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

AND

IN THE MATTER of a submission pursuant to Clause 6 of Schedule 1 of the RMA in respect of the **Private Plan Change 85 – Mangawhai East**

SUBMISSION ON PRIVATE PLAN CHANGE 85 – MANGAWHAI EAST

To: District Plan Team

Kaipara District Council

Email: planchanges@kaipara.govt.nz

1. Introduction and Submitter Interest

This submission is lodged under Clause 6 of Schedule 1 of the Resource Management Act 1991 ("RMA") by the owners of Lots 1–7 Windsor Way, Mangawhai (referred to as "the submitters" and "the submission area" for the remainder of this document).

The submitters cannot gain an advantage in trade competition through this submission. They are directly affected by the plan change. The effects are not related to trade competition.

The submission area forms part of the land subject to Private Plan Change 85 ("PPC85") by CABRAS. The area is low-lying, exhibits poor natural drainage, and is susceptible to shallow groundwater and ponding.

The submitters engaged Cook Costello Ltd to undertake an independent Stage 1 peer review of the PPC85 stormwater management strategy (Appendix 11). The review dated 11 August 2025 identified material deficiencies in the information and design detail for the Windsor Way sub-catchment. A copy of the Cook Costello review is attached, **Appendix B**.

2. Summary of Key Concerns and Specific Provisions of PPC85 that this Submission Relates to

The submitters key concerns with respect to PPC85 relate to the 'Stormwater Management Plan' that underpins the approach to stormwater management with the PPC85 area. Specifically:

1. Absence of site-specific hydraulic analysis – No site-specific stormwater flood AEP modelling, swale capacity assessment, or downstream impact analysis has been provided for Windsor Way.

2. High flood and ponding susceptibility – Flat terrain, groundwater as shallow as 400 mm BGL in winter, and tidal tailwater effects present a high likelihood of extended inundation.

3. Unproven soakage reliance – The proposal to achieve "hydraulic neutrality" via infiltration is unsupported by local geotechnical or hydrogeological testing.

4. Risk from ground level changes – Even minor filling could obstruct drainage, alter overland flow paths, and induce long-term peat settlement.

Given the above, the submitters oppose PPC85 in part. Specifically, presently, it is the content of the Stormwater Management Plan and the associated PPC85 provisions that reference the Stormwater Management Plan (DEV X-P7, DEV X-LU-S1, DEV X-SUB-S8, DEVX-REQ1) that this submission relates to. The relief sought is detailed in Section 4 of this submission.

3. Statutory and Technical Framework

Under s31(1)(b)(ii) RMA, the Council must manage the effects of land use to avoid or mitigate natural hazards, including flooding.

KDC GD01 and GD04 require:

- Modelling of 10%, 2%, and 1% AEP events (with climate change factors).
- Proven primary and secondary flow capacity.
- Avoidance of adverse impacts on neighboring properties.

NZBC Clause E1 mandates the safe conveyance and disposal of surface water without causing damage or nuisance.

4. Relief Sought

The submitters seek the following relief:

1. Provide a site-specific hydraulic and hydrologic assessment for the Windsor Way sub-catchment, including climate change and blockage scenarios.

2. Demonstrate swale, overland flow, and outlet capacity for design AEP events in accordance with GD01 and GD04.

3. Prohibit reliance on infiltration-based disposal unless supported by local infiltration testing and mounding analysis or drainage infrastructure.

4. Ensure any ground filling, if proposed, is integrated with a coordinated drainage design to prevent ponding or backflow effects on adjoining land.

5. Alternative relief with similar effects.

RMA Directive Context

- Part 2, Sections 5, 6, and 7 of the Resource Management Act 1991 require sustainable management of natural and physical resources in a way that:
    - Enables people and communities to provide for their social, economic, and cultural well-being.
    - Safeguards the life-supporting capacity of air, water, soil, and ecosystems.
- In relation to PPC85, this entails:
    - Avoiding, remedying, or mitigating adverse effects of stormwater management failures on Windsor Way residents.
- Section 31 obligates councils to:
    - Control the effects of land use to avoid or mitigate natural hazards, such as flooding.
- Schedule 4 requires:
    - Adequate information is provided to clearly understand potential environmental effects.
- Failure to address site-specific stormwater risks:
    - Would be inconsistent with the statutory duties outlined in the Act.

