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Dear Michael

PALMERSTON NORTH CITY COUNCIL – AOKAUTERE STRUCTURE PLAN

Introduction

Hudson Associates Landscapes Architects was commissioned by Palmerston North City Council to provide landscape and visual assessment advice as part of the background investigations for the Aokautere Structure Plan (the “structure plan area”). The structure plan area comprises 490 ha and is shown in *Figure 1* below.

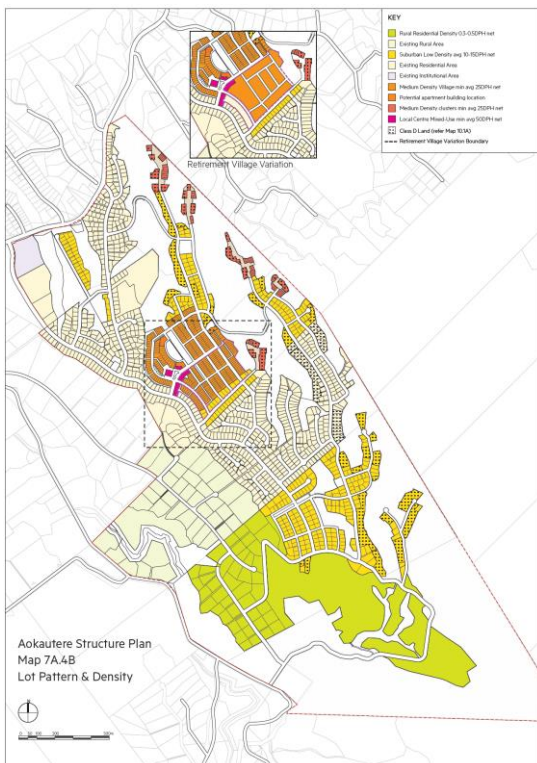


Figure 1. Aokautere Structure Plan



Figure 2 Area of Aokautere Structure Plan

My role has involved reviewing the existing character of the site and its locality, identifying and evaluating existing landscape attributes and considering the likely effects of urbanisation on landscape character and visual amenity within the structure plan area. I have also identified ways in which the landscape and appreciation of its character can positively contribute to the urban areas planned for the structure plan area.

The main purpose of this report is to recommend landscape areas and features to be protected, to identify opportunities to enhance appreciation of landscape character and visual amenity and for new landscape interventions to help shape a quality urban environment.

I consider the flat terraces and contrasting gullies to be the key landscape characteristics that define Aokautere landscape character of the structure plan area. The key outcomes I have sought through the proposed Structure Plan are to reflect the gully network in the urban design and roading layout by:

- a.* Developing a unique Aokautere identity that reflects the gully character
- b.* Retaining and enhancing the gullies and views of them
- c.* Contributing to a high level of amenity and quality lifestyle
- d.* Integrating landscape design with low impact stormwater management
- e.* Providing cycle and pedestrian networks

Executive Summary

The most important landscape elements to address within the structure plan process are the underlying (abiotic) landforms and the natural biotic patterns and processes that give distinctiveness to the landscape and will endure as land uses change. These include the gullies and flat terraces, the water runoff and the gully vegetation. Within this context, there are two main gullies generally running in a north-south direction plus at least six lesser gullies that separate the terrace landform covering most of the block.

At the eastern end of the block the landform takes on a hilly character as it rises to Bryants Hill and the lower slopes of the Tararua Ranges (*figure 5*). This hilly landform within the structure plan area is known as the Water's Block and is zoned for rural-residential development with discretion for sites 0.5ha or greater.

The key landscape elements of relevance to Plan Change G are:

1. The gullies, incised into the flat terrace plateau
2. The elongated terraces that separate and border the gullies
3. The escarpments forming the interface between each gully and terrace
4. The varying ages of native vegetation within the gullies
5. The rolling hills and meandering streambeds within the Water's block

The existing landscape character and visual amenity of the structure plan area is highly reflective of these land-shaping processes and forms. It was important therefore to ensure that the urban areas within the Structure Plan were complementary to existing landscape qualities, while managing the potential for effects from residential development. Those effects that need to be managed include:

1. Retaining public views and access to the gullies through roading design and lot layout design
2. Creating pedestrian and cycling opportunities through roading design
3. Enabling natural processes and treatment through stormwater capture, water sensitive treatment and design
4. Providing pedestrian linkages through the gullies for access and recreational benefit
5. Providing for connectivity within urban areas by residential block design

