Case Study Report

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Project name	National Engineering Design Standards		
Subject	National Engineering Design Standards Case Study Report		

1. Purpose of this report

The purpose of this report is to present the case studies developed by GHD as part of the National Engineering Design Standards (NEDS). The case studies have been developed to illustrate the advantages that NEDS and the National Codes of Practice could have over the status quo**.** The case studies draw out the challenges with current practice and the ways standardisation could bring benefits, noting that specific performance outcomes have not yet been proposed or codified in the NEDS. This report presents the findings of the case studies.

2. Scope and limitations

2.1 Scope of work

The Case Study Report provides a summary the findings of the assessment of four representative case studies and documents the implications of the proposed NEDS framework and the National Codes of Practice, comprising:

- Summary of key insights from stakeholder workshops and framework testing.
- Assessment of how each case study would have been delivered under the proposed NEDS framework and the National Codes of Practice.
- Identify potential benefits in design processes, consistency, efficiency, project delivery and asset management outcomes.
- Provide indicative estimates of potential cost and time savings and other benefits based on engineering judgement and case study evidence.
- Highlight impact on different stakeholder groups, including asset owners, regulators, consultants, contractors, developers and service providers.
- Identify lessons learned and common themes across the case studies to support framework refinement.

2.2 Limitations

This report has been prepared by GHD for MartinJenkins and may only be used and relied on by MartinJenkins for the purpose agreed between GHD and MartinJenkins as set out in section 1 of this report.

GHD otherwise disclaims responsibility to any person other than MartinJenkins arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

3. Case Studies

As part of the National Engineering Design Standards (NEDS), GHD have developed case studies to illustrate the advantages that NEDS and the National Codes of Practice could have over the status quo. The case studies draw out the challenges with current practice and the ways standardisation could bring benefits, noting that specific performance outcomes have not yet been proposed or codified in the NEDS.

The case studies make these challenges tangible and credibly demonstrate how a nationally consistent framework could improve outcomes, including potential efficiencies in time, cost and process where reasonably evident. While the case studies describe situations that worked reasonably well, they still demonstrate the value that NEDS and the National Codes of Practice could bring. It strengthens the case for national standardisation to see that NEDS and the National Codes of Practice could benefit projects that worked well (and bring even greater benefit to projects that ran badly).

Four case study themes, outlined in Table 1, were agreed to reflect key areas of the water sector. Each case study compares the current state with a future state where NEDS and the National Codes of Practice have been established.

Table 1 Case studies

Case Study	Reasoning
Capital upgrade in response to growth or environmental drivers	Significant brown fields response to growth or environmental drivers to explore the application of the NEDS in this context and at this scale. With the planning intensification of our towns and cities, this is also a very current topic
Routine pipe renewal	More routine and planned activities that should be driven by asset management processes, NEDS to provide a consistent approach to the standard of renewals.
Greenfield development in response to growth	More routine and planned activities that should be driven by asset management processes, NEDS to provide a consistent approach to the standard of renewals.
Small water service provider	Exploring how the NEDS may benefit or impact a smaller service provider/council differently from metropolitan locations.

To inform the analysis, GHD interviewed developers and practitioners involved in each case study. These interviews were structured around a consistent set of key design questions (outlined below), enabling a comparable assessment of current challenges and potential improvements under the proposed framework.

The key design questions were:

– Consistency: Would NEDS reduce friction for users operating across multiple jurisdictions?
– Cost effectiveness: Where would consistent national requirements drive savings in products, processes, or services?
– Local variation: Would NEDS provide the ability to accommodate local physical conditions, e.g. rainfall, seismicity, temperature, growth, without opening the door to sentiment-driven variation?

– Scale effect: Would NEDS make life easier for smaller, less-resourced providers? Would NEDS leave room for innovation by larger, more capable providers?

Any time or cost savings expressed in relation to the case studies are indicative only, based on practitioner opinion and have not been verified.

3.1 General Case Study Insights

The primary value of NEDS and the National Codes of Practice is expected to come from greater consistency in technical requirements, clearer compliance pathways, reduced design duplication, more streamlined approvals processes and more efficient and effective use of assets across the entire lifecycle.

The greatest benefits are likely to be realised in greenfield developments, routine renewals, and by smaller water service providers, where designs may typically tend to be simpler and more repetitive. Under such circumstances, standardised requirements and clear compliance pathways will reduce the need to develop, maintain, and interpret local engineering standards because these local standards can be usefully replaced by single National Codes of Practice. In contrast, more complex and higher-risk projects, such as major wastewater or drinking water infrastructure upgrades in constrained or high-risk physical contexts, would still require significant specialist input and project-specific solutions. Under the latter scenario NEDS could provide more moderate efficiency gains through improved approval certainty, consistency where applicable, and known compliance pathways.

The case studies indicate that the benefits of NEDS are likely to vary according to project scale, complexity, risk, and the capability of the water service provider. Across all cases, NEDS and National Codes of Practice, it is considered that these tools would not completely remove the need for professional judgement or site-specific design, as factors such as hydraulic performance, geotechnical conditions, environmental constraints, growth requirements, and asset criticality will continue to require tailored engineering assessment and design response.

NEDS and National Codes of Practice can clarify how and where design interacts with other legislative requirements such as bylaws and the Building Code providing greater certainty to designers on what is required and therefore helping to manage approval timeframes.

Overall, the case studies suggest that NEDS has significant potential to improve sector-wide efficiency through both time and direct cost savings, with the magnitude of benefits increasing as project complexity decreases and reliance on repeatable, standardised solutions increases. Further value lies in considering whole-of-life expenditure, with reductions achieved through more proactive maintenance, extended existing asset life, reduced failures and emergency repairs and decreased reliance on reactive interventions.

3.2 Infrastructure Lifecycle, Expenditure and NEDS Influence

When considering the potential for cost efficiencies associated with the implementation of NEDS and the National Code of Practice, it is useful to understand the infrastructure lifecycle and where various types of expenditure occur. Viewing costs across the lifecycle provides context for how NEDS may influence both time and cost outcomes, not simply through standardisation, but through clearer compliance pathways, reduced duplication, and improved decision-making across stakeholders.

Figure 4.1 illustrates the infrastructure lifecycle. The cost elements associated with each stage are summarised below.