5. Conclusion

This submission is intended to ensure PPC85 is implemented in a manner that is technically robust, consistent with statutory requirements, and protective of existing landowners. The relief sought is necessary to address foreseeable drainage risks to Windsor Way.

The submitters wish to be heard in support of this submission.

Submitters:

Derek Westwood
Thalia Ormerod
David & Fiona Collins
Tomasz Kus
Susan Hoskin
Lynnette Nicholson
Kim & Shane Growden

Signed on behalf of Submitters:
Derek Westwood

Chartered Professional Engineer (CPEng)
CMEngNZ, IntPE(NZ)
Date: 14 August 2025

Appendix A – Summary of Cook Costello Findings (8 August 2025)

- Flat terrain (3.6–4.8 m RL); Lot 1 within predicted 100-year coastal inundation under climate change.
- No defined overland flow paths; ponding common.
- Groundwater is as shallow as 400 mm BGL in winter.
- No local infiltration testing; soakage capacity unproven.
- No swale sizing or downstream effects modelling.
- Risk that fill could worsen ponding and cause settlement.

Appendix B – References

- Cook Costello Ltd (2025) Stage 1 Report Stormwater – PPC85 Review.
- Kaipara District Council (2020) GD01 – Stormwater Management Guidelines.
- Kaipara District Council (2020) GD04 – Development Engineering Standards.
- NZ Building Code Clause E1 – Surface Water.
- Resource Management Act 1991.

Review of Private Plan Change 85 Regarding Stormwater through Windsor Way Lots 1-7

Project

Lot 1-7 Windsor Way

Job No.

17384

Client

Windsor Way Residents

Revision

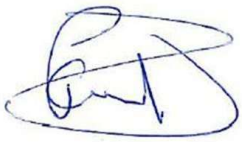
1.0

Date of issue

11/08/2025

cook | costello

DOCUMENT CONTROL RECORD

Client:	Derek Westwood, Thalia Ormerod, David & Fiona Collins, Tomasz Kus, Susan Hoskin, Lynnette Nicholson, Kim & Shane Growden
Project description:	Stormwater Review
Client address:	Lot 1-7 Windosr Way
Date of issue:	Monday, 11 August 2025
Status:	Issued
Originator	 Emily Thompson **Civil/Geotechnical Engineer** BE(Hons)
Approved for issue:	 Philip Cook **Chartered Professional Engineer (Civil)** BE(hons),Dip Ag, CPEng, CMEngNZ, IntPE(NZ), MACENZ,MInstD
Office of origin:	Whangarei
Telephone:	09 438 9529
Contact email:	ccl@coco.co.nz

Version	Date	Comment	By
0.9	6th August 2025	For review	E. Thompson
1.0	8th August 2025	Approval	P. Cook

Table of Contents

1. Executive Summary

Summary of Findings	
Site Elevation & Flood Risk	Site is generally flat (3.6–4.8 m RL); Lot 1 close to 100-year coastal inundation level.
Ponding & Drainage	No clear internal flowpaths; ponding likely due to flat topography and a lack of flow paths onsite .
Stormwater Strategy of CABRAS	Hydraulic neutrality through soakage of soils, rain gardens and potentuailly widening the existing swales; lacks design detail or modelling support, excpected due to uncertiancy around development.
Modelling & Design Gaps	No AEP rainfall modelling, no swale/pipe sizing, no downstream impact assessment especially for soakage.
Hydrologic design possible downfalls	Storm surge and shallow groundwater affect drainage; raising land levels as shown risks exacerbating ponding.
Compliance Reference	Review benchmarked against KDC, GD01, GD04, and NZBC clause E1.

2. Introduction

This report documents a Stage 1 technical peer review of the stormwater management strategy presented in Appendix 11 of the Private Plan Change 85 (PPC85) for the Mangawhai East development area. The review focuses on the Windsor Way site, which occupies a relatively flat area within the broader PPC85 development area.

The intent of this review is to:

- Assess the technical adequacy and completeness of the existing stormwater documentation.
- Identify potential gaps, deficiencies, or risks.

No independent stormwater modelling or site inspection has been undertaken as part of this Stage 1 review. The review benchmarks compliance against the Kaipara District Council (KDC) engineering guidance documents, particularly “GD01 – Stormwater Management Guidelines” and “GD04 – Development Engineering Standards” and the relevant provisions of the “New Zealand Building Code (NZBC)”.

