Memo – Ara Hills Response

To:	**Vineway Ltd**
From:	**James Kitchen**
Cc:	
Date:	**1/07/2025**

Subject: – Delmore Stage 1 and 2, Russell Road, Orewa

We have reviewed the memo from Ara Hill' engineers, and respond as follows -

4 Roading

The roading extension is covered by the Ara Hills Response Memorandum prepared by Public Works Advisory. In summary, it is confirmed that the Ara Hills consent holder is required to construct the Grand Drive extension to the Delmore boundary.

5 Earthworks

a) Cut at the boundary of Delmore / Ara Hills

Based on Mckenzie & Co's understanding that Ara Hills are required to construct the Grand Drive extension, it was our expectation that Ara Hills would need to approach Delmore to construct a batter along the boundary to enable them to deliver the road, to the Delmore boundary.

The road levels are set on the boundary, by Supporting Growth, and as such, this batter was always understood by both parties (AVJ Hobsonville and Vineway Limited) as requiring co-ordination, contrary to the wording contained within Mr. Roberts' brief.

The cut on the boundary of Ara Hills is inevitable, and either party who builds the road would be required to co-ordinate with both landowners to facilitate this batter. As shown below, in the image included with Mr. Roberts' brief, there is a significant batter located at the boundary.

AVJ Hobsonville and Vineway Limited have already undertaken discussions regarding this area, as there is significant benefits to both parties to co-ordinate this cut. This is discussed further by Public Works Advisory.

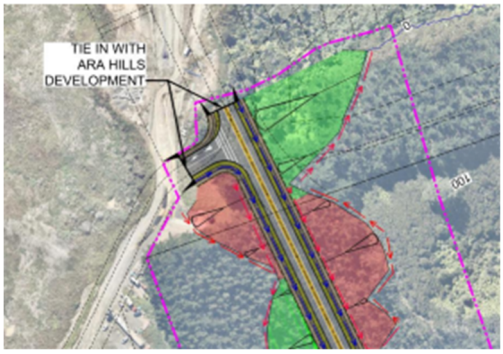

Figure 1- Cut batter shown on NOR 6 design, shown in red, fully contained within the NOR boundary.

b) Truck movements based on earthworks volumes

The applicant will manage any required haulage of surplus through Ara Hills and Grand Drive via a detailed Construction Traffic Management Plan ("**CTMP**") which will be submitted to Auckland Council for certification prior to earthworks commencing. This plan is required as a condition of consent.

Although the lodged model currently indicates a Stage 1 surplus of 146,000 m^3, ongoing refinements to the digital terrain model and phasing strategy will potentially further reduce these volumes. Any remaining material will be reused on site wherever feasible.

6 Stormwater

Mr. Roberts has stated the following in Section 6.2 and 6.3 of his Memorandum:

"The Delmore flood report has simply referred to this increase in flood level within Ara Hills as being "contained within the existing channel, with no anticipated consequences". Further, Section 6.6 of the Stormwater Management Plan (SMP) prepared by Mckenzie & Co (Appendix 6 of the Application). states that the design surface level of the lower Stage 2 lots is approximately RL26m, being significantly higher than the modelled flood plain level. However, this level is the highest elevation on the Ara Hills Stage 2 lots, whereas the lower end of the Ara Hills lots have a finished level of approximately RL15m, being below the flood level. I consider that these lots do not form part of the "existing channel" as stated by Mckenzie & Co. My opinion is that the proposed increase in flood levels is likely to have an effect on the lower residential lots of the Ara Hills development, due to being flooded to a higher elevation in excess of 300mm in the 100 year storm event. In my view this has not been sufficiently considered or assessed as part of the Delmore flood assessment."

The Levels shown for the Ara Hills lots described in the Aireys Memorandum are shown below.

The lots at the bottom of the Ara Hills site have two distinct features:

1) A flat building platform, with Finished Floor Level's shown on the approved plans, shown below in **Figure 2** at approximately RL 26.
2) A 1 in 1.5 (66.6%) reinforced mass-stablised slope.

The two areas are clearly visible in **Figure 2** below, with the flat building platform (RL 26) area being devoid of contours and the batter slope having close contours, indicating steepness.

