



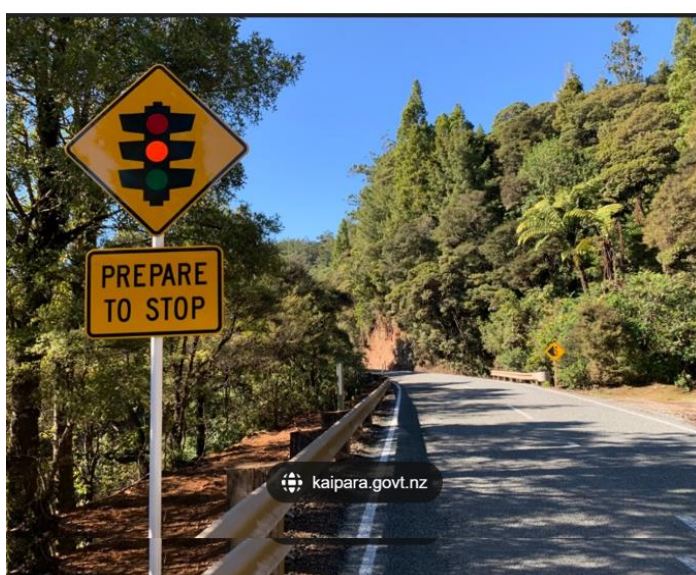
Review of Road Maintenance Delivery by NTA and Ventia for Kaipara District Council

Part of Section 17A Review on Road Maintenance Delivery

Prepared for: Kaipara District Council

Prepared by: Kingston Infrastructure Ltd

Date: 11 February 2024



Bottom Line up Front (BLUF)

The on-road performance of Kaipara District Council's Road Maintenance Delivery by Ventia and the Northland Transportation Alliance (NTA) is having a negative impact on all three parties' credibility and reputation. Higher than tolerated drainage and pavement defects on the unsealed network, potholes and slumps on approaches to single lane bridges, what appears to be do-nothing rather than do-minimum for small dropouts/underslips or deeply scoured drains, is affecting residents' confidence in receiving value for money.

Although NZTA commended the current Asset Management Plan (AMP), there is little evidence how the NTA and Ventia collaborate to translate the AMP objectives into day-day operational delivery. Multiple information requests as part of this review on specific intervention levels or design and Quality Assurance documentation or how network deficiencies are prioritised remain outstanding.

Council is considering how to improve its customer engagement and service delivery methodology from 1 July 2024, so the recommendations below are based on what should be done up to 1 July 2024 to grow confidence that the basics are being done well. To achieve these recommendations, Council will need to reallocate funding now (for example to improve drainage, money will need to come from another work category) in discussions with NZTA and determine priorities for the 12 month period starting 1 July 2024.

Background

When Council was elected in October 2022, the new Mayor and Deputy acknowledged residents' dissatisfaction with road maintenance delivery across the Kaipara District. It was agreed in September 2023 that Council would commission their own Section 17A review (under the Local Government Act 2002) to determine the optimal delivery model for medium term (1 July 2024-1 July 2025 when Separable Portion 3 under the existing maintenance contract could start) and longer term (5+ years from 1 July 2025). Blair King of Kingston Infrastructure Ltd along with Frank Aldridge of The Integral Group Ltd were engaged to complete this Section 17A review and provide recommendations.

To address ongoing maintenance delivery concerns whilst the review progresses, Council on 6 December 2023 engaged Blair King of Kingston Infrastructure Ltd separately to identify and implement changes for improving road maintenance over a 4 to 5 month period.

This report provides an update on this engagement and the outcomes to date.

Residents Maintenance Requirements

Residents and users expect Council to deliver the basics of road maintenance well. Themes that appear consistently in Annual Plan submissions are ensuring the roadside drainage is effective and maintained as a priority, pavements cater for the required traffic volumes without significant defects, contractors demonstrate ownership and value-for-money, and vegetation is kept back from the roads and footpaths to give visibility or safe access.

