

Part 1: Introduction

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1.1 Referenced Documents

Planning and Policy

- > The *Christchurch City District Plan*
www.ccc.govt.nz/the-council/plans-strategies-policies-and-bylaws/plans/christchurch-district-plan
- > Resource Management Act (1991)
- > Local Government Act (2002) and Local Government Act 2002 Amendment Act 2014
- > New Zealand Building Code (1992)
- > Christchurch City Council *Long Term Plan*
- > Christchurch Central Development Unit *Central City Recovery Plan*
<https://ceraarchive.dPMC.govt.nz/documents/christchurch-central-recovery-plan>
- > Canterbury Regional Council *Land Use Recovery Plan*
www.ecan.govt.nz/our-responsibilities/regional-leadership/Pages/LURP.aspx

Design

- > Christchurch City Council *Waterways, Wetlands and Drainage Guide, Ko Te Anga Whakaora mō Ngā Arawai Rēpo (WWDG)* (2003) www.ccc.govt.nz/environment/water/policy-and-strategy/waterways-wetlands-and-drainage-guide/
- > Christchurch City Council Design Guide *Crime Prevention Through Environmental Design*
www.ccc.govt.nz/assets/Documents/Culture-Community/Community-Safety/CPTEDFull-docs.pdf
- > Christchurch City Council *Water Supply, Treatment, Pumping Station and Reservoir Design Specification* www.ccc.govt.nz/consents-and-licences/construction-requirements/infrastructure-design-standards/watersupply
- > Transit New Zealand *Guidelines for Planting for Road Safety*
- > All New Zealand Transport Agency (NZTA) guidelines (including RTS series) and manuals (including TNZ standards and the *Bridge Manual*)
- > NZS 3910 *Conditions of contract for building and civil engineering construction*
- > NZS 4404 *Land development and subdivision infrastructure*
- > AS/NZS 1158 Set *Lighting for roads and public spaces set*

Construction

- > Christchurch City Council *Civil Engineering Construction Standard Specifications Parts 1-7*
www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/download-the-css

Where a conflict exists between any Standard and the specific requirements outlined in the Infrastructure Design Standard (IDS), the IDS takes preference (at the discretion of the Council).

1.2 Introduction

The Infrastructure Design Standard (IDS) is revised on a regular basis. It started with the Christchurch Metropolitan Code of Urban Subdivision, which was written in 1987. That document was developed at a time when Christchurch consisted of five local authorities and it was a testament to the cooperation between council staff in those organisations, the engineering and surveying professions and the construction industry.

Since then the 1991 Resource Management Act has been introduced, which removed the control of subdivision from the Local Government Act. More importantly, the face of local government in Christchurch underwent major change in 1989 with local government amalgamation and the current code also no longer reflects the Council's organisational structure.

Consultation with the surveying profession in 2001 showed that the Metropolitan Code was still the principal document used in the design of subdivisional works. However, a large number of uncoordinated and informal amendments had started to erode the document's integrity. It did not relate to the many Council publications, both planning and engineering related, which were intended to directly impact on land and asset developments. Also the code was seen by many as failing to recognise technological advances in the construction industry.

A team, comprising designers from Technical Services and Design (formerly City Solutions and Capital Programme Group) and asset managers from the asset groups, wrote each Part of the IDS. The teams perused current documentation, industry standards and codes from other local bodies. Each of the twelve parts can therefore be aligned with the relevant asset group but is particularly related to the type of infrastructure.

The IDS 2010 was adopted through a Council resolution on 24 June 2010, for immediate application to both Council funded assets and assets that will be vested on subdivision. It replaced the use of both the Metropolitan Code of Urban Subdivision and NZS 4404 within Christchurch City.

The 4 September 2010, 22 February 2011 and subsequent earthquake series caused significant damage in some areas of Christchurch. The effect of the earthquakes prompted a progressive reassessment of the standards for the design of infrastructure in liquefaction prone areas. The IDS 2013 therefore included recommendations on matters to consider when designing infrastructure in those areas likely to be affected during an earthquake. These recommendations were compiled with the assistance of the Natural Hazards Platform and external personnel experienced in geotechnical and drainage engineering. Further developments in the design of three water's infrastructure were reflected in the 2015 IDS amendments.

The IDS 2016 reflects changes arising from the review of the current operative *City Plan* and *Banks Peninsula District Plan* and the resulting replacement *District Plan*. It also includes best practice developed in tandem with Stronger Christchurch Infrastructure Rebuild Team (SCIRT). This project is part of an on-going review of how the Council goes about designing and building the City, to support the *Central City Recovery Plan* and the *Land Use Recovery Plan*. For those wanting to know more about creating great environments through urban design, visit the Council's website www.ccc.govt.nz/the-council/future-projects.

