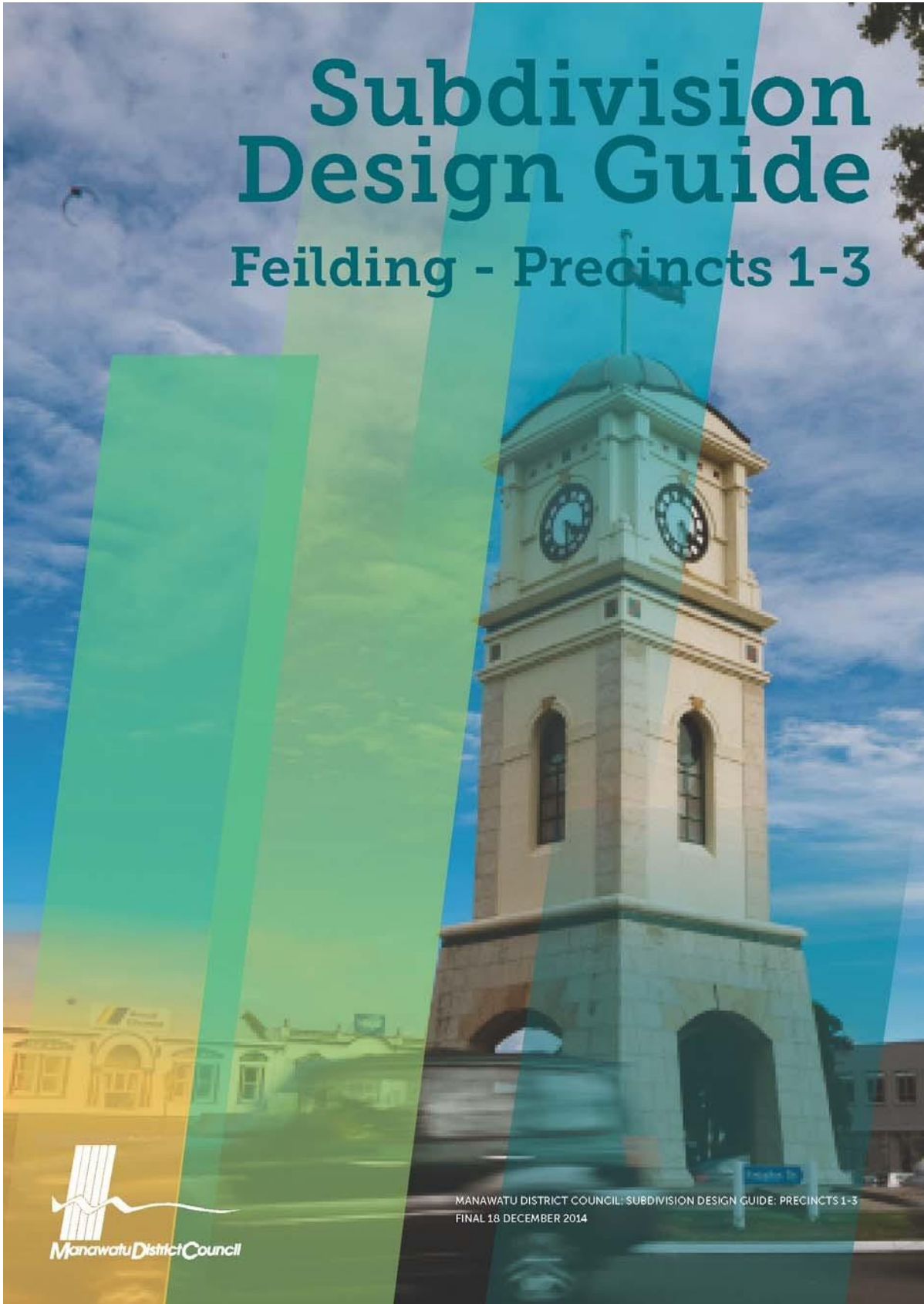


# APPENDIX 10 – SUBDIVISION DESIGN GUIDE

# Subdivision Design Guide

## Feilding - Precincts 1-3



MANAWATU DISTRICT COUNCIL: SUBDIVISION DESIGN GUIDE: PRECINCTS 1-3  
FINAL 18 DECEMBER 2014

# Subdivision Design Guide

## Feilding - Precincts 1-3

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# 01 Introduction

The introduction to the Subdivision Design Guide provides an explanation as to its purpose, relationship to the District Plan and design process.

