Existing DN250 main at 0.4% gradient with a flow capacity of approximately 39 L/s. There is no residual capacity under current conditions.
    - **Upgrade 2:** Existing DN250 main at 0.4% gradient with a flow capacity of approximately 39 L/s. There is no residual capacity under current conditions.
    - **Upgrade 3:** Existing DN250 main at 1.0% gradient with a flow capacity of approximately 60 L/s, providing a residual capacity of 20 L/s under current conditions.
- Pump Station 13 (PS13) currently operates with a pump rate of approximately 68 L/s, controlling discharge to the downstream system.
- Downstream sections near Plimmerton are not expected to experience immediate issues under current conditions, as any surcharging would occur further upstream before flows reach these lower parts of the network.
- Overall, the existing network performs adequately under current (2018 baseline) conditions but has limited available capacity to accommodate additional flows from the fully developed NGA without bulk upgrades and storage.

The PCC GIS data contains some inconsistencies when compared with the WWL InfoWorks ICM model, with the GIS indicating some flows heading north toward Pukerua Bay. These discrepancies have been reviewed, and the GIS data has been disregarded for the purposes of this assessment. All analysis has been based on the WWL-supplied calibrated InfoWorks ICM model, which WWL has confirmed as being the most accurate and up-to-date representation of the existing bulk wastewater network and the preferred source for all network data and analysis.

## 10.4 INTEGRATION WITH MURI ROAD DEVELOPMENT

The wastewater design for Mt Welcome incorporates allowance for flows from the adjoining Muri Road Development, which is designed to discharge to the SH59 bulk main via the proposed Mt Welcome wastewater network. The Muri Road site is constrained by existing downstream infrastructure and has limited direct access to the SH59 network and has therefore been designed integrally with Mt Welcome.

For modelling and planning purposes, the Muri Road development has been designed for 500 lots, with the catchment being split into East and West sub-catchments, each representing approximately 250 lots. A cost-sharing agreement between both developers is currently being established to formalise shared infrastructure responsibilities and funding contributions. While we expect the number of lots to be approximately 500, there is the design flexibility for storage design and network capacity to be adjusted as the development design process progresses.

The same hydraulic modelling and design parameters have been applied to Muri Road as to Mt Welcome to ensure network consistency and performance alignment. Final flow rates and storage volumes will be confirmed through detailed design. Further coordination between both development teams is required to refine upgrade triggers, staging, and programme alignment.

## 10.5 PROPOSED NETWORK DESIGN

A predominantly gravity-based network has been designed across the site. Given the topography minimum grade requirements are not generally a constraint, and local network standards can be achieved. However, the undulating terrain and constraints within gullies, means that 6 pump stations will be required along with localised low-pressure systems. The pump station and low-pressure systems designs are detailed further in this report. The below tables outlines design flows for each pump station catchment. Below summarises the parameters used for the internal reticulation network.

- ADWF (per person): 200 L/person/day
- Dry Weather Peaking Factor (PF): PF = 7.23 × Area^0.2 (Area in ha)
- PDWF: ADWF × PF
- Self-cleansing velocity: ≥ 0.75 m/s at PDWF
- Maximum velocity: ≤ 3.0 m/s at PWWF
- Minimum grades:
    - DN 150 → 1.11 %

- DN 225 → 0.69 %
- DN 300 → 0.44 %

Table 4 below summarises the calculated flows for each catchment based on the design flow parameters outlined above. These results differ from the InfoWorks ICM model outputs, which simulate wastewater flows under historical rainfall conditions; however, the calculated flows have been used as a reference for assessing smaller catchments and confirming pipe gradients. These design flows have also been used as a check and for guidance against the ICM model. WWF outputs from the ICM model can be found in attached Hydraulic Modelling Report in Appendix 2.

**Table 4:** Design Flows

| Asset ID | Catchment | Population | ADWF (L/s) | PDWF (L/s) | PWWF (L/s) |
|---|---|---|---|---|---|
| **WWPS - 1** | 374 lots<br>1.3ha Commercial | 1309 | 3.01 | 10.52 | 12.57 |
| **WWPS – 2** | 136 lots | 476 | 1.09 | 5.11 | 5.87 |
| **WWPS – 3** | 27 lots | 94.5 | 0.22 | 1.41 | 1.53 |
| **WWPS – 4** | 42 lots | 147 | 0.34 | 1.80 | 2.07 |
| **WWPS – 5** | 171 lots | 598.5 | 1.38 | 5.28 | 6.17 |
| **WWPS – 6** | 203 lots | 710.5 | 1.63 | 6.99 | 8.10 |
| **Muri West** | 250 lots | 875 | 2.01 | 8.44 | 15.88 |
| **Muri East** | 250 lots | 875 | 2.01 | 8.38 | 16.09 |

The piped network is also designed to incorporate flows from the Muri Road development and convey them through this site to the SH59 bulk main.

The proposed wastewater network layout is illustrated on the 4000-series Civil Design Drawings in Appendix 1.

### 10.5.1 PUMP STATION DESIGN AND STORAGE

Six wastewater pump stations are proposed across the site. Pump Station 1 (PS1) will serve as the primary peak wet-weather storage facility, providing the main attenuation function for the development prior to discharging to the existing bulk main. The PS1 discharge rate will be controlled and rate-limited to align with the capacity of the downstream trunk network and the proposed bulk-main upgrades.

The remaining five pump stations are designed solely to convey wastewater from local low points where gravity discharge is not achievable. It is understood that Wellington Water's current telemetry and control systems do not support operation of multiple linked pump stations in a daisy-chain configuration, meaning that each station cannot dynamically manage storage based on downstream water levels. As a result, 8 hours of maintenance storage has been incorporated into each internal pump station, with PS1 providing the final attenuation and flow control prior to discharge to the public network. Each pump station is intended to be vested to Council.

Figure 20 below illustrates the general locations of the proposed pump stations. All internal pump stations discharge via gravity mains to PS1 for flow attenuation. Table 5 summarises the proposed internal storage capacities and pump rates, with PS1 discussed in further detail later in this report.

**Table 5:** Pump Station Summary

| Asset ID | Catchment | Storage (Hours) | No Pumps (l/s) | Pump Rates (l/s) | Max Storage ($m^3$) |
|---|---|---|---|---|---|
| **WWPS - 1** | Full Development | - | - | - | - |
| **WWPS – 2** | 136 lots | 8 | 1 | 6 | 32.6 |

| Asset ID | Catchment | Storage (Hours) | No Pumps (l/s) | Pump Rates (l/s) | Max Storage (m³) |
|---|---|---|---|---|---|
| **WWPS – 3** | 27 lots | 8 | 1 | 2 | 6.8 |
| **WWPS – 4** | 42 lots | 8 | 1 | 2 | 10.3 |
| **WWPS – 5** | 171 lots | 8 | 2 | 11 and 25 | 91.7 |
| **WWPS – 6** | 203 lots | 8 | 1 | 7 | 49.2 |
| **Muri West*** | 250 lots | 8 | 1 | 8.5 | 70.4 |
| **Muri East*** | 250 lots | 8 | 1 | 8.5 | 69.0 |

*The Muri Road catchments have been included more hydraulic modelling purposes only. Gravity discharge has been assumed into the respective east–west catchment pump stations, with those requiring pumping directed to WWPS-5. Pump rates and maximum storage volumes have been provisionally assumed using the same methodology applied to Mt Welcome but remain subject to refinement. The final Muri Road pump station configuration and wastewater servicing methodology will be confirmed during their detailed design of the development.

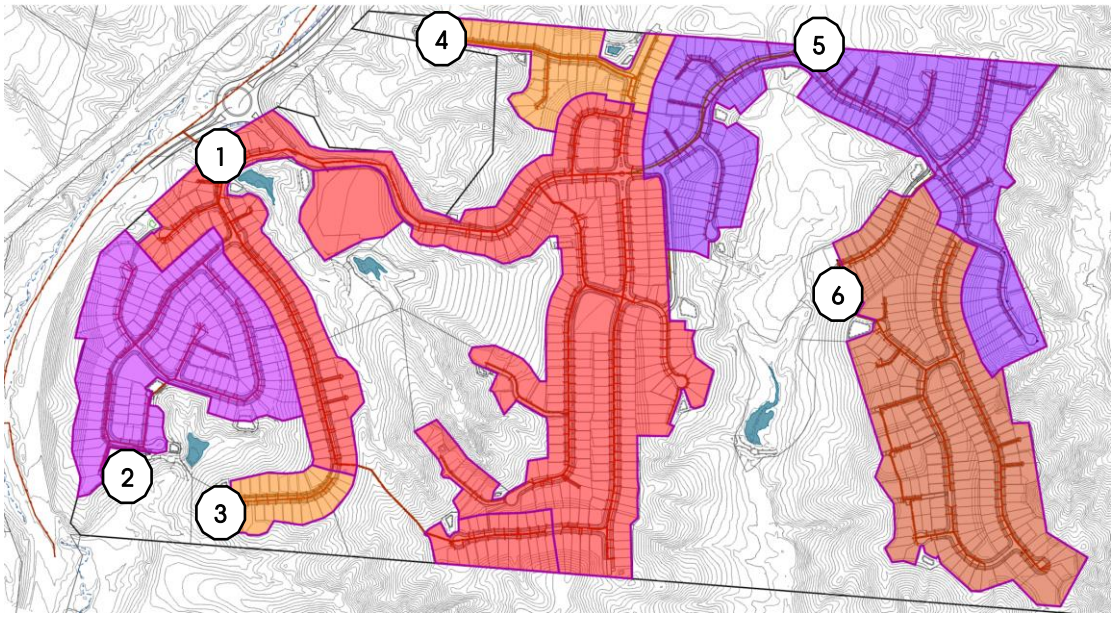



**Figure 20:** Pump Station Locations

Storage requirements for each pump station have been modelled using InfoWorks ICM, accounting for the hydraulic interaction between stations operating in series. Several design scenarios were tested within the model to evaluate alternative storage configurations and discharge control strategies. Detailed ICM outputs are located within Appendix 2 along with the detailed hydraulic modelling report.

## 10.6 LOW PRESSURE WASTEWATER SYSTEMS (LPS)

Topographical constraints within the site necessitate the use of low-pressure wastewater systems in 7 localised catchments. These catchments are small and do not warrant construction of an additional public pump station. A low-pressure unit will be installed on each lot at the time of development, with the unit remaining a private asset of the lot owner.

The system will provide up to 24 hours of storage and allow controlled discharge from each property. Discharge management, including restriction of flows during significant wet weather events, will be achieved through a smart pressure sewer system enabling centralised monitoring and control of individual units. The proposed approach is consistent with Wellington Water's Pressure Sewer Design Guide and Water Services Association of Australia WSA 0716.

At the property boundary, a boundary box containing backflow prevention, an isolation valve and a flushing tee will mark the point of transfer to public ownership. The low-pressure sewer network downstream of the boundary is proposed to be vested in Council.


**Figure 21**. Low Pressure System Diagram

Wellington Water has advised that, while its policy on pressure sewers is currently under review, these systems have been accepted in areas where direct wastewater flow mitigation is not required. For this development, mitigation will be provided further downstream of the low-pressure outlets rather than at the immediate connection to the gravity network.

### 10.6.1 LOW PRESSURE DESIGN

For the performance assessment and hydraulic calculations of the LPS system the following assumptions have been adopted:

- Residential loading: 420 L/lot/day (140 L/person/day × 3 people) = ~0.0049 L/s per lot
- No allowance for inflow and Infiltration:
- Smart system operation
- Network sized to carry ≥1.5 × ADWF at ultimate build-out
- Performance checks:
    - Minimum velocity 0.6 m/s (target 0.9 m/s) for daily solids removal.
    - Retention < 8 hrs

Table 6 below summarises flow and catchment sizes from each LPS catchment.

**Table 6:** LPS Catchments

| LPS ID | Lots | ADWF (L/s) | 1.5 x ADWF (L/s) |
|---|---|---|---|
| LPS A | 7 | 0.049 | 0.073 |
| LPS B | 7 | 0.049 | 0.073 |
| LPS C | 12 | 0.084 | 0.126 |
| LPS D | 26 | 0.182 | 0.273 |
| LPS E | 4 | 0.028 | 0.042 |

| LPS ID | Lots | ADWF (L/s) | 1.5 x ADWF (L/s) |
|---|---|---|---|
| LPS F | 19 | 0.133 | 0.200 |
| LPS G | 13 | 0.091 | 0.137 |

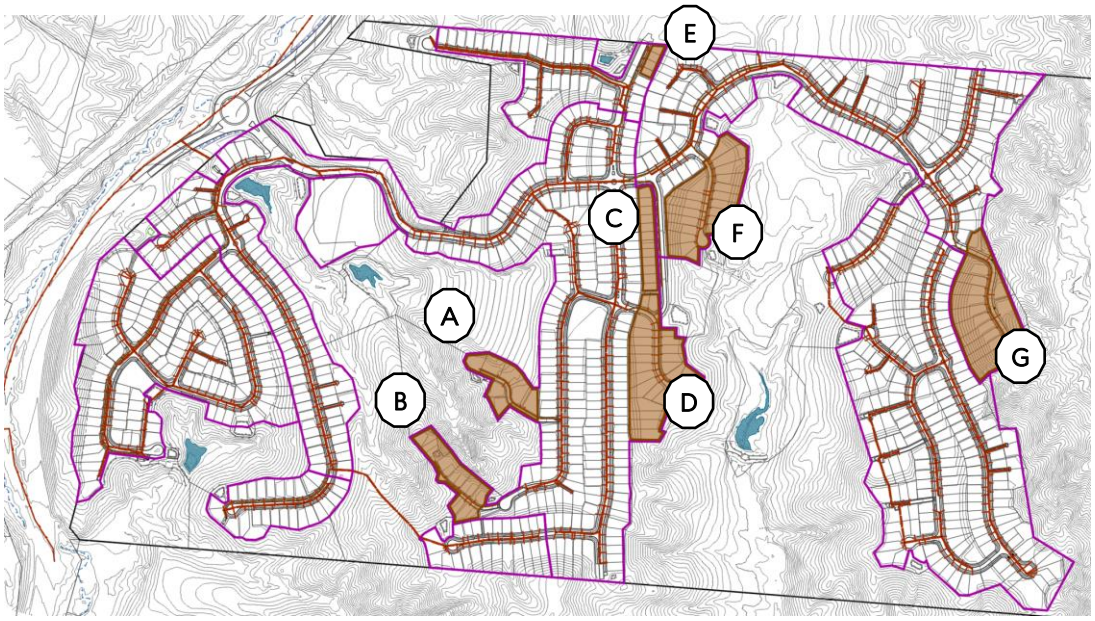



**Figure 22**. Low Pressure System Catchments

### 10.6.2 LPS SUMMARY

Within specific catchments, a low-pressure wastewater system is considered more suitable than a public or centralised pump station due to local topographical constraints and catchments sizes. The system will be designed in accordance with Wellington Water's standards and the WSAA 07-16 Pressure Sewer Design Manual.

A dispensation application will be lodged with Wellington Water to obtain early approval for the proposed systems.

## 10.7 WASTEWATER MODELLING

An assessment of wastewater network capacity, proposed network performance, and pump station storage has been undertaken to identify system constraints and confirm the upgrades required to service the development.

The report outlines modelling undertaken under various development and upgrade scenarios to determine the most effective servicing approach for the site. Discussion and technical guidance were provided throughout by the Wellington Water Limited (WWL) modelling team. Hydraulic modelling was completed using InfoWorks ICM 2024.5, based on the current 2018 Porirua base model and proposed design layouts prepared in Autodesk Civil 3D 2025. Below table outlines key parameters used to model the networks:

- Model: Simplified Northern Growth Area Model (v2024.5)
- Scenario: 2018 ICM model baseline
- Baseflow: 0.1 L/s per ha
- Domestic flow: 200 L/person/day
- PS13 – Plimmerton Pump Station: P1 – Duty 68.0 L/s
- Pump station storage: PS2 to PS6 – 8 hours; PS1 – PWWF
- Pump capacity: ≥ 120 % of design PWWF (duty/assist or standby)

A detailed Hydraulic Modelling Report is provided in Appendix 9.

## 10.8 WASTEWATER PUMPSTAION 1 (PS1)

Pump Station 1 (PS1) will provide peak wet-weather attenuation for the Mt Welcome development prior to discharge into the existing SH59 bulk main. Several scenarios were assessed, covering internal storage, pump rates, and downstream capacity to identify a balanced approach between storage requirements, network upgrades, and development staging.

The key scenarios, storage requirements, discharge rates, and network overflows are summarised below with further detail provided in the Hydraulic Modelling Report within Appendix 2.

**Table 7:** PS1 Storage Scenarios

| Scenario | Discharge leaving site (L/s) | Storage on site ($m^3$) | Overflow in the bulk network |
|---|---|---|---|
| 1. Mt Welcome fully developed (949 lots + commercial) | 31 (gravity) | – | – |
| 2. NGA fully developed (incl. Muri Road) | 27 | 1,590 | None |
| 3. NGA fully developed (incl. Muri Road) | 42 | 380 | S133404 (79$m^3$), S130207 (42$m^3$), S130204 (33$m^3$) |
| 4. NGA fully developed (incl. Muri Road), No trunk upgrades | 20 | 1940 | None |

### Scenario 1

Hydraulic modelling indicates that Mt Welcome can discharge via gravity without on-site attenuation at PS1 or bulk network upgrades if developed solely. This provides a peak discharge of approximately 31.26 L/s, servicing 949 residential lots and a commercial area. This scenario assumes no concurrent NGA development and demonstrates the feasibility of gravity servicing while deferring the need for large-scale storage infrastructure. Upgrade staging is detailed in Section 10.9.4 of this report.

### Scenario 2

Flow rates leaving the site are reduced under the fully developed 1,500-lot NGA scenario, as discharge volumes are increased due to the tank and pump requirement. This scenario results in significant on-site storage requirements to prevent overflow within the lower reaches of the bulk network. This scenario assumes that the three key downstream upgrades have been implemented, these are discussed further in Section 10.9.

### Scenario 3

At higher discharge rates (42 L/s), the system is generally capable of conveying flows; however, minor overtopping is observed at critical manholes near Plimmerton. These effects can be addressed through future downstream upgrades.

### Scenario 4

This scenario tests network performance under a constrained discharge condition of 20 L/s, assuming no bulk main upgrades are implemented.

When the Muri Road development is included, both on-site storage and bulk network upgrades become essential to accommodate additional flows. Under this combined, fully developed NGA scenario, substantial storage capacity is required to manage peak wet-weather discharges.

The final storage requirements for PS1 will depend on development timing across the wider Northern Growth Area (NGA). It is recommended that consent conditions require confirmation of storage sizing when future civil stages trigger the need for PS1 construction.

Real-time control (RTC) systems could be developed and implemented to coordinate storage and discharge across the Northern Growth Area (NGA). Such a system would allow flows to PS13 to be timed and optimised, improving the overall efficiency and utilisation of available storage throughout the network. This concept should be further explored with Wellington Water (WWL) during the detailed design stage of the project.

## 10.9 PROPOSED BULK NETWORK UPGRADES

Targeted capacity upgrades are proposed along key sections of the SH59 bulk main to address existing network constraints identified through hydraulic modelling. Several pipe upgrade options and on-site attenuation measures were evaluated; however, while additional storage can assist in managing peak wet-weather flows, it does not resolve the underlying downstream pipe capacity limitations. A storage only approach can often concentrate higher pumped discharges, worsening downstream pipe capacity constraints.

The proposed upgrade locations were identified in areas where existing capacity is limited and surcharging occurs by low pipe gradients or where overflows are first expected to occur under increased discharge conditions.

In this context, surcharge refers to water levels rising above the pipe crown but remaining contained within the underground network, such as within pipes and manholes. Overtopping, however, occurs when surcharge levels exceed the ground surface or manhole rim, causing uncontrolled overflow.

It should be noted that the development will add flow to pipes that are already operating close to capacity (Upgrades 1 and 2). Although these sections are expected to surcharge under future development conditions, modelling confirms that water levels will remain contained within the system and will not overtop. This controlled surcharge also assists in attenuating peak flows entering the more constrained downstream network within the Plimmerton catchment and network. These upgrades may be brought forward if required. The proposed upgrades are summarised in table below.

**Table 8.** Bulk Network Upgrade Summary

| Upgrade | Existing | Existing Capacity | Proposed | Proposed Capacity |
|---|---|---|---|---|
| 1 | DN250 0.4% | 39 L/s | DN375 at 0.4% | 112 L/s |
| 2 | DN250 0.4% | 39 L/s | DN375 at 0.4% | 112 L/s |
| 3 | DN250 1.0% | 60 L/s | DN375 at 1.0% | 219 L/s |

As the existing pipe grades cannot be increased, the solution involves upsizing specific pipe sections to improve capacity. It is acknowledged that this will temporarily result in larger upstream pipes discharging into smaller downstream sections, which does not fully comply with the WWL RSWS. However, this staged upgrade approach is considered fit for purpose as an interim measure until the remaining downstream sections are upgraded as identified in PCC's Long-Term Plan and Development Contribution Policy.

### 10.9.1 BULK WASTEWATER UPGRADE 1


**Figure 23** Upgrade 1

The first stage of works involves upgrading approximately 189 m of the existing DN250 wastewater main to DN375. This section follows the Ara Harakeke Pathway alignment, avoiding the trafficable off-ramp from SH59 to Airlie Road. The existing DN250 main, laid at a 0.4% gradient, currently conveys approximately 39 L/s. Upgrading to DN375 will increase the capacity to around 112 L/s, providing sufficient allowance for the proposed additional discharge. The works can be undertaken without disrupting vehicle traffic; however, temporary pedestrian management along the Ara Harakeke Pathway will be required during construction.

### 10.9.2 BULK WASTEWATER UPGRADE 2


**Figure 24**. Upgrade 2

The second upgrade involves replacing approximately 22m of the existing DN250 wastewater main with a DN375 pipe. Two approaches are being considered: either replacing the existing main along its current alignment or installing a new section within the SH59 berm. Locating the new main within the berm, outside the trafficable carriageway, would enable the works to be undertaken with minimal traffic disruption, reduce vegetation removal, and allow the pipe to be installed offline.

The existing DN250 main, is at a 0.4% gradient, with a capacity of 39L/s; upgrading to DN375 will increase capacity to around 112L/s

### 10.9.3 BULK WASTEWATER UPGRADE 3


**Figure 25**. Upgrade 3 (163m)

The third upgrade requires 163 m of the existing DN250 wastewater main to DN375. This may be achieved either by replacing the existing pipe or by constructing a new bypass. Installing a bypass along the Ara Harakeke Pathway alignment would avoid vegetation removal, provide a more accessible construction corridor, and improve access for future maintenance activities.

The existing DN250 main, is at 1.0% gradient and a current capacity of 60L/s. Upgrading to a DN375 main at the same gradient will increase capacity to approximately 219L/s.

### 10.9.4 UPGRADE STAGING

We have proposed a staged approach to wastewater upgrades that aligns with the progression of development. The staging has been based on Mt Welcome as the primary development, noting that other known developments discharging to the same bulk main include Plimmerton Farms and Muri Road.

For the purposes of this staging assessment, we have adopted the 2018 base scenario, excluding the delivery of surrounding developments. This will be further refined during detailed design. It is anticipated that the number of lots supported under each stage may reduce once the Muri Road development is incorporated into the programme. Until development sequencing is confirmed, Muri Road has not been included in the current staging.

Given the long-term development programme, it is recommended that storage capacity and network upgrade requirements be periodically reviewed as the development progresses. The next review should occur at Stage 10, when the Muri Road connection is established. This stage will enable servicing of approximately 541 residential lots and the commercial area, for which the existing infrastructure has sufficient capacity. At that time, the hydraulic design and modelling should be reassessed to confirm and refine storage requirements prior to commissioning the Muri Road connection.

**Table 9:** Wastewater Enabling Upgrades

| No of Lots | Proposed Infrastructure | Proposed Upgrades |
|---|---|---|
| **301** | Gravity Network (GN) | |
| **375** | GN + PS2 | |
| **407** | GN + PS2 | |
| **501** | GN + PS2 + PS3 | |
| **542** | GN + PS2 + PS3 + PS4 | *Review Model & Storage* |
| **590** | GN + PS2 + PS3 + PS4 + PS5 | |
| **759** | GN + PS2 + PS3 + PS4 + PS5 + PS6 | |
| **949** | GN + PS2 + PS3 + PS4 + PS5 + PS6 | *Review Model & Storage* |
| **949 + Muri 1 (1199)** | GN + PS1 + PS2 + PS3 + PS4 + PS5 + PS6 + PS7 | Bulk Upgrades + PS1 Storage |
| **949 + Muri 2 (1449)** | GN + PS1 + PS2 + PS3 + PS4 + PS5 + PS6 + PS7 + PS7 | PS1 Storage |

Detailed wastewater modelling and calculations can be found in Appendix 2.

### 10.9.5 BULK UPGRADE OUTCOMES

Three staged wastewater main upgrades are proposed, totalling approximately 395 m of pipe capacity improvements, with diameters increased from DN250 to DN375 to address existing constraints and support future development within the NGA.

- Stage 1 – 210 m of main along the Ara Harakeke Pathway, avoiding the SH59 off-ramp to Airlie Road. Works can proceed without disrupting vehicle traffic, though temporary pedestrian management will be required.
- Stage 2 – 22 m of main within the berm outside the trafficable carriageway, enabling construction with minimal disturbance to road users.
- Stage 3 – 163 m of main, either by replacing the existing pipe or constructing a new bypass within the Ara Harakeke Pathway corridor to minimise vegetation removal and improve long-term maintenance access.

These upgrades will increase trunk main capacity near Mt Welcome from 39 L/s to 112 L/s, improving network performance and enabling staged NGA development. Some surcharging may occur during peak wet-weather events, but no overflows are expected once upgrades and interim storage are in place. On-site storage can be reduced as downstream upgrades near Plimmerton and PS13 are completed.

## 10.10 SUMMARY

- The full NGA development (1,449 lots + 1.7 ha commercial) produces a peak discharge of approximately 56 L/s at manhole PCC_WW007923, resulting in limited downstream capacity and an estimated 389 $m^3$ overflow under existing conditions.
- The Mt Welcome development alone (excluding Muri Road Stage 2) can discharge 32 L/s by gravity without causing new overflows downstream.
- Three option sets were tested to mitigate the increased flows of the NGA.
    - Localised bulk main upgrades increase capacity locally but shift hydraulic constraints further downstream toward PS13.

- PS1 attenuation (1,600 m³) reduces peak discharge to around 28 L/s and effectively prevents downstream overflows; however, it does not resolve the underlying capacity limitations in the bulk main, and the required storage volume is not considered feasible. Relying solely on this option would also constrain all further NGA development.
- A combined option (bulk upgrades + PS1 attenuation) enables higher discharge rates (42 L/s) and reduced storage on site. Storage can be reduced with only minor, localised overtopping near Plimmerton, which can be addressed through future downstream upgrades.

- An 8-hour storage duration across the proposed pump stations provides the best performance balance, minimising downstream impacts.

# 11.0 WATER SUPPLY

## 11.1 OVERVIEW AND DESIGN OBJECTIVES

- Looped reticulation where practicable for network redundancy
- Integration with the Muri Road bulk main and reservoir
- Support staged delivery so construction and commissioning can proceed progressively.
- Apply Safety in Design
- Incorporate mana whenua values through ongoing engagement.

## 11.2 DESIGN STANDARDS & COMPLIANCE

The water supply system is designed to provide a reliable primary supply for Mt Welcome and to interface with the Muri Road works, meeting Wellington Water's service levels and firefighting requirements. Capacity and pressure targets are set to support the planned yield while maintaining compliance with RSWS v3.0.

- Wellington Water RSWS v3.0 compliance.
- Minimum operating pressure: 25 m (may be reduced to ~10 m near a reservoir).
- Maximum operating pressure: 90 m.
- Firefighting: SNZ PAS 4509:2008 compliance

## 11.3 EXISTING INFRASTRUCTURE

The site is not currently connected to a public potable network; the few existing dwellings use roof water. A DN225 transmission main runs adjacent to the site beneath SH59, supplying the Pukerua Bay Reservoir.

## 11.4 PROPOSED RETICULATION DESIGN

The proposed water network consists of primary water mains located within the road berms on one side of each road, with rider mains extending to service lots on the opposite side of the roads. The network configuration is generally described below:

- Primary watermains in one road berm; rider mains to opposite lots.
- Hydrants at ~135 m spacing (final locations at detailed design).
- Looping where feasible; residual dead-ends provided with flushing points.
- DN150 connection to the existing Pukerua Bay DMA Zone at Gray St
- Pressure reducing valve (PRV) at RL 90
- Pipe sizes/materials to be confirmed through detailed design

The proposed water supply plans are provided in the 5000-series Civil Design Drawings in Appendix 1.

## 11.5 SUPPLY AND PRESSURE ZONING

The network will operate as two pressure zones, separated by a pressure-reducing valve (PRV) at RL 90 located within the bulk-main pump house that feeds the new reservoir. The PRV will cap pressures in the lower zone to WWL RSWS limits (slightly lower than existing Pukerua Bay reservoir pressure) and enable controlled back-feeding from the new reservoir, increasing effective storage and resilience within the Pukerua Bay zone. The reservoir and zoning are summarised in Table 10. below.

**Table 10**. Reservoir & Pressure Summary

| Zone | Top Water Level (TWL) | RSWS Service Range | Proposed Service Range | Lots |
|---|---|---|---|---|
| **Lower Zone**<br>Existing Pukerua Bay Reservoir 2.3ML | RL 125 | RL 35-100 | RL 53 - 82 | 263 + Commercial |
| **Upper Zone**<br>Proposed 3.7ML Reservoir | RL 186 | RL 96-161 | RL 90 - 162 | 686 |

## 11.6 LOWER ZONE

The lower zone will be supplied primarily by the existing Pukerua Bay reservoir, with a supplementary interconnection to the new reservoir for redundancy. All lots in this zone comply with RSWS pressure requirements.

The existing Zone Management Plan (ZMP) indicates that the Pukerua Bay reservoir has approximately 0.8 ML of spare capacity, based on information provided by Wellington Water. This equates to capacity for approximately 326 additional residential lots. Of this, 144 lots have already been allocated under Resource Consent RC8763 (34 Muri Road subdivision), although only 46 of those lots are located below RL 100 and consented to be supplied from the existing reservoir, with the remaining lots to be serviced from the future reservoir.

In addition, an allowance of 44 lots for infill development is identified in Table 7-2 of the *Porirua City Model Update and SMP 7 Growth* report. This results in an available capacity for approximately 236 lots from the existing Pukerua Bay reservoir.

Based on this assessment, the proposed 236 lots within the lower terrace are expected to be adequately serviced by the existing reservoir supply with a total of 263 lots and the commercial area within this pressure zone.

Once surplus capacity is used from Pukerua Bay reservoir, the balance of the lots are dependent on a gravity feed with PRV from the Mt Welcome reservoir for supply but will remain in the lower pressure zone.

### 11.6.1 LOWER ZONE BACK UP FEED

Under WWL RSWS requirements, no more than 50 lots are to be isolated from a single point of supply. Given the staging and layout of the development, a temporary secondary feed from the proposed bulk main is planned to ensure compliance and maintain a backup feed. The proposed configuration is summarised below and shown in Figure 26.

1. **Domestic Main:**
   A new DN150 domestic main will be installed within the SH59 berm, connecting to the existing DN150 main at Gray Street. This will supply the lower zone, as further described in Section 11.5.
2. **Bulk Main:**
   A new DN225 bulk main will be constructed, connecting to the existing trunk main within SH59.

This main will ultimately supply the future reservoir and will initially extend to the proposed pump station and PRV located within Road 1.

3. **Interim Secondary Supply.**
   The bulk main will initially extend to the future pump station and PRV located within Road 1. In the interim, the PRV will supply a DN150 domestic main that extends back down Road 1 to service the lower terrace. This arrangement provides a secondary feed and should be operational prior to, or at the time of, construction of the 50th lot.

   Once the reservoir is commissioned, the bulk main will be connected directly to the reservoir, and the PRV will be reconfigured to supply the domestic network from the reservoir, maintaining a resilient dual-supply arrangement.

This approach has been discussed with Wellington Water and has been agreed to be acceptable in principle.


**Figure 26.** Backup Feed Diagram

## 11.7 UPPER ZONE

The upper zone servicing 686 residential lots will be supplied by the proposed reservoir, described in Section 11.8 below. Two minor exceptions are noted: 3x lots at RL 90–96 near the Road 1 pump station will experience >90 m head (slightly above the RSWS upper limit), and 29x lots at the southern end of the Lucas Block will have ~24 m head (marginally below the 25 m minimum). Given the close proximity to the reservoir and short distribution lengths, these are considered an acceptable departure from the standards.

The upper zone will be connected to the lower zone through a pressure reducing valve at RL85 as described above to increase network redundancy.

## 11.8 PROPOSED RESERVOIR

A new reservoir will provide the primary water supply to the development. The reservoir has been approved under a separate resource consent (RCA24215), granted on 3 February 2026 in conjunction with the northern landowners (Muri Road).

This consent authorises land use consent for the construction of a water supply reservoir with associated earthworks, reticulated water mains, a pumping station, accessway, and subdivision consent to create two infrastructure allotments accommodating the reservoir and pumping station.

The design and coordination of the reservoir works are being undertaken by Envelope Engineering. The reservoir is located on elevated land within the neighbouring Muri Road block to the north and is intended to service both the Mt Welcome and Muri Road developments.

The following key design parameters are being adopted in the reservoir design:

- Primary supply to both Mt Welcome Upper Zone and Muri Road.
- 3.7 ML storage, sized to service up to ~1,500 lots (~900 Mt Welcome, ~600 Muri Road).
- Sizing based on RSWS assumptions: 3.5 occupants/dwelling and 700 L/person/day.
- Constructed at RL 180 with TWL RL 186; compliant service range RL 96–161.
- Final sizing and specifications to be confirmed at detailed design.

The later stages of the development within the upper zone will require the new reservoir to be constructed and commissioned before lots can be serviced, while the lower lots can be supplied from the existing Pukerua Bay reservoir, with commissioning of the new reservoir occurring concurrently with early-stage development.

The proposed location of the reservoir and connecting bulk main are shown in Figure X below. The final reservoir capacity and design parameters will be confirmed during detailed design in consultation with Wellington Water.

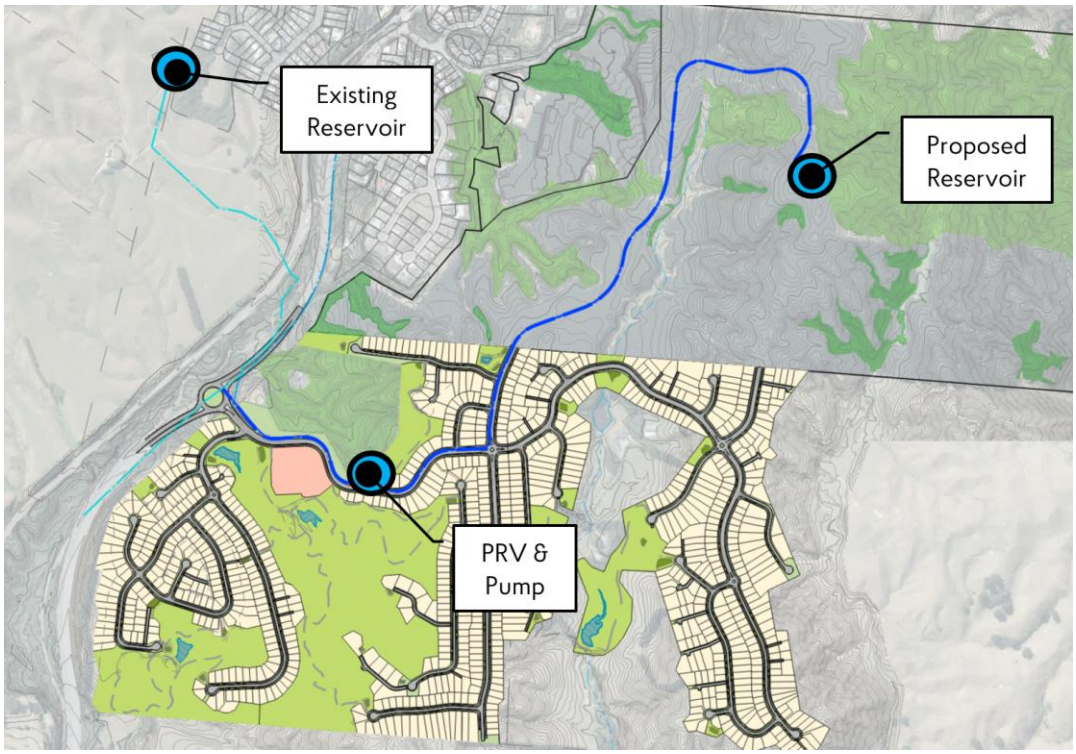



**Figure 27.** Proposed Bulk Network

The proposed reservoir and bulk main design can be found in Appendix 3.

### 11.8.1 PROPOSED BULK MAIN

Approximately 2.4 km of new public bulk main is required to connect the proposed reservoir to the existing bulk main along SH59. This proposed bulk main is being designed and consented under the same application as the reservoir. The following points summarize the proposed bulk watermain design.

1. Connect to the existing DN225 bulk main within the SH59 corridor adjacent to the site.
2. Install ~2,400m of DN225 main to provide bulk supply to the reservoir.
3. Construct a pump station at RL 90 to boost pressure in the bulk main to the reservoir operating level.
4. Provide an equipment building of approximately 6m × 4m to house the pumps and PRV.

The bulk main alignment runs within the Mt Welcome road reserve, then continues into the Muri Road site within a same planned road reserve. The road cross-section and location of the bulk main within the road will be consistent across the boundaries. The route is being coordinated with the Muri Road developer and design team.