2.1. Proposed development

The proposed development involves the subdivision and future residential development within the Mangawhai East growth area, as outlined under Private Plan Change 85 (PPC85). The area lies within a low-lying, relatively flat part of the site, and is subject to potential inundation and slow-draining conditions due to shallow gradients, high groundwater levels, and proximity to coastal influences.

Figure 1: A draft concept design of the Mangawhai East growth area, by CABRAS

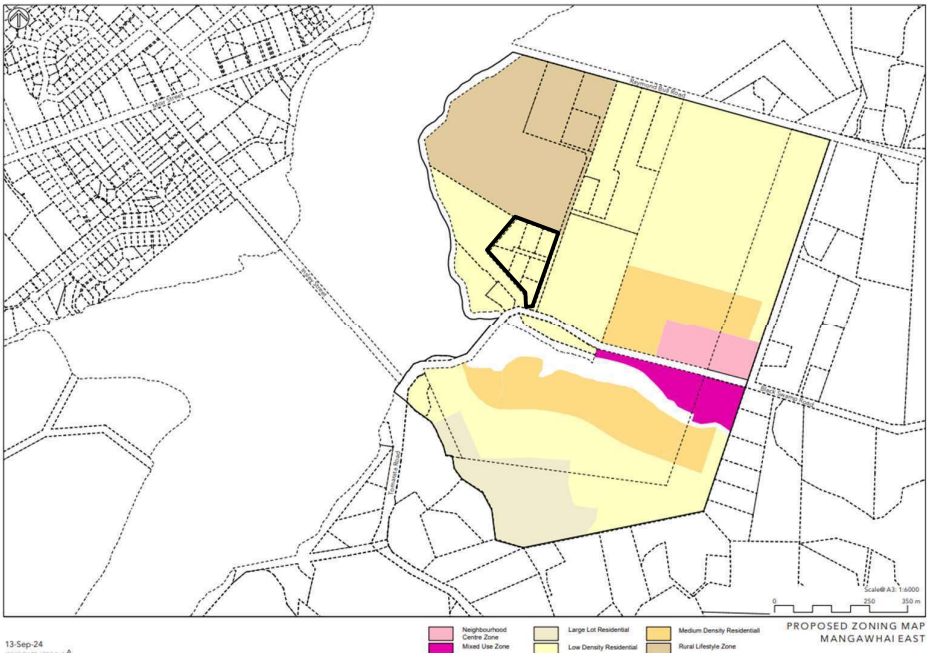


Figure 2: Proposed development zones (CABRAS)

3. Desktop Study

3.1. Site Description

The Windsor Way site is relatively flat, with ground levels ranging from approximately 3.6 m to 4.8 m NZVD2016.

There have been reports of ponding, high groundwater levels and poor drainage noted onsite due to the close proximity of the sea, the relatively flat land and poor drainage infrastructure.

Lots 1, 3 and 5 have dwellings onsite, while Lot 2 has a shed. All other lots are currently undeveloped.

