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Ambridge Rose
157 Edgewater Drive
Pakuranga
Auckland 2010

Re: s92 Request Response (Coastal Hazards) – Ambridge Rose Retirement Village, Pakuranga.

This letter provides a response to parts of an Auckland Council Section 92 request for further information in relation to the proposed Ambridge Rose Retirement Village, 147-153 Edgewater Drive, Pakuranga. The matters covered here relate to the assessment of coastal hazards (CHA, April, 2025)[1]. The s92 request relates to the long-term potential coastal erosion hazard at the site and the alignment of the proposal with key objectives and policies of the Auckland Unitary Plan. Relevant questions are reproduced below in italics, followed by responses.

Objectives and Policies of the Auckland Unitary Plan

a. *The coastal erosion hazard zone delineated in the site-specific ASCIE map (4D Environmental Limited, April 2025) indicates potential future impacts to the proposed development over the 100-year planning timeframe. Having identified the site's coastal erosion hazards (both current and projected), please … provide a comprehensive assessment of how the proposal aligns with Objective E36.2(2) and Policies E36.3(3)(a–i) of the AUP (OiP).*

The relevant objective and policies are reproduced below:

Objective E36.2(2): Subdivision, use and development, including redevelopment in urban areas, only occurs where the risks of adverse effects from natural hazards to people, buildings, infrastructure and the environment are not increased overall and where practicable are reduced, taking into account the likely long-term effects of climate change.

Objective E36.2(2) aims to manage the adverse effects of development in hazard areas. These adverse effects can include damage to buildings and/or associated infrastructure, as well as impacts on coastal processes, amenity values and public access. The proposal includes a plan for monitoring and mitigation to address any adverse effects of coastal erosion hazard if it becomes necessary in the medium- to long-term. This is covered in more detail in later parts of this response below.

[1] Gibberd, B. 2025: Ambridge Rose Retirement Village – Coastal Hazard Investigation Report. Prepared by 4D Environmental, April 2025.

Policies E36.3(3)(a-i): Consider all of the following, as part of a risk assessment of proposals to subdivide, use or develop land that is subject to natural hazards:

- *(a) the type, frequency and scale of the natural hazard and whether adverse effects on the development will be temporary or permanent;*
- *(b) the type of activity being undertaken and its vulnerability to natural hazard events;*
- *(c) the consequences of a natural hazard event in relation to the proposed activity;*
- *(d) the potential effects on public safety and other property;*
- *(e) any exacerbation of an existing natural hazard risk or the emergence of natural hazard risks that previously were not present at the location;*
- *(f) whether any building, structure or activity located on land subject to natural hazards near the coast can be relocated in the event of severe coastal erosion, inundation or shoreline retreat;*
- *(g) the ability to use non-structural solutions, such as planting or the retention or enhancement of natural landform buffers to avoid, remedy or mitigate hazards, rather than hard protection structures;*
- *(h) the design and construction of buildings and structures to mitigate the effects of natural hazards;*
- *(i) the effect of structures used to mitigate hazards on landscape values and public access;*
- *(j) site layout and management to avoid or mitigate the adverse effects of natural hazards, including access and exit during a natural hazard event;*

The proposed development does not increase the risk of adverse effects from coastal inundation or cause an immediate increase in coastal hazard risk. Episodic natural hazard "events" are not expected to impact the proposed development. The coastal hazard in this case relates to the potential for coastal erosion hazard risk to develop gradually in the medium to long term. The rate of toe erosion at the site has historically been very slow, and measuring these rates accurately has been inhibited by obscuring vegetation and mapping limitations. Prediction of future rates is further complicated by accelerating sea level rise. The CHA estimates approximately 2-6 m of toe retreat over a 50-80-year timeframe, depending on underlying shoreline retreat rate and the impact of future sea level rise. If erosion rates are consistent with the lower estimates, the proposed development may not be affected by coastal erosion over its expected lifespan. However, given the uncertainty and necessary precaution, the CHA calculations suggest that in 50+ years, coastal erosion may affect Building A, and the land seaward of the buildings.

The consequence of gradual shoreline retreat seaward of the site would be eventual slope failure within the council reserve and the seaward edge of the development site. The property and associated infrastructure between the proposed buildings and the coastal bank may therefore be impacted by land movement. If these processes continued unmanaged, slope failure associated with toe erosion could expose the basement wall of Building A. Building B is not likely to be directly impacted by coastal erosion in the next 80 years.

The proposed development does not affect the processes driving coastal erosion and therefore does not create a new coastal hazard or exacerbate hazard at the neighbouring properties.

The mechanism of shoreline retreat at the site is uni-directional and is therefore permanent. The proposed buildings are not relocatable or adaptable. Any coastal erosion hazard risk will develop gradually over time.

