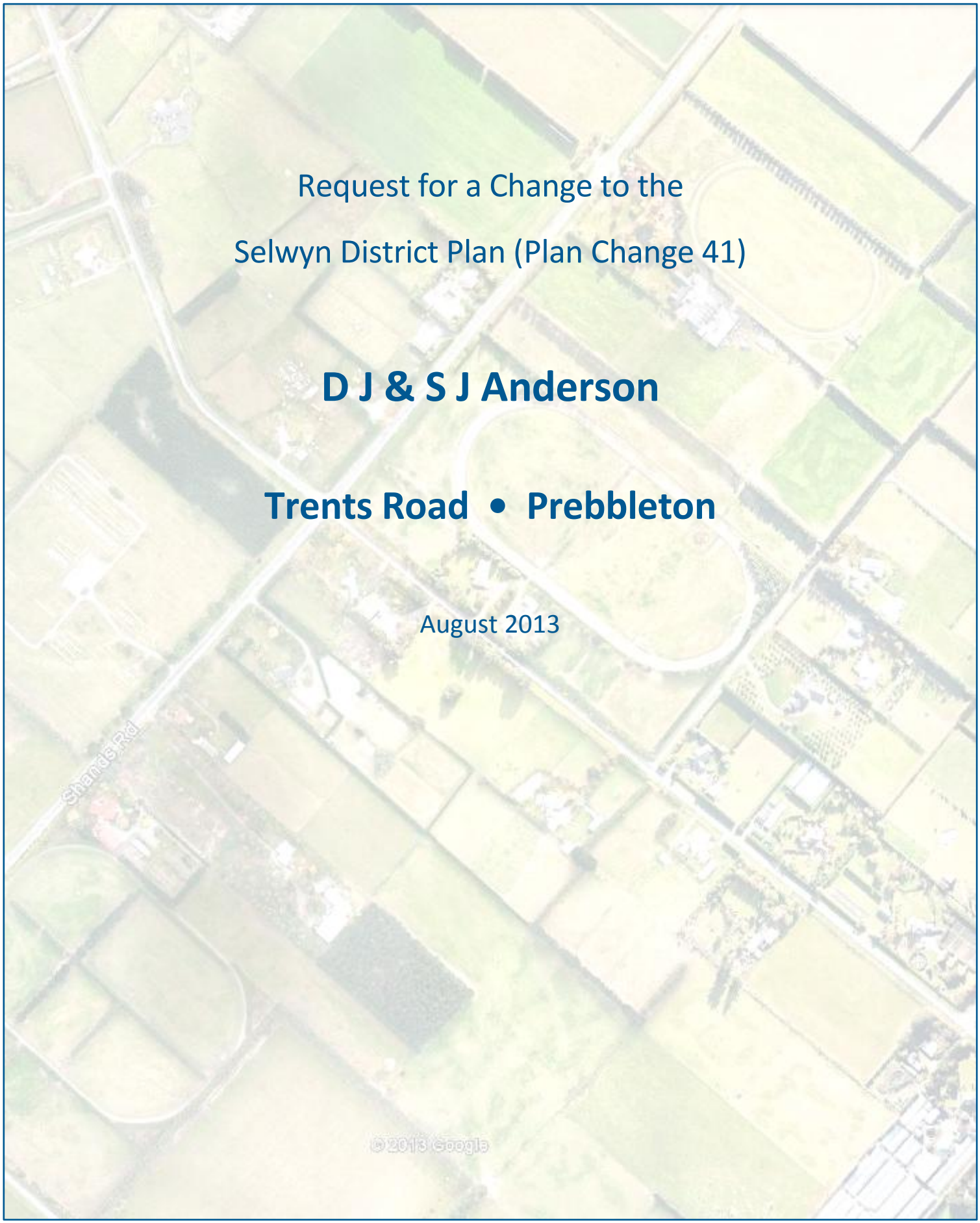
Request for a Change to the

Selwyn District Plan (Plan Change 41)

D J & S J Anderson

Trents Road • Prebbleton

August 2013



Request To Change the Selwyn District Plan under Clause 21 of the First Schedule of The Resource Management Act 1991

TO: The Selwyn District Council

D J & S J Anderson request changes the Selwyn District Plan as detailed below.

1. **The location** to which this request relates is:

Legal Description:	Lot 2 DP 51743
Total Area:	9.2 hectares
Address:	311 Trents Road
Location:	North east corner of Trents Road and Shands Road, Prebbleton

2. **The Proposed Plan Change** undertakes the following:

1. Amend Selwyn District Plan Planning Plan Sheets 1 and 2 of Maps 14,125 and 127, by rezoning Lot 2 DP 51743 on the north east corner of Trents Road and Shands Road from Inner Plains to Living 3.

2. Insert new Outline Development Plan, Trents Road, Prebbleton in Appendix 19 of Volume 1 Townships as illustrated in Attachment 1 as "Living 3 Zone, Trents Road, Prebbleton – Outline Development Plan".

3. Amend Part C, Living Zone Rules – Buildings, permitted activity rule 4.2.2 in Volume 1 Townships as follows:

For the Living 3 Zone at Rolleston <u>and Prebbleton</u> identified on the Outline Development Plans in Appendix 19, 39, and 40 the following shall apply:

4.2.2 Any principal building shall be a permitted activity if:

i. That apart from one vehicle crossing and access not exceeding 100m2 in area all land within the setback areas from roads as specified in Rule 4.9.<u>31</u>(i) <u>and 4.9.34</u>, excepting State Highway 1, will be devoted to landscaping; including the provision of at least one specimen tree capable of growing to at least 8m high being planted for every 10 metres of frontage and to be spaced at no less than 5 metres and no greater than 15 metres. The area between all road boundaries (other than with State Highway 1) and a line parallel to and 15m back from the road boundary is landscaped with shrubs and specimen trees covering as a minimum the lesser of 30% of the area or 250m2; and

ii. The number of specimen trees in this area is not less than 1 per 10m of road frontage or part thereof; and

iii. The trees are selected from the list below planted at a grade of not less than Pb95; and

iv. Shrubs are planted at 'aa' grade of not less than Pb3 and a spacing of not less than 1 per square metre, typically located within a garden area dressed with bark chips or similar material; and

v. Any paved surface area within the area does not exceed 100m2 in area.

vi. The list of suitable specimen trees for the purpose of this rule is:
— Maple, Silk Tree, Alder, Birch, River She Oak, Leyland Cypress, Monterey Cypress, Lacebark, American sweet gum, Magnolia, Pohutukawa, weeping Kowhai, Common Olive, Pine, Lemonwood, Kohuhu, Ribbonwood, Plane, Totara, Poplar, Oak, Elm, Michelia

vii. The Council will require a planting plan to be submitted at building consent stage, prepared by a suitably qualified landscape professional, identifying compliance with the above control.

viii. The landscaping shall be maintained and if dead, diseased or damaged, shall be removed and replaced.

Note: Rule 4.2.2 shall not apply to allotments of 4ha or greater in the Living 3 Zone identified on the Outline Development Plan in Appendix 39 and 40.

4. Replace Part C, Living Zone Rules – Buildings, permitted activity rule 4.2.3 in Volume 1 Townships with the following:

4.2.3 Any Fencing in the Living 3 Zone shall be limited to a maximum height of 1.2m, be at least 50% open, and be post and rail, traditional sheep, deer fencing, solid post and rail or post and wire only;
Except that nothing in the above controls shall preclude:

i the use of other fencing types when located within 10m of the side or rear of the principal building. Such fence types shall not project forward of the line of the front of the building.

ii fencing required by an Outline Development Plan and/or rule in this Plan as a noise barrier

5. Insert Appendix 41 Indicative Road Cross Section – Living 3 zone and Fencing Typologies as contained in proposed Plan Change 32 to Volume 1 Townships.

6. Add a new permitted activity rule in 4.9 **Prebbleton** Buildings and Building Position after 4.9.12 as follows:

Prebbleton

4.9.XX Any building in the Living 3 zone Trents Road, Prebbleton (as shown on the Outline Development Plan in Appendix 19) shall be set back at least:

(i) 15 metres from any road boundary except on corner lots a minimum setback of 10m applies to one road boundary

(ii) 5 metres from any other boundary

7. Add a new permitted activity rule in 4.9. Buildings and Building Position as follows:

Living 3 Rural Residential – Shands Road, Noise Mitigation

4.9.XX For the purpose of protection against traffic noise intrusion from Shands Road any dwelling, family flat and any rooms within accessory buildings used for sleeping or living shall be located at least 25 metres from Shands Road and physical acoustic barriers shall be established in the locations indicated on the Outline Development Plan, Trents Road, Prebbleton in Appendix 19. The finished height of any acoustic barrier shall be no less than 3 metres above the adjacent ground level of any residential lot. The mass of any acoustic barrier shall be 8-10 kg/m^2 and shall be constructed and maintained with no gaps in the barrier construction or at ground level.

8. Add the following to Part C, 4 Living Zone Rules - Buildings, Reasons for Rules, Building Position

The requirement in the Living 3 Zone, Trents Road, Prebbleton, for a larger building setback from Shands Road and a noise attenuation structure near the Shands Road boundary and 25m along the adjoining side boundaries, has the purpose of reducing adverse noise impacts of Shands Road traffic on residents and any consequential reverse sensitivity effects.

9. Amend Part C, 12 Living Zone Rules-Subdivision, Standards and Terms, Effluent Disposal 12.1.3.4 as follows:

Any allotment created in: Castle Hill, Doyleston, Lake Coleridge Village, Leeston, Lincoln, Prebbleton, Southbridge, Springston, Tai Tapu and West Melton, or is within a Living 3 zone is supplied with reticulated sewage treatment and disposal facilities.