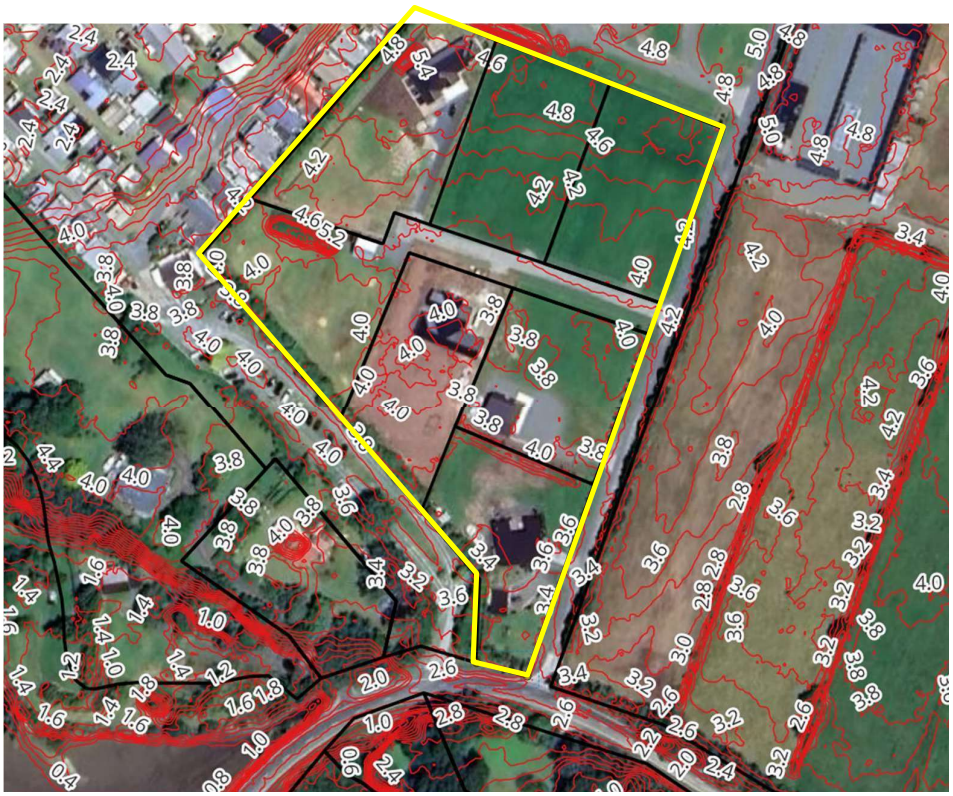


Figure 3: Site levels and general layout from 2024 LiDAR

There is a predicted 100-year coastal inundation level (3.7 m RL) mentioned in the CABRAS report, which includes projections for sea level rise and vertical land movement. Lot 1 is located at the lowest point of the 7 lots (3.4 to 3.8 m). While the site is not currently affected by coastal erosion, Lot 1 is expected to fall within the inundation zone under 100-year + climate change scenarios.

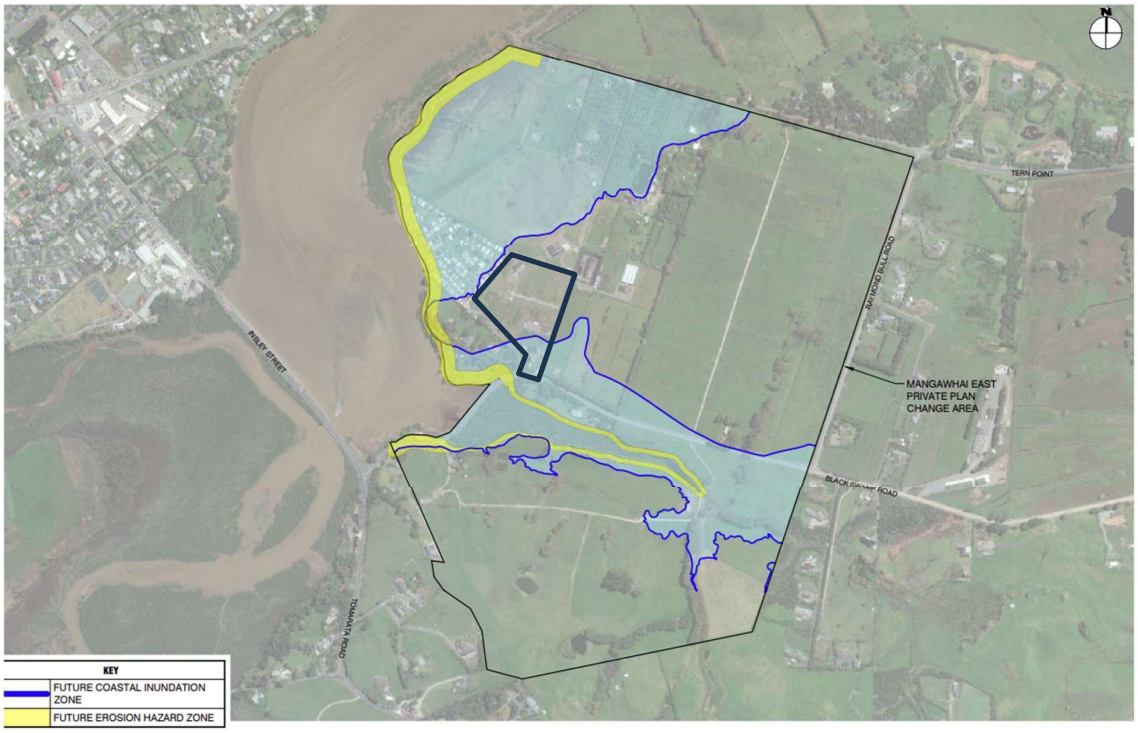


Figure 4: Inundation zone theorised for the proposal in 100 years (Coastal)

4. Drainage and Ponding Behaviour

Lots 1-7 of Windsor Way are positioned near the upper extent of a small catchment. As a result, it relies on localised conveyance via shallow swales and slow-draining surface depressions to manage runoff. The overall drainage efficiency of the site is limited by three key factors:

- flat topography,
- shallow groundwater, and
- a lack of defined overland flow paths.

