Civil Engineering Infrastructure Assessment

Ratanui Plan Change

65 & 73 Ratanui Road, Paraparaumu
Welhom Developments Limited
29/11/2024
FINAL

Document Control

Project Number	P22-323
Project Name	Ratanui Plan Change
Client	Welhom Developments Limited
Date	29/11/2024
Version	V1
Issue Status	FINAL
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1. Introduction

Woods has been engaged by Welhom Developments Limited ('Welhom') to provide an infrastructure assessment in relation to the proposed rezoning and subsequent use of the site at part of 65, and 73 Ratanui Road, Paraparaumu (the 'Site') for future residential subdivision and development, including the potential for a retirement village ('Proposed Development'). This report has been prepared to support the private plan change request to Kāpiti Coast District Council ('KCDC') to rezone the site from rural lifestyle to residential. It addresses civil engineering aspects, including earthworks, road access, stormwater and wastewater drainage, and water supply for the future residential development, and concludes there is no material impediment to development of the Site from a civil engineering infrastructure perspective

1.1. Site Description

The Site is located at 65 & 73 Ratanui Road, Paraparaumu on the northeast side of Paraparaumu township and comprises two allotments:

- Lot 4 DP 58017, Certificate of Title 29D/823, approximately 9.43ha (65 Ratanui Road)
- Lot 3 DP 497389, Certificate of Title 734643, approximately 5.37ha (73 Ratanui Road)

Part of 65 Ratanui Road is proposed to be retained by the Vendor through a boundary adjustment subdivision process.

The topography of the Site is undulating with small hummocks and hollows typical of the Kāpiti Coast dune lands.

An open channel bisects the Site and is maintained by KCDC as part of its stormwater network. This is classified by Greater Wellington Regional Council ('GWRC') as a highly modified stream.

The Site is extensively fenced and is currently used for small-scale pastoral farming. The north boundary of the Site has two hill slopes with some blackberry and boxthorn cover. Small clusters of trees are extant across the Site.

A large shed is located on the south side of the Drain.

The Site is bounded to the west by residential properties, to the north and east by farmland, and to the south by Ratanui Road. A preschool is located opposite the Site on the south side of Ratanui Road.

The Site has been identified by the Kāpiti Coast District Council's 2022 Growth Strategy – Te Tupu Pai as a "Medium-priority greenfield growth area" which signals its potential for future urban growth.

Figure 1 below shows the Site location and surrounding land areas.

