appendix 13 engineering performance standards

AP13 introduction

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AP13.i This appendix sets out all engineering performance standards in relation to network utility systems.

AP13.1 purpose, scope, and definitions

PC14

AP13.1.i The purpose of these Engineering Performance Standards is to provide guidelines to achieve the purpose of the Act in relation to the design, construction, expansion, enhancement, maintenance, and operation of network utility systems, whether the activity is carried out by or on behalf of the utility service or as part of a subdivision or development.

AP13.1.ii These Engineering Performance Standards are performance based with emphasis on outcomes and effects. They are not a prescription of methods or materials but are intended to permit flexible and innovative approaches or solutions to all aspects of engineering works.

AP13.1.iii These Standards cover design, construction, earthworks, roads, stormwater drainage, sewerage and trade waste drainage and water supply. There is also a reference to other utilities.

AP13.1.iv Where an application is for a controlled activity, these Engineering Performance Standards, together with other relevant parts of the Plan, will be used for setting consent conditions. Where an application is for a discretionary or non-complying activity, the Engineering Performance Standards, together with other relevant parts of the Plan, will provide a guide in the assessment of any application, including setting consent conditions.

AP13.1.v Definitions, additional to those defined in the Act, are:

Adequate

Adequate to achieve the objectives of these Standards.

Construction

In these standards, 'construction' includes repair and replacement and any operation involving the disturbance of ground.

EDA

Equivalent Design Axle

Level of construction monitoring

One of five levels of construction monitoring, as defined by the Institution of Professional Engineers New Zealand.

Performance criteria

Criteria to be used in the preparation, submission and assessment of proposals for measuring the performance of the proposals against objectives.

Roading hierarchy

As shown on the Planning Maps: Map A2.1 (Urban Road Hierarchy) and Map A2.2 (District Road Hierarchy).

Suitably experienced and qualified person

Generally a registered engineer holding an annual practising certificate or, in respect of subdivisions, a registered surveyor holding an annual practising certificate and, in either case, a person who is experienced in the type of work. Notwithstanding this, Council will accept designs, certifications, reports and construction reviews from other recognised professionals and non-registered persons who have, in the Council's viewpoint, sufficient recent experience in the particular aspect of the work.

AP13.2 environmental results anticipated

PC14

AP13.2.i The environmental effects resulting from the application of these Engineering Performance Standards will be:

a) to achieve the intention of the design and the utilisation of natural and physical resources in a safe and efficient manner which will enhance or minimise reduction of amenity values and avoid, remedy or mitigate any adverse effects.
b) to minimise the discharge of dust or vapour into the air; to minimise noise and health risk; to protect the neighbouring environment from surface, groundwater and road surface water runoff; and to protect the neighbouring environment from the migration of silt, soil and road surface material.
c) to minimise the likelihood of erosion, slippage, subsidence, inundation, or falling debris; to protect the neighbouring properties from the effects of erosion, slippage, subsidence, inundation, and falling debris; to prevent undue alteration of the natural landscape; and to protect both the land and the neighbouring environment from any adverse effects caused by groundwater flows.
d) to protect the environment from flooding, to minimise the likelihood of breakdown of the drainage system resulting from flooding, to reduce silting of waterways through soil carried in surface water runoff; to reduce the likelihood of erosion, slippage, subsidence and inundation caused by surface water runoff or groundwater flows; and to minimise the likelihood of contaminants entering the system with consequent effects on the environment at the discharge point.

e) to prevent contamination of the environment by sewage or trade waste and the consequent effect on the ecosystem; to prevent the contamination of groundwater by sewage seepage; to minimise the likelihood of sewage spills through sewerage network breakdowns; and to minimise the volume of sewage discharge through preventing inflow of ground and surface water.
f) to protect potable water supplies from contamination; to minimise the likelihood of surface or ground water flooding due to leakage; and to help in containing the environmental damage caused by fire or explosion.

AP13.3 general criteria

PC14

AP13.3.i All engineering works carried out to these Engineering Performance Standards shall comply with all relevant matters in all these criteria.