Despite NRC flood mapping not identifying Windsor Way as a flood-prone area, local knowledge and observations indicate that rainfall events frequently lead to significant temporary surface ponding due to poor runoff conveyance. The shallow site gradients inhibit natural overland flow, and in many cases, water remains on the surface for extended periods until it evaporates or infiltrates slowly into the ground.

The reviewed PPC85 documentation includes a proposal for the wider Northern development to discharge stormwater primarily through soakage-based solutions, including raingardens and recharge pits. While these approaches may assist with maintaining hydraulic neutrality on a macro catchment level, they could introduce localised issues at Windsor Way. Specifically, soakage systems are only

effective when the receiving soils and groundwater conditions allow for vertical or lateral movement of water. At Windsor Way, several borehole records confirm the presence of a high water table, with groundwater levels recorded as shallow as 400 mm below ground level in winter months (BH3, July). It is believed that peat or other low-permeability soils may be affecting the drainage of the water table despite the presence of sand soils.

Introducing more soakage into an area with limited infiltration capacity can overwhelm the subsurface layers, leading to increased groundwater mounding, causing prolonged surface saturation and the potential emergence of springs or seepage zones. These effects would be exacerbated in high rainfall periods or if nearby properties also attempt to manage stormwater via soakage. In the absence of positive drainage (e.g., piped outlets or engineered overland paths), water may accumulate and persist on the surface, particularly in flatter areas such as Lots 1–4.

Additionally, the existing tidal outlet downstream of the site is influenced by coastal tailwater levels. During high tide or storm surge events, the discharge capacity of the swales and drains is further reduced, causing a backup of water on site. This could be further exacerbated as the low gradients over the site do not provide sufficient hydraulic gradient to drive the water into the tidal outlet.

These observations suggest that while the proposed soakage strategy may be suitable elsewhere within the PPC85 development area, it poses a notable risk at Windsor Way without further site-specific investigation, modelling and mitigation. As such, detailed hydraulic modelling and an evaluation of alternative discharge options or subsoil drainage are warranted to ensure that stormwater can be effectively managed under a range of conditions, including peak groundwater and high-intensity rainfall events.

Lot	Borehole	Jan (mm BGL)	Jul 19 (mm BGL)	Jul 26 (mm BGL)	Aug (mm BGL)
4	BH1	1700+	-	1650	1650
4	BH2	3400+	-	2400	1650
6	BH3	2200+	400	1200	700

- "+" indicates water was not observed, and depth to water exceeded the given measurement.
- "-" indicates no reading taken.

5. Stormwater Management strategy proposed (CABRAS)

The reviewed report outlines a conceptual stormwater management strategy for the wider Mangawhai East development. For the Windsor Way site, this strategy includes three primary components: hydraulic neutrality, groundwater recharge, and swale-based conveyance. No attenuation is proposed for most events, except for the 95th percentile storm (1-in-20). The following summarises each aspect and provides commentary on its potential limitations or unintended impacts.

5.1 Hydraulic Neutrality

The CABRAS documentation states that future development should achieve hydraulic neutrality, meaning post-development flows are not to exceed pre-development runoff flows. This principle is generally supported, particularly in areas discharging to sensitive receiving environments or where infrastructure is constrained.

Commentary:
While appropriate as a general principle, achieving hydraulic neutrality across the broader development does not guarantee that local effects, such as flow redirection or swale overtopping, will be avoided at the Windsor Way site. The site's shallow groundwater and limited downstream vertical fall make it more vulnerable to even marginal increases in local runoff to the site, especially if the swales or soakage areas do not perform as intended. Furthermore, no quantification or verification of neutrality (e.g. modelled pre- vs post-development flows) has been provided for this area.

5.2 Groundwater Recharge

Where peat soils are to be retained, the report recommends stormwater recharge to ground as a means of maintaining peat integrity and avoiding subsidence or oxidation. A 5 mm recharge requirement is cited to ensure stormwater mimics natural infiltration.