Hallmarks of good delivery of these basics should include:

- Well-maintained drainage channels and culverts along with adequate crossfall on pavements
- Right work completed right first time, through optimal use of crews, aggregates and equipment. This is evident usually where the Contractor is considered “smart” – ie they have the engineering and planning resources internally creating proactive work programmes in RAMM that are communicated and tracked creating effective delivery.
- Collaboration, shared responsibility and shared risk between Council, Engineers and Planners, and the Contractor in agreeing how to best use the available funding for example on slips or dropouts (whether the fix should be a highly engineered solution with low risk but high cost, or a lightly engineered solution that may fail but multiple sites can be completed for the same overall cost)
- Unambiguous Pavement/Maintenance Intervention Strategies that are the day-to-day linkage between the outcomes within the Asset Management Plan, to practical delivery and funding. This includes feedback processes to drive efficiencies or value for money.
- Councillors or residents understand / influence agreed level of service for asset classes.
- Renewals or capital work focus on gains to overall asset residual life across the network, reflecting expected growth and transport needs. In other words, the money spent on renewals is keeping pace with predicted deterioration.
- Evidence captured such as Quality Assurance documentation and growth impacts (Resource or Building Consent impacts) to influence annual work programmes / budgets.
- Reporting more on how works completed have improved the pavement or drainage asset residual life, or what the forecasted cost-to-complete is for a bridge project, and less on how many potholes were filled or how many defects were recorded that month.
- Timely updates to enable informed decision making at Council, Regional Transport Committee and any Civil Defence / Emergency Management needs, and clear communication to residents and users of progress against targets or service responses.

Actions

Across the allocated two days per week, I have been assessing the performance of NTA and Ventia on the above broad outcomes through:

- site visits with residents or suppliers to review completed work,
- driving higher profile routes noting the standard of maintenance,
- following up on customer service requests for priority defects, and
- meeting with NTA staff or elected members.

My observations and recommendations are below, acknowledging the necessary decision to enable me to direct delivery as Engineer to Contract is still being worked through between KDC, Ventia and the NTA.

General Comments

Watertable Drainage and scouring across Roads

The NTA report that the overall deficiency (or cost to remedy) water tables and drainage especially on the unsealed network has significantly increased over the term of the current 4+2+1+1 year contract. Within NTA's 2021-24 Asset Management Plan, it was recognised that drainage needed an improved focus, and goals included:

The Northland Transportation Alliance (NTA) has developed a Resilience Strategy. This strategy identifies critical culverts and overland flow paths that are at high risk of causing road washouts or slips during heavy rain events. Drainage improvement identified through this strategy will be prioritised and undertaken as funding allows.

Budget constraints continue to hinder the ability of the Roading Department to implement and treat the identified drainage deficiency on the network. The focus will be on carrying out surface water channel maintenance on arterial and forestry roads on the network to minimise water ingress into pavements to extend the pavement life and reduce pavement maintenance.

Discussions with Ventia and NTA along with the Panel Members on the Regional Review has highlighted this is an area of low collaboration in getting the best value for money. Ventia for example have 320 priority one culvert cleans identified that are "awaiting approval" in RAMM costing \$150,000 if part of routine work. Inspections of the rural network with farmers and looking at failures highlight multiple areas, such as Lawrence Road, Avoca North Road, Pukehuia Road, Otioro Road, where blocked drains and culverts are being attributed to the cause of underslips and slumps. Examining where the budget went highlights one stormwater capital improvement to install new culverts in Breakwater Place Mangawhai to deal with localised ponding/flooding cost \$148,000 which would be 50% of the discretionary budget in 2022-23. It is unclear how Council staff/NTA/Ventia rank and subsequently recommend projects that will be allocated capital funding. As the capital or discretionary budget is relatively small, this is an area where collaboration between client, engineer-to-contract and contractor would improve value for money from investment.

The unsealed network has multiple examples of water scouring across the road, occasionally to the extent where the road is operating as the main drainage channel. One example looked at was Lawrence Road where a heavy metal overlay was proposed. Photographs 1 to 5 below show the water scouring the road surface down to clay. There were no plans by NTA or Ventia to remedy the underlying causes. Since the site visit, Ventia has advised the cost to remedy the private driveway at the start of the scour is \$8,000 of which nearly half would be traffic control costs. Other photos show the scour across the road leading into slumps and underslips, contrary to the "Resilience Strategy" noted in the Asset Management Plan.

It is recommended that *Council reprioritise funding in discussion with NZTA to create a clear programme of culvert and water table maintenance/clearance on unsealed roads prior to winter 2024 (Recommendation 1).*



Photo 1: Lawrence Road: Site of proposed heavy metal overlay. Underlying drainage faults not addressed as priority actions beforehand. Driveway at top of hill needs \$8000 (of which nearly \$4000 is traffic control cost) to add culvert/headwalls which is outside of the scope of Part 2 of the Consolidated Bylaw.