AP13.3.ii Performance criteria apply to all aspects of work covered in these Engineering Performance Standards. The work shall:

a) minimise any adverse effect on the environment
b) be adequate for its intended use or the intended land use
c) permit or provide reasonable access for the maintenance of the work or utility system
d) (for utility systems) not require undue maintenance
e) (for utility systems) be such that maintenance can be carried out safely; and
f) (for utility systems) be cost effective to maintain
g) (for utility systems) be compatible with the existing network utility system in all respects

AP13.4 design

PC14

AP13.4.i The objective of the design is to provide a clear and accepted base for the definition of the physical works and to achieve the environmental results set out in AP13.2 above.

AP13.4.ii The functional requirement of the design is to define the extent of the works, to provide sufficient information for correct construction, to provide a basis for approvals and acceptance and to ensure that any adverse effect on the environment is minimised.

AP13.4.iii The performance criteria are that the design shall:

a) incorporate all the components of the Engineering Performance Standards as required for the intended project
b) be legible and easily understood and supported by sufficient drawings, calculations and background information to allow checking
c) (where applicable) take into consideration the whole catchment as it relates to the project
d) take into consideration the effects of sudden or catastrophic failure of any component or portion of the project
e) ensure safety of construction, operation and maintenance is maximised
f) minimise any loss of amenity values
g) (where applicable) incorporate the findings of the geotechnical report
h) (where applicable) ensure that all conditions of any resource consent will be complied with
i) be prepared by a suitably experienced and qualified person

AP13.5 construction

PC14

AP13.5.i The objective of construction is to complete the physical works in a safe and efficient manner and to achieve the environmental results set out in AP13.2 above.

AP13.5.ii The functional requirement of construction is to provide the physical works in a safe and efficient manner and to minimise any adverse effect on the environment.

AP13.5.iii The performance criteria are that the construction shall:

a) be undertaken to the approved design, ensuring that the performance criteria laid down in this standard are met
b) be carried out with due consideration for the safety of both work site personnel and the general public
c) be carried out in accordance with good engineering practice
d) minimise any degradation of materials and systems being used in the works
e) minimise any disruption and nuisance to neighbours and the general public
f) where the work is in an existing road, easement, or reserve, minimise the disruption of vehicular or pedestrian traffic; minimise the spread of dust, dirt or mud; and restore all surfaces and services, on completion of the work, to as near as practicable to their previous or better condition.

AP13.6 construction monitoring

PC14

AP13.6.i The objective of monitoring construction is to provide verification that the construction has been carried out and completed in accordance with the design and to achieve the environmental results set out in AP13.2 above.

AP13.6.ii The functional requirement of construction monitoring is to provide a level of monitoring appropriate to the nature of the project, an independent assessment of the compliance of the construction with the design and to ensure that any adverse effect on the environment is minimised or remedied.

AP13.6.iii The performance criteria are that the monitoring of construction shall:

a) be undertaken by a suitably experienced and qualified person
b) be appropriate to the size, importance and complexity of the project
c) be appropriate to the potential adverse effects on the environment of the project
d) be appropriate to the experience, in the class or classes of work, of the contractor or person directly in charge of the project
e) be recorded in a producer statement construction review from a suitably experienced and qualified person and deposited with the Council on completion of the construction

AP13.7 earthworks

PC14

AP13.7.i The objective of earthworks is to improve land utilisation, to safeguard people, property and the environment from the adverse effects of unstable land, and to achieve the environmental results set out in AP13.2 above.

AP13.7.ii In respect to topography, the functional requirements of earthworks shall be to improve land utilisation, protect people, property and the environment from the adverse effects of unstable land, and to minimise any adverse effects on the environment.

AP13.7.iii In respect to topography, the performance criteria are to:

a) (where applicable) provide a safe, stable and accessible building site on each lot
b) provide for the adequate control of stormwater
c) avoid the likelihood of erosion and instability
d) not unnecessarily alter the natural landscape

AP13.7.iv In respect to the structure of the earthworks, the functional requirements shall be to withstand and remain stable under anticipated loads and to minimise any adverse effect on the environment.

AP13.7.v In respect to structure of the earthworks, the performance criteria are that the work shall:

a) remain safe and stable for the duration of the intended land use
b) not unnecessarily rely on artificial or man made structures for stability
c) cater for the natural groundwater flows
d) be geotechnically sound
e) if utilising built structures, these shall remain safe and stable for the duration of the intended land use

AP13.8 roads

PC14

AP13.8.i The objective of roads is to ensure safe and efficient movement of people, vehicles and goods with minimum adverse effect on the environment and to achieve the environmental results set out in AP13.2 above.

