ENVELOPE

WETLAND AND DUNE AVOIDANCE

77 KĀPITI ROAD, PARAPARAUMU

TO	Stephanie Blick	**DATE**	22/10/2026
PROJECT NAME	1942-02 77 Kāpiti Road	**PREPARED BY**	Louis Freeland
CLIENT	New Central Park Limited		

1.0 INTRODUCTION

New Central Park Limited (NCPL) is proposing the comprehensive development of land at 77 and 109 Kāpiti Road and 1 Brett Ambler Way, Paraparaumu, together with associated works on adjoining land. The Project is a comprehensive, masterplanned mixed-use development providing for the expansion of the Paraparaumu Metropolitan Centre.

The Project comprises:

- Approximately 600 residential dwellings, including apartments, townhouses, duplexes, courtyard housing and standalone dwellings;
- Approximately 20,000 m² GFA of Large Format Retail (LFR);
- Approximately 3,800 m² of other retail and commercial activities, including specialty retail and drive-through activities;
- Subdivision to create residential, commercial, LFR and other development allotments, together with roads, reserves and infrastructure;
- A new internal transport network, including the Town Centre Link Road, local roads and JOALs, together with pedestrian and cycling connections and provision for public transport;
- Three waters infrastructure required to service the development;
- An extensive network of open space, landscaping and blue-green infrastructure; and
- Wetland reclamation and creation and ecological restoration and enhancement, including a constructed indigenous wetland primarily providing ecological offsetting and compensation, together with complementary flood-storage functions.

The development has been comprehensively masterplanned to integrate the residential, commercial, transport, infrastructure, ecological, landscape and open space components of the Project. It is intended to proceed progressively in stages as an integrated extension to the existing Paraparaumu town centre.

This memorandum forms part of the technical documentation supporting the substantive application for the Project and considers, from a civil engineering perspective, the practicability of avoiding or retaining the existing dunes and natural inland wetlands within the site.

In particular, it outlines the engineering constraints associated with the site's ground conditions, earthworks balance, flood management requirements, transport network and servicing infrastructure, and the implications of alternative approaches involving greater retention of the existing landforms and wetlands.

The dunes and wetlands are considered together because the engineering constraints are interrelated. The dune sand provides a potential on-site source of engineered fill required to raise the low-lying parts of the site, while the management of unsuitable material, development platform levels, road network and flood storage requirements all influence the extent to which the existing dunes and wetlands can be retained. This memo should be read alongside other project documentation and reports submitted with the substantive application.

2.0 SAND DUNES

2.1 EXISTING LANDFORM

The existing sand dunes form a central spine across the site and comprise two distinct dunes, with a channel cut between them. Geotechnical investigations show that these are comprised of sand with a nominal thickness of topsoil material within the upper ~200 mm of material. They are approximately 5 – 15 m in height above the adjacent land.

2.2 PROPOSED LANDFORM

It is proposed to remove the dunes and recreate a comparable landform as a constructed landscape mound in the west of the site, formed from peat and other material that is unsuitable for use as engineered fill beneath the development (e.g. organic sands).

2.3 TECHNICAL JUSTIFICATION

Removal of the dunes is necessary for two interrelated reasons: the earthworks volume balance, and the development layout.

2.3.1 VOLUMETRIC BALANCING

Geotechnical investigations suggest a layer of average 1.0 m thickness of peat with an additional 1.5 m of organic sands within the flatter areas of the site. Across the site, we estimate in the order of 260,000 m^3 of peat material, with 160,000 m^3 of organic sands (not accounting for a portion of these that may be possible to re-use).

This material is generally not suitable for use as engineered fill and while there are solutions for leaving the peat in-situ, KCDC have requested in previous applications for the site that this is removed from under building and road areas. Removal of peat from beneath building platforms and roads is also the recommendation of the project geotechnical engineer (Torlesse Geotechnical Assessment Report, ref. T0793/04).

Accordingly, there are two broad options for this material:

- Excavate and re-use this on site in some form. Typically, this would be used as landscaping fill, and topsoil material to assist in stabilisation for proposed lots. Within the proposed scheme, this material can also be used to form the constructed landscape mound and as topsoil within the constructed wetland.
- Excavate and take this material off site. This requires a suitable and consented place to dispose of the material.