10. Amend Part C, Living Zone Rules – Subdivision, Standards and Terms, Prebbleton 12.1.3.28 as follows:

In the Living 1A, 1A1, 1A2, 1A3, 1A6, LX ~~and 2~~A and 3 zones in Prebbleton, any subdivision is in general accordance with the respective concept and/or Outline Development Plans in Appendix 19.

11. Add a new Rule 12.1.3.42 in Volume 1 Townships

12.1.3.42 Any subdivision in the Living 3 Zone on Trents Road, Prebbleton shall be in general accordance with the Outline Development Plan Trents Road, Prebbleton in Appendix 19.

12. Add the following to Table C12.1 for Prebbleton:

Township	Zone	Average Allotment Size Not Less Than
Prebbleton (Trents Road)	Living 3	Between 5000m^2 and 1ha

13. Add new Living 3 Zone Assessment Matters as follows:

- *The extent to which features that contribute to rural character, including open space and plantings, have been retained or enhanced.*
- *Whether fencing, roading (including cross sections and typologies) and utilities reflect the semi-rural nature and level of service appropriate for rural-residential areas.*
- *The extent to which any identified natural hazards and/or constraints, including flood and liquefaction hazard areas have been addressed.*
- *Whether overall densities based on the level of development and open space anticipated for rural residential living environments have been achieved*
- *Whether provision is made for safe connections and linkages between the subdivision and adjoining Townships to enable access to public transport and community and commercial facilities.*
- *Ensure connections to reticulated water and wastewater services are available at all property boundaries and appropriate measures are available to effectively treat and dispose of stormwater.*

14. Any other consequential amendments including but not limited to renumbering of clauses and District Plan maps as appropriate

15. It is noted that with the proposed Changes to the Selwyn District Plan currently proposed through the Land Use Recovery Plan that the numbering of some rules and appendices may need amending before adoption.

DATED: 15 August 2013

.....
(Signature of applicant or person authorised to sign on behalf)

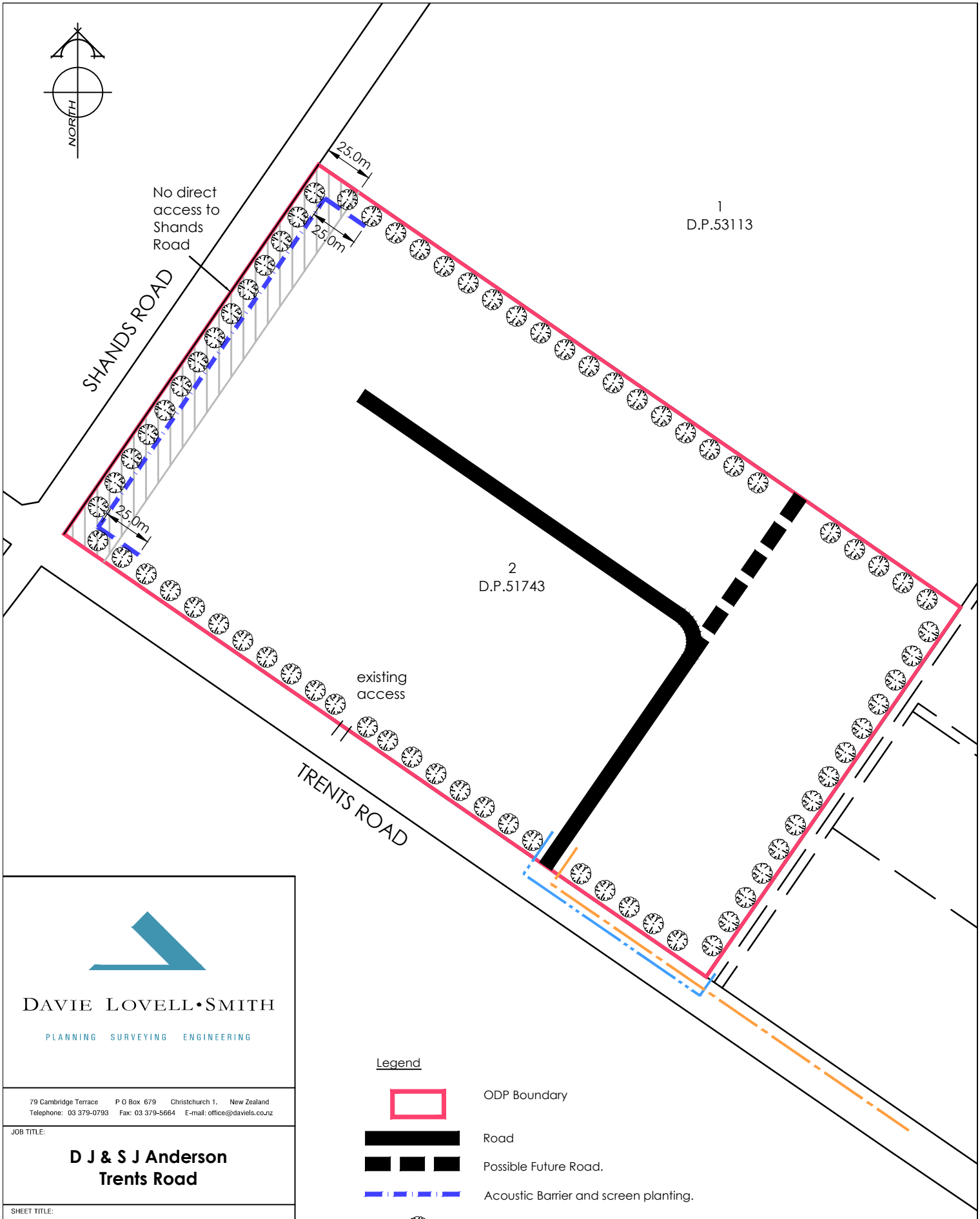
Title and address for service:

D J & S J Anderson
c/- Davie, Lovell-Smith
PO Box 679
Christchurch 8140
Attention: Patricia Harte
Telephone: (03) 379 0793
Email: Patricia.Harte@dls.co.nz

Address for the applicant and all Council fees:

D J & S J Anderson
Trents Road,
R.D.6
Christchurch 7670
Telephone: (03) 349 6356
Email: dave-sue-anderson@xtra.co.nz

Attachment 1 – Proposed Outline Development Plan



Legend

- ODP Boundary
- Road
- Possible Future Road.
- Acoustic Barrier and screen planting.
- Trees to be retained.
- Dwelling setback for noise mitigation.
- Sewerage to connect to existing SDC system.
- Water to connect 150Ø line.

DAVIE LOVELL•SMITH

PLANNING SURVEYING ENGINEERING

79 Cambridge Terrace P O Box 679 Christchurch 1. New Zealand
Telephone: 03 379-0793 Fax: 03 379-5664 E-mail: office@daviels.co.nz

JOB TITLE:

D J & S J Anderson
Trents Road

SHEET TITLE:

Outline Development Plan

SCALE : 1:2500@A4 DATE : August 2013

CAD FILE : J:\16845\Plans and CT\ODP r1.dwg REVISION : R1

DRAWING No : P.16845 SHEET No:

TABLE OF CONTENTS

Appendices

	Resource Management Act 1991 **Selwyn District Council** Selwyn District Plan	Plan Change **P41**
Private Plan Change Request – D & S Anderson		
References: Selwyn District Plan Volume 1: Townships Part C – Rules, Fencing and Subdivision Part E – Appendices, Outline Development Plan Planning Maps District Plan Maps 125 and 127		

1 Introduction

D & S Anderson requests a change to the Selwyn District Plan by rezoning 9.2 hectares of Rural Inner Plains land to Living 3 southwest of Prebbleton.

This document forms the Section 32 evaluation of the plan change, consisting of an evaluation of the contents of the Proposed Plan Change, and incorporates material from the following documents:

- Davie Lovell-Smith Infrastructure Report –– (Appendix A);
- Graham Densem Landscape and Visual Assessment– (Appendix B)
- Riley Consultants Geotechnical Assessment –(Appendix C);
- Davie Lovell-Smith Preliminary Site Investigation, Soil Contamination (Appendix D)
- Novo Group Acoustic Assessment – (Appendix E)

1.1 Planning Background

As one of the fastest growing districts in New Zealand, provision for rural residential development has been an issue in Selwyn District for some time. The extensive rural areas of the district and the proximity to greater Christchurch urban area has made the eastern extent of the district highly desirable for 'rural residential' living. In the face of this pressure, the District has maintained strong policies to avoid development encroaching on versatile soils and to preserve compactness of its townships. The Canterbury earthquakes have also added critical pressure on the district to provide land for residents who have been displaced.

The policy history for rural residential development in Selwyn has been a long and complex one. Selwyn District provided for this in the past either specifically through private plan changes or resource consents relating to specific site/s or generally through identified zones within the Transitional District Plans prepared under the Town and Country Planning Act 1977. These rural-residential zones provided for allotments of 5000m^2 to 2 hectares in size whereas lot sizes have varied considerably for rural residential use established by resource consent e.g. 0.2 to 4ha. Where rural-residential zones adjoined existing towns, the Selwyn District Council in their current District Plan extended the urban limits to include these zones. Where they were set apart from towns, even by a small distance, these zones were provided as "Existing Development Areas" within the Rural Zone of Selwyn District Plan. In many cases these areas are not serviced with reticulated sewerage.

In 2007 Dave and Sue Anderson approached the Selwyn District Council with a view to development of their property on the North West corner of Trents and Shands Road for rural residential purposes. At the time the Council indicated that a plan change was an option, but suggested that they wait until the Council had developed its response to Proposed Change 1 to the Canterbury Regional Policy Statement (CRPS). The proposed change brought the recommendations from the Greater Christchurch Urban Development Strategy (UDS) into a statutory planning context and identified various growth areas. Relevant matters within Proposed Change 1 to the CRPS included the identification of growth targets for Selwyn District, the number of rural-residential households to be provided for, and the circumstances in which rural-residential development is appropriate.