## Subdivision Design Guide Purpose

The purpose of this guide is to give developers and subdivision designers a design process and guidelines on best practice subdivision and infrastructure design.

This guide sets out best practice design principles and illustrates their application in subdivision and infrastructure planning and design within the Feilding Growth areas known as Precincts 1-3 (refer Diagram 1).

The Design Guide provides a set of outcomes and guidelines to inform landowners, developers, potentially affected people and the wider community about subdivision expectations within the Feilding Growth areas.

## District Plan Relationship

The Design Guide works in conjunction with the rules and standards in the Manawatu District Plan including the Structure Plans that provide a spatial plan for each of the Growth Precincts.

## How it Should be Used

The Design Guide should be used by subdivision designers (be that landowners, surveyors, planners, engineers or others) from the earliest stages of the design process. It will be used by the Council in its assessment and decision making on applications under the District Plan for resource consents for subdivisions.

The Design Guide does not seek to impose rules on new development, or prescribe specific design solutions. Rather, it offers a flexible framework within which developers and surveyors can work. The Design Guide identifies key subdivision design principles to assist the integration of new subdivision development into the surrounding area and to enhance the character of the area.

Developers are encouraged to look beyond the minimum standards and consent requirements of the District Plan and engineering requirements and to explore opportunities that will enhance and create a better urban environment, for now and which will last well into the future.

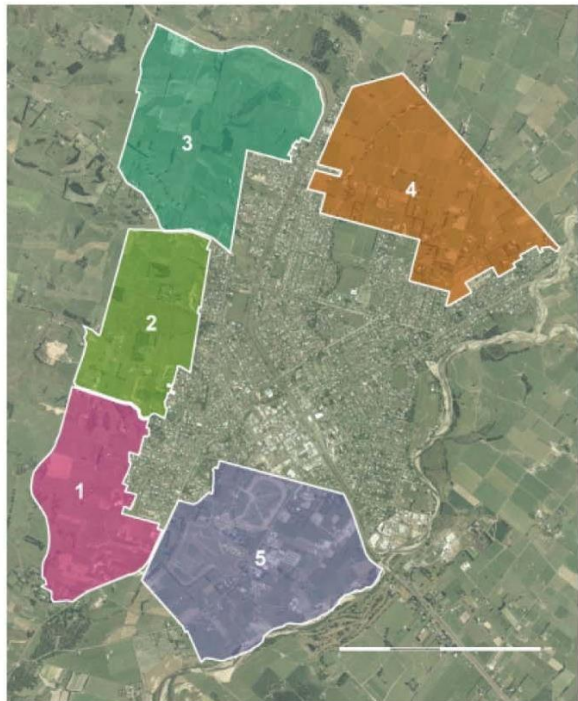


Diagram 1 showing locations and extent of Precincts 1-5

## Design Process

To achieve the best outcomes in terms of design effectiveness and process efficiencies, the applicant and or/their advisers should consider the process described in Diagram 2. Diagram 2 illustrates the best approach to addressing design effectiveness and process efficiencies. Applicants and their advisers should consider this process when considering development.

Each of the process steps is described below as actions – these are not intended to be prescriptive, but are common to best practice subdivision design processes.

### 1. Research

- Be familiar with your site of interest and collect as much information as you can – aerial photos, cadastral plans, titles, any historical information about buildings, previous land uses, hazards such as flooding or slips, large trees, underground or overhead services etc.
- Read the Design Guide to understand what the Council is considering are important in subdivision design. This includes all outcomes, guidelines and landscape advisory notes.
- Look at the District Plan to see what the resource consent requirements are for both subdivision and land uses.
- In the District Plan there is a Structure Plan map. Look at this and locate your property of interest and see what the context is. Also look at any connections that need to be made, slope or open space areas, or buffers for example.
- Consider the professional assistance (eg surveyor, engineer, planner) you may need – each of these have professional institutes and have lists of people in our area to contact.

### 2. Communicate

- Meet with a Council officer to discuss your ideas. It may be that several different officers (eg to help with infrastructure enquiries, or roading) will need to assist. It may also be beneficial to have an initial meeting and then follow-up meetings as ideas evolve.
- Consider your neighbours' interests. Do you know them and what their plans are? There may be mutual benefits to you and your neighbours if there are road connections to be made for example.
- Council may need to process your subdivision application through a publicly notified process. It is usually good practice to at least know your neighbours' interests prior to that process as often there can be ways of adjusting subdivisions to reduce or eliminate any issues.