Photo 2: *Lawrence Road* looking downhill at site of proposed heavy metal overlay, scour from LHS creating trail of sediment and aggregate in paddock, and removing support for powerpole



Photo 3: *Examples of recently blocked culvert inlets from silt (Pukehuia and Otioro Roads)*



Photo 4: Lack of maintained upstream water table & cutoffs leading to scour and loss of culvert headwall.



Photo 5: Lawrence Road – lack of upstream water table maintenance scouring into dropout.

Deeply Scoured Water Tables

Whilst the Asset Management Plan highlights the intention to carry out surface water channel maintenance on arterial and forestry roads, this maintenance is not evident from drive overs.

Ventia staff advise there is no item within the schedule of rates for what would be known as 'Check Drains', which is a method of adding barriers across the drain to slow the water and lower scour potential. Where the water table has deeply scoured (near vertical sides greater than 0.5m), the pavement will "shove" laterally due to lack of side support, or overslips can occur (where the bank above the road slumps into water table and blocks it) due to the loss of toe support.

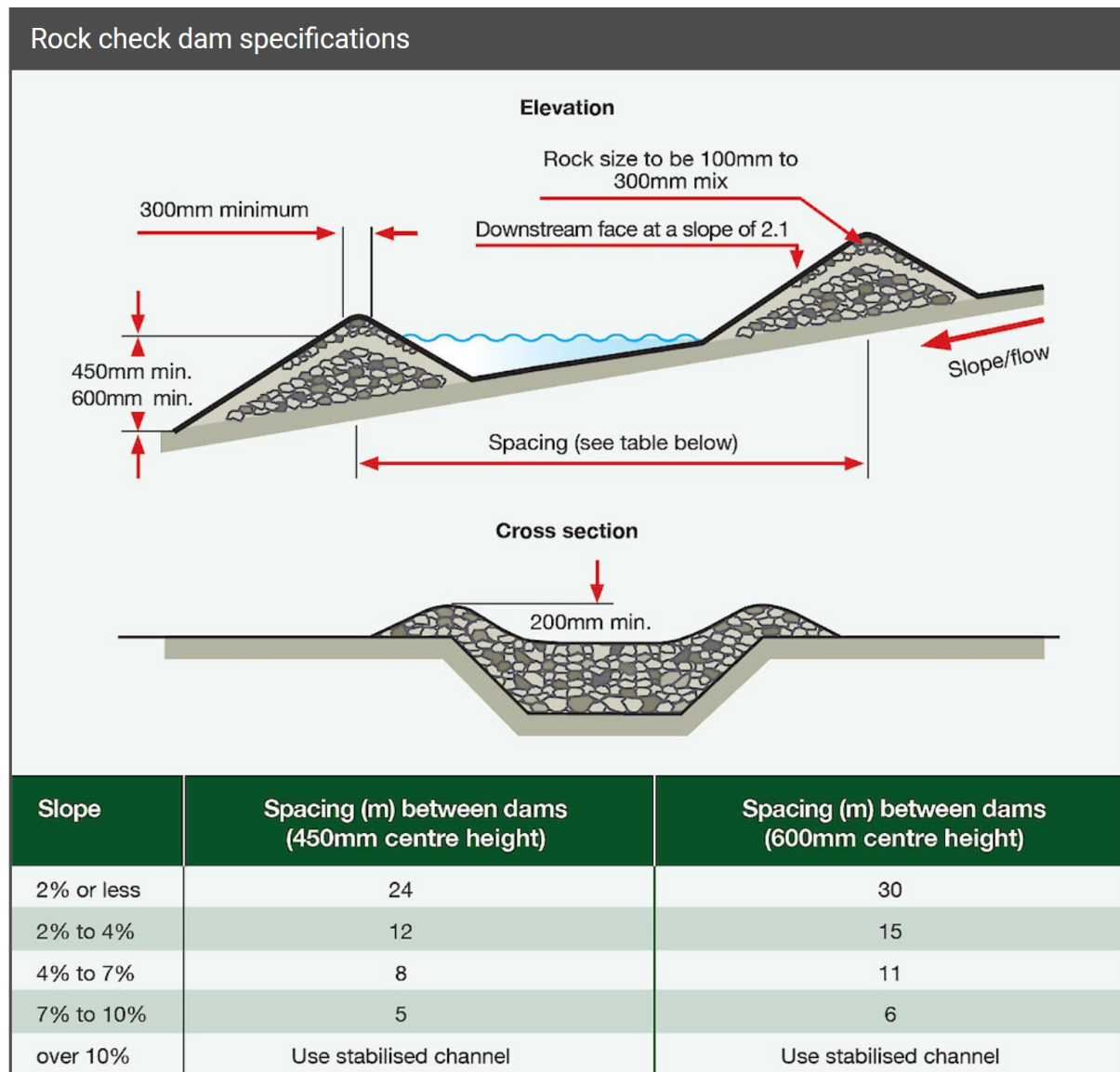


Figure 1: Rock Check Dam Specification (source NZ Forest Road Engineering)