The targets outlined in PC1 framed the context for several plan changes to the Selwyn District Plan, a Structure Plan for Prebbleton and a Rural Residential Background report, all of which the Andersons participated in by way of formal and informal submissions. Plan Change 17 (PC17) initiated by the Council recommended rezoning of six areas to accommodate approximately 170 rural residential households around the district. These were chosen for their suitability to integrate with existing townships. There has been significant controversy associated with this approach, as it appeared PC17 precluded other areas which were equally suitable for similar rural residential development, the application site being one of many.

Around this time two privately initiated plan changes (PC8 and PC9) were granted for 148 rural residential households. This significantly affected the context of PC17 as the 200 rural residential households projected by PC1/Chapter 12A were (in theory) now largely allocated to PC8 and 9 areas. As a result of approving these plan changes, most areas that were in PC17 will now need to be deferred until 2016. This is due to the Council potentially being unable to give effect to Chapter 12A should any new plan change requests for rural residential development propose a combined total of over 52 potential households.

Post-Earthquake Policy Context

1.1. The planning climate for development was further affected by the Canterbury earthquakes. This period saw PC1 of the CRPS being made operative (Chapter 12A), giving more surety to development. As a result of this, as well as PC 8 and 9 becoming operative, the Council withdrew PC17 and replaced it with Plan Change 32 (PC32). This new plan change provides for rural residential development at a policy level and steps away from allocation by promotion of specific zonings, but rather provides for privately initiated plan changes on a 'first come first served' basis.

1.2. It is noted that since notification of Proposed Plan Change 32 that Chapter Part 12A of 1998 Operative Regional Policy Statement, which deals with the "Development of Greater Christchurch", is no longer part of that RPS as a result of a Court decision. Proposed Change 1 to the RPS dealing with the same matters has (along with appeals to PC1) been revived but has been put aside while a Land Use Recovery Plan under the Canterbury Earthquake Recovery Act 2011 is prepared. While it is possible that this Recovery Plan will address rural residential development, it is expected due to time constraints in particular, that it will not do so in a manner that differs significantly from the PC1 or Chapter 12A approach. For this reason the applicants have chosen to take the initiative and request rezoning of their land for rural residential development.

2 The Environment

2.1 The Application Site

The land to be rezoned is a single property with a site area of 9.2 hectares and is on the northwest corner of Trents and Shands Road, south west of Prebbleton. The address is 311 Trents Road and the legal description is Lot 2 DP 51743, CT 30B/235 refer Figure 1 below.

The land to be rezoned is primarily used for residential and horse training, as shown in the aerial below. The property currently has access onto Trents Road some 175meters from the intersection with Shands Road.

Existing shelterbelts can be found along many of the internal boundaries of the site, as well significant plantings along the south (Trents Road) and western (Shands Road) boundaries of the site. The topography of the site is flat. The property is currently divided into a number of horse holding paddocks, a large raining track for trotting horses. In addition there is a house and a small table complex.

A detailed description of the site is contained in the Visual and Landscape Assessment by Graham Densem in Appendix B.

Figure 1 – GoogleMaps Aerial of Site (May 2013)

2.2 The Surrounding Environment

Prebbleton township is located to the northeast of the site – see Figure 2. The urban limit of Prebbleton, as defined in Proposed Change 1 of the Canterbury Regional Policy Statement, is approximately 670m to the northeast. The land in between this urban limits boundary and the site is the Kingcraft Drive "Existing Development Area" (EDA) which contains 40 properties all with substantial dwellings and curtilage. Access to the EDA is via Trents Road and Blakes Road but there in connection through the block.

To the north is a lifestyle property with a single house, which has frontage onto Shands Road. Along the southern boundary of the site is a Selwyn District Council water race which drains water to the east Opposite the site the property is used as a nursery and for tree propagation. To the west across Shands Road are various lifestyle properties.

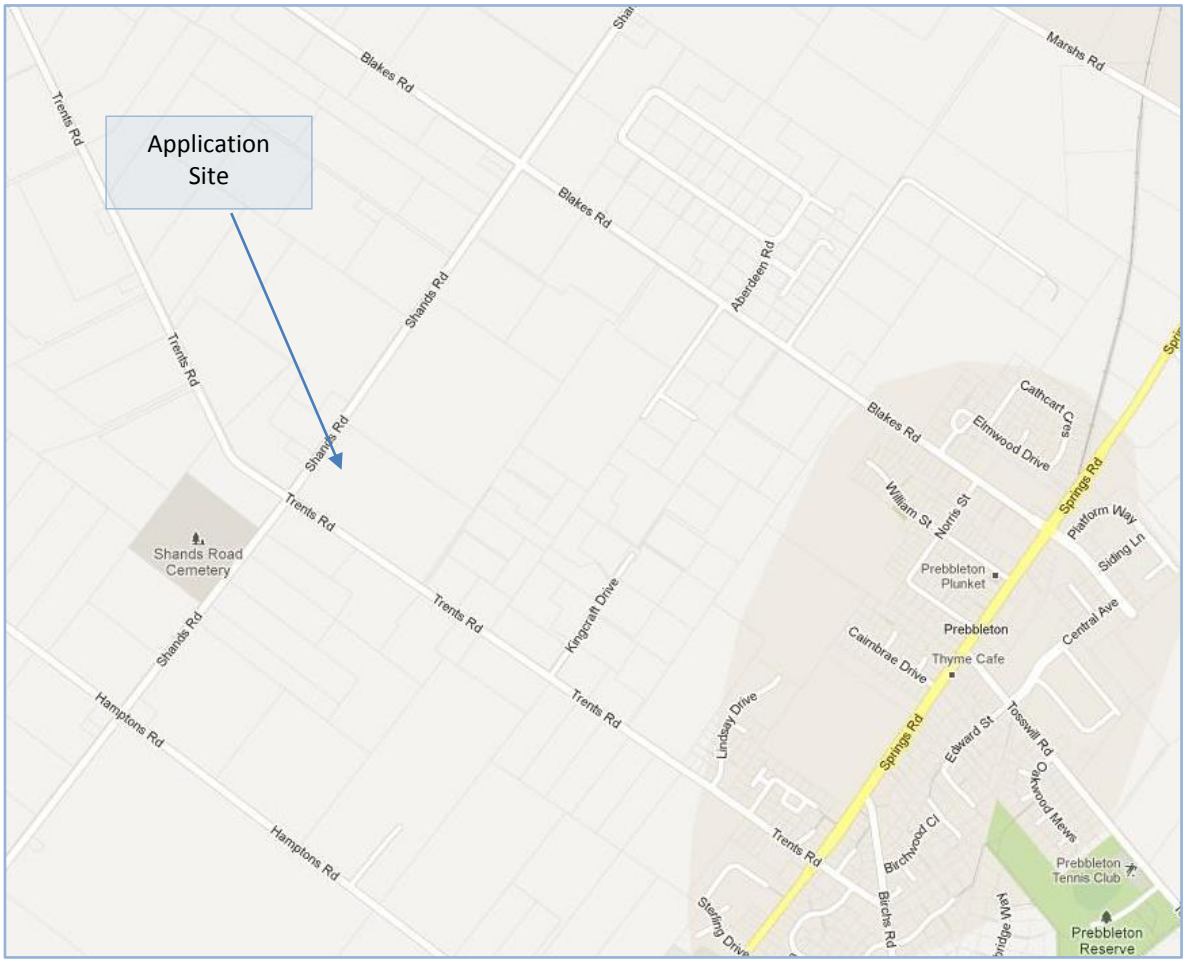


Figure 2 - Location Map

3 The Plan Change

3.1 Description of the Proposal

It is proposed to rezone approximately 9.2 hectares of Rural Inner Plains land to Living 3. This provides the opportunity to develop approximately 16 rural-residential allotments all accessed from Trents Road. The allotments are to be developed with an average area of between 5000m^2 and 1ha in accordance with the definition of rural-residential development and as proposed for this Living 3 zone.

An Outline Development Plan (ODP) has been prepared for inclusion in the District Plan. The ODP provides for:

- Road access from Trents Road, with potential link to the land to the north.
- An internal roading providing access to allotments.
- An acoustic fence along the Shands Road boundary which is to be screened by planting
- Setback of houses from Shands Road to mitigate noise impacts
- Retention of perimeter trees

3.2 Servicing

Servicing of the development will be by reticulated Council services. Details of the infrastructure requirements for the development are contained in the Infrastructure Report in Appendix A and are summarised as follows:

- Sewerage connection via a rising main which connects to Council's Pump Station at Waratah Park on the corner of Trents Road and Lindsay Drive.
- Water reticulation from extension of a water main in Trents Road on the south east corner of the site.
- Stormwater treatment and disposal for stormwater from road, roof and hardstand, by swales and discharged to soak holes within the site.
- Power reticulation from Trents Road.
- Telecommunications reticulation from Trents Road.

3.3 Proposed Amendments to the District Plan

The following amendments to the Selwyn District Plan are proposed:

1. Amend Selwyn District Plan Planning Plan Sheets 1 and 2 of Maps 14,125 and 127, by rezoning Lot 2 DP 51743 on the north east corner of Trents Road and Shands Road from Inner Plains to Living 3.

2. Insert new Outline Development Plan, Trents Road, Prebbleton in Appendix 19 of Volume 1 Townships as illustrated in Attachment 1 as "Living 3 Zone, Trents Road, Prebbleton – Outline Development Plan".

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ii. The number of specimen trees in this area is not less than 1 per 10m of road frontage or part thereof; and

iii. The trees are selected from the list below planted at a grade of not less than Pb95; and

iv. Shrubs are planted at 'aa' grade of not less than Pb3 and a spacing of not less than 1 per square metre, typically located within a garden area dressed with bark chips or similar material; and

v. Any paved surface area within the area does not exceed 100m2 in area.