# 12.0 UTILITIES

## 12.1 TELECOMMUNICATIONS

We have initiated discussions with Tuatahi First Fibre and Chorus as two potential network operators. Both have confirmed through their initial high-level assessments that the existing fibre infrastructure along SH59 is sufficient to service the site. Conditional clearance letters have been issued and are included in Appendix 4 of this report.

## 12.2 EXISTING POWER

An existing overhead power line traverses the site, with underground 11 kV cables connected at various pole locations. These cables are routed underground to service the individual dwellings within the development. Any realignment of existing services will be addressed during the detailed design phase.

## 12.3 PROPOSED POWER

Envelope have had ongoing discussions with Wellington Electricity Limited (WEL) and Edison Consulting Group regarding options to service the development. It is recognised that power infrastructure is not yet in place, consistent with other services required to accommodate the fully developed site. Network reinforcement will be necessary and will need to be delivered alongside other developments and projects in the area.

To confirm the extent of network upgrades and associated costs, a High-Level Report (HLR) will be commissioned by Pukerua Property Group LP. This will assess the network and provide a concept design for power supply. A supporting letter from WEL has been provided in Appendix 4 of this report.

## 12.4 GAS

No gas supply is proposed for the new residential or commercial areas.

# 13.0 CONCLUSION

In summary, this report confirms that the site can be developed and adequately serviced subject to further engineering design, provided that the recommendations of this report are followed.

# 14.0 ADHERENCE TO THE EXPERT CONDUCT CODE.

While this is not a matter before the Environment Court, the author of this report has read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023 ('Code'). The author has complied with the Code in the preparation of this report.

The data, information, facts and assumptions the author has considered as part of this report are set out in this report. The reasons for the conclusions of the report are also set out in this report. Unless stated otherwise, this report is within the author's expertise and the author has not omitted to consider material facts known to him that might alter or detract from the opinions expressed.

# 15.0 LIMITATIONS

This report has been prepared for the project described to us and its extent is limited to the scope of work agreed between the client and Envelope Engineering Limited. No responsibility is accepted by Envelope Engineering Limited or its directors, servants, agents, staff or employees for the accuracy of information provided by third parties and/or the use of any part of this report in any other context or for any other purposes.

# APPENDICES

## APPENDIX 1
## ENGINEERING PLANS

The full drawing package is provided as a separate attachment.

# APPENDIX 2
# WASTEWATER HYDRAULIC MODEL REPORT

# APPENDIX 3
## RESERVOIR DESIGN PLANS (RCA24215)

# APPENDIX 4
# UTILITY PROVIDER LETTERS

# APPENDIX 5
# EXISTING UTILITY SERVICES

ENVELOPE

# STORMWATER MANAGEMENT PLAN

Mt Welcome

# DOCUMENT CONTROL RECORD

| | |
|---|---|
| **CLIENT** | Pukerua Property Group LP |
| **PROJECT** | Mt Welcome |
| **PROJECT NO.** | 1753-02 |
| **DOCUMENT TYPE** | R003v3-1753-02 Stormwater Management Plan |
| **DATE ISSUED** | 4 June 2026 |
| **ADDRESS FOR SERVICE** | Envelope Engineering Limited<br>Level 1, 65 Cuba Street, Te Aro,<br>Wellington |
| **CONTACT** | Kyle Dirse, Director<br>kyle.dirse@envelope-eng.co.nz<br>+64 27 568 2788 |

# ISSUE AND REVISION RECORD

| | |
|---|---|
| **DATE OF ISSUE** | 4 June 2026 |
| **STATUS** | Final v3 |
| **ORIGINATOR** | Kyle Dirse – Director / Senior Civil Engineer |
| **REVIEWED** | Andrew Jackson – Director, Civil |
| **APPROVED FOR ISSUE** | Kyle Dirse – Director / Senior Civil Engineer |

# 1.0 EXECUTIVE SUMMARY

Envelope Engineering Ltd has been engaged to prepare this Stormwater Management Plan (SMP) to support the proposed Mt Welcome residential development, located south of Pukerua Bay within the Porirua Northern Growth Area (NGA).

This SMP has been prepared in accordance with the objectives and policies of the Proposed Porirua District Plan, the Wellington Water Regional Standard for Water Services (RSWS v3.1), and Greater Wellington Regional Council (GWRC) Plan Change 1.

The purpose of this SMP is to provide an integrated framework for the design, implementation, and long-term management of stormwater infrastructure within the site. It addresses the potential hydrological and water-quality effects associated with the proposed development and demonstrates how the proposed stormwater system achieves compliance with regional and local requirements. The SMP confirms that the proposed stormwater management approach:

- Maintains hydraulic neutrality, ensuring post-development peak flows do not exceed pre-development levels for all storm events up to and including the 1 % AEP event
- Provides stormwater treatment achieving at least 85% of the Mean Annual Runoff Volume (MARV)
- Reduces contaminants such as suspended solids, copper, and zinc through a treatment-train approach incorporating water-sensitive urban design
- Protects downstream watercourses and flood capacity, ensuring no increase in flood risk or erosion potential
- Confirms that the 1% AEP event can be safely conveyed via defined overland flow paths through the road network and stormwater management system, with no increase in flood risk to proposed lots, downstream properties, or infrastructure.
- Integrates stormwater design with the site's landform and ecological corridors, supporting environmental enhancement and long-term sustainability.

Stormwater Management Approach

- The proposed system adopts a treatment-train and water-sensitive design philosophy,
- Centralised raingardens treating road and allotment runoff
- Retention wetlands and attenuation ponds providing flow detention and controlled discharge to pre-development rates
- Primary and secondary conveyance networks designed for the 10 % AEP and 1 % AEP events (including climate-change allowances)
- Erosion and scour protection at all outlet structures
- Developer-maintained devices during staging to protect operational wetlands and raingardens until vesting to Porirua City Council / Wellington Water

# CONTENTS

## APPENDICES

## FIGURES



## TABLES

# 2.0 INTRODUCTION

## 2.1 GENERAL

The proposed Mt Welcome Development is located south of Pukerua Bay, within the Porirua Northern Growth Area (NGA). The site comprises currently undeveloped land identified for residential development.

This Stormwater Management Plan (SMP) provides the framework for the design and implementation of stormwater management measures required to support the development. It outlines the hydrological, hydraulic, and water-quality strategies necessary to achieve compliance with Wellington Water's Regional Standard for Water Services and the Greater Wellington Regional Council Plan Change 1 requirements.

This SMP also includes a Stormwater Impact Assessment required under Schedule 29 of PC1, addressing all relevant matters including hydrology, water quality, flooding, erosion, ecological, and cultural considerations.

## 2.2 SITE DESCRIPTION

The site is located at 422 State Highway 59, Pukerua Bay, and encompasses a total area of 205.60 hectares. It formally comprises the following land parcels:

- Part Lot 1 DP 89102 (4.38 ha)
- Lot 2 DP 891020 (5.64 ha)
- Lot 1 DP 534864 (55.33 ha)
- Lot 2 DP 534864 (140.25 ha)
- Lot 1 DP 608433, Lot 1000 DP 608433 (34 Muri Road)
- Road Reserve (SH59 Corridor)

References to "the site" within this report refer collectively to all seven allotments, unless stated otherwise.

The site is situated in a rural area south of Pukerua Bay and north of Plimmerton, within the Porirua City boundaries in the Wellington region. It is bounded by State Highway 59 to the west and three adjoining land blocks to the north, east, and south.

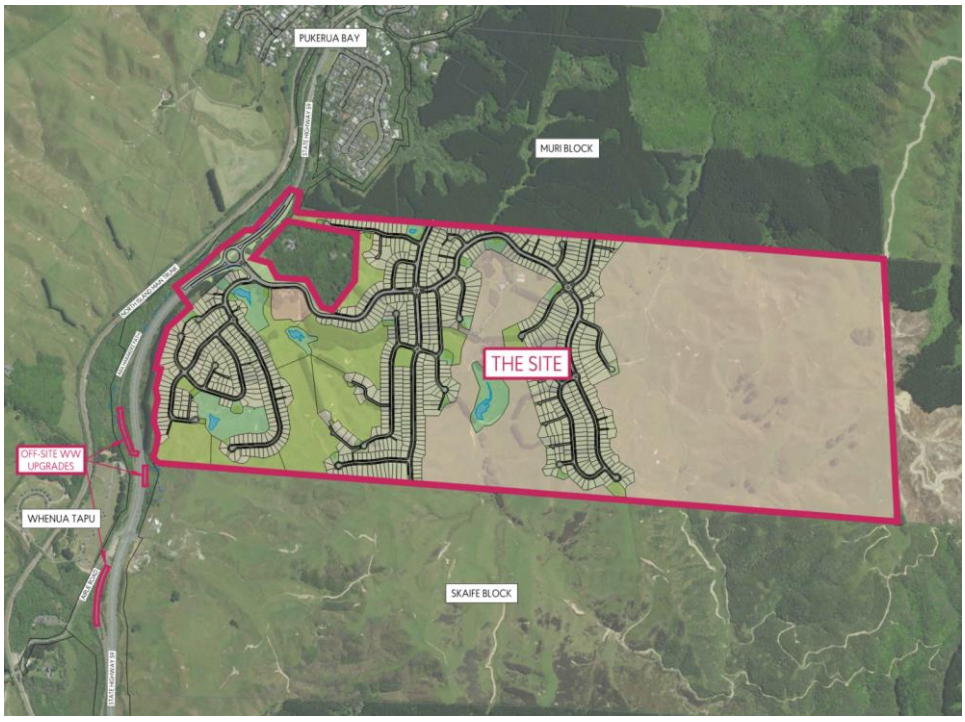



**Figure 1.** Site Extents Plan – Entire Site.

## 2.3 RELATIONSHIP TO OTHER PLANS

This report should be read in conjunction with the following plans and reports:

- Envelope Engineering Infrastructure Report.
- Envelope Engineering Draft ECMP
- Envelope Engineering Flood Assessment
- BlueGreen Ecology Assessment.
- Engeo Geotechnical Engineering Report.
- PDP Hydrological Assessment
- PDP Water Quality Assessment
- PDP Preliminary Site Investigation

# 3.0 SITE EVALUATION

## 3.1 SITE HISTORY

The site is currently used as a deer farm, comprising predominantly pastoral grassland with several existing homesteads, farm sheds, and associated agricultural infrastructure.

Historical aerial imagery dating back to 1942 shows the land as open pasture, and it has remained pasture since that time, with no significant changes in land use or built development.

## 3.2 DATA SOURCES & INVESTIGATIONS

The below table is a summary of the data sources and investigations that have informed this SMP.

**Table 1**. Data Sources

| Existing Site Data | Source of Data |
|---|---|
| Topography | Porirua LiDAR 2023<br>Envelope topographical survey around site features |
| Geotechnical | ENGEO<br>Geotechnical Investigation – Mt Welcome Development - Project Number 19796.000.002 |
| Existing Stormwater Network | PCC GIS Maps<br>Envelope site investigations |
| Streams | BlueGreen Ecological Assessment |
| Flood Hazards | PCC GIS Maps |
| Ecological | BlueGreen Ecological Assessment |
| Hydrological | PDP Hydrological Assessment |
| Contaminated Land | PDP Preliminary Site Investigation |

## 3.3 SITE TOPOGRAPHY

The topography is varied and includes some land that is moderately steep and undulating, with elevations ranging from approximately RL 50 m near the western boundary (adjacent to SH59) to RL 300 m at the eastern extent of the site. The landform includes three prominent high points separated by two gullies. The western portion of the site comprises of rolling hills and shallow gullies, while the central and eastern areas are steeper, with slopes typically between 26° and 45°, and locally exceeding 45° in areas.

## 3.4 ECOLOGY AND ENVIRONMENTAL

BlueGreen Ecology have prepared the ecological assessment for the site. Their investigations identified that the existing streams, wetlands, and terrestrial habitats are of low ecological value, being largely exotic and modified by historic farming activities.

Overall, BlueGreen Ecology assess that the development will achieve a net ecological gain through riparian enhancement, stormwater quality treatment, and the removal of farming practices that currently degrade ecological values.

## 3.5 GEOTECHNICAL

ENGEO have completed a geotechnical report for the Mt Welcome development, which should be read in conjunction with this report. The key points relevant to the proposed civil works are summarised below:

- The site is located approximately 500 m from the mapped trace of the Pukerua Fault, within a seismically active area that also includes the Ohariu and Wellington Faults. While the site is not directly traversed by a known fault, ground rupture and regional subsidence could occur during a major seismic event on nearby or unmapped faults.
- Liquefaction risk is considered low within the developable areas but may occur locally in low-lying gullies and valley floors.
- Groundwater was recorded between approximately 0.4 m and 3.8 m below ground level, varying seasonally and by location. Continued groundwater monitoring is recommended to inform the detailed design of earthworks, stormwater ponds, and slope stability assessments.
- Soakage had not been deemed a suitable method of discharge, and no tests have been completed.
- Slopes steeper than 25 degrees require specific engineering assessment and mitigation where development is proposed above or below them. Specifically Engineered Design (SED) zones should be applied in these areas.
- Most surficial soils and Greywacke rock are suitable for reuse as engineered fill, subject to verification and field compaction testing.
- Detailed design of the proposed stormwater retention ponds and adjacent embankments is required by a chartered professional engineer.
- Installation of piezometers for ongoing groundwater monitoring for a minimum of four months prior to major earthworks is recommended to support final design and construction staging.

## 3.6 CONTAMINATION ASSESSMENT

Pattle Delamore Partners (PDP) have been engaged to carry out a Preliminary Site Investigation (PSI) to assess the risk of any previous land activities on the health of future residents. The investigation identified potential contamination sources from historical sheep dip/spray race operations and from older buildings that may have contributed asbestos and lead residues to surrounding soils.

PDP recommend that areas associated with these potential HAIL activities are subject to a Detailed Site Investigation (DSI) to confirm the extent of contamination and whether the National Environmental Standard for Assessing and Managing Contaminants in Soil (NESCS) will be triggered.

## 3.7 EXISTING HYDROLOGY

The Mt Welcome development lies within the Porirua Harbour Freshwater Management Area (FMA). The site discharges into four main catchments:

- Taupō Stream (T1, T2, T3, T)
- Kakaho Stream West
- Kakaho Stream East (K)
- Waimapihi Stream (Muri) (M)

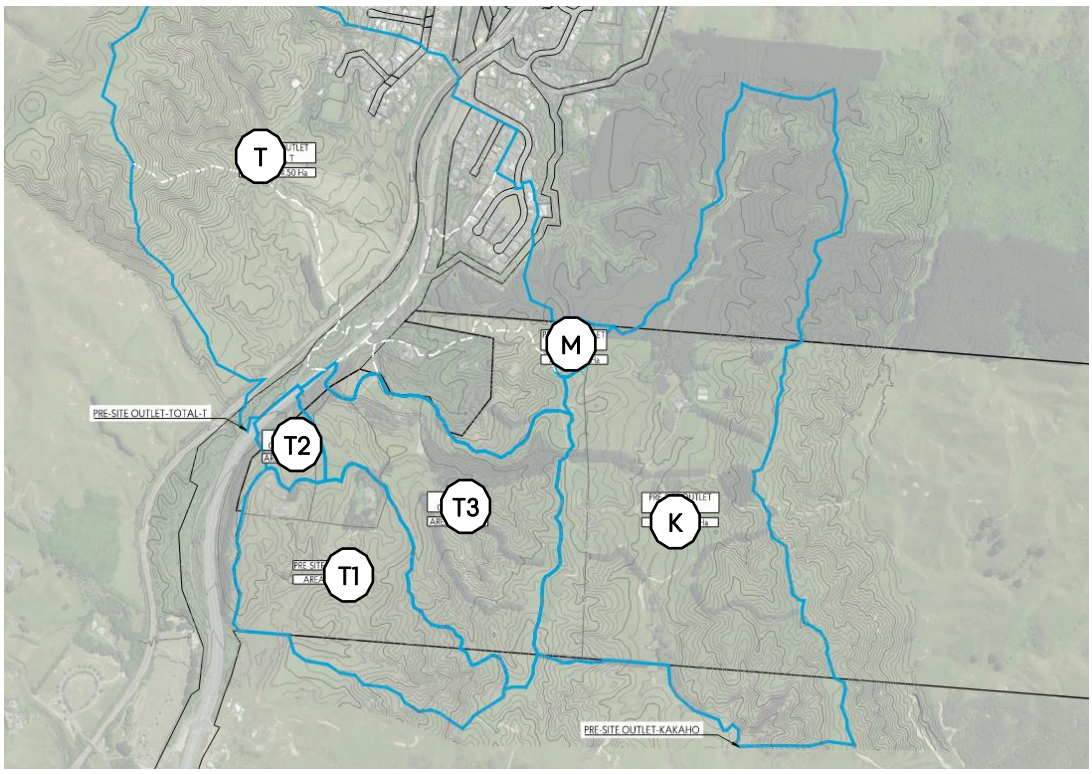



**Figure** 2. Existing Catchments

The pre-development catchments and their associated discharge points used in this assessment are shown in Figure 2. Further hydrological detail for each catchment is available in the PDP Hydrology Report. Catchment plans are provided on Sheet 4600 of the Civil Engineering drawings in Appendix 1.

### 3.7.1 TAUPŌ STREAM

The Taupō Stream catchment discharges west and south contributing to the headwaters of the Taupō Stream and Taupō Swamp. The catchment is divided into three sub-catchments all of which flow toward the Taupō Swamp complex, a regionally significant lowland wetland. The wetland is recognised for its high ecological and hydrological value and is a key receiving environment for stormwater generated from the site.

We have labelled the primary control catchments as **T1, T2, and T3**, representing the development discharge points immediately upstream of the receiving stream. **T** (the total catchment) represents the combined control point located slightly downstream of all discharge outlets and includes flows from the SH59 intersection and the upstream catchment. These control points are referenced throughout the report to compare pre- and post-development conditions.

### 3.7.2 KAKAHO STREAM CATCHMENTS (WEST AND EAST)

The Kakaho Stream West and Kakaho Stream East catchments discharge south toward the Kakaho Stream, which in turn flows into the Pāuatahanui Arm of Te Awarua-o-Porirua Harbour approximately 4.6 km downstream. This harbour is a sensitive estuarine environment, with elevated sedimentation and contaminant sensitivity identified in regional studies.

Upstream of the site, the Muri Road catchment remains largely rural, comprising commercial pine forestry and Significant Natural Areas (SNAs). Active pine harvesting is currently underway. Within the site, future development will follow a similar approach to the adjoining Mt Welcome area, with runoff conveyed through Kakaho stream catchments.

This catchment has been labelled **K**. For the civil engineering design, only the western portion has been assessed, as this area is attenuated within the proposed retention wetlands.

### 3.7.3 WAIMAPIHI STREAM CATCHMENT

A small portion of the northern site drains into the upper Waimapihi Stream catchment, flowing northwards through the Muri Road block before ultimately discharging to the coast at Pukerua Bay.

This catchment has been labelled **M** for reference.

## 3.8 MONITORING

Baseline water-quality and hydrological monitoring is being undertaken by PDP to characterise existing conditions within the receiving environments.

Existing water-quality data from the Taupō Swamp catchment, collected between July 2020 and August 2025, has been used to establish baseline conditions for the Taupō Stream and Swamp complex. Results and interpretation are provided in the PDP Hydrology and Water Quality Assessment.

At present, no long-term monitoring data is available within the Kakaho Stream catchments.

To understand the existing hydrological conditions at the site, PDP has installed water quality baseline monitoring stations within the wetlands and streams discharging from the site. The monitoring sites of relevance to this report are three surface water monitoring locations SW01, SW02 and SW03, which continuously measure turbidity in the streams at the boundary extent of the site. These key areas can be seen in figure 2 below.


**Figure 3.** PDP Key Surface Monitoring Locations

## 3.9 EXISTING RETICULATION NETWORK

There is no existing vested, piped stormwater infrastructure at the site. However, there are 20 existing culverts within area. The majority are related to existing agriculture activities and enable farm tracks through the low-lying areas. These have minimal effect or use on the proposed development and will generally be remove and replaced where not supporting hydrological, ecological functions or ongoing agricultural access. Existing culvert plans can be found within the Civil Design plans in Appendix 1 and are showed in Figure 4 below.

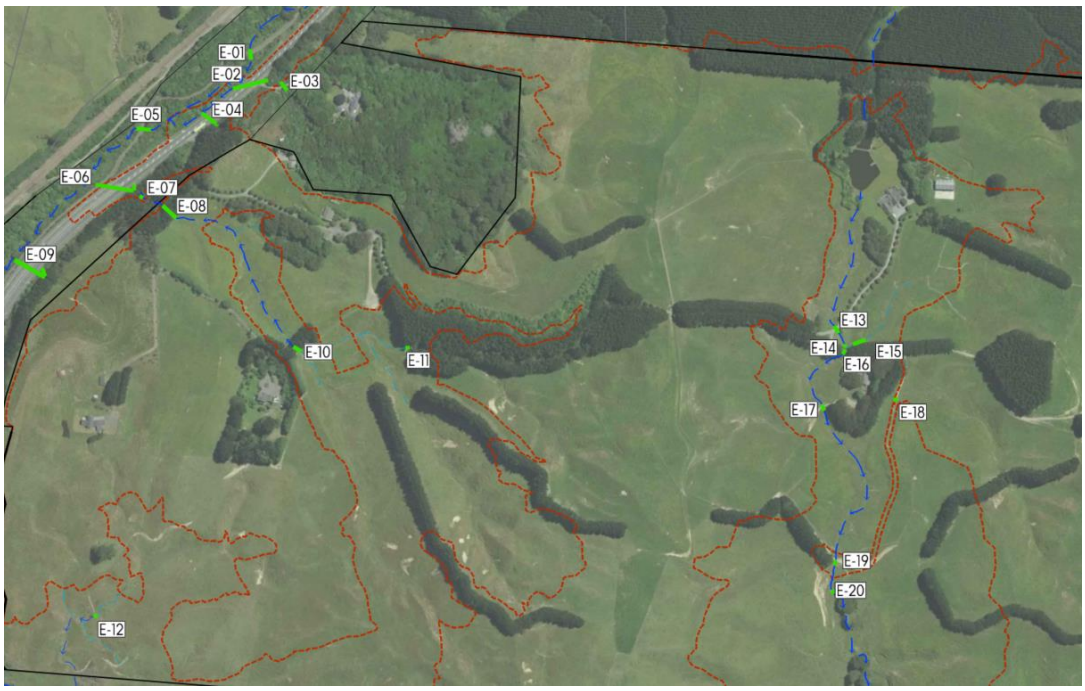



**Figure 4.** Site Wide Existing Culvert Locations

There are 8 culverts of varying sizes directly adjacent to the site along SH59 The culverts and narrow channels create constrictions which creates a flood risk on site. These culverts convey all stormwater towards the Taupo Swamp downstream. These culverts are further detailed within the Envelope Infrastructure Report and are shown in Figure 5 below.

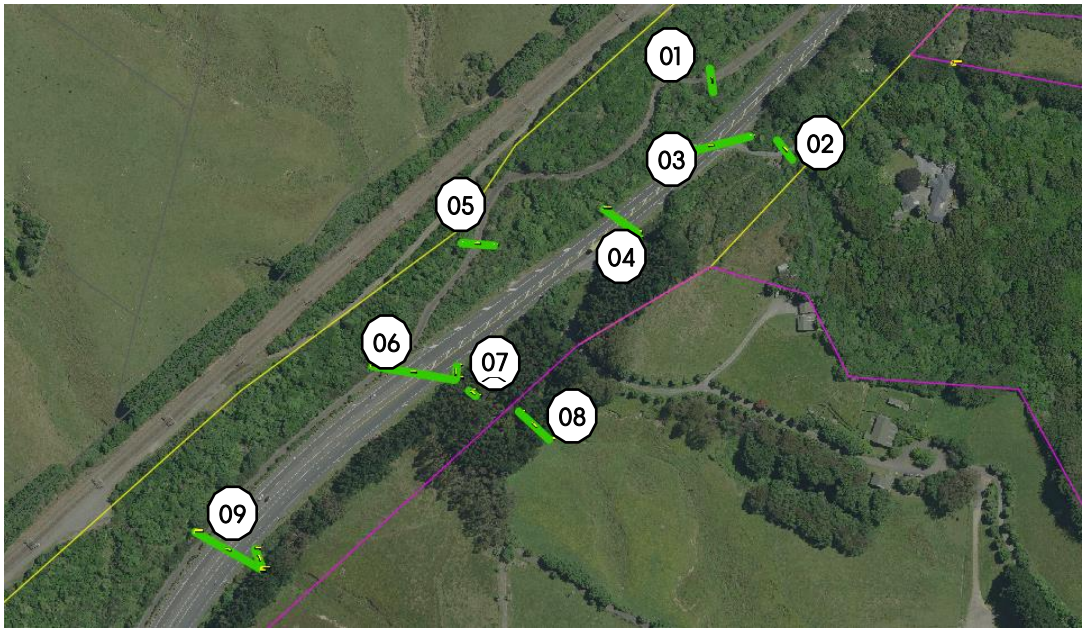



**Figure 5.** SH59 Existing Culvert Locations

Table 2 summarises the existing culvert dimensions, including size, length, and grade, based on field investigations and topographical survey data where access was available.

**Table 2**. Existing Culverts

| Culvert ID | Diameter | Length | Grade | Note |
|---|---|---|---|---|
| E-01 | 900mm | 14.5m | 1.20% | No Change |
| E-02 | 375mm | 48m | 1.30% | To Be Removed |
| E-03 | 375mm | 15m | 4.70% | No Change |
| E-04 | 300mm | 25m | --- | To Be Removed |
| E-05 | 900mm | 20m | 1.30% | No Change |
| E-06 | 600mm | 52m | 3.60% | To Be Extended East |
| E-07 | 900mm | 6m | 4.00% | To Be Removed |
| E-08 | 675mm | 25m | 2.10% | No Change |
| E-09 | 450mm | 45m | 0.40% | No Change |
| E-10 | 525mm | 12m | --- | No Change |
| E-11 | 300mm | 6m | 3.60% | No Change |
| E-12 | 525mm | 6m | 5.00% | No Change |
| E-13 | 900mm | 12m | 1.80% | No Change |
| E-14 | 675mm | 4.5m | 0.00% | No Change |
| E-15 | 450mm | 18.5m | 4.00% | No Change |
| E-16 | 750mm | 7m | 5.50% | No Change |
| E-17 | 675mm | 9m | 1.60% | No Change |
| E-18 | 375mm | 9m | 3.90% | No Change |
| E-19 | 750mm | 6.2m | 1.80% | To Be Removed |
| E-20 | 750mm | 6.2m | 12.60% | No Change |

## 3.10 EXISTING STREAMS

Stream corridors are mapped within the Proposed Porirua District Plan (PDP) and Wellington Water hydrology layers, which identify several defined stream environments across the Mt Welcome site.

These mapped features represent modelled drainage lines derived from LiDAR topography and catchment analysis and indicate where permanent or intermittent streams may occur.

Field assessments undertaken by PDP and BlueGreen Ecology have refined this mapping to confirm the actual extent, alignment, and flow permanence of the on-site streams.

The verified stream mapping and classifications have been used to define hydrological sub-catchments and inform the stormwater management design, ensuring that discharge locations correspond with existing flow paths and that downstream hydrology is maintained.

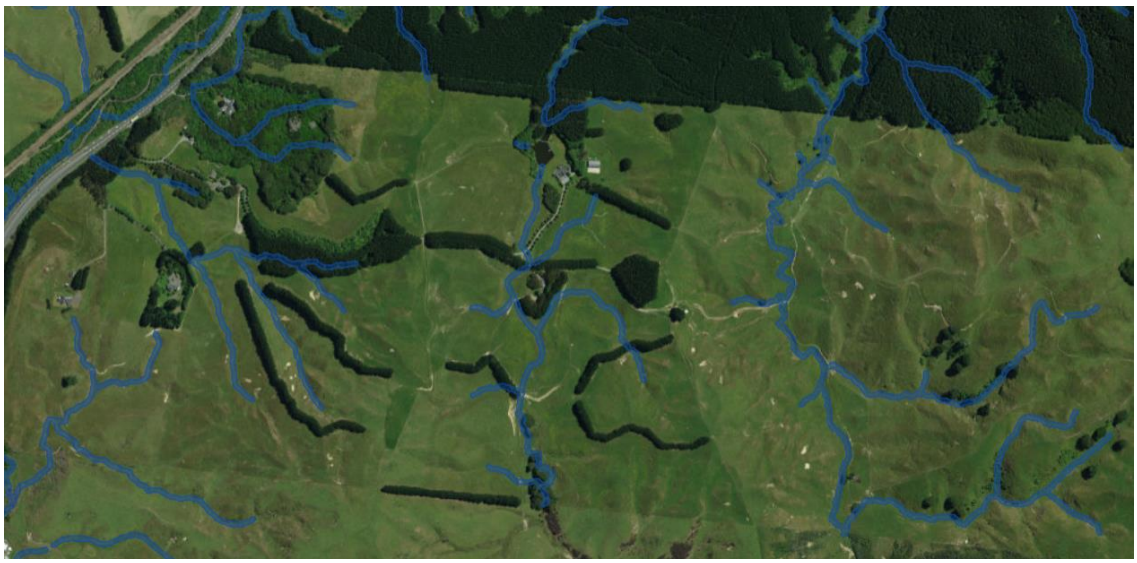


**Figure 6.** Porirua Proposed District Plan Stream Corridors

## 3.11 EXISTING WETLANDS

Existing wetlands within the site have been mapped by BlueGreen Ecology. Several natural and modified wetland features occur within and downstream of the Mt Welcome site, primarily associated with the Taupō Swamp complex and the headwaters of the Kākaho Stream.

These wetlands form part of the wider Porirua Harbour catchment network and are recognised as being of high ecological value. Further detail on wetland classification, extent, and hydrological monitoring is provided by PDP and BlueGreen Ecology.

## 3.12 EXISTING OVERLAND FLOW PATHS

The western side of the block discharges into the Taupo swamp downstream. This western catchment is conveyed through a series of stormwater culverts that have been installed under SH59. These culverts are generally undersized and would contribute to the localised flooding seen in Figure 7.

Flood modelling undertaken as part of the project flood risk assessment confirms that overland flow paths are generally confined to the natural valley systems and drainage corridors within the site. Existing overland flow paths are therefore not a dominant feature across the developable areas.

## 3.13 EXISTING FLOOD HAZARDS

Flood hazard areas are identified in both the Proposed Porirua District Plan and the Wellington Water “Rainfall Risks in Porirua” GIS database. The mapped flood extents generally align with the Flood Management Area (FMA) boundaries shown in the District Plan.

Minor flood hazards have been identified within low-lying gullies near SH59, as shown on the Wellington Water 1% AEP flood maps (refer to Figure 6). The flood risk is limited in extent and does not materially affect the proposed development or create downstream impacts. Some localised ponding occurs along the State Highway 59 corridor, where culverts are undersized and partially blocked by sediment, restricting hydraulic capacity. These areas will be retained as stormwater reserves, with no residential development proposed within them.

Additionally, some localised flooding occurs along the existing SH59 corridor and adjacent stream channels.


**Figure 7.** Wellington Water Flood Map

Updated draft flood maps are being prepared by Wellington Water and Porirua City Council for the Mana and Pukerua Bay catchments, incorporating overland flow paths for the Mt Welcome area. Preliminary review indicates that the draft mapping may over-represent flood ponding in the upper site where topography does not support such accumulation. The maps remain in draft form and are expected to be refined prior to being made operative under the District Plan.

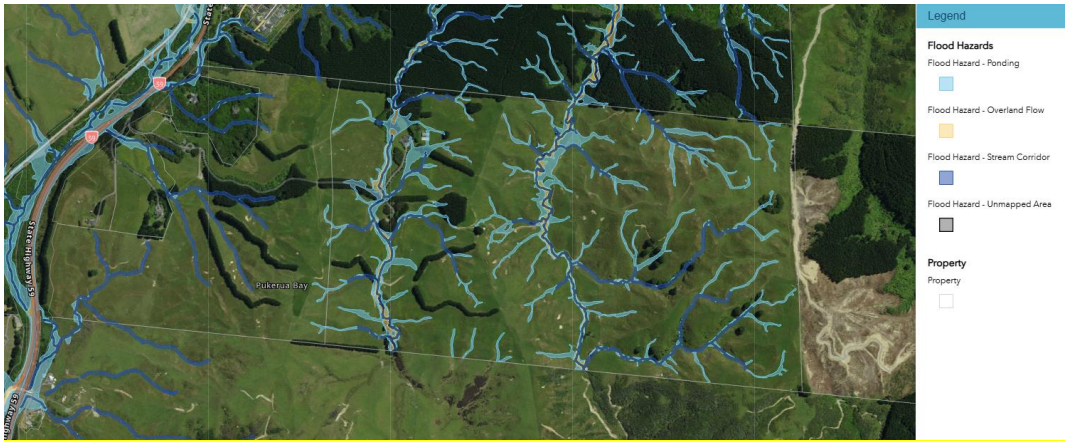



**Figure 8.** Porirua City Flood Maps (Draft)

Due to the site's elevated topography, flooding is not expected to pose a risk to the development area. Some localised flooding occurs along SH59 and will be addressed in coordination with NZTA during detailed design to confirm suitable mitigation measures and acceptable flood depths.

The Taupō Stream catchment ICM model provided by WWL was used as the basis for the Envelope flood risk assessment. The pre-development scenario results are presented in the report included in Appendix 5.

# 4.0 MANA WHENUA VALUES

## 4.1.1 GENERAL

This Stormwater Management Plan has been prepared to manage freshwater values in a manner consistent with Te Mana o te Wai and the principles of the National Policy Statement for Freshwater Management.

It aligns with the Te Awarua-o-Porirua Whaitua Implementation Programme and the freshwater objectives and policies of the Wellington Regional Natural Resources Plan.

The stormwater management approach recognises and provides for mana whenua values as expressed by Ngāti Toa Rangatira, the iwi with mana whenua status over the Porirua catchment. The

use of water-sensitive design, together with stream and wetland enhancement measures, is intended to sustain and enhance mauri and support the long-term health of receiving environments.

The proposed management approach seeks to uphold kaitiakitanga through protection of water quality, restoration of hydrological function, and enhancement of ecological and cultural values associated with downstream environments such as Taupō Swamp and Te Awarua-o-Porirua Harbour.

### 4.1.2 CONSULTATION

Engagement with Ngāti Toa Rangatira has been ongoing throughout the design and development process, ensuring iwi values and cultural considerations are incorporated into the design and implementation of the project. A summary of engagement is outlined below:

- 10 June 2025 – Initial meeting: Project overview, timeframes, process, and discussion of key issues to work through.
- 19 June 2025 – Site visit: Initial site orientation and walkover of the Lower Terrace to familiarise iwi representatives with the project area.
- 25 September 2025 – Hui: Progress update in response to further information sought on Structure Plan compliance, stormwater management, ecology, and works in waterways.
- 13 October 2025 – Site visit: Follow-up visit to discuss key areas of interest including the design of the roundabout, approach to ecology and archaeology, attended by the applicant's planning, ecology, archaeology, and engineering experts.
- 05 November 2025 – CVA: A Cultural Values Assessment was received and reviewed by the project team, which provided several comments on the development proposal and highlighted a number of matters. A follow-up meeting was subsequently scheduled, and these matters will be addressed through the AEE.

### 4.1.3 WHAITUA

The site lies within the Te Awarua-o-Porirua Whaitua, which encompasses the catchments draining to Porirua Harbour.

The Te Awarua-o-Porirua Whaitua Implementation Programme (2019) establishes outcomes and recommendations focused on improving water quality, managing sedimentation, and restoring ecological integrity within the harbour and its tributaries.

This Stormwater Management Plan supports those objectives by:

- Managing flows to achieve hydraulic neutrality and minimise erosion;
- Providing water-quality treatment for road and lot runoff through raingardens and retention wetlands
- Incorporating biodiversity and riparian planting to enhance ecological resilience and habitat connectivity.

The proposed design approach is therefore consistent with the Whaitua's objectives to protect the mauri of Te Awarua-o-Porirua Harbour and support sustainable water management across the wider catchment.

# 5.0 DEVELOPMENT OVERVIEW

## 5.1 DEVELOPMENT

The proposed development comprises approximately 950 residential allotments ranging in size from 316m² to 2,386m², enabling the construction of 950 future dwellings with an average lot size of around 523m². The development also includes a commercial centre to serve the new local community, together with associated three-waters infrastructure (wastewater, including storage facilities; stormwater management systems; and water reticulation), roading, and a connected network of pedestrian and cycling trails.

Earthworks will be undertaken to establish suitable finished surface levels for building platforms, roads, parks, and drainage systems. The proposal will also incorporate extensive landscaping and public open spaces, including recreation and drainage reserves for stormwater attenuation and conveyance. A new intersection with State Highway 59 will provide primary access to the site and integrate the development with the wider transport network.

### 5.2 STAGING

Development will occur in staged phases, allowing a progressive and coordinated delivery of housing and infrastructure. Indicative staging is shown on the drawings provided in Appendix 1. Staging will be managed to ensure that appropriate infrastructure (stormwater, wastewater, water supply, and access) is available for each stage prior to release. Additional staging details are provided in the accompanying Envelope Infrastructure Report.

### 5.3 IMPERVIOUSNESS ASSUMPTIONS

For stormwater modelling purposes, the site has been represented as 0 % impervious under pre-development conditions, reflecting its current pastoral state apart from minor structures. Two small external catchments from SH59 (assumed 90 % impervious) drain into the main gully before entering existing highway culverts. These have been included in the hydrological model to assess existing culvert capacity and downstream performance.

The proposed development will primarily comprise detached residential dwellings. The principal sources of impervious area within the residential lots will be building roofs, driveways, and paved outdoor areas.