The Structure Plan seeks to protect and enhance landscape character and amenity values in the following ways:

1. Retain and enhance the natural gully network as an integral part of the design
2. Provide public open space reserves and access along the roads, gullies and stream networks
3. Adopt a residential layout and road alignments that enables views and appreciation of the gullies
4. Integrate stormwater collection, detention, and management with the urban and landscape design

Background

Palmerston North City Council has prepared a draft Structure Plan as part of Proposed Plan Change G to the Palmerston North District Plan. PCG responds to the Housing Capacity Assessment 2021 which was adopted by the Council in June 2021 and provides additional housing supply to help meet growth projections for Palmerston North over the short, medium and long term.

The Structure Plan has been prepared following best practice urban design principles and has included a master-plan based design process.

My role was to work alongside the urban design team at McIndoe Urban in a master plan design process, to deliver a Structure Plan which had regard to the existing landscape qualities of Aokatuere. The master plan approach has aimed to recognise the landscape character of the area and work with the other disciplines involved in order to create a design that responds to this character of the site and the needs of urban development. Co-ordination with the urban designer, ecologist, stormwater engineer, geotechnical engineer, acoustic engineer, traffic engineer, planners and counsel has been an integral part of the process, with landscape being fundamental in the overall design.

The Structure Plan is at **Attachment A**. Specifically, it includes:

1. Rooding layout and hierarchy
2. Indicative street cross section for each level of the hierarchy
3. Provision for pedestrians and cyclists
4. Retention of gully systems public open space
5. Block layout and lot layout design
6. A range of urban forms and densities
7. Walkway network
8. Stormwater design enabling capture, treatment and detention
9. Retail precinct
10. Area for potential use as a Retirement Village

Methodology

The methodology used for development of the structure plan involved a multi-disciplinary team which I participated in and contributed to throughout. The method was a reductionist approach by taking available information on all opportunities and constraints, creatively interpreting these with the urban designer into layout designs, then retesting with specialists to refine the design. The design was then tested through public input at an open day and further refined following feedback.

The process I undertook included; field work to familiarise with the site and context, a review of drone photography, study of contour information and GIS data, close liaison throughout with urban designer on layout and spatial design, consideration of ecological information following the ecologists assessment, close liaison with the stormwater engineer for roading and block layout design and placement of detention ponds, liaison with PNCC Park and Recreation designers for walkway, parks and open space location and design, receipt of advice from traffic engineers on roading design and road layout, alignment with land stability constraints as identified by

geotechnical engineers, liaison with the landowner for the Waters Block design, and liaison with PNCC planners throughout for co-ordination and technical expertise.

In order to guide my advice and contribution throughout the process, I made an assessment of the landscape character of both the wider and local area which informed my understanding of constraints and opportunities for design of the development within the Plan Change G area.

Aokautere Landscape Character Assessment

The landscape of Aokautere can be characterised as one of interfaces. At the broader scale this is interfaces between the foothills of the Tararua Ranges and the plains. At the local scale this is interfaces between the extensive flat pastoral terraces and the eroded gullies that dissect them. These interfaces create the opportunity for residential development that is distinctive and responsive to its context. The majority of the site is characterised by a plateau landscape dissected by deep gullies that are incised into the sedimentary river deposits of pumice sand and gravel.