### 3. Assess

- There may be areas of the site that are constrained in some way eg by slope, proximity to incompatible uses, flooding hazard. Assess the site with a view to mapping and addressing these constraints.
- Assess the site and map for opportunities in the same way. There may be good views, flatter land, good connection points for streets or paths and proximity to a natural feature like a river for example.
- Overlay these constraints and opportunities on a map to see where the best locations for development areas are.
- If you are using a professional like a surveyor or planner they should do this with/for you. It is very useful to have this as background to support your subdivision application.

### 4. Design Options

- The position of streets and paths will be influential to the layout for lots and these will also be the likely position for infrastructure. An engineer or surveyor will usually need to be involved in this process.
- It would be advisable to see the Council again with a few options and get officers advice and comments. They will have some thoughts on how well the options satisfy the Design Guide intentions and District Plan rules and Structure Plans.

### 5. Document

- There are specific requirements that need to be satisfied when applying for a resource consent. Council will advise you of their information needs at your first meeting. It is important to follow this advice as Council will continue to ask for further information until it is satisfied that everything is complete. This will take more time and may add to processing costs for your application.
- Include in the documentation the information and research gathered, including photographs.
- The process of documentation is usually undertaken by a professional as they know the Council requirements and can provide an appropriate level of assessment.
- Submit the documentation to Council.

## Outcomes

The outcomes sought by the application of the Design Guide for subdivision in the growth areas around Feilding are set out below. The subdivision and development outcomes sought are benefits in the form of:

- 1** An efficient design and consenting process which derives from early Council engagement and the clarity of Council's expectations as expressed by the guidelines.
- 2** Subdivision design that is responsive to existing on site constraints and opportunities.
- 3** Responsive house lot layouts which recognise the context of the area, or other potential development in the area which could generate conflicts between activities.
- 4** Developments which express the town's rural character and therefore have an identity and character which is unique to Feilding.
- 5** Efficient and cost effective infrastructure provision from clearer 'structure planning' for roads and other services that tie into Council's asset planning.
- 6** Good 'connectivity' within and between new development areas and the existing Feilding township which makes it easy and cost effective for people to move around by driving as well as walking and cycling.
- 7** Streets which are sized to suit the traffic use as well as encouraging walking and cycling. This will result in infrastructure which is cost effective and more attractive to live with and use than large wide unused roads.
- 8** Attractive entrances to the town of Feilding that derive from buffer planting on key entry roads.
- 9** Residential areas where houses all have a street frontage to encourage a healthy and safe community. Also areas where there are multiple opportunities for people to interact and passive surveillance of and from people using the street.
- 10** Safe and good quality open spaces which result from their careful siting, sizing, planting and the passive surveillance gained from adjoining land uses.
- 11** Amenity value of recreation and movement derived from parks, rivers and other open spaces connected as a network.
- 12** Cost effective and sustainable stormwater management through the provision of open stormwater swales in road design and on-site detention of peak flows.
- 13** Future proofing for the needs of future generations through the design of subdivisions to enable increased numbers of houses if required and small local commercial centres when the catchment is sufficient to support them.
- 14** Reduced risk of effects from natural hazards through designing carefully for sloping land areas or areas with flood potential.

## Content

The guidelines for Precincts 1-3 focus on the provision of residential land uses.

The guide as it applies to Precincts 1-3 has sections which address:

- Context
- Street and Path Connections
- Density and Lot Layout
- Open Space and Natural Features
- Natural Hazards and Resilience
- Stormwater Management
- Utility Services Networks

For each of those sections there are up to 10 guidance points. The nature of subdivision design is that all of the points across all of the sections are interrelated and need to be considered together. The guidelines are illustrated with photographs and diagrams which are intended to be indicative only.

## The Feilding Framework Plan

As background to these Design Guidelines and the District Plan provisions as they apply to the growth areas in Precincts 1-3, Council prepared a Feilding Framework Plan. This Framework Plan examined different forms of existing urban development in the town to understand what forms are most effective for the living environments. The Framework Plan also considered future growth projections and set out key principles of good urban design. An intended outcome from these guidelines is the achievement of those principles.

The Framework Plan also provided long term spatial plans for each of the Precincts that give indicative concepts for how the development could ultimately be provided for over time. The Framework Plan provides an indicative concept for testing infrastructure feasibility, potential yield of lot numbers, residential amenity opportunities, suitability of areas for development and for the purposes of costing of infrastructure.