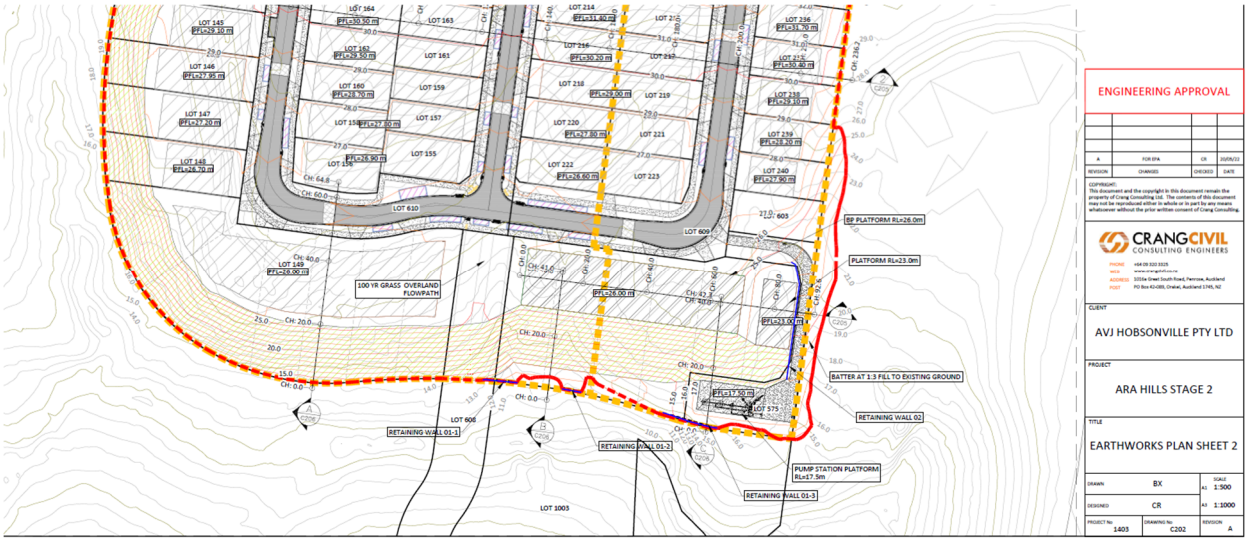

Figure 2 - Finished contour plan, Ara Hills.

Cross section A-A, which corresponds to 'A-C205' in **Figure 2** is provided below in **Figure 3**, clearly showing the building platform.

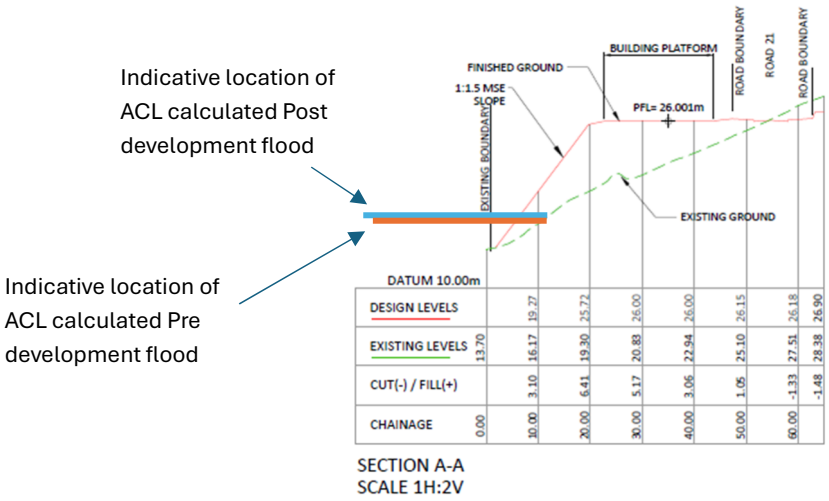

Figure 3 - Cross section A-A, showing Flood level calculated by Airey Consultants Ltd

The bottom of these slopes are at approximately RL 13 – 15m as mentioned in the report. Given the flood level is approximately 16.34RL (Ara Hills) it would practically only be the toe of the embankment being submerged. This information shows that the statements made by Mr Roberts are incorrect. There are no building platform areas located at RL15m, as suggested by Mr. Roberts. The lowest building platform area within this area of site is RL23m, as shown as a hatched area below in Figure 4.