Options for use of material on-site are always favoured as they are generally more cost-effective, have a reduced environmental footprint (material is not leaving the site so there are fewer vehicle movements) and *may* be preferred from a cultural perspective as experienced on other projects within the District.

The excavation of peat on the site creates a secondary issue which needs to be considered in parallel – that the removal of peat material creates a need for additional suitable material to build the land up above flood levels. This requires in the order of 2.0 m (on average) of suitable materials to build up to the required levels which is approximately 670,000 m^3 of material across the site. Table 1 provides an estimate of earthworks volumes for various layers and components.

Table 1. Indicative Earthworks and Material Balance.

Material / requirement	Indicative quantity
Estimated peat material	257,000 m^3
Estimated organic sands (to be re-used, with treatment if needed)	324,000 m^3
Suitable material required to achieve development levels	674,000 m^3
Estimated reuse as topsoil and wetland material	87,000 m^3
Estimated imported material to construct roads, carparks, and building platforms	50,000 m^3
Estimated material currently identified as requiring either off-site disposal or placement on-site	170,000 m^3
Suitable fill available from proposed dune earthworks	307,500 m^3
Additional suitable fill required to be imported	Zero, based on current expected quantities.

The quantities above are indicative and are based on the current geotechnical investigations and earthworks design. The final material balance will depend on the detailed earthworks methodology, the extent to which excavated material can be reused, and the requirements for engineered fill and landscape formation.

For the development there is both a need to remove the peat and to replace it with competent material.

Options were first considered about how to utilise the unsuitable material on-site. With a 100 mm layer of topsoil across ~20 ha of developable area and 500 mm across the proposed wetland the material able to be used on site is in the order of 40,000 – 50,000 m^3 of material.

There is still a significant shortfall in the order of 170,000 m^3 of material that is unable to be accommodated on site. Removing this off site was investigated however there are several issues:

- There are no suitable, consented dump sites that we are aware of that are available to take this volume of material in the local area.
- Even if there was a suitable, local dump site the cost of this would be in the order of $15 – $25M + GST, depending on cartage distance, dumping costs and the cost of fuel. We have undertaken numerous feasibility assessments with the applicant and the removal of this material off site in such large quantities would impose a significant constraint in terms of development feasibility.
- Additionally, the removal of this material would require an estimated 12,000 – 18,000 additional round trips for a truck and trailer (depending on loading) which would potentially have temporary adverse effects.
- This would still leave the import of material which would have similar implications (lack of suitable sites, significant costs involved and additional truck movements).

These estimates relate to the removal of unsuitable material and do not account for the additional costs and vehicle movements associated with importing suitable engineered fill to replace that material and achieve the required development levels.

Accordingly, an approach involving retention of the dunes would need to consider both sides of the earthworks balance – the management and disposal of unsuitable material generated from the low-lying parts of the site, and the sourcing and importation of suitable material that would otherwise be available from the existing dune landforms.

The implications are therefore not limited to construction cost. They also include the availability of suitable disposal and source sites, the duration and intensity of heavy vehicle movements, construction programming and the potential environmental effects associated with transporting substantial volumes of material to and from the site.

While the removal of unsuitable material off site and importation of replacement engineered fill is technically feasible, this approach is not considered practicable having regard to the substantial volumes involved, the lack of readily available disposal and material source sites, the associated costs and the additional heavy vehicle movements required. These constraints have informed the earthworks strategy developed through the masterplanning process.

The proposed modification and removal of the existing dunes addresses these interrelated constraints by providing an on-site source of suitable sand for engineered fill, while also creating space for the placement and reuse of unsuitable material. In particular, the use of peat and other unsuitable material to form the proposed constructed landscape mound reduces the volume of material requiring off-site disposal and contributes to the proposed landscape treatment (refer Landscape and Visual Assessment submitted with the substantive application).

2.3.2 DEVELOPMENT LAYOUT

The layout of the development has been informed by the constraints of the site as well as requirements of KCDC as a key stakeholder who has planned the Town Centre Link Road (the spine road) as a strategic project for some time.

