

2. GENERAL DESIGN PROVISIONS

2.1 Design, Construction and Monitoring

All investigation, calculations, design, supervision and certification of the works referred to in these Engineering Standards shall be carried out by persons who:

- Have the appropriate experience in the relevant areas;
- Hold appropriate qualifications and membership of professional bodies;
- Have professional indemnity insurance to the value of at least \$1,000,000.

Provisions for the approval of design and construction are outlined in Section 3.

2.2 Supporting Information and Calculations for Design

Section 88 and the Fourth Schedule of the RMA sets out what information an application for resource consent must include. The information in the application should be at a level of detail sufficient for a person to make an informed judgment on the application.

Information Requirement Guidelines

The following table provides guidelines for the information required to enable engineering assessment as part of the assessment of resource consent applications:

Table 2.1: Supporting Documentation Requirements

Area	Supporting Documentation
<i>Earthworks</i>	<ul style="list-style-type: none"> ▪ <i>Sufficient information to demonstrate that the site is stable and suitable for the proposed use</i> ▪ <i>Demonstrate that a building platform is available for each site</i> ▪ <i>Demonstrate that there is access to each site that meets these Engineering Standards</i> ▪ <i>An assessment of earthworks volumes</i> ▪ <i>Measures to mitigate any detrimental effects shall be identified</i> ▪ <i>A Construction Management Plan as described in Section 2.3 of this document</i> ▪ <i>A geotechnical report may be required – this will be confirmed after discussion with Council</i>
<i>Roading</i>	<ul style="list-style-type: none"> ▪ <i>Drawings showing practical access to all building sites</i> ▪ <i>Assessment of traffic volumes and vehicle operating speeds</i> ▪ <i>Horizontal and Vertical Geometry</i> ▪ <i>Sight distances</i> ▪ <i>Typical Sections</i> ▪ <i>Pavement Design</i> ▪ <i>Surfacing Design</i> ▪ <i>Design of surface drainage and other road components</i> ▪ <i>Utility service locations</i> ▪ <i>Any other topographic features e.g.: Fences, Power Poles</i> ▪ <i>Identifying Road to vest</i> ▪ <i>Management of private ways</i>
<i>Stormwater</i>	<ul style="list-style-type: none"> ▪ <i>Plans of a stormwater system to serve the development in accordance with the requirements of these Engineering standards</i> ▪ <i>Identify existing and post-development drainage paths and soil conditions</i>

Area	Supporting Documentation
	<ul style="list-style-type: none"> ▪ <i>Where appropriate, provide for a piped stormwater system for the primary flow</i> ▪ <i>Identify the extent of secondary flowpaths and associated flooding areas for the 100 year ARI flood</i> ▪ <i>Identify the need for any vesting of land or easements to enable the discharge of stormwater flows via pipelines or overland flow paths across the lots of the subdivision</i> ▪ <i>Identify any requirements for stormwater detention and/or treatment systems</i> ▪ <i>The design shall identify all off site effects including changes to flow peaks and frequency patterns, flood water levels, contamination levels and erosion and concentration of stormwater on downstream properties</i> ▪ <i>Measures to mitigate any detrimental effects shall be identified</i> ▪ <i>Lifecycle maintenance costs and requirements</i>
Wastewater	<ul style="list-style-type: none"> ▪ <i>Plans of any communal wastewater system to serve the development in accordance with the requirements of these Engineering Standards including the current development proposal, potential future development and staging and topographical plans.</i> ▪ <i>Demonstrate that the reticulation at the point of connection to the existing Council system and any downstream asset, including pump stations, pipe work, and treatment system is capable of taking the flow of the proposed development as well as the existing flow</i> ▪ <i>Demonstrate that the proposed reticulation is adequate to serve the proposed development and, where required by Council, the potential upstream catchment</i> ▪ <i>The design shall include pipe sizes, materials and layout of the proposed reticulation</i> ▪ <i>Hydraulic design, including capacity and self cleaning ability</i> ▪ <i>Design of pump stations and rising mains</i> ▪ <i>Lifecycle maintenance costs and operational requirements</i>
Water Supply	<ul style="list-style-type: none"> ▪ <i>Plans of any communal water supply system to serve the development in accordance with the requirements of these Engineering standards</i> ▪ <i>Analysis of water demand including fire fighting capability allowances</i> ▪ <i>Establish that the existing water supply reticulation system is adequate to serve the proposed development</i> ▪ <i>The proposed reticulation is adequate to serve the proposed development</i> ▪ <i>The proposal has no more than minor effects on the environment and other water users</i> ▪ <i>Potential water hammer effects are considered and appropriate measures are included</i> ▪ <i>Required pressures and flows can be met from all hydrants and service connections</i> ▪ <i>Lifecycle maintenance costs and operational requirements</i>