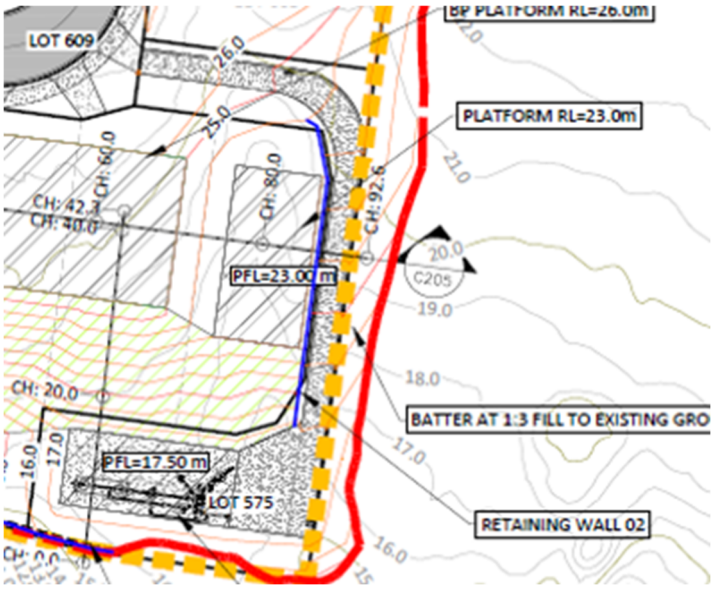

Figure 4 - Lowest Platform Level = R23.0m

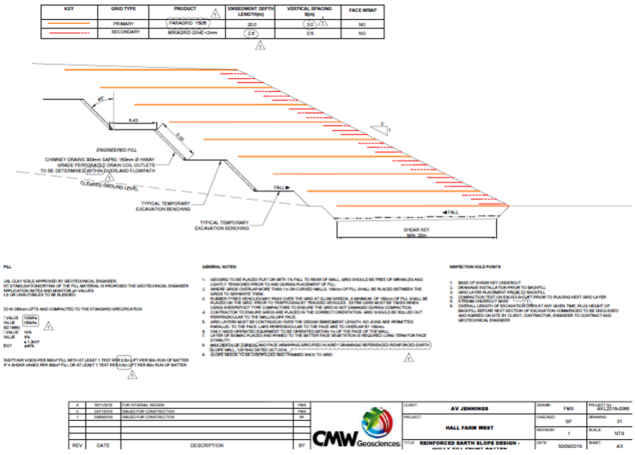

Figure 5 - MSE reinforced embankment

In 6.3, there is a statement by Mr. Roberts:

"While I acknowledge that there is potential / likelihood of dwellings being constructed on the more elevated areas of those sites, it is not a guarantee. Also, the lower areas may still be used for amenity / outdoor living such as patio's, decking, swimming pools etc"

Upon review of the Ara Hills cross-sections, it is considered that this statement is misleading with regard to the potential for future development within these areas. Mr. Roberts is suggesting that the batter slope areas as shown in **Figure 4** above (with gradients of 66%) could be developed with patios, decking, or swimming pools.

McKenzie & Co refute the reality of this statement. Given the steep slope grade of 66%, and the presence of geogrid through the embankment, the notion of these slopes being used for the above purposes is unrealistic. It is considered by McKenzie & Co that this statement by Mr. Roberts is overstating both the risk associated with the existing flood plain and the minimal increase of this flood plain generated by the Delmore development (in the order of 140mm, as elaborated further below).

Flood level

The flood levels have been calculated by Airey Consultants Limited, as part of the resource consent process for Ara Hills, which shows that the calculated flood depth for the pre-development flow, is 16.28m, and the post Ara Hills development scenario is RL16.34m. This is an increase of 60mm.

It should be noted that a significant portion of the Delmore length of stream, will have been subject to this 60mm increase. While there is an increase in flood level, there was not an increase in flood risk. We have taken the same approach as AVJ has taken.

It is important to note that this plan was issued in 2021, using different climate change factors that was used in the Delmore flood modelling. For comparison –

- 2021 climate change increase for 1% AEP – 16.8%
- 2025 Climate Change increase for 1% AEP – 32.7% (used in Mckenzie & Co Modelling for Delmore).

This explains why our flood model is significantly higher than the AVJ model.

The design is also in a different vertical datum, being AUK1946, vs NZVD2016. This means there will be approximately 300mm difference between the levels (based on LINZ conversion).