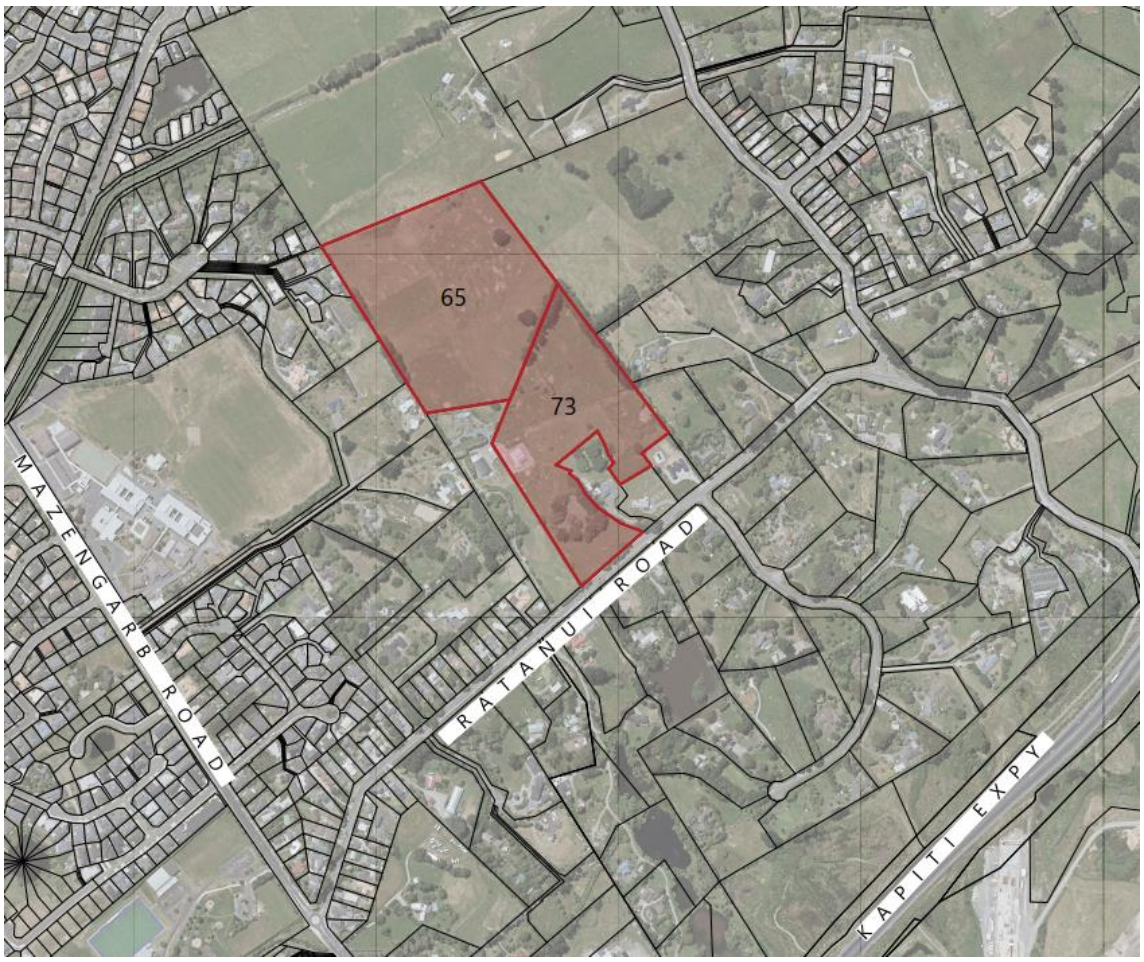

Figure 1: Site Location (red hatch) and Surrounding Land Areas (Land Information New Zealand via LINZ Data Service)

1.2. Development Proposal

The Proposed Development is to change the zoning of the Site from the current Rural Lifestyle zoning to a General Residential zoning. We understand that the Site may yield up to approximately 235 residential dwellings under existing Kāpiti Coast District Plan density standards for the General Residential zone, as established by an economic assessment by Property Economics Limited. However, some specific provisions are proposed to enable development of the Site as a retirement village.

The intent of this report and the assessments undertaken to support it is to provide certainty regarding key requirements for any future residential activity on the Site (including potential for a retirement village) , whilst allowing flexibility as the detailed design phases evolve in the future.

Future servicing options have been assessed and have confirmed that servicing of the land can be achieved in an appropriate manner to meet KCDC requirements.

Bulk earthworks would be required to form a suitable finished surface and integrate the proposed developed landform into the existing contour. Connections for roading & access, water supply, and wastewater would be made to existing KCDC assets in Ratanui Road. Land would need to be set aside for stormwater treatment and attenuation, before discharge into the existing Drain that bisects the Site. Telecommunications and electrical supply assets also exist in Ratanui Road, and connections would be made to these.

Specific design for these services will be determined at the time of future subdivision or land use consents.

1.3. Information Provided by Others

We have relied on the information provided by Welhom and its consultant team during the preparation of this report and have commented where we have adopted recommendations or drawn inference from information provided by others.

Copies of information provided by others that we have relied on are appended to this report or referenced if they are appended directly to the Plan Change application.

1.3.1. Ecology

An ecological report dated 29 November 2024 has been provided by Vaughan Keesing of Blue Green Ecology (Appendix A). The report summarises the findings of a site survey to identify the presence of natural wetlands as defined by the GWRC Regional Policy Statement and the National Policy Statement for Freshwater Management. The extent of the existing wetlands are quantified and the level of ecological value assessed.

The advice from the reporting suggested that the natural wetlands were determined to have low ecological values and replacement offset features could be co-located within the stormwater management areas (SMA) or compensatory flood storage area.

1.3.2. Transportation

Stantec has prepared an assessment dated 29 November 2024 that establishes traffic volumes anticipated to be generated by the Proposed Development and concludes that Ratanui Road can accommodate the additional traffic generated from either a residential or retirement village uses safely and efficiently, with some improvements to the Ratanui Road frontage. The assessment concludes that key consideration needs to be given to the form of the access point from the Site onto Ratanui Road, namely a new intersection (or driveway for a retirement village scenario) with a right turn bay, refuge island and speed threshold treatments.

We understand that the roading infrastructure requirements on Ratanui Road to accommodate traffic volumes from the Site are the same for typical residential development and a comprehensive care retirement village development.