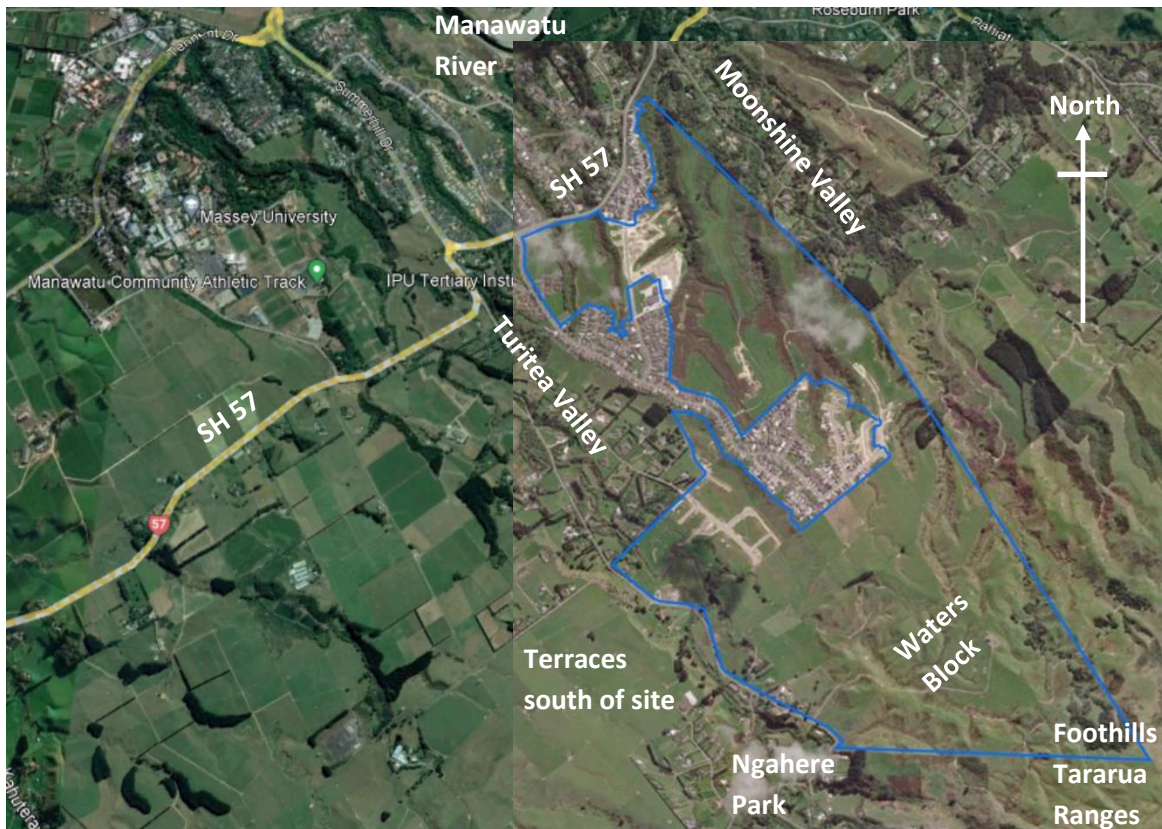


Figure 3 Wider context

In the larger context the site is contained by two valleys (Moonshine and Turitea to the north and south respectively), the Manawatu River and State Highway to the north-west and the climbing foothills to the east. Within this larger context lies the Massey University campus south-west of Turitea Valley, suburban housing west of the State Highway, rural-residential housing in Turitea and Moonshine Valleys and steep farmland to the north and east. The two escarpments that separate the

site from Turitea and Moonshine Valleys are the major landforms that define the northern and southern edges of the terrace plateau.

To the south of Turitea Valley the land rises again to continue the terrace formation, backdropped by lifestyle properties across the hills in Ngahere Park on the foothills of the Tararua Ranges east of the terraces.

North of the site and parallel to part of its northern edge is Moonshine Valley, which is a well-established lifestyle subdivision. It lies at a lower level and is separated from the site by an escarpment that defines the southern edge of the Valley. Properties within Moonshine Valley are typically 1-1.5ha which has allowed the establishment of larger trees and more extensive areas of vegetation than typically occurs within the other lifestyle areas such as Polson Hill to the north.

Between these two major escarpments of Moonshine and Turitea Valleys that bound the site, the terrace plateau is dissected by two major and many smaller gullies created through erosion into the pumice/gravel sedimentary material that makes up the geology of the site. These incised gullies are key elements in contributing to the unique landscape character of the site and are elements that have provided opportunities for the urban design to reflect the landscape character of the site. Due to their extended linear form and the flat terrace plateau between each gully, the opportunity has been taken in certain places in the layout design to create views of the gullies from the terraces and access to the gullies. Placing roads along the top edge of the escarpment in selected locations has enabled internal views within the gullies, while the overall east-west alignment of the main terrace roads has enabled distant views to the Tararua Ranges to the east.

This design approach is different to existing development on the Aokautere plateau which has turned its back on the terraces and filled them in some areas. The proposed approach is to recognise the existing gully landscape character as a positive feature and enhance the relationship to this through road design, block layout, stormwater design and recreational amenity. This occurs through the location of the roading network, open space and the local business zone, and allotment layout.