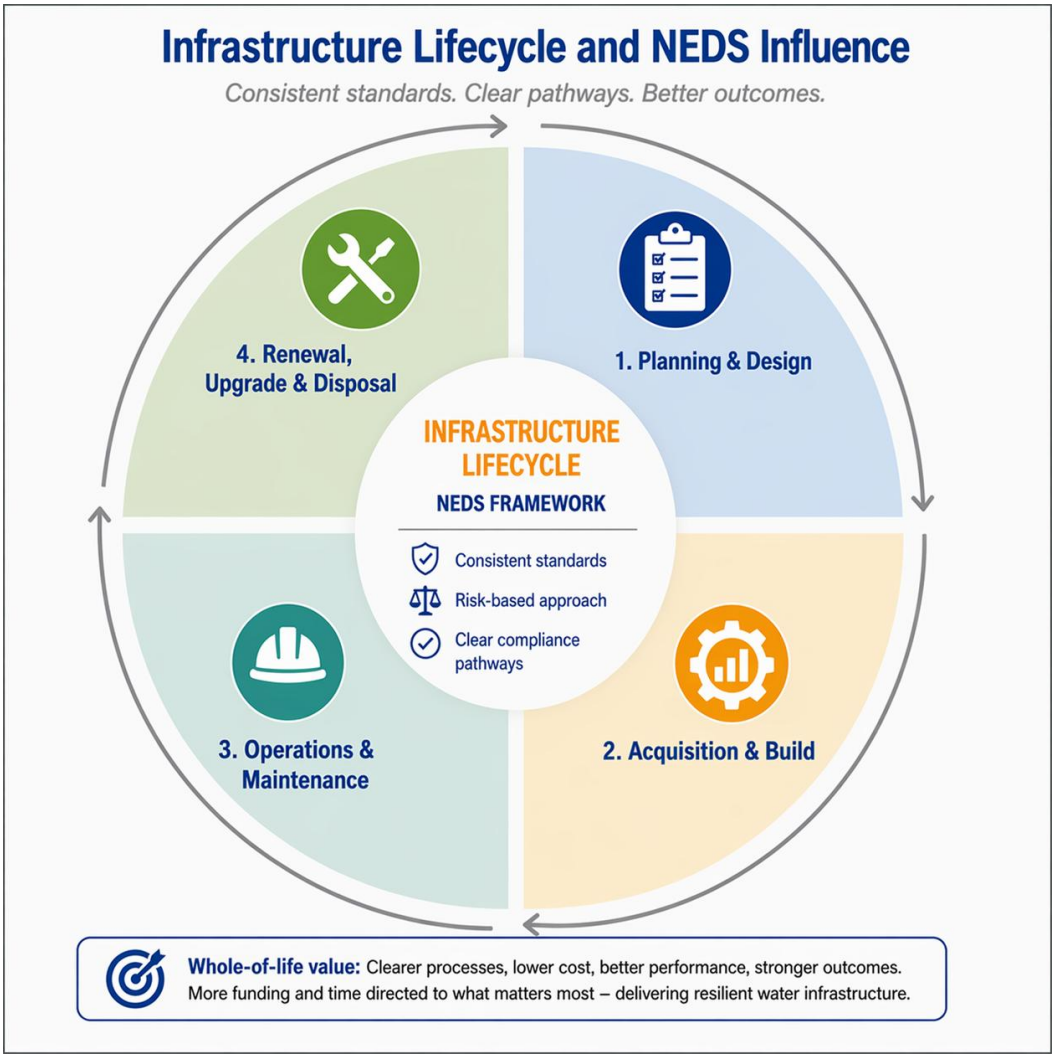

Figure 3.1 Infrastructure lifecycle and NEDS influence

Capital expenditure (CapEx) is typically associated with constructing, renewing, or upgrading infrastructure assets, including detailed design and pre-construction services where a project proceeds to implementation.

Operating expenditure (OpEx) relates to the ongoing operation, maintenance, and management of assets, including planning, feasibility, modelling, and minor works.

Concept and preliminary design activities often sit between these categories and are typically classified based on the likelihood of progressing to construction.

NEDS has the potential to influence both CapEx and OpEx across all lifecycle stages. However, the impacts are not driven solely by cost classification. They arise from how processes change and can be managed, particularly through clearer requirements, consistent standards, and better-defined compliance pathways. At the same time, there is potential for increased costs where more stringent performance expectations are introduced, which should be understood in the context of improved performance outcomes.

The potential influence of NEDS and the National Code of Practice across the infrastructure lifecycle is summarised in

Table 2 Potential influence of NEDS and the National Code of Practice across the infrastructure lifecycle

Stage	Focus and Activities	Primary Expenditure Classification	Specific Theme Types	Potential NEDS Influence
1. Planning and Design	Feasibility, demand forecasting, site surveys, environmental approvals, and engineering blueprints.	CapEx (Upfront/Capitalised) where the project is likely to be constructed. OpEx if the work is abandoned after feasibility testing, early site investigations or cannot gain relevant regulatory approvals.	– Strategic planning costs – Engineering and design fees – Regulatory approval fees – Community consultation	– Reduced cost of strategic planning and design from being able to draw from lessons learned and use of known design criteria (or aspects of designs) from elsewhere in the country rather than adjusting design approaches each time to meet the requirements of bespoke council National Code of Practice. – Faster (and therefore less costly) regulatory approvals as all parties, including the regulator, would understand the key requirements of each project based on nationally consistent standards and clear compliance pathways. – Reduced costs due to less friction in community consultation over time, as communities can be pointed to clear regulatory requirements and similar successful infrastructure projects constructed to identical performance-based standards elsewhere in the country.
2. Acquisition and Build	Procurement, physical construction, installation, safety testing, and official asset handover.	CapEx (Procurement and Construction)	– Earthworks and excavation – Piping, pumps, and valves – Plant construction – Commissioning and testing	– Potential cost reduction through standardised methods and potentially standardised products and materials in the future and more straightforward and consistent construction expectations across the country. – Cost impacts from NEDS and associated National Code of Practice will vary regionally, depending on the gap between existing practices and the requirements of the standards. – Where an increase in costs occurs it also reflects the delivery of additional benefits, including enhanced reliability, resilience and environmental outcomes, supporting improved whole-of-life value.
3. Operations and Maintenance	Running the network daily, control systems, monitoring water quality, and executing preventative or emergency repairs.	OpEx (Operational and Maintenance)	– Treatment chemicals – Energy and pumping power – Routine / scheduled maintenance – Unplanned reactive repairs and maintenance – Online monitoring systems – Compliance Reporting	– The impact on OpEx will depend on where the performance-based expectations codified in NEDS are set. Where they are higher than existing practice, this may entail greater OpEx. However, this will generate additional benefits in resilience, reliability, and protection of public health, safety, and the environment. It will also increase the “efficient use” of existing infrastructure – i.e. help “make the most” of what we already have. – A Water Service Provider (WSP) may focus less effort on capital projects if this were to occur due to fewer “early life failures” and existing assets performing well for longer.
4. Renewal, Upgrade and Disposal	Restoring original capacity, upgrading to meet population growth, improved environmental outcomes or safely decommissioning old lines.	CapEx (Renewals / Upgrades) and OpEx (Disposal)	– Pipeline relining or replacement – Treatment plant upgrades – Decommissioning old mains – Safe environmental salvage	– NEDS can support more consistent renewal and upgrade processes, reduce rework and improve efficiency. – End-of-life considerations (e.g. removal, reuse or recycling) may increase upfront cost; however, where materials are reused or recycled, this reduces embodied carbon and diverts waste from landfill. These outcomes enhance environmental sustainability and support more resilient, circular infrastructure systems, representing a deliberate trade-off of higher initial cost for improved long-term value.

Cost efficiencies under NEDS are most likely to be realised in the planning, design, approvals, and standard renewal stages, where current processes are fragmented and duplicative. These efficiencies arise from clearer requirements, reduced rework, and more consistent compliance pathways.