Commentary:
Although this approach aligns with GD01 guidance for peat management, it raises several site-specific concerns. Firstly, groundwater levels are already high across most of the site, particularly in mid- and late-winter, with borehole monitoring showing levels as shallow as 400–700 mm BGL. Recharging these soils during storm events may worsen surface saturation. Secondly, the possibility of emergent springs or prolonged ponding should be considered if recharge volumes exceed the site's natural drainage capacity, which may already be the case during winter. There is also concern that neighbouring properties, which may rely on subsoil infiltration for surface water disposal, could be adversely affected if water tables rise as a result.

A potential mitigation measure could include subsoil drains installed beneath swale bases or within sand pockets to provide controlled discharge once groundwater reaches a critical level. This option is not discussed in the current strategy.

It should also be noted that raising the ground level over the peat to account for the new coastal inundation levels will lead to consolidation and ongoing uncontrollable creep settlement over several decades or more. There is no discussion regarding the overfilling required and loss of permeability associated with this.

5.3 Swale-Based Conveyance

The CABRAS proposal includes swale conveyance through road corridors, with the suggestion that swales may be widened to accommodate larger flows. No hydraulic calculations or cross-sections are provided to demonstrate swale dimensions or flow capacity.

Commentary:
Swales are a practical and low-impact solution for gently sloping sites, and their inclusion is appropriate and encouraged. The report does not quantify the required capacity or provide design storm sizing, which is necessary under GD04. For the Windsor Way site in particular, sizing swales appropriately is critical, especially along the eastern boundary, where development to the east is at a similar elevation. If that development is not coordinated to limit discharge or maintain swale capacity, there is a real risk of flows bypassing, preveting out flow due to an increase in tail water depthor overtopping the swale system and entering adjacent properties, including those on Windsor Way.

We recommend that swale sizing be confirmed using rainfall events from 10% to 1% AEP scenarios, depending on the impact on nearby houses with the failure of such swales, with allowance for climate change and blocked inlets, to ensure resilient performance.

5.4 Attenuation

Attenuation is not proposed except for the 95th percentile storm event, which aligns with Auckland Council and KDC guidance in tidal or coastal environments.

Commentary:
Given the site's proximity to tidal influences, the lack of attenuation is reasonable, and I do not believe that attenuation should be the first choice in the development. However, if proper conveyance is not achieved, attenuation may be required, and it is important to determine if conveyance can be achieved before discounting attenuation.

5.5 Potential Site Filling (Not Proposed in CABRAS, but Referenced)

The CABRAS report includes a plan showing a potential ground level increase of approximately 200 mm above the 100-year coastal inundation level (RL 3.7 m NZVD2016). This fill concept is clearly marked as “not proposed” and is not discussed further in the report or included in the stormwater management strategy. No supporting modelling or design detail accompanies the plan.

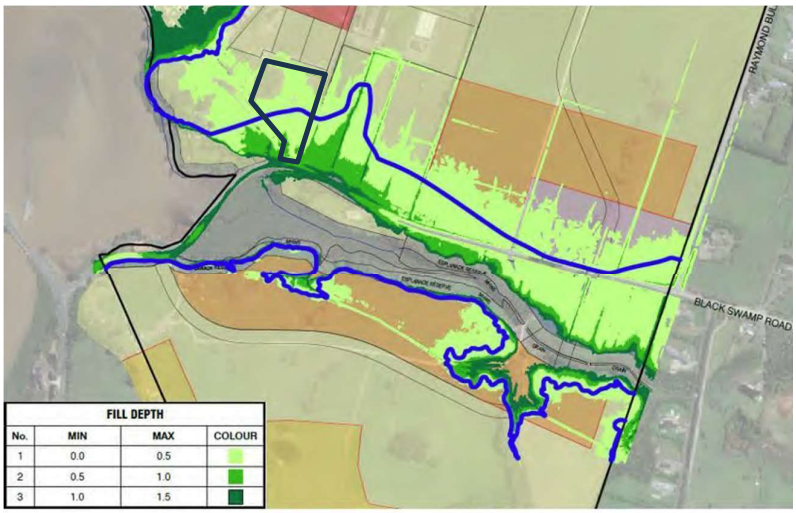


Figure 4.1.1a: Filling around Black Swamp Road

Figure 5: Non proposed filling of the development to be 200mm above 100 year coastal innundation level

Commentary:

Although not formally proposed, the presence of this fill plan in the documentation suggests it may be reconsidered at a later stage. Given the site’s already flat topography, even small increases in ground level may worsen surface drainage and exacerbate localised ponding.