AP13.8.ii In respect to layout, the functional requirement is that the layout should, as appropriate for its position in the roading hierarchy, ensure that people, vehicles, and goods can move safely and efficiently, minimise any adverse effect on the environment, make provision for network utility systems and make provision for amenity values.

AP13.8.iii The performance criteria are that the layout of the road network shall:

a) provide adequate vehicular access to each lot
b) link and be compatible with the existing road network
c) provide for the safe movement of both vehicular and non-vehicular traffic
d) provide adequate access for emergency vehicles

AP13.8.iv Within the Services Overlay on Maps 5, 7 and 8, the road network must provide links to the existing network and adjoining land as appropriate, while avoiding or minimising any adverse effects on the safety and efficiency of State Highway 6. These matters shall be considered as part of any subdivision consent application within the Overlay, where relevant, having regard to the location of the subdivision.

AP13.8.v The functional requirement of the road structure is that it shall withstand the anticipated loads for the design life of the road, transfer applied loads so as not to adversely affect the underlying subgrade or service and minimise any adverse effect on the environment.

AP13.8.vi Within the Services Overlay on Planning Map 23, a route of 'sub collector' status shall be established, which when linked will provide a through route from Princes Drive to Waimea Road and Annesbrook Drive. Establishing an adequate roading requirement shall be a factor in considering any subdivision consent application within the Overlay, having regard to the location of the subdivision.

AP13.8.vii The performance criteria are that the structure of the road shall:

a) have a design life of at least 25 years based on EDA, or equivalent design methods
b) be constructed from materials suitable for the intended use
c) maintain adequate surface smoothness
d) be protected from the adverse effects of surface and ground water

AP13.8.viii The functional requirements of the road network stormwater control system are that it shall protect the road, road users and adjoining land from the adverse effects of water and minimise any adverse effect on the environment.

AP13.8.ix The performance criteria are that the road network stormwater control system shall:

a) have a design life of at least 80 years
b) adequately convey water to an approved discharge point
c) avoid the likelihood of leakage and infiltration and the penetration of roots
d) avoid the likelihood of blockages
e) provide reasonable access for maintenance

AP13.9 stormwater drainage

PC14

AP13.9.i The objective of the stormwater drainage system is to safeguard people, property and the environment from the adverse effects of surface water and to achieve the environmental results anticipated in AP13.2 above.

AP13.9.ii The functional requirements of the layout of the stormwater system shall be to protect property and the environment from the adverse effects of surface water and minimise any adverse effects on the environment.

AP13.9.iii The performance criteria for the layout of the stormwater drainage system are that it shall:

a) adequately service its catchment
b) adequately service each lot, road area or other land area falling to the point of entry into the drainage system
c) cater for a 2% annual exceedance probability rainfall event (50 year flood) for major rivers and streams as defined in the NCC Engineering Standards 1993, and a 6.67% annual exceedance probability rainfall event (15 year flood) for all other circumstances using a system appropriate for the potential land uses.
d) ensure gravity operation
e) (if linking to) be compatible with the existing drainage network
f) not unduly restrict the location of any future building

AP13.9.iv The functional requirement of the structure of the stormwater drainage system shall be to accommodate the anticipated flows, withstand the anticipated loads and minimise any adverse effects on the environment.

AP13.9.v The performance criteria for the structure of the stormwater drainage system are that it shall:

a) have a design life of at least 80 years
b) be constructed from materials suitable for the intended use
c) ensure safety in operation
d) avoid the likelihood of leakage and infiltration and the penetration of roots
e) avoid the likelihood of blockages
f) (if pipes or lined channels) avoid the likelihood of penetration by roots or the unintended entry of groundwater

AP13.10 sewerage and trade waste drainage

PC14

AP13.10.i The objective of the sanitary sewerage and trade waste network is to safeguard people from injury or illness caused by infection or contamination resulting from sanitary sewage or industrial liquid waste, to convey sanitary sewage or industrial liquid waste to treatment systems and/or final discharge points and to achieve the environmental results anticipated in AP13.2 above.

AP13.10.ii The functional requirements of the layout of the sewerage network shall be to ensure the removal of sanitary and industrial sewage and minimise any adverse effect on the environment. By 2007, a stormwater bylaw will control the quality of stormwater discharges to NCC infrastructure.