1.3.3. Survey

A topographical survey of the Site has been carried out by Leith Consultants Limited in February & March 2023 for 65 Ratanui Road, and in May 2024 for 73 Ratanui Road. There were some areas of the Site where survey pick-up was not possible due to the presence of existing heavy vegetation. Where site-specific topographical survey information is not available, Woods has supplemented this with publicly available Lidar data and GIS.

1.3.4. Economics

An economic assessment has been prepared by Property Economics Limited, that establishes a reasonable upper bound of approximately 235 dwellings could be expected to be constructed on the Site, if the Site is developed as a residential subdivision adopting existing KCDC residential zone provisions. The Property Economics report is appended to the Plan Change application.

2. Earthworks

2.1. Existing Site Characteristics

2.1.1. Notable Site Features

- The topography of the Site is very undulating as is characteristic of the Kāpiti Coast dune lands. Elevations range from approximately RL 16.0m down to RL 4.0m (Wellington 1953 local vertical datum).

- Two large hillocks are present at the north end of the Site.
- A man-made pond exists in the southern part of the Site.
- A deeply incised channel with steep banks bisects the Site. The GWRC watercourse map shows the channel as being a highly modified stream. It is maintained by KCDC as part of its stormwater open channel network.
- A number of low-value small 'wetlands' are present on the Site, as outlined in the Ecological Assessment report prepared by Bluegreen Ecology.

2.1.2. Soil

A geotechnical and contamination report (Appendix B) for the Site, prepared by Riley Consultants, indicates that the Site is generally underlain with 0.15m to 0.50m of topsoil overlaying a fine sand layer with varying quantities of silt. Groundwater has been recorded at depths of 2m to 8m below ground level. While no significant contaminants were identified, isolated arsenic contamination and cadmium levels exceeding background concentrations were noted.

Riley noted that disposal options for contaminated soil depend on regional acceptance limits but concluded that contaminated material can be addressed using the normal array of methods.

2.1.3. Clearing

Clearing of the Site will be required to facilitate the proposed earthworks, and would include removal of all existing buildings, trees and vegetation, and other miscellaneous features such as fences, redundant farming infrastructure, culverts in the existing Drain.

All materials removed from the Site would be disposed of at the appropriate facilities. Additional testing for asbestos in existing buildings will be required prior to their demolition.

2.2. Finished Site Levels & Earthworks

A preliminary assessment of the required cut and fill volumes has been undertaken. This assessment is based on the following principles:

- Finished ground profile to direct stormwater to stormwater management areas and provide overland flow paths for mitigation of flood risk.
- Achieving appropriate development standards, particularly for finished gradients of roads and accessways
- Minimise retaining walls throughout the development where possible.
- Achieve a cut/fill balance.
- Consider stormwater mitigation measures and identified wetlands.

Bulk earthworks would be required for the Site to achieve desirable topography for drainage, building platforms, road formation, maintaining accessible site gradients for the resident's mobility. The earthworks operation includes stripping topsoil, bulk cut & fill, servicing trenching and respreads of topsoil.

A number of scenarios have been assessed to optimise the earthworks. An estimated bulk volume of subsoil cut to fill is expected to be in the order of 55,000m^3 over the entire Site. Topsoil stripping and re-placement after bulk earthworks is not included in this volume. Maximum cut and fill depths would be approximately 6m and 4m, respectively. Additional imported granular filling has been specified by Riley as ground improvement for building foundations.

Some parts of the site may need to be set aside as undevelopable, unless the contributing constraints can be resolved. These include:

- The large hills at the north end of the Site, which straddle the boundary. It is unlikely to be physically feasible to remove these hills without agreement from the neighbouring landowner.

- Some parts of the Site which are subject to existing flooding, specifically along the southwest boundary of the Site. These are small portions of the Site that do not unduly constrain the civil infrastructure requirements associated with residential development of the Site.

Fill material placed within the Site would need to be placed to an engineered standard in accordance with geotechnical recommendations. This is likely to include specific provisions for conditioning existing sandy material for placement as engineered fill (by wetting/drying and/or addition of cement or lime), construction of specific lateral spread mitigation around the stormwater management areas and flood storage area, and construction of imported hardfill rafts for building construction. All future filling operations would be monitored by a suitably qualified geotechnical consultant to ensure compliance with the design standard.