While costs, particularly OpEx may increase where higher performance standards are introduced, these increases are expected to deliver benefits such as improved resilience, reliability, and environmental outcomes.

Overall, the key value lies in considering whole-of-life expenditure, with reductions achieved through more proactive maintenance, extended existing asset life, reduced failures and emergency repairs and decreased reliance on reactive interventions.

3.3 Large Asset Upgrade Project

3.3.1 Case study overview – wastewater

A large metropolitan wastewater authority delivered a critical Central Business District (CBD) wastewater pump station, rising main renewal and sewer network upgrade as part of a wider central city infrastructure upgrade programme. The project was in response to repeated failures and bursts in ageing assets that conveyed wastewater to a main interceptor, resulting in service reliability risks, undesirable environmental impacts, and limited capacity for future growth. The programme objective was to move beyond reactive renewals and instead improve network resilience, provide for future capacity and enable operational flexibility.

Early master planning identified that the existing CBD wastewater system lacked redundancy and future capacity. The recommended response was to develop a connected rising main network, enabling up to three alternative conveyance routes to the main interceptor. This approach would allow flows to be diverted during failures or maintenance, significantly reducing the consequences of asset outages and relieving capacity pressure on the existing pump station by providing a second pump station and thus also additional room for growth. The project described here was the first project enabled under the master plan involving the delivery of a new pump station and rising main rather than a like-for-like replacement of existing infrastructure.

The pump station was designed and constructed on a highly constrained, congested CBD site, requiring extensive specialist inputs and complex structural and seismic design to meet the performance expectations of a critical asset and the Building Code.

The rising main was routed through a dense urban environment, including a major state highway crossing, and incorporated complex valving arrangements to support flexible operation and flow diversion across the wider network.

While initially designed for open-trench construction, the project adopted an alternative construction methodology during the tender phase. The contractor proposed a trenchless guided auger boring method, which was accepted by the client for the same price and substantially reduced surface disruption in the CBD.

Delivery involved close collaboration between designers, the wastewater authority’s internal teams, local consenting authorities, structural and seismic technical specialists, regulators (including archaeology and environmental approvals), and early-contractor-involvement partners who provided input into the constructability and alternative installation methods.

Indicative costs were in the order of NZD$10 million (capital and design) for the pump station and NZD$21 million (capital and design) for the rising main. Both assets have now been successfully constructed and are operational, delivering immediate reliability improvements and forming a key building block in a more resilient, interconnected CBD wastewater network.

The project was delivered under an “upgrade” model, as it involved the design and construction of entirely new wastewater assets rather than like-for-like replacement. The approach was driven by asset failures and the need to future-proof capacity against population growth, with planning ultimately based on a 50-year horizon.

Overall, the project illustrates how strategic master planning, resilience-led investment, and innovative construction methods can successfully and effectively upgrade ageing urban wastewater systems.

However, it provides a useful case study for NEDS as it demonstrates network-level thinking, flexibility in delivery, and the pursuit of long-term resilience outcomes in critical water infrastructure. It also demonstrates the likelihood

that for complex projects both the National Codes of Practice and an alternative solutions pathway will be needed to address the context specific considerations for projects of this nature.

Less complex upgrade projects would be expected to rely primarily on the deemed to comply pathway through the National Codes of Practice.

3.3.2 The differences NEDS would make to how the project ran

Table 3 How the large asset project ran

Phase	How the project ran	How the project would have run if NEDS and the National Codes of Practice were in place
Planning and Design (including approvals)	Design and approvals followed established requirements of the regional wastewater standards and the client's gateway project approval processes, supported by a robust safety-in-design process, operational and planning input from the metropolitan wastewater authority, and independent third-party design review prior to tender.	The NEDS will set performance-based standards (mandating what outcomes must be achieved rather than prescribing exactly how to design), complemented by the National Codes of Practice that offer accepted design methods as one way to comply (aka deemed to comply pathway). This structure means a designer can choose to follow the National Code of Practice as a compliant solution or, where necessary, propose that a design or components of a design progress an alternative solution which also satisfies the National Performance Criteria. On a complex project such as this one, the clarity provided by the NEDS and the National Code of Practice would likely have reduced time and cost by providing clear design and approval pathway options. Design would have been more efficient, with the designer able to replicate previous successful designs where appropriate and be confident in meeting regulatory requirements. It is possible that a design such as this may have deemed to comply components ***and*** some elements requiring the use of the alternative solutions pathway (outside of those prescribed by the National Code of Practice). However, we would expect standardisation to be useful for some key elements, for example, pipeline design or setting parameters around handling seismicity that were particularly important (and locally bespoke) for this location. It is important to note that the NEDS framework provides for alternative solutions for this reason – one benefit of performance-based specifications is that they provide for innovation in this way. Further, over time, some solutions that start as "alternative" may be incorporated in revisions of the National Code of Practice. **Key takeaway: National standardisation is likely to decrease the costs of design and approvals for many asset upgrade projects, especially those where there is less need for bespoke designs. Complex design contexts may require use of the alternative solutions pathway.**
	This project presented as a complex design located in a congested central business district, built on reclaimed land with significant seismic risk.	This project presented as a complex design located in a congested central business district, built on reclaimed land with significant seismic risk
	The water service provider holds a global dewatering consent, so while the regional council was not directly involved, the consent conditions applied.	NEDS would not change the need to hold resource consents (or the natural resource permits that will replace resource consents once the Natural Environment Bill has entered into force). However, NEDS would provide clear performance expectations that may be referenced in other regulatory approvals or give other regulators assurance.

Phase	How the project ran	How the project would have run if NEDS and the National Codes of Practice were in place
		Key takeaway: NEDS may offer some efficiency improvements in obtaining other regulatory approvals.
	As an identified critical asset, the pump station was subject to a full building consent process, including a structural assessment and site-specific seismic hazard assessment requiring design for a 1-in-100-year earthquake event, which added significant time and cost through an onerous approvals process (including $80,000 for a seismic assessment). Ultimately, after all the assessments and documentation had been submitted, the Council decided that the requirements did not apply to the pump station after all.	Currently, different regions often follow their own local code of practice and have differing interpretations of how to apply the Building Code to water infrastructure; for example, in some parts of New Zealand, major utility providers progress pump station construction without formal building consents, while others require full compliance with Building Code processes. Individual engineers and councils may have person-specific or department-specific design preferences (for instance, always using certain structural supports or conservative design margins regardless of site conditions). The existence of NEDS will not alleviate building consent authority decisions (or indecision) over whether a building consent is required. However, if we assume a building consent is required for infrastructure that is subject to NEDS, the consent authority can be more confident about how the Building Code consent requirements should be incorporated into the design process. **Key takeaway: NEDS can provide greater confidence and consistency in the design of infrastructure subject to Building Consent requirements, potentially improving the efficiency of regulatory reviews and approvals.**
	Archaeological Authority required.	**Key takeaway: No change is expected to this process.**
	Major approvals were largely completed between 2019 and 2022	NEDS will not remove approval requirements. It may reduce regulatory approval timeframes by providing nationally consistent design standards and recognised compliance pathways, reducing uncertainty and review effort. Based on professional judgement, NEDS could have reduced the planning, design and approval programme by approximately 3-6 months on a project of this scale. Site-specific engineering design challenges may still require project-specific solutions to respond to environmental or Building Code requirements. NEDS would improve certainty and reduce overall delivery programme risk. **Key takeaway: NEDS should provide greater certainty about the performance outcomes and design requirements for infrastructure projects thus, through more confidence, be able to reduce the timeframe for major regulatory approvals.**
Upgrade	Construction commenced, under strong external pressure, with the pump station and rising main delivered over approximately 1.5 and 2 years, respectively.	NEDS is unlikely to significantly reduce construction durations driven by complex physical construction constraints or stakeholder requirements. However, standardisation of key components, specifications and construction practices could reasonably reduce procurement effort and design-related rework during construction, thus potentially delivering time savings of several weeks to a few months and reducing overall project costs.