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Note: Rule 4.2.2 shall not apply to allotments of 4ha or greater in the Living 3 Zone identified on the Outline Development Plan in Appendix 39 and 40.

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ii fencing required by an Outline Development Plan and/or rule in this Plan as a noise barrier

5. Insert Appendix 41 Indicative Road Cross Section – Living 3 zone and Fencing Typologies as contained in proposed Plan Change 32 to Volume 1 Townships.

6. Add a new permitted activity rule in 4.9 Prebbleton Buildings and Building Position after 4.9.12 as follows:

Prebbleton

4.9.XX Any building in the Living 3 zone Trents Road, Prebbleton (as shown on the Outline Development plan in Appendix 19) shall be set back at least:

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The requirement in the Living 3 Zone, Trents Road, Prebbleton, for a larger building setback from Shands Road and a noise attenuation structure near the Shands Road boundary and 25m along the adjoining side boundaries, has the purpose of reducing adverse noise impacts of Shands Road traffic on residents and any consequential reverse sensitivity effects.

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Township	Zone	Average Allotment Size Not Less Than
Prebbleton (Trents Road)	Living 3	Between 5000m^2 and 1ha

13. Add new Living 3 Zone Assessment Matters as follows:

- *The extent to which features that contribute to rural character, including open space and plantings, have been retained or enhanced.*
- *Whether fencing, roading (including cross sections and typologies) and utilities reflect the semi-rural nature and level of service appropriate for rural-residential areas.*
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- *Whether overall densities based on the level of development and open space anticipated for rural residential living environments have been achieved*
- *Whether provision is made for safe connections and linkages between the subdivision and adjoining Townships to enable access to public transport and community and commercial facilities.*
- *Ensure connections to reticulated water and wastewater services are available at all property boundaries and appropriate measures are available to effectively treat and dispose of stormwater.*

4 Consultation

Dave and Sue Anderson and their consultants have undertaken considerable consultation with Selwyn Council staff in relation to this proposal to ensure that the area to be rezoned is appropriate located in relation to Prebbleton township and can be adequately serviced. This consultation has resulted in:

- the sewage disposal being reticulated rather than the use of on-site systems being adopted or a low pressure system.
- An acoustic fence being required for the Shands Road frontage to limit noise impacts on residents and in turn reduce the possibility of residents complaining about noise.

The Andersons have also undertaken consultation with the neighbouring landowners. In all cases the neighbours are either supportive or ambivalent about the plan change. The owner of the land adjoining the plan change site to the north is keen for this plan change to proceed as it provides and alternative access to his property from Trents Road.

Initial consultation has been undertaken with iwi through Mahaanui Kurataiao Limited. Te Whakatau Kaupapa indicates that there are no silent files in the Prebbleton area. In addition there are no waterbodies or remnant vegetation expected to be of significance to tangata whenua. Consultation to date has not identified any particular tangata values on or near the plan change site.

5 Assessment of Environmental Effects of the Proposed Change

Proposed Objective B3.4.6 in proposed Plan Change 32 (PC32) to the Selwyn District Plan sets out a range of matters relating to enabling rural-residential development while addressing potential adverse effects on the environment. These matters are considered below.

5.1 Location outside Urban Limits

Proposed Change 1 to the Canterbury Regional Policy Statement (PC1) and PC32 seek that rural residential development, (residential development with an average density of 1-2 houses per 1 hectare) is located outside the Urban Limits but adjoining townships in the Greater Christchurch urban Development Strategy area. The reasons for this approach are several and include:

- Achieve efficiencies in transport
- Facilitates a diverse range of living environments
- Reinforces the urban form of existing townships

The site to be rezoned is outside the Urban Limits set for Prebbleton being approximately 170m from the urban limits boundary to the east (on the western boundary of Waratah Park). The site does not adjoin the township in terms of the official urban limits but it does adjoin the Existing Development Area (EDA) based around Kingcraft Drive. From both a planning and community perspective the area is treated and perceived as part of Prebbleton. The draft Prebbleton Structure Plan and the Planning Maps show the EDA as joined to and part of the township. This is more so now that the intervening area between the EDA and the Springs Road residential area has been in-filled with the Waratah Park development and a recent plan change incorporated in the draft Land Use Recovery Plan.

5.2 Facilitating Housing Choice and Diverse Living Environments

The creation of a Living 3 zone on the site on the corner of Trents Road will provide for a housing choice not currently available, but one which is sought after. In the past the Living 2 and 2A zones provided for larger lot residential development. However most of that land is developed and it is unlikely that similar zoning will be established within townships within the Greater Christchurch Urban Area as there is now a move to achieve higher residential densities within these areas. The environment of the site is very pleasant and restful with the surrounding shelter trees and internal plantings. The size of lots proposed, generally in the order of 5000m2, will enable reasonably efficient use of land while maintaining that distinction from residential development with expansive and tall plantings and open grassed areas. The number of lots to be created will be small, however it will provide a valued opportunity for creation of quality residential environments close to Prebbleton.

5.3 Character and Amenity

The land subject to this proposal is currently a mix of a rural use (horse training) with an associated residential component. Changing this use to rural-residential will alter the character of the area; however that does not necessarily mean that any adverse effects will arise. The interface between the rural and urban areas of Prebbleton will be shifted further west, to what is logically a viable boundary between Prebbleton and the surrounding rural area.

A full description of the visual and landscape character of the site and its surrounds is contained in the Visual and Landscape Assessment by Graham Densem contained in Appendix B. The following summarises the existing character. The trees on the site are visually prominent, comprising shelter belts on its margins and shelter and amenity trees in the house and stable areas and adjacent paddocks. Most of the trees are not of significant value as individual specimens but collectively they create an attractive environment of rural shelter and enclosure. The Shands Road frontage is lined with a continuous belt of evergreen trees about 6-8 metres high which have been trimmed into a hedge. The Trents Road frontage is also lined with trees which are slightly taller, being in the range of 8-10 metres. These trees are mostly deciduous broadleaves and are not trimmed but have crowns that spread above the road berm creating an attractive, enclosed, leafy rural feel to this section of Trents Road.

An additional element in this environment is the water race along the Trents Road frontage which reinforces the natural character of the area. All these existing character and amenity elements are considered to be completely consistent with, and in fact an asset, in relation to the small-scale rural residential development proposed. Over time new owners will develop on-site plantings which will further reduce the visual impact of the housing and hardstand areas.

The Graham Densem Assessment in section 5 of his report sets out a list of matters which are important in maintaining rural character and environmental values of the site and its surrounds. These matters are now listed with comments as to how they are addressed through this Plan Change. References to Amendment numbers are to those in the Plan Change Request.

1.	***Spaciousness:***	
(a)	*section sizes shall be no less than 0.5ha, which enables wide separation between neighbouring houses;*	Achieved by average lot size being between 0.5 and 1ha – Refer Amendment 8
(b)	*site coverage shall be no greater than 10% on any given lot, ensuring the majority of the lot remains open for trees, gardens and natural processes;*	Existing SDP Township rule 4.7.1 sets limit as the lesser of 10% or 500m^2
(c)	*no structures shall be erected within 15m of the property frontage;*	Achieved by Amendment 5 – New setback provisions
(d)	*no fences hedging or screen planting shall be erected on private street frontages or side boundaries within the 15m setback zone;*	Achieved by amendments to SDP Township Rules 4.2.2 and 4.2.33 – Refer Amendment 3.
(e)	*rural character shall be maintained in street design through openness at ground level, continuous grassed surfaces and tree planting.*	Achieved by adoption of Proposed Appendix 41 Indicative Road Cross Section – Living 3 Zone – Refer Amendment 4 Achieved by amendments to SDP Township Rules 4.2.2 and 4.2.33 – Refer Amendment 3.
2.	***Urban Character:***	
(a)	*all surface drainage shall be by grassed swales and according to natural drainage principles;*	Achieved by adoption of Proposed Appendix 41 Indicative Road Cross Section – Living 3 Zone – Refer Amendment 4
(b)	*street cross-sections shall emphasise grassed surfaces, avoiding kerbs and upstanding hardware in providing for essential services;*	Achieved by adoption of Proposed Appendix 41 Indicative Road Cross Section – Living 3 Zone – Refer Amendment 4
(c)	*signage such as entrance identifiers and street names shall be coordinated in a rural style.*	Achieved through subdivision consent conditions
(d)	*Fences, where erected, shall be of the farming vernacular, retaining a sense of openness.*	Achieved by amendments to SDP Township Rules 4.2.2 and 4.2.33 – Refer Amendment 3

3.	*Trees:*	
(a)	*Extensive plantings of deciduous, evergreen and native trees will occur in streets and reserves, to establish a leafy skyline for the development;*	Achieved by amendments to SDP Township Rules 4.2.2 and 4.2.33 – Refer Amendment 3
(b)	*Tree Covenant Areas will be defined on private sections where the development borders neighbouring properties (north and east) and Trents or Shands Roads. No buildings will be permitted within these areas and existing boundary trees must be retained and maintained by the owner. New trees may be planted in these areas so long as they do not inconvenience neighbours;*	Achieved by Outline Development Plan requirement to retain perimeter trees and consequent conditions on subdivision consents.
(c)	*It is expected most owners will undertake further amenity plantings within their properties;*	N/A
(d)	*Where appropriate, suitable existing trees within the site will be retained, including those which will be on private sections.*	Achieved through subdivision consent conditions
4.	*Water race:*	
(a)	*The district water race on the Trents Road frontage will be regarded as an amenity asset and its banks rounded as far as possible within SDC requirements and the need to retain frontage trees;*	N/A
5.	*Shands Road Frontage:*	
(a)	*For the purpose of noise control, a noise absorbent fence will be constructed along the length of the new zone, immediately behind the existing frontage trees. A second line of amenity trees will then be planted on the residential side of the fence, to screen it from view. The trees will be within a designated 'Tree Area' as in 3(b) above;*	Achieved by Outline Development Plan requiring acoustic fence and screen planting. – Refer Amendment 6
6.	*Trents Road Frontage:*	
(a)	*Where suitable, existing trees on the Trents Road frontage will be retained, to maintain the leafy rural feel of the road. This refers particularly to the half of the frontage nearest to Shands Road.*	Achieved by Outline Development Plan which requires retention of perimeter trees and by subdivision consent conditions.