In accordance with the Porirua Medium Density Residential Zone (MRZ) provisions, a maximum site coverage of 50 % applies to residential lots, providing sufficient allowance for dwellings and driveways while maintaining compliance with permeability standards. The District Plan also requires a minimum proportion of permeable surface to be retained within each lot to support infiltration and landscaping.

Roading will contribute additional impervious surfaces through sealed carriageways, kerbs, and footpaths. This has been allowed for based on the proposed road cross sections and layout.

For design purposes, the following imperviousness assumptions have been adopted:

**Table 3:** Post Developed Impervious

| Catchment | Impervious % |
|---|---|
| Residential Lots | 75% |
| Roads | 85% |
| Commercial Area | 90% |
| Recreational Reserves | 0% |

Imperviousness is expected to remain consistent across all stages of development and has been used to inform the hydrological modelling and stormwater management design.

## 6.0 STORMWATER MANAGEMENT

### 6.1 PRINCIPLES OF STORMWATER MANAGEMENT

The stormwater management approach for the Mt Welcome development has been guided by the principles of integrated catchment management, water-sensitive urban design, and hydraulic neutrality, consistent with the Wellington Water RSWS v3.1 and GWRC Plan Change 1. These principles ensure that stormwater is managed in a way that protects downstream environments, enhances ecological and cultural values, and supports long-term asset resilience and maintainability.

Key principles applied to this development include:

- Stormwater treatment and attenuation are centralised, minimising the use of on-lot devices and reducing operation and maintenance costs.
- Post-development catchments are aligned with pre-development catchments to maintain existing discharges and downstream receiving environments
- Apply Safety in Design principles and identify project specific risks
- Support of development staging to ensure the network can be constructed and commission progressively
- Recognise and protect the natural environment with low impact and water sensitive design
- Incorporate cultural values through engagement with mana whenua

## 6.2 DESIGN APPROACH

The development will increase the extent of impervious surfaces, which has the potential to elevate stormwater runoff to downstream environments if not appropriately mitigated. Mitigation measures have been incorporated into the civil design and verified through detailed stormwater modelling.

Table 4 summarises the design parameters used for stormwater conveyance, peak-flow attenuation, and flood-risk management.

**Table 4.** Hydrology & Flooding Design Criteria.

| Design Criteria | Parameter | Reference |
|---|---|---|
| Primary Network | 10% AEP + CC | Wellington Water Regional Standard for Water Services (RSWS), Version 3.0. |
| Secondary Network | 1% AEP + CC | WWL RSWS v3.0 |
| Freeboard | Residential Buildings – 0.3m | WWL RSWS v3.0 |
| Attenuation | Hydraulic Neutrality of peak flows up to 1% AEP event | WWL RSWS v3.0 |
| Rainfall | HIRDS RCP 6.0 2081 – 2100 | NIWA HIRDS |
| Retention (Target) | 85% Mean Annual Runoff Volume (MARV) | GWRC Plan Change 1 – Schedule 29 |
| Water Sensitive Design | To meet WSD objectives | WWL Design for Stormwater: Treatment Device Design Guide (2021) |

Detailed Hydrology and Hydraulic Modelling results are presented in Section 7 of this report.

## 6.3 PERFORMANCE CRITERIA

The Porirua District Plan, Wellington Water RSWS v3.1, and GWRC Plan Change 1 (Schedule 29) outline key requirements for stormwater management in subdivision and land-development projects. The design achieves compliance with these requirements through the following measures:

- A site-specific hydrologic and hydraulic assessment showing how stormwater will be collected, conveyed, treated, attenuated, and discharged in accordance with RSWS and PC1 hydrological control standards.
- Design all internal stormwater networks, overland flow paths, treatment, and attenuation facilities to integrate with the existing public network and comply with RSWS
- Provide stormwater treatment in accordance with GWRC Plan Change 1 and the Wellington Water Design for Stormwater: Treatment Device Design Guide, achieving at least 85% MARV treatment and target contaminant-load reductions.
- Implement erosion and sediment controls consistent with GWRC Erosion and Sediment Control Guidelines to protect treatment devices and downstream environments during construction.

- Ensure building platforms enable dwelling construction with a minimum 200mm freeboard above the 1 % AEP flood level
- Maintain on-site attenuation and hydraulic neutrality to ensure no increase in downstream flood risk.
- Recognise and provide for ecological and cultural values of the receiving environment and define long-term maintenance responsibilities consistent with Wellington Water's operation and maintenance expectations.

## 6.4 TREATMENT TRAIN APPROACH

The design of the stormwater piped network, including sizing and hydraulic calculations, is provided in the Envelope Infrastructure Report. The proposed stormwater management system is summarised as follows:

1. Lot Runoff (10% AEP): Stormwater from residential lots is collected via downpipes and lateral connections and discharged into the underground piped network.
2. Road Runoff (10% AEP): Stormwater from roads is captured through catchpits and conveyed into the same piped network.
3. Major Flow (1% AEP): During larger events, overland flow will be conveyed safely along road corridors and directed to downstream attenuation devices.
4. Primary Treatment: The piped network discharges to centralised bioretention basins (raingardens) sized to treat 85% MARV of the contributing impervious catchment. Larger events bypass the raingarden via an orifice and dedicated bypass pipe.
5. Secondary Treatment / Conveyance: Treated flows and bypass flows are conveyed to wetland retention ponds, while some smaller sub-catchments discharge directly to gullies where maintaining existing flow is required.
6. Attenuation and Storage: The wetland retention ponds provide both water-quality and quantity control—retaining and detaining runoff from frequent, low-intensity events and storing flows up to the 1% AEP storm.
7. Discharge: The ponds release flows back to existing watercourses at pre-development discharge rates, maintaining hydraulic neutrality and improving downstream water quality.


## 6.5 PRIMARY NETWORK

Stormwater runoff from events up to 10% AEP (with climate-change allowance) will be conveyed through the primary piped network and discharged to the retention wetlands located at 4 different locations within the development area. Due to the steep topography of the site, the proposed network has additional capacity to service greater events then the 10% AEP.

Catchpits are positioned at low points and regular intervals along the road corridors to capture runoff efficiently. Each residential lot will be provided with a lateral connection to the public piped stormwater network. The proposed network layout is shown on the 4000-series design drawings (Appendix 1).

The primary network discharges to centralised bioretention devices (raingardens), which have been designed with low-flow and high-flow outlets:

- Low-flow outlets convey runoff to the raingardens, sized for the water-quality flow event as defined in Wellington Water's Design for Stormwater: Treatment Device Design Guide. The water-quality flow has been calculated as 10 mm of rainfall over the contributing calculated water quality area.

- High-flow bypasses divert flows exceeding the water-quality event directly to the downstream outlet, ensuring bypass flows are conveyed without compromising treatment performance.

The raingarden outlets and associated high-flow bypasses combine and discharge at multiple outlet locations across the site. These discharge points have been strategically positioned along existing flow paths to maintain the site's pre-development hydrological flows. These outlet locations have been confirmed in consultation with PDP and BlueGreen Ecology to align with existing catchment hydrology and ecological values.

As the proposed development areas are typically situated on the upper terraces, with stormwater management devices located within the lower gullies, flows must be conveyed safely down steep embankments without compromising slope stability or causing erosion. In some locations, piped conveyance systems will be installed along the embankments, while in others, flow will discharge at the upper slope.

All stormwater outlets will incorporate energy-dissipation measures and scour protection to control flow velocity, prevent erosion, and protect the receiving environments. Further details are provided in Section 6.12.

## 6.6 SECONDARY NETWORK

The 1% AEP event will be conveyed as overland flow toward the retention wetlands via the road corridors. Due to the site's topography, all roads have been designed with defined secondary flow paths that discharge either directly to the retention wetlands or via raingardens that ultimately connect to the same system. No low points or areas of on-road ponding have been designed or are required, and there are no anticipated constraints in directing overland flows to suitable outlet locations. The site does not contain any flood-prone areas requiring minimum floor level or freeboard controls.

Overland flows descending the steeper embankments toward the ponds will generally follow the alignment of the primary network conveyance system. Appropriate erosion and scour protection—such as rock armouring, revegetation, or energy-dissipation structures, will be incorporated to ensure slope stability and protect receiving environments. Further details are provided in Section 6.12 – Scour and Erosion Control.

A flood assessment has been prepared by Envelope Engineering to assess flood risk and overland flow management across the site and is attached within Appendix 5. The modelling confirms that the proposed road corridors and retention wetlands provide effective conveyance and attenuation of the 1% AEP event, with flood effects generally limited to shallow flows within roads and stormwater management areas. No flood hazards are within proposed residential lots, and no material increase in flood risk to surrounding land or infrastructure.

## 6.7 HYDRAULIC NEUTRALITY & ATTENUATION

The proposed stormwater management system has been designed to achieve hydraulic neutrality, ensuring that post-development peak discharges do not exceed pre-development levels for all design events up to and including the 1% AEP storm.

To achieve this, the civil design incorporates four primary retention wetlands (A, B, C, and E) strategically located within the site's main gully systems. Each wetland provides both attenuation and retention functions, temporarily detaining runoff from its contributing sub-catchment before releasing flows to the receiving environment via controlled outlets.

An additional, smaller retention wetland (D) is located at the northern extent of the site and discharges to the Muri Road catchment. This wetland will maintain a permanent water level but will likely require lining due to limited infiltration capacity. Its function is primarily for peak-flow attenuation rather than retention. The retention functions of these wetlands and detailed further into this report. These locations are shown in Figure A below

**Table 5.** Retention Wetland Storage Summary

| Retention Wetland ID | Function | Catchment |
|---|---|---|
| A | Attenuation / Retention | T1 |
| B | Attenuation / Retention | T3 |
| C | Attenuation / Retention | T3 |
| D | Attenuation | Muri |
| E | Attenuation / Retention | K1 / K2 |

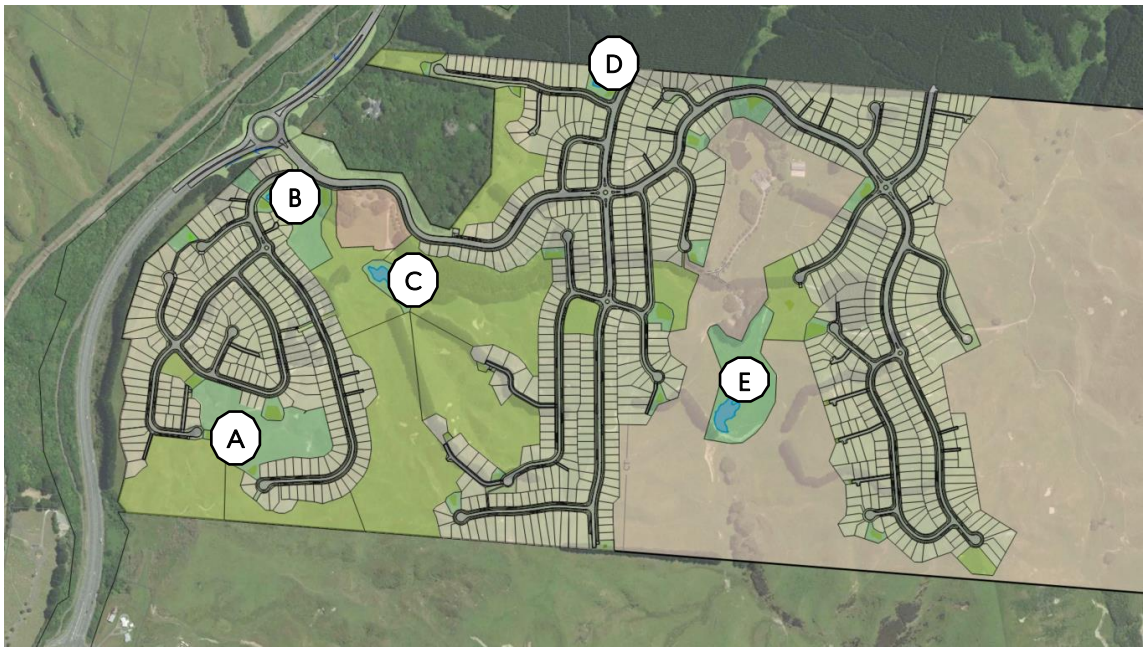



**Figure 9.** Attenuation & Retention Areas

The function and storage capacity of each wetland summarised in Table 6. This details the different water levels and stages of storage provided within each retention wetland.

Each wetland incorporates multi-stage outlet structures designed to regulate flow, maintain extended detention during frequent storm events, and dissipate energy to minimise downstream scour and erosion. The detailed design phase will confirm final outlet dimensions, including orifice sizes, weir levels, and specific energy-dissipation treatments.

This details on pre- and post-development discharge rates for all return periods (2-, 5-, 10-, and 100-year AEP) are provided in Section 7 of this report. The results demonstrate that the proposed system effectively attenuates runoff, maintains pre-development discharge rates, and provides improved hydrological control across all design events. PDP has undertaken independent hydrological modelling to verify post-development performance at each catchment outlet and can be found in the PDP Hydrological Assessment.

**Table 6**. Retention Wetland Design Summary

| Outlet | Water Level (m RL) | Water Area (m²) | Water volume (m³) |
|---|---|---|---|
| **Retention Wetland A** | | | |
| Permanent | 41.00 | 1,020 | 770 |
| 10% AEP | 42.25 | 2,140 | 2,480 |
| 1% AEP | 42.75 | 2,340 | 3,680 |

| Outlet | Water Level (m RL) | Water Area (m²) | Water volume (m³) |
|---|---|---|---|
| Spillway | 43.50 | 3,300 | 5,700 |
| **Retention Wetland B** | | | |
| Permanent | 54.30 | 1,050 | 480 |
| 10% AEP | 55.90 | 2,270 | 3,020 |
| 1% AEP | 56.65 | 3,110 | 4,980 |
| Spillway | 58.17 | 4,900 | 10,700 |
| **Retention Wetland C** | | | |
| Permanent | 64.50 | 880 | 720 |
| 10% AEP | 65.73 | 1,940 | 2,350 |
| 1% AEP | 66.50 | 2,600 | 4,050 |
| Spillway | 67.50 | 3,550 | 6,950 |
| **Retention Wetland D** | | | |
| Permanent | 108.80 | 200 | 50 |
| 10% AEP | 109.17 | 270 | 130 |
| 1% AEP | 109.36 | 310 | 180 |
| Spillway | 109.70 | 395 | 261 |
| **Retention Wetland E** | | | |
| Permanent | 91.40 | 1,840 | 1,090 |
| 10% AEP | 92.74 | 5,350 | 5,820 |
| 1% AEP | 93.21 | 6,690 | 8,150 |
| Spillway | 93.70 | 8,470 | 11,650 |

Together, these wetlands provide distributed flow control across the site, ensuring that downstream receiving environments are protected from increased peak flows, scour, and erosion, and that overall catchment behaviour remains hydraulically neutral post-development.

## 6.8 RETENTION FUNCTION

Retention wetlands are proposed within the site's existing gullies to provide the final stage of stormwater attenuation and hydrological control. As outlined in Section 6.7 of this report, these wetlands serve a dual purpose—attenuating peak flows and providing stormwater retention.

Each wetland integrates extended detention and permanent storage to manage frequent rainfall events, attenuate flows up to the 1% AEP storm, and retain 85% of the Mean Annual Runoff Volume (MARV). Key features include:

- Siting within natural gullies to maximise storage efficiency and minimise geotechnical and earthworks risks.
- Detention and retention volumes sized to achieve hydraulic neutrality and reduce peak flood flows.
- Controlled outlet structures designed to limit discharges to pre-development rates up to the 1% AEP event.
- Permanent pools that provide baseflow storage and promote sediment settlement.

- Bunds and access tracks to enable inspection, operation, and long-term maintenance.

Further details on pre- and post-development hydrological effects for each catchment are provided in the PDP hydrology report.

## 6.9 STORMWATER TREATMENT

The treatment objectives for this site are to limit the amount of runoff from the site and to limit the amount of contaminant laden stormwater (e.g. gross pollutants, contaminants etc.) that are discharged from the site.

Raingardens have been designed to provide water-quality treatment in accordance with GWRC Plan Change 1 (Schedule 28) and the Wellington Water Design for Stormwater: Treatment Device Design Guide.

For each sub-catchment (RG-01 to RG-30), the total impervious and water-quality contributing areas were calculated from the civil design model. The required bioretention area was then calculated from the Water Quality Flow (WQF) produced to determine to size the raingardens. Key design parameters use for the raingardens are summarized below.

**Table 7.** Raingarden Design Summary

| Parameter | Design Value | Basis / Reference |
|---|---|---|
| Media infiltration rate | 175 mm/hr | Bioretention media ensuring <24 hr drawdown |
| Ponding depth | 300mm | Extended depth for increased volume |
| Media void ratio | 40 % | Standard value per WWL guidance |
| Media depth | 600mm | |
| Drawdown time | ≤ 24 hours | Achieved under conservative assumption |
| Treatment target | ≥ 85 % MARV | Schedule 28 – Hydrological control requirement |
| Treated event | Water Quality Event (WQE) | Based on WQV sizing and WQF from contributing impervious area |

These results confirm that the proposed bioretention system satisfies hydrological control requirements and meets reduction targets. Table 1 summarises the estimated pollutant-removal performance.

**Table 8.** Estimated Raingarden Pollutant Removal Efficiency

| Parameter | Estimated Removal Rates |
|---|---|
| TSS | 90% |
| Total Nitrogen | 40% |
| Total Phosphorus | 60% |
| Zinc | 90% |
| Copper | 90% |

Envelope Engineering has provided calculations within Appendix 2 demonstrating that the total capacity of the raingardens can accommodate the expected Water Quality Flow (WQF) from the impervious surfaces in the lots and roads. Based on the raingardens receiving the water quality flow event, it has been assumed they will treat the stormwater in accordance with the estimated removal rates provided in Table 8.

These structures are not designed to provide retention due to the geotechnical constraints of the site, but rather to improve the water quality of the run-off before being discharged to downstream

receptors. The retention wetlands, located downstream of the raingardens, will retain the flows from the site to ensure peak flows are lower than predevelopment, reducing the risk of large-scale sediment mobilisation.

**Table 9.** Summary of stormwater discharge outlets

| Raingarden ID | WQA ($m^2$) | WQF ($m^3/hr$) | Raingarden Area ($m^2$) |
|---|---|---|---|
| RG-01 | 12054 | 120.5 | 160 |
| RG-02 | 4332 | 43.3 | 61 |
| RG-03 | 14652 | 146.5 | 175 |
| RG-04 | 8278 | 82.8 | 110 |
| RG-05 | 19167 | 191.7 | 250 |
| RG-06 | 31243 | 312.4 | 420 |
| RG-07 | 8160 | 81.6 | 100 |
| RG-08 | 19210 | 192.1 | 241 |
| RG-09 | 6805 | 68.0 | 80 |
| RG-10 | 2359 | 23.6 | 31 |
| RG-11 | 6912 | 69.1 | 80 |
| RG-12 | 3785 | 37.9 | 43 |
| RG-13 | 36602 | 366.0 | 450 |
| RG-14 | 6458 | 64.6 | 80 |
| RG-15 | 16789 | 167.9 | 190 |
| RG-16 | 1933 | 19.3 | 24 |
| RG-17 | 7304 | 73.0 | 90 |
| RG-18 | 2586 | 25.9 | 35 |
| RG-19 | 1912 | 19.1 | 24 |
| RG-20 | 6173 | 61.7 | 80 |
| RG-21 | 13487 | 134.9 | 170 |
| RG-22 | 20409 | 204.1 | 260 |
| RG-23 | 15738 | 157.4 | 190 |
| RG-24 | 7220 | 72.2 | 90 |
| RG-25 | 39141 | 391.4 | 500 |
| RG-26 | 1819 | 18.2 | 18 |
| RG-27 | 2356 | 23.6 | 14 |
| RG-28 | 2043 | 20.4 | 20 |
| RG-29 | 8573 | 85.7 | 105 |
| RG-30 | 1463 | 14.6 | 15 |

## 6.10 WATER QUALITY ASSESSMENT

A Water Quality Assessment by PDP evaluated existing and potential effects of the Mt Welcome development on Taupō Swamp, Kākaho Stream, and Te Awarua-o-Porirua Harbour.

Baseline monitoring recorded slightly elevated nutrient and metal concentrations from existing deer-farming land use, but generally below guideline thresholds. Turbidity was high during rainfall events due to steep, erodible pasture slopes.

Following development, nitrogen and phosphorus loads will reduce as livestock are removed and land use transitions to residential. Raingardens will provide primary treatment and are critical for zinc and copper removal from road runoff, while retention wetlands will further attenuate flows and provide incidental sediment filtration.

PDP concluded that, with the proposed stormwater measures implemented and maintained, residual effects on downstream environments will be less than minor. Continued baseline monitoring prior to construction is recommended to confirm pre-development conditions.

## 6.11 STATE HIGHWAY 59

The new roundabout proposed within the State Highway 59 corridor will require significant stormwater upgrades and will generate approximately 4,000m² of new impervious surface. The following design measures have been adopted to achieve stormwater neutrality and align with best-practice stormwater management principles:

- Peak flow attenuation for the new impervious area will not be provided at the roundabout itself. Instead, Retention Wetland B has been intentionally oversized to compensate for the additional runoff, effectively mitigating any increase in downstream peak flows and maintaining overall catchment discharge neutrality.
- Retention within the roundabout footprint is not practicable due to poor infiltration conditions within the State Highway corridor. Accordingly, the impervious area is included within the Retention Wetland B catchment model, with post-development hydrological performance and downstream monitoring incorporating this contribution. Supporting analysis is provided in the PDP Hydrological Report.
- Roadside swales will provide first-flush treatment and contaminant removal prior to discharge for 2,660m² of the new impervious surfaces. This represents the best practicable option (BPO) for the constrained highway corridor, as standalone roadside raingardens are not preferred by NZTA and would be operationally difficult to maintain.
- Some existing culverts will be removed as outlined in Section 3.9 as part of the road widening works. The existing culverts are generally undersized and will be replaced with new, realigned culverts to accommodate the proposed roundabout, while maintaining existing flows to the Taupō Stream.

## 6.12 CULVERTS

A total of 11 culverts are proposed within the site. Five associated with the SH59 upgrades and seven within the development site. The four outlet structures from the retention wetlands have been classified as culverts. These will discharge from the wetlands via a controlled inlet structure within the pond (e.g., outlet and scruffy manhole or similar).

Culverts P30, P32, P33, P35 (Retention Wetland B), P38, and P40 (Retention Wetland E) will be designed to provide fish passage in accordance with Section 6.13. Any adjustments to culvert sizing required to accommodate fish passage requirements will be confirmed during detailed design.

The proposed culverts are shown in Figure 10 and summarised in Table 10 below. Detailed culvert plans are also included in Appendix 1. Detailed calculations, including 10- and 100-year peak flows and velocities, are provided in Appendix 2.

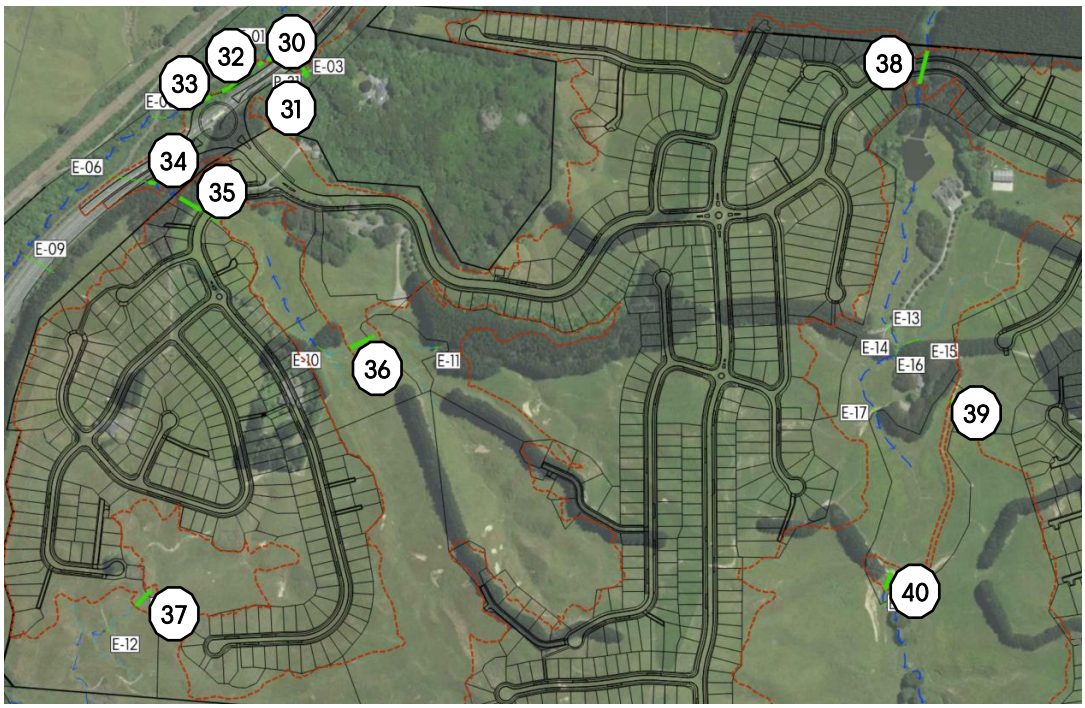



**Figure 10.** Proposed Site Wide Culverts

**Table 10**. Proposed SH59 Culverts

| Culvert ID | Diameter | Length | Grade | Note |
|---|---|---|---|---|
| P-30 | 750mm | 56m | 1.20% | Replace E-02 with 750mm Dia |
| P-31 | 375mm | 13m | 10.00% | Second High Level Inlet With E-03 |
| P-32 | 1500 x 1000 Box | 45m | 2.00% | Piping of stream to allow SH59 upgrade |
| P-33 | 1500 x 1000 Box | 58m | 3.00% | Piping of stream to allow SH59 upgrade |
| P-34 | 600mm | 10m | 3.60% | Extension of E-06 |
| P-35 | 600 to 900 mm | 60.5m | 1.5% - 6% | Retention Wetland B Outlet |
| P-36 | 450 to 675 mm | 36m | 10% - 15% | Retention Wetland C Outlet |
| P-37 | 600mm | 28m | 14% - 25% | Retention Wetland A Outlet |
| P-38 | 900mm | 44m | 3.50% | Road/Stream Crossing |
| P-39 | 600mm | 10m | 2.00% | Replace E-18 with 600mm Dia |
| P-40 | 350 to 2100 mm | 28.5m | 5% - 6% | Retention Wetland E Outlet |

Figure 11 below further detail the proposed culverts required to be installed for the SH59 intersection.

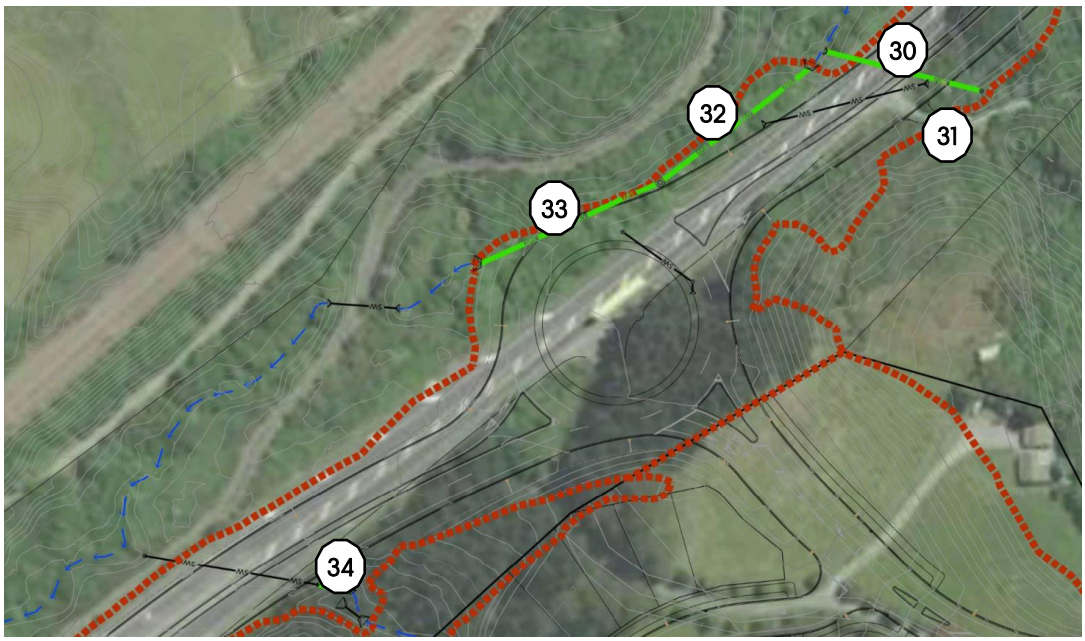



**Figure 11.** Proposed SH59 Culverts

## 6.13 FISH PASSAGE

During detailed design the culvert sizing will be reviewed against the New Zealand Fish Passage Guidelines (2018, NIWA) to ensure that all permanent crossings support fish movement.

Under the proposed development, several new or replacement culverts within perennial and intermittent stream reaches will be designed to enable the safe upstream and downstream passage of fish species under a range of flow conditions. Design measures include:

- Culvert Width and Embedment
    - For streams with a bank-full width less than 3m, the guidelines recommend a culvert width of at least 1.3 times the measured bank-full width to minimise hydraulic constriction and preserve natural channel processes.
    - The natural streambed will be reinstated within the culvert to approximately 25% of the culvert depth, using existing bed material (gravels, cobbles, fines) wherever practicable to replicate the natural substrate and roughness conditions.
    - The existing stream gradient will be maintained through the culvert to ensure consistent energy slope, reduce perching risk, and maintain velocities within the preferred range for native fish (< 0.3m/s for general passage, < 0.1m/s for climbing species under baseflow).

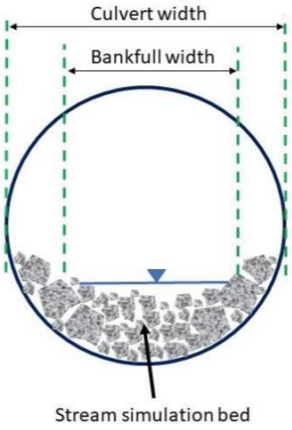



**Figure 12**. Stream Simulation Sketch (Extract from NZ Fish Passage Guidelines 2018)

- Steep Gradient Crossings

    - In steeper crossings (~6% gradient), baffles or roughened inverts should be incorporated to create resting zones and hydraulic diversity suitable for climbing species
    - Baffle spacing should follow NIWA guidance, typically 1–1.5 times the culvert diameter, and baffle height should not exceed 15% of culvert diameter to prevent debris accumulation and excessive head loss.
- Barrier Removal and Realignment
    - The perched middle culvert in the north-western tributary will be removed or re-graded to align with the natural stream bed, reinstating continuous fish passage and flow connectivity through the new stormwater wetland outfall.
- Retention Wetland Connectivity
    - Where required, the retention wetland outlet will incorporate a fish-passage capable weir within the outlet structure to maintain aquatic connectivity.
    - The outlet will provide a continuous wetted low-flow pathway to support fish passage and will be designed to maintain permanent baseflow connectivity, with internal roughness or texturing included to assist fish movement.
    - Vertical risers may be incorporated within the scour/scruffy manhole structure as an emergency overtopping measure during large storm events or blockage scenarios. These risers will be configured so they do not impede fish passage, with low-level cut-outs or similar features provided to maintain uninterrupted low flows and aquatic connectivity.
- SH 59 Roundabout Culvert
    - The 110 m Taupō Stream culvert will be installed at the existing stream gradient, with an inverted gravel bed to mimic the natural channel and promote hydraulic roughness.
    - Culvert alignment will be straight and consistent with the existing channel to avoid turbulence or flow separation.
    - Although downstream passage is currently limited by existing barriers, this culvert will be constructed to be fish-passage capable, providing for future connectivity improvements should downstream remediation occur.

Overall, the proposed culvert and wetland system will remove existing barriers, provide continuous aquatic connectivity, and result in a net improvement to fish habitat and passage relative to the current condition. Specific fish passage design details will be developed and finalised during the detailed design phase.

## 6.14 SCOUR AND EROSION

All stormwater outlets will be designed with energy-dissipation and scour-protection measures to prevent erosion of outlet channels, embankments, and downstream receiving environments. Materials and treatments will be sized to suit the discharge velocity at each outlet, in accordance with the Wellington Water Regional Standard for Water Services and TR2013/018, Hydraulic Energy Management: Inlet and Outlet Design for Treatment Device.

Many outlets are located at the base of steep embankments, where stormwater is conveyed by pipes discharging into gullies or retention wetlands. These piped sections are required to prevent uncontrolled surface flow and associated slope scour. Where velocities warrant, internal baffles or step-down structures will be incorporated within the pipes to further dissipate energy prior to discharge.

At each outlet, suitable erosion-resistant materials (rock, concrete, or geotextile reinforcement) will be used to stabilise the outfall zone. If additional energy-dissipation device, such as riprap aprons, bubble up manholes, or rock-mattress outfalls they will be provided to reduce flow velocity at discharge.

Vegetated riprap and native planting should be established around all outlet and receiving areas to promote long-term slope stability and natural filtration.

# 7.0 HYDROLOGY & HYDRAULIC MODELLING

## 7.1 OVERVIEW

Hydrological and hydraulic modelling for the Mt Welcome development was undertaken to assess peak flow attenuation, network performance, and hydrological neutrality. A summary of the key parameters and results is provided below, with the full model outputs included in Appendix C.

## 7.2 HYDROLOGY & HYDRAULIC MODELLING

The hydrological and hydraulic modelling for this development has been undertaken using Autodesk InfoDrainage (2025) in accordance with the Wellington Water Reference Guide for Design Storm Hydrology Standardised Parameters for Hydrological Modelling (April 2019) and the Regional Standard for Water Services. The model applies the SCS Curve Number (CN) method for runoff estimation, consistent with Wellington Water's standardised hydrological parameters

Soil infiltration and initial abstraction parameters were informed by site-specific geotechnical investigations, which confirmed the presence of low-permeability silt and clay soils characteristic of the surrounding area. Composite curve numbers ranging from CN 68 (pervious surfaces) to CN 98 (impervious surfaces) were adopted and applied consistently across both pre- and post-development scenarios. Attenuation and storage within the proposed retention wetlands have been represented in the model.

The InfoDrainage model simulates both sub-catchment hydrology and the hydraulic performance of the primary piped network. A two-dimensional (2D) surface-flow component was not included; therefore, localised overland-flow or surface-flooding effects under 1 % AEP events are considered qualitatively rather than dynamically modelled.

## 7.3 RAINFALL

Rainfall inputs were sourced from NIWA HIRDS v4 for the Whenua Tapu rainfall station (ID 140806), incorporating RCP 6.0 (2081–2100) to account for climate-change allowance. Figure 13 and Figure 14 below presents the design rainfall distribution curves exported from the model, illustrating the temporal pattern applied to all simulated design storms.

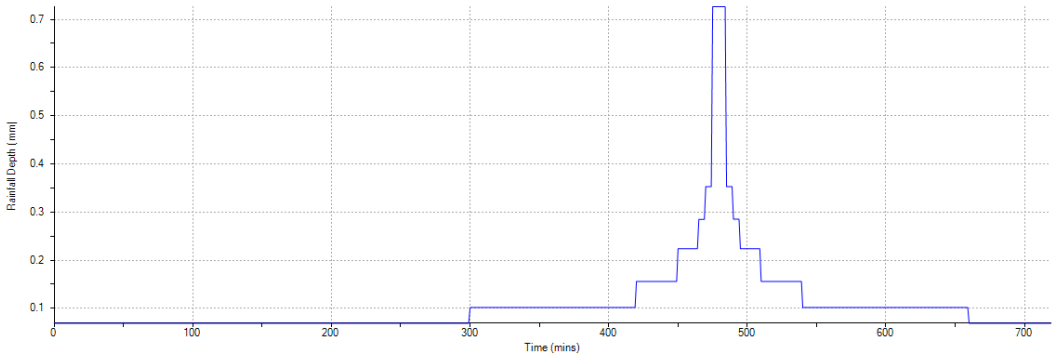



**Figure 13.** 10% AEP Rainfall Distribution

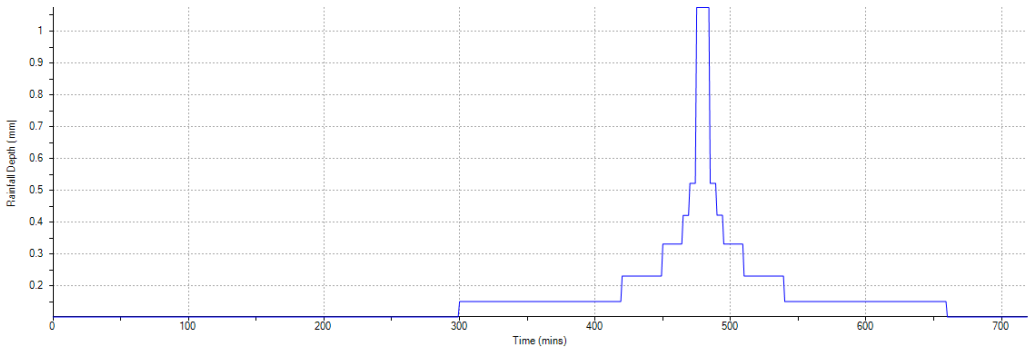



**Figure 14.** 1% AEP Rainfall Distribution

The below table outlines hydrological control based on the Greater Wellington Hydrological Control Guidance Note September 2025.

**Table 11.** Retention & Hydrological Control

| Design Criteria | Parameter | Reference |
|---|---|---|
| HIRDS v4 location | Whenua Tapu (ID 140806) | Historic baseline (no CC uplift) |
| 2-yr ARI, 24-h depth | 68.1 mm | From HIRDS v4 |
| Water-quality storm depth | 22.7 mm ≈ 23 mm | = (2-yr, 24-h) ÷ 3 |

In lieu of site-specific data, data collected at the closest regional rain gauge at the Taupō Stream at the Whenua Tapu site (ID 140806) indicates that the average annual rainfall in the general site area is approximately 1,040 mm/year.