## Development Contributions

In terms of the costs of enabling the development within the Precincts through the provision of infrastructure, Council has determined that this infrastructure will be provided for as part of the Development Contributions Policy. The Structure Plans identify as 'deferred' those parts of the growth areas not considered necessary to meet projected demand over the long term. Services will not be provided to the deferred areas, but Council may consider subdivision applications within those deferred areas if the subdivider makes provision for those services independently of Council.



## 02 Context

The characteristics of the area around the land to be subdivided will vary from place to place. In order for the subdivision to integrate, connect and take advantage of those characteristics and mitigate any potential adverse effects that may arise from development, the design should be consistent with the following guidelines:

- C1 Consider the long-term future of the area around the subdivision and respond in design layout.
- C2 Consider the external and internal opportunities and constraints for the subdivision area as a deliberate part of the subdivision design process.
- C3 Ensure that at the rural interface, the subdivision design recognises the potential for adverse effects from incompatibility between residential amenity or activities and rural activities. For example, by positioning lots to enable an open space and/or planted buffer to be incorporated.
- C4 Consider that Feilding has a rural-town character and the subdivision design can take advantage of this distinctive attribute in the design of roads, or placement of building sites or open spaces. For example, it may be possible to direct roads to gain views towards rural land or house sites to get a rural aspect.
- C5 Consider the natural landforms in the wider landscape in the subdivision design. For example gaining long views out to hills or gaining the benefits of visual and open space amenity of the two rivers.
- C6 Ensure that subdivision design responds to the local climatic conditions. For example, organise lots so that buildings and outside areas can be positioned to have good sunlight access and shelter (be that from trees or building design) from prevailing winds.
- C7 Ensure that connection points for vehicles and walking/cycling and the adjacent areas (existing or zoned for growth) are provided for with the aim of enabling direct movement to local amenities. For example, the town centre.



Example of Framework Plan

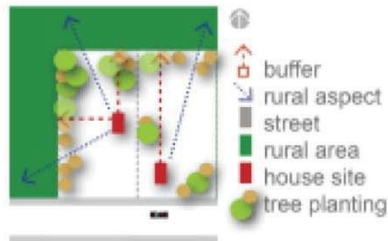


Diagram showing buffer and view opportunities



Example of rural aspect



Example of amenity of rivers

# 03 Street and Path Connections

The streets and path connections within the growth precincts of Feilding are important for moving people and goods between local destinations, and as public spaces that contribute to the visual and social amenity of the place. The Structure Plans identify the main streets (collectors and some local roads) which are intended to ensure connectivity between land in different ownerships. A more detailed street network (with frequent connections) is required to produce well connected residential subdivisions and the neighbourhoods these form. In order for these connections from subdivision to deliver on both function and amenity, the design should be consistent with the following guidelines:

- SP1 Ensure the street network shown on the Structure Plans is provided for in the first instance. Build on this connectivity, making sure street connections are integrated with the existing residential areas and can be extended to deferred zones in the future.
- SP2 Ensure the street type reflects the future anticipated role in the district network and as indicated on the Structure Plans. For example, only part of a street may need to be formed in the initial subdivision, but it may need to be added to in the future.
- SP3 Ensure that streets and paths are sized for the volume of their vehicle or pedestrian use, including vehicle type. Roads and streets that are too wide are an inefficient use of land, which generate larger stormwater runoff drainage needs, uncomfortably proportioned spaces and higher traffic speeds. For example, the collector and local road cross sections provide a generic guide.