2.2.1. Retaining Walls

Construction of a relatively flat finished surface conducive to residential development poses challenges when integrated into undulating terrain as is present on the Site. This requires that either land is set aside to batter height difference within the Site boundary, or walls are constructed at/near the Site boundary, or a combination of both to achieve the earthwork principles outlined above.

2.2.2. Erosion & Sediment Control

The construction works on the Site would be managed to ensure potential dust, sediment and erosion environmental effects will be effectively managed and/or mitigated. This management would include staging the construction, progressive stabilisation and employing appropriate erosion and sediment control measures. The sandy nature of the soil on the Site and proximity to existing residential buildings means that wind-blown erosion will be particularly important to control. A combination of specific mitigation measures would be selected from a range of available options when an erosion and sediment control plan is prepared at the time of applying for resource consent, and could include sediment retention ponds, irrigation, and progressive re-stabilisation of the Site with topsoil and grass/planting, or hardfill, as soon as possible.

3. Roading & Access

3.1. Existing Site Characteristics

To the west of the Site, the north side of Ratanui Road is urbanised with kerb & channel. It transitions to a rural formation at the west extent of 65 Ratanui and is formed with a narrow-sealed shoulder and grassed berm east of this point. A gravel-surface shared path is located immediately adjacent to the Site boundary and extends further east along Ratanui Road.

The south side of Ratanui Road is urbanised with kerb & channel, concrete footpath with a formalised drainage swale between that and the boundary. At the eastern extent of 62 Ratanui the road transitions to a rural formation, formed with a narrow-sealed shoulder and grassed berm east of this point.

The speed limit part way along the Site frontage is 50km/h before changing to 60km/h where the road environment transitions from urban to rural.

Street lighting is provided via outreach arms attached to utility poles on the south side of Ratanui Road. The eastern-most streetlight is located opposite the midpoint of 65 Ratanui Road.

3.2. Road Access

3.2.1. Site Entry

Stantec has advised that consideration to the form of Site access will be required to ensure that the anticipated vehicle movements to and from the Site can be accommodated safely and efficiently. This will require a formed T-intersection and include at least one median refuge island on Ratanui Road to facilitate pedestrian movements to the existing footpath on the south side of Ratanui Road. We anticipate that widening of the existing carriageway would be required to facilitate construction of the right-turn bay and

refuge island, and that the Ratanui Road Site frontage would be upgraded to an urban standard with kerb & channel and footpath.

The proposed entry would be designed to meet the performance criteria and design principles of the relevant standards and conform to KCDC's Transport Strategy.

3.2.2. Ratanui Road Capacity

Stantec has confirmed that the current form and function of Ratanui Road is sufficient to accommodate the additional traffic movement anticipated due to the Proposed Development. Consequently, Stantec has advised that no major upgrades of Ratanui Road or the surrounding network are expected to be triggered by the Proposed Development, in either a residential development or retirement village scenario.

3.2.3. Internal Access

The Site would be serviced by an internal network of roads that would vary in width dependant on their hierarchy and vehicle movements. The layout and widths would be specifically designed at resource consent stage to ensure appropriate vehicle tracking can be achieved, including for firefighting and rubbish collection (if applicable).

3.2.4. Geometric Design

Road longitudinal and cross-fall gradients would be designed in accordance with KCDC requirements, or if the Site is developed as a retirement village, in accordance with any criteria that the village operator has to maintain in order to provide accessible gradients for residents' mobility.

Stormwater runoff within the road corridors will be via street sumps which will discharge directly into the stormwater reticulation system. These sumps will be located in the kerb and channels adjacent to the formed carriageway.

Road corridors will be used as overland flow paths to direct stormwater runoff should there be a blockage of the sump intakes.

3.3. Road Pavement

The Riley geotechnical assessment notes that a low subgrade California Bearing Ratio (CBR) of 3% or less is expected across the Site. Due to this it will likely be necessary for subgrade improvement prior to road construction. As significant earthworks are required across the Site, it is recommended that required improvements are addressed during the earthworks phase using by stabilising the ground with lime and/or cement. Alternatively, increased road pavement thickness could be considered. Under channel drains may also be required to manage the groundwater.

Based on the Riley geotechnical report and estimated traffic volumes presented in the Stantec reporting we estimate flexible granular pavement thickness of approximately 300mm to 350mm will be required. Pavement design would be confirmed at detailed design stage following detailed assessment of traffic loading and further CBR testing.