## 7.4 HYDROLOGICAL RETENTION RESULTS

PDP's hydrological modelling confirms that the proposed retention wetlands effectively manage post-development flows, with wetlands modelled to be wetter or unchanged more than 99% of the time and experiencing fewer dry-season drawdowns. The retention systems provide permanent or near-permanent water levels, attenuate 1% and 10% AEP peak flows, and collectively support hydraulic neutrality across the development. Ephemeral streams retain their overall character, with reduced peak-flow durations.

For full modelling results, water-level time-series, and detailed water-balance calculations, refer to the PDP Hydrology Assessment.

## 7.5 PEAK FLOW RESULTS

The results and comparison points below assess pre- and post-development conditions at key catchment outlets, rather than solely at the pond discharge points. These locations capture a broader range of contributing areas, including outlets that do not discharge to the main retention wetland, including the SH59 upgrades. The "T" catchments ultimately discharge to the Taupō Swamp, while the "K" catchments discharge to the Kauko Stream.

**Table 12**. Summary of stormwater model outputs.

| | 10% AEP | | 1% AEP | |
|---|---|---|---|---|
| Catchment | Pre Dev (L/s) | Post Dev (L/s) | Pre Dev (L/s) | Post Dev (L/s) |
| T1 | 1583 | 1512 | 2788 | 2674 |
| T2 | 188 | 209 | 330 | 325 |
| T3 | 797 | 823 | 911 | 945 |
| T (Total) | 4057 | 3920 | 6869 | 5937 |
| K | | 2285.3 | | 3504.2 |
| Muri | 100 | 83 | 176 | 113 |


**Figure 15.** Pre/Post Comparison Outlets

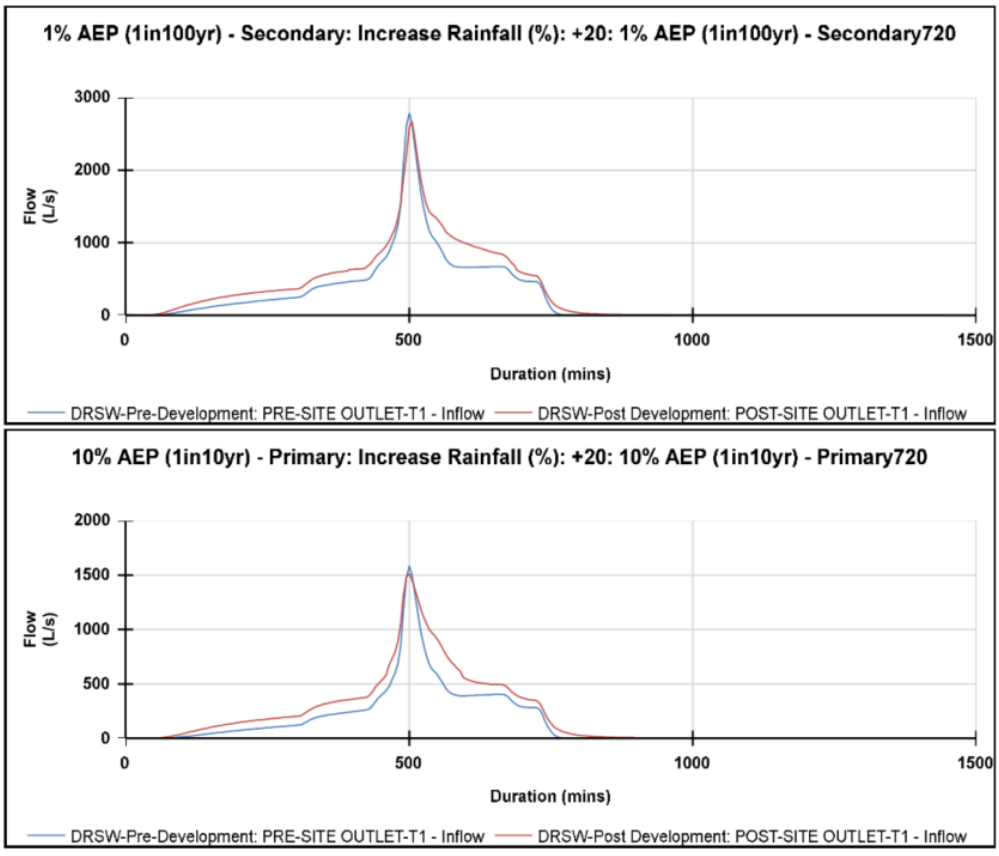



**Figure 16.** Pre and Post Development Comparison **(T1)** for the 10- and 100-Year Storm Events

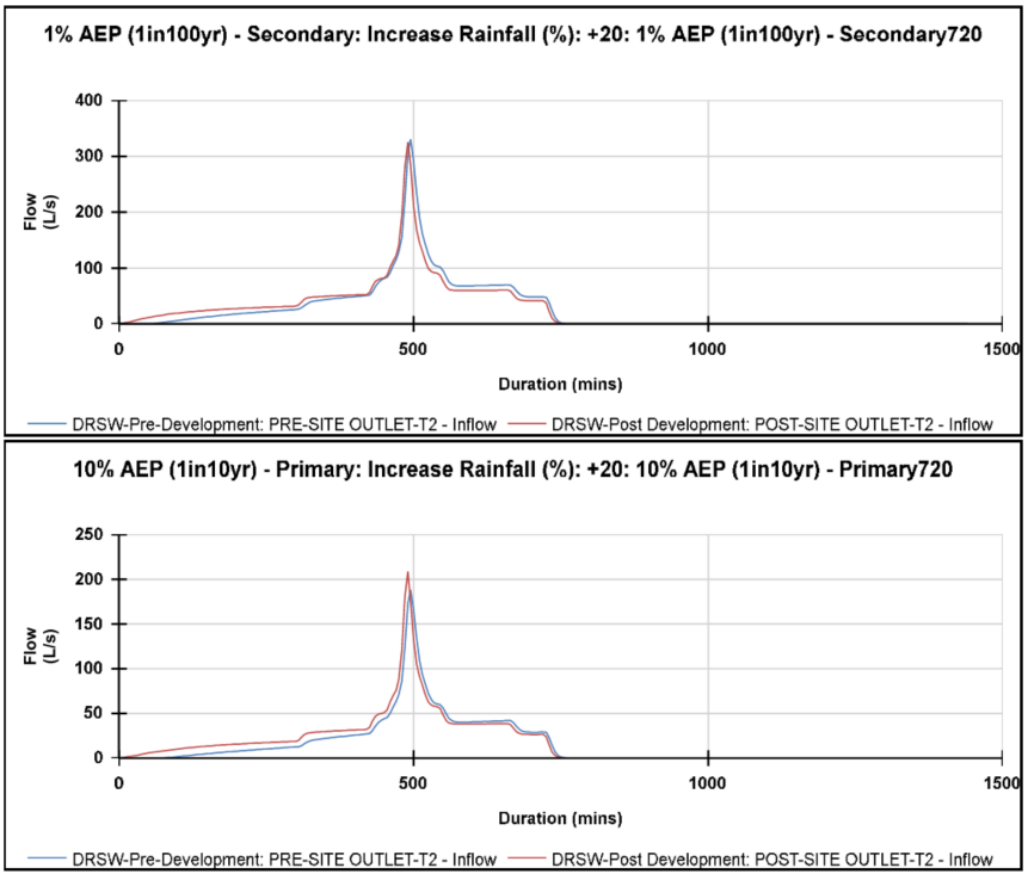



**Figure 17.** Pre and Post Development Comparison **(T2)** for the 10- and 100-Year Storm Events

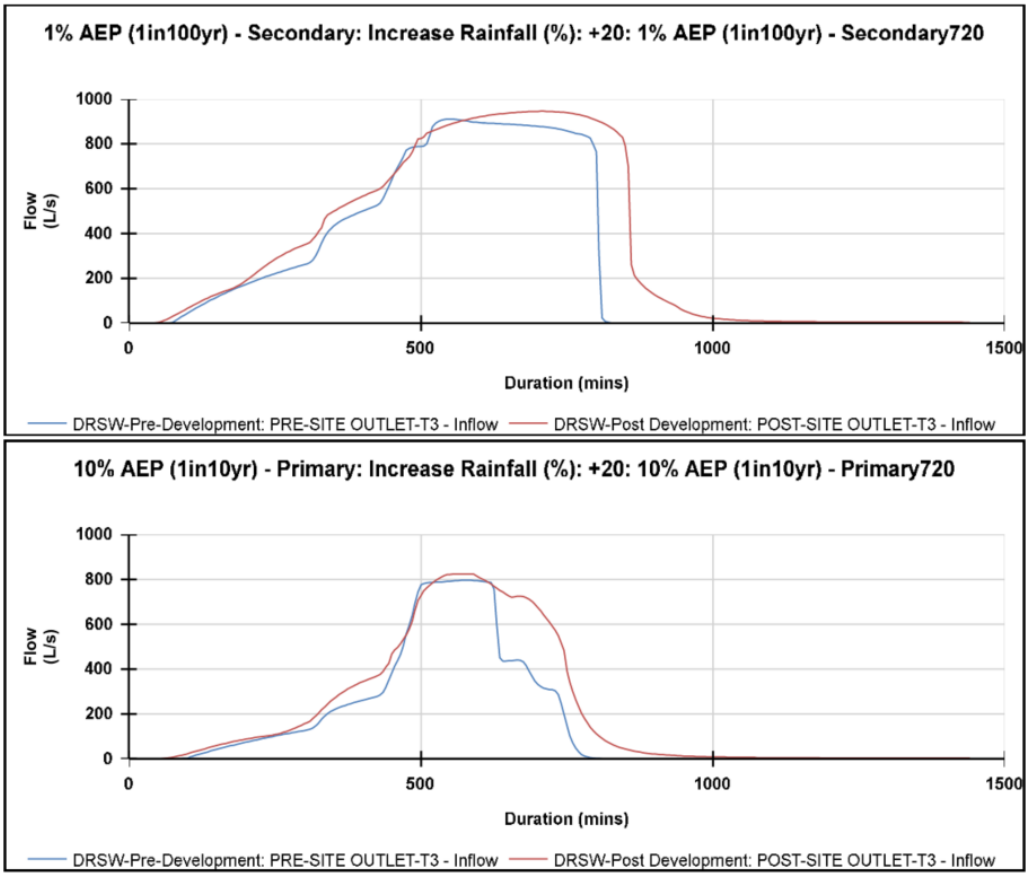



**Figure 18.** Pre and Post Development Comparison **(T3)** for the 10- and 100-Year Storm Events

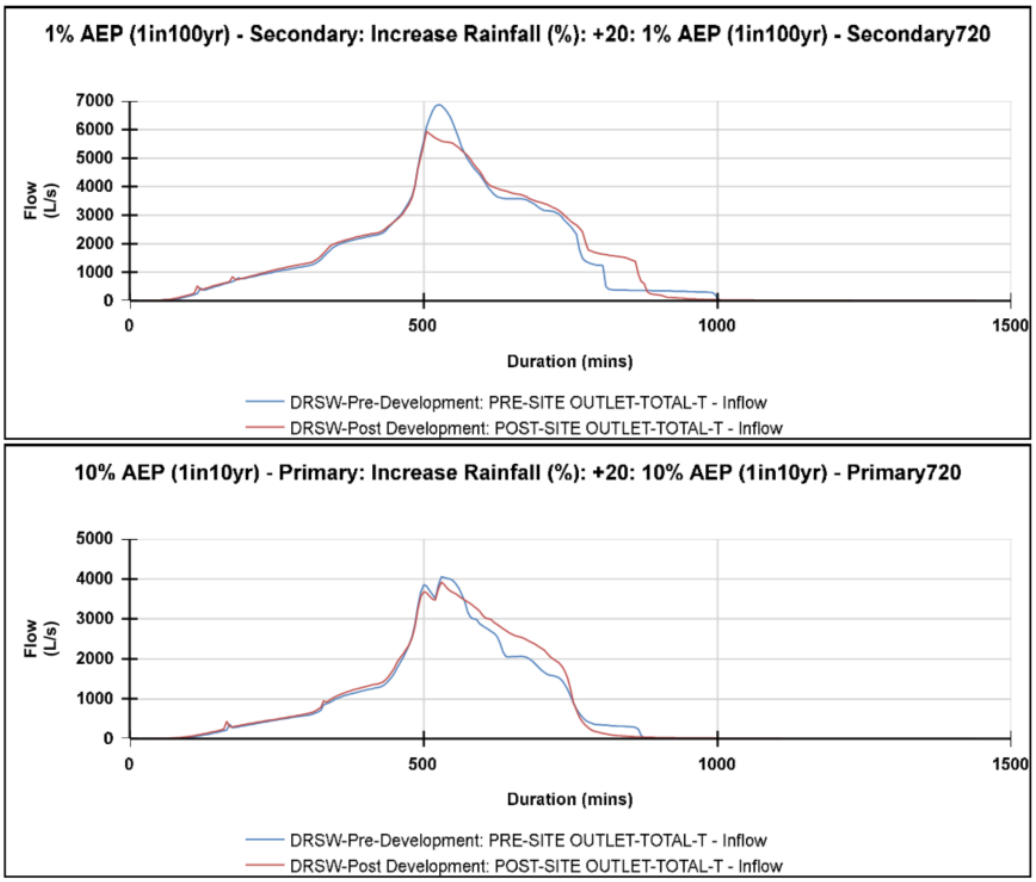



**Figure 19.** Pre and Post Development Comparison **(T-T)** for the 10- and 100-Year Storm Events

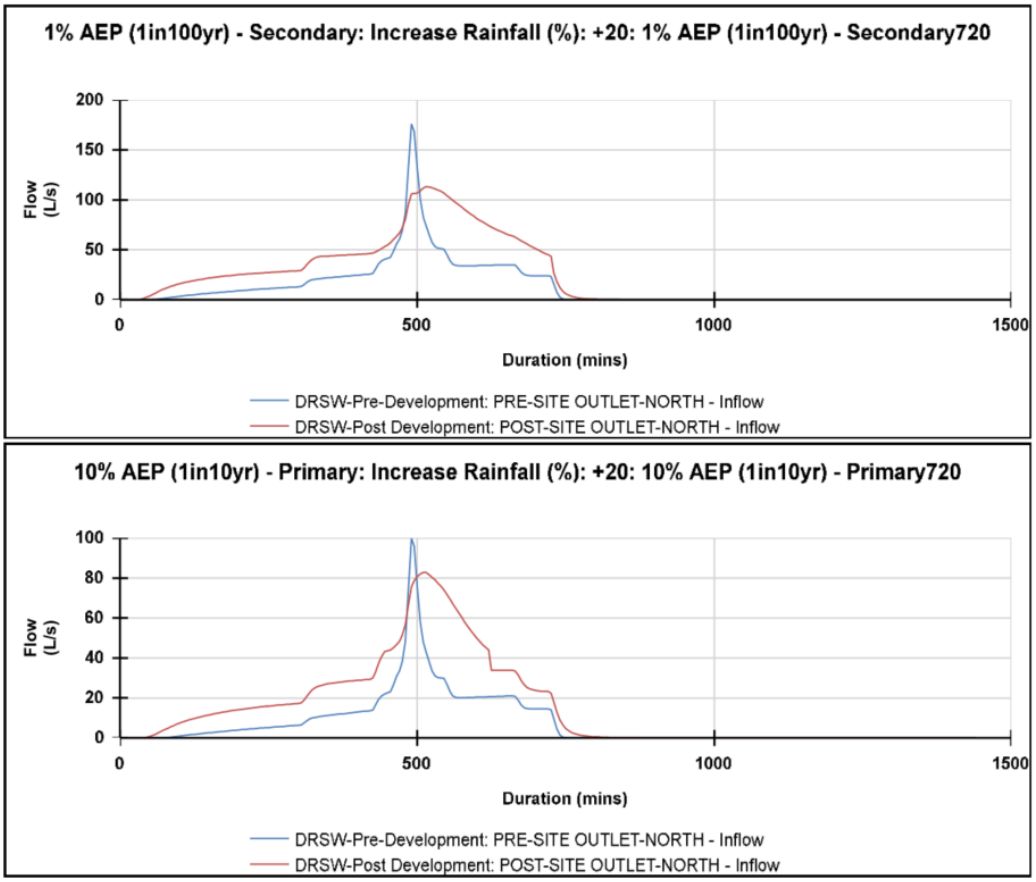



**Figure 20.** Pre and Post Development Comparison **(Muri)** for the 10- and 100-Year Storm Events

## 7.6 SUMMARY

The hydrological and hydraulic modelling confirms that the proposed stormwater management system achieves hydraulic neutrality, effective peak-flow attenuation, and maintains suitable wetland and downstream hydrological conditions. Key outcomes include:

- Peak flows are reduced or closely matched to pre-development levels across major catchments for both 10% and 1% AEP events.
- Retention wetlands maintain or improve water levels more than 99% of the time, with fewer dry-season drawdowns.
- Hydraulic neutrality is achieved through integrated raingardens, piped networks, and retention wetland storage.

Full model outputs and detailed calculations are provided in Appendix B, C and D and the PDP Hydrology Assessment.

# 8.0 ASSET OWNERSHIP, OPERATION & MAINTENANCE

## 8.1 OWNERSHIP AND VESTING

All stormwater infrastructure located within road reserves, drainage reserves, and communal open spaces—including piped networks, manholes, raingardens, wetlands, and attenuation basins—will be vested in Porirua City Council and managed under Wellington Water's asset management framework.

Private laterals serving individual lots will remain the responsibility of the property owner beyond the boundary.

Where shared access lots (JOALs) are proposed, the underground piped network will be vested to Council, protected by a stormwater easement registered over the private land. However, catchpits within private accessways are expected to remain privately maintained, managed collectively by the benefiting lots through a residents' association or encumbrance.

The ownership and long-term maintenance of raingardens serving private roads will be discussed further with Wellington Water to determine whether vesting or private maintenance is preferred.

If these isolated treatment devices are to remain privately maintained, a proprietary treatment system may be adopted as an alternative to simplify the long-term maintenance regime while maintaining equivalent treatment performance.

## 8.2 ACCESS AND SAFETY PROVISIONS

All stormwater treatment and attenuation devices will include dedicated maintenance access for inspection, cleaning and media replacement.

- Maintenance access (3.0m wide, maximum gradient 1V:6H) will be provided to all centralised bioretention devices and ponds. This access extends around raingardens at a similar width to enable inspection and maintenance.
- Vehicle access (3.0 m wide) will be provided to and across all wetland retention bunds to allow desilting, maintenance, and periodic inspection.
- Council pedestrian access will be maintained to all pipes and structures located within the retention wetlands and receiving environment. Vehicle access will not be permitted in these areas to avoid damage to vegetation and wetland planting.
- Safety features, including appropriately graded batter slopes, will be incorporated where required to meet health and safety standards and Wellington Water's operational guidelines.
- Where assets are located adjacent to private property, stormwater easements will be established to provide legal access for inspection and ongoing maintenance.

## 8.3 OPERATIONS & MAINTENANCE MANUALS

Ongoing operation and maintenance (O&M) will be undertaken by Wellington Water, or by Porirua City Council following standard maintenance frequencies.

This Operation and Maintenance framework applies to all stormwater treatment and attenuation assets within the development, including raingardens and retention wetlands. These assets will be vested in Porirua City Council and managed under Wellington Water's asset-management framework following a minimum one-year maintenance and establishment period post-construction.

Standard underground stormwater networks, including pipes and manholes, will vest to Council at Section 224(c) certification and form part of the public stormwater system maintained under Wellington Water's regional operations contracts.

During the active maintenance period, the developer will carry out all operation, inspection, and maintenance activities to confirm effective vegetation establishment, hydraulic functionality, and structural integrity. A joint handover inspection with Porirua City Council and Wellington Water will be undertaken prior to vesting.

Key maintenance activities will include but are not limited to:

### Stormwater Network (outlets, sumps,)

- Regular inspection and clearing of litter, debris, and sediment from sumps and outlet structures.
- Inspection and repair of erosion, scour, or blockage at structures.

### Raingardens

- Removal of litter, debris, and sediment from inlets, outlets, and forebays.
- Re-mulching, weeding, and replanting to maintain vegetation cover.
- Sediment removal when accumulation exceeds 150 mm or 30% of the designed sediment storage volume.

### Retention Wetlands

- Maintaining permanent access to inlet and outlet structures and clearing them of debris and sediment.
- Monitoring and maintaining vegetation, and replanting as required to achieve at least 80% vegetation cover in accordance with the landscape management plans.

Detailed operations and maintenance plans will be prepared as part of the detailed design process, in accordance with the Wellington Water Regional Standard for Water Services and submitted for approval prior to vesting.

Following vesting, Porirua City Council (via Wellington Water) will assume long-term maintenance responsibility.

## 8.4 RETENTION WETLANDS

Because the wetland retention ponds will service large upstream catchments, they will need to be operational and functional while adjacent earthworks and civil staging are still underway.

To de-risk sediment and debris entering these devices during construction, it is proposed that the developer extend the maintenance period for these assets beyond the initial 1-year establishment phase, until the majority of the contributing catchment is fully stabilised and civil works completed.

This approach will allow any required cleaning, sediment removal, or replanting to be undertaken prior to final vesting, ensuring the ponds are handed over in good operational condition. This will be detailed within a detailed O&M Manual during the detailed design phase.

## 8.5 WHOLE-OF-LIFE CONSIDERATIONS

The stormwater system has been designed with long-term maintenance, renewal, and operational sustainability in mind.

- Materials comply with WWL approved materials and design lives > 100 years.

- Raingardens have been located centrally to minimise maintenance requirements
- Sediment storage volumes in treatment devices have been sized for 10 years of accumulation before desilting is required.

Overall, the stormwater infrastructure has been designed to be robust, accessible, and maintainable in accordance with Wellington Water's operational expectations and Porirua City Council's asset-management practices.

# 9.0 CONSTRUCTION PHASE MANAGEMENT

## 9.1 EARTHWORKS AND ESC

Envelope Engineering have prepared a draft Earthworks and Construction Management Plan for the site. This outlines measures to ensure the environmentally conscious completion of works at the site. It is expected that the proposed contractor will prepare a stage-specific management plan for works at the site.

As large-scale earthworks proceed, it will therefore be important to manage erosion and sediment generation carefully, requiring the need for robust erosion and sediment control measures to maintain existing water quality standards during and after construction.

It is likely that control of sediment on this site will require the use of a flocculant and the use of this would be controlled a Flocculation Management Plan (FMP).

Further details of this are described in the Construction Phase Management below and within the draft ECMP.

## 9.2 WATER QUALITY

For water monitoring, turbidity will be continuously measured at the downstream monitoring points (SW01, SW02, and SW03) for the duration of the works, in accordance with the PDP Water Quality Assessment. While this data is not yet finalised, baseline water quality will be confirmed prior to the commencement of construction. This will continue to be monitored during and after construction and is further detailed in PDPs hydrology assessment.

## 9.3 DURING CONSTRUCTION

There will need to include measures to ensure that the proposed stormwater retention wetlands and treatment devices are protected during construction works, which could include:

- Isolating treatment devices so they remain offline until their contributing catchments are fully stabilised.
- Implementing erosion and sediment controls to prevent silt-laden runoff from entering treatment systems.
- Allowing an appropriate establishment period for planting prior to commissioning each device.
- Delaying the vesting of the retention wetlands until earthworks or civil construction within the upstream catchment has been completed to a suitable benchmark.

Once a contractor is appointed, a detailed construction methodology and protection plan will be developed to ensure the wetlands and treatment devices are constructed correctly and their functionality is safeguarded throughout the remaining works.

## 9.4 POST CONSTRUCTION

The proposed stormwater system incorporates centralised attenuation, retention, and treatment devices, minimising the number of assets requiring long-term maintenance by Council. Dedicated maintenance tracks are provided alongside the bioretention devices to allow safe and efficient access for Council maintenance crews. Access is also provided to key stormwater structures within the retention wetlands.

As all stormwater is treated prior to entering the retention wetlands, these wetlands are not expected to require the same level of maintenance or sediment removal as bioretention systems.

# 10.0 ALTERNATIVES CONSIDERED

Given the site's specific conditions, opportunities, and constraints, a range of stormwater management devices have been assessed for their suitability. The existing gullies present an opportunity to integrate stormwater retention and attenuation within natural landforms, reducing earthworks and enhancing downstream environments. Given the steeper road gradients and higher residential densities, roadside raingardens are not considered a practical or effective treatment option for this development and have been designed to be centralised.

## 10.1 DEVICE ALTERNATIVES

**Table 13**. Target Load Reductions for Copper and Zinc

| Stormwater Device | Considerations | Suitability |
|---|---|---|
| Detention / Retention Basin | Provides peak-flow attenuation and supports hydrological stability of downstream environments. Can be integrated into existing gullies due to geotechnical limitations. | Yes – within existing gullies |
| Roadside Raingardens | Generally unsuitable for steeper roads due reduced treatment area and high flow velocities. | No |
| Centralised Raingardens | Suitable. Can be sized for 85% MARV treatment and located at existing flow paths. Centralised systems simplify long-term maintenance. | Yes |
| Tree Pits | Effective for localised treatment of small impervious areas but limited capacity for large catchments | No |
| Wetlands | Large area requirement to achieve hydrological and water-quality performance. Difficult to accommodate within the steep terrain and geotechnical constraints on earthworks areas. | Yes – within existing gullies |
| Bioswales | Generally unsuitable for steep slopes due to high flow velocities and erosion potential. | No |
| Proprietary Treatment | Compact and modular; useful for isolated areas such as JOALs. Simplifies maintenance where vegetated raingardens are impractical. | Yes – as alternative to private raingardens |
| Soakage Devices | Ground conditions are unsuitable for infiltration and may induce local instability due to low permeability soils and shallow groundwater. | No |
| Permeable Paving | High maintenance requirement and reduced performance on steep grades. Provides minimal hydrological benefit under current soil conditions. | No |
| On-lot rainwater re-use for non-potable | Installation, operation, and maintenance are the responsibility of individual homeowners, making long-term compliance and performance difficult to ensure. Systems increase build cost and complexity, require ongoing maintenance of pumps and filters, and often deliver limited hydrological benefit during wet periods when tanks remain full.<br><br>Given the site's centralised stormwater management approach, on-lot reuse would add little additional value to overall system performance. | No - not adopted for this site |

## 10.2 PREFERRED OPTION & OUTCOMES

The preferred stormwater management approach combines conventional pipe networks for conveyance with distributed WSUD devices (bioretention basins, detention/retention ponds, and wetlands) integrated within existing gullies.

This approach:

- Meets Wellington Water's Level of Service and RSWS v3.0 performance objectives for flow, water quality, and retention.
- Aligns with GWRC PC1 hydrological control policies by managing the frequency, volume, and quality of runoff before discharging to sensitive receiving environments.
- Minimises earthworks by utilising natural gully formations for treatment and attenuation, reducing disturbance and enhancing ecological outcomes.
- Balances constructability, cost, and long-term maintenance by centralising treatment in accessible locations while maintaining distributed hydrological control.
- Supports mana whenua and community outcomes through improved water quality, reduced downstream erosion, and enhancement of natural waterways and wetlands.

Overall, the preferred option provides a practical, resilient, and environmentally responsive stormwater solution that achieves the required technical, ecological, and cultural outcomes for the Mt Welcome development.

# 11.0 STORMWATER IMPACT ASSESSMENT

This SMP has been compiled to comply with the information requirements required by Schedule 29 of GWRC Plan Change 1. This section is included for ease of reference.

**Table 14.** GWRC Plan Change 1 – Schedule 29 Requirements

| Requirement | Design Response |
|---|---|
| Site evaluation: the site must be assessed for its topography, soil type, land use, drainage patterns (including wetlands/water courses), natural features, topographical and geotechnical constraints and potential flood areas. | Section 3 of this report provides a comprehensive site evaluation, prepared in consultation with the wider project team and supported by technical inputs referenced in the SMP |
| Catchment evaluation: analyse catchment wide characteristics and requirements (utilising existing local authority stormwater management strategies where available) to consider the proposed development in a broader stormwater discharge and receiving environment context to understand relevant catchment issues, including flooding, climate change projections (frequency and volume), water quality and any additional design or mitigation measures required to address wider catchment matters. | Section 3 of this report provides a comprehensive catchment evaluation, prepared in consultation with the wider project team and supported by technical inputs referenced in the SMP |
| Stormwater discharge calculation: calculation of stormwater discharge volumes and flow rates along with analysis of stormwater contaminant generation from and new and/or redeveloped impervious surfaces. | Sections 7 and 8 of this report present the stormwater discharge modelling results, including runoff volumes and peak-flow rates for new and redeveloped impervious areas. Contaminant load assessments prepared by PDP, are referenced in this report and confirm the adequacy of the proposed treatment approach. |

| Requirement | Design Response |
|---|---|
| Identification of actual and potential stormwater impacts: undertake evaluation of the actual and potential impacts on the receiving environment, including water quality, natural flow regimes of waterways, soil erosion, flooding, changes in hydrology and climate change (frequency and volume). | Effective for localised treatment of small impervious areas but limited capacity for large catchments |
| Implementation of Water Sensitive Urban Design principles: provide an analysis of how Water Sensitive Urban Design measures have been identified and incorporated into the site design and layout, building and road/paving materials and features and how existing natural features and new stormwater treatment systems have been enhanced and integrated to mimic natural processes. | Sections 7 and 8 of this report assess the actual and potential stormwater impacts on the receiving environment through detailed hydrological and hydraulic modelling.<br><br>Modelling results completed by Envelope and PDP confirm that post-development discharges are hydraulically neutral, with water quality and hydrological effects mitigated through the proposed stormwater management devices |
| Mitigation measures: Assessment of proposed mitigations to reduce the effect of stormwater discharges on water quantity and quality, including the approach to treat in accordance with Schedule 28 (contaminant treatment) and implement hydrological control. Measures must support achieving relevant target attribute states (beyond zinc and copper) for ecosystem health, including nutrients, visual clarity and E. coli or enterococci. | Sections 7 and 8 evaluate mitigation for water quality and quantity, including 85% MARV treatment and contaminant removal per Schedule 28. Hydrological control and Contaminant load modelling reports prepared by PDP confirm compliance. |
| Operation and maintenance of stormwater management systems: analyse the long-term (life-cycle) operational and maintenance requirements including funding mechanisms and identification of persons responsible for ongoing maintenance. | Section 9 details the operation and maintenance requirements, identifies responsible parties, and outlines management mechanisms to ensure ongoing performance. |
| Cultural considerations: to be informed by engagement with mana whenua. | Section 4 describes how this plan aligns with Te Mana o te Wai and has been informed by engagement with mana whenua to protect and enhance freshwater values. |

# 12.0 CONCLUSION

This Stormwater Management Plan presents an integrated approach to managing stormwater for the Mt Welcome development. The proposed system combines hydrological control, water-quality treatment, and conveyance to ensure the development operates effectively and in accordance with local council rules and guidelines. Key outcomes of the SMP include:

- Post-development peak flows are reduced or comparable to pre-development levels.
- Retention Wetlands provide stable long-term retention and support hydraulic neutrality across all catchments.
- Raingardens and the treatment train effectively remove sediment, metals, and nutrients from impervious runoff.

- Improved land cover and treatment devices result in cleaner, lower-impact discharge to downstream environments.
- The primary network meets WWL levels of service, with defined overland flow paths and maintenance access.
- Devices can be isolated during construction, with erosion and sediment controls ensuring protection until systems are established.

## 13.0 ADHERENCE TO THE EXPERT CONDUCT CODE.

While this is not a matter before the Environment Court, the author of this report has read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023 ('Code'). The author has complied with the Code in the preparation of this report.

The data, information, facts and assumptions the author has considered as part of this report are set out in this report. The reasons for the conclusions of the report are also set out in this report. Unless stated otherwise, this report is within the author's expertise and the author has not omitted to consider material facts known to him that might alter or detract from the opinions expressed.

## 14.0 LIMITATIONS

This report has been prepared for the project described to us and its extent is limited to the scope of work agreed between the client and Envelope Engineering Limited. No responsibility is accepted by Envelope Engineering Limited or its directors, servants, agents, staff or employees for the accuracy of information provided by third parties and/or the use of any part of this report in any other context or for any other purposes.

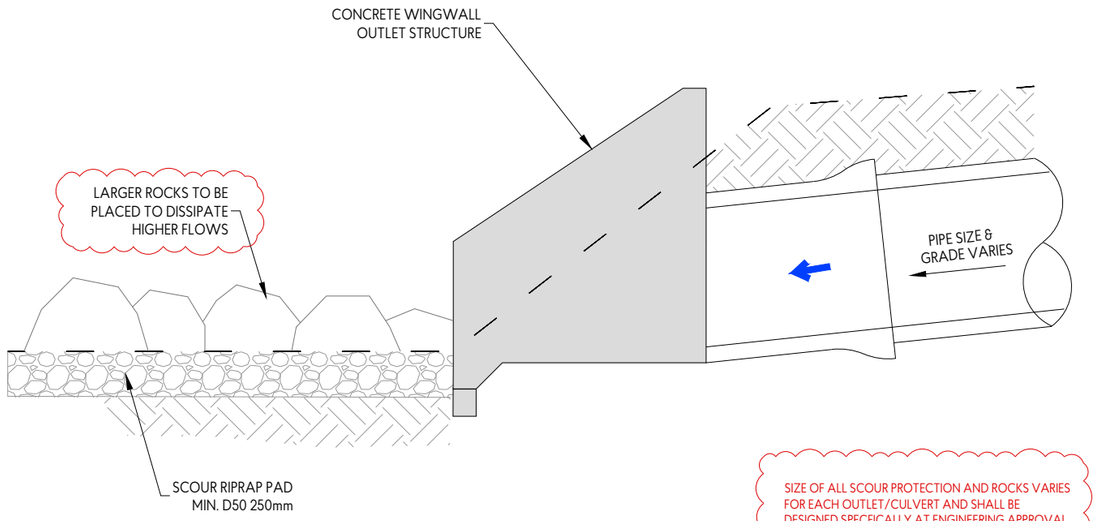
# APPENDICES

# APPENDIX 1 ENGINEERING PLANS

The full drawing package is provided as a separate attachment.

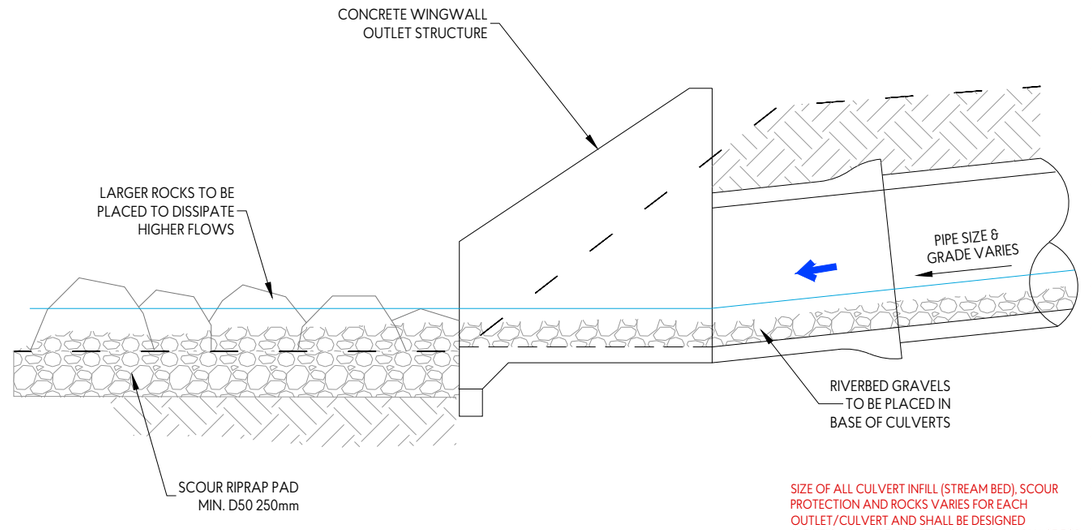
NOTES:

1. DETAILS SHOWN ARE TYPICAL DETAILS.
2. DETAILED SPECIFIC STORMWATER OUTLETS FOR EACH OUTLET WILL BE DESIGNED AND SUBMITTED FOR APPROVAL AT ENGINEERING APPROVAL.



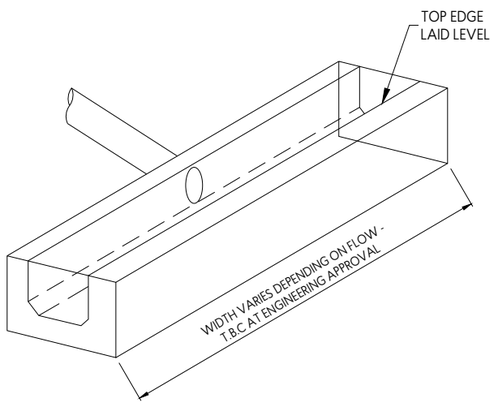

TYPICAL STORMWATER DISCHARGE
HEADWALL OUTLET

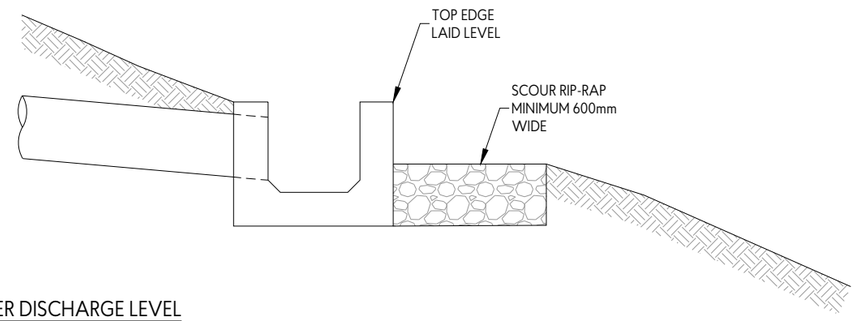
SIZE OF ALL SCOUR PROTECTION AND ROCKS VARIES FOR EACH OUTLET/CULVERT AND SHALL BE DESIGNED SPECFICALLY AT ENGINEERING APPROVAL PHASE FOR EACH OUTLET/CULVERT.