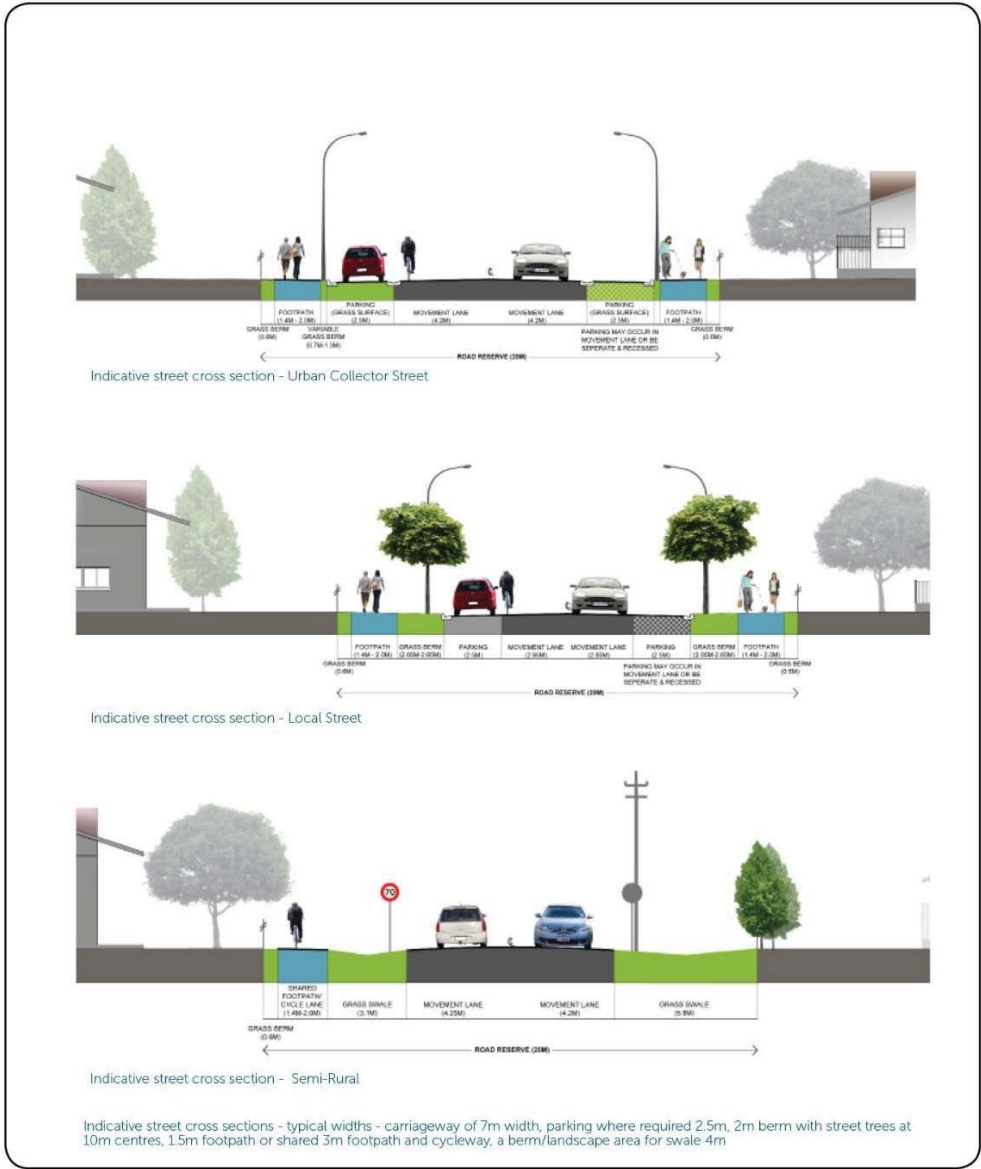
good



poor



The residential good example has the same road reserve width as the poor example. The good example has more amenity - grassed berm and street trees which give it a friendly scale. The poor example is very hard and the road area is over sized for the level of use by vehicles.



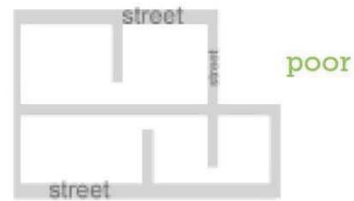
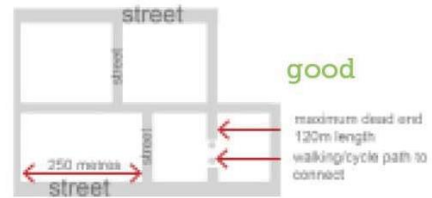
SP4 Ensure that there is good connections between streets. This enables a network that promotes efficient vehicle, walking and cycling movements.

SP5 Ensure that 'dead end streets' or cul-de-sacs are only used where the topography limits the ability to connect streets to others – in Precincts 1-3 there may be these situations. If these dead end streets are proposed for residential areas they should be no longer than 120m in length and preferably have a walking/ cycle path connection from the end to another street.

SP6 Where a public street is not being provided (such as for a small number of lots) and private Right of Way access is being proposed ensure that all private way access is designed to have the same amenity considerations as a street including sufficient width for a path and trees.

SP7 Ensure that streets are designed to include cycling and walking paths with street tree planting in a grassed berm between the road and path. This provides visual amenity and a comfortable separation between activities. For example, the collector and local road cross sections provide a generic guide.