4. Stormwater

4.1. Site and Constraints

4.1.1. Existing Site Characteristics

The Site is bisected by an existing un-named open channel. This appears to be a man-made land-drainage channel and is deeply incised with steep banks. Despite its likely provenance, it is considered a highly modified stream by GWRC. This Drain is managed and maintained by KCDC as part of its own stormwater network. The topography of the Site is very undulating and is characteristic of the Kāpiti Coast. Consequently, the existing catchment that falls directly to the Drain is relatively small.

4.1.2. Infiltration Testing

Infiltration testing has been carried out by Leith Consulting for 65 Ratanui Road in March & April 2023, and for 73 Ratanui Road in May 2024. The infiltration testing method is generally in accordance with the KCDC Low Impact Urban Design and Development Stormwater Guidelines 2012 Appendix 4.1 and is confirmed in correspondence with Leith Consulting attached in Appendix D. Results of the soakage testing are attached in Appendix D.

The infiltration results from the testing across 65 Ratanui Road in 2023 present a significantly lower infiltration rate than the more recent testing on 73 Ratanui Road. We understand that the groundwater level was significantly higher during the 2023 testing, and that this may have contributed to the lower tested infiltration rate. For the purposes of establishing approximate land area requirements for stormwater attenuation, we recommend that a rate of approximately 50mm/hr is adopted across the Site for soakage elements of a stormwater system). Further testing at subsequent phases of design development should be carried out to confirm this rate, and any spatial variability across the Site.

4.1.3. Existing Modelled Flooding & Compensatory Flood Storage

The KCDC online GIS portal indicates that there is significant flooding across parts of the Site near the Drain. Further advice was sought from KCDC to confirm the underlying assumptions associated with the model results shown on the KCDC GIS.

KCDC and Awa Environmental Ltd, as KCDC's nominated flood modelling consultant, have advised that updated modelling has recently been undertaken. Correspondence from Awa is attached in Appendix E.

Woods has obtained and interrogated a copy of the model and used the results to inform the requirements for compensatory flood storage. The flood modelling results indicate:

- Significantly less flooding than indicated on the publicly available KCDC online GIS; and
- Some flooding crossing the southwest boundary and entering the Site.

Existing flood plain storage would either be protected by setting aside this land as 'undevelopable', or by providing offset compensatory storage to ensure proposed development does not contribute to increased adverse effects.

4.1.4. Hydraulic Neutrality

The principle of hydraulic neutrality (matching post-development discharge flowrate to be no greater than pre-development) would be applied in accordance with KCDC requirements. The existing topography is very undulating and consequently we have calculated the existing catchment and flowrate discharging to the drain is relatively small, meaning that the volume of stormwater needing to be attenuated and/or disposed of on-site would be relatively large.

It is conceivable that the post-development stormwater runoff peak flowrate from the Site could occur before the peak flowrate in the Drain. Under this scenario, it may be possible to design and get approval from KCDC for a stormwater system which releases a larger proportion of the post-development stormwater runoff to the Drain before the peak flowrate in the Drain occurs; this can be addressed with KCDC during the phases of design development.

4.2. Proposed Stormwater Management

Woods has investigated stormwater management requirements for the Site and created a concept stormwater design for the Proposed Development in accordance with the restrictions and requirements noted above. The concept design comprises the following components:

- Rainfall would be obtained from NIWA HIRDS v4 for RCP8.5 climate change scenario and a 100-year event horizon, in accordance with KCDC and Welhom requirements.