Information was sought from NTA and Ventia on what is the intervention level that would trigger "do minimum" to stop the pavement collapsing into the drain, and what method they have used to reinstate, or where they have reinstated, how did it occur. As no response has been received, it is recommended Council use accepted good practice, being cut the scour to shape, add bidum mat and infill with compacted gabion rock, and in long channel runs, use check drains (refer Figure 1 above).

Multiple reasons were given as to why examples on Otioro Road by Kaiwaka could not be repaired, such as the grader would hook this gabion rock out when wide grading or budget isn't available. A subsequent site visit identified along the first 1km of road, the water table had been "grader infilled", however this loose clay material, as expected, washed down the waterway and blocked the culverts in subsequent heavy rain. Details have been sought on what the instruction to contractor was along with cost, and a similar case is evident in Cames Road. In response to a complaint lodged in May about the scour undermining the concrete dish-channel and sealed pavement, a contractor has infilled the scour with limestone in late 2023, which unsurprisingly subsequently washed out into a farm paddock. Refer Photograph 6 below.

It is recommended *Council agree to prioritise a programme of work to repair deeply scoured water tables to rebuild resilience in the unsealed network, by deferring part of the heavy metal overlays programme (Recommendation 2).*



Photo 6: Watertable scouring leading to pavement collapse. Right hand is Cames Road infilled with limestone.

Multiple new concrete driveways such as on Pukehuia Road and Lawrence/Cames/Devich Roads have been installed without a maintainable stormwater path for the contractor. Already water is scouring across the concrete frontage, and the risk of a grader breaking these concrete aprons is high. Refer Photograph 7 below.



Photograph 7: Lawrence Road where new driveways built but water scouring past. This needs coordination between development engineers and asset maintenance teams as part of design/construction signoff.

It is recommended that Council *provide better guidance and requirements for new vehicle crossings to ensure the on-going maintenance needs for roadside drainage and pavements are low cost to ratepayers (Recommendation 3).*

Where the driveway is not at a level of deterioration that would enable Council to require the owner to rebuild as per Section 11.7 of Part 2 in the Council Consolidated Bylaw, but there is a lack of appropriate culverts (to effectively channel stormwater from the pavement) that is already causing significant road damage, it is recommended Council *require a 50% cost share with private landowners to remediate existing crossing/culverts that are creating significant scour in pavements up to \$6,000 per crossing (Recommendation 4).*

11. Vehicle crossings

- 11.1 Any person wishing to construct, repair, remove, reconstruct or widen any vehicle crossing shall apply to an Authorised Officer for permission and pay such fees as prescribed in Council's Fees and Charges.
- 11.2 No person shall construct, repair, remove, reconstruct, relocate or widen any vehicle crossing without first having obtained a permit from an Authorised Officer.
- 11.3 A permit issued by Council under clause 11.2 may be subject to such conditions and standards the Authorised Officer considers reasonably necessary to ensure protection of the road adjacent to the vehicle crossing, and to ensure safe and convenient use of the road by pedestrians and vehicles.
- 11.4 A permit for the construction, repair, removal, reconstruction, relocation or widening of a vehicle crossing, and is not subject to a resource consent, shall be valid for six (6) months, during which time the work shall have been completed, to the satisfaction of an Authorised Officer.
- 11.5 If construction, repair, removal, reconstruction, relocation or widening of a vehicle crossing has not been completed within six months of the date of issue of the permit, the permit shall be deemed to have expired and the permit holder shall be required to apply for a fresh permit and pay a further fee before construction, repair, removal, reconstruction, relocation or widening can begin or be continued.
- 11.6 No person shall drive, ride, propel, or wheel any motor vehicle across any footpath or water channel in any public place otherwise than upon a vehicle crossing properly constructed under the provisions of this Bylaw. This does not include driving across a water channel along a beach within the district.
- 11.7 If in the opinion of an Authorised Officer any vehicle crossing is in a bad or unsafe state of repair, an Authorised Officer may by notice in writing, require the owner of the land to

Figure 2: Excerpt from KDC Consolidated Bylaw – 11.7 requires the crossing to be “bad or unsafe state of disrepair” before the owner can be fully liable.