TYPICAL STORMWATER CULVERT & DISCHARGE
HEADWALL OUTLET WITH FISH PASSAGE

SIZE OF ALL CULVERT INFILL (STREAM BED), SCOUR PROTECTION AND ROCKS VARIES FOR EACH OUTLET/CULVERT AND SHALL BE DESIGNED SPECIFICALLY AT ENGINEERING APPROVAL PHASE FOR EACH OUTLET/CULVERT IN ACCORDANCE WITH NEW ZEALAND FISH PASSAGE GUIDELINES.




TYPICAL STORMWATER DISCHARGE LEVEL
SPREADER OUTLET - OPTION 1



REVISIONS:

| REV | NOTES | BY | DATE |
|---|---|---|---|
| R1 | RESOURCE CONSENT ISSUE | PWJ | 13-11-2025 |
| R2 | SW OUTLET WITH FISH PASSAGE ADDED | PWJ | 04-06-2026 |

PROJECT:

PUKERUA PROPERTY GROUP LP
MT WELCOME - PUKERUA BAY
PORIRUA

TITLE:

TYPICAL STORMWATER OUTLET DETAILS
SHEET 5 OF 5

ENVELOPE
WWW.ENVELOPE-ENG.CO.NZ

DESIGNED: PWJ
DRAWN: MJP
CHECKED: KD
PLOT DATE: 04-06-2026
SCALE A1: 1:10
SCALE A3: 1:20
STATUS: RESOURCE CONSENT
PROJECT No: 1753-02
DRAWING No: 4904
REVISION: R2

# APPENDIX 2 STORMWATER CALCULATIONS

| | |
|---|---|
| **Client** | Pukerua Property Group LP |
| **Project Site** | Mt Welcome |
| **Envelope Ref** | 1753-02 |
| **Version** | 1 |
| **Date** | 3/6/2026 |

*Outputs from ICM Cut-Off Model*

## POST DEVELOPMENT - 10 YEAR

| Culvert ID | Diameter | Length | Grade | Note | MODEL ID-POST | Model Diam | Length (m) | Gradient (m/m) | Max flow (m³/s) | Max velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|---|
| P-30 | 750mm | 56m | 1.20% | Replace E-02 with 750mm Dia | SW-OUT-94-1.1 | CIRC | 46.5 | 1.2% | 1.7 | 3.1 |
| P-31 | 375mm | 56m | 10.00% | Second High Level Inlet With E-03 | SW-IN-94-1C.1 | CIRC | 14.8 | 10.0% | 0.1 | 3.9 |
| P-32 | 1500 x 1000 Box | 45m | 2.00% | Piping of stream to allow SH59 upgrade | SW-IN 90-3.1 | RECT | 54.5 | 2.0% | 3.7 | 1.8 |
| P-33 | 1500 x 1000 Box | 58m | 3.00% | Piping of stream to allow SH59 upgrade | SWMH 90-2.1 | RECT | 57.5 | 3.0% | 3.7 | 1.8 |
| P-34 | 600mm | 10m | 3.60% | Extension of E-06 | EX-SW-IN-02.1 | CIRC | 51.2 | 3.6% | 1 | 2.9 |
| P-35 | 600 to 900 mm | 60.5m | 1.5% to 6% | Retention Wetland B Outlet | SWMH 01-2 (SD-IN).1 | CIRC | 57.5 | 6.0% | 1.1 | 1.5 |
| P-36 | 450 to 675 mm | 36m | 10% to 15% | Retention Wetland C Outlet | SWMH 23-2 (SD-IN).1 | CIRC | 31 | 10.0% | 1.1 | 2.9 |
| P-37 | 600mm | 28m | 14% to 25% | Retention Wetland A Outlet | SWMH 20-2 (SD-IN).1 | CIRC | 26 | 14.0% | 1.2 | 3.5 |
| P-38 | 900mm | 44m | 3.50% | Road/Stream Crossing | SW-IN 74-2.1 | CIRC | 41.5 | 3.5% | 1.8 | 2.6 |
| P-39 | 600mm | 10m | 2.00% | Replace E-18 with 600mm Dia | SW-IN 73-2.1 | CIRC | 10 | 2.0% | 1 | 2.7 |
| P-40 | 350 to 2100 mm | 28.5m | 5% to 6% | Retention Wetland E Outlet | SWMH 72-2.1 | CIRC | 25.5 | 6.0% | 4.1 | 3.8 |

## POST DEVELOPMENT - 100 YEAR

| Culvert ID | Diameter | Length | Grade | Note | MODEL ID-POST | Model Diam | Length (m) | Gradient (m/m) | Max flow (m³/s) | Max velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|---|
| P-30 | 750mm | 56m | 1.20% | Replace E-02 with 750mm Dia | SW-OUT-94-1.1 | CIRC | 46.5 | 1.2% | 2.4 | 4.2 |
| P-31 | 375mm | 56m | 10.00% | Second High Level Inlet With E-03 | SW-IN-94-1C.1 | CIRC | 14.8 | 10.0% | 0.3 | 4.6 |
| P-32 | 1500 x 1000 Box | 45m | 2.00% | Piping of stream to allow SH59 upgrade | SW-IN 90-3.1 | RECT | 54.5 | 2.0% | 8.1 | 2.6 |
| P-33 | 1500 x 1000 Box | 58m | 3.00% | Piping of stream to allow SH59 upgrade | SWMH 90-2.1 | RECT | 57.5 | 3.0% | 8.1 | 2.6 |
| P-34 | 600mm | 10m | 3.60% | Extension of E-06 | EX-SW-IN-02.1 | CIRC | 51.2 | 3.6% | 1 | 3.1 |
| P-35 | 600 to 900 mm | 60.5m | 1.5% to 6% | Retention Wetland B Outlet | SWMH 01-2 (SD-IN).1 | CIRC | 57.5 | 6.0% | 1.9 | 2.5 |
| P-36 | 450 to 675 mm | 36m | 10% to 15% | Retention Wetland C Outlet | SWMH 23-2 (SD-IN).1 | CIRC | 31 | 10.0% | 1.5 | 3.7 |
| P-37 | 600mm | 28m | 14% to 25% | Retention Wetland A Outlet | SWMH 20-2 (SD-IN).1 | CIRC | 26 | 14.0% | 1.5 | 4.4 |
| P-38 | 900mm | 44m | 3.50% | Road/Stream Crossing | SW-IN 74-2.1 | CIRC | 41.5 | 3.5% | 2.5 | 3.7 |
| P-39 | 600mm | 10m | 2.00% | Replace E-18 with 600mm Dia | SW-IN 73-2.1 | CIRC | 10 | 2.0% | 1.1 | 2.7 |
| P-40 | 350 to 2100 mm | 28.5m | 5% to 6% | Retention Wetland E Outlet | SWMH 72-2.1 | CIRC | 25.5 | 6.0% | 6.1 | 4.7 |

# APPENDIX 3 INFODRAINAGE OUTFLOW SUMMARY

# APPENDIX 4 INFODRAINAGE CONTROL SUMMARY

# APPENDIX 5 FLOOD RISK REPORT

## Appendix D: Geotechnical Advice

# Site Memorandum

| | | | |
|---|---|---|---|
| **Project Name** | Mount Welcome | | |
| **Memo Topic** | RFI response | | |
| **Memo Date** | 4 June 2026 | **ENGEO Project No.** | 019796.000.002 |
| **To** | William Dorset | **Copy** | |
| **Author** | Karen Jones | **Reviewer** | NA |

## 1 Introduction

ENGEO Ltd was requested to provide a response to the request for more information ('RFI') for the reports we have provided for the Mount Welcome development at Pukerua Bay. The 22 RFIs and covering letter (ref 1015972.2000 dated 2 April 2026) have been provided by Tonkin and Taylor on behalf of the Porirua City Council.

The RFIs and our responses are attached to the rear of this document as Appendix 1 in a spreadsheet form.

| RFI number | T+T Review Comments | ENGEO Response |
|---|---|---|
| **Site Investigation and Ground Model** | | |
| 1 | The number and spacing of intrusive investigation points appear insufficient to capture the anticipated variability in subsurface conditions across the site. The ground model should be supported by an appropriate level of intrusive investigation (e.g. boreholes and test pits) and laboratory testing to define soil and rock stratigraphy, groundwater conditions, areas of weak ground or uncontrolled fill, and any evidence of slope instability. As a guide, MBIE Module 2 Table 2.1 recommends a minimum number of investigation locations based on site area. | The geology of the site is not particularly variable and we consider that the investigation undertaken are sufficient for this stage of the project. Module 2 recommends 166 investigation locations. We have completed 50 and completed a comprehensive site walkover to identifiy geological and geomorphological features. Given the topography there are many parts of the site that are inaccesible for borehole rigs and excavators. An appropriate level of supervision will be required during the earthworks stage to continually reference the ground conditions to the geological model. |
| 2 | In the material properties and slope stability analyses, loess and colluvium have been treated as a single unit. This assumption may not be appropriate, as it does not account for differences in soil structure and the collapsible behaviour of loess and its sensitivity nature to saturation and disturbance. Further justification or sensitivity assessment is required. | For this reason we assumed very conservative parameters for the colluvium/loess unit and have used parameters for loess rather than colluvium. Limit equilibrium slope stability modelling software does not model differences in soil structure and collapsible behaviour. We have modelled the loess/colluvium unit in each slope model with a cohesion of 1 to reflect its sensitivity to saturation. Therefore we do not consider that a sensitivity assessment is required. |
| **Liquefaction and Seismic Hazards** | | |
| 3 | Liquefaction-prone soils are identified within low-lying gullies and valleys; however, the assessment appears to focus on building platforms and does not clearly address wetlands or embankments constructed from unsuitable materials. Please provide information on liquefaction risks and associated consequences for these features. | We have provided a plan showing the areas where there are gully areas containing possible liquefiable soils and the proposed locations of the wetlands and the unsuitable embankment. This shows that three of the five wetlands are not within areas expected to contain potentially liquefiable soil. The ground in the proposed location of the two wetlands in gullies may be liquefiable. The proposed location of the unsuitable embankment is partially within a gully with potentially liquefiable soil. At this stage, investigations in the base of the gullies is not possible due to restricted/difficult access. Where there is potentially liquefiable soil, any fill embankments will be founded on rock or keyed in below any liquefiable material and suitable drainage will be installed. |
| 4 | Liquefaction potential within the low-lying gully and the post-seismic stability of the embankment constructed from unsuitable material, including the potential for flow failure, do not appear to have been assessed and should be addressed. | The main gully is not being developed, apart from a wetland being constructed within it (see above). We have modelled the seismic stability of the unsuitable material in Appendix 9 of the report using conservative geotechnical parameters and conservative gradients. As stated above, any fill embankment will be founded on rock or keyed in below any liquefiable material and suitable drainage will be installed. Failure of the unsuitable embankment is expected in a ULS event. We have based our risk assessment on likelihood and consequence of failure and, because the likelihood of failure is low and consequence is low as there are no structures near or below the toe of the slope, the risk to life or injury in a ULS event is low. |
| 5 | The estimated seismic-induced slope displacement ranges from 120 mm to 1400 mm. Please provide an assessment of the potential effects of these displacements on underground services. | The estimated slope displacements quoted are for ULS events. Underground services are not expected or required to remain operable after a ULS event. Underground services are, however, required to remain operable post SLS event. The majority of the services will be located beneath the roadways. Of the slopes we modelled where there may be small scale failures in a SLS event, these failures are expected either from slopes below building platforms or above building platforms where underground services are not expected to be located. All services will be located outside the potential failure zones where possible, or slope stabilisation measures will be put in place, such as, the use of geogrid. |
| **Slope Stability and Rock Behaviour** | | |
| 6 | The slope stability analyses do not appear to account for persistent defects or unfavourably oriented discontinuities within the rock mass. It is unclear how unfavourable defects would be managed if encountered, including any mitigation measures. | Due to the high density of fractures within Greywacke rock, it is not practical to assess continuous rock defects until the cuts are excavated. An engineering geologist will be onsite regularly during construction to identify any unfavourable or persistent defects. Slopes will be either modified if possible or suitable engineering solutions will be installed, such as, rock bolting or anchored mesh, or catch fences where suitable. |
| 7 | Results of the slope stability analyses indicate that anticipated seismic displacements for the proposed fill batters are likely to be moderate to large. Mitigation measures will be required for these batters to reduce displacement risk under ULS earthquake loading. A feasibility-level design should be provided to demonstrate that suitable mitigation options are achievable. | In Section 8.2 we acknowledge that mitigation measures will be required for all fill batters due to the expected seismic displacement; mitigation will likely be either reducing the slope angles or geogrid reinforcement. We provide a slope model of the slope with the largest expected displacements (Section B) which includes the installation of geogrid beneath the building platforms. This indicates that it is possible to achieve a reduction in the expected displacement. With the geogrid as shown the displacement reduces from 340-440mm to 100-200mm in a ULS event. Note that this geogrid arrangement is not the final design. |
| **Drainage, Erosion and Fill Performance** | | |
| 8 | Please provide design details of subsoil drainage for fill slopes over gullies or within areas of significant fill depth, including discharge locations. | Slope specific subsoil drainage for fill slopes will be designed in conultation with the civil engineer. Typically, a subsoil drain will be placed up the centre of the gully at the beginning of the project. After this, laterial subsoil drains will be placed at the rear of the fill embankments at 1/3rd increments up the slope which tie into the central gully drainage trench. Additionally, during earthworks, if seepage is encountered during excavation of fill benches, this will be captured with drainage (wrapped novocoils) tied into the centre gully drainage trench. |
| 9 | ENGEO recommends diverting free-flowing water away from fill slopes and applying hydroseeding. However, the erosion control approach is not clearly defined, including surface water interception, drainage pathways, and discharge locations. Further detail is required. | The 10-year event is contained within the piped network, with erosion protection detailed at each outlet and discharge locations shown on the stormwater design plans. Scour and erosion for stormwater outlets will be designed in accordance with the SMP (Section 6.14) and detailed at detailed design. Given the steep network, 100-year flows are largely contained within the network; where overland flow occurs, it runs down the batters at shallow depths and low velocities, with batters to be planted. The 100-year flow paths are shown in the Envelope Flood Risk Assessment and Flood Maps. |
| 10 | If seepage is encountered in exposed cut faces, please comment on mitigation measures to manage slumping, muddy flows, and other associated instability. | If this occurs, drainage will be installed/drilled into the slopes to discharge to the base of slope. |
| 11 | Please provide details of measures to manage surface water and groundwater infiltration. | Surface water is managed in accordance with the stormwater plans and SMP, with flows directed through the network to the designated management areas and devices |
| 12 | In the slope stability analysis, please consider the potential for increased pore water pressure or saturation of fill embankments due to surface water infiltration, particularly where site-won materials contain a high proportion of fines. | In our slope models we have modelled each slope with raised groundwater as well as a saturated fill surface to consider the effects of surface water infiltration. |
| 13 | Some fill embankments will disrupt existing natural drainage paths. Please outline mitigation measures to maintain overland flow continuity. | All existing flow paths have been designed with outlets to match the pre-development discharge. This has been informed by ecology and hydrology input to ensure existing hydrology and flow paths are respected |
| 14 | Discharge locations of stormwater pipes are shown; however, outlet details are not provided. If discharging to gullies, please confirm whether erosion assessments have been undertaken and provide details of mitigation measures. | Scour and erosion for stormwater outlets will be designed in accordance with the SMP (Section 6.14) and detailed at detailed design. |
| 15 | For cut batters greater than 8 m where loess soils are present, please provide details of the proposed erosion design to mitigate the development of tunnel gullies. | Erosion controls will need to be slope-specific and will be completed at detailed design stage. Surface water will be directed away from the cut slopes with the use of cut-off drains at the crest of slopes and slopes will be planted to minimise erosion. SED zones will be detailed in the completion report if loess is present on building platforms. |
| **Materials, Settlement and Ground Conditions** | | |
| 16 | ENGEO considers the risk of collapsible soils to be very low; however, this is not clearly justified given the presence of loess. | Where there is loess soil beneath structures, the majority of the this will be removed therefore the risk is low. Where loess remains, drainage will be installed to direct water away. SED zones will be detailed in the completion report if loess is present on building platforms. |
| 17 | Please comment on the erodibility of loess soils and the potential effects of sediment generation on stormwater systems, including proposed management measures. | Where stormwater flows over loess soil, erosion is possible. Overall sediment loss will be reduced with retirement from grazing, planting and stormwater diversion. Rain gardens have been designed in accordance with Wellington Water standards and will capture 90% of sediment from the reticulated stormwater system. The project ecologist has confirmed that there will be some natural load from undeveloped areas of the site into retention wetlands, but this will be less than is occurring at present and wetlands will be able to receive the sediment without needing to be cleaned out. Stormwater flow will not be concentrated within loess cuts or embankments. |
| 18 | ENGEO notes potential differential settlement for buildings on mixed cut and fill ground; however, the feasibility of foundation solutions to address this has not been demonstrated and requires clarification. | Where this occurs this will be clearly stated in the completion report as a specific engineer design zone and will need to be considered during house design - by a notice on the title if required |
| 19 | Please identify contingency measures to address potential subgrade settlement. | If soft subgrade is encountered, this will be excavated and removed. |
| 20 | Please outline remedial options for areas containing non-engineered fill, weak ground, or unsuitable materials where undercutting is not feasible (e.g. due to groundwater). | We do not anticipate any non-engineered fill in areas where it cannot be excavated. In the unlikely event that areas of weak ground or unsuitable material are encountered where structures are required, preloading of the ground may be utilised. |
| **Stormwater Wetlands and Embankments** | | |
| 21 | ENGEO proposes stormwater retention wetlands using site-won soils; however, ground conditions and associated geotechnical risks in these areas have not been clearly defined. Further clarification is required. | Evaluation of ground conditions and associated geotechnical risks have been assessed based on boreholes and test pits in the general areas as well as laboratory testing. Results are intended to be used to inform derivation of geotechnical parameters and assessment of the embankment geometry and configuration. ENGEO will complete a detailed design report (Overseen by a Recognised Dam Engineer (PIC/DSAP) concerning each of the wetlands which will include:<br>- Determination of pre-development groundwater levels.<br>- Determination of ground model (geological stratigraphy).<br>- Derivation of geotechnical engineering parameters for soils used in modelling.<br>- Computational slope stability and seepage analyses of stormwater embankments. We will complete iterative design of the embankments until acceptable FoS are achieved for all design cases to meet NZSOLD Dam Safety Guidelines (2024).<br>- Consolidation / settlement analysis of embankments (using Settle 3).<br>- Production of a Detailed Dam Design Report summarising laboratory test results and analyses for each of the stormwater embankments, including geotechnical recommendations for soil parameters, design slopes for the proposed stormwater embankments and conduit penetration recommendations.<br>- Liaison with Civil Engineers and complete plan check on their drawings and advise on relevant earthworks specifications pertaining to the Wetland Embankments. |
| **Earthworks within covenant areas** | | |
| 22 | Covenant areas within the proposed development are protected by way of Conservation Covenants under section 77 of the Reserves Act 1977. Please clarify if proposed earthworks are likely to impact on the two covenant areas shown within Lot 1311. | The Lot 1311 covenant area does not currently exist and will be created through a conservation covenant being placed on the title when created through the subdivision process following the completion of earthworks, refer to proposed conditions of consent 101, 102 and 114 in Appendix 7 of the Substantive Application. |

## Appendix E: Ecological Advice

BlueGreen Ecology Ltd
M [redacted]
E [redacted]
W BlueGreenEcology.nz

02 June 2026
Pukerua Property Group LP (CC: Torrey McDonnell, William Dorset)

Email: William.Dorset@classicdevelopments.co.nz

Dear Pukerua Property Group

Following on from the Fast Track Panel formation conference, a meeting was held with GWRC on 28 May 2026 and their consultant freshwater ecology reviewer (Gareth Taylor). It was agreed that I would undertake a formal SEV measurement and calculation of the unnamed tributary of the QEII stream that is required to be piped if the SH59 access must contain an NZTA dedicated roundabout, and from there recalculate the offset requirements.

For context, in the ecological assessment, I had predicted a conservative current SEV score of 0.65 and a resultant post culvert (with substrate bottom and no change to wetted width or velocities) SEV of 0.3 and that the offset through riparian enhancement (and some instream woody debris additions) gain 0.2 SEV on a averaged 0.4 current score which is typical of pastoral high erosion streams in Wellington. The benefits being shade, surface stormwater filtration, vegetation not stock, reduced bank erosion, instream complexity additions etc).

On Monday 1 June, I undertook 10 transects SEV measurements and collected the other data relevant to running the SEV model (I have used the 2013 model). Photos of each transect are attached.

The following is a copy of the functional scoring columns from the model.

| Function category | Function | Variable (code) | Mt Welcome | MTW culvert |
|---|---|---|---|---|
| | | Vchann | 0.75 | 0.10 |
| | | Vlining | 0.98 | 0.00 |
| | | Vpipe | 1.00 | 1.00 |
| **Hydraulic** | **NFR** | **=** | **0.83** | **0.07** |
| | | Vbank | 0.54 | 0.00 |
| | | Vrough | 0.82 | 0.00 |
| **Hydraulic** | **FLE** | **=** | **0.44** | **0.00** |
| | | Vbarr | 0.00 | 0.00 |
| **Hydraulic** | **CSM** | **=** | **0.00** | **0.00** |
| | | Vchanshape | 0.80 | 0.20 |
| | | Vlining | 0.98 | 0.00 |
| **Hydraulic** | **CGW** | **=** | **0.92** | **0.07** |
| | | **Hydraulic function mean score** | **0.55** | **0.03** |
| | | Vshade | 0.58 | 1.00 |
| **biogeochemical** | **WTC** | **=** | **0.58** | **1.00** |
| | | Vdod | 0.50 | 0.50 |
| **biogeochemical** | **DOM** | **=** | **0.50** | **0.50** |

| | | | | |
|---|---|---|---|---|
| | | Vripar | 0.60 | 0.00 |
| | | Vdecid | 1.00 | 1.00 |
| **biogeochemical** | **OMI** | **=** | **0.60** | **0.00** |
| | | Vmacro | 1.00 | 1.00 |
| | | Vretain | 0.90 | 0.20 |
| **biogeochemical** | **IPR** | **=** | **0.90** | **0.20** |
| | | Vsurf | 0.50 | 0.37 |
| | | Vripfilt | 0.80 | 0.00 |
| **biogeochemical** | **DOP** | **=** | **0.65** | **0.18** |
| | | **Biogeochemical function mean score** | **0.65** | **0.38** |
| | | Vgalspwn | 0.40 | 0.00 |
| | | Vgalqual | 0.25 | 0.00 |
| | | Vgobspwn | 0.10 | 0.10 |
| **habitat provision** | **FSH** | **=** | **0.10** | **0.05** |
| | | Vphyshab | 0.75 | 0.38 |
| | | Vwatqual | 0.27 | 0.38 |
| | | Vimperv | 1.00 | 1.00 |
| **habitat provision** | **HAF** | **=** | **0.69** | **0.53** |
| | | **Habitat provision function mean score** | **0.40** | **0.29** |
| | | Vfish | 0.00 | 0.00 |
| **Biodiversity** | **FFI** | **=** | **0.00** | **0.00** |
| | | Vmci | 0.84 | 0.44 |
| | | Vept | 1.00 | 0.11 |
| | | Vinvert | 0.77 | 0.16 |
| **Biodiversity** | **IFI** | **=** | **0.87** | **0.24** |
| | | Vripcond | 0.76 | 0.00 |
| | | Vripconn | 0.00 | 0.00 |
| **Biodiversity** | **RVI** | **=** | **0.00** | **0.00** |
| | | **Biodiversity function mean score** | **0.29** | **0.08** |
| | | **Overall mean SEV score (maximum value 1)** | **0.506** | **0.203** |

The spreadsheet used and the data therein is available on request.

The result of the formal SEV measurements and calculation is a current SEV of 0.51, which, given the true left side is influenced to a reasonable degree by the SH 59 proximity, is to be expected.

Further the SEV is unlikely to be better than 0.51 as the SH59 influences on stream values are unlikely to change, and other improvements (such as the fish barrier issue) are unlikely to be addressed or too difficult to improve. In short, the improvement of the 0.51 current SEV is not resting on the usual simple aspects of removal of stock and creation of riparian vegetation.

The result of a long pipe (110m) where the diameter and gradient allow retention of the velocity, substrate and wetted width, is a little less than the example I used (0.3) attained from another stream pipe example (i.e. 0.2).

The resultant ECR formulation is:

**(0.51-0.2) / (0.6-0.4) = 1.55** -i.e. an ECR of 1m lost stream to 1.55m stream improvement – noting both streams are circa average 1.5m in width.

Using a current SEV of 0.51 and a post-culverting SEV of 0.20, and assuming an offset site improving from 0.40 to 0.60, the resulting ECR is 1.55:1. This means that for every 1 m of stream lost, 1.55 m of stream enhancement is required

This is without the multiplier of 1.5 added which is used most often to reflect a default or to account for a lag time in the improvements of gains at the offset work.

The AEE reported a 1: 1.75 ECR (which also did not use the multiplier, but that fact had not been explained in the report).

I do not consider that the multiplier should be applied, firstly because default of success would be a breach of conditions and there is no difficult site circumstance of condition that makes removal of stock, fencing, native revegetation or installation of large woody debris difficult or at risk of success.

While the riparian vegetation to be planted will take between 5 and 10 years to provide shade and drop leaf litter and invertebrates directly into the stream, the fencing off and planting and weed management etc will change the erosion susceptibility of the banks, the woody inputs will have an immediate benefit, and the filtration of stormwater over the surface through vegetation will function from the time of the fencing. In short, while the shade component will take approximately 7-10 years, most of the other functions and gains of riparian edge treatment occur sufficiently quickly that a true lag time for in-stream habitat gains of the SEV are not sufficient to warrant (in my opinion) such a multiplier.

Under this revised SEV -ECR outcome the requirements for the extent of west kakaho improvements would technically be reduced by a small amount (23m).

The report states that (page 54) 193m of perennial stream requires enhancement to offset the 110m culverting of the Taupo stream

Now the 110m piping requires 170.5m or the west kakaho main stem to be enhanced.

Yours sincerely
Dr Vaughan Keesing

Ecologist

02.06.2026
BlueGreen Ecology Ltd.

Transect 1

Transect 2

Transect 3

Transect 4

Transcect 5

Transcect 6

Transect 7

Transect 8

Transect 9

Transect 10

## Appendix F: Transport Advice

**Stantec New Zealand**
Level 3, 2 Hazeldean Road
Addington, Christchurch 8024
NEW ZEALAND
Mail to: PO Box 13052, Christchurch 8140

4 June 2026

Project No: 310206500

Incite
P O Box 2058
Wellington 6140

**Attention: Torrey McDonnell**

Dear Torrey

**Reference: Mt Welcome – Response to Council Comments on Transport Matters**

This letter has been prepared to inform the memorandum from the Applicant that responds to directions from the Panel Convener in Minute 3 (dated 27 May 2026) which requests further information relating to transport matters, specifically in respect of individual lot vehicle crossings, as part of their Fast Track application completeness review.

The relevant extract from the Council's assessment is provided below:

| | | |
|---|---|---|
| Transport | Insufficiently detailed | An *Integrated Transport Assessment* is provided at Appendix 14.<br><br>Locations of vehicle crossings are not identified on the roading plans. This does not provide sufficient information for the resource consent sought under rule TR-R2 of the Porirua District Plan 2025 or an assessment of the effects. |

In providing a response, the table below provides a detailed assessment of the relevant Transport Chapter standards as they relate to the design and layout of vehicle crossings. Where potential non-compliances have been identified, an assessment of any associated effects has been provided.

| Ref | Standard | Assessment |
|---|---|---|
| **TR-S3** | **Design of Vehicle Access** | |
| 1. | The vehicle access must be designed to achieve the design speeds, minimum widths, maximum gradients and seal requirements in TR-Table 2.<br><br>*Based on TR-Table 2, individual lot driveways are classified as a Vehicle Access Level 1, requiring the following:*<br>• *Maximum Gradient: 20%*<br>• *Movement lane: 2.75-3m*<br>• *Where an access rises to the road, the maximum gradient must be 5% within 6m of the road boundary.* | **Individual Lot Driveways**<br><br>**Will comply.**<br>Individual lot driveways can be designed to achieve a Level 1 formed width.<br><br>Whilst details of internal driveway gradients for individual lots will be confirmed at next stage of design, a review of the building platform levels relative to the adjoining road carriageways indicates all driveways can be formed to achieve a maximum gradient of 20%.<br><br>Where driveways slope up towards the road, they will be designed to achieve a maximum gradient of 5%, to maintain adequate sightlines between drivers and |

| Ref | Standard | Assessment |
|---|---|---|
| | | pedestrians on adjoining footpaths (ensuring the vehicle bonnet does not obstruct the driver's field of view), supporting safe visibility at the site boundary. Again, review of the building platforms relative to the road levels confirms this can be achieved. |
| 2. | Provision for turning in a common area must be designed in accordance with TR-Figure 1. | **Does not apply.**<br>Not required for vehicle crossings serving individual residential lots. |
| 3. | A Vehicle Access Level 4 must include streetlighting provided in accordance with the following:<br>a. Streetlighting must be designed in accordance with NZ Transport Agency document M30 Specification and Guidelines for Road Lighting Design (2014);<br>b. Streetlighting bulbs must be on the Waka Kotahi NZ Transport Agency List of M30 Approved Luminaires.<br>c. Streetlighting columns must comply with the Waka Kotahi NZ Transport Agency M26:2012 and M26A:2017 Specification for Lighting Columns.<br>d. Streetlighting columns in Private Ways Level 4 must be a minimum of 8m in height. | **Does not apply.**<br>Not required for vehicle crossings serving individual residential lots. |
| 4. | Pedestrian walkways, cycleways and shared paths in vehicle access areas must comply with the:<br>Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling (2017) | **Does not apply.**<br>Not required for vehicle crossings serving individual residential lots. |
| **TR-S5** | **Vehicle Crossings** | |
| 1. | The spacing of vehicle crossings along a road frontage must not be less than the dimensions in TR-Table 3. The number of vehicle crossings along any one road frontage must not exceed the number in TR-Table 4.<br>• <70m Collector and Access roads = 1 per 25m<br>• 0-16m frontage length = 1 vehicle crossing on Collector and Access roads | **Will not comply.**<br>Given that many proposed lots have frontages of approximately 15m, achieving a ratio of 1 driveway per 25 m of road frontage is not feasible.<br>It is unclear how this '1 driveway per 25m' requirement was determined, and TR-S5 provides no matters of discretion for developments that do not meet this standard. Whilst limiting driveway frequency can have traffic safety benefits, the standard is overly restrictive. The proposed driveway frequency of roughly one per 15 m is considered appropriate for the site's intended land use, and aligns with established residential patterns in similar density developments in Pukerua Bay and the wider district. |

| Ref | Standard | Assessment |
|---|---|---|
| | | In this regard, a search of the accident record for those nearby streets of Gray Street, Muri Road and Sea Vista where established driveway ratios are similar to that proposed, indicates no history of crashes occurring in the last 10-years that can be attributed to conflict between traffic turning at driveways. This is not surprising considering the low traffic generation levels typical of residential driveways. With these examples of good safety records and with low residential driveway volumes, it is assessed that the spacing of vehicle crossings not fully achieving the standard will not lead to adverse safety outcomes. |
| 2. | The length of a vehicle crossing parallel to the road must be no more than:<br>i. 3m for Vehicle Access Level 1;<br>ii. 6m for a Vehicle Access Level 2, 3 or 4; or<br>iii. 9m if heavy vehicles are to be accommodated on the site. | **Will not comply.**<br>The 3m maximum width is considered overly restrictive for the residential development of the form proposed.<br><br>Given that a number of the proposed lots are anticipated to accommodate double garages, it is expected that associated vehicle crossings will be formed at widths generally in the order of 4.5 to 5.5m, consistent with typical residential design practice as is common throughout suburban areas in the District. In such environments, driveway traffic volumes are low, and the likelihood of simultaneous vehicle and pedestrian movements at the crossing infrequent.<br><br>Accordingly, vehicle crossing widths of 4.5 to 5.5m are appropriate and consistent with typical residential subdivision design, and the associated departure from a 3m maximum is not assessed as giving rise to adverse safety or pedestrian amenity effects due to low traffic volumes and infrequent vehicle–pedestrian interactions. |
| 3. | A vehicle crossing for a site with frontage to two or more roads must connect to the road with the lower road classification. | **Will not Comply**.<br>For lots with frontage to more than one road, vehicle access will be taken from the lower order road in all instances, with the exception of 7 lots (298, 300, 351, 560, 573, 604 and 928). In each of these cases, the Site topography results in the lot levels sitting either higher or lower (by between 1 and 4.5m) than the road level on the minor frontage street, making vehicle access from that street impracticable.<br><br>The intent of the standard is interpreted to reduce side friction on higher order roads which have a predominant through-traffic function. In this instance, the collector roads in question already service a number of residential accesses on both the same and opposite sides of the road. Traffic generation associated with these seven additional residential driveways on the respective collector road frontages will be low, at less than 1 vehicle movement an hour, and will not materially affect the function, capacity, or safety of these roads. |

| Ref | Standard | Assessment |
|---|---|---|
| | | It is also noted that the proposed access arrangements for these 7 lots allow the construction of driveways that achieve the required minimum sight distance standards (where such arrangements would not be fully achievable on the minor road frontage), ensuring safer vehicle ingress and egress. |
| 4. | The minimum design vehicle used for a vehicle crossing must be a 5.2m x 1.94m vehicle (99th percentile vehicle). | **Will comply.**<br>Individual lot driveways will be designed to accommodate a B99 vehicle. |
| 5. | A vehicle crossing must not be located within 6m of an intersection tangent point as shown in TR-Figure 3.<br>A Vehicle Access Level 1 is exempt from the exclusion in respect of the kerb section marked XY, with driveways needing to be located outside of the intersection tangent point. | **Will not comply.**<br>Almost all individual driveways can achieve the separation distance from an intersection, with the exception of the 14 driveways serving lots #30, 247, 248, 272, 337, 341, 395, 543, 580, 756, 757, 781, 830, and 923. In these cases, localised constraints including changes in levels along the lot frontage relative to the street require driveways to be located opposite an intersection. It is noted this number is lower than previously indicated in the earlier compliance schedule, since it takes account of a reassessment of the clause where 'Level 1' driveways are not required to meet the 6m separation from the tangent point of the intersection, meaning fewer driveways are now non-compliant on this basis.<br>The intent of this standard is to reduce overlapping turning movement conflicts between vehicles entering and exiting driveways and vehicles turning at intersections. It is noted that such arrangements involving low volume single residential lot driveways are not unusual, and indeed a number of such examples where driveways connect opposite side roads at tee-intersections can be seen nearby on Gray Street, Muri Road and Sea Vista Drive, without adversely impacting on their safe operation.<br>A search of the accident record for these nearby streets along their length indicates no history of crashes occurring in the last 10-years that can be attributed to conflict between traffic turning at intersections and vehicles entering / exiting residential driveways. This is not surprising considering the low traffic generation levels typical of residential driveways. With these examples of good safety records and with low residential driveway volumes, it is assessed that these 14 vehicle crossings not fully achieving the minimum separation distances will not lead to adverse safety outcomes. |
| 6. | A vehicle crossing must provide a clear visibility splay for pedestrian safety from 1.0m above ground level as shown in TR-Figure 2. Where two-way access is provided at the vehicle crossing, the | **Will comply.**<br>Individual driveway crossings will be designed to ensure suitable visibility splays are provided.<br>An additional consent condition is recommended to ensure there are restrictions on boundary fencing arrangements |

| Ref | Standard | Assessment |
|---|---|---|
| | visibility splay is only required on the side adjacent to the exiting vehicle. | and landscaping, to ensure sightline splays are not adversely impacted. |
| 7. | The minimum sight distances at a vehicle crossing must be in accordance with TR-Table 5 and measured in accordance with TR-Figure 4.<br>• 50km/h speed limit = 40m sight distance<br>• 40km/h speed limit = 30m sight distance<br>• 30km/h speed limit = 25m sight distance | **Will not comply**<br>Whilst the posted speed limit within the Site will likely be 50km/h, a combination of the road geometry, gradients, and adopted road typologies will encourage lower operating speeds in the order of 40km/h.<br>At this stage, the precise location of all vehicle crossings has not been finalised, with lot-specific design typically coming later for developments of this scale. This is a common approach in vacant lot subdivisions as it provides design flexibility for future house designs.<br>In the majority of cases, driveways will be located to achieve the required sight distance. However, it is acknowledged that in some instances, such as where lots are located in proximity to horizontal curves, intersections, or where topographical constraints apply, it may not be practicable to fully achieve the specified sightline requirements based on the posted speed limit. Such situations are typically associated with tighter road geometry, where operating speeds are inherently lower, noting such circumstances are not uncommon and in practice do not present safety risks given the moderated speed environment of the adjoining road combined with the very low volume of vehicle movements at the driveways.<br>In such cases a consent condition is recommended (and has been included in the Substantive Application as Condition 31 in Appendix 7) requiring driveways where compliance with the standard is not fully met to be located to maximise sightlines. Some amendments to Condition 31 are recommended as outlined below the table. |
| 8. | A vehicle crossing must not be located within 30m of a railway crossing, measured from the nearest edge of the vehicle crossing to the nearest railway track. | **Does not apply.**<br>There are no railway crossings within 30m of the Site. |
| 9. | A vehicle crossing located within a Rural Zone must be formed in accordance with TR-Figure 5. | **Does not apply.**<br>The development area extent within the Site is zoned a mixture of Medium Density Residential Zone and Neighbourhood Centre Zone. |
| 10. | A vehicle crossing that crosses a footpath, cycleway or shared path must not exceed a crossfall gradient of 2.5%. | **Will comply**<br>The road berms, footpaths and shared paths across the Site have been designed to a 2% crossfall, and all driveways will be designed to tie-in with this gradient. |
| 11. | There must be a minimum separation of 2m along the footpath between crossings serving adjacent sites. Where two crossings on adjacent sites can be combined and the | **Will not comply**.<br>The majority of lots across the site will comply with the minimum 2m separation between adjacent vehicle crossings. A small number of lots located at the heads of |

| Ref | Standard | Assessment |
|---|---|---|
| | combined crossings do not exceed a total width of 6m at the boundary, no minimum separation distance will apply. | cul-de-sacs, where frontage widths reduce as a consequence of lot geometry, will instead be served by combined vehicle crossings. In these instances, the total crossing width will exceed 6m.<br><br>The purpose of the standard is interpreted as avoiding the formation of over-wide vehicle crossings which can adversely affect pedestrian amenity by increasing the extent of potential conflict areas along footpaths (consistent with the purpose of related standards such as TR-S5.2 above).<br><br>In this case, the combined crossings are limited to cul-de-sac environments, where traffic volumes are low and vehicle speeds are inherently constrained by the no-exit road layout. As such, the likelihood of simultaneous pedestrian and vehicle movements at these crossings is low. Accordingly, the limited departures from the 6m maximum combined vehicle crossing width are not assessed as giving rise to adverse safety or amenity effects. |
| **TR-S6** | **Design of on-site car parking spaces** | |
| 1. | Where provided on a site, car parking spaces must:<br>a. Comply with the minimum dimensions of TR-Table 6; | **Will comply.**<br>Where driveways and garages are provided on individual lots, associated car parking spaces will be designed to meet the minimum dimensions specified in TR-Table 6. |
| | b. Have a maximum gradient of:<br>i. 5% (1 vertical to 20 horizontal) for surfaces parallel to the angle of parking for non-residential activities;<br>ii. 10% (1 vertical to 10 horizontal) for surfaces parallel to the angle of parking for residential activities; and<br>iii. 6.25% (1 vertical to 16 horizontal) for surfaces at any other direction to the angle of parking. | **Will comply**<br>Given the individual residential lot nature of the development, driveways are required to satisfy the maximum 10% grade.<br>The purpose of identifying a maximum gradient within parking modules is to ensure a level of convenience for those entering / exiting vehicles and to enable the safe opening of doors (without them closing on their own - as can be the case on steep grades). Review of the lot levels shows all on-site car parks can be designed to satisfy the 10% maximum grade. |
| | c. Have a minimum height clearance of 2.3m | **Will comply.**<br>All residential garages will include a minimum 2.3m clear height. |
| 2. | For any blind aisle, the aisle must extend 1m beyond the last parking space the aisle provides access to. | **Does not apply**.<br>No off-street carparks (other than driveways serving individual residential lots) are included in this application. |

As shown, assessment of the individual lot vehicle crossings indicates some departures from TR-S5.