SP8 Ensure that where topographical constraints limit vehicle street connections, that a network of walking and cycle paths of a safe and comfortable size are provided. For example, between hill development areas or from hill development areas down to existing areas below.



Street network diagram - good connectivity and poor connectivity



Example shows path separated from road but still visible to provide passive surveillance

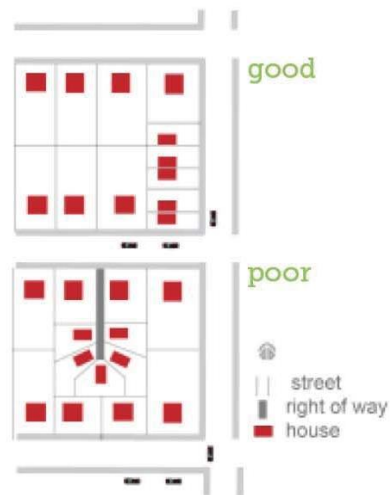


Example shows path connection that can connect between two topographically steep areas

# 04 Density and Lot Layout

The design of subdivisions, including the placement of streets (which forms the shape of blocks) and lots, is highly influential on the resultant quality of development once houses and other buildings are located there. Street layouts are described in Street and Path Connections above. To ensure the resultant density and layout of the development from subdivision delivers a quality place to live, the design should be consistent with the following guidelines:

- DL1 Ensure that all lots have frontage to a street (or a private way) with a width that is sufficient to enable the house to 'front' the street (or private way). No rear lots should be created.
- DL2 Ensure that for a cul-de-sac street, there is a maximum length of 120m and no more than 20 houses accessed from it. This will ensure that long lengths of disconnected 'dead end' streets are not prevalent in the subdivision design.
- DL3 Ensure that lots that have a boundary to an off road path, open space, river, or park are designed for the house to 'front' to that path, open space, stream or park with windows to a main living space. For example, orientating the local street alongside the path, open space, or stream to encourage house orientation towards it.
- DL4 Consider the provision of a range of lot sizes within the subdivision to provide for diversity in the house types and sizes to recognise the range of housing needs within Feilding.
- DL5 Ensure that larger (ie 2000m<sup>2</sup> or larger) lot layouts enable a future house to be positioned on that lot (or a further subdivision of that lot). For example, ensure a wide enough street frontage for a new house in the future.



Lot layout diagram - good example shows frontages for all and a two sizes of lots. poor example shows no frontage to small lots at rear.



Example shows frontage of residential properties to a park opposite - the street between the park and residential lots allows the good frontage.

- DL6** Ensure that the slope of the land, including those areas identified on the Structure Plans as Open Space/Slope Areas, is considered in the lot configuration. It is noted that the identified areas are indicative only (ie there maybe other areas outside those shown) and are typically for areas with a slope of greater than 12 degrees. Development on land with a slope of up to 30 degrees may be possible, but erosion potential increases with slope. The guideline is to provide a house site and access that does not require large scale earthworks in the form of large height cuts. For example, buildings may have pile foundations or lots are provided at larger sizes so houses can avoid being built on steeper sloping land (refer also to the Horizons One Plan provisions).
- DL7** Consider the natural land forms in Precincts 1-3 in the positioning of lot boundaries and roads to avoid straight-line boundary fences or roads that cut unnaturally across the landscape. For example, arrange to follow contours or along gullies.
- DL8** Ensure that Open Space/Slope Areas shown on the Structure Plan are considered as part of the subdivision stormwater management network. For example, providing for short term detention of water, overland flow paths or conveyance to watercourses, or soakage.

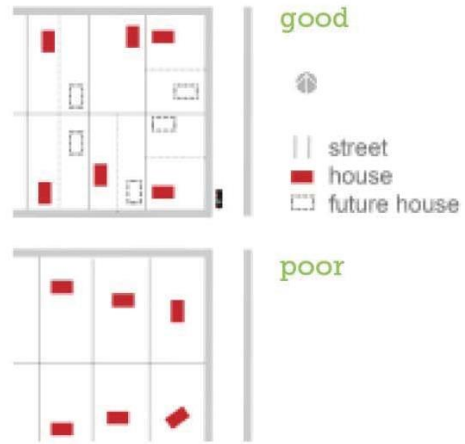


Diagram shows good arrangement of lots and house sites for the larger lot areas to enable later additional density. The poor example shows house sites not well located in terms of providing for future houses.