Nonetheless, the Ara Hills plan shown below as **Figure 5** shows that in both the pre and post development scenarios, the flood plain increases from 16.28m, to 16.34m as part of the Ara Hills development, and the lower parts of the lots identified by Mr. Roberts are flooding already in both scenarios.

There is an increase in flood levels resultant from the development of Delmore, however, it is not inconsistent with the existing flood hazard that exists on the site, based on the Ara Hills flood report, as the flood hazard already exists.

The modelled increase of 140mm at the Ara Hills lots does not increase the flood risk to habitable floor levels or increase flood risk to pedestrian or vehicle egress or other activities, and therefore we stand by our assessment that the flood risk to Ara Hills is low.

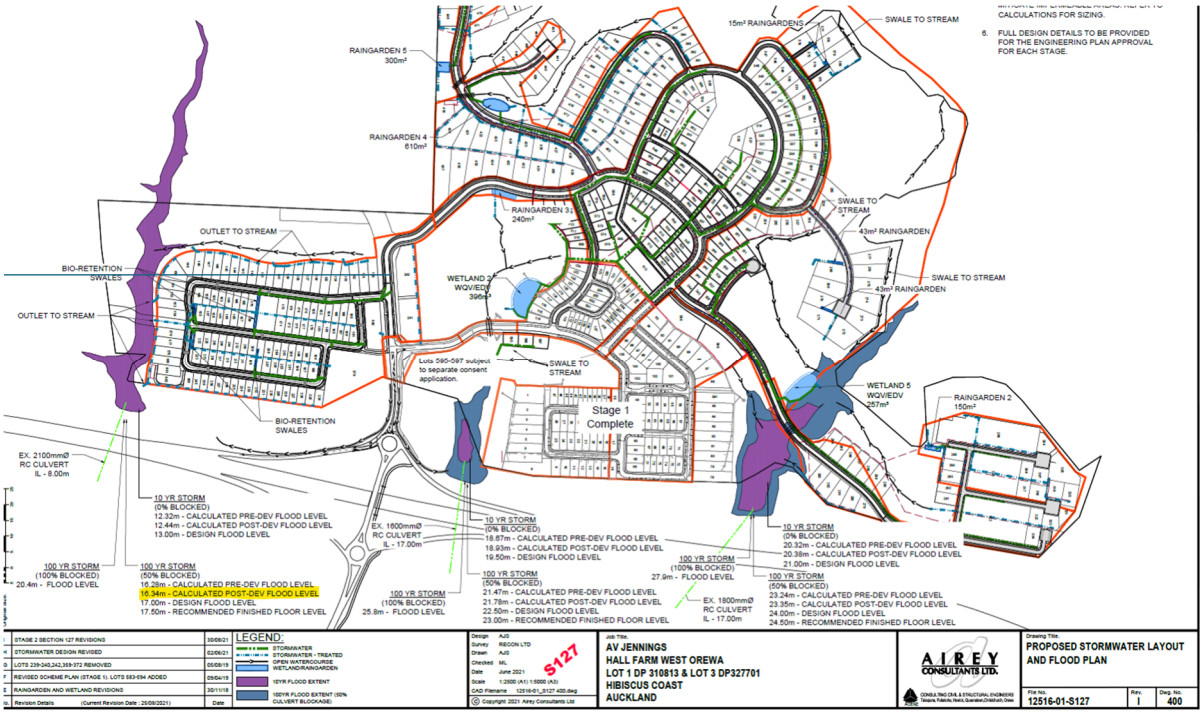

Figure 6 - Ara Hills proposed flood plain map, 2021

Pumpstation

The Ara Hills pumpstation level (as seen in **Figure 2**, further above) l is already prone to flooding in the Delmore pre-development scenario, when McKenzie & Co apply the latest climate change data. The finished level of the pumpstation is RL17.5m AUK1946, which is 17.2m in NZVD. The existing flood level (pre-development of Delmore) is 17.17mRL , so based on the latest climate change data, the existing Ara Hills pumpstation does not have the required freeboard. Therefore flood risk already exists, it is not a product of the Delmore development.

The minor 140mm increase in flood level created by Delmore doesn't introduce a new flood risk, as the pumpstation site is modelled as already non-compliant in the pre-development scenario. In our experience the Ara Hills consent holder will already need to be looking at remediation works given the current risk profile, which Delmore does not create.