KCDC's requirements have influenced not only the alignment and function of the spine road, but also its cross-section and overall corridor width. In particular, the design has been required to accommodate active transport infrastructure as an integral part of the road corridor, including on-road cycle lanes and a shared path connection, together with the vehicle carriageway, pedestrian facilities, berms and the space required for drainage, lighting and utility infrastructure.

The resulting road corridor is therefore wider than would be required for a conventional vehicle-only local road. Its width reflects the multiple transport and infrastructure functions that KCDC has required the spine road to perform.

The road alignment itself is also constrained. Once the required connection points, network function, intersection arrangements and cross-section are established, the available corridor through the site is limited by the width required to accommodate the KCDC-agreed road cross-section, horizontal and vertical road geometry, intersection locations and levels, existing tie-in levels, continuity of pedestrian and cycle facilities, access to adjoining development areas, flood levels and conveyance, stormwater treatment, three-waters infrastructure, development platform levels, ground conditions and constructability.

The road network also establishes the principal servicing corridors and controls the levels of the adjoining development areas. Moving or narrowing a section of road therefore has effects beyond the road corridor itself. The required alignment of the Town Centre Link Road and connecting roads would, in any case, require substantial excavation of the dune form to achieve the required road geometry and levels.

2.3.3 ALTERNATIVE DUNE RETENTION OPTIONS

The practicability of retaining the existing dune landforms needs to be considered in the context of the wider engineering requirements of the site, rather than solely the physical ability to construct around individual dune areas.

The principal alternative approaches include:

- Full retention of both dunes – This would require substantial changes to the proposed road and development layout, together with an alternative strategy for sourcing suitable engineered fill and managing unsuitable material generated elsewhere on the site.
- Partial retention of the dune system – This could reduce the extent of dune modification but would need to be reconciled with the required road corridors, development platform levels and earthworks balance. The extent of retention achievable would depend on the resulting engineering and servicing constraints.
- Retention of the dunes with imported engineered fill – This would reduce the availability of on-site sand for engineered fill and increase reliance on external material sources, while still requiring management of unsuitable peat and organic material excavated from the lower-lying parts of the site.

These alternatives are technically possible in principle. However, each has consequences for the integrated earthworks strategy, road network, servicing arrangements, development levels and construction methodology.

The proposed approach has been developed having regard to these interrelated constraints, with the objective of achieving a practicable earthworks and infrastructure solution for the comprehensive development of the site.

Table 2. Alternative Options Assessment.

Alternative	Engineering implications
Full retention of both dunes	Not feasible as it would mean the strategic link road between Kapiti Road and Ihakara Street could not be constructed.
Western dune retention	Not feasible without additional source of fill material for import and a suitable dump site. Retention would significantly constrain development in terms of costs and loss of yield. Potentially significant construction traffic effects.
Eastern dune retention	Would mean that strategic links to Iver Trask Place and Brett Ambler Way could not be constructed. Not feasible without additional source of fill material for import and a suitable dump site. Retention would significantly constrain development in terms of costs and loss of yield. Potentially significant construction traffic effects.
Retention with imported fill	Not feasible without additional source of fill material for import and a suitable dump site. Retention would significantly constrain development in terms of costs and loss of yield. Potentially significant construction traffic effects.
No dune retained, with no replacement feature	Construction costs offset by additional land gained with no dune being retained.

Alternative	Engineering implications
	Not favoured as an option through previous consultation based on visual effects.

3.0 WETLANDS

3.1 EXISTING WETLANDS

Natural inland wetlands, as identified by the project ecologist, are located across the lower-lying flat land within the site. These are described in detail in the Ecological Impact Assessment, submitted with the substantive application.

3.2 PROPOSED CONSTRUCTED WETLAND

It is proposed to construct an indigenous wetland in the southern portion of the site. This will be used primarily for ecological offsetting and compensation (refer Ecological Impact Assessment), with a secondary function of flood storage. This is consistent with MCZ-P1 within the KCDC District Plan, which anticipates a large, consolidated stormwater management area and, if practicable, wetland providing for flood storage, ecological values and amenity values. The details of this are outlined within various documents submitted with the substantive application.