The development will be constructed in a manner that reflects the intended rural-residential characteristics of the Living 3 Zone, as detailed in Policy B3.4.3(b) in PC32 of the Selwyn District Plan. This includes not using kerb and channel on the roads, no large entrance features and limited use of street lighting in accordance with the Council's Code of Practice. Details of these mattes will be confirmed at time of subdivision. The final form of the development will ensure that the characteristics of the zoning sought will be achieved.

5.4 Water Quality

Rezoning of rural land for rural-residential use has the potential to adversely impact on ground and surface water quality. This potential arises from on-site effluent treatment and disposal or stormwater generated by increases in impervious surface coverage. As set out in the Infrastructure Report in Appendix A, it is proposed that the development be fully reticulated for effluent disposal. A connection to the new Council pump station on the corner of Trents Road and Lindsay Drive Road is to be undertaken ensuring that all allotments developed will be able to dispose of effluent in a manner that will avoid any potential for adverse impacts on groundwater quality.

Stormwater generated within the development will be treated via swales and discharged to ground via soakholes. The details of stormwater treatment and discharge are set out in the Infrastructure Report in Appendix A.

The site has the ability to treat and dispose of stormwater within its own boundaries, as well as the ability to access the Prebbleton township water supply and effluent disposal network without substantial expenditure being required by the public to upgrade the networks. No additional significant infrastructure, other than reticulation of services within the development site itself and an extension to the sewerage line east to Waratah Park is required. In this regard, the rezoning and subsequent development of this land is largely self-contained.

5.5 Neighbouring Activities and Potential Reverse Sensitivity Issues

Activities on neighbouring properties are largely lifestyle and rural residential. Some minor grazing occurs on the property to the north and the rural residential lot to the east has a small olive grove. To the south across Trents Road are Morgan and Pollard landscape contractors who have extensive landscape show areas as well as a nursery for shrubs and the like. Farming uses are well established further west of Shands Road behind the lifestyle properties which front the western side of Shands Road. Further south on Shands Road is the Council's cemetery. There is no intensive animal or crop production in the vicinity of the Plan Change area.

Larger residential allotments such as those proposed as part of the proposed Plan Change provide opportunities for locating dwellings and outdoor living areas away from neighbouring boundaries. These larger lots combined with the limited productive activities in the vicinity will either mitigate or avoid any potential adverse effects associated with the rural use of neighbouring properties, and consequent reverse sensitivity effects.

The one element that could cause adverse effects on amenity and consequent reverse sensitivity issues is the vehicle noise from Shands Road. To assist in the assessment of this matter the Selwyn District Council asked Russell Malthus of NovoGroup to consider what level and type of noise control might be needed to limit traffic noise from Shands Road to an acceptable level for future residents. This assessment is attached in Appendix E and concludes that:

- With 95% of the traffic on Shands Road at this point occurring between 6am and 10pm, most of the noise generated is in this period and will be perceived as relatively constant except for the peak hours 7am and 5pm when the noise would be about 3dBA higher. The night time noise between 10pm and 6am would be at least 10dBA lower than daytime and would be perceived as intermittent. The increase in noise from the estimated 9% increase over the period 2014 to 2041 as a result of the southern motorway extension and general growth is unlikely to be noticeable. Traffic volumes on Trents Road can be disregarded as they are much lower than Shands Road and would not contribute significantly to the noise environment.

- Predicted noise levels associated with the traffic volumes were calculated which showed that outdoor noise level 25 m setback from Shands Road without an acoustic barrier would be 65dBA which significantly exceeds the acceptable NZTA Planning Policy Manual level of 55dBA Leq (16hr). However an acoustic barrier fence of at least 3m would be sufficient to reduce the daytime levels to 55dBA Leq (24hr) at the 25m setback. Sound levels closer to the fence would be lower due to greater screening. With an external noise level of 55dBA Leq (24hr) and a dwelling with typical building construction which achieves a 15dBA reduction with window open, internal noise levels would be in the order of 40dBA. As this

occurs during the daytime this is consistent with the recommend noise levels in *AS/NZS 2107:2000 Acoustic- Recommended design sound levels and reverberation times for building interiors*.

To mitigate any possible noise effects to an acceptable level the Plan Change therefore:

- Includes a new rule which requires dwellings and accessory buildings used for sleeping or living to be no closer than 25 metres to Shands Road and that they are subject to a 3m high acoustic barrier of a specified density.

- The Outline Development Plan also requires this 25m setback and an acoustic fence to be erected along the Shands Road frontage and 25m along tte adjacent side boundaries, which will sit between the existing shelter trees and a new belt of trees to ensure that its visual impact is minimised. This is considered to be a more visually satisfactory attenuation of noise as compared to mounds.

5.6 Natural Features

There are no natural features within the proposed Plan Change area. The water race along the southern boundary is a relatively natural feature that will not be altered by the proposal except to the extent that a further bridge will need to be established across the race to serve development within the Plan Change area. Details of the water race with regard to amenity and natural character are discussed and assessed by Graham Densem in his Visual and Landscape Assessment Report in Appendix B of this request.

No reserve areas are proposed within the development due both to its small size and the generous plantings that exist or are anticipated to be established by future residents. These will, in general, be retained on private property, but will add significantly to the amenity experienced by residents of the whole development.

The Outline Development Plan for this Plan Change area requires retention of existing perimeter planting as well planting to screen the acoustic fence which will sit inside the existing tree belt on Shands Road. In addition to the road cross section will contain grassed berms and swales which add to the natural character of this rural residential development.

5.7 Transportation

Proposed Roading Layout

The Outline Development Plan provides for roading and pedestrian/cycle access throughout the development by way of a spine road from Trents Road. A future link is provided for from this road through to the land to the north of the Plan Change site. All roads created by this development will be vested in Selwyn District Council. It is anticipated that the roads will be 19m wide and will serve as local roads.

The road linkage from the spine road provides for access to the land immediately north and the western section of the Shands Road/Blakes Road/Springs Road/Trents Road block. This access has the potential to serve a number of important purposes. Firstly, it will enable the block immediately to the north to be accessed from Trents Road should it be developed for rural residential or similar purposes. Secondly, it could provide access for other land in the western part of the block to the point that a linkage could be provided right through to Blakes Road. This will enable residents of

the area to access the various facilities on Blakes Road such as the school, preschool and community centre and the Springs Road shops without having to use Shands Road.

Further possibilities include the development of walking and cycle linkages through to Waratah Park or Springs Road. While this is not currently possible due to the lot layout of Kingcraft Drive, this could change if strategic purchases or agreements were obtained by Council or interested parties. These future linkages are considered to have a positive benefit not only for the future residents within the Plan Change area, but also for all existing and future residents of the block.

Site Access

Shands Road is classified an arterial route in the District Plan and Trents Road is deemed to be a local road. All lots will be accessed from Trents Road, avoiding any direct access from Shands Road. The existing house and horse training operation is accessed from Trents Road some 175m east of the Shands Road intersection. Most of the new allotments will be accessed via the internal spine road. As the lot on the corner of Shands and Trents Road can be provided with a complying vehicle crossing with a minimum 75m separation from the Shands Road intersection, access to this lot could be by direct access to Trents Road or via the internal road and a right of way.

The speed limit of Trents Road and Shands Road bordering the site is 100km/hr. The stretch of Trents Road to the southeast of this site, namely from the Waratah Park subdivision and Kingcraft Drive EDA, is 70km/hr where residential development occurs. It is noted that additional land on either side of Trents Road between Springs Road and Shands Road are also earmarked for urban residential zoning as part of the proposed Land Use Recovery Plan. This may provide an opportunity to extend the 70km speed limit once these areas are developed reflecting the urban settlement patterns of this general area.

Wider Traffic Environment

The wider traffic environment comprises roads such as Selwyn, Shands and Springs Road which are important corridors for private and freight traffic travelling between Christchurch, Prebbleton, Lincoln and Rolleston and further afield. These routes are fed from many east-west linkage roads such as Marshs, Blakes, Trents, Birchs, Tosswill and Hamptons Roads. Generally Trents Road, which extends through to State Highway 1 (SH1) at Templeton, is used less for commuter purposes than the others referred to.

This wider traffic environment is expected to change significantly in the next 20-30 years both as a result of an increase in population and economic activity in the south western greater Christchurch urban area and with the Christchurch Southern Motorway Stage 2 (CSM2) works by New Zealand Transport Authority (NZTA).) CSM2 involves the establishment of a motorway from Halswell Junction Road near Springs Road through to the SH1/ Robinsons Road intersection. In addition, SH1 is to be widened and upgraded to a 4 lane expressway from Rolleston to Robinsons Road (MSRFL) which also forms part of this project. The following aspects may have relevance to this Plan Change area.

CSM2 has no direct link with Springs Road (Springs Road will pass over CSM2) but rather creates an interchange at Shands Road just south of Marshs Road. This interchange is located approximately 1.6km north of Plan Change site on Shands Road. The interchange is intended to provide more direct access to Lincoln in particular by way of Shands Road, thereby reducing the use of Springs Road, through Prebbleton as a through road to Lincoln and beyond. It will also enable some residents of Prebbleton to make quicker trips to Christchurch. The reduction in the future use of Springs Road (i.e. reduction from the baseline level of growth) is an intended consequence to improve the amenity and function of the Springs Road as the location of commercial and community activities, making it more user-friendly.