- In accordance with KCDC requirements, stormwater reticulation within the Site would be designed to pass the 10-year storm event while overland flow for events greater than the 10-year event will be contained within the proposed internal road network.
- The stormwater attenuation system for the Site as a whole would be designed to mitigate the increase in stormwater runoff associated with the development for all rainfall events up to and including the critical duration 100-year storm event.
- We have assumed that rock-filled soakpits for roof water runoff designed for the 10-year AEP 1hr rainfall event in accordance with the NZ Building Code compliance doc E1/VM1 would be provided. Soakpits would be distributed across the Site located underneath greenspace areas/between townhouses etc for a retirement village development, or on each allotment under a residential development scenario. Roof water runoff in excess of the soakpit capacity would be directed to the stormwater management area. Further Site testing may be required to validate that the assumed (conservative) infiltration rates are available across the entire Site and can be relied upon during periods of high groundwater.
- Stormwater management areas would provide quality and quantity mitigation for the Proposed future development. Part of the area set aside would be formed as wetland and would provide stormwater treatment as well as offsetting the existing low-value wet areas identified on the Site that would be demolished due to development of the Site. Some existing wetlands identified by Blue Green Ecology could be integrated into these new stormwater management areas and/or compensatory flood storage areas.
- The Site would logically be split into two catchments, defined by land each side of the existing Drain; this avoids earthworks level and quantity issues associated with raising part of the Site to convey stormwater overland across the Drain to a centralised stormwater management area. Each catchment would have its own stormwater management area for treatment and attenuation of stormwater runoff.
- We have assumed that invert of constructed stormwater management areas would act as an effective 'upper bound' to groundwater levels, and consequently that groundwater interception would not use up available storage volume within these ponds.
- Compensatory Flood Storage Areas have been set aside adjacent to the Drain and along the west boundary of the Site, as identified by the recent KCDC/Awa modelling.
- A culvert crossing over the Drain has been assumed, based on assessment of predevelopment flowrate within the Drain within the KCDC/Awa flood model.
- KCDC freeboard requirements for this Site are still being assessed by KCDC as part of the updated suite of modelling but we have been advised that that this is likely to be 300mm to 500mm above the ponded 100-year water surface. Subject to detailed design, we consider that this freeboard can be provided. Detailed modelling will be required to confirm available freeboard above the 100-year overland flow path water surface within the Site.
- Access to the Drain for maintenance by KCDC would need to be provided. This maintenance would typically be carried out by a small excavator and truck and would be provided by having a suitably formed accessible hardstand on one side of the Drain.

5. Wastewater

5.1. Existing Wastewater Infrastructure

5.1.1. Existing KCDC Wastewater Infrastructure

There is an existing 150mm PVC gravity sewer pipe within the berm fronting the Site, this connects to a 225mm gravity pipe within the road carriageway approximately 40m to the west of the Site. A 225mm diameter rising main also discharges into the 225mm gravity pipe at the same location. The 225mm gravity pipe appears to discharge into a pump station approximately 240m to the west of the Site.

A construction tender was advertised on the NZ Government GETS portal for the upgrade of the existing wastewater network in Ratanui Road in April/May 2024. We do not consider this poses any risk to the Proposed Development.

5.1.2. Existing On-Site Wastewater Infrastructure

The Land Information Memorandum (LIM) for 65 Ratanui Road as provided to Woods in Feb 2023 indicates that wastewater is treated and disposed to ground on-site via a private septic tank and effluent disposal field. While the location of the existing on-site effluent disposal field is not specifically shown on drawings included within the Feb 2023 LIM, it is indicated to be to the west of the existing dwelling. The existing septic tank and disposal field would be contained within the parcel to be kept by the vendor and created by a boundary adjustment subdivision. Consequently, no change to the wastewater servicing regime for 65 Ratanui Road has been contemplated.

No documentation is available to indicate if the existing sheds on 73 Ratanui Road are connected to the KCDC wastewater system.

The KCDC GIS system indicates that both 65 and 73 Ratanui Road have a wastewater connection to the existing 150mm diameter pipe within the Ratanui Road berm.

5.2. Wastewater Demand and Capacity

5.2.1. Consultation

Woods prepared a preliminary wastewater demand summary in early May 2024 that was provided to KCDC to facilitate a services capacity assessment by KCDC's nominated consultant, to identify the scale and nature of any off-site infrastructure upgrades triggered by a potential retirement village development. The services capacity assessment was provided to Woods on 21 July 2024, is attached in Appendix F, and is discussed further in the below sections.

An updated services capacity assessment has been requested by Welhom based on the wastewater demands from a residential development scenario as attached in Appendix G. The results from this updated wastewater services capacity assessment will be provided to KCDC as soon as possible once they become available, along with a covering memo from Woods to address any specific matters identified, if any. These results are expected imminently, and will be made available prior to public notification of the application.

5.2.2. Wastewater Flow Calculations

An estimated wastewater demand has been calculated in accordance with the KCDC Engineering Code of Practice and proposed adoption of the General Residential Zone rules including an allowance for some of the lots to be developed at a higher density, and is attached in Appendix G.

The calculations in Appendix G also assess the demand for a potential retirement village development in accordance with typical per-capita demands. This calculation was used to inform the wastewater capacity assessment attached in Appendix F. Consequently, the wastewater capacity assessment is being updated as the demands on the network for a residential development scenario would be greater than for a retirement village.