The location of the constructed wetland has also been informed by the need to provide flood storage within the southern part of the site, in hydraulic connection with the Wharemauku Stream and as indicated on the MCZ Structure Plan. This enables the proposed ecological restoration and flood management functions to be integrated within a consolidated area, rather than providing separate and potentially fragmented infrastructure and ecological areas across the development.

3.3 TECHNICAL JUSTIFICATION

3.3.1 FRAGMENTED NATURE OF WETLANDS

The existing wetlands are highly fragmented. They do not form a single wetland area that can readily be isolated from the development footprint. Instead, separate wetland areas occur across most of the flat parts of the site.

The majority of the wetland extent occurs within the part of the site planned for residential development. Wetlands also occur in or near the spine road corridor and adjoining development areas, the Kāpiti Road end of the site including the proposed large format retail development area, the Iver Trask Place extension and its connection into the internal road network, and areas that require earthworks, development platforms, drainage and servicing.

This fragmented pattern is a significant constraint on avoidance. If the wetland extent was concentrated in one location, the road and development network could potentially be configured around that area. That is not the situation on this site.

Avoiding the wetlands collectively would require the engineering layout to weave between a series of separate retained areas while still maintaining the required road connections, road geometry, development access, levels, drainage, servicing and flood management. There is limited flexibility to achieve this.

The retention of individual wetlands would also require consideration of the surrounding development levels and the land needed to maintain appropriate hydrological buffers, access and drainage arrangements. Avoidance of the wetland footprint alone would not necessarily resolve these constraints, as adjoining earthworks and infrastructure could still affect the hydrological conditions supporting the retained wetland areas.

Accordingly, the practicability of retaining individual wetlands needs to be assessed in terms of whether they could continue to function within the proposed developed environment, rather than simply whether their physical footprints could be excluded from earthworks.

Retaining isolated wetland areas within the development would also present challenges in maintaining their existing hydrological conditions. The surrounding development areas generally require filling to achieve suitable building and road levels, together with subsoil drainage and stormwater infrastructure. These works would alter the existing surface water and shallow groundwater regimes, potentially affecting the frequency, duration and extent of inundation within retained wetland areas.

Accordingly, physical retention of individual wetlands would not necessarily result in the retention of their existing hydrological and ecological functions.

3.3.2 ROADING NETWORK

The location of the external road connections has been informed by a substantial body of technical assessment undertaken through the preparation of the 2012 Paraparaumu Town Centre Structure Plan and subsequently reflected in the current Metropolitan Centre Zone Structure Plan. This work considered the wider transport network, infrastructure requirements and

physical constraints of the area to identify appropriate locations for the connections needed to support the planned development of the Metropolitan Centre.

The proposed road network has been developed having regard to this earlier technical work, the connections identified in the Structure Plan and subsequent engagement with KCDC. While alternative internal alignments are technically possible, relocating these connections would have wider implications for intersection locations, road geometry, development levels, pedestrian and cycling connectivity, drainage and servicing infrastructure.

The internal road network therefore needs to be considered as an integrated system, rather than a series of individual road sections that can be independently relocated to avoid wetland areas. Once the external connections are fixed, the internal road network has to transition between them using acceptable horizontal and vertical geometry. This substantially reduces the number of realistic alternative alignments through the site.

The Iver Trask Place extension has been included as part of the wider connectivity sought for the development and its integration with the existing Metropolitan Centre, including the civic and community focal point around Iver Trask Place (MCZ Precinct B), consistent with the connectivity direction in MCZ-P9.

Its location and function have been developed through the wider masterplanning and KCDC engagement process.

From a civil engineering perspective, the connection needs to be tied into the existing network at an appropriate level and then connect efficiently into the internal road system.

Changing its location or alignment to avoid wetland areas would affect the geometry of the connecting roads, intersection arrangements, development levels, drainage, underground services and earthworks. It cannot therefore be considered as a stand-alone section of road that can simply be moved around a wetland footprint.