Recent upgrades of the Selwyn and Lincoln-Rolleston Roads, in conjunction with Shands Road have created a new district arterial that will connect with the interchange on Shands road to cater for growth, especially from the expanding southern areas of Rolleston. Additional progressive upgrades are expected to take place on adjoining local roads, including Shands Road, to cater for traffic using the CSM2 interchange. Funding for these upgrades have been made in the 2012-2022 Long Term Plan, however at this stage no decision has been made on the form of these upgrades. This will be determined after CSM2 is in place and the impacts of the changed traffic environment are known.

The assessment of traffic impacts of the CSM2 compares the predicted traffic flows from 2016 to 2046 with and without (baseline) the CSM2 which indicates that with CSM2:

- Marshs Road will have increased traffic because it will provide a direct link to the Shands Road interchange
- On the corridor connecting Lincoln and Prebbleton to Hornby and the rest of Christchurch, completion of the Project is expected to result in a transfer of traffic from Springs Road to Shands Road. This is likely to be a result of being able to access the motorway via the Shands Road interchange, rather than the baseline situation of getting on or off the CSM1 section of the motorway from Springs Road.
- On Shands Road, the increase just north of Prebbleton (south of Marshs Road) is 1,250 vpd (9%). As Shands Road is of a similar standard to Springs Road, this transfer of vehicles is not expected to adversely impact the operation of Shands Road.
- No increase above the baseline is shown for Trents Road between Shands and Springs Road; however this connection may prove to be used more frequently with the CSM2 in place.
- It is expected that Trents Road east of Main South Road will experience a decrease in traffic (1000 VPD) as traffic transfers to higher standard roads created as part of CSM2. This is as a result of the **overpass** created over the new motorway on western section of Trents Road between Blakes-Trents Road intersection and Shands Road.

Expected Traffic Generation

Surveys of rural residential developments around Canterbury suggest that daily traffic generation is approximately 8 vehicle trips per day per dwelling unit. This is assumed to be a 'high-end' estimate, which allows for a robust assessment to be carried out. It is anticipated that up to 16-17 allotments could be created as part of this subdivision if a minimum allotment size of 5000m^2 is proposed. Based on this, up to 128-136 vehicle trips per day (vpd) could be generated by this development.

The latest available traffic data from Selwyn District Council is shown in Table 1 (below). According to this data, the current vehicle trips per day on Trents Road between Shands and Springs Roads is 797 vpd as at October 2012. No estimate is available on the future traffic volumes, but on the basis of the growth projections used for the CSM2 assessment a doubling could be expected by 2046 i.e. approximately 1600vpd. On the basis of a conservative estimate of 136 vehicle trips being generated by full development of the plan change area, the total vpd in 2046 for this stretch of Trents Road is estimated as 1,736vpd (1600 + 136). This is still a moderate volume and one easily provided for within the current road formation and the general traffic environment in the area.

Table 1: SDC TRAFFIC COUNTS		
Location	**Average Daily Traffic**	**Date**
Shands Rd		
Blakes - Trents	6273	July 2011
Trents – Hamptons	6205	June 2011
Trents Rd		
Blakes – Shands	550	June 2011
Shands – Springs	797	Oct 2012
Source: Selwyn District Council		

The anticipated increase in traffic using the Trents/Shands Road intersection is also considered in the CSM2 traffic assessment. The intersection is assessed as having the same level of service with or without the CSM2 project proceeding. This is level of service E which at the lower end of the scale. The use of this intersection by traffic from the proposed rural residential development is not anticipated to reduce the level of service. However, over time it is expected that consideration will be given to how this intersection could be improved in terms of formation and sightlines which are currently partly obscured by vegetation near and at the corners.

Walking and Cycling

Trents Road has a verge on both sides which enables walking through to Springs Road. The western section the verge on the southern side is wider and more likely to be used by pedestrians whereas the northern side is partly occupied by the water race. The width and slope of the sides of the water race reduce the usable area for walking and cycling, however there would be significant advantages for all Trents Road residents if a path could be created on the northern verge. This could possibly be considered at the time the sewerage pipe is being laid from Lindsay Drive up to the Plan Change area.

The Council has turned its mind to the possibility of a walking and cycle route along Trents Road as part of its policy to link townships and the Walking and Cycling Strategy and in response to the opportunities potentially created by CSM2 and the four-laning of SH1. Trents Road provides a link between Templeton to Prebbleton, which in turn links to Lincoln via the Rail Trail. At this stage the Council has not made a commitment to this project.

5.8 Natural Hazards

A geotechnical investigation has been prepared by Riley Consultants for the application site (Appendix C). The testing undertaken for this investigation complied with the guidelines produced by the Ministry of Business, Innovation and Employment. With regards to the liquefaction potential for the site, the Riley report concludes:

1. *The ground has performed well during the recent Canterbury earthquake sequence.*
2. *Ground conditions typically consist of topsoil underlain by generally loose, fine alluvium (silty sand) to a maximum depth of 1.95m over competent gravel with subordinate sand, silt and cobbles. A design groundwater level of 7m is considered appropriate for the site. The encountered ground conditions correspond well with the regional geology from published information.*
3. *The fine alluvium has a variable bearing capacity of approximately 200kPa. The gravel has a geotechnical ultimate bearing capacity of at least 300kPa, and is a suitable stratum for*

*any foundation type. Specific investigations for each individual development are recommended in line with the **DBH** Guidelines.*

4. *The proposed subdivision is considered acceptable from a geotechnical perspective provided the recommendations outlined in this report are followed.*
5. *Based on the interpreted geology and design groundwater conditions, the site is considered to have a minor risk of liquefaction from future design earthquake events. The risk of liquefaction-induced ground damage is consistent with a TC1 zoning.*

There are no other known potential natural hazards that could affect the Plan Change site. In particular the site is not likely to be subject to material damage from erosion, falling debris, subsidence, slippage of inundation from any source.

5.9 Soil Contamination

A Preliminary Site Investigation into the potential for soil contamination has been undertaken for this property in terms of the Ministry for the Environment's Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand, 2011. This investigation contained in Appendix D to this plan change request, and considered the following information:

- Review of Selwyn District Council property information provided in a LIM
- Obtaining ECan data from the Listed Land Use Register (LLUR)
- Review of ECan GIS data
- Review of 4 historic aerial photos from circa 1940 to current
- Review of historical ownership history
- Review of local knowledge of site history
- Site visit

The investigation concludes:

> *The investigations undertaken have revealed that the majority of the site is unlikely to have been used in a manner that would have resulted in soil contamination of concern; however the site has had a confirmed HAIL use carried out on it, with the use of an above ground diesel storage tank. The risk of contamination is limited to the area around the tank. A detailed site investigation will be required to determine the level and type of any contaminants present and the possible risks to human health and the environment. The site appears to be well maintained and it is therefore envisaged that the diesel storage tank was used in a proper and safe manner. If a detailed site investigation reveals soil contamination associated with the fuel storage tank, it is likely that this contamination would be minor and could be easily and economically remediated.*

5.10 Versatile Soils

The site generally contains Class II versatile soils. Within the last 50 or so years the site has either been used for extensive grazing and/or as a horse training facility. While both of these uses are land based, neither has used the soil for intensive production. Rural residential development will involve increased building and hard surface coverage; however the requirements of the rural-residential Living 3 zone and the expectations of the residents will result in the productive use of the land for tree growth, grassed areas and land drainage (swales, soakholes etc.). In addition, the potential to use parts of the new lots for horticulture will remain. Given the limited scale of the rezoning, the limited productive use of the site in the past and the ongoing use of the soils of the site for some productive and natural functions, the loss of productive capacity is considered to be limited.

5.11 Beneficial Effects

The provision of larger residential lots within the Prebbleton area will provide choice both for local residents and residents from further afield. This option is currently not available in what is a very desirable locality, with easy access to Christchurch and points further south. With the recent earthquakes in Canterbury, there is need to provide a range of choices for households who need to relocate. This proposal provides an option for people seeking a larger fully-serviced allotment that is located close to the amenities of a town and within commuting distance of Christchurch.

6 Statutory Requirements of Section 32 of the Act

Before a proposed Plan Change is publicly notified an evaluation must be carried out by the person making the request. The evaluation, carried out under Section 32 of the Resource Management Act, must examine:

(a) the extent to which each objective is the most appropriate way to achieve the purpose of the Act; and
(b) whether, having regard to their efficiency and effectiveness, the policies, rules, or other methods are the most appropriate for achieving the objectives.

The evaluation is required to take into account:

- The benefits and costs of policies, rules, or other methods; and
- The risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the policies, rules, or other methods.

The Guidance Note on Section 32 analysis on the Quality Planning website makes the following statement:

> **Appropriateness** - means the suitability of any particular option in achieving the purpose of the RMA. To assist in determining whether the option (whether a policy, rule or other method) is appropriate the **effectiveness** and **efficiency** of the option should be considered:
>
> - **Effectiveness** - means how successful a particular option is in addressing the issues in terms of achieving the desired environmental outcome.
> - **Efficiency** - means the measuring by comparison of the benefits to costs (environmental benefits minus environmental costs compared to social and economic costs minus their benefits).

In this case it is the appropriateness of rezoning rural land for rural-residential use that needs to be examined.

6.1 Objectives and Policies of the Selwyn District Plan

As the Proposed Plan Change does not seek to alter any objectives or policies of the Selwyn District Plan, the examination under Section 32(3)(a) of whether the objectives of the District Plan are the most appropriate way of achieving the purpose of the Resource Management Act is not required. This is because as the District Plan is operative it is assumed that the objectives are the most appropriate way to achieve the purpose of the Act. Similarly, it is assumed that as no policies are proposed to be altered, that they are the most appropriate means of achieving the objectives of the District Plan.