5.2.3. Preliminary Servicing Reticulation Design

Woods has established that the existing KCDC gravity wastewater network in Ratanui Road cannot service the Site for wastewater without at least one sewer pump station. We have investigated two main options:

a) Gravity wastewater throughout the Site, draining to a centralised pump station, likely located on the north side of the Drain. This pump station would discharge to the KCDC Ratanui Road wastewater network.

b) A Local-Pressure Sewer system throughout the Site, discharging to the KCDC Ratanui Road wastewater network.

The Option A centralised pump station would need to include storage in accordance with KCDC requirements to appropriately mitigate the risk of overflow to the Drain during unplanned shut-down of the pump station, and a dedicated odour control system to mitigate the risk of odour and chemical attack of wastewater on the pump station wet-well.

Option B would have a series of small pump stations distributed throughout the Site, each serving several units. These would macerate the wastewater and pump it into a pressure pipe network, typically laid within the common services trench.

Both options could require an odour treatment device to be installed at or near the discharge point in Ratanui Road to mitigate the risk of hydrogen sulphide attack on concrete wastewater assets. This is a standard requirement with well-established technical solutions that can be applied as a matter of course during the next phases of design development.

5.2.4. Upgrades to KCDC Network

The KCDC wastewater services capacity assessment attached in Appendix F assessed that the existing wastewater network has the capacity to accept the additional discharge from a potential retirement village development scenario, and that the current KCDC wastewater network upgrade works in Ratanui Road would further alleviate very minor identified issues. No required upgrades to the existing network are identified.

Welhom has also progressed with commissioning an update to the wastewater services capacity assessment for a residential demand enabled by the adoption of residential zone rules, to confirm if sufficient capacity exists in the KCDC network and/or the specific upgrades needed that are specifically triggered by a residential development on the Site (as opposed to a retirement village). Welhom will provide this assessment to KCDC once it has been completed with a covering memo from Woods.

While the scale of any off-site upgrades (if any) would be informed by this updated wastewater capacity assessment, we are confident that the Site could be serviced for wastewater by the KCDC network for the following reasons (and that there would be technical solutions available to mitigate any impacts on the KCDC network):

- It is normal development practice that any upgrades to council assets triggered by development of a specific site are funded by that developer, and do not foresee any reason why this Site should be addressed differently.
- The Site has been identified by the Kāpiti Coast District Council's 2022 Growth Strategy – Te Tupu Pai as a "medium-priority greenfield growth area" which signals its potential for future urban growth, along with significant tracts of surrounding land. It follows that KCDC will need to work with developers, both for this Site and surrounding land, to ensure that KCDC services are assessed and upgraded in an efficient manner to facilitate development. If upgrades are required to provide sufficient capacity, then it is reasonable for each developer to contribute to the funding of these upgrades in accordance with any specific funding agreements with KCDC.
- One of the options for servicing the Site is by way of Local-Pressure Sewer. This servicing option has the benefit of reducing the infiltration risk associated with wet-weather events, which is the critical scenario contemplated by the wastewater service capacity assessment. Consequently, off-

site upgrades that may be required based on a gravity sewer network on the Site may be reduced or completed negated by using a Local-Pressure Sewer on the Site.

5.2.5. Trade Waste

Review of the KCDC Trade Waste Bylaw indicates that a requirement for a trade waste consent may be triggered by the waste characteristics of discharge from a retirement village main building (e.g. from an on-site café, or medical waste prohibited for discharge to sewer by NZS 4304), or by a non-residential use.

If a trade waste consent is required, a flow meter would need to be installed to quantify the flowrate and volume of trade waste discharged to the KCDC reticulated sewer network. Other conditions to the trade waste consent may also be imposed by KCDC, including pre-treatment of waste-streams.

Further discussion with KCDC would be required during detailed design to quantify any specific trade waste requirements in accordance with the KCDC Trade Waste Bylaw.

6. Water Supply

6.1. Existing Water Supply Infrastructure

6.1.1. Existing KCDC Water Supply Infrastructure

Existing KCDC water supply reticulation is present within Ratanui Road in proximity to the Site. A 100mm diameter asbestos cement pipe is located at the southern corner of the Site and a 375mm diameter asbestos cement main is located in the opposite side of road carriageway. Refer to existing services drawings obtained from the KCDC online GIS portal in Appendix I.

6.1.2. Existing On-Site Water Supply Infrastructure

The KCDC online GIS portal indicates both 65 & 73 Ratanui Road are currently supplied with potable water via a residential metered consumer connection to the KCDC water supply network on Ratanui Road.