An alternative alignment seeking to avoid individual wetland areas would therefore need to be assessed against the resulting effects on the wider road network and adjoining development areas. In particular, relocating the connection may transfer the required earthworks and infrastructure into other parts of the site, potentially affecting other wetlands, development platforms or areas required for flood management.

Avoidance of one wetland area would not necessarily result in a corresponding reduction in the overall extent of wetland disturbance across the site.

Preliminary analysis of this with the project ecologist suggests that approximately 4.1 ha of existing wetland would be affected by the construction of the required roading connections (Link Road, Iver Trask Place and Brett Ambler Way) alone. This does not account for any development around these. Figure 1 shows an approximation of these areas overlain onto development plans which were used to illustrate the effect of the main road network in isolation.

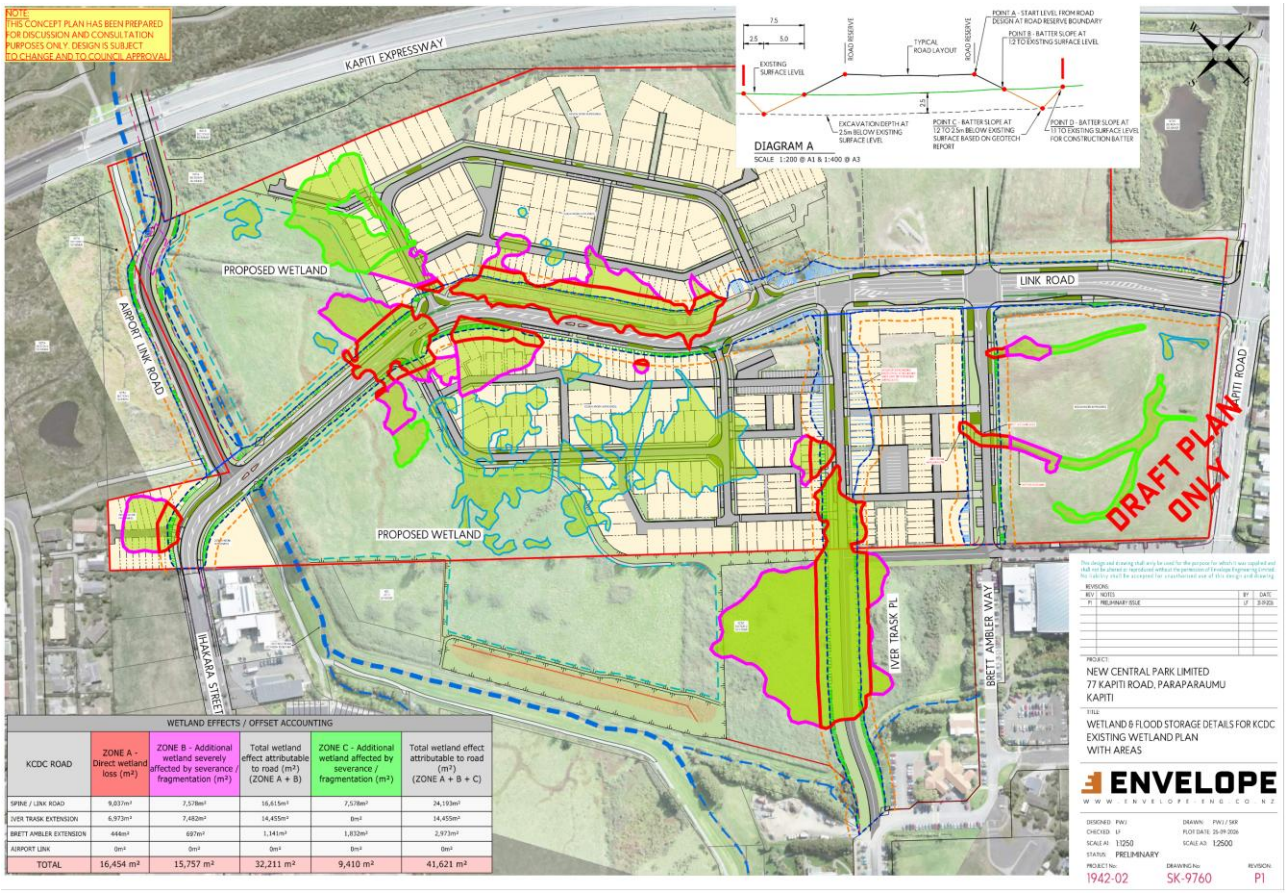


Figure 1. Effect of main road network on wetlands at the site.