One of the effects of a layout where the road borders the gully is the reduced number of lots that are serviced by the roading infrastructure. Typically, a road is bordered on both sides by housing. This cannot occur where the road borders the gully, but the public benefit is an appreciation of the unique landscape in which the subdivision is located, which in turn adds value to it in terms of amenity and sense of place and possibly in terms of property values. While being a design feature, the extent of single sided roading has been limited due to terrace width and only covers a relatively small portion of the total roading proposed. However, it does provide for the visual and physical relationship to the essential elements that form the landscape character of the site and make the Aokautere terraces unique. The opportunity for the roading network to integrate with the landscape and ensure visibility and access by the public to the Aokautere gully network is an important feature of the plan change.

Input from the Geotechnical and Stormwater Engineers has provided guidance on constraints for the placement of roads and lots, with a 5m setback being recommended for stormwater purposes (and with related benefits for managing/avoiding erosion of gully slopes). Significant geotechnical issues have been avoided in preparation of the Structure Plan. The Waters Block has some geotechnical constraints when assessed in terms of slope, however the Geotechnical Assessment identifies that the land may have more potential to be developed, although specific geotechnical assessment will be

necessary in this area to identify suitable building platforms and specify any other necessary design requirements in the creation of rural/residential lots. Meandering streams or wet areas have been identified as part of the ecological assessments and will be protected through provisions requiring the vesting of the gully network and conservation allotments, to provide for development and restoration.

The effects that have been (and need to be) considered include:

- The effect of losing reference to the unique terrace landscape character
- The effect of minimising infrastructure costs for roading
- The effect of roading design on water quality
- The effect of roading design on users, including pedestrians and cyclists
- The downstream effect of un-detained stormwater flows and non-sensitive water design
- The effect of runoff on escarpment stability
- The effect of uniformity in lot density
- The effect of block size
- The effect of limited connectivity

Landscape opportunities and constraints

There are a number of physical components that shape the character of the structure plan area, which have been considered as part of the visual and landscape effects in the design of the Structure Plan. The following landscape opportunities and constraints have been identified:

- Slope - gradient
- Stability – geotechnical risk
- Water sensitive design – stormwater capture and treatment
- Access to gullies – visual/physical
- Terrace width – road and block layout
- Views – internal/external
- Amenity features e.g. open space throughout including in dense town centre cluster
- Recreational access and play spaces – distributed per density and utilising views
- Stormwater design utilising detention and amenity
- Streetscape design
- Walking and biking opportunities – within road cross section design and gullies
- Ecology – experience and restoration of native vegetation
- Opportunities for a wide range of housing designs, including intensive, individual, apartment and retirement village

Development responses/methods

The design strategy takes a landscape led approach that is centred on preserving the gullies, water sensitive design, walkability, connectivity, and high amenity streets. Water sensitive design has formed an integral aspect of the streetscape with raingardens and swales to collect water and detention ponds to improve water quality and reduce erosion in the gullies and downstream. Design treatments engaged to address the effects and the opportunities and constraints include:

- (a) Responding to the landscape context in design of the housing extension area. The extensive flat terraces interspersed by deep gullies, some of which are covered in regenerating native vegetation, provide the opportunity to appreciate the interface between the two. Public views and access to the gullies is a distinguishing component of the design of the Aokautere Structure Plan, along with road location and design, stormwater capture and controlled outlet into the gullies and walking access through them as part of the open space network.
- (b) Managing the pattern of residential development within the structure plan area to reflect topography and existing environment, with varied density in locations throughout to reduce homogeneity, increase owner diversity, meet varied market demand, and satisfy government housing policy. Potential for larger rural-residential lots are included in the Waters Block and Turitea Valley. The approach to these areas is discussed in further detail below.
- (c) Roading layout is designed to allow interaction with the gullies by crossing them in selected locations, while also abutting them in others. In several areas the road abuts the gully edge rather than following the centre of the terrace. This ensures that continuous housing along the gully edges is avoided, thereby protecting the public views along and across the gullies that are characteristic features of the context. This principle is discussed further below. Providing for visual and physical access to the gullies from the roads along the north-eastern peninsula enhances appreciation of this landscape characteristic. Open space play areas are located throughout the site to cater for local neighbourhoods. Walkways are also provided for in these locations to allow increased public appreciation and enjoyment of the open space that the gullies provide.
- (d) Creation of a connected network of open space including gullies and ridges has been designed in conjunction with the stormwater collection and retention system to allow for multi-use of the space where feasible. Walkways and recreation areas have considered views of and connection to the gullies
- (e) Maintenance and enhancement of high visual amenity in areas such as the streetscape design has been incorporated to provide for connection with the gullies or to enhance the amenity of the road through street tree planting, rain gardens and traffic calming through road width
- (f) Adopting a block size that allows easy walking connection and integrating this with connection to open space. Blocks of no more than 250m have been used for blocks with larger residential lots, with smaller block size of approximately 100m for denser areas. Extended blocks can deter walking due to the difficulty in gaining access off the main road. The current situation on Pacific Drive has some extended blocks of over 300m between exits, which reduces amenity and discourages walking.
- (g) Potential for diverse housing opportunities including a retirement village occupying an entire block in proximity to the commercial centre. If well designed to interact with the commercial centre and the surrounding street pattern, this has the potential to fit into the structure plan concept