Phase	How the project ran	How the project would have run if NEDS and the National Codes of Practice were in place
		Key takeaway: NEDS should reduce the cost of constructing and upgrading the infrastructure through increased standardisation of design and construction methods.

3.3.3 The differences NEDS would make to future phases

Table 4 Large asset upgrade and the differences NEDS would make to future phases

Phase	Under the status quo	If NEDS and the National Codes of Practice were established
Operations and Maintenance	Not addressed under the current local design codes	Economies of scale can be achieved as standard components and best practices are adopted widely. NEDS can improve operational efficiency by prompting the use of standardised components, equipment and maintenance practices across the sector. This can reduce spare parts inventories, simplify staff training, improve maintenance consistency, and enable economies of scale in procurement and asset management. The New Zealand Infrastructure Commission (2026)[1] Noted that once constructed, infrastructure in New Zealand rarely meets its full lifecycle potential because there is insufficient funding and focus put on infrastructure asset management and maintenance programmes. As a result, NEDS has the potential to reduce whole-of-life operating and maintenance costs while also setting a consistent expectation for maintenance and renewal activities during the operational lifetime of the asset to support sustained asset performance and reduce premature failure. Based on professional judgement, these attributes could collectively reduce maintenance costs and fault response effort by approximately 10% while also lowering whole-of-life operating costs through lifecycle efficiencies achieved via improved operational performance. The greatest savings are likely to be achieved through consistent requirements for shorter-life and frequently maintained assets such as service connections, valves, hydrants, fittings, meters and control equipment where standardisation can simplify maintenance, reduce spare parts inventories, and improve replacement efficiency. **Key takeaway: NEDS should reduce the cost of operations and maintenance following the upgrade of a network. This would be achieved through economies of scale which can be achieved as standardised components and operational practices are adopted widely.**

[1] **https://tewaihanga.govt.nz/national-infrastructure-plan-online/foreword**

3.3.4 How NEDS would affect the experiences of stakeholders

Table 5 How NEDS would affect the experiences of stakeholders on the large asset upgrade project

Stakeholder	Current Project Experience	Potential Stakeholder Benefits under NEDS and The National Codes of Practice
Heritage New Zealand	Issued an archaeological authority.	No direct impacts.
Contractor	Early Contractor Involvement, i.e. contractors provided advice on the construction method for piling the pump station foundations and a new approach to pipeline installation.	Contractors would experience relatively low impacts as they adapt to standardised methods and specifications. They stand to benefit strongly from improved delivery certainty, reduced rework, and more predictable construction requirements across regions. Over time, standardisation also supports economies of scale in materials and methods, improving construction efficiency.
City Council	Issued a building consent and resource consents for contamination, noise, vibration and archaeology.	We expect councils to experience low to moderate impacts through the transition costs associated with aligning consent processes and internal practices with NEDS. These are balanced by the benefits, including more streamlined, consistent and predictable approval pathways for new infrastructure.
Water service provider	Multiple teams within the WSP were involved. The WSP holds a global dewatering consent – so while the Regional Council was not directly involved, the project works were required to comply with the existing consent conditions	WSPs may experience a moderate degree of cost increase, where NEDS introduce higher performance expectations than are currently used (e.g. for resilience, reliability and environmental protection). However, these costs are balanced by significant long-term benefits, including improved asset performance and reduced risk of failure, thus supporting better service outcomes and more consistent network performance over time.
Independent consultant	Provided an independent review	We expect consultants to experience transition costs as they adapt to new standards and performance frameworks. However, in return, they would benefit from clearer, nationally consistent benchmarks for assessing design compliance, reducing ambiguity and improving the efficiency and reliability of review processes.
Designers	Involved from concept through to construction	We would expect low to moderate impacts through the transitional costs associated with aligning designs to new national requirements and adjusting to more standardised approaches. However, transitional costs are offset by strong benefits, including a reduced need to tailor designs to different regional standards, the ability to reuse proven solutions, and improved certainty in approvals. This leads to more efficient design processes over time and a clearer, more consistent design framework.

Stakeholder	Current Project Experience	Potential Stakeholder Benefits under NEDS and The National Codes of Practice
Summary: This case study involves the upgrade of a critical CBD wastewater pump station and rising main to improve network resilience, increase capacity and support future growth. Delivered in a constrained urban environment, the project required complex structural, seismic, consenting and constructability solutions. It provides a useful test of NEDS because it demonstrates a project where significant professional judgement and site-specific design would still be required. Under NEDS, the greatest benefits would likely come from clearer compliance pathways, nationally consistent design requirements, reduced design duplication and more predictable approvals. While NEDS would not fundamentally change the engineering challenges, it could reduce design and approval timeframes, improve consistency and lower delivery risks for similar large asset upgrade projects.		

3.4 Routine Renewals

3.4.1 Case study overview – water and wastewater

A significant brownfield water and wastewater infrastructure renewal was delivered within an established residential suburb of a large metropolitan area in the lower North Island between September 2019 and September 2023. The project responded to frequent water main bursts and the deteriorating condition of ageing wastewater infrastructure in a residential area built in the 1960s, where assets were approaching the end of their service life.

Delivered under an integrated design–procure–construct model, the project renewed approximately 1.7 km of 150 mm wastewater mains and upgraded around 850 m of 180 mm outside diameter polyethylene (OD PE) water main, along with 600 m of 63 mm rider main. The project was delivered as a renewals project in a brownfield context, rather than an upgrade, as it did not involve upsizing assets. The project included renewal of water and wastewater infrastructure, but not stormwater, on the basis of increasing risk of asset failure.

A key challenge was that sections of the existing wastewater network were located within private properties and constrained by retaining walls, limiting access and increasing maintenance risk. To address this, wastewater assets were relocated into road corridors, future-proofing access and reducing long-term operational impacts on residents.

Construction was tailored to site conditions and constraints, using a combination of open trench installation and trenchless technologies. Directional drilling enabled new pipelines to be installed with minimal surface disruption. Pipe bursting was applied on steep streets to safely replace failing pipes, and spiral-wound lining was used near housing and ancillary buildings where excavation was impractical. Water main works were largely undertaken within the road corridor using open trench methods.