The IDS 2018 reflects changes primarily due to submissions. These include the recently released New Zealand Fish Passage Guidelines, the requirement to include indicative bus routes on plans, and updates to street light specifications.

The IDS 2022 includes minor changes due to updated Council policies and sustainable and affordable alternatives. A comprehensive review is planned to implement Council's climate change strategy, along with additional sustainability aspects.

1.3 Document Purpose

The purpose of the Infrastructure Design Standard is to provide the design standard for both Council funded assets and assets that will be vested with Council, through processes such as subdivision.

The purpose of this revision is to incorporate the changes arising from submissions and to update the technical engineering aspects of the Infrastructure Design Standard to current practice.

There may be examples within the city where infrastructure does not comply with the requirements of the IDS. It is not the intention that compliance with the IDS be used as a vehicle to justify inclusion in or reprioritise the Council's programme of work determined by the *Long Term Council Community Plan*.

Where the *District Plan* is referred to, this means those objectives and provisions in the operative district plan (either the *Christchurch City Plan* or the *Banks Peninsula District Plan*) that have not been replaced by the *Christchurch Replacement District Plan (District Plan)*, unless specifically stated otherwise.

The parts of the IDS are summarised below and are intended to be read together as one document:

- > **Part 1:** Introduction introduces the major changes and includes those definitions specific to the IDS.
- > **Part 2:** General Requirements covers a number of regulatory details and sets out the process from design to acceptance by the Council of land developments.
- > **Part 3:** Quality Assurance sets out the requirements for the application of quality assurance to the construction of all assets. Each project will require the implementation of a project quality system, with documentation and certification presented to the Council at both the design and construction stages; the traditional Council role of Clerk of Work-type inspections will be replaced with a structured audit-based system.
- > **Part 4:** Geotechnical Requirements sets out the requirement for geotechnical input in land development and what must be considered by the geotechnical engineer. It emphasises the Council's desire to work with the landforms and preserve natural features. It also details issues to be considered on Hazardous Activity and Industries List (HAIL) sites and under erosion, sediment and dust control.
- > **Part 5:** Stormwater and Land Drainage builds on the *Waterways and Wetlands Drainage Guide*, which sits behind the IDS as a supporting document. Part 5 provides more prescriptive design and compliance criteria than is found in the *WWDG* but reinforces the change of emphasis to include water quality and ecological protection. Fish passage design is included



Waterways, Wetlands and Drainage Guide

- > **Part 6:** Wastewater Drainage incorporates both an explanation of Christchurch’s reticulation system and how the Council’s philosophy has changed. It provides the design and compliance criteria for wastewater systems and includes modern materials. The requirements for private drains have been tied to the New Zealand Building Code and it references the two pumping station specifications.
- > **Part 7:** Water Supply covers the design and compliance criteria of the water reticulation. It references the *Water Supply Wells, Pumping Station and Reservoir Design Specification* for larger infrastructure and includes modern materials.
- > **Part 8:** Roading sets out both the design and compliance criteria for the road layouts e.g road classification and the roads themselves e.g. footpaths, construction depths. It includes the National Roads Board specifications for the design and construction of roads replaced with Austroads specifications.
- > **Part 9:** Utilities covers the Council’s compliance requirements for telecommunication, electricity and gas. It excludes the utility design itself, as this must be to the network operator’s requirements.
- > **Part 10:** Reserves, Streetscape and Open Spaces is a section on landscaping and reserves, based on NZS 4404 and modified to suit the Christchurch context. It sets criteria for reserves, including layout, facilities, structures and furniture. It also applies to landscaping in legal roads.
- > **Part 11:** Lighting sets the Council’s requirements in an environment in which private companies can carry out street lighting design and construction. It builds on AS/NZS 1158. It includes LED requirements.
- > **Part 12:** As-Built Records sets the Council’s requirements for as-built information on completion of the development.

1.4 Definitions

The following definitions apply in the Infrastructure Design Standard, unless inconsistent with the context. These definitions are additional to those definitions in the *District Plan*.