Although an assessment of the appropriateness of the objectives and policies of the Plan is not required, it is worthwhile to consider the proposed Plan Change against the proposed objectives and policies contained within Proposed Plan Change 32 (PC32). PC32 was notified by the Council in March 2012, and introduces the Living 3 Zone to the Township section of the Selwyn District Plan as the means of providing opportunities for rural-residential development:

... in locations that adjoin established townships to encourage energy conservation, cost effective provision of infrastructure and convenient access to the amenity, services, employment and social opportunities provided in townships. The intensification of rural land to Living 3 Zone densities is expected to be through a comprehensive plan change process to avoid unconsolidated urban sprawl, inefficiencies in the provision of infrastructure and services, loss of rural character and adverse reverse sensitivity effects.[1]

PC32, and in particular Objective B3.4.6 and Policy B3.4.3(b), provide an appropriate policy basis for examining any proposed rezoning. While PC32 is on hold pending the finalisation of the Land Use Recovery Plan being prepared under the earthquake legislation, the new objective and policy are relevant to the consideration of this proposed rezoning. The following assesses the proposed rural-residential rezoning against these two matters.

Objective B3.4.6 states:

To manage rural residential activities by facilitating a maximum of 200 households in each of the periods to 2016, 2017 to 2026 and 2027 to 2041 through the Living 3 Zone, which are to be located outside the Urban Limits but adjoining Townships in the Greater Christchurch Urban Development Strategy area to:

- *Facilitate the provision of housing choice and diverse living environments outside the Urban Limits prescribed in the Regional Policy Statement*
- *Avoid significant adverse landscape and visual effects on rural character and amenity*
- *Avoid the cumulative loss of productive rural land and rural character that will result from the incremental rural residential development and to ensure that a consolidated pattern of urban growth is achieved across the Greater Christchurch Urban Development Strategy area of the District*
- *Be integrated with existing settlements to promote efficiencies in the provision of cost effective infrastructure, including the requirement to connect to reticulated wastewater and water services*
- *Ensure that rural residential expansion occurs in a way that encourages the sustainable expansion of infrastructure, and provides for a choice of travel modes*
- *Assist in achieving concentric and consolidated townships and to retain the distinctiveness between rural and urban environments*
- *Avoid incompatible amenity expectations between different land uses, particularly between rural residential living environments and the sensitive boundary interfaces of the Living 3 Zone with Townships and Rural zoned land*
- *Avoid significant reverse sensitivity effects with strategic infrastructure, including quarrying activities, Transpower High Voltage Transmission Lines and associated infrastructure, Burnham Military Camp, Council's Rolleston Resource Recovery Park and wastewater treatment plants in Rolleston and Lincoln, West Melton Military Training Area, agricultural research farms associated with Crown Research Institutes and Lincoln University.*

To date (May 2013), there are only two areas that have operative Living 3 zoning, both of these are in Rolleston. It is understood that the Outline Development Plans that facilitate the development of these areas provide for a total 148 rural-residential sections. The Council notified a private plan change for a Living 3 Zone at Lincoln in October 2012, however it is noted that the Council's website states that it is currently on hold at the applicant's request.

[1] Amendment 3 of PC 32 to A4.5 Townships and Zones – Use of Zones of the Township Section of the Selwyn District Plan.

This proposed Living 3 zone at 331 Trents Road, Prebbleton provides for an addition 16 rural-residential allotments within the Selwyn area of the Greater Christchurch Urban Development Strategy, as shown in the potential subdivision layout in Appendix F. When operative, the proposed zoning would mean that there was provision for a total of 164 rural-residential allotments within the identified area of Selwyn. This provision falls within the 200 lots sought by Objective B3.4.6. However, it is noted that that it is unlikely that the Rolleston Living 3 zones will be used for rural residential development in the foreseeable future, and in particular in the period 2013-2016, as a dairy operation has recently been established on this land. In comparison the current owners of 331 Trents Road intend to subdivision and develop their property for rural residential purposes once the Living 3 zoning is in place, thereby providing a housing choice within the Prebbleton area that is not currently available.

The eight aspects of Objective B3.4.6 are implemented through a new policy, B3.4.3(b), which sets out the strategic outcomes for new Living 3 areas. The majority of these matters are considered in depth in the Assessment of Effects in Section 5 of this report and are summarised in the following assessment. The matters in policy B3.4.3(b) are now considered.

(a) avoid identified constraints, including strategic and nationally important facilitates operating within the eastern area of the District, such as agricultural research farms associated with Crown Research Institutes and Lincoln University, Council's Rolleston Resource Recovery Park and wastewater treatment plants in Lincoln and Rolleston, Transpower High Voltage Transmission lines and associated infrastructure, Burnham Military Camp and West Melton Military Training Area.

The location of the proposed new Living 3 zone avoids all of the identified strategic and nationally important facilities identified above. The site is also located 1600 metres from the proposed extension to the Christchurch Southern Motorway. (CSM2) Further the site is not located in an area of high groundwater or close to the identified intensive farming activities in the north.

(b) avoid land that contain sites of significance to tangata whenua or where development would result in significant adverse effects on ecological values or indigenous biodiversity

There are no known wāhi tapu, wāhi taonga or mahinga kai sites within the application site or close by. The site also does not contain any significant ecological indigenous biodiversity values.

(c) avoid land that is unreasonably susceptible to liquefaction and lateral displacement during large earthquake events, soil contamination and identified natural hazards

Natural hazards and soil contamination are considered in detail in the Geotechnical Report in Appendix C and Soil Contamination Report in Appendix D of this Plan Change Request respectively and are summarised in Section 5 Assessment of Effects. The conclusion of those assessments is that the site is not subject to significant natural hazards that would prevent it from being developed. Further the site is also generally suitable for rural-residential development as there is low risk of contamination for the majority of the site.

(d) are efficiently serviced with network infrastructure, particularly water, waste water and roading

As discussed, within the Infrastructure Report in Appendix A of this Plan Change, the site is able to be efficiently serviced and connected to Council infrastructure.

(e) does not significantly undermine the consolidated management of urban growth or result in the loss of a clear separation between Townships and the rural environment

The location of the proposed rezoning adjoins an existing rural-residential area, which provides a constraint on the westward growth of the urban area of Prebbleton. This extension essentially confirms the western edge of the Prebbleton urban area. Further the proposed rezoning does not extend the town beyond Shands Road, which is accepted as being the western edge of the wider township area.

As discussed within the landscape assessment in Appendix B, the site will retain its existing rural character from an external perspective, which will assist in ensuring that a visual separation between the town and the wider rural area remains.

(f) are integrated with townships to facilitate access to public transport, health care and emergency services, schools, community facilities, employment and services

Trents Road is one of the main local roads of Prebbleton. The frontage of the site to Trents Road and the proposed access point, as shown in the proposed Outline Development Plan, assist in integrating the rezoned area with the township. Such integration would not occur, for example, if Shands Road had been used for access. Trents Road provides future residents with access to Springs Road, the main road of Prebbleton. Similarly Trents Road provides access to Lindsay Drive which will is expected to link through to Blakes Road via Cairnbrae Drive at the end of 2013. This route will provide a link to facilities such as the Prebbleton Primary School.

The proposed Outline Development Plan highlights a possible northern linkage should the land to the north be rezoned in the future. However additional linkages eastwards are not currently possible due to the Kingcraft Drive development.

(g) are adjacent to the urban edge of Townships on at least one boundary, while avoiding future urban growth areas identified in Township Structure Plans, areas currently zoned Living Z, or the Regional Policy Statement

The proposal is located adjacent to an existing rural-residential development at Kingcraft Drive. This area is not currently zoned, but is identified in the District Plan as an Existing Development Area. The proposed rezoning can effectively be seen as a minor extension of this existing rural-residential area. The site is located outside of the areas identified for the future urban growth of Prebbleton.

(h) are developed in accordance with an Outline Development Plan contained within the District Plan that sets out the key features, household density, infrastructure and integration of the rural residential area with the adjoining Township.

The proposed Plan Change seeks to include an Outline Development Plan for the rezoned area and associated rules requiring its implementation in the District Plan. The ODP identifies key elements to be created or maintained in the site's development including retention of the perimeter trees and a building setback from Shands Road to mitigate the impact of vehicle noise.

On the basis of the above, it is considered that this site is able to meet the strategic outcomes sought by Policy B3.4.3(b).

Policy B4.3.4(b) also sets out the amenity outcomes and levels of services that the Council are expecting from the Living 3 zone. These are now considered.

- *appropriate subdivision layouts and household numbers that allow easy and safe movement through and between neighbourhoods, achieve the necessary degree of openness and rural character and avoid the collective effects of high densities of built form*

  A possible subdivision layout showing a potential 16 allotments is contained in Appendix F. This possible layout, which has informed the proposed Outline Development Plan, provides for easy and safe access to Trents Road.

  This possible layout informed the landscape assessment contained in Appendix B, which concludes that the retention of the existing site plantings means that the external rural character of the site will remain largely intact. In addition, there are numerous elements of the development required by the ODP and existing and proposed new rules which will retain a high degree of rural character e.g. extensive grassed and treed areas. All these requirements will maintain the amenity and character of the area.

- *public reserves, parks and peripheral walkways are avoided unless it is appropriate to secure access to significant open space opportunities that benefit the wider community*

  No public reserves or peripheral walkways are proposed within the Outline Development Plan for this zone.