Roading

The roading hierarchy reflected in the Structure Plan distinguishes the range of activity levels in the design and consequently provides opportunity for varied cross sections and neighbourhood characteristics. Narrower carriageways are incorporated into less busy areas in the Aokautere area and rain gardens are incorporated along many streets. These provide an essential contribution to stormwater treatment through primary filtering of road runoff while also providing the opportunity for amenity enhancement of the roading corridor. Extensive low level planting is envisaged as part of the design in addition to the regular planting of street trees to define and enclose the carriageway. Rain gardens are further interspersed with parking bays to provide for on street parking. The rain gardens are designed as part of water sensitive design. They also reduce the dominance of vehicles and increase the dominance of vegetation and the amenity within the street.

Two gully crossings are proposed. These crossings provide necessary links between peninsulas that allow for multiple access. They also overcome the current situation in Aokautere whereby the entire existing development is essentially a cul-de-sac. The northern crossing will link from Johnstone Drive while the centre crossing will link from near the village centre across to the extensive north-eastern peninsula.

In addition to providing for essential traffic circulation, the cross-gully links allow for public experience of the gullies, their topography and the native vegetation along the northern route. Being one of the fundamental characteristics of the landscape context, the gullies are seen as an asset that enhance the distinctive qualities of Aokautere. Enabling public experience of them through road crossings, which incorporate pedestrian access (as discussed below), is a desirable landscape outcome of the design. This provides access to the views across and within the gullies to *[figure 4 below]*.



Figure 4. Typical view across one of the gullies within the Aokautere Structure Plan site.

A gully edge roading occurs on the south-eastern peninsula where approximately 250m of road has large lot residential on one side of the road and gully on the other. In this particular location the abutting is due to the narrowness of the peninsula rather than a deliberate design intent, but the

outcome does allow for public appreciation of the wider context as seen from the road (similar to the approach in other areas where gully views have been maximised through roads abutting their edges).

Road widths vary with deliberate provision for cycle access either on the carriageway or on wide shared pathways, depending on the roading hierarchy. In the less busy roads, cyclists share the pedestrian area, which is widened to cater for dual use. These road users are separated from the carriageways by linear rain gardens, providing safety from vehicles and allowing enhancement of the pedestrian/cyclist experience through placement away from the vehicle movements.

Stormwater

Stormwater design has been integral within the landscape design. Detention ponds have been designed according to the local catchment size and placed in conjunction with this catchment size and landscape considerations for views and proximity to open space such as recreation areas. In some locations, these detention ponds are incorporated into the edges of the gully systems while in other locations they have been designed into the playground/open space areas. As detention ponds need to provide for stormwater levels that are only occasionally experienced, they can also function to enhance an open space or playground most of the time, with suitable safety requirements needing to be met in the design. These additional benefits have been considered where feasible within the Structure Plan with the facilities placed and sized with this dual function intent at least from a landscape/design perspective.

Stormwater is also gathered by cut-off channels along the gully edge upper contour that abuts residential lots. This is to limit the uncontrolled flow of additional runoff that will occur through roofing and hard surfaces. Storage of this water in detention ponds will mainly occur above the escarpments and can be designed as a new element into these landscape features as reflected in the Structure Plan.