Key participants in the process were:

– Client Council Controlled Organisations (CCO) – responsible for the design approvals process.
– Consultant Designer – Design of the renewed infrastructure to the required Wellington Water specifications.
– District Council – for building consent (required for this project but not often for renewals)
– Contractor – Early Contractor Involvement (ECI) – advised on constructability.

The project was CapEx-funded, reflecting the installation of some new assets. Physical works were valued at approximately NZ$4.7 million, with a total project cost of about NZ$5.5 million.

The result is a more reliable, resilient water and wastewater service for the area, with improved access for maintenance and reduced risk of system failures.

3.4.2 The differences NEDS would make to how the project ran

Table 6 How the routine renewals project ran

Phase	How the project ran	How the project would have run if NEDS and the National Codes of Practice were in place
Planning and Design (including Local Council approvals)	The project followed the Wellington Water Regional Standard and Regional Specification, which is based on a primary framework derived from NZS 4404, replacing local council engineering National Code of Practice. Where works interfaced with private property, NZS 4404 and the G13 Wastewater Building Code were also applied to support building consents for altered laterals (pipes connecting private drainage to the public system).	By rationalising the current fragmented standards, the full NEDS framework would avoid the discrepancies and confusion that designers currently face when working with a range of specifications such as NZS 4404:2010 the subdivision engineering standard, various regional standards, and local council engineering codes of practice. Redundancies and conflicting requirements could be eliminated, reducing confusion and associated inefficiencies. For projects of this nature, professional judgement suggests approval and design programs could be reduced by several weeks**.** **Key takeaway: NEDS could significantly reduce planning and approval timeframes for routine renewals by providing nationally consistent design requirements, standard details and approval pathways.**
	Governance was led through a linear gateway approval process, including design approvals and a granted dispensation for hybrid lining and pipe bursting of concrete-encased pipes; this opportunity was identified through ECI. The process was generally clear but slow due to risk-averse and bureaucratic controls in relation to approvals. The responsiveness of the process was slowed due to interactions between the local council and the CCO/Design team, seven design gateways were moved through to obtain required preconstruction approvals, changes in design scope and a slow process to assess an alternative solution. Challenges arose from the need to comply with regional-specific rules, such as aquifer drilling depth limits, and noted that such rules were inconsistent across a range of councils, which can lead to the same outcome being delivered in different, more complex ways across the region and the country.	In the future, the introduction of NEDS is expected to streamline brownfield infrastructure renewals by providing a consistent framework for design and approvals across New Zealand. The NEDS and National Codes of Practice framework may impose requirements on projects based on risk, with higher risk infrastructure having more rigorous design, verification and approval processes. In the case of this relatively simple project and others like it, we would expect a national framework proportionate to risk to reduce the cost of obtaining approvals. With a consistent standard, project planning and approval phases would likely be faster and more predictable. The elimination of overly cautious or duplicative local processes means less time and money spent on negotiations and bespoke compliance. Having clear national guidelines can clarify roles and approval requirements up front, reducing ambiguity and last-minute changes. Insights suggest that non-construction costs, design, approvals, management, on projects like this one could potentially be cut by a significant margin, for instance, reduced from roughly 10 to 15% of total project cost to perhaps 7 or 8% if unnecessary procedures are stripped away and only critical compliance steps are mandated. In other words, non-construction costs (currently ~NZD$0.55–$0.83 million on a NZD$5.5 million project) could be reduced to about NZD$0.4 million, implying savings on the order of NZD$0.1–$0.4 million. Over many projects, such savings would translate into more funding and time directed to actual physical works, improving overall value for money. NEDS and associated National Codes of Practice could reduce approvals and transaction costs by providing clearer and more predictable pathways. This could

Phase	How the project ran	How the project would have run if NEDS and the National Codes of Practice were in place
		deliver moderate to high benefits by enabling earlier contractor input and more clarity about the processes required for the adoption of context-specific solutions for example trenchless methods suited to ground conditions, especially for routine renewals. **Key takeaway: NEDS could provide clearer and more predictable pathways for approving construction methods, reducing time spent obtaining dispensations and project-specific approvals.**
	No Regional Council approvals were required for this project.	**Key takeaway: There would be no change in this area.**
District Council approvals	Connections of private systems to the public network followed standard reconnection practices; no vesting of assets with the Council was required for this project.	**Key takeaway: NEDS could provide greater consistency in requirements for network connections and asset ownership interfaces, reducing administrative effort and project-specific interpretation.**
Renewal	Physical works were valued at approximately NZ$4.7 million, with a total project cost of about NZ$5.5 million.	Another potential future benefit of NEDS is greater standardisation of asset components and materials. By establishing a nationally recognized approved supplier, product lists or standard component sizes, the industry could improve supply chain efficiencies and quality assurance. Contractors across the country would have clarity on what materials are pre-approved for widespread use for instance, standard pipe materials and diameters as already defined in some regional standards, reducing the risk of failures from untested products. However, over-consolidation in this area could restrict options and hinder competition and innovation in manufacturing. **Key takeaway: NEDS could reduce construction costs through greater standardised materials, specifications and approved products, enabling economies of scale, more efficient procurement and reduced contractor uncertainty.**

3.4.3 The differences NEDS would make to future phases

Table 7 Routine renewals and the differences NEDS would make to future phases

Phase	Under the status quo	If NEDS and the National Codes of Practice were established
Operations and Maintenance	Not addressed under the current local design codes	Economies of scale can be achieved as standard components and best practices are adopted widely. In addition, a stronger focus on timely maintenance and renewals under a consistent NEDS framework can improve asset resilience, reduce premature failure and reactive response and extend asset lifespan. While taking a more proactive approach may involve some increased operational effort in the short term, it is expected to result in

Phase	Under the status quo	If NEDS and the National Codes of Practice were established
		lower total whole-of-life expenditure (CapEx and OpEx) over time through more efficient, longer-performing assets. **Key takeaway: NEDS should reduce the cost of operations and maintenance for a network. NEDS could reduce whole-of-life operational costs by prompting use standardised asset component replacement, maintenance practices, and asset information requirements, improving maintenance efficiency and reducing spare parts inventories.** **NEDS would enable proven renewal solutions and best practices to be more easily replicated across New Zealand, improving delivery efficiency, consistency and value for money across infrastructure renewal programmes.**

3.4.4 How NEDS would affect the experiences of stakeholders

Table 8 How NEDS would affect the experiences of stakeholders on a routine renewal project