Pavement Intervention Strategy/Slip Intervention Strategy

Information has been sought from the NTA giving specific intervention levels for common defects such as when roadside scour or rutting, or spraying of water tables would be addressed. Whilst there is no shortage of strategic documents, there is a lack of operationally useful guidance linking what the contractor is loading into RAMM based on their inspections, and how this will then be prioritised and actioned. Some contracts have photos to clearly outline what is acceptable, what needs monitoring and what should be repaired as a matter of urgency. This information has not been sighted. An example of what is sought is outlined in Figure 3 below:

Surface Scour					
Defect	Loss of surface material caused by the flow of water along and/or over the road. Can occur longitudinally and/or transversely. Caused by poor or blocked drainage systems, excessive longitudinal grades or lack of compaction.				
Example Defects Condition	A culvert is blocked causing water to flow across the road creating a scour.				
Example Photos	1 - Acceptable	2 - Acceptable - Monitor	3 - Defect - Medium	4 - Poor - Intervention	5 - Very Poor - Safety
	TBA				
Defect Description	N/A	Minor scour across the road. Early stages but further rain will cause this to deteriorate.	Isolated scouring that has removed surface running material exposing subbase.	Scour affecting ride quality particularly when two vehicles meet.	Scour causing significant ride quality and safety issues.
Typical Treatment	None	Monitor	Grade and/or remet within 3 Months	Programme grading in the next months' programme.	Grade and/or add metal within 48 hours and/or place warning signs.

Figure 3: Intervention Strategy Example

On slips, good practice would set out who (whether its the maintenance contractor, the slip repair contractor, the slip repair designer, or the NTA) is monitoring and actioning elements to protect the road / slip, whether fully repaired or to be repaired. Whilst I have sought a table of information on the slips post Gabrielle that would identify location and agreed repair complexity, I have yet to receive this. A slip intervention strategy would sit alongside that table showing:

- *What is the likely delivery method.* Defining whether a contractor is engaged to do a generic repair methodology such as posts or steel i-beams and timber rails or rock armouring where appropriate, or whether the solution justifies more Geotech information.
- *What the defects liability period covers and when that starts/ends.*
- *How any handover between Capital and Maintenance would occur.* Outlining who does the maintenance of water channels or weep drains or other new assets whilst the slip repair is within this defect's liability period, and at what frequency
- *What recording of post or pre-repair settlement, or ground movement is undertaken*
- *QA to ensure the completed design meets the proposed outcomes (such that stormwater is diverted away from the slip face).*

Photo 8 at Mangawhai-Kaiwaka Road by Hilltop Road is an example of the “design intent” for the road reinstatement being lost in communication between parties. Although the slip repair was deemed complete, the new concrete dish channel to transport stormwater across the slip, was infilled during pavement construction. This resulted in scour down the slip face by stormwater, and a subsequent visit has confirmed kerb and channel will need to be installed.

Photo 9 at Mountain Road shows a “retreat” constructed in the bank behind a major slip. The marker pegs below the road show this slip face still moving. It would be prudent to have regular surveys of these repairs to assess ground movement and determine whether remedial work to stabilise the toe of the slip is warranted.



Photograph 8: Mangawhai Road at Hilltop Road: Slip repair had new concrete dish-channel installed, this has been then infilled by the pavement construction, allowing stormwater to overtop and scour the repaired slip face. Solution is a new kerb and channel. Consideration should also be given to a guardrail extension treatment due to steep land drop-off.

It is recommended that the NTA cross-check unrepaired underslips in RAMM for date of identification to see if they can be claimed as part of the Cyclone Gabrielle, and the Table of Slips is updated to include the above Slip Intervention Strategy (Recommendation 5).

It is recommended that NTA address the stormwater remedies for Mangawhai Road (at Hilltop Road) slip repair and consider guardrail extension treatment due to steep drop off (Recommendation 6).



Photograph 9: Mountain Road slip repair: Slip front still moving, creating tension on fibre optic, no Slip Intervention Strategy supplied from NTA advising what are the trigger points for intervention.

Slumps and pavement defects on approaches to one lane bridges

There is a lack of evidence showing low-cost high value works in addressing slumps/depressions/potholes on the approaches to bridges are being proactively managed.

The presence of potholes and slumps on these approaches within the wheel tracks is both a road safety hazard (damage to vehicles, unexpected loss of visibility if water has ponded), and adds “impact loading” on abutments and wingwalls.