AP13.10.iii The performance criteria for the layout of the sanitary sewerage and trade waste network are that it shall:

a) adequately service each lot
b) adequately convey sanitary or industrial sewage to an approved discharge point
c) (if linking to) be compatible with the existing network
d) utilise gravity operation where feasible
e) not unduly restrict the location of any future buildings

AP13.10.iv The functional requirements of the structure of the sanitary sewerage and trade waste network shall be to accommodate the anticipated flows, withstand the anticipated loads and minimise any adverse effects on the environment.

AP13.10.v The performance criteria for the structure of the sanitary sewerage and trade waste network are that it shall:

a) have a design life of at least 80 years
b) be constructed from materials suitable for the intended use
c) ensure safety in operation
d) avoid the likelihood of leakage and infiltration and the penetration of roots
e) avoid the likelihood of blockage

AP13.11 water supply

PC14

AP13.11.i The objective of water reticulation is to provide a water supply for consumption, health and hygiene, and fire fighting and to achieve the environmental results anticipated in AP13.2 above.

AP13.11.ii The functional requirement of the layout of the water reticulation network shall be to ensure an adequate supply of potable water, make provision for fire fighting requirements and minimise any adverse effect on the environment.

AP13.11.iii The performance criteria for the layout of the water reticulation network are that it shall:

a) adequately service each lot, development or road area
b) (if linking to), be compatible with the existing water reticulation network
c) be compatible with other utility systems
d) avoid the likelihood of potable water contamination
e) provide for each connection a water meter on road reserve accessible for meter reading
f) (where applicable) permit appropriate access for fire fighting

AP13.11.iv The functional requirement for the structure of the water reticulation network shall be to accommodate the anticipated flows, withstand the anticipated pressures and loads and minimise any adverse effect on the environment.

AP13.11.v The performance criteria for the structure of the water reticulation network is that it shall:

a) have a design life of at least 70 years
b) be constructed from materials suitable for the intended use
c) avoid the likelihood of leakage
d) avoid the likelihood of potable water contamination
e) if carrying non-potable water, be clearly identified as such
f) (where applicable) provide appropriate access to the system for fire fighting purposes

AP13.12 other utilities

PC14

AP13.12.i The objective of other utilities is to provide a service (eg. telecommunications, energy) to properties and to achieve the environmental results anticipated in AP13.2 above.

AP13.12.ii The functional requirements for the layout of the utility reticulation network shall be to ensure an adequate supply of the service or commodity to individual sites and minimise any adverse effect on the environment.

AP13.12.iii The performance criteria for the layout of the utility reticulation network are that it shall:

a) adequately service each lot, development or road area
b) (if linking to) be compatible with the existing utility reticulation network
c) be compatible with other utility systems
d) avoid the likelihood of contamination or leakage

AP13.12.iv The functional requirement for the utility reticulation network shall be to accommodate the anticipated demand, withstand the anticipated pressures and loads and minimise any adverse effect on the environment.

AP13.12.v The performance criteria for the structure of the utility reticulation network is that it shall:

a) have a design life of at least 70 years
b) be constructed from materials suitable for the intended use
c) avoid the likelihood of leakage
d) avoid the likelihood of contamination
e) be compatible with other utility systems
f) be clearly identified
g) be safe
h) not be visually intrusive

AP13.13 system development

PC14

AP13.13.i This section applies to assessment of the effects of an activity or subdivision on Council storm water, sewerage, and water supply systems, arising from the proposed means of management of storm water, sewerage or water supply at the site.

AP13.13.ii Where this section applies, storm water, sewerage or water supply proposals shall be assessed by the following criteria, in addition to the other provisions of this Plan:

a) effects on adjacent sites, including development potential
b) the relationship of the proposed new works to the pattern and timing of development of the District as a whole
c) any economies of scale available from alternative designs that would cater for greater or lesser areas of land, either within or outside the site
d) the capacity, availability and accessibility of the existing Council service and the effects of any new system linking to it
e) the effects of any stand alone system, including effects on the long term development potential, efficiency and cost effectiveness of an existing or future Council system
f) the effects of any temporary system, where the capacity of any Council service is not adequate, but is programmed by the Council for upgrading in the future;
g) the long term maintenance and operating costs of the proposed system

AP13.13.iii Where the method proposed to manage stormwater, sewerage or water supply complies with, or is consistent with, any Strategic Plan or long-term strategy published by the Council for the development of the District, the effects on the Council stormwater, sewerage and water supply systems will be acceptable for the purposes of this section.