The current proposed consent condition #31 ‘vehicle crossings’ requires separation from intersections to be ‘maximised’ where full compliance is not achieved. It is noted this could be further refined to capture a more holistic response to design departures as follows:

Condition 31

*Individual lot vehicle crossings shall be designed to be in accordance with the standards included under TR-S5 of the Porirua District Plan where practicable. Where full compliance is not practicable, vehicle crossings will be designed to incorporate any appropriate mitigations including:*

a. *vehicle crossings shall be designed to a maximum 5.5m width to allow for access to a double garage or associated driveway, where the formation width under TR-S5.2 cannot be complied with;*
b. *vehicle crossings shall be located so as to maximise separation as far as practicable where separation distances under TR-S5.5 cannot be complied with;*
c. *vehicle crossings shall be located so as to maximise sightlines as far as practicable where driveway sightlines under TR-S5.7 cannot be complied with; and*
d. *consent notices shall be placed on lots placing restrictions on boundary fencing arrangements and landscaping, to ensure sightline splays are not adversely impacted where TR-S5.6 cannot be complied with.*

Details of the wording of this revised condition can be further developed with Council to assist the Panel.

We trust the above assessment provides the necessary clarification on the associated transport matters related to the request for additional information on individual lot driveways.

Yours sincerely

**Stantec New Zealand**

**Jamie Whittaker**
Principal Transportation Planner

# Appendix G: Construction Noise and Vibration Assessment


MARSHALL DAY Acoustics

# MT WELCOME DEVELOPMENT
# CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

Rp 001 r01 20260443 | 29 May 2026

Level 2, 5 Willeston Street
PO Box 25442
Wellington 6140 New Zealand
T: +64 4 499 3016
www.marshallday.com

Project: **MT WELCOME DEVELOPMENT**

Prepared for: **Pukerua Property Group LP**
**247 Cameron Road**
**Tauranga 3110**

Attention: **William Dorset**

Report No.: **Rp 001 r01 20260443**



## Document Control

| Status: | Rev: | Comments | Date: | Author: | Reviewer: |
|---|---|---|---|---|---|
| | - | | 19 May 2026 | H. Zhang | S. Arden |
| | 01 | Changes following first issue comments | 29 May 2026 | H. Zhang | |

Cover Photo: Creative Agency 514-806-1644

# SUMMARY

This report assesses the likely construction noise and vibration effects of the proposed Mt Welcome residential development at Pukerua Bay, including earthworks, civil and road works, and the SH59 roundabout construction. The assessment focuses on the noisiest and most vibration-intensive activities which may potentially affect nearby receivers, particularly existing dwellings on and around State Highway 59, Pukemere Way, and Gray Street. The works are expected to extend beyond 20 weeks, so long-term construction noise criteria have been applied.

- **Assessment basis:** Noise has been assessed against NZS 6803:1999 and the Porirua District Plan 2025, with reference to AAAC guidance and the NZTA construction noise and vibration guide. Vibration has been assessed primarily against DIN 4150-3:1999, with additional consideration of vibration amenity effects under BS 5228-2:2009.
- **Noise findings:** Predicted construction noise complies with the applicable guideline noise limit of 70 dB $L_{Aeq}$ at nearby occupied buildings during normal site working hours.
- **Indoor effects:** Internal noise levels are expected to remain below 45 dB $L_{Aeq}$ for most dwellings for typical and most worst-case scenarios. Some short-duration worst-case activities may result in indoor levels of 45–50 dB $L_{Aeq}$ at 434 and 422C State Highway 59 which could be audible with some effect on concentration for limited durations
- **Vibration findings:** There is no predicted risk of cosmetic building damage for most receivers. However, both amenity and cosmetic damage thresholds could be exceeded at the 422C SH59 shed/workshop if a 10-12 tonne vibratory roller is used close to the boundary (worst-case assumption). These risks are expected to be avoidable through equipment selection and work method controls.
- **Overall conclusion and recommendations:** Construction noise and vibration effects are expected to be manageable with best practicable measures. The most effective controls will be selection of quieter and lower-vibration equipment, proactive communication with neighbours, and preparation of a targeted Construction Noise and Vibration Management Plan (CNVMP) before works begin. The CNVMP should include mitigation measures, monitoring, community liaison, complaint response procedures, staff training, and building condition surveys where vibration risk is present and focus on those dwellings where guideline limits are predicted to be exceeded.

** This summary has been prepared with the assistance of AI and reviewed by us*

# TABLE OF CONTENTS

## 1.0 INTRODUCTION

We have been engaged by Pukerua Property Group to prepare an assessment of construction noise and vibration related to the proposed residential development at Mt Welcome, Pukerua Bay (the 'Site').

The full proposal is to be submitted as a fast-track consent application and involves:

- Preparation works, such as earthworks, civil works, construction (including earthworks, civil works, construction of roads, etc.)
- Building and facilities construction, including dwellings, a commercial town centre, parks, and trails/walkways
- Construction of a roundabout to State Highway 59 (the 'SH59 RAB') as the primary Site accessway

Given the scale of the project and current design stage, there is limited information regarding specific construction methodologies, durations, staging, etc. particularly around building construction and works after establishment of on-site roading. Hence, this report focuses on earthworks, civil and road construction, and SH59 RAB construction. In our experience, these construction activities are generally the noisiest and the most potentially intrusive to neighbours compared to building construction and other proposed on-site works.

This report provides our assessment of the potential construction noise and vibration effects that may arise from the proposed works. It establishes the guideline performance standards, provides predictions of the typical and worst-case noise and vibration levels, and sets out the high-level best practicable options (BPO) for construction noise and vibration management.

A glossary of acoustic terminology is included as Appendix A.

## 2.0 SURROUNDING ENVIRONMENT AND RECEIVERS

The subject site is a large rural area, located along the eastern side of State Highway 59 and south of the Pukerua Bay suburb. The Site is currently used for agriculture and includes existing dwellings, sheds, and other related structures.

The Pukerua Bay receiver buildings closest to the proposed works are located along Pukemere Way and Gray Street. When works are within the northern portion of the Site, these receivers are approximately 150 to 200 metres away. Works will generally be significantly further away from these receivers (in excess of 400 metres).

There are also other rural dwellings located outside the Site and further afield.

Appendix B shows:

- Aerial views identifying the Site, proposed development layout, and the three terraces
- The extent of the work area for the SH59 RAB
- The closest potentially noise and vibration sensitive locations. We note that some addresses may be inaccurate as these could not be confirmed via desktop review
- The identification of buildings that are or contain dwellings (based on desktop review)[1]

The proposal would only occupy the western section of the land parcel in which the Site is contained. We have assumed that all existing buildings and structures within the proposal footprint will be

[1] We should be advised if there are any additional dwellings that have been omitted from this assessment

deconstructed and removed by completion of the works. We have assumed that the dwellings (and their associated structures) to remain based on received plans to date are:

- 434 State Highway 59
- 422C State Highway 59

These will be the closest sensitive receivers to the proposed works

## 3.0 PROJECT WORKS DESCRIPTION

To carry out our assessment, we refer to the second substantive application documents for the proposal, publicly available here (the 'application documents').

For assessment purposes, we have addressed **Earthworks** and **Civil and Road Works** separately but note that in some cases, these works may be carried out concurrently. Based on the type of proposal, the information received to date, and our experience with similar projects, we have summarised the associated activities below:

- **Earthworks** – Specific methodologies have yet to be confirmed, but earthworks will be required for cut and fill, material removal/import, stabilisation of ground, and preparation of building/roading sites
    - Split into 8 stages across the proposal footprint (see the application documents for further details)
    - We have assumed the following activities: Excavator (up to 20T), loaders, trucks, and vibratory compaction (using a vibratory drum roller up to 12T)
- **Civil and Road Works** – Specific methodologies have yet to be confirmed, but works will include construction of water infrastructure, drainage systems, on-site roads, and the SH59 RAB
    - Split into 20 stages across the proposal footprint, plus the SH59 RAB (see the application documents for further details)
    - We have assumed the following activities: Excavator (up to 20T), loaders, trucks, rattle guns, paving machine, concrete pours, and grader

We have carried out our assessment of construction noise and vibration emissions by:

- Adopting methodologies that have been used on similar projects
- Modelling typical and worst-case construction noise to provide a range of potential construction noise levels at nearby receivers
- Modelling received noise and vibration levels without mitigation measures
- Assuming works will be carried out up to the boundary of the work areas as shown in the application documents
- Assuming sequential order for Earthworks stages (1 to 8) and that Civil and Road Works will follow Earthworks. This is only relevant for determining received levels at existing buildings within the Site, prior to their removal
- Assuming that existing buildings within the footprint for a stage of works would be unoccupied prior to commencement of that stage
- Assuming the total project works duration would exceed 20 weeks

We have assumed the site working hours would be from 7.30am to 6.00pm, Monday to Saturday (the 'site working hours'). Intention to work outside of these hours may warrant a further assessment as more stringent noise and vibration limits would apply.

## 4.0 ASSESSMENT APPROACH

We understand that as part of the fast-track application process to date, Porirua City Council expect an assessment of construction noise and vibration in accordance with the requirements of the Porirua District Plan 2025 (the 'District Plan').

For the assessment of construction noise and vibration, the District Plan makes reference to New Zealand Standard NZS 6803:1999 "*Acoustics – Construction Noise*" ('NZS 6803:1999') and German Standard DIN 4150-3:1999 "*Structural Vibration – Part 3: Effects of Vibration on Structures*" ('DIN 4150-3:1999') respectively.

The Association of Australasian Acoustical Consultants (AAAC) has prepared guidelines[2] ('AAAC Guidelines') for interpreting and applying NZS 6803:1999. In preparing this assessment, we have adopted these guidelines. The key elements we have adopted are summarised below:

- The NZS 6803:1999 limits should be applied as triggers to adopt BPO management and mitigation measures
- Construction noise predictions should be based on a 15-minute sample time
- Predicted noise levels for a noise assessment should include a typical range of noise levels, as well as realistic worst-case predictions
- When determining indoor noise effects, the following typical sound reduction values should be adopted
    - Partially open windows: 15 dB
    - Closed windows (older buildings): 20 dB
    - Closed windows (modern buildings): 25 dB
    - Sealed non-openable windows (modern apartment or commercial buildings): 30 dB
- We have adopted the indoor noise effects descriptions from the AAAC Guidelines in describing the potential noise effects

For works related to the SH59 RAB, we have referred to the New Zealand Transport Agency document '*State Highway Construction and Maintenance Noise Vibration Guide*' (the 'NZTA Guide') which is typically adopted for any works related to State Highways across New Zealand. The NZTA Guide includes construction noise and vibration criteria.

Additionally, we have included discussion of vibration-related amenity for a more robust assessment of potential vibration effects that could arise from the proposed works.

## 5.0 RESOURCE MANAGEMENT ACT

Regardless of compliance with any noise or vibration limits, the overarching requirement for the construction activities is to satisfy Section 16 (s16) of the Resource Management Act (RMA).

s16 states that an activity shall adopt the best practicable option (BPO) to ensure that the emission of noise does not exceed a reasonable level. Within the RMA, the definition of noise includes vibration. Additionally, Section 17 of the RMA states there is a duty to avoid, remedy, or mitigate any adverse effect on the environment.

[2] AAAC Guidelines for Interpreting and Applying NZS 6803-1999 v1.0.

# 6.0 NOISE

## 6.1 Noise Performance Standards

Rule NOISE-R2 (Noise from construction activities) of the District Plan states that noise from construction activities must be measured, assessed, managed, and controlled in accordance with the requirements of NZS 6803:1999. This is also the standard referenced in the NZTA Guide.

### 6.1.1 External Noise Levels

We have used Table 2 and Table 3 of NZS 6803:1999 to determine the guideline noise limits that apply to the proposal's construction activities.

We note that the wording of the District Plan does not mean compliance with these noise limits is required, only that an assessment is carried out and that appropriate management measures are adopted during works. This is reflected in the NZTA Guide.

The period over which the Project works are required will exceed 20 weeks. Therefore, we have applied the long-term duration noise limits of NZS 6803:1999.

Full details of the District Plan rule and guideline noise limits of NZS 6803:1999 are included as Appendix C.

In summary, the applicable guideline noise limit for all nearby receivers is **70 dB $L_{Aeq}$** during the site working hours (7.30am to 6.00pm, Monday to Saturday). Occupied dwellings have an additional limit of **85 dB $L_{AFmax}$**.

The noise limits apply at 1 metre outside the façade of buildings, and only when they are occupied.

### 6.1.2 Internal Noise Levels

Neither the District Plan nor NZTA Guide require internal noise assessments of construction noise. However, we have carried out a further assessment on nearby building occupants to provide a greater understanding of the potential indoor noise effects from construction noise.

The noise level received inside a sensitive space (e.g. a bedroom, office, living room) will depend on the external noise level, the façade performance (particularly the glazing) and the acoustics of the room.

NZS 6803:1999 states that, where it is not possible to measure at 1 metre from the façade, an internal assessment can be done instead, assuming a façade sound level difference of 20 decibels.

The responses of building occupants vary, but with effective prior engagement, can be summarised as follows for sustained construction noise, as taken from the AAAC guidelines:

- < 45 dB $L_{Aeq}$ — Unlikely to interfere with daily residential and commercial activities
- 45 – 50 dB $L_{Aeq}$ — May be audible within the building if quiet activities are occurring. Concentration may be affected
- 50 – 55 dB $L_{Aeq}$ — Annoyance for some occupants. Concentration may be affected but residential and office activities can generally continue. Sound levels for television, radio and phone conversations would need to be slightly raised.
- 55 – 60 dB $L_{Aeq}$ — Concentration likely to be affected and phone conversations may become difficult. Television, and radio levels would need to be raised. If noise continues for extended periods, people are likely to seek respite by moving to another room.
- > 60 dB $L_{Aeq}$ — Untenable for residential and most commercial environments.

## 6.2 Predicted Noise Levels

Table 1 shows the sound power levels of activities/equipment assumed to be required for the proposed works, including setback distances at which the risk of infringing the guideline noise limits begins with no mitigation implemented.

The sound power levels are sourced from British Standard BS 5228-1:2009 "*Code of practice for noise and vibration control on construction and open sites, Part 1: Noise*", and from measurements of similar equipment, carried out by us.

**Table 1: Indicative noise levels at 1m from the building façade[3] with no mitigation or screening from buildings**

| Equipment | Set of Works | Sound Power Level (dB $L_{Aeq}$) | Noise Level (dB $L_{Aeq}$) | | | Setback (m) |
|---|---|---|---|---|---|---|
| | | | 10 m | 20 m | 50 m | 70 dB $L_{Aeq}$ |
| Grader | Civil and Road | 111 | 86 | 80 | 71 | 52 |
| Plate compactor | Both* | 108 | 83 | 77 | 68 | 40 |
| Trucks | Both | 106 | 81 | 75 | 66 | 33 |
| Rattle gun | Civil and Road | 106 | 81 | 75 | 66 | 33 |
| Loader | Both | 105 | 80 | 74 | 65 | 30 |
| Paving machine | Civil and Road | 104 | 79 | 73 | 64 | 28 |
| Excavator (20T) | Both | 103 | 78 | 72 | 63 | 25 |
| Concrete truck and pump | Civil and Road | 103 | 78 | 72 | 63 | 25 |
| Static or vibratory roller | Both | 103 | 78 | 72 | 63 | 25 |
| Generator (150 kVA) | Both | 93 | 68 | 62 | 53 | 8 |
| Pump (150mm dia)/compressor | Both | 93 | 68 | 62 | 53 | 8 |

*I.e. Earthworks and Civil and Road Works

Appendix D provides our predicted construction noise levels at the dwellings closest to the Site, with no mitigation. Our predictions have been grouped by the three terraces (Lower Terrace, Upper Terrace, and Lucus Block) as the main construction 'blocks'.

We have assumed that the non-dwelling buildings identified (e.g. garages, sheds, agriculture support) are generally not occupied and so we have not included the predicted construction noise levels received at these. If required, it can be assumed that the construction noise levels received at these buildings would be the same as the associated dwelling.

We have predicted that the guideline noise limits would be complied with at all times at all nearby occupied dwellings during the assumed working hours.

Worst-case noise exposure would be plate compaction near the Earthworks boundary closest to this receiver. This would likely only be required for a short duration, and quieter forms of compaction are available.

Appendix E provides worst-case construction noise contours. These provide better resolution for how worst-case Earthworks noise emissions at receivers would change between stages. There is less

[3] In accordance with the requirements of NZS 6803:1999 (Section 6.1.1) inclusive of 3 decibels façade reflection

clarity regarding grouping of Civil and Road Works, so these contours have been presented across the full terraces and the SH59 RAB.

### 6.3 Potential Noise Effects

In accordance with AAAC Guidelines, we have predicted the internal noise levels for the same dwellings included in Appendix D by assuming an outside-to-inside façade reduction of 20 dB for each building (applied to older buildings with windows and doors closed).

We have calculated that within all dwellings, internal noise levels from construction would be <45 dB $L_{Aeq}$ for:

- Throughout typical case scenarios
- Most of the time during worst-case noise exposure

This level of noise is unlikely to interfere with daily residential activities. Further discussion on what typical and worst-case noise levels represent is also included in Appendix D.

Internal noise levels from construction of 45-50 dB $L_{Aeq}$ have been predicted for:

- 434 State Highway 59 during worst-case of SH59 Earthworks (Stage 2C) and construction
- 422C State Highway 59 during worst-case of Earthworks stage 6A

This level of noise may be audible indoors if quiet activities are occurring, and concentration may be affected.

We emphasise that the predicted worst-case levels will be for limited durations when only the noisiest activities are located at their closest positions to affected receivers. Additionally, our predictions are without any mitigation or management measures, which can be implemented to significantly reduce potential indoor noise effects.

## 7.0 VIBRATION

### 7.1 Vibration Performance Standards

Rule NOISE-R2 (Noise from construction activities) of the District Plan states that noise (which includes vibration under the definitions of the District Plan) from construction activities must be measured, assessed, managed, and controlled in accordance with the requirements of DIN 4150-3:1999.

DIN 4150-3:1999 is one of the standards referenced for the assessment of vibration in the NZTA Guide, along with British Standard BS 5228-2:2009 "*Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*" ('BS 5228-2:2009').

#### 7.1.1 Cosmetic Building Damage

DIN 4150-3:1999 includes vibration limits for avoiding cosmetic building damage, such as cracking in paint or plasterwork. The Standard states: "*Experience has shown that if these values are complied with, damage that reduces the serviceability of the building will not occur.*"

We have summarised the applicable vibration limits below. Further information relating to the Standard can be found in Appendix F.

For this Project, we've applied the long-term vibration limits (DIN 4150-3:1999 Table 3) as a conservative approach. These limits are shown in Table 2.

**Table 2: Vibration limits in horizontal plane of highest floor (DIN 4150-3:1999 Table 3)**

| Building Type | Peak Particle Velocity (mm/s) |
|---|---|
| Commercial or industrial | 10 |
| Residential | 5 |

### 7.1.2 Vibration Amenity

The main vibration concern of building owners and occupants is usually building damage, but the threshold levels of vibration perception and annoyance are much lower than what would cause damage. While certain vibration events may be comfortably below structurally significant levels, they may be intense enough to cause concern or distress among building occupants.

In-line with the NZTA Guide, we propose that the amenity effects of construction vibration are assessed in accordance with BS 5228-2:2009. The standard provides guidance on the amenity effects of vibration and is widely used in New Zealand. The descriptions are reproduced below, and are supplemented with our own descriptions for 2 mm/s and 5 mm/s (to bridge the gap between 1 and 10 mm/s in the standard):

- 0.14 mm/s PPV Just perceptible in the particularly sensitive environments
- 0.3 mm/s PPV Just perceptible in normal residential environments
- 1 mm/s PPV Typically acceptable with prior notification
- 2 mm/s PPV Clearly perceptible but typically acceptable in dwellings and workplaces if it occurs intermittently, and with effective prior engagement
- 5 mm/s PPV Highly unsettling in dwellings and workplaces. If prolonged, some occupants may want to leave the building. Computer screens will shake, and items could fall off shelves if they are not level
- 10 mm/s PPV Likely to be intolerable for any more than a very brief period

We propose 1 mm/s PPV to be the vibration trigger level at which BPO mitigation and management measure related to vibration must be adopted.

## 7.2 Predicted Vibration Levels

Table 3 shows the setback distance at which the risks of cosmetic building damage and vibration amenity trigger begin for the potential high vibration activities we have assumed for the proposal.

Our predictions are based on regression analysis of available vibration measurements. Cosmetic damage setbacks include a 100% safety factor as a conservative approach.

**Table 3: Predicted vibration setback distances from construction activities to building foundations**

| | Amenity Setback (m)[4] | Cosmetic Building Damage Setback (m)[5] | |
|---|---|---|---|
| Equipment | 1 mm/s PPV | Residential 5mm/s PPV | Commercial 10mm/s PPV |
| Vibratory roller (10-12T) | 38 | 14 | 6 |
| Plate compactor (450kg) | 12 | 6 | 3 |

[4] Based on regression analysis of available vibration measurements, no safety factor (representative)

[5] Based on regression analysis of available vibration measurements, plus a 100% safety factor (conservative)

While the exact locations where compaction will be required are currently unconfirmed, based on the Earthworks footprint there is a risk that the vibration performance standards could be infringed at some nearby buildings.

Figure 1 shows the area within the Earthworks footprint nearby the 422D State Highway 59 shed/workshop where the amenity trigger level could be exceeded by use of a 10-12T vibratory roller. There is no predicted risk for cosmetic building damage.

**Figure 1: Vibration amenity setback within Earthworks footprint for 422D SH59 (10-12T vibratory roller)**

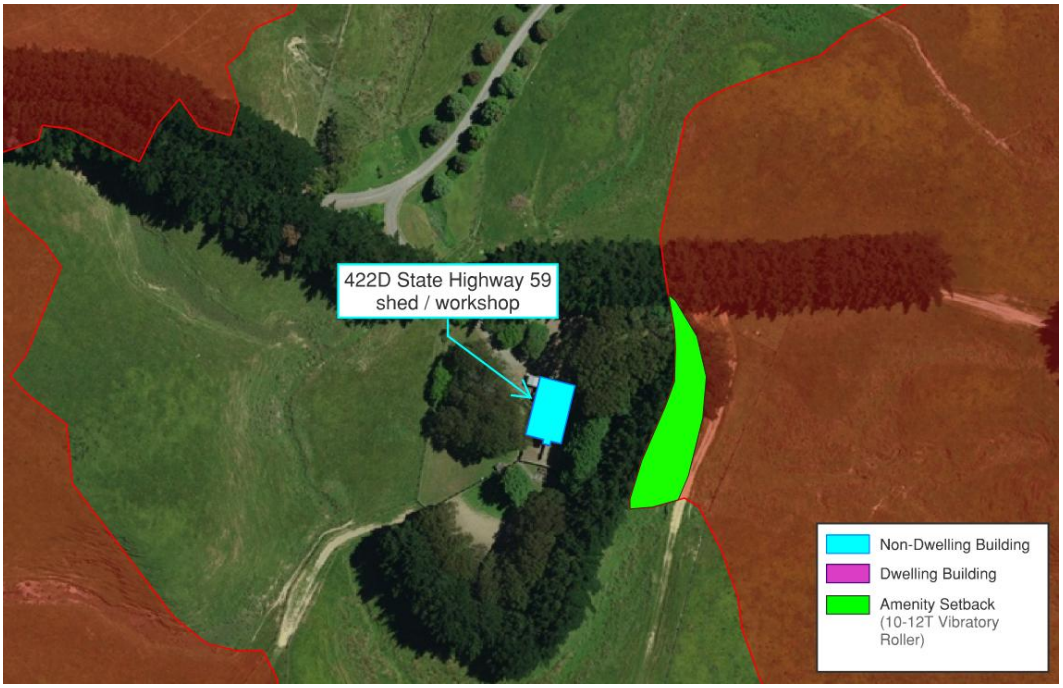
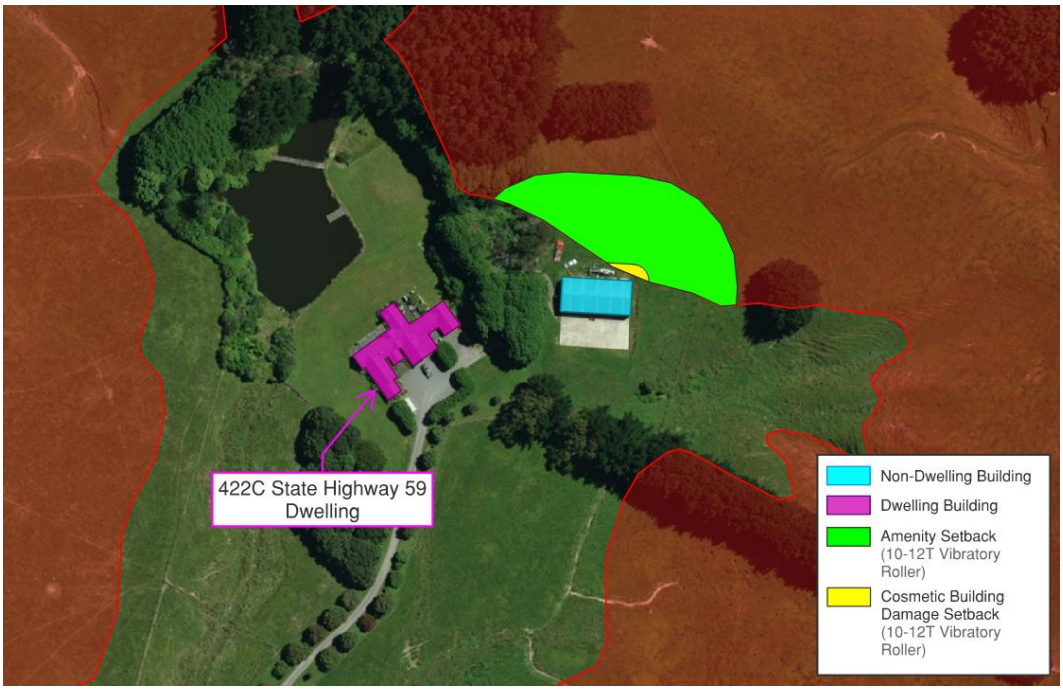



Figure 2 shows the area within the Earthworks footprint nearby the 422C State Highway 59 shed/workshop where both the amenity trigger level and cosmetic building damage limit could be exceeded by use of a 10-12T vibratory roller.

**Figure 2: Vibration setbacks within Earthworks footprint for 422C SH59 (10-12T vibratory roller)**



For both cases, use of smaller and lower-vibration compaction equipment would enable acceptable received vibration levels in respect of both amenity and avoiding cosmetic building damage.

There are no other predicted construction vibration risks at other receiver buildings.

## 8.0 MITIGATION AND MANAGEMENT

### 8.1 High-level Recommendations

Given that compliance with the NZS 6803:1999 noise limits has been predicted at all receivers throughout the proposed works, we expect equipment selection and communication with neighbours to be the most effective measures to reduce the risk of any potential construction noise effects. We recommend such management is implemented as even when compliance with noise limits is achieved, noise complaints may still arise.

Selection of equipment suitably sized for the work would help to ensure construction noise is no louder than necessary, and prior notification to neighbours that construction noise may at times be audible generally eases undesirable responses.

The same measures can be adopted for construction vibration, but with strict avoidance for risk of cosmetic building damage. This is readily achievable with selecting appropriately sized equipment.

### 8.2 Construction Noise and Vibration Management Plan

The most effective way of managing noise and vibration from the site would be to prepare and implement a Construction Noise and Vibration Management Plan (CNVMP) once methodologies have been confirmed.

The CNVMP can be targeted to address only those dwellings where the construction noise guideline limits or the vibration damage/amenity limits are predicted to be exceeded which can change/be verified with monitoring.

The overarching intent of such a CNVMP should be s16 of the RMA which, in summary, states that an activity shall adopt the BPO to ensure that the emission of noise does not exceed a reasonable level. Within the RMA, the definition of noise includes vibration. Section 17 of the RMA also states that there is a duty to avoid, remedy or mitigate any adverse effect on the environment.

The emphasis of the CNVMP should be on managing noise and vibration effects on occupants of surrounding buildings. A CNVMP would provide project-specific mitigation, management, and contingency measures to enable the minimisation of any potential noise effects to the greatest possible extent.

In respect of construction vibration, the CNVMP could provide guidance on pre-condition building surveys if risk of cosmetic building damage is expected, and establish vibration amenity trigger levels as complaints may still arise despite compliance with building damage limits.

The CNVMP could also provide guidance on monitoring, complaints response, and staff training procedures.

We recommend a CNVMP is prepared by a suitable qualified person and submitted to Porirua City Council for certification, prior to the commencement of any works.

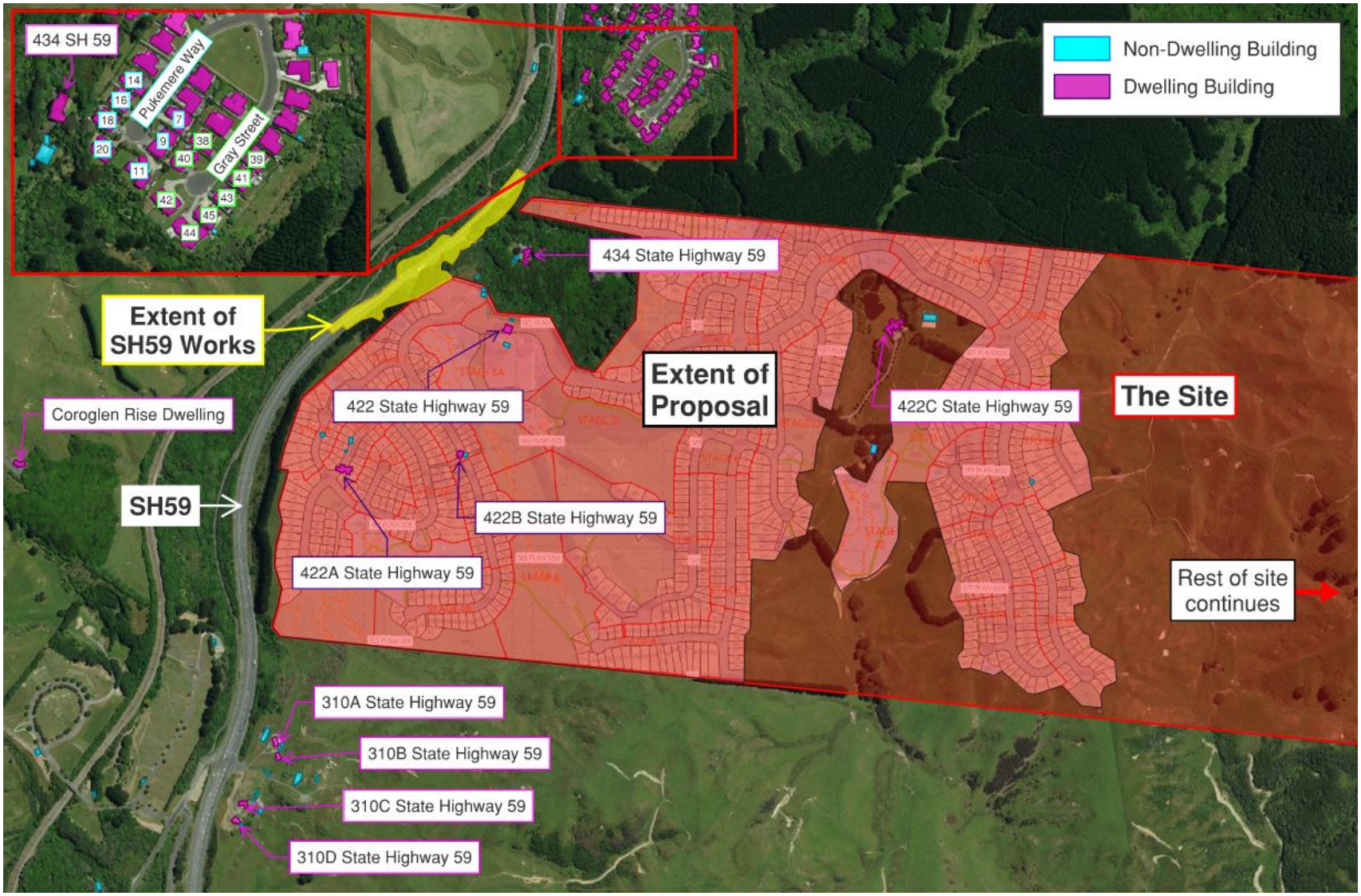
Appendix G shows general descriptions of items that should be included in the CNVMP.

## APPENDIX A GLOSSARY OF TERMINOLOGY

| | |
|---|---|
| **Noise** | A subjective term used to describe sound that is unwanted by, or distracting to, the receiver. |
| **A-weighting** | A set of frequency-dependent sound level adjustments that are used to better represent how humans hear sounds. Humans are less sensitive to low and very high frequency sounds.<br><br>Sound levels using an "A" frequency weighting are expressed as dB $L_A$. Alternative ways of expressing A-weighted decibels are dBA or dB(A). |
| **dB** | Decibel. The unit of sound level. |
| **$L_{Aeq}$** | The equivalent continuous A-weighted sound level. Commonly referred to as the average sound level and is measured in dB. |
| **$L_{Amax}$** | The A-weighted maximum sound level. The highest sound level which occurs during the measurement period. Usually measured with a fast time–weighting i.e. $L_{AFmax}$ |
| **$L_w$** | Sound Power Level. The calculated level of total sound power radiated by a sound source. Usually A-weighted i.e. $L_{WA}$. |
| **PPV** | Peak Particle Velocity. The measure of the vibration aptitude, zero to maximum. Used for building structural damage assessment. |
| **Vibration** | When an object vibrates, it moves rapidly up and down or from side to side. The magnitude of the sensation when feeling a vibrating object is related to the vibration velocity.<br><br>Vibration can occur in any direction. When vibration velocities are described, it can be either the total vibration velocity, which includes all directions, or it can be separated into the vertical direction (up and down vibration), the horizontal transverse direction (side to side) and the horizontal longitudinal direction (front to back). |

## APPENDIX B SITE AND SURROUNDING ENVIRONMENT

**B1 Aerial overview of Site and surrounding environment** **[Base image: Land Information New Zealand]**



**B2** Proposal footprint and layout showing separation of terraces [Base image: Classic Developments document '*Mt Welcome Masterplan Concept_*']


**B3**

## APPENDIX C CONSTRUCTION NOISE LIMITS

Rule NOISE-R2 in the Porirua District Plan 2025 specifies the requirements for construction noise and vibration and is reproduced below:

> "***Noise-R2*** ***Noise from construction activities***
>
> *[…]*
>
> *Where:*
> *a. The noise from construction activities must be measured, assessed, managed and controlled in accordance with the requirements of NZS 6803:1999 Acoustics – Construction noise and DIN 4150-3:1999 Structural Vibration – Part 3: Effects of Vibrations on Structures."*

The noise limits of NZS 6803:1999 depend on the duration of construction works. Construction projects which are of a shorter duration have a higher allowable noise limit than those of a longer duration. The long-term duration limits apply for this project.