6.2. Water Supply Demand and Capacity

6.2.1. Consultation

Woods prepared a preliminary water demand summary in early May 2024 that was provided to KCDC to facilitate a services capacity assessment by KCDC's nominated consultant, to identify the scale and nature of any off-site infrastructure upgrades triggered by a potential retirement village development. The services capacity assessment (based on the water supply demand from a retirement village) was provided to Woods on 10 October 2024, is attached in Appendix F, and is discussed further in the below sections.

6.2.2. Water Demand Calculations

An estimated water demand has been calculated in accordance with the KCDC Engineering Code of Practice and proposed adoption of the General Residential Zone rules, including an allowance for some of the lots to be developed at a higher density, and is attached in Appendix H.

The calculations in Appendix H also assess the demand for a potential retirement village development and include allowances for potable supply in accordance with typical per-capita demands, plus in-ground hydrants to FW2 standard in accordance with SNZ PAS 4509:2008, and an allowance for fire sprinklers within a retirement village main building, as adopted from the nearby Summerset Waikanae village. This calculation was used to inform the water supply capacity assessment attached in Appendix F, as it had a higher demand than a residential development scenario. Consequently, the water supply capacity assessment is conservative when considering a residential development.

We note that KCDC requires that new developments incorporate water saving measures to reduce the demand on the council reticulated network, and typically involve the use of rainwater tanks. If the Site were

to be developed as a retirement village (and therefore remain in private ownership), then the use of an on-site bore for irrigation demand and outdoor taps could be considered. A retirement village development would also have control over the implementation of low water usage fixtures and fittings. Conversely, general residential development on the Site would be subject to the normal KCDC requirements such as rain tanks.

6.2.3. Preliminary Servicing Reticulation Design

A potable water network would be installed across the Site to service domestic supply and fire hydrants.

A residential development scenario would necessitate that the pipes within the Site are vested in KCDC in accordance with normal practice, and a separate metered point of supply would be required for each individual lot or dwelling in accordance with the KCDC Water Supply Bylaw 2013 and Land Development Minimum Requirements 2022.

Whereas under a retirement village development scenario, the point of supply would be located at the Ratanui Road Site boundary and would comprise a backflow preventer for each of the potable and fire sprinkler connections, and a water meter for the potable connection.

A separate dedicated fire sprinkler water main from the Site boundary to a retirement village main building would be required only if the Site is developed as a retirement village. A booster pump set may be required for the fire sprinkler network, as is normal practice. The requirement for this private asset would be determined by fire protection engineers during detailed design of a retirement village main building.

The water supply service capacity assessment indicates that no potable water supply buffer storage tanks or booster pumps are likely to be required; this conclusion applies equally to both a residential development or a retirement village development scenario on the Site.

6.2.4. Upgrades to KCDC Network

The KCDC water supply services capacity assessment attached in Appendix F assessed that the existing water supply network has the capacity to cater for the additional demand from a retirement village development, which has a greater total water demand than a 235-dwelling residential development. It clearly follows that it has sufficient capacity to cater for a residential development (of lower demand). No required upgrades to the existing network are identified under either the residential or retirement village scenario.

7. Utilities

7.1. Existing Services

Existing utility service networks providing electrical supply (Electra), telecommunications (Vodafone and Chorus) and gas (FirstGas) are present within Ratanui Road in proximity to the Site.

7.1.1. Electricity Supply

While an electrical supply network layout would be influenced by the particular development form, electrical supply would be provided to service all dwellings in accordance with utility company and industry standards. All cables would be placed underground.

Confirmation that the Site can be serviced for electricity supply is attached in Appendix J.

7.1.2. Telecommunications

While the telecommunications network layout would be influenced by the particular development form, telecommunications would be provided to service all dwellings in accordance with utility company and industry standards. All cables would be placed underground.

Confirmation that the Site can be serviced for telecommunications is attached in Appendix J.

Appendix A Ecological Report

(Provided Separately)

Appendix B Geotech & Contamination Report

(Provided Separately)

Appendix C Traffic Assessment

(Provided Separately)

Appendix D Soakage Testing Results & Correspondence

(Provided Digitally)

Appendix E Flooding Modelling Information & Correspondence

Appendix F Services Capacity Assessment

Appendix G Wastewater Demand Calculations

Appendix H Water Demand Calculations

Appendix I Existing Services (KCDC GIS)

Appendix J Utility Services Correspondence