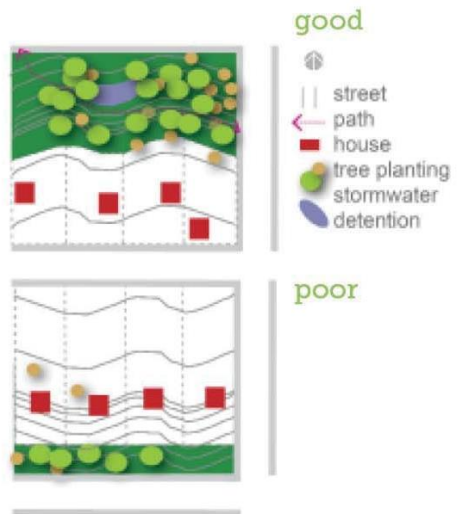


Diagram shows good arrangement of lots away from steeper land, less potential for fence lines cutting across contour, maintenance of vegetated slopes, ability to detain stormwater flow and a walking path link. The poor layout will require significant earthworks to create house locations and access, removes vegetation and will increase stormwater runoff.

# 05 Open Space and Natural Features

Precincts 1-3 include hillside land which is steep sloping and/or has existing vegetation which contributes to the visual amenity backdrop of Feilding. These hillside areas also contribute to the District’s ecological values, as well as stormwater runoff and erosion mitigation.

With the transition of currently rural land to residential uses in the Growth Precincts, there is also a need to consider the range of both formal and informal recreational and social needs of the people that will become resident and work there. In order for the resultant development from subdivision to benefit from the open space and natural features, as well as deliver a quality place to live, the subdivision design should be consistent with the following guidelines:

**ON1** Ensure that public open space is provided for within the growth areas that will provide a local purpose reserve area for residents of the area. The Structure Plans have nominated a location for these in each of the higher density Precincts as required. Other public open space areas may be provided – for example smaller ‘pocket parks’ can add to the amenity of a new residential area provided these parks are well positioned, sized and shaped.

**ON2** Ensure that public open space is located where it will have surveillance from houses, work places, passing vehicles or walkers/cyclists and is designed to be visually permeable from those streets and paths. For example, ensure that no fences are built, clear stemmed trees are used to form edges to the space to allow people to see out of and into the park, from surrounding streets.

**ON3** Ensure that within the nominated locations for open spaces on the Structure Plans, that the subdivision layout provides for future local centre business (typically small local shops). Also ensure future development does not obscure the open space behind. For example, by the placement of roads to gain shop frontages and allowing for parking on the street.

good



poor



Good example has small street between open space and house front - this allows for low/no fences, provide passive surveillance. The poor example has park at back of house - this leads to fences being built.



Structure Plans show locations for larger open spaces and locations for local shops in the future.

- ON4 Ensure that open space is provided for in association with river corridors, gullies, and sloping land for conservation purposes, and as appropriate, for public access and recreation purposes. In some circumstances it is recognised that open space will be private.
- ON5 Ensure that public open spaces, such as those associated with the river corridors, gullies or on steeper slopes, are formed as a network of spaces that allow for active modes of movement (such as walking, cycling, jogging)
- ON6 Ensure that the provision and planting of buffer areas, shown on the Structure Plans, are designed to reflect their role as entry areas to the town and are comprised of large sized street trees that are either underplanted or able to be mown beneath.
- ON7 Ensure that the Crime Prevention through Environmental Design (CPTED) principles are provided for in the subdivision design of open spaces. These can be found on Council’s website.

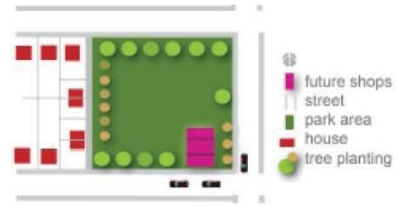


Diagram shows a new neighbourhood park with provision in future for shops. Note the small street at the park edge and smaller lots for houses to face the park



Example shows pathway beside waterbody in natural open space setting (photo Simon Devitt)



Example shows buffer planting of large street trees and underplanting of lower shrubs



# 06 Natural Hazards and Resilience

The growth areas of Feilding are located both on sloping and flat land where two watercourses (Makino Stream and Oroua River) flow. The natural hazards identified include flooding, liquefaction and erosion on the sloping areas. In order for the resultant development from subdivision to respond to these hazards and generate a resilient urban form, the subdivision design should be consistent with the following guidelines:

**NR1** Ensure that the Open Space/Slope Areas, as shown on the Structure Plans, are recognised and provided for in the layout of the subdivision to maintain some sloping land as open space (refer to Open Space and Natural Features Guidelines). This helps to reduce erosion from runoff and peak flows into water courses in flood.