The noise limits from NZS 6803:1999 for long-term durations are shown in Tables C1 and C2. These are the same as the airborne noise criteria from Table 1 of the NZTA Guide.

**C1 Construction noise limits for activities sensitive to noise (e.g. occupied dwellings)**

| | | Long-term duration[6] | |
|---|---|---|---|
| **Time of week** | **Time period** | **dB $L_{Aeq}$** | **dB $L_{AFmax}$** |
| Weekdays | 0630 – 0730 | 55 | 75 |
| | 0730 – 1800 | 70 | 85 |
| | 1800 – 2000 | 65 | 80 |
| | 2000 – 0630 | 45 | 75 |
| Saturdays | 0730 – 1800 | 70 | 85 |
| | 1800 – 0630 | 45 | 75 |
| Sundays and public holidays | 0730 – 1800 | 55 | 85 |
| | 1800 – 0630 | 45 | 75 |

**C2 Construction noise limits for noise affecting any other activity (e.g. occupied commercial building)**

| | | Long-term duration |
|---|---|---|
| **Time of week** | **Time period** | **dB $L_{Aeq}$** |
| All days | 0730 – 1800 | 70 |
| | 1800 – 0730 | 75 |

[6] Construction work at any one location with a duration exceeding 20 weeks

## APPENDIX D PREDICTED RECEIVED NOISE LEVELS

Tables D1 and D2 summarise the predicted noise levels of Earthworks and Civil and Road works received at nearby receivers respectively. The predicted noise levels are without mitigation measures or site hoardings implemented. Expected infringements of the guideline noise limits are indicated by red highlight.

The worst-case (WC) scenario is when activities are closest to a receiver, and the typical (Typ) levels being what might be expected over the duration of the set of works when activities are being carried out in the closest stage (e.g. Earthworks stages 1 – 8). Received noise levels would be lower than the presented typical levels for works in stages further away.

This means that for the majority of the project, the worst-case scenario would not occur as these represent relatively small working areas, and presented typical levels would also be limited in duration.

Note that for the Earthworks, we have included columns for the noisiest stage (NS) – this is what the typical and worst-case levels are representative of. This was not done for the Civil and Road Works, but it can be assumed that generally, the noisiest stage is the one closest to each receiver.

**D1 Predicted received noise levels from Earthworks without mitigation**

| | Predicted received noise levels (dB $L_{Aeq}$) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lower Tce (1, 2A, 2B) | | | Upper Tce (3, 4, 5, 6B) | | | Lucus Block (6A, 7, 8) | | | SH59 RAB (2C) | |
| **Address** | **Typ** | **WC** | **NS** | **Typ** | **WC** | **NS** | **Typ** | **WC** | **NCS** | **Typ** | **WC** |
| 38 Gray Street | 50-55 | 50-55 | **1** | 50-55 | 55-60 | **5** | 45-50 | 50-55 | **6A** | 45-50 | 50-55 |
| 39 Gray Street | 45-50 | 45-50 | **1** | 50-55 | 50-55 | **5** | 45-50 | 45-50 | **6A** | 45-50 | 50-55 |
| 40 Gray Street | 50-55 | 50-55 | **1** | 50-55 | 55-60 | **5** | 45-50 | 50-55 | **6A** | 50-55 | 50-55 |
| 41 Gray Street | 45-50 | 45-50 | **1** | 50-55 | 50-55 | **5** | 45-50 | 45-50 | **6A** | 45-50 | 50-55 |
| 42 Gray Street | 50-55 | 50-55 | **1** | 50-55 | 55-60 | **5** | 45-50 | 45-50 | **6A** | 50-55 | 55-60 |
| 43 Gray Street | 45-50 | 45-50 | **1** | 50-55 | 55-60 | **5** | 45-50 | 50-55 | **6A** | 45-50 | 50-55 |
| 44 Gray Street | 50-55 | 50-55 | **1** | 50-55 | 60-65 | **5** | 45-50 | 45-50 | **6A** | 45-50 | 50-55 |
| 45 Gray Street | 45-50 | 45-50 | **1** | 50-55 | 55-60 | **5** | 45-50 | 45-50 | **6A** | 40-45 | 50-55 |
| 7 Pukemere Way | 50-55 | 50-55 | **1** | 50-55 | 55-60 | **5** | 45-50 | 45-50 | **6A** | 50-55 | 50-55 |
| 9 Pukemere Way | 50-55 | 50-55 | **1** | 50-55 | 55-60 | **5** | 45-50 | 45-50 | **6A** | 50-55 | 55-60 |
| 11 Pukemere Way | 50-55 | 50-55 | **1** | 50-55 | 55-60 | **5** | 45-50 | 45-50 | **6A** | 50-55 | 55-60 |
| 14 Pukemere Way | 50-55 | 50-55 | **1** | 50-55 | 50-55 | **5** | 45-50 | 45-50 | **6A** | 50-55 | 55-60 |
| 16 Pukemere Way | 50-55 | 50-55 | **1** | 50-55 | 55-60 | **5** | 45-50 | 45-50 | **6A** | 50-55 | 55-60 |
| 18 Pukemere Way | 50-55 | 50-55 | **1** | 50-55 | 50-55 | **5** | 45-50 | 45-50 | **6A** | 55-60 | 60-65 |
| 20 Pukemere Way | 50-55 | 50-55 | **1** | 50-55 | 50-55 | **5** | 45-50 | 45-50 | **6A** | 50-55 | 55-60 |
| Coroglen Rise Dwelling | 45-50 | 45-50 | **1** | 35-40 | 35-40 | **4** | 35-40 | 35-40 | **6A** | 45-50 | 45-50 |
| 434 State Highway 59 | 55-60 | 55-60 | **1** | 50-55 | 60-65 | **5** | 40-45 | 40-45 | **6A** | 55-60 | 65-70 |
| 468 State Highway 59 | 50-55 | 50-55 | **1** | 50-55 | 50-55 | **5** | 40-45 | 45-50 | **6A** | 55-60 | 60-65 |
| 310A State Highway 59 | 45-50 | 45-50 | **2A/B** | 35-40 | 40-45 | **4** | 30-35 | 30-35 | **6A** | 35-40 | 35-40 |
| 310B State Highway 59 | 45-50 | 45-50 | **2A/B** | 35-40 | 40-45 | **4** | 30-35 | 30-35 | **6A** | 30-35 | 35-40 |
| 310C State Highway 59 | 45-50 | 45-50 | **2A/B** | 35-40 | 40-45 | **4** | 35-40 | 35-40 | **6A** | 35-40 | 40-45 |
| 310D State Highway 59 | 45-50 | 45-50 | **2A/B** | 35-40 | 40-45 | **4** | 30-35 | 30-35 | **6A** | 35-40 | 40-45 |
| 422A State Highway 59* | 60-65 | 60-65 | **1** | - | - | **-** | - | - | **-** | - | - |
| 422C State Highway 59 | 40-45 | 40-45 | **1** | 55-60 | 60-65 | **3** | 60-65 | 65-70 | **6A** | 30-35 | 30-35 |

* Assumed to be unoccupied following completion of Stage 1

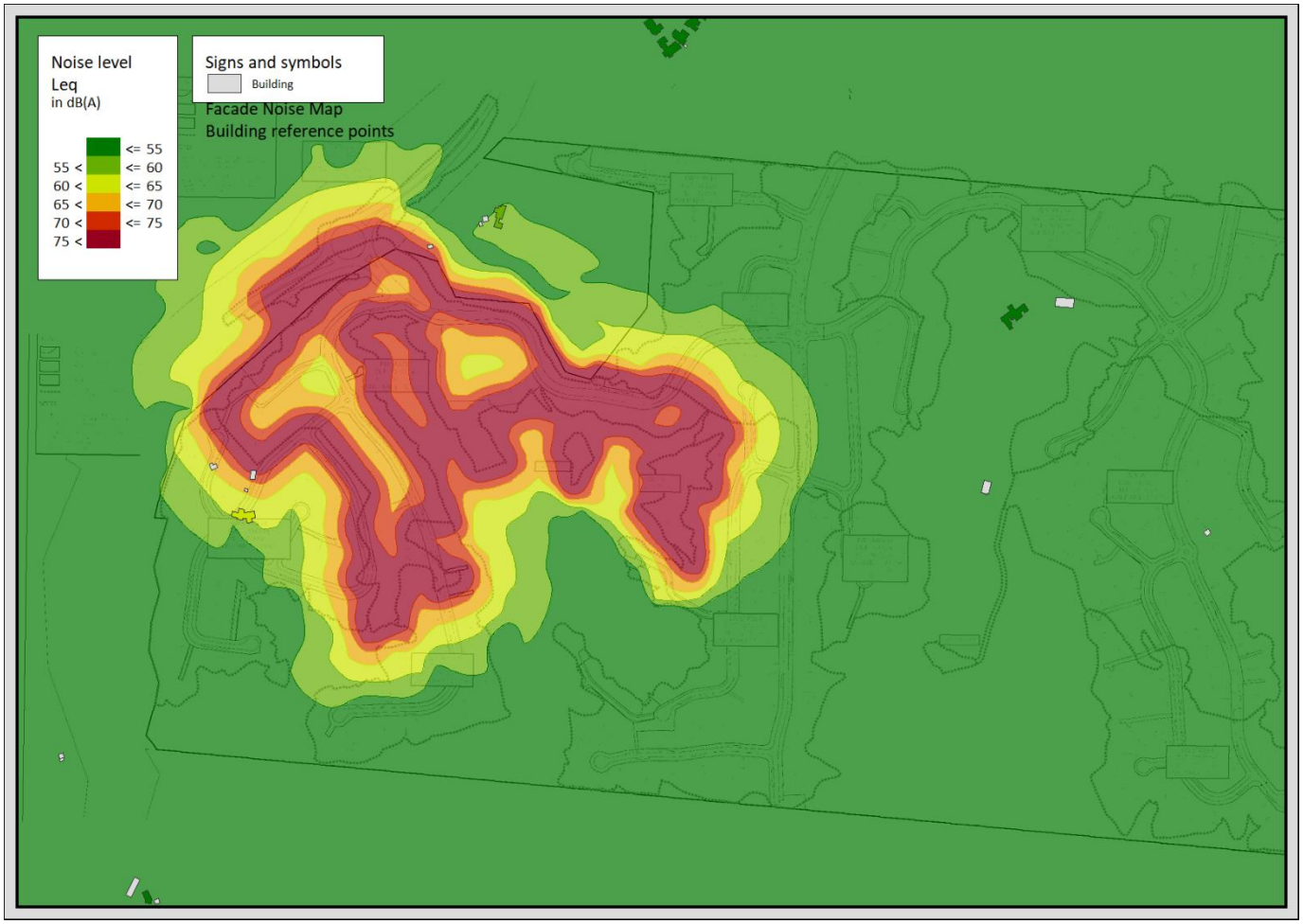
**D2 Predicted received noise levels from Civil and Road Works without mitigation**

| | Predicted received noise levels (dB $L_{Aeq}$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Lower Terrace | | Upper Terrace | | Lucus Block | | SH59 RAB | |
| Address | Typ | WC | Typ | WC | Typ | WC | Typ | WC |
| 38 Gray Street | 45-50 | 45-50 | 50-55 | 55-60 | 40-45 | 50-55 | 45-50 | 55-60 |
| 39 Gray Street | 40-45 | 45-50 | 45-50 | 50-55 | 40-45 | 45-50 | 45-50 | 55-60 |
| 40 Gray Street | 45-50 | 50-55 | 50-55 | 55-60 | 45-50 | 50-55 | 50-55 | 55-60 |
| 41 Gray Street | 40-45 | 45-50 | 45-50 | 50-55 | 40-45 | 45-50 | 45-50 | 50-55 |
| 42 Gray Street | 45-50 | 50-55 | 45-50 | 55-60 | 40-45 | 40-45 | 50-55 | 55-60 |
| 43 Gray Street | 40-45 | 45-50 | 50-55 | 55-60 | 40-45 | 45-50 | 45-50 | 55-60 |
| 44 Gray Street | 45-50 | 50-55 | 45-50 | 55-60 | 40-45 | 45-50 | 50-55 | 55-60 |
| 45 Gray Street | 40-45 | 45-50 | 45-50 | 50-55 | 40-45 | 45-50 | 45-50 | 50-55 |
| 7 Pukemere Way | 45-50 | 50-55 | 45-50 | 55-60 | 40-45 | 45-50 | 50-55 | 55-60 |
| 9 Pukemere Way | 45-50 | 50-55 | 45-50 | 55-60 | 40-45 | 45-50 | 50-55 | 55-60 |
| 11 Pukemere Way | 45-50 | 50-55 | 45-50 | 55-60 | 40-45 | 45-50 | 50-55 | 60-65 |
| 14 Pukemere Way | 45-50 | 50-55 | 45-50 | 55-60 | 40-45 | 45-50 | 50-55 | 60-65 |
| 16 Pukemere Way | 45-50 | 50-55 | 45-50 | 55-60 | 40-45 | 45-50 | 50-55 | 55-60 |
| 18 Pukemere Way | 45-50 | 50-55 | 45-50 | 50-55 | 40-45 | 45-50 | 55-60 | 60-65 |
| 20 Pukemere Way | 45-50 | 50-55 | 45-50 | 50-55 | 40-45 | 45-50 | 50-55 | 60-65 |
| Coroglen Rise Dwelling | 40-45 | 45-50 | 35-40 | 40-45 | 30-35 | 35-40 | 45-50 | 45-50 |
| 434 State Highway 59 | 50-55 | 60-65 | 45-50 | 60-65 | 35-40 | 35-40 | 55-60 | 65-70 |
| 468 State Highway 59 | 45-50 | 50-55 | 45-50 | 55-60 | 40-45 | 40-45 | 55-60 | 60-65 |
| 310A State Highway 59 | 45-50 | 45-50 | 35-40 | 40-45 | 30-35 | 30-35 | 35-40 | 40-45 |
| 310B State Highway 59 | 45-50 | 45-50 | 35-40 | 40-45 | 30-35 | 30-35 | 30-35 | 40-45 |
| 310C State Highway 59 | 45-50 | 45-50 | 35-40 | 40-45 | 30-35 | 35-40 | 35-40 | 40-45 |
| 310D State Highway 59 | 40-45 | 45-50 | 35-40 | 40-45 | 30-35 | 35-40 | 35-40 | 40-45 |
| 422C State Highway 59 | 35-40 | 35-40 | 55-60 | 60-65 | 50-55 | 60-65 | 30-35 | 35-40 |
| 422D State Highway 59 | 30-35 | 30-35 | 50-55 | 60-65 | 50-55 | 60-65 | 25-30 | 30-35 |

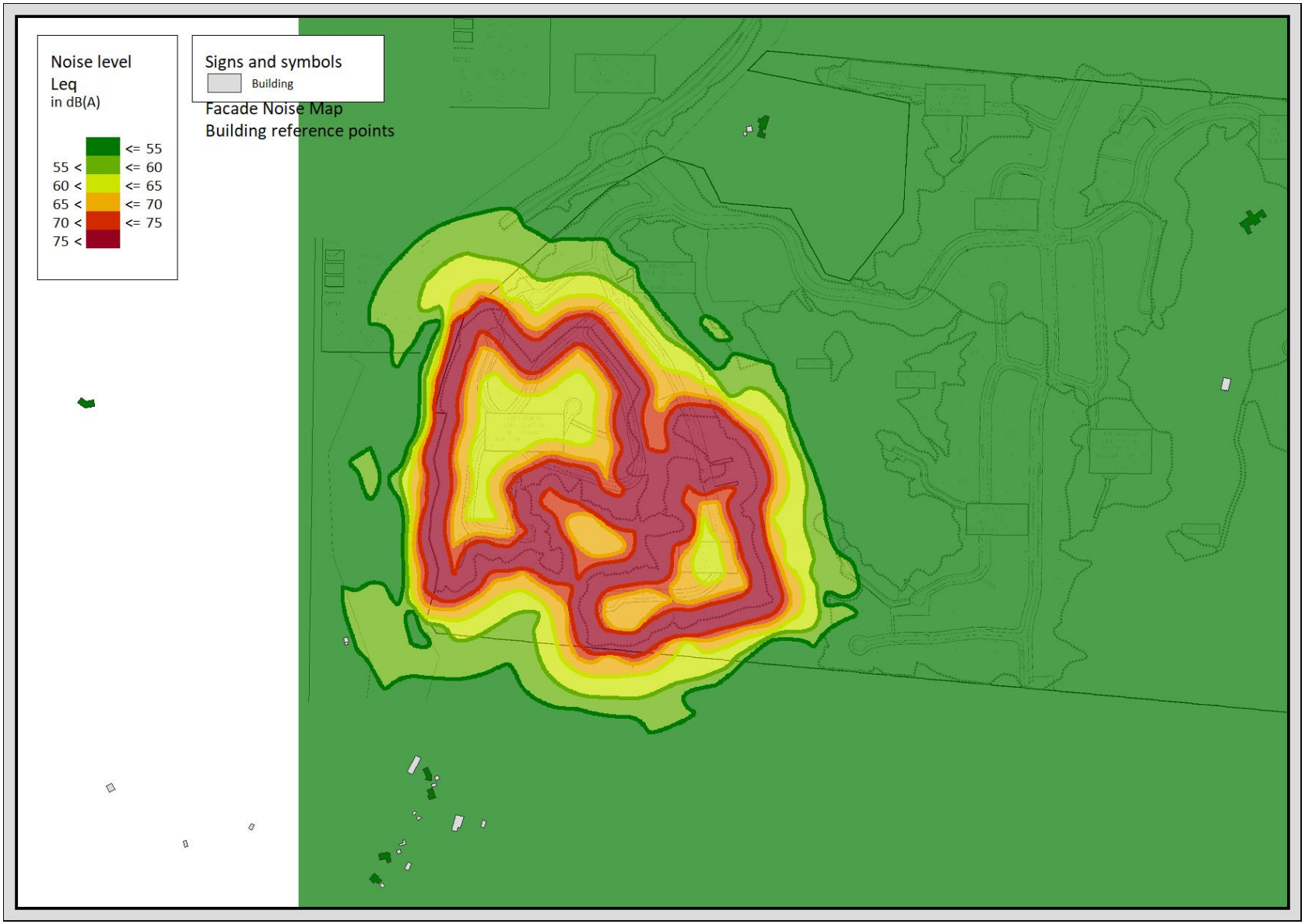
## APPENDIX E WORST-CASE CONSTRUCTION NOISE CONTOURS

The following construction noise contours are representative of when the noisiest activity of the specified stage of works is being carried out at their expected extents. Note that the noise contours within the working area of each stage shown are not representative as the model is for construction activities up to the stage boundary, i.e. noise levels are likely to be higher within the working areas. Additionally, only occupied buildings/dwellings have been shaded in as per the noise level colour key, and any sheds, garages, etc. have been left unshaded (grey)