3.3.3 FLOOD MANAGEMENT

Flooding at the site is driven by the Wharemauku Stream. Consequently, any flood mitigation needs to be adjacent to this area as it needs to be hydraulically connected with where the flooding is coming from. This necessitates a flood management area in the south of the site as anticipated by the Structure Plan (Metropolitan Centre Structure Plan, District Plan Appendix 19; refer also MCZ-P1 and MCZ-R16) as well as previous works undertaken on behalf of KCDC to support previous flood management schemes for the Wharemauku Stream and the Link Road Design (when the concept was progressed initially by KCDC).

The provision of a flood management function is therefore required in the south of the site to enable flood-free building platforms for the balance of the site. This requires lowering of the southern part of the site, which will have direct effects on several existing wetlands.

The location of the flood storage area has also been informed by a substantial body of technical assessment undertaken through the preparation of the current Metropolitan Centre Zone Structure Plan. This work considered the flooding and stormwater management constraints associated with the Wharemauku Stream and identified the southern part of the site as an appropriate location for flood storage and stormwater management. The inclusion of this area within the Structure Plan therefore reflects earlier technical investigations into the flood management requirements necessary to support the planned development of the Metropolitan Centre.

The flood storage area cannot be considered independently of the wider earthworks and development levels. Its location and design influence the volume of material that must be excavated, the levels of adjoining development platforms, the management of flood conveyance and the ability to provide appropriate stormwater infrastructure.

Relocating the flood storage area further from the Wharemauku Stream, or materially reducing its extent to retain existing wetlands, would require reconsideration of the hydraulic performance of the development and the earthworks needed to achieve suitable flood-free building platforms.

The proposed location therefore reflects both the earlier technical work underpinning the Metropolitan Centre Zone Structure Plan and the need to integrate flood management with the site's existing topography, the Wharemauku Stream and the wider development layout.

4.0 CONCLUSION

From a civil engineering perspective, the existing dunes and natural inland wetlands cannot practicably be retained in their current form without compromising the integrated development of the site that the Metropolitan Centre Zone provides for. The reasons are interrelated:

- Earthworks balance – the peat and organic sands beneath the low-lying parts of the site need to be removed from beneath building platforms and roads, and the land needs to be raised by approximately 2 m on average to achieve flood-free levels. The dune sand provides the principal on-site source of engineered fill, and the dune footprint provides the area in which the unsuitable material can be placed. Exporting the surplus and importing replacement fill is technically possible but is not practicable.
- Development layout – the alignment, cross-section and levels of the Town Centre Link Road, and the external connections at Kāpiti Road, Ihakara Street and Iver Trask Place, are constrained by KCDC requirements and the existing network. These roads cross both the dune system and the wetlands, and they set the levels and servicing corridors for the adjoining development. Approximately 4.1 ha of wetland is affected by the required road connections alone.
- Fragmentation of the wetlands – the wetlands are dispersed across most of the flat land rather than concentrated in one area. Retaining them would require the road and development network to weave between isolated remnants, and the surrounding filling and drainage would be likely to degrade any remnants retained.
- Flood management – the flood storage required to provide flood-free building platforms must be located in the south of the site, where it is hydraulically connected to the Wharemauku Stream. This location is anticipated by the Metropolitan Centre Structure Plan and coincides with existing wetlands.

For these reasons, retention of the existing dunes and wetlands is not considered practicable within the engineering constraints of the site and the comprehensive development anticipated by the Metropolitan Centre Zone. The proposed earthworks strategy, road network and consolidated southern wetland represent an integrated response to these constraints, while providing for the on-site reuse of unsuitable material, ecological offsetting and compensation, and flood storage.

5.0 LIMITATIONS

This Memo is for the use of New Central Park Limited only and should not be used or relied upon by any other person or entity or for any other project.

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