Introducing fill without a coordinated grading and conveyance strategy can lead to:

- Reduced fall across the site, making an already flat site effectively flatter;
- Entrapment of surface runoff in low areas or around fill transitions;
- Increased reliance on swales or overland flow paths, which must be carefully graded to avoid backfall or stagnation;
- Disruption of existing or proposed drainage patterns, especially if design across property boundaries is not coordinated.
- Cause ongoing long-term creep settlement where fill is over peat.

If this fill concept is revisited in future stages, it is strongly recommended that it be supported by:

- Site-specific drainage and overland flow modelling;
- Clear demonstration that fill will not isolate parts of the site hydraulically;

- Design solutions that preserve or improve drainage continuity toward the proposed discharge zones.
- Detailed geotechnical reporting on how to mitigate ongoing creep settlements due to fill material.

While raising building platforms may be desirable for resilience to coastal inundation, filling should not proceed in isolation from a complete stormwater design. In a flat site context like Windsor Way, even minor changes in surface level can materially alter where water collects and how it moves, potentially making existing issues worse rather than better.

6. Proposed Discharge Zones

To help address the existing drainage and ponding issues observed on the Windsor Way site, an internal redistribution of stormwater flow may be required. This approach may be independent of the CABRAS development but may ultimately benefit from alignment or compatibility with its stormwater infrastructure, particularly on the eastern boundary.

No official concept has been determined at this stage; however, initial ideas involve dividing the site into two indicative discharge zones:

Lots 5–7: Discharge is proposed to the east, toward an existing or proposed swale located near the site boundary. While access and capacity are not confirmed at this stage, early consideration of this flow direction may help inform future design opportunities.

Lots 1-4: Discharge is proposed to the south, via a new swale along the southern boundary, connecting into the existing road corridor drainage.

There may also be a benefit in considering whether Lots 2 and 4 could partially discharge eastward, depending on the ability of site grading or the existing fall. This could help distribute runoff more evenly and reduce pressure on any single outlet path.

These suggestions are preliminary and intended only to highlight potential options for improving drainage resilience across the Windsor Way site. While specific responsibilities and design outcomes remain to be determined, early coordination with nearby works - such as appropriately sizing the eastern swale and Black swamp road outlet to the sea - may provide mutual benefit in future design stages.

7. Conclusions

This review has identified that the current CABRAS stormwater strategy for Lots 1–7 Windsor Way provides a broad conceptual framework but lacks sufficient technical detail to confirm compliance with Kaipara District Council requirements (GD01, GD04) and NZBC Clause E. In part. this will be because specific development is not confirmed; however, it may be necessary to go into further detail considering the known ponding issues on Lots 1-7 and potential effects from the stormwater and groundwater on nearby land.

Key risks identified include:

- Incomplete hydrologic and hydraulic modelling, including the absence of AEP design event calculations and swale sizing.
- Lack of detail around overland flow management and stormwater discharge routing.
- Potential exacerbation of ponding and slow drainage due to shallow gradients, tidal influences, and shallow groundwater.

Based on this review, it is recommended that further investigation into the development's effects on groundwater and determining adequate stormwater conveyance design to fit in with lots 1-7 Windsor Way.

Limitations

This report has been prepared for the benefit of Mr Derek Westwood et al. as our client(s) with respect to the review of the Kaipara District Council proposed plan change 85. It shall not be relied upon for any other purpose. The reliance by other parties on the information or opinions contained in this report shall, without our prior review and agreement in writing, be at such parties' sole risk.

Opinions and judgments expressed herein are based on our understanding and interpretation of current regulatory standards and should not be construed as legal opinions. Where opinions or judgments are to be relied on, they should be independently verified with appropriate legal advice. Any recommendations, opinions, or guidance provided by Cook Costello in this report are limited to technical engineering requirements and are not made under the Financial Advisers Act 2008.

Cook Costello has performed the services for this project in accordance with the standard agreement for consulting services and current professional standards for environmental site assessment. No guarantees are either expressed or implied.