A simple remediation which the Ara Hills developer might consider would be to construct a small flood protection wall within the pumpstation site, approximately 300mm high, either just around the water sensitive electrical gear shown in blue, or the full site shown in yellow (refer to **Figure 6**, below).

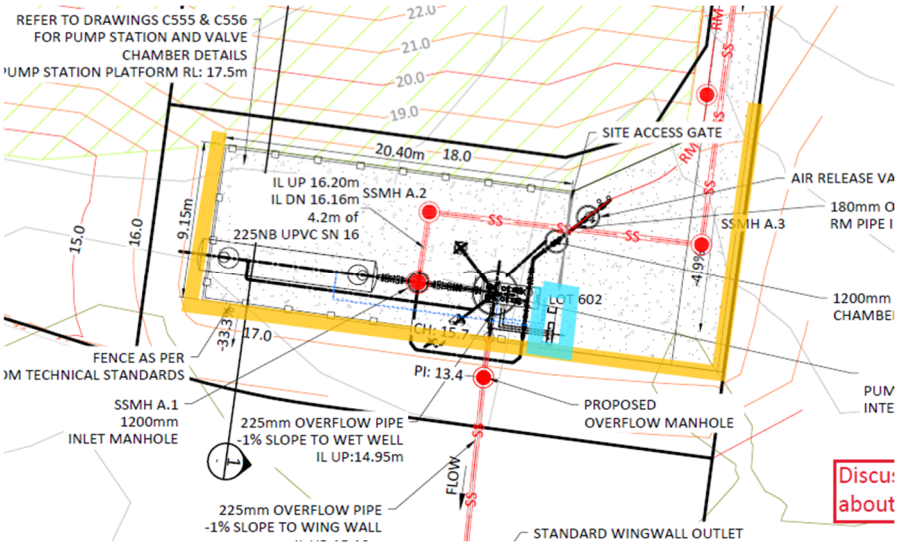

Figure 7 - Pumpstation flood protection wall

7. Wastewater

A review of the existing DN315 gravity wastewater pipe, located within the NZTA land east of Ara Hills, has identified that it has full-flowing capacity of 267 L/s, so the pipe capacity is not a constraint, contrary to the statements provided by Mr. Roberts. Peak wet-weather flows for Ara Hills and Delmore development represent less than 30% of that capacity, being 75 l/s. The limiting factor is Watercare's Wastewater Code of Practice, which cites a guideline maximum velocity of 3 m/s. McKenzie & Co's hydraulic model shows a peak of approximately 3.8 m/s under full-development loading.

Section 5.3.5.6 of Watercares Code of Practice provides some solutions where velocities are above 3m/s, such as providing an energy dissipating chambers at the end of the steep pipe.

8. Water

It is noted that AVJ are progressing with a reservoir for the Ara Hills development, which—based on their memo—appears to be primarily driven by the presence of a single point of supply for their development and the associated limitations on network redundancy.

McKenzie & Co have undertaken further testing and modelling of the surrounding network, which confirms that water supply to the Delmore development can be provided from the existing network without adversely affecting flows or pressures within Ara Hills. Our updated hydraulic analysis shows that sufficient capacity and service levels are maintained, even with the addition of Delmore's demand. Refer to the Water Capacity Memorandum prepared by McKenzie & Co for more comprehensive detail.

While it is acknowledged that the existing 355 mm diameter main is currently aligned to the proposed Ara Hills reservoir, its location within the Future Urban Zone makes it highly likely that it will ultimately form part of a future Watercare ring main extending to Wainui Road. As such, it remains a viable and appropriate servicing option for Delmore as part of that broader network, although the timing of this full connection is yet to be confirmed.

With the inclusion of the Wainui Road link, the McKenzie & Co modelling demonstrates that both standard supply pressures and firefighting demands can be met across the Delmore site.

In response to items 8.12 and 8.13 of Mr. Roberts Memorandum, it is noted that Delmore is not requesting to connect to the Ara Hills reservoir. Delmore will connect to the existing public network, which is located at Delmore's boundary. We note that connecting to transmission mains—such as the DN355 main—is a common and accepted

practice, including for the Ara Hills development itself. Several other neighbourhoods are already connected to this pipe, so it is unclear what specific concern is being raised in relation to Delmore's proposed connection.