Area	Supporting Documentation
<i>Landscaping</i>	<ul style="list-style-type: none"> ▪ <i>Plans showing existing mature trees and bush areas within the site, and proposed modifications or enhancements to these areas including any screening of new buildings when required by the District Plan</i> ▪ <i>A landscape assessment of all areas to be designated as reserve</i> ▪ <i>A development plan for reserves</i> ▪ <i>Plans illustrating street planting, reserve planting, the alignment of footpaths, location of park furniture, facilities structures, play equipment, lighting and landscape features such as mounding, stormwater treatment ponds etc. proposed for the development</i> ▪ <i>Requirement for irrigation or other services</i> ▪ <i>Fencing provisions</i> ▪ <i>Lifecycle maintenance costs and operational requirements</i>

All designs shall be carried out by a qualified professional as outlined in section 2.1 providing certification that the design complies with the necessary standards.

2.3 General Design Information

2.3.1 Council Owned Assets

All new systems which are connected to Council's systems shall be in accordance with Council's resource consents, existing management plans and other legal obligations.

Guidance Notes:

1. *Stormwater discharges should be managed to avoid increases in peak flows and ensure that Council's consent requirements for them are not violated. Particular requirements are detailed in Section 6 of these Engineering Standards.*
2. *Only sewage similar to typical domestic sewage should be discharged into Council systems unless a specific Trade Waste agreement has been agreed to by Council. Council should be consulted about these requirements at the design stage. Particular requirements are detailed in Section 7 of these Engineering Standards.*
3. *Council should be consulted about the requirements for water supply at the design stage. Particular requirements are detailed in Section 8 of these Engineering Standards.*
4. *With the exception of service connection pipes perpendicular to the main pipes along streets, services should be clear of footpaths wherever possible. When this is not considered possible, Council should be consulted at the design stage.*

2.3.2 Privately Owned Assets

Guidance Notes:

1. *Any development which has unit titles or similar and has internal roading, stormwater, wastewater or water systems that are the responsibility of multiple landowners should have an overriding body (a body corporate or similar) with control over these assets. This "body" should be responsible for the maintenance and replacement of these assets and should be sustainable over the life of the asset and change of ownership of individual titles.*
2. *The costs of maintaining these assets are the responsibility of the owners. Council has no responsibility for the maintenance or replacement of these assets.*
3. *It is recommended that where possible the assets are constructed to these Engineering Standards.*

2.3.3 Design Lives

New engineering services shall be designed and constructed to achieve the following design lives (note the physical life shall be as per the manufacturer’s life expectation based on research and experience).

The required asset design lives are shown in the table below.

Table 2.1: Asset Design Lives

Asset	Design Life
Bridges and Earth retaining structures	100 years
Road Pavements	25 years
Carriageway Sealing	7 years
Pipes and Fittings	100 years
Manholes, Storage Chambers (including septic tanks and pump chambers) and all underground storage chambers	80 years
Telemetry and Electrical systems	15 years
Valves	40 years
Pumps	15 – 25 years
Wastewater Treatment and Disposal Systems (excluding the items listed above)	40 years

2.4 Vesting and Easements

Roads, stormwater pipelines, land for overland flowpaths and wastewater and water infrastructure shall be vested in Council or protected by easements in gross in favour of Council as specified in Sections 5, 6 and 7 of these *Engineering Standards*.

2.5 Management Entity

Where a subdivision contains private shared accesses or other communal assets, an entity such as a registered company or other corporate body should be formed to:

- *Implement a constitution which contains rules which the owners of the lots are required to comply with;*
- *Co-ordinate and manage the maintenance and use of jointly owned access lots or rights of way;*
- *Maintain and upgrade the shared private access network to a standard that complies with these Engineering Standards, including associated stormwater drainage, subsoil drainage, slip stabilisation works and retaining walls;*
- *Own, operate, maintain, upgrade and administer all matters associated with any communal water supply, wastewater treatment and disposal system or other communal asset;*
- *Maintain any communal landscape works, weed control, pest control and animal control required by the subdivision consent.*

The constitutional document should be submitted to Council for approval prior to registration of the entity. The document should provide an outline of the legal responsibilities of the entity to the satisfaction of the Council, including ensuring that the entity is capable of operating indefinitely. A solicitor’s undertaking should be provided to Council confirming that the entity will be duly registered.

2.6 Low Impact Design Principles

In developing these standards Council acknowledges the benefit that Low Impact Design has for both Council's assets and the environment. Accordingly Council encourages design that follows these principles as noted in the various referenced documents, in particular NZS4404:2010 and Auckland Regional Council TP124. The use of Low Impact Design will benefit the community in terms of sustainability of both stormwater and roading infrastructure which in turn will benefit the water quality of Kaipara's waterways.