Examples pointed out in discussions with farmers as shown in Photographs 9 & 10 below on Paradise Valley, Tangowahine Valley/Murrays Road, Mountain Road suggest improving these will help Councils credibility with road users. Ventia as noted in their January 2024 report intending fixing the sunken approaches to the bridge at the Murrays Road/Tangowahine Valley Road intersection.

In Pukehuia Road, one of the bridges has the wingwalls being undermined by the stream, which is diverted from its historic path by a sole willow tree in the stream bed. It would be significantly more cost effective to remove that tree as the cause of the erosion than leave it for another 5 years to further slowly undermine the bridge supports and pavement.



Photograph 9: Mountain Road and Paradise Valley Road. Single lane bridges with obvious defects that are low cost to remedy.



Photograph 10: Single Lane Bridge Paradise Valley Road. Slump and water ponding on approach.

It is recommended Council *receive information on the level of defects that exist at the approaches to single lane bridges along with the cost to remediate so it can make an informed decision on priorities (Recommendation 7).*

Engineering/Quality Assurance

Reviews of digout or stabilised pavement failures such as Cove Road and Lawrence/Valley Roads indicate a period where there has been little “engineering” for solutions, as opposed to doing what has been done in the past. Information was sought from the NTA and Ventia to confirm the aggregates and proposed stabilised mixture are appropriate and will give the required pavement residual life. No lab testing results have been supplied that would show for example whether the percentage of lime or cement being added into the stabilised mix is optimal. No QA information was provided showing that checks occurred to verify the material has been well compacted into a mosaic before sealing. These are low-cost improvements and covered in recommendation 8 below.

Whilst the contractor is proactive in using localised aggregate sources, and common products such as Cirtex Geogrid to provide strength to soft subgrades, it is unclear due to a lack of as-built information on how the digout was completed compared to good design or suppliers’ recommendations. Whilst Ventia and NTA note the number of patches seen that have failed is small, the lack of QA information means it is difficult to distil the reasons why one digout repair has failed and another on the same road is intact.

Ventia have stated in January 2024 they will be providing further training to staff in stabilising technique and use of geogrid/geofabric to address this, however a Notice to Contractor confirming the need for as-builts and QA information would be prudent.



Photograph 11: Cove Road failure: No pavement compaction QA results, no aggregate lab testing results, no as built confirming the location of positive drainage from digouts (potentially the white novaflow by cone)

It is recommended a Notice to Contractor (NTC) be issued noting improvements are also required in the supply and storage of Quality Assurance records for every pavement repair, including photographic evidence of as-builts, Inspection Test Plans (ITPs), check sheets, materials testing results, compaction, and positive drainage confirmation (Recommendation 8).

Recommendations

A summary of the recommendations to date, as outlined in this report, are listed below:

1. Council reprioritises funding to create a clear programme of culvert clearance on unsealed roads.
2. Council agrees to prioritise a programme of work to repair deeply scoured water tables to rebuild resilience in the unsealed network, by deferring part of the heavy metal overlays programme.
3. Council provides better guidance and requirements for new vehicle crossings on unsealed roads to ensure the on-going maintenance needs for roadside drainage and pavements are low-cost to ratepayers.
4. Council requires a 50% cost share with private landowners to remediate existing crossing/culverts that are creating significant scour in pavements up to \$6,000 per crossing.
5. NTA cross-check unrepaired underslips in RAMM for date of identification to see if they can be claimed as part of the Cyclone Gabrielle, and the Table of Slips is updated to include the above Slip Intervention Strategy.
6. NTA address the stormwater remedies for Mangawhai Road (at Hilltop Road) slip repair and consider guardrail extension treatment due to steep drop off.
7. Council receives information on the level of defects that exist at the approaches to single lane bridges, along with the cost to remediate, so it can make an informed decision on priorities.
8. A Notice to Contractor (NTC) be issued noting improvements are also required in the supply and storage of Quality Assurance records for every pavement repair, including photographic evidence, Inspection Test Plans (ITPs), check sheets, materials testing results, compaction, and positive drainage confirmation.

Additionally, to address growing resident concern, it is recommended that:

9. Council work with NTA and Ventia to improve communication to resident service requests, such that direct questions receive timely and clear answers on what will occur and when.

Applicability

This report has been prepared for the use by Council, with respect to the brief given to assess and improve road maintenance delivery.

Recommendations and opinions in this report are based on data from discrete investigation locations. The nature and continuity of maintenance activities away from these locations are inferred but it must be acknowledged that actual conditions or performance could vary.

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