The application proposes a plan for measurement of erosion rates to determine shoreline retreat more accurately and to monitor for signs of slope instability. If the monitoring indicates that coastal erosion and associated instability threaten the development, remedial action would be taken. It is likely that vertical palisade wall would be preferred, located along the site boundary to ensure the buildings and infrastructure are protected. The wall would be located within the property boundary and above mean high water springs, with the primary purpose of stabilising the slope rather than interfering with coastal processes at the toe. The wall would be subject to resource consenting, at which time the effects on coastal hazards and coastal processes would be considered in detail. The proposed consent conditions include provisions for monitoring and remedial action.

Public access to the foreshore seaward of the site is currently very restricted, due to the steep sloping bank and heavy vegetation. The intertidal area is also almost completely covered with mangroves and has a muddy substrate that makes movement difficult. The value of public access to this section of CMA is therefore of limited value and there is currently no accessible public access along the coastal margin within the reserve. It is my understanding that there are no plans for work on the esplanade reserve and that the esplanade reserve adjacent to the site is not part of any planned greenway route. The proposed development does not adversely affect public access to the CMA.

A change from a heavily vegetated sloping bank to a vertical retaining wall is likely to have some impact on natural character and landscape values. These impacts could be mitigated through careful use of materials, design, colours and planting.

<u>Monitoring and Mitigation</u>

b. *Please … provide the following clarifications re the proposed shoreline monitoring and mitigation items in the Coastal Hazards Report.*

    - *Has consideration been given to conducting inspections after severe weather events? If so, what threshold will define a severe weather event for triggering such inspections?*

The coastal margin at the site is a steeply sloping bank cut into Tauranga Group sediments. The mechanism of erosion at the site is gradual undermining at the toe and subsequent slope instability due to oversteepening. The site is within a sheltered tributary of the Tamaki River estuary and is fronted by mangroves. Wave exposure at the site is therefore very low, and storm events are not likely to be key drivers of erosion. Available data indicates that the rates of erosion are slow (approximately 0.02-0.05 m per year). Regularly spaced long term monitoring of bank retreat is therefore more appropriate than event-driven monitoring.

- *What specific methods will be used to monitor "toe erosion" (e.g., surveying, photographic comparison, drone imagery)?*

The rate of erosion is very slow, and toe of the bank is obscured by vegetation cover in most areas. Aerial photography or drone imagery is not likely to provide sufficiently accurate output to monitor erosion over management timeframes. A practical and cost-effective approach would be to place benchmarks along the top of the bank to allow for physical measurement of toe retreat, and to

collect photographic records from fixed locations on the foreshore at the dune toe. Where fixed structures exist on the foreshore, measurements can be made to the toe of the bank to provide further data.

- *What data will be collected to quantify toe erosion (e.g., measurements of setback, volume loss)?*

Simple measurements of distance to the toe of the bank at regular spacing (e.g. 15-20 m spacing) along the foreshore. Photographic records are useful to support measurements and evaluate any change.

- *What aspects of "vegetation" will be monitored (e.g., type, density, health, extent on the slope) and how will vegetation changes be assessed in relation to slope stability and erosion?*

To my knowledge, no earthworks or vegetation is proposed on the Council reserve as part of the development. Observations of changes in vegetation may occur as it indirectly relates to observed land instability, but no direct vegetation monitoring is proposed as part of the coastal hazard monitoring.

- *What specific indicators of slope instability will be assessed during monitoring (e.g. surface cracking, ground slumping)?*

Monitoring will include investigation for head scarps, tension cracking or slumping on the coastal slope and adjacent land.

- *What methods will be used to detect these indicators of slope instability (e.g. visual inspections, inclinometers, drone or photogrammetric surveys)?*

Visual inspection should be undertaken by a geologist or engineer. The presence of any of the features defined above (head scarp, cracking, slumping) within 2 m of the property boundary would trigger a detailed risk assessment to be undertaken by an appropriately qualified professional. The risk assessment may include a photogrammetric survey and should include a stability analysis based on the ground profile at the time of the assessment, considering erosion rate over the next 10 years.

- *What criteria or thresholds will be used to "deem a risk within ten years"? Is there a specific quantitative or qualitative measure that triggers this assessment?*

Available information suggests toe retreat of the consolidated sediments is 2-5 m per century. A key output of the ongoing monitoring outlined in the proposed consent conditions is to evaluate erosion rates more accurately and determine likely change in the following 10-20 years. This information can complement slope stability monitoring described above. A fixed trigger (e.g. two metres of horizontal retreat of the toe of the coastal bank) or evidence of instability close to the property boundary could also be applied to prompt a detailed review of coastal hazard risk.

Kind regards,

Bronwen Gibberd, 4D Environmental Ltd