Residential

Residential density has been varied across the site. Greater density is typically located close to the urban centre, with the provision of retail space and open space for amenity purposes planned around the town centre. Two storey housing is anticipated, with smaller lots. A dense cluster is also provided for at the end of each main terrace, with multi-storey anticipated in order to take advantage of views to the gullies and wider area. A retirement village could be located in this area but should be designed to complement the Structure Plan design including integration with the roading network, local business zone, and open spaces and reserves. The variation in housing density and typology is anticipated to allow diversity in terms of affordability, socio-economic profile, and demographics. Blocks have been designed to avoid rear lots, which detract from connectivity to the streetscape.

Village

Housing density increases proximate to the village centre, which incorporates the local business zone area. Open space has been a feature of the design in this area, with a semi-circular lawn adjacent to a long linear wetland both being deliberate elements expressing the local landscape character of this area. The linear wetland aligns with a natural watercourse that has been modified by previous development in the area. Reinstatement of this feature as an amenity design feature is in accord with building on the natural landscape characteristics of the site, while the semi-circular lawn is in recognition of the greater formality of the density of housing in that particular area. The local business

area has a triangular area of open space at its centre which incorporates the needs of traffic flow and parking, but still provides local landscape amenity. This assists with the centre becoming an attractive, and accessible central focal point or hub for the surrounding community. Potential exists for placement of a retirement village in proximity to the local business area, but it would need to be well designed to integrate with the Structure Plan (which includes a precinct plan for a proposed neighbourhood centre), which has been comprehensively planned through a multi-disciplinary process.

Rural-Residential

Rural residential lots of no less than 0.5ha have the potential to be located at the eastern end of the development in the Waters Block. Design of these will be driven by the geotechnical constraints of the rolling land plus the sinuous network of wetlands that fill the gullies. Although currently grazed, this wet network provides potential for restoration and has been separated out into its own lot for a possible reserve. Access to these eastern lots can be either via the connection to Turitea Valley Road or via Pacific Drive. These larger lots complement the range of lot sizes throughout the whole new Aokautere development. This area of rural-residential lots creates an interface between the urban density of the suburban area and the rural area of the Tararua foothills. Views of the area external to the site are readily obtained from these rolling sites, complementing the internal gully views experienced within the site. This area also extends the design principle of providing for diversity in terms of size, potential cost and demand.

Rural residential lots are also provided for in the southwest of the Structure Plan adjacent to a new roading link off Valley Views Road. This proposed development extends the current theme of rural-residential living in that area with the new link providing for internal access up onto the Aokautere terrace. This link connects the rural-residential allotments to the proposed shopping centre without having to access the state highway network. This rural residential area has been designed to integrate with the landscape character of the area, which is typified by open space as its main rural amenity characteristics. The varied topography, wetland systems and roading layout have been recognised in design of the Structure Plan, and connectivity has been provided to integrate this area with the adjacent terrace development.

Visual Catchment and Viewing Audience

Despite its elevation in relation to Palmerston North city and SH57, external views into the structure plan site are limited. This is due to a lack of elevated viewpoints and also due to the extended flat nature of the plateau. The edges of the terrace can be seen, which are the escarpments above Moonshine and Turitea Valleys but visibility beyond these is difficult. Existing housing lines the southern edge of the plateau so views up from Turitea Valley into the Structure Plan area are limited. Some views from the farmed terraces south of Turitea Valley are from a similar elevation as the site, but their visibility of the site is limited by existing development along the top of the Turitea escarpment. Parts of the site can be seen from selected locations in Ngahere Park (*see figures 3 above and 6 below*), with its elevated viewing position providing views across the wider Palmerston North landscape. The ability to see the site from these distant external views is not necessarily a negative thing as it is seen as an extension of an already developing area.

Elements of development may be partially visible from small areas of Moonshine Valley. Elevated parts of the multi-storey developments at the northern end of the terraces may be visible as part of the escarpment backdrop between Moonshine Valley and the plateau. Residents within these multi-storey buildings would gain extensive views, with any visibility into Moonshine properties being very limited by existing vegetation. Conversely, distance and existing vegetation would limit any perceived 'overlooking' of the Moonshine Valley (a point raised in feedback as part of the Structure Plan process), to the extent it occurred, if at all. Longer views from properties in Polson Hill Drive may see some development within the site, but this would be limited by existing vegetation and distance.