- *suburban forms of services are avoided, such as kerb and channel road treatments, paved footpaths, large entrance features, ornate street furniture and street lighting (unless at intersections)*

  Council's Proposed Plan Change 32 introduces a new rule requiring all roading with in Living 3 zone to incorporate the road treatment shown in a cross section in a new Appendix. That cross-section shows swales either side of the road and no kerbs or footpaths. As discussed in the Infrastructure Report, the road construction will reflect this treatment and Council's Engineering Code of Practice. All other aspects of the road construction, such as street lighting will also reflect the desired rural-residential character.

- *fencing that is reflective of a rural vernacular, in particular fencing that is transparent in construction or comprised of shelterbelts and hedging (see Appendix 41 for examples of such fencing)*

  This proposed change seeks to amend Rule 4.2.3 so that it applies to this land as well. This rule requires a particular typology of fencing to be created. Additionally, the proposed Outline Development Plan requires the retention of the existing external plantings on the boundaries of the site. Through including this site as part of rule 4.2.3 and the retention of the existing plantings, the proposal will ensure that a rural vernacular will occur within the final development.

Overall it is considered that the Proposed Plan Change is consistent with the strategic outcomes sought for rural-residential development by Selwyn District Council. Additionally the resulting amenity is considered to be consistent with the outcomes required under Proposed Plan Change 32.

Given the conclusions within Section 5 on the effects of the proposal on the environment and the above assessment, the proposed rezoning of the 9.2 hectare site at 331 Trents Road, Prebbleton is considered to be an appropriate means of achieving the outcomes sought by the objectives and policies of the District Plan.

6.2 Assessment of the Benefits and Costs of the Proposed Change

In order to determine the effectiveness and efficiency of the proposed rezoning, an assessment of the benefits and costs of the proposed Plan Change, together with an examination of the risks of acting or not acting based on the information provided is required. In order to determine the relative benefits and costs of the proposed change, options other than the proposal should also be examined. In terms of this proposal the options considered are:

- Option 1 – Leave the area zoned Rural
- Option 2 – Rezone the land as Living 3
- Option 3 – Apply for resource consent for proposed subdivision and development

The following is an assessment of these options.

Benefits and Costs of Option 1 – Leave the area zoned Rural

Benefits/Advantages	Costs/Disadvantages
• Maintains the existing character of the area. • Allows the Council to implement proposed Change 1 to the 1998 Canterbury Regional Policy Statement (CRPS) and Land Use Recovery Plan within their own timeframe.	• Does not fulfil the District Plan's objective of an equitable process to rezoning land. • Does not implement Proposed Change to the CRPS 1998 or LURP. • Reduces level of choice for potential purchasers of rural-residential allotments. • Does not contribute to the cost of existing reticulation of services.

Benefits and Costs of Option 2 - Rezoning the Subject Land as Living 3

Benefits/Advantages	Costs/Disadvantages
• Implements Proposed Change 1 to the CPRS 1998 and LURP. • Implements the Proposed Change 32 • The area is not dependent on the development of other land to provide access or infrastructure, such as stormwater disposal. • Provides an alternative for prospective purchasers of rural-residential allotments within Selwyn District and elsewhere. • Economic benefit to Council from larger rating base through additional properties being added upon subdivision, and the payment of development contributions for new infrastructure (e.g. Eastern Selwyn Sewerage Scheme).	• Loss of rural land for productive purposes. • Change in character of the area from rural to rural-residential. • Small increase in traffic generated within and around Prebbleton.

Benefits/Advantages	Costs/Disadvantages
• Provides long-term certainty for both the developer and potential purchasers as to the use of the land. • Supports existing Council reticulated services, e.g. sewer system and water supply.	

Benefits and Costs of Option 3 – Develop the land by Resource Consent

Benefits/Advantages	Costs/Disadvantages
• Council has the ability to place stricter controls on the development through consent conditions than may be possible through a plan change. • Potential for greater environmental benefit through Council having greater control over development, and being able to require some land for environmental compensation for the use proposed. • Assists in implementing Proposed Change 1 the CPRS 1998 and LURP.	• Potential social cost arising from lack of long-term certainty for potential and future purchasers and adjoining neighbours as to the use of the land, as additional consents to alter conditions can be sought. • Potential and future purchasers would need to obtain consent if they were to alter uses, for example home occupation rules from the rural zone would still apply. • Restricted timeframe in which land has to be developed and houses built, leading to potential economic costs for landowner/developer. • Less flexibility in being able to develop the land. • Possibly higher costs to develop land through the placing of tighter controls on the development by way of strict conditions on a consent. • Unwanted precedent in terms of allowing large scale rural-residential activity in the rural zone through consent only.

The above assessment highlights that the advantages and benefits of rezoning this area of land for rural-residential use (Option 2) outweigh the potential costs and disadvantages. Whilst the costs or disadvantages of the other options clearly indicate that they are not appropriate.

6.3 Effectiveness

In determining the effectiveness of the Plan Change and other options to achieve the objectives, it is considered appropriate to include within "the objectives" the objectives of the relevant broader policy documents. These matters are considered in more detail in Sections 7 to 9 of this report. These latter objectives are particular relevant because they set out, at a strategic level, how growth should be provided for within the Selwyn District. On this basis the proposed Plan Change is assessed to be the most effective to achieve the objectives of the District Plan, CRPS 2013, and Proposed Change 1 of the CRPS 1198. In particular the proposed Plan Change is the only method that can ensure all of the following:

- A rural-residential development of an appropriate density.
- Development in accordance with an outline development plan

- Integration of development with existing infrastructure
- Specific amenity standards to be achieved in final development.

6.4 Efficiency

In determining efficiency, it is necessary to compare the costs and benefits of the three options listed in the tables above. These costs and benefits relate to a variety of matters including environmental, process and land use compatibility. In relation to all these matters Option 2 has a greater number of benefits/advantages as compared to Options 1 and 3, while Option 2 has the same or lesser costs/disadvantages.

Assessment Regarding Information Provided

There is a large amount of information available about the site and the effects of the proposed rezoning; as such it is considered that there are no risks in acting.

6.5 Overall Assessment

Based on the assessment above, the overall conclusion is that the Proposed Plan Change is a more appropriate method for achieving the objectives and policies of the District Plan than the existing plan provisions or the alternatives canvassed above. It is also concluded that the environmental, social and economic benefits of the Proposed Plan Change outweigh any of the costs. On this basis, the proposed rezoning is considered to be an appropriate, efficient and effective means of achieving the purpose of the Resource Management Act.

7 Canterbury Regional Policy Statement 2013

The Selwyn District Plan is required under section 73(4) of the Resource Management Act to give effect to the Canterbury Regional Policy Statement 2013 (CRPS). Any proposed change to the District Plan must also give effect to the CRPS. Section 74(2) of the Act also requires territorial authorities to have regard to any proposed regional policy statement when preparing or changing a district plan.

The CRPS provides guidance on matters relevant to the growth of settlements within the region. Chapter 5 of the CRPS addresses concerns resulting from landuse and infrastructure on a region wide basis, and the objectives and policies of this chapter seek to ensure that development and growth does not have an adverse effect on the environment.

The objectives and policies in Chapter 5 of the CRPS 2013 seek to promote urban and rural-residential developments that have regard to the efficient use and development of resources while ensuring that any adverse effects on the environment are avoided, remedied or mitigated. Consolidation and integration with existing infrastructure is promoted, whilst ensuring that regionally significant infrastructure and the strategic transport network are not adversely impacted by any new development.

The proposal is effectively an extension of an existing rural-residential development (Kingcraft Drive). On this basis the proposed rezoning is considered to implement the requirements of consolidation and integration. The rezoning provides a different housing choice for the community, and will be connecting into existing infrastructure. The rezoning combined with the development requirements such as reticulation of services, ensures that the completed proposal will have minimal effects on the physical environment, as set out in the AEE. The location of the site also

ensures that transportation infrastructure, including the proposed Stage 2 of the Christchurch Southern Motorway, is not compromised. Overall, the proposed rezoning is considered to give effect to the objectives and policies in Chapter 5.

Chapter 6 is intended to address the issues relating to growth and development within the Greater Christchurch Area. This chapter does not exist in an operative state at this stage, but is proposed to be inserted through the Land Use Recovery Plan (LURP) prepared under the Canterbury Earthquake Recovery Act 2011. A draft version of the LURP was released for comment in March 2013, and this is considered in Sections 7.1 and 8 below.

7.1 Chapter 6 as proposed by LURP

Chapter 6 as proposed by the LURP sets out the objectives and policies to guide the recovery of the Greater Christchurch area, including the intended land use distribution for the planning period up to 2028. Primarily this chapter addresses matters associated with the urban areas of Greater Christchurch. As rural-residential development is a form of housing choice available for recovery, it is also addressed within Chapter 6. With the principles of consolidation and intensification guiding urban development, Chapter 6 sets out to manage rural-residential development in a way that does not compromise those principles. This is acknowledged in Objective 6.2.1(f). The amendments to be included within the CRPS include a definition of rural-residential which is:

> ***Rural residential activities****: means residential units outside the identified priority areas at an average density of between 1 and 2 households per hectare*

The guiding policy on rural-residential development is Policy 6.3.8. This policy allows for rural-residential development, beyond that which existed at 1 January 2013, to be provided by Territorial Authorities in accordance with a rural-residential development plan prepared in accordance with the Local Government Act 2002. Selwyn District Council is currently preparing this plan and it is understood that this Development Plan will be largely based on the Council's 2010 Rural Residential Background Report and proposed PC32. On that basis it could be expected that this proposed Plan Change rezoning of 331 Trents Road Living 3 will be largely or fully in accord with the Development Plan when it is completed.

In identifying areas where rural-residential development may be appropriate, Policy 6.3.8 sets out a 'checklist' of matters that must be taken into consideration. The following table considers the proposed rezoning against these matters.

Policy 6.3.8	**Comment in relation to Proposed Rezoning**
(1) The location must be outside the priority areas for development and existing urban areas;	The location of the proposed rