

**BEFORE THE INDEPENDENT HEARING PANEL
APPOINTED BY UPPER HUTT CITY COUNCIL**

IN THE MATTER of the Resource Management
Act 1991 (**RMA**)

AND

IN THE MATTER of a request by **MAYMORN
DEVELOPMENTS LIMITED** for
Private Plan Change 55
(Gabites Block) to the Upper
Hutt District Plan under Part
2 of Schedule 1 to the RMA

SUMMARY STATEMENT OF EVIDENCE OF ALAN MITCHEL BLYDE

CIVIL ENGINEERING ISSUES

17 OCTOBER 2022

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1. I have prepared a summary statement of my evidence in chief dated 30 September 2022, which also addresses subsequent discussions relevant to my expertise.

Earthworks

2. Earthworks are required to enable access over the site and to enable future land use. These include measures to:
 - Reduce steepness and cross gullies, and smooth undulations within the hilltops.
 - Provide lot platforms that will minimise the need for future earthworks during house building stage.
 - Provide site access with roads and pedestrian pathways that have appropriate widths and achieve design standards for gradient and geometry.
 - Provide flood mitigation including attenuation ponds, rain gardens, and other measures such as culvert upgrades
3. Environmental drivers for Earthworks:
 - To be in accordance with overarching regional earthworks provisions encompassed within the GWRC Natural Resources Plan.
 - Protection of Gabites Block Natural Areas (GBNAs) and minimising earthworks within these.
4. Other key considerations for earthworks are:
 - Achieving a cut and fill balance as far as practicable (i.e. limiting the need for excess material leaving the site and the requirement for additional material to be imported to site)
 - Providing gradients in accordance with geotechnical recommendations outlined by Engeo
 - Earthworks fills in accordance with NZS: 4431: 1989 Code of Practice for Earth Fill and Residential Development.

Erosion and Sediment Control

5. Primary responsibility for significant earthworks and sediment and erosion control lies with GWRC. The guiding document is "Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Wellington Region 2021".
6. Requirements will be included in Resource Consent applications to UHCC and GWRC and then imposed as conditions of consent.

Wastewater

7. There is a public main within Maymorn Road immediately adjacent to the site, but this has capacity constraints during wet weather. During normal conditions the network has capacity and could accommodate additional flows from the site. Wastewater discharge from the site needs to be "attenuated" during significant rainfall events and released into the system once the peak has passed. On-site disposal is not suitable due to poor ground permeability in certain areas requiring large disposal areas not conducive to sloping land. The lower, flatter part of the site is underlain by gravels which are typically free-draining, however a high-water table is present.
8. During earlier discussions with Wellington Water (**WWL**), a number of acceptable options for peak flow control were agreed but, more recently, WWL has identified their preferred option is to discharge to the existing public wastewater network from a decentralised, on-lot private pump and storage system, connected to a public low-pressure sewer system. The on-lot pump and storage system will include 'smart controllers' enabling WWL to instigate peak flow control during times of wet weather.

Water Supply

9. There are existing public water mains parallel to the site boundary along Maymorn Rd, however there is no capacity available to provide water to the site.
10. UHCC/WWL have proposed upgrades to the wider public water supply network however there is nothing proposed in Council's LTP.
11. As there is no public water supply available, on-lot water supply utilising rainwater collection tanks is the only option. Each lot will need to have an adequate water supply and water storage for both potable use and firefighting. The UHCC Code of Practice contains guidance on suitable storage requirements. In addition to the potable water storage, additional water storage will be required for firefighting purposes. The firefighting storage should meet the requirements of SNZ PAS 4509:2008. On the basis that future houses are sprinklered with a domestic sprinkler supply (fed from a rainwater collection tank), then the total water supply storage requirements for a typical dwelling would be 37,800 litres for potable water and 7,000 litres for fire fighting supply, giving a total storage requirement 44,800 litres.
12. This water storage requirement could be met with the provision of 2x 25,000 litre tanks on each site. These tanks are typically 3.5m diameter x 3.0m high and therefore two of these tanks could readily be accommodated on a lot of 1,000m² or larger. The proposed size of the lots for the Northwest Area (average 600m², down to a minimum of 400m²) means it is more difficult to satisfactorily integrate the required storage with any proposed house design. For this reason, it is proposed that subdivision below 1000m² only be carried out when a suitable public water supply is available to serve the Northwest Area.

Flood Management

13. There is an existing stream that bisects the site. This stream is a tributary of the Mangaroa River. It travels northwards through the site and joins another tributary just beyond the site, before passing underneath Maymorn Rd in a culvert and then joining the Mangaroa River.
14. A Floodplain Assessment has been completed which details the existing flood risk for the site that would occur in a 100-yr storm event, including a 20% increase in rainfall to cater for climate change. The assessment includes a plan showing Proposed Stream Corridors specifically with respect to flooding/ conveyance of stormwater. The mapped stream corridors (flooding) are generally aligned with the mapped Waterways included as Figure 14 within the ecological report. As well as the stream corridors, the site is at risk of flooding over part of the lower-lying, flat part of the site.
15. The Floodplain Assessment report includes modelling of a future scenario where the flat lower part of the site is to be fully developed and identifies that, with the following upgrades and stormwater management works, flooding can be contained within stormwater management areas and away from development areas / house sites:
 - Existing stormwater culverts across the site will be upgraded/upsized to allow better through-flow and prevent backing up and ponding upstream of culvert crossings within streams.
 - The existing stream on-site will be doubled in size to allow a significant increase in attenuation capacity within the site, thereby preventing downstream properties from any increased flood effects which could have otherwise occurred with additional development on the Gabites Block.
 - Additional pond storage and detention basins will be strategically located within drainage reserve areas to provide additional attenuation volume for flood flow control.
16. Mitigation measures will be finalised as part of future resource consent applications, designed with comprehensive development plans and will involve preparation of a detailed Stormwater Management Plan (**SMP**). The measures will be designed to ensure that peak flow to downstream properties is controlled and remains hydraulically neutral. In addition, the measures will ensure that development areas on Gabites Block can be developed with no flood risk in a 1 in 100 year plus climate change event.

Stormwater Management

Road Stormwater

17. Future roads across the site are expected to be vested in Council as public roads. Stormwater assets within the road lot would therefore become public assets. On the steeper parts of the site there is a greater need to control the runoff velocity of road-

based stormwater and there may be more kerb and channel used. These channels would drain into roadside sumps which are likely to be connected to short, piped networks within the road. These piped networks would discharge to existing gullies. On the lower, flatter parts of the site stormwater runoff from roads is expected to be controlled by roadside swales.

Stormwater Quality

18. Treatment of stormwater runoff from all trafficked areas is to be provided, this could be achieved with either rain gardens or constructed wetlands. Swales may also be used on the flatter parts of the site for pre-treatment. The final form of treatment proposed will be detailed within a development-specific SMP provided at the time of future consent applications and will likely be in compliance with the WWL “*Water Sensitive Design for Stormwater: Treatment Device Design Guideline*” (December 2019).

Stormwater Attenuation

19. Due to the downstream constraints, there is a need to provide attenuation of peak runoff rates to ensure hydraulic neutrality. For runoff from the proposed roadway areas, this could be achieved by constructing ponds at or close to the discharge points.

Stormwater Discharge

20. Discharge from stormwater pipes collecting runoff from roadways will be into existing gullies with suitable erosion control. As noted above the discharge will include or be preceded by treatment and attenuation devices.

On-Lot Stormwater

21. Stormwater generated from development on individual lots will be managed on each site and will be required to be designed to achieve hydraulic neutrality. Roof water would be collected to rain tanks adjacent to each house which will serve as the primary source of potable water for the houses. There will be overflow connections from the rain tank passing to the downstream disposal point. The discharge point will vary depending on the location of the house site within the lot, the terrain of the lot, and whether there is a piped system available within the road.
22. Lots below the road would typically discharge to gully areas via a designed outfall structure with energy dissipation and scour protection. Some lots that are close to the road where a piped system is present may discharge to the piped network provided that this has been included in the attenuation calculations at subdivision stage.

Utility Services

Power

23. Wellington Electricity have advised that network upgrades would be required for the proposed development to be fully developed. This is not unusual for developments of this scale. Further detailed discussions are ongoing with Wellington Electricity to determine the timing of the upgrade.

Telecommunications

24. Chorus has confirmed the development can be serviced by their network.

Alan Blyde

17 October 2022