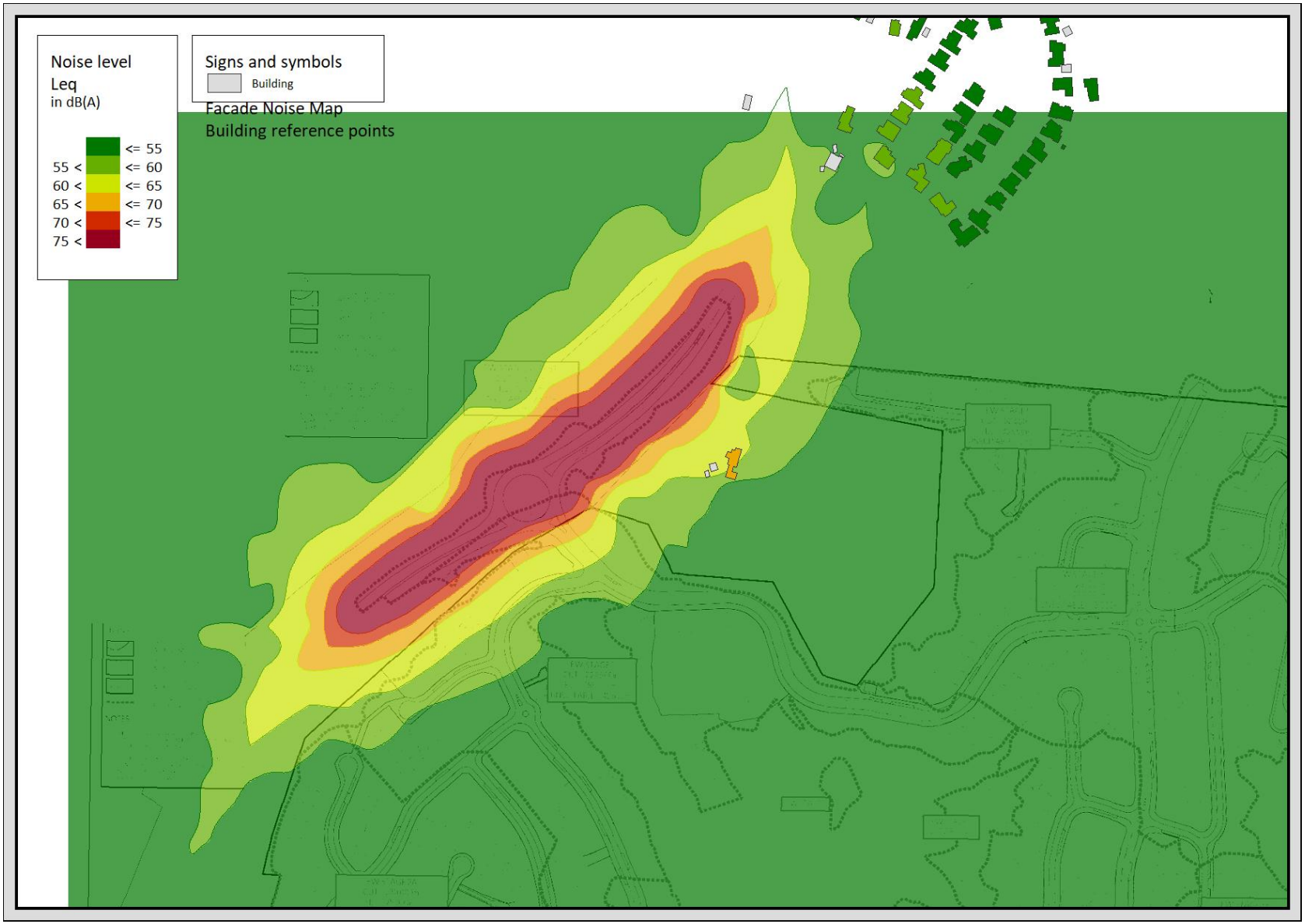
### E1 Earthworks – Stage 1



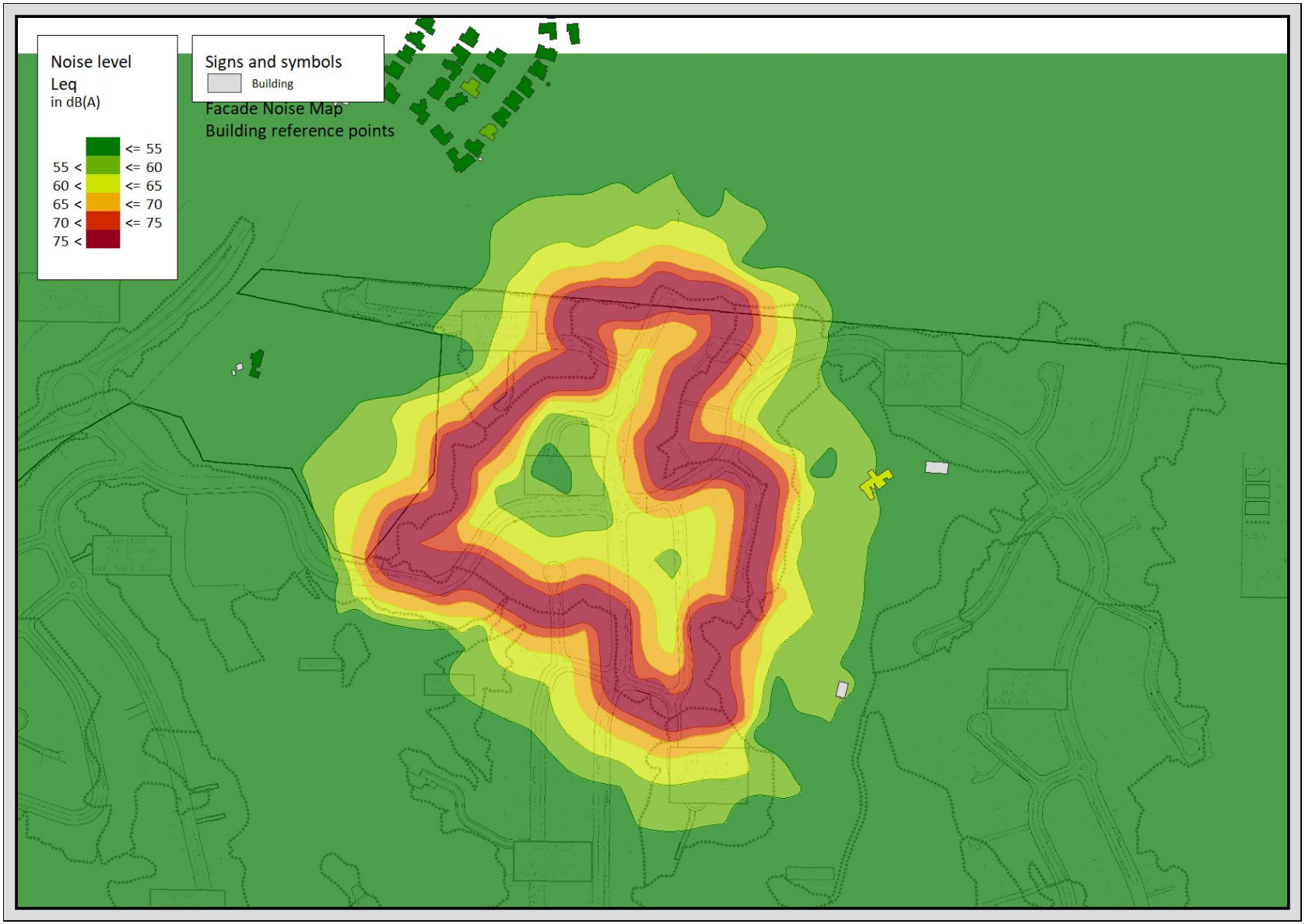
**E2 Earthworks – Stage 2A/B**



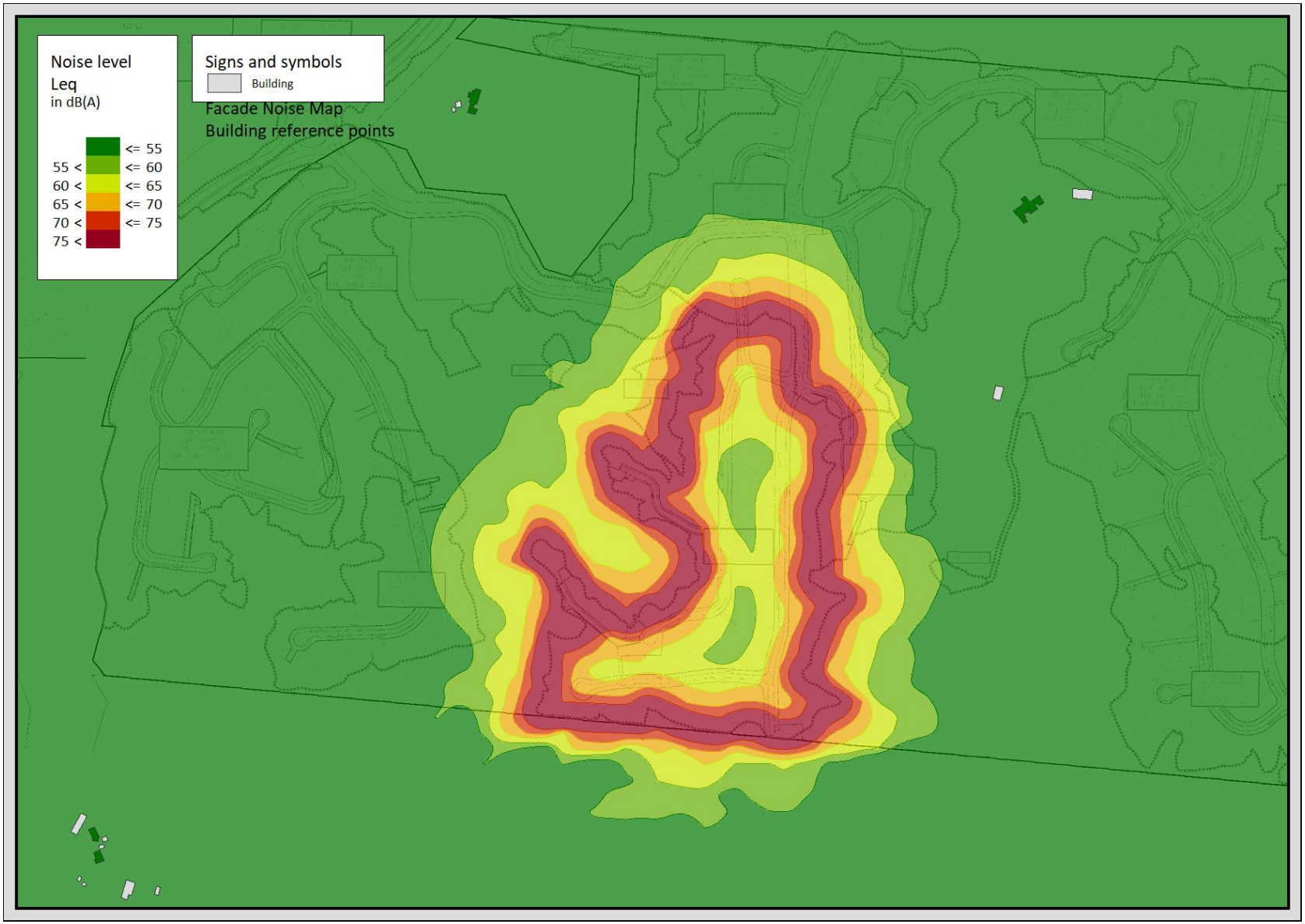
**E3 Earthworks – Stage 2C (SH59)**



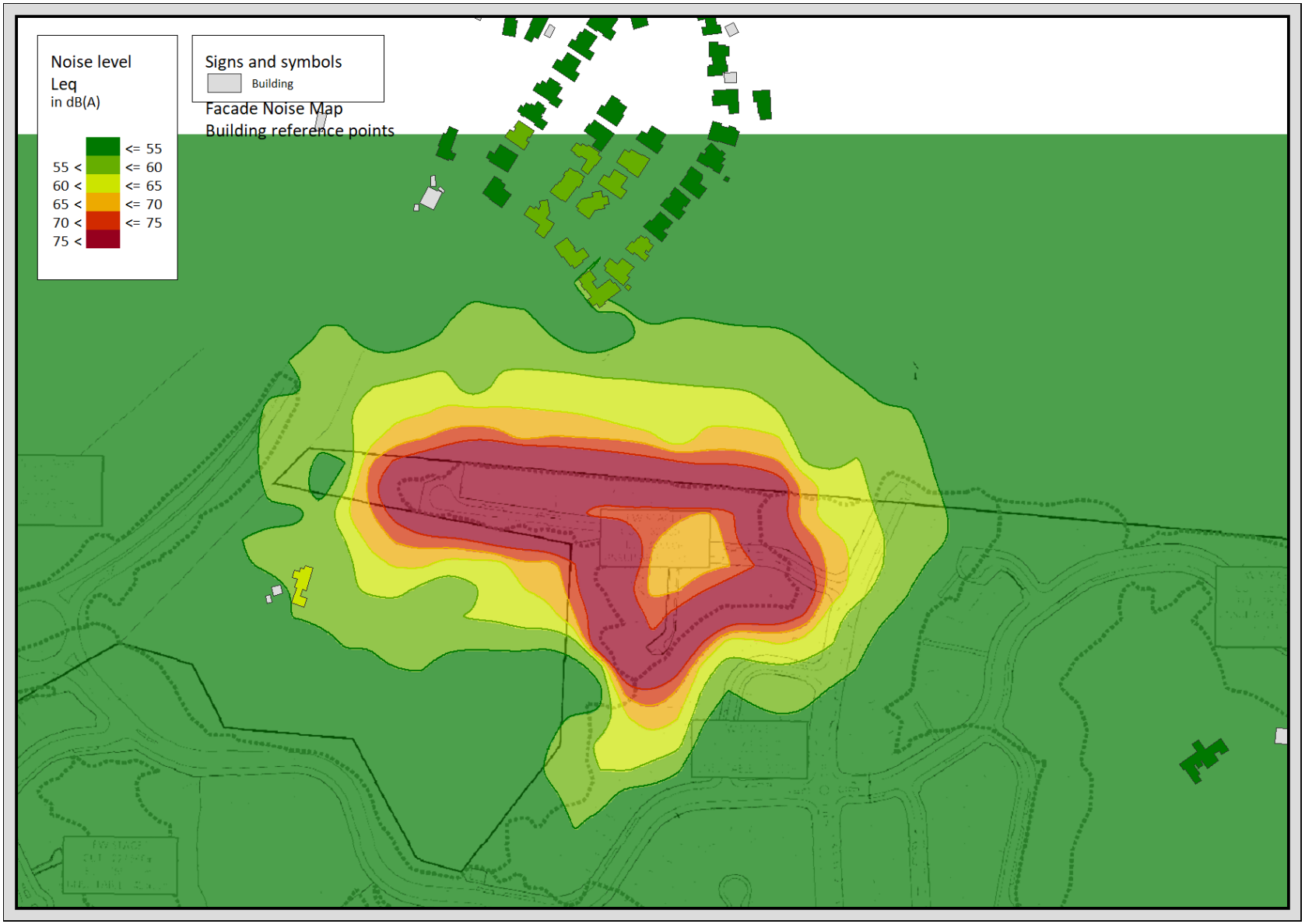
**E4 Earthworks – Stage 3**



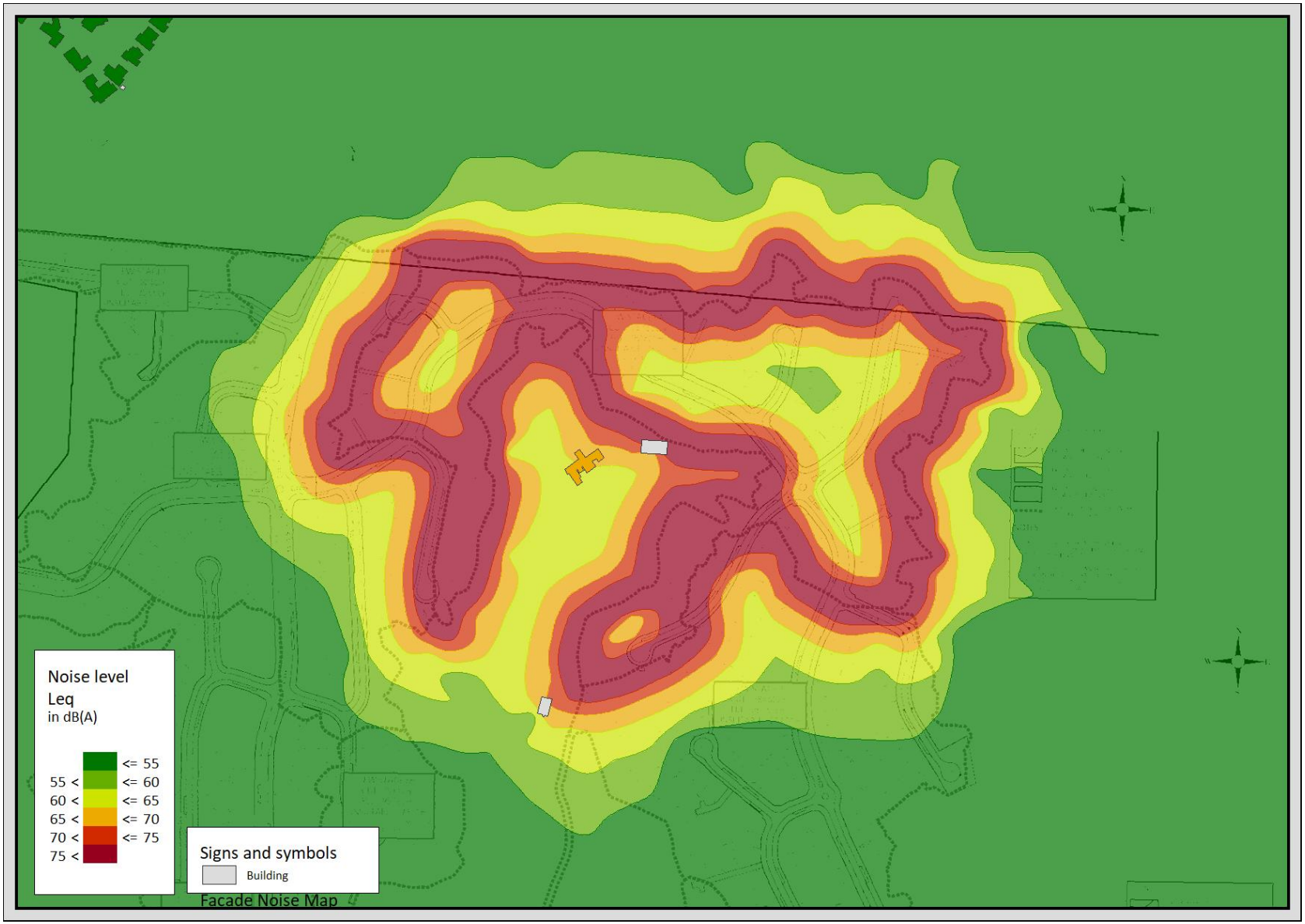
**E5 Earthworks – Stage 4**



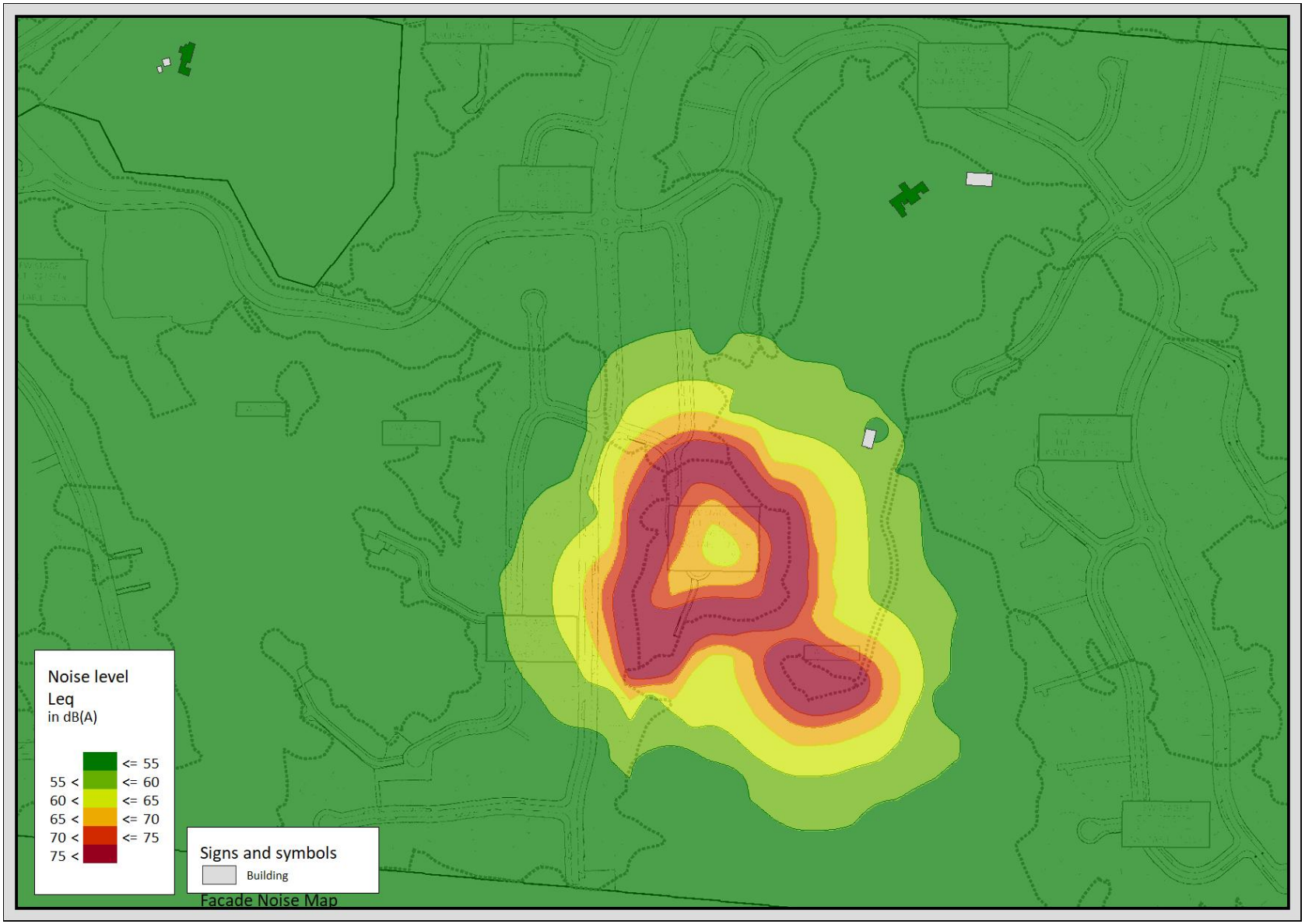
**E6 Earthworks – Stage 5**



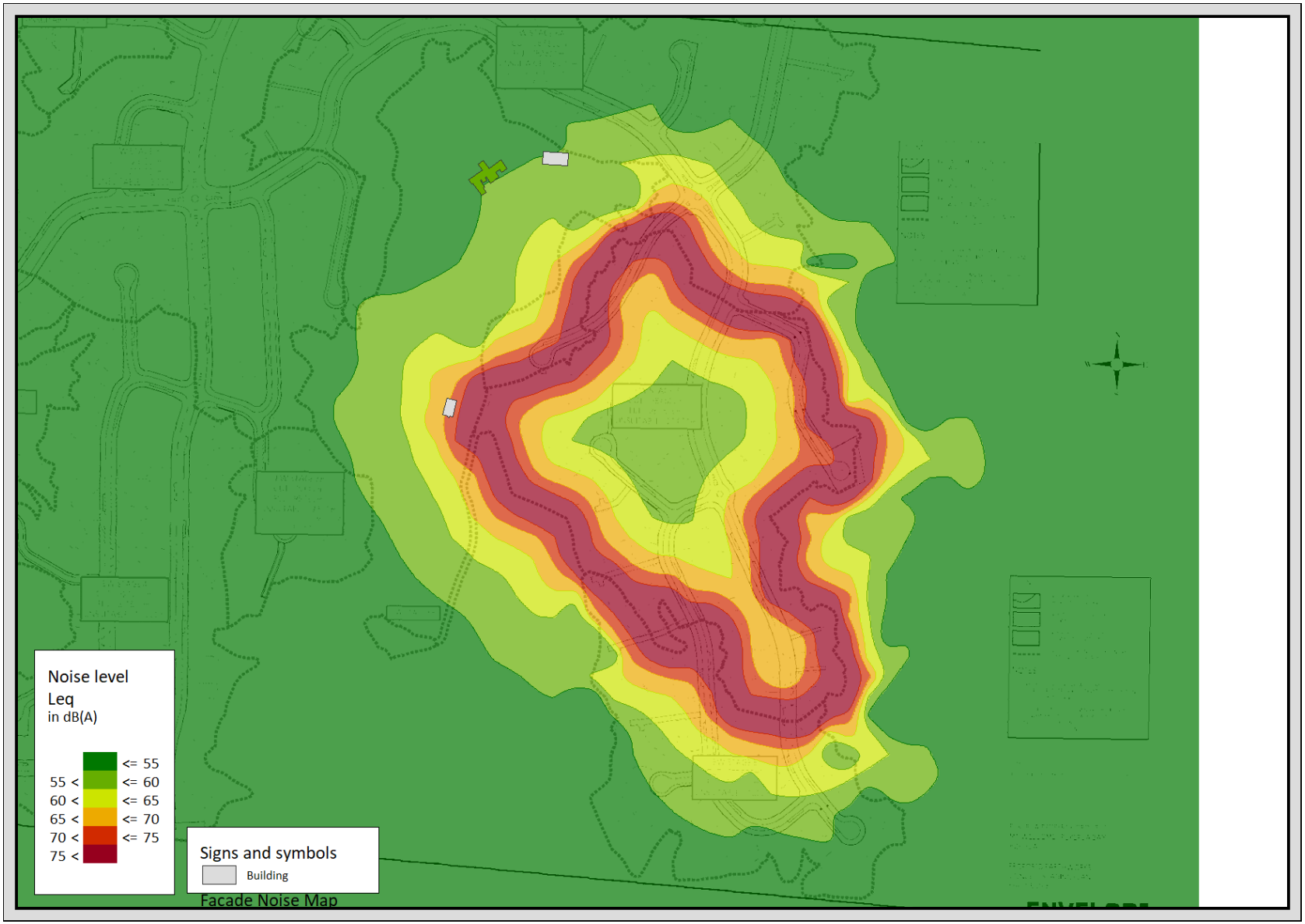
**E7 Earthworks – Stage 6A**



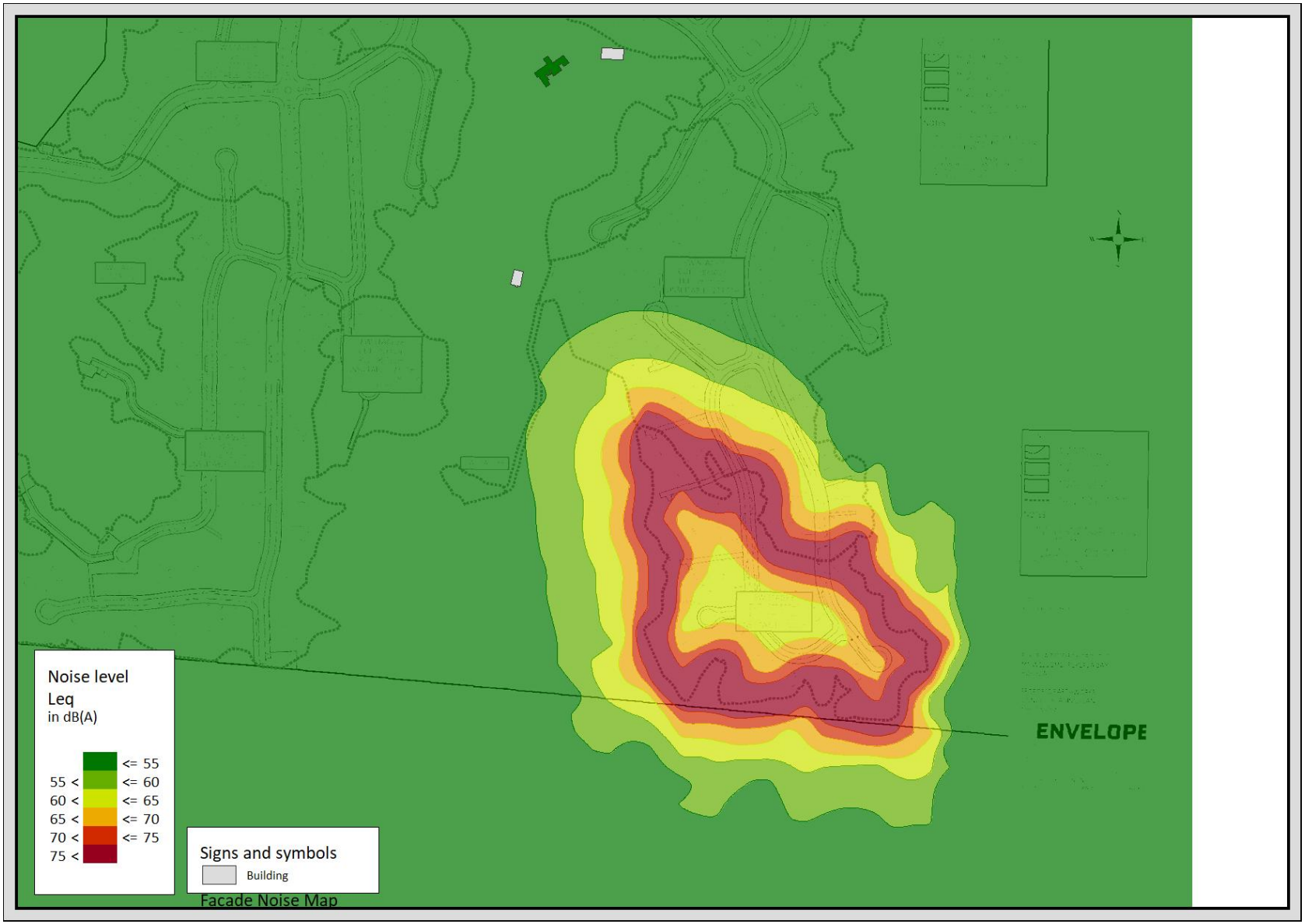
**E8 Earthworks – Stage 6B**



**E9 Earthworks – Stage 7**

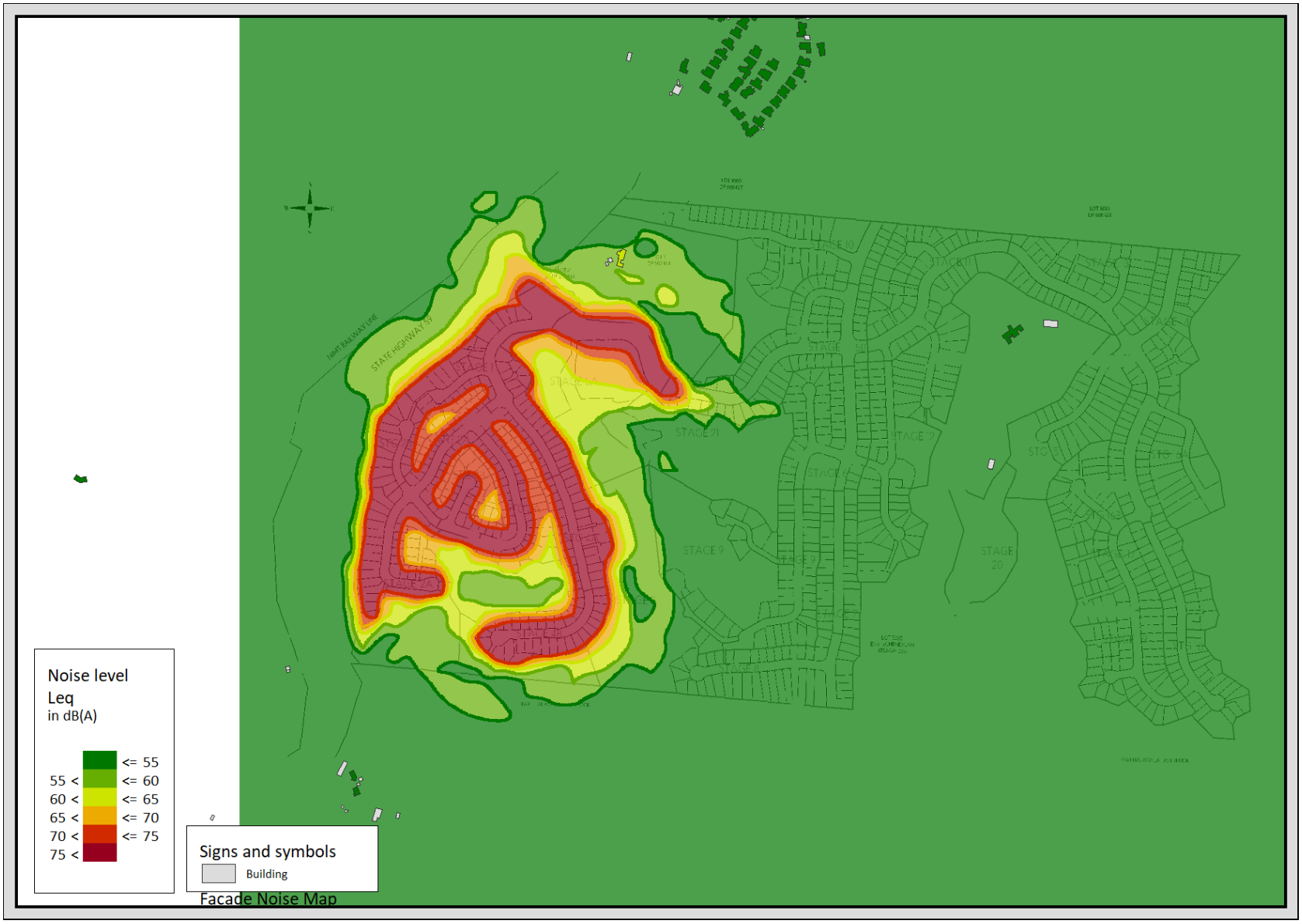


**E10 Earthworks – Stage 8**




Facade Noise Map

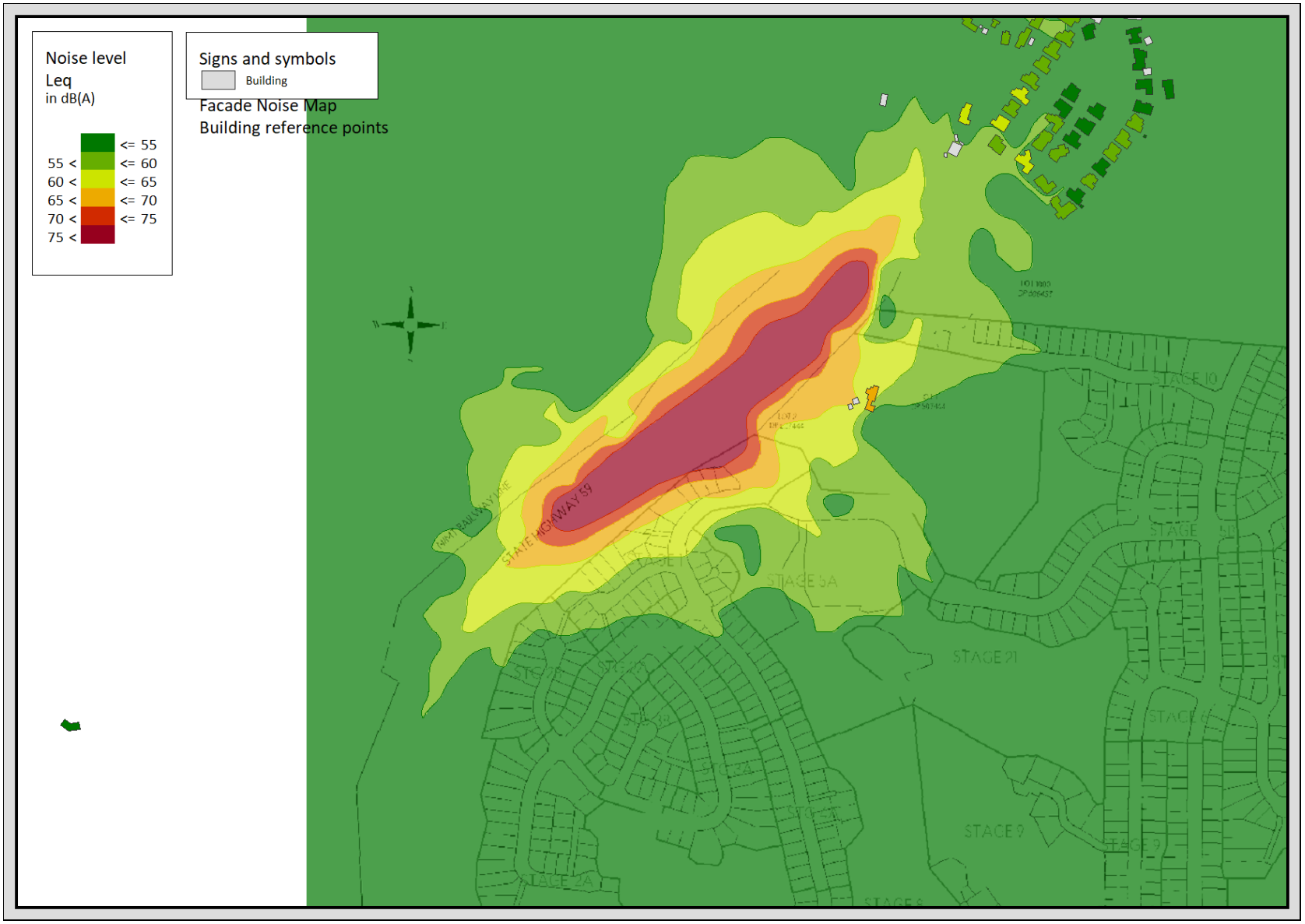
**E11 Civil and Road Construction – Lower Terrace**



**E12 Civil and Road Construction – Upper Terrace**

**E13 Civil and Road Construction – Lucus Block**

**E14 Civil and Road Construction – SH59**



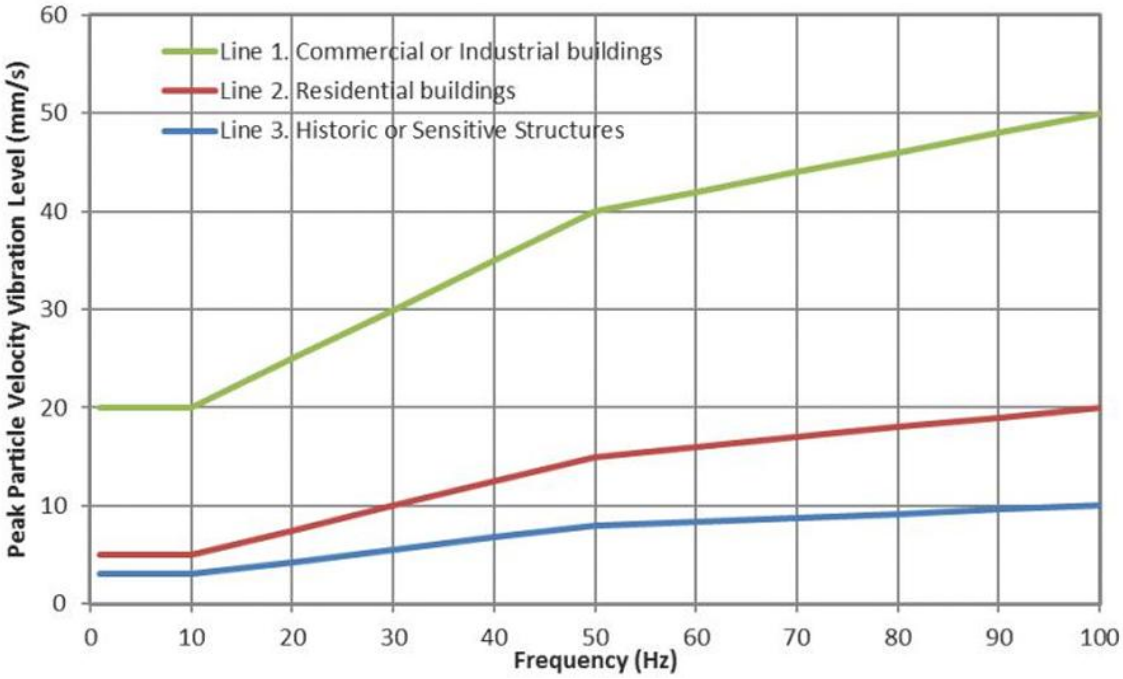
## APPENDIX F CONSTRUCTION VIBRATION LIMITS

DIN 4150-3:1999 limits are for avoiding cosmetic building damages, such as cracking in paint or plasterwork. Cosmetic building damage effects are deemed 'minor damage' in the Standard and can generally be easily repaired. The Standard states: "*Experience has shown that if these values are complied with, damage that reduces the serviceability of the building will not occur*." Much higher vibration levels (i.e. an order of magnitude higher) would be needed for potential structural damage.

The short-term (transient) vibration limits from DIN 4150-3:1999 are shown in Figure F1 and apply at building foundations in any axis.

The long-term (continuous) vibration limits from DIN 4150-3:1999 are shown in Table F2 and apply at all floor levels, but levels are normally highest in horizontal axes on the top floor.

**F1 Short-term (transient) vibration at building foundations (source: DIN 4150-3:1999: Fig 1)**




**F2 Vibration limits at horizontal plane of highest floor (DIN 4150-3:1999: Tables 1 and 3)**

| | Peak Particle Velocity Vibration Level (mm/s) | |
|---|---|---|
| **Building Type** | **Short-term (transient)** | **Long-term (continuous)** |
| Line 1. Commercial or industrial | 40 | 10 |
| Line 2. Residential | 15 | 5 |
| Line 3. Vibration sensitive | 8 | 2.5 |

## APPENDIX G CNVMP CONTENTS

The objective of the CNVMP is to set out the procedures to identify and adopt the BPO for minimising adverse construction noise and vibration effects on neighbours.

The CNVMP should include (but not be limited to) details regarding:

- Community liaison and engagement outcomes
    - Letter drops and/or newsletters containing information about upcoming works relevant to construction noise/vibration
    - Scheduling and timing agreements made with engaged receivers
    - Actions to take following the reception of any complaints
- Physical noise and vibration mitigation measures
- Construction noise and vibration monitoring
    - Monitoring would provide the contractor with information regarding construction methodologies; the identification of any processes that are unnecessarily noisy and/or high vibration; confidence to potentially affected receivers that their concerns are being addressed; and assessments of compliance with the relevant limits
    - Vibration monitoring may be necessary to ensure that the cosmetic building damage vibration limits are being complied with
- Contingency measures including, but not limited to, scheduling of activities to mutually agreed times, the review of methodologies, mitigation measures, and management strategies to ensure they represent the BPO
- Staff training

## Appendix H: Schedule of Changes Post Application Withdrawal

17 March 2026

Alex Mickleson
Fast-track Applications
Environmental Protection Authority
Private Bay 63002
Wellington 6140

Tēnā koe Alex

**RE: Summary of changes to Mt Welcome Substantive Application**

Please see below summary of changes to documents within the Mt Welcome Substantive Applications lodged 21/11/2025 and 13/02/2026.

| Document | Changes from previously lodged document |
|---|---|
| Mount Welcome Substantive Application and Assessment of Environmental Effects | The following sections have been updated:<br>• 3.1.1 - FTAA Schedule 2 listing details updated in line with changes gazetted in March 2026<br>• 3.1.1, 7.6.3 & 10 - Reference to proposed reservoir on Muri Block updated now resource consent has been granted<br>• 3.1.1 - Pre-lodgement engagement timeline updated with stakeholder engagement Nov 2025 to March 2026<br>• 3.1.5 - FTAA s30 notice information updated, GWRC only required to provide notice (notice provided 18/02/26)<br>• 3.2.3 - Reference added to SH59 being a Limited Access Road (information requested by PCC)<br>• 6 - Pre-lodgement engagement timeline updated with stakeholder engagement Nov 2025 to March 2026, including additional engagement with owners to west of SH59 (information requested by EPA)<br>• 7.2 - Staging updated to reference super lots, figures updated to reflect updated scheme plans with refined staging<br>• 7.5.4 - Winter earthworks proposal amended in line with GWRC feedback<br>• 7.6.2 - Reference to updated pre and post development stormwater modelling added (information requested by PCC)<br>• 7.9.1 - Map of wetland reclamation updated to reflect new plan set (information requested by GWRC)<br>• 7.9.4 Culvert information updated (information requested by EPA)<br>• 7.10 - addition of dams as a complex freshwater fishery<br>• 7.12 - consent lapse date - new condition requiring first stage to be completed within 5 years, with balance of lots 15 years<br>• 9 – Assessment added to Table 6 for 13(4)(y)(i) and 13(4)(y)(vi)<br>• 13.2 & 13.3 - Assessment added for relevant national policy statements promulgated in December 2025 |

| | |
|---|---|
| | • 14 – Changes made to proposed conditions based on engagement with GWRC, PCC and Te Runanga o Toa Rangatira<br>• 15.7 - Clarification that the Project Hydrologist will undertake ongoing modelling (information requested by EPA)<br>• 15.11.1 - Amended approach to bird management with pre-clearance survey and avoidance instead of bird nest transfer, Figure 42 also updated as it did not reflect final scheme plan<br>• 16 - More information provided on reclamation extent proposed (information requested by EPA)<br>• 17 - More information provided with regard to standard and complex freshwater fisheries activities (information requested by EPA)<br>• 18 – Information provided on Government Policy Statement on Housing and Urban Development 2025 to assist Panel with s81(2)(aab) which was added in December 2025 FTAA amendments<br>• 20 - Reference to birds removed from Wildlife Authority application<br>• 21 – section removed as repeats general engagement information in Appendix 2<br>• 27 – section removed as repeats general engagement information in Appendix 2 |
| [Redacted] Mount Welcome Substantive Application and Assessment of Environmental Effects Copy | New redacted version provided incorporating above changes. |
| [Redacted] Appendix 2 - Pre-lodgement consultation Copy | New redacted version provided incorporating below changes. |
| Appendix 1 - Records of Title | No changes |
| Appendix 2 - Pre-lodgement consultation | Updated with additional consultation with PCC, GWRC, NZTA, and Ngāti Toa between November 2025 and March 2026. Changes include:<br>• Additional detail and minutes from meetings with PCC, GWRC, NZTA, and Ngāti Toa<br>• Additional detail on response to feedback provided from GWRC and Ngāti Toa on conditions since November 2025<br>• Letter confirming landowner agreement to undertake works at 34 Muri Road (information requested by MfE)<br>• Letter confirming landowner of 422 State Highway 59 written approval<br>• Additional engagement with owners to west of SH59 (information requested by EPA) |
| Appendix 3 - Section 30 Notices From Local Authorities | FTAA s30 notice information updated, GWRC only required to provide notice (notice provided 18/02/26). |
| Appendix 4 - Resource Consents Assessment | No changes |

| | |
|---|---|
| Appendix 5 - Assessment of RMA planning document objectives and policies | Assessment added for relevant national policy statements promulgated in December 2025 including:<br>• National Policy Statement for Natural Hazards<br>• National Policy Statement for Infrastructure |
| Appendix 6 - NES-F analysis | No changes |
| Appendix 7 - Proposed Conditions of Consent | Updated with post-lodgement consultation with PCC, GWRC, NZTA, and Ngāti Toa. PCC condition changes include:<br>• New conditions requiring first stage to be completed within 5 years, with balance of lots 15 years<br>• Condition 6, 13, 25, 26 – Additional requirements for a Landscape and Ecology Management Plan to support implementation of the Landscape and Ecology Plans<br>• Condition 30 – Additional requirements for wetland bunds including consideration of liquefaction and lateral spread and design water levels<br>• Condition 32, 33 – Additional conditions with regard to roading engineering approval and safe system audit<br>• Condition 38-46 – Conditions amended to remove nest relocation process and instead have pre-clearance checks and avoidance of any nests<br>• Condition 48 - Ngāti Toa oversight over stream and wetland restoration and offsetting<br>• Condition 82 - Ngāti Toa engagement for street and reserve naming<br><br>GWRC condition changes include:<br>• Added regional consent matrix<br>• Condition 3, 10, 52, 53 – Additional requirements for a Landscape and Ecology Management Plan to support implementation of the Landscape and Ecology Plan<br>• Condition 23 – Additional requirements added for Chemical Treatment Management Plan<br>• Condition 30 – Amendments to require any winter earthworks to be approved through amendment to SSESCP rather than a standalone plan<br>• Condition 37 to 39 – New conditions to require GWRC pre-construction meeting |
| Appendix 8 - Structure Plan Assessment | No changes |
| Appendix 9 - Infrastructure Report | Updated with post-lodgement consultation with PCC, GWRC, NZTA, and Ngāti Toa. Changes include:<br>• Staging and servicing sequencing refined with explanation of “super lots” for phased delivery<br>• More detailed and updated engineering design and three waters servicing<br>• Expanded information on integration With Muri Road Block<br>• Updated section on utilities. |
| Appendix 10 - Earthworks Construction Management Plan | No changes |
| Appendix 11 - Stormwater Management Plan | Updated with post-lodgement consultation with PCC. Changes include: |

| | |
|---|---|
| | • Expanded information on culverts<br>• Refined flood risk assessment and inclusion of a separate Flood Risk Report with pre and post development flood maps<br>• Updated monitoring and hydrology inputs. |
| Appendix 12 - Wastewater Hydraulic Modelling Report | No changes |
| Appendix 13 - Economic Assessment | No changes |
| Appendix 14 - Integrated Transport Assessment | Executive summary added. |
| Appendix 15 - Ecological Assessment | Changes include:<br>• Updated with regard to bird management<br>• Reclamation figures updated. |
| Appendix 16 - Lizard Management Plan | No changes |
| Appendix 17 - Wildlife Approval Application | Wildlife Approval for relocation of birds removed. |
| Appendix 18 - Hydrology Assessment | No changes |
| Appendix 19 - Water Quality Assessment | No changes |
| Appendix 20 - Water Quality Assessment for Roundabout | No changes |
| Appendix 21 - Landscape and Visual Effects Assessment | No changes |
| Appendix 21 - LVEA Appendices Part A | No changes |
| Appendix 21 - LVEA Appendices Part B | No changes |
| Appendix 22 - Master Plan and Landscape Urban Design Strategy | Changes include:<br>• Masterplan and images updated to reflect changes to the "western Kakaho revegetation mix" area shown on sheet L2.24 of the LEPs.<br>• Plant mixes on page 56 onward. |
| Appendix 23 - Landscape and Ecology Plans Part A | Changes include:<br>• Sheet added: L2.24 Landscape and Ecology Plans - Sheet 15 (western Kakaho revegetation mix centered on sheet).<br>• Sheet added: L5.03 Planting schedule 02 - Sheet 2 (extension of plant schedule to include additional mix species for lower and upper retention wetland + margins mixes and additional gully and riparian wetland mixes).<br>• Sheet change: L5.02 Planting schedule 02 - Sheet 1 (extension of plant schedule - second half of schedule 02 continued on sheet 2).<br>• Plan changes: L2.10, L2.12, L2.13, L2.14, L2.15 and L2.19 - Lower and upper retention wetland + margin mixes and additional gully and riparian wetland mixes added to plans.<br>• Sheet changes: L2.22 and L2.23 - New Western Kakaho revegetation mix shown on both sheets. |
| Appendix 23 - Landscape and Ecology Plans Part B | |
| Appendix 24 - Archaeological Assessment | Executive summary added. Added 2019 report as appendix (was missing from 21 Nov version). |

| | |
|---|---|
| Appendix 25 - Archaeological Management Plan | No changes |
| Appendix 26 - Geotechnical Investigation Part A | No changes |
| Appendix 26 - Geotechnical Investigation Part B | No changes |
| Appendix 26 - Geotechnical Investigation Part C | No changes |
| Appendix 26 - Geotechnical Investigation Part D | No changes |
| Appendix 27 - Preliminary Site Investigation | Executive summary added. |
| Appendix 28 - Contaminated Site Management Plan | No changes |
| Appendix 29 - Streetlighting Plans | No changes |
| Appendix 30 - RC PLANS FOR SUBMISSION | |
| *1753-02-2000-ExistingContours* | No changes |
| *1753-02-2100-ProposedContours-Overall* | No changes |
| *1753-02-2110-ProposedContours-Detailed* | No changes |
| *1753-02-2150-ProposedContours-SurplusFill* | No changes |
| *1753-02-2200-Proposed-Cut-Fill-Overall* | No changes |
| *1753-02-2201-Proposed-Cut-Fill-LargeScale* | No changes |
| *1753-02-2210-Proposed-Cut-Fill-Detailed-Pt-1* | No changes |
| *1753-02-2220-Proposed-Cut-Fill-Detailed-Pt-2* | No changes |
| *1753-02-2250-Proposed-Cut-Fill-SurplusFill* | No changes |
| *1753-02-2280-Proposed-EWs-Staging-Overall* | No changes |
| *1753-02-2281-Proposed-EWs-Staging-Layouts* | No changes |
| *1753-02-2300-Proposed-ESC-Overall* | No changes |
| *1753-02-2400-Proposed-ESCP-Stage 1* | No changes |
| *1753-02-2500-SED-Lots* | Added plans showing lots with potential SED considerations |
| *1753-02-3000-Roading-Overall* | No changes |
| *1753-02-3100-Roading-Detailed* | No changes |
| *1753-02-3200-Roading-Long-Sections* | No changes |

| | |
|---|---|
| *1753-02-3300-Roading-Cross-Sections* | No changes |
| *1753-02-3600-Roading-Driveways* | Added plans showing potential driveway non-compliances – within 6m of an intersection. |
| *1753-02-4000-Drainage-Overall* | No changes |
| *1753-02-4100-Drainage-Detailed* | No changes |
| *1753-02-4200-Drainage-SW-Longsections* | No changes |
| *1753-02-4300-Drainage-Wetlands* | Updated with GCR Table and notes referring to pipes designed for Hydraulic flow – fish passage to be designed in at detail design phase. |
| *1753-02-4400-Drainage-WW-Longsections* | Updated with missing WW Long-Sections. |
| *1753-02-4600-SW-Pre-Dev-Catchments* | No changes |
| *1753-02-4650-SW-Post-Dev-Catchments* | No changes |
| *1753-02-4900-Drainage-TypicalDetails* | No Changes |
| *1753-02-5000-Water&Services* | No Changes |
| *1753-02-8210-SH59-ProposedContours* | No Changes |
| *1753-02-8230-SH59-Proposed-Cut-Fill* | No Changes |
| *1753-02-8240-SH59-Proposed-ESCP* | No Changes |
| *1753-02-8300-SH59-Roading* | Updated with post-lodgement consultation with PCC and GWRC. Changes include:<br>- Added alignments and chainages to plans and added profile views. |
| *1753-02-8400-SH59-Drainage* | Revised pipe sizing |
| *1753-02-8800-SH59-Bulk Wastewater Upgrades* | No changes |
| *1753-02-SK8430-Drainage Culverts Existing* | Added plan set showing existing culverts |
| *1753-02-SK8440-Drainage Culverts Proposed* | Added plan set showing proposed culverts |
| *1753-02-SK9200-Ecological Remediation* | Updated with post-lodgement consultation with PCC and GWRC. Changes include:<br>- Added to Civil Plan set. |
| *1753-02-SK9250-Ecological Overlay* | Updated with post-lodgement consultation with PCC and GWRC. Changes include:<br>- Included plan showing ecological areas overlay. |
| *1753-02-0000-Cover-Index* | |
| *1753-02-1000-Scheme-ExistingLots* | No change |
| *1753-02-1004-Scheme-SuperLots* | Added ROW easements for access to “LO” Covenant Area |
| *1753-02-1010-Scheme-ProposedDevelopment* | Updated with post-lodgement consultation with PCC and GWRC. Changes include: |

| | |
|---|---|
| | - Added ROW easement to “LO” Covenant Area. |
| Appendix 31 - Legal submissions | Updated in line with relodged application and FTAA amendments |
| Appendix 32 - Email from Heritage & Archaeology Services Ltd 21 Nov 25 | No changes |
| Appendix 33 - P Harsveldt CV Heritage & Archaeology Services Ltd | No changes |
| New Appendix 34 | Envelope memo - stream width assessment dated 18/2/26 |
| New Appendix 35 | Flood Risk Assessment Report |