The Structure Plan identify approximately the sloping areas - these are face or gullies. The photograph show a gully which runs out towards the floodplain from the hill Precincts

**NR2** Ensure that stormwater runoff from roads, driveways and building roofs is managed (refer to Stormwater Guidelines) to minimise discharge peak flows. For example, the use of detention capacity in open spaces, rainwater tanks for each house lot, and swales in streets (refer to Streets and Path Connections Guidelines).

**NR3** Ensure appropriate consideration is given to Horizons Regional Council flood hazard mapping, Building Act 2004, and any other relevant Regulations and Codes. Additional site investigations in the Precincts may be required to address these matters.



The Feilding town sits on a flood plain. It is important to plan new development to recognise hazards and to minimise the extent to which new development may exacerbate them

**NR4** Ensure that infrastructure resilience is considered in subdivision design. For example, by interconnected street access, alternative service (eg water or power) provision, and non-mechanised infrastructure systems.

# 07 Stormwater Management

Feilding has known stormwater management and flooding issues. Additional urbanisation can exacerbate this issue. The provision of extensive stormwater infrastructure adds to the cost of development. The use of “low impact” design techniques for stormwater management has the potential to be cost effective and minimise stormwater discharges. The subdivision design should be consistent with the following guidelines:

- SM1 Ensure that subdivision design for stormwater run-off from the subdivision area is considered in the context of the whole Precinct and considered as a network – for example shared detention systems or network linkages with adjacent areas.
- SM2 Ensure that stormwater neutrality is achieved in the subdivision. For example, through provision of a combination of open space areas, detention areas, swales, and other on-site management techniques.  
  
If the following stormwater management techniques are utilised stormwater neutrality may be achieved within a subdivision:
  - i) Providing 16m<sup>3</sup> of property level on-site stormwater tank storage which discharges via orifice control to 10m of ‘french’ drain or soakway drain within each property; and
  - ii) Roadside open drains to collect road runoff, directed to detention ponds located at subcatchment level to attenuate flows; and
  - iii) Providing detention ponds with sufficient capacity to retain the road stormwater runoff.

Alternatively, the developer will need to apply a robust alternative method of stormwater management which limits any increases in flows to the Makino Stream and Oroua River to:

  - i) A maximum impermeable area of less than 100m<sup>2</sup> per subdivision (including cumulative stages of the subdivision) contributing to the Makino Stream without mitigation; and
  - ii) Pre-development levels in the 1% annual exceedance probability (AEP) plus climate change flood to 2090 to the Oroua River.
- SM3 Ensure that stormwater networks being provided for as part of street design are incorporated into the subdivision design. For example, the collector and local road cross-sections provide a generic guide.
- SM4 Consider the benefit to stream water quality from stormwater management by minimising hard surface areas (such as parking, driveways, roads etc) and the use of swales and detention areas that gives runoff some settlement and filtering time prior to discharge
- SM5 Consider the management of roof rainwater and its potential for collection and use for garden watering.



Examples show the network process - collection of stormwater at source - to rainwater tanks from roofs and to swales from roads, the direction of that runoff to a filtering area and then its discharge finally through a re-vegetated local stream to the receiving water course.

## 08 Utility Services Networks

The Feilding growth precincts are intended to be more urban than rural in character. Being adjacent to the existing urban area the precincts can readily be connected with utility service extensions for waste water, water supply, stormwater and power, telephone and other utilities. Council plans the supply of its utility assets and any upgrading of capacity according to estimated demand and where this occurs in the network. In order for the design of utilities to be efficient and cost effective, the subdivision design should be consistent with the following guidelines:

- US1 Ensure that the utility provision as part of subdivision design coordinates with Council's wider network design provision.
- US2 Ensure the utility provision is planned for on a Precinct wide basis to provide for maximum efficiencies in the cost of implementation. This planning may include larger capacity infrastructure to provide for future connections.
- US3 Ensure that utility provision is for reticulated services including for waste water unless residential lots are larger than 5000m<sup>2</sup> in which case these may be able to be serviced on site (refer to Horizons One Plan).
- US4 Ensure provision of utilities by the subdivider/ developer where growth precincts are proposed to be advanced ahead of Council's asset planning and in the deferred areas of development as shown in Structure Plans.