Stakeholder	Current Project Experience	Potential Stakeholder Benefits under NEDS and The National Codes of Practice
District Council	Awarded building consent	The impact is likely to be low overall, particularly where the council's role is primarily aligned with statutory functions, such as Building Act administration, which would remain unchanged. Benefits may be limited and indirect, such as improved clarity in upstream design standards, while costs are expected to be minimal, unless there is a need to align or integrate with revised processes or expectations under NEDS.
Contractor	Early Contractor Involvement (ECI) – advised on constructability	NEDS/National Codes of Practice could provide moderate benefits through clearer articulation of construction expectations and standardised approaches, potentially improving delivery efficiency and reducing ambiguity. Where the National Code of Practice promote practices such as early contractor involvement, there could be additional cost efficiencies identified during design and construction.
Client Council-Controlled Organisation	Responsible for the design approvals process.	NEDS/National Codes of Practice could provide moderate to high benefits through clearer approvals, compliance requirements and lifecycle expectations, supporting more informed planning and investment decisions. These benefits are likely to be realised at a strategic and portfolio level, for example, consistency in decision-making and reduced uncertainty in business cases.
Consultant Designer	Design of the renewal project and obtaining approvals	NEDS/National Codes of Practice deliver high efficiency benefits, particularly by reducing time spent interpreting and reconciling multiple local standards and by providing a clearer approval pathway. This could lower design costs and reduce rework, especially for organisations working across multiple regions. Transition costs are likely

Stakeholder	Current Project Experience	Potential Stakeholder Benefits under NEDS and The National Codes of Practice
		to be low to moderate, primarily associated with familiarisation and updating internal design practices, but these would likely reduce over time as consistency improves.
Summary: This project involved relatively straightforward, repeatable renewal works using established technologies and construction methods. As a result, it is particularly well-suited to standardisation under NEDS. Nationally consistent design requirements, standard details, and risk-based approval pathways could significantly reduce planning and approval effort, lower transaction costs, improve delivery efficiency and allow a greater proportion of project funding to be directed towards physical works.		

3.5 Greenfields Development

3.5.1 Case study overview – water and wastewater

The Drury South Water and Wastewater Servicing project delivered essential drinking water and wastewater infrastructure to enable the Drury South Crossing greenfield development in South Auckland. Delivered between 2018 and 2020, the project connected a ~361-hectare mixed-use precinct to Auckland's existing trunk networks, supporting early occupation and long-term growth in line with the Auckland Unitary Plan.

Drury South was identified as a priority growth area to accommodate significant residential and industrial development. The site lacked existing three-waters services, and development milestones were contingent on timely delivery of compliant water and wastewater infrastructure. Key drivers included enabling development on a compressed programme, meeting Auckland Council consenting requirements, and achieving Watercare engineering approvals to allow subdivision completion and occupation.

The project provided an integrated servicing solution comprising:

– Drinking water supply: New water mains connecting the precinct to the existing Watercare network, sized to meet staged development demand and fire-fighting requirements, with allowance for future growth.
– Wastewater collection and conveyance: A new wastewater pump station, internal gravity sewers, and a ~3.3 km rising main connecting to Watercare's trunk system, conveying flows onward for treatment at Māngere.
– Stormwater works for the precinct were delivered separately, with close coordination to manage shared corridors and interfaces.

The project was delivered under a fast-tracked, phased programme aligned to the developer's staging. Design commenced in early 2018, with approvals and construction progressing in parallel. Works were packaged into multiple construction phases to service development areas as they came online.

Key interfaces included Watercare Services Ltd (approvals and asset owner), Auckland Council (resource consenting), and coordination with Auckland Transport and KiwiRail for crossings beneath State Highway 1 and the North Island Main Trunk rail corridor. Early engagement and trenchless construction methods minimised disruption and managed risk.

The project was completed on schedule, enabling timely occupation and unlocking development across the precinct. The new infrastructure provides reliable, compliant water and wastewater services, protects public health and the environment, and is future-proofed to support ongoing growth in South Auckland. The physical works contract was originally awarded at NZD$13.5 million and was completed at a final outturn cost in the order of NZD$14–$15 million, reflecting the scale and complexity of the delivered infrastructure. Assets were vested in Watercare for long-term operation, delivering enduring value by enabling economic development, housing supply, and a sustainable new community at Drury South.

3.5.2 The differences NEDS would make to how the project ran

Table 9 How the greenfield development project ran

Phase	How the project ran	How the project would have run if NEDS and the National Codes of Practice were in place
Planning and Design (including approvals)	The project was designed and approved in accordance with Watercare engineering standards, Auckland Council requirements, and approvals associated with crossings beneath State Highway 1 and the North Island Main Trunk rail corridor. The approval process involved multiple agencies and iterative reviews, with detailed compliance, quality assurance and engineering acceptance requirements.	NEDS and National Codes of Practice could provide nationally consistent design requirements, standardised technical expectations and recognised compliance pathways. Designers would have greater certainty regarding requirements for pump stations, rising mains, asset performance and network integration, reducing the need for project-specific interpretation and repeated review cycles. Based on professional judgement, design and approval costs could be reduced by approximately 20–25%, with programme savings of several weeks to a few months for projects of this scale. Nationally consistent design requirements, deemed-to-comply solutions, standard templates and reduced council-specific design variations reduce engineering effort and redesign. **Key takeaway: NEDS could significantly reduce design and approval costs for greenfield developments through improved consistency and clearer approval pathways.**
	Multiple agencies reviewed aspects of the project independently, including Watercare, Auckland Council, Auckland Transport and KiwiRail. Reviews could take several weeks, with requests for further information creating programme uncertainty.	NEDS would not remove statutory approval requirements. However, nationally recognised standards would increase confidence in design outcomes, and reduce ambiguity during reviews by limiting the risk of differing interpretations by reviewers. More consistent performance requirements could reduce the number of design iterations and RFIs required before approval. Clear compliance pathways and nationally recognised performance requirements reduce Requests for Further Information (RFIs), streamline assessments and improve reviewer confidence. It is estimated that savings of 15-30% reduction in approval effort and 20-40% reduction in review time, depending on the number of agencies involved. **Key takeaway: NEDS could improve approval efficiency and reduce approval-related programme risk and achieve significant time and cost savings.**
	Asset vesting and engineering acceptance required extensive quality assurance documentation, commissioning records and formal compliance sign-off by Watercare directly. During commissioning, Watercare's online guidance was also out-of-date, and the updated version required rework.	NEDS could establish nationally recognised requirements for asset handover, commissioning and quality assurance. Consistent documentation requirements would reduce rework, improve clarity of expectations and simplify the asset acceptance process. Standardised commissioning, QA records, and asset data requirements reduce rework and clarification during engineering acceptance. 10-20% reduction in handover and acceptance effort through improved documentation consistency.