Accessible – as defined in NZS 4121: 2001

Annulus – gap between the original pipe and an inserted pipe

Arboriculture – the management of individual trees or groups of trees primarily for their amenity value

Basic boundary fence – treated timber post and three rail fence with vertical 1.8m timber palings

Canopy – the branches and foliage of a tree out to the drip line

Check valve – one way, no return valve

Corridor Access Request – a formal application to Christchurch City Council for the installation of a network service within legal roads

Designer – the principal designer

Developer – as defined in NZS 4404: 2010

Diameter – all pipe diameters are nominal internal, unless specifically stated otherwise

Drainage – as defined in NZS 4404: 2004

Drip line – from one outer extremity of the canopy of a tree(s) to the other outer extremity of the canopy in a 360° aspect

Earthworks – as defined in NZS 4404: 2010

Engineer – equivalent to “Developer’s professional advisor” as defined in NZS 4404: 2004

Engineering Acceptance – the written confirmation of the Council’s acceptance of the Design Report and design, including drawings, calculations, specifications

Environment Canterbury – Canterbury Regional Council

Establishment (landscape) – as defined in *CSS: Part 7* clause 14.0 - Establishment

Frangible (tree) – as defined in *Transit Guidelines for Planting for Road Safety*, mature trees, not hardwoods, with a trunk diameter less than 100mm at 400mm above the ground

Frangible (street lighting column) – as defined in NZTA M/26: 2012

Geoprofessional – as defined in NZS 4404: 2010

HN-HO-72 – as defined in *Bridge Manual* Section 3: Design Loading

Hydrogen sulphide – H₂S

Maximum operating pressure – this is specified by the Engineer and is the maximum pressure the pipeline must sustain, including surge.

Network Utility Operator – as defined by s. 166 of the Resource Management Act 1991

Owner – as defined in NZS 4404: 2010

Private way – as defined by s. 315 of the Local Government Act 1974

Qualified arborist – a person who is in possession of a recognised arboriculture degree, diploma or certificate, and on the job experience, is familiar with the equipment and hazards involved in arboriculture operations, has demonstrated proficiency in inspecting, analysing and treating hazardous trees and has demonstrated the ability to perform the tasks involved. A Certificate shall consist of a minimum of 240 credits of learning (i.e. Level 4).

Qualified horticulturalist – a person who is in possession of a recognised horticulture degree, diploma or certificate, and on the job experience, is familiar with the equipment, hazards and techniques involved in horticulture operations, and has demonstrated the ability to perform the tasks involved. A Certificate shall be a minimum of Level 3 i.e. the equivalent to one year full time study.

Rated pressure – this is specified by the manufacturer as the limit that the particular component can sustain in use

Residential Zone – as listed in Chapter 14 and delineated on the planning maps in the *District Plan*

Residual pressure – remaining pressure at a point under a particular demand

Reticulation – a system of interlacing pipes, wires and other connections, constructed like a net, which feed out from a central supply to customers

Riparian – of, inhabiting, or situated on the bank of a river

Street – has the same meaning as “road” as defined by s. 315 of the Local Government Act 1974

Surface water run-off – as defined in NZS 4404: 2010

Test pressure – this is the pressure the pipeline must sustain during the test

Utility – as defined in the *District Plan* but excluding those utilities owned and operated by Christchurch City Council

Wastewater – as defined in NZS 4404: 2010

Water hammer – transient pressure surges, can be positive and negative pressure

Works Access Permit – permission from Christchurch City Council to install network services within legal roads

1.5 Abbreviations

The following abbreviations apply in the Infrastructure Design Standard. These abbreviations are additional to those abbreviations in NZS 4404.

AA DT – Average annual daily traffic

AEP - annual exceedance probability

ASF (l/s) – average wastewater flow is the daily average flow from domestic, industrial and commercial sources, excluding infiltration and surface entry, as determined in clause 6.4 – Sanitary Sewer Design Flows (Wastewater Drainage)

CAR – Corridor Access Request

CPTED – Christchurch City Council Design Guide *Crime Prevention Through Environmental Design*

CSS – Christchurch City Council *Construction Standard Specifications*

GPS – global positioning system

HAIL – Hazardous Activity and Industries List

IDS – *Infrastructure Design Standards*

ISO – International Standards Organisation

LTCCP – *Long-Term Council Community Plan - Our Community Plan*

MF (l/s) – maximum flow is the instantaneous design total peak

NUO – Network Utility Operator

NCR – Non-Conformance Report

OD – outside diameter

P/A ratio – peak to average ratio PSF/ASF

PE 80B – Polyethylene type 80B

PE 100 – Polyethylene type 100

PN – Pressure nominal

PSF (l/s) – peak wastewater flow

PVC-o – Oriented Poly-Vinyl Chloride

PVC-u – Unplasticised Poly-Vinyl Chloride

PWAP – Parks and Waterways Access Policy

RAMM – Road Asset and Maintenance Management

RMA – Resource Management Act

RON – road opening notification

SCADA – Supervisory, Control And Data Acquisition

SCIRT – Stronger Christchurch Infrastructure Rebuild Team

SN – Stiffness number

SPF – Storm peak factor

STMS – Site Traffic Management Supervisor

TNZ – Transit New Zealand

WAP – Works Access Permit

WWDG – Waterways, Wetlands and Drainage Guide