Figure 5 View from Moonshine Valley (Whiskey Way) towards escarpment with plateau beyond

Internal views from existing houses within the Aokautere plateau will occur where these properties gain visibility of the site. Further development is already occurring within these views as Aokautere expands and development in the Structure Plan area is an extension of existing development. The change from a rural pastoral plateau to urban is likely to occur anyway, either through extension of the current housing style or through implementation of housing through the structure plan.

Views from Turitea Valley will change due to the extension of lots accessed off Valley Views Road and Turitea Road. Creation of additional lots off Valley Views Road is already occurring and additional rural-residential zoning is already in place, so the changes are anticipated and in keeping with the current context. Additional rural-residential land will be visible from Turitea Valley Road as will the new access road providing a link up the escarpment to the plateau. Valley Views Road does not join this new connection road, which is a deliberate decision in order to prevent traffic through flow. This additional roading and the additional lots are a further extension of the rural-residential character that already exists through Valley Views and the current extension of this on the escarpment separating the valley from the plateau.

While the additional work will bring about change into Turitea Valley, the character is gradually changing and the new additions are of a rural-residential character, which is in keeping with the context. Effects on views have been managed by Lot size and design in conjunction with geotechnical slope and stability mapping. Lots within the Waters Block vary in size according to the topography, with boundaries aligned according to access and topographical/geotechnical constraints. Roding alignment has been prepared having regard to geo-technical advice to ensure suitable stability. To maintain the rural character of Turitea Valley, no areas of urban housing are provided for in the valley.

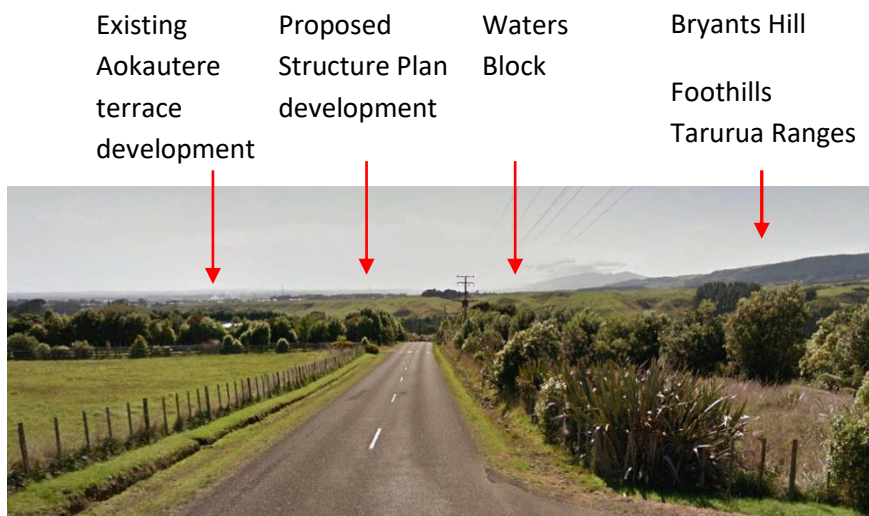


Figure 6 View from Ngahere Park Rd looking north to Aokautere plateau

Limitations

This report does not address cultural heritage or Maori values as these are being addressed in other reports. Limitations on site access existed in some parts of the site and these were addressed by extensive use of high-resolution drone and aerial photography plus GIS mapping and detailed contour information. Reliance on geotechnical, hydrological and traffic engineering advice has been included throughout the design process.

Conclusion

The pronounced differences between the flat terraces and incised gullies give the Aokautere plateau its unique landscape character. Recognising these features as opportunities is the underlying factor behind the landscape driven design for the structure plan. The limitation they represent in terms of standard flat residential design is seen as a benefit in terms of offering an alternative approach to urban design led by the physical abiotic and biotic characteristics of the site. The integrated approach of considering landscape character, water sensitive design, multi functioning road design, geotechnical mapping, traffic engineering, retail requirements, housing variety and housing policy have all been combined to create the urban design proposed in the structure plan.

In my opinion, this represents a coherent and forward-looking design that is landscape led but acknowledges the multitude of aspects that contribute to a future development that provides diversity and contemporary urban design.

ATTACHMENT A

DRAFT AOKAUTERE STRUCTURE PLAN