Phase	How the project ran	How the project would have run if NEDS and the National Codes of Practice were in place
		Key takeaway: NEDS could improve consistency and efficiency and reduce cost associated with asset acceptance and vesting processes.
Build	Physical works were delivered under a staged design-and-construct programme with multiple construction contracts and interfaces. Trenchless crossings and staging were used to meet programme objectives and stakeholder requirements.	NEDS is unlikely to significantly reduce construction durations associated with physical works, land access or utility crossings. However, greater standardisation of materials, specifications and accepted construction practices could reduce procurement effort, contractor uncertainty and design-related rework. Standard materials, specifications and accepted construction methodologies reduce procurement effort, contractor uncertainty, and design-related variations. Such standardisation is expected to improve delivery certainty. It is estimated that a 5-10% reduction in project delivery cost could be achieved through lower transaction costs, lower risk of design related variations, and improved procurement efficiency. Construction duration savings are likely modest. **Key takeaway: NEDS could reduce construction-related transaction costs through standardised products and specifications. Professional judgement suggests moderate cost savings may be achieved through improved procurement efficiency and reduced project delivery risk.**

3.5.3 The differences NEDS would make to future phases

Table 10 Greenfield development and the differences NEDS would make to future phases

Phase	Under the status quo	If NEDS and National Codes of Practice were established
Operations and Maintenance	Not addressed under the current local design codes	NEDS could improve long-term operability by promoting nationally consistent asset standards, equipment specifications and maintenance requirements. Standardised pump station components, SCADA requirements and maintenance practices would reduce training requirements, simplify spare parts inventories and improve asset management consistency. Based on professional judgement, operational and maintenance costs may be reduced by approximately 10–20% through lifecycle efficiencies, procurement benefits and more consistent maintenance practices. **Key takeaway: NEDS should reduce whole-of-life operational costs while improving asset consistency and reliability across water service providers. Consistent equipment specifications, SCADA requirements, spare parts and maintenance practices improve efficiency and reduce whole-of-life costs.**

3.5.4 How NEDS would affect the experiences of stakeholders

Table 11 How NEDS would affect the experiences of stakeholders on the greenfield development project

Stakeholder	Current Project Experience	Potential Stakeholder Benefits under NEDS and The National Codes of Practice
Water Service Provider (Watercare)	Responsible for design approvals, asset acceptance, network connections and operational requirements.	For larger well-resourced WSPs, the National Code of Practice may be considered to provide low potential for additional benefit because their own local Code of Practice are often well developed and represent sector best practice. For smaller providers, NEDS/National Code of Practice could provide moderate to high benefits by improving asset consistency, operability, and long-term maintainability. A shift from bespoke design approvals to standards-based acceptance and assurance would support more reliable integration of vested assets and reduce variability in asset quality, with benefits realised at a network and portfolio level.
Council / Regulators	Responsible for planning approvals, transport interfaces and statutory functions.	The impact is likely to be low to moderate. NEDS would provide greater clarity on approval requirements and interaction with bylaws, Building Code and District Plan requirements. Benefits are largely indirect, through clearer upstream standards and reduced ambiguity in technical expectations, with limited additional cost beyond process alignment.
Contractor and Suppliers	Delivered physical works and procured materials in accordance with project-specific requirements.	NEDS/National Codes of Practice could provide moderate benefits through clearer construction expectations, more standardised designs, and improved procurement predictability. It could also potentially reduce lead times for products by increasing stocks, given the more certainty of product/component selections. Should NEDs address approved products and materials, then nationally consistent product and material approval pathways may enable economies of scale, reduce market fragmentation, and create clearer opportunities for suppliers, while still requiring adjustment to more uniform specifications.
Developer	Responsible for delivering the infrastructure required to enable development and satisfy utility and regulatory approval requirements.	NEDS/National Codes of Practice are expected to deliver moderate to high benefits through greater up-front certainty, reduced jurisdictional differences, and clearer performance requirements. This supports more predictable consenting, design approvals, vesting, and delivery outcomes across regions. These benefits are offset by a need for earlier consideration of the full asset lifecycle at the design stage, shifting effort forward in the project lifecycle but reducing overall risk and rework.
Consultant Designer	Responsible for design development, approvals support and compliance demonstration.	NEDS/National Codes of Practice are likely to deliver high efficiency benefits, particularly by reducing time spent interpreting multiple local standards and navigating

Stakeholder	Current Project Experience	Potential Stakeholder Benefits under NEDS and The National Codes of Practice
		inconsistent approval pathways. Clear national benchmarks support reuse of standard solutions while retaining scope for professional judgement through performance-based alternatives. Transition costs are expected to be low to moderate, mainly related to familiarisation and updating internal practices.

Summary: The Drury South Water and Wastewater Servicing project delivered essential water and wastewater infrastructure to support a 361-hectare greenfield development in South Auckland, including new water mains, a pump station, gravity sewers, and a rising main connected to Watercare's trunk network. The case study shows that NEDS and a National Code of Practice could have reduced design, approval, handover, and procurement effort by providing clearer national standards, consistent compliance pathways, and standardised documentation. Overall, NEDS would improve certainty, reduce rework and approval risk, and support better whole-of-life asset outcomes, while having a modest impact on physical construction duration.

3.6 Small Service Providers

3.6.1 Case study overview – stormwater

Rangitīkei District Council (Rangitīkei DC), the local authority managing water, wastewater, and stormwater networks across several small communities; including Taihape, Mangaweka, Marton, Bulls, Ratana and supplies only water to a number of rural settlements. A total of 15,000 people live across the Rangitikei district.

Rangitikei DC engaged GHD to develop a detailed design for the Hunterville Stormwater Upgrade. Hunterville has a population of approximately 400 people, with only 2.9km of piped stormwater network. Open drains in Hunterville are typical identified as private assets, or waterways managed by Horizons Regional Council. This can make managing an interconnected network of varying ownership difficult when upgrades or improvements are required.

This project addresses repeated flooding at a residential property by replacing the old informal drainage, backyard channels and overland runoff, with a robust piped stormwater solution, incorporating a defined overland flow channel following the piped alignment. The overarching objective was to protect homes and the community from heavy rainfall flooding, as part of Rangitīkei DC's broader strategy to improve three-waters infrastructure in its towns.

The design introduced a new stormwater pipeline alignment through multiple residential properties along Feltham Street and Paraekaretu Street. This pipeline collects runoff from the steep hillside and neighbourhood above that previously flowed through informal channels and now conveys it underground, including piping sections through private land to intercept flows that used to flood backyards.

The new piped and overland flow network discharges into an existing open channel running between Paraekaretu St and Milne Street, so that diverted stormwater follows the newly established drainage path instead of spilling onto private property.

As part of improving the stormwater network through private property, the project also converted a problematic open drain in Paraekaretu Street into a piped section, connected into the new downstream piped system. This upgrade both increases capacity and allows for future development opportunities in that property, ensuring the network will function when the landowner develops their property (a scenario the Council has proactively planned for).

The stormwater pipeline is sized to handle primary flows from rain events, greatly reducing the chance of surface flooding in normal storms. For larger rain events beyond the pipe's capacity, the design deliberately provides a safe overland flow path: a shallow grassed swale above the pipeline route which will carry any excess runoff in a controlled way.

In addition, special grated inlets, low-profile "scruffy dome" covers on manholes, allow surface water to quickly enter the pipe system during intense rainfall, further protecting properties. These design elements ensure that even in extreme storms, runoff will be directed overland along planned paths rather than through private land potentially inundating dwellings.

The detailed design was based on available surveys and LIDAR data; it assumes stable ground conditions and accurate service information. No new geotechnical drilling was done, so the design allows for typical soil behaviour and that groundwater can be managed during construction. Land access agreements and approvals (e.g. for work on private property) were secured by Rangitīkei DC before construction began. These assumptions mean that any unforeseen ground issues or delays in permissions could require minor design adjustments.

A Safety in Design (SiD) review was completed to identify potential construction and maintenance hazards. Key considerations include safe excavation/trenching practices, working on private land near homes, and protecting public safety during installation. Mitigation measures, such as trench support, traffic management if needed, and clear communication with residents, are noted. Remaining or unusual risks are documented for the Council and contractors to manage during the construction phase, ensuring that safety responsibilities are clearly identified and passed on as the project moves from design to delivery.

Implementing the Hunterville Stormwater Upgrade will significantly reduce flooding risk for Milne Street and surrounding properties. By upgrading the open-channel network with a new piped system and providing a controlled overland flow route, the design offers a long-term, resilient drainage solution for this small community.

The project not only resolves the immediate flooding problem but also improves overall stormwater management in Hunterville, contributing to safer neighbourhoods and demonstrating Rangitīkei DC's commitment to strengthening its three-waters infrastructure in small towns. The end result will be a more reliable stormwater system that protects homes, minimizes minimises flood damage, and benefits the wider Hunterville community and its environment.

3.6.2 The differences NEDS would make to how the project ran

Table 12 How the small service providers project ran

Phase	How the project ran	How the project would have run if NEDS and the National Codes of Practice were in place
Planning and Design (including approvals)	The project was designed in accordance with NZS 4404 and Rangitīkei District Council's local engineering requirements, with consideration of Horizons Regional Council requirements and local conditions.	NEDS could reduce reliance on locally developed engineering standards by providing nationally consistent requirements for stormwater design, network performance and approvals. Designers would spend less time interpreting differences between councils and approval requirements could become more consistent nationwide. At the same time, nationally consistent standards should remain performance-based to allow adaptation to local ground conditions, environmental constraints and community needs. **Key takeaway: NEDS could reduce engineering effort and accelerate project delivery through greater consistency and reduced design rework. Time savings of several days to several weeks for routine projects and potentially several months for larger development.**
	Council approvals were managed internally, supported by direct communication between stakeholders and a relatively streamlined process.	NEDS and the National Code of Practice would provide a common approval framework and design requirements. The greatest benefits would arise from improved consistency, and reduced ambiguity for designers and council staff. The framework would need to retain sufficient flexibility to accommodate local conditions and practical engineering judgement, particularly for smaller councils and rural projects. Programme savings ranging from several weeks to a few months, where multiple agencies are involved. **Key takeaway: NEDS could reduce administrative effort and improve approval certainty while retaining local flexibility. NEDS could also improve approval efficiency and reduce programme risk by providing clearer and more consistent compliance pathways.**
	Materials selection and design decisions relied on local experience, accepted practice and available supplier information.	Nationally recognised design standards and approved materials could improve consistency in specification development, product availability and procurement decisions. Professional judgement suggests design and procurement efficiencies for projects of this scale are likely to be modest but positive, potentially reducing project costs by up to approximately NZD $10,000 across design and construction. **Key takeaway: NEDS could improve efficiency through standardised design approaches and nationally recognised products. NEDS can also create procurement efficiencies by reducing product variability and increasing consistency across the sector. Improved pricing certainty through economies of scale will be achieved.**
Upgrade	Construction relied heavily on local contractor experience and knowledge of local conditions to	NEDS is unlikely to materially change physical construction activities on projects of this scale. However, greater standardisation of materials and construction requirements

Phase	How the project ran	How the project would have run if NEDS and the National Codes of Practice were in place
	inform design constraints and select appropriate construction methods.	could reduce procurement effort, improve pricing certainty and increase confidence in long-term asset performance. **Key takeaway: NEDS could provide modest construction efficiencies through standardisation and procurement benefits. The greatest construction benefits arise from reduced procurement effort and fewer design changes rather than faster physical construction. Limited impact on physical construction duration. NEDS can reduce transaction costs and delivery risk.**

3.6.3 The differences NEDS would make to future phases

Table 13 Small service providers and the differences NEDS would make to future phases

Phase	Under the status quo	If NEDS and the National Codes of Practice were established
Operations and Maintenance		NEDS could improve long-term asset performance through the use of nationally accepted specified components, standardised maintenance requirements and clearer asset management expectations. Consistency in asset information, components and maintenance practices may provide clarity for smaller providers with limited resources. An estimated 5-15% reduction in whole-of-life operation and maintenance costs could be expected for smaller councils. **Key takeaway: NEDS should support more efficient asset management and maintenance while improving confidence in long-term asset performance. Standardised asset components, maintenance requirements and asset data improve operability and reduce lifecycle complexity and cost.**

3.6.4 How NEDS would affect the experiences of stakeholders

Table 14 How NEDS would affect the experiences of stakeholders on a small service provider project

Stakeholder	Current Project Experience	Potential Stakeholder Benefits under NEDS and The National Codes of Practice
Contractor	Relied heavily on local knowledge and practical experience to deliver the works.	Contractors could benefit to a moderate degree from clearer design requirements, more consistency in materials and specifications and improved product availability. Local flexibility may be somewhat impaired, but it remains important to ensure that practical, low-cost solutions can still be adopted. Increased opportunity for design-build projects of this scale.
Suppliers and Manufacturers	Product acceptance depended on local council requirements and preferences.	Suppliers and manufacturers could be significantly impacted by the NEDS framework. Nationally recognised specifications may improve market certainty, encourage wider

Stakeholder	Current Project Experience	Potential Stakeholder Benefits under NEDS and The National Codes of Practice
		product availability and support economies of scale. A transparent pathway for alternative products would remain important to promote innovation.
Community / Residents	Benefited from reduced flooding risk and improved stormwater management outcomes.	NEDS have the potential to have a significant direct impact on residents for example through reduced flood risk and could contribute to more consistent infrastructure performance, improved service levels and more efficient project delivery across communities. Increased efficiencies may also feed into residential rates and the degree to which they may be increased year on year.
Small Water Service Provider / Council	Responsible for project funding, approvals, stakeholder engagement and long-term asset ownership.	Smaller providers are expected to realise significant benefits through reduced need to develop and maintain local engineering standards. NEDS would provide access to nationally recognised best practice and reduce administrative burden. However, trade off would be less ability to rely on local knowledge to manage upfront local investigative costs and tailor design accordingly.
Consultant Designer	Worked closely with council staff to understand local requirements and expectations.	Designers would benefit from reduced variation between councils and clearer nationally recognised requirements. This would improve efficiency and reduce project-specific interpretation. Reduced opportunity for consultant designers to work with smaller budgets/projects. Design more likely to be done in house or via contractor.
Summary: The Hunterville Stormwater Upgrade case study shows how Rangitīkei District Council addressed repeated flooding in a small community by replacing informal drainage paths with a piped stormwater network and controlled overland flow route through private properties. NEDS and a National Code of Practice could have supported the project by providing clearer national stormwater design standards, more consistent approval pathways, standardised materials, and improved procurement certainty, reducing design effort, rework, and administrative burden for a small council. Overall, NEDS would provide the greatest value to small service providers by improving consistency, asset management, and long-term maintenance outcomes, while still needing enough flexibility to account for local conditions and practical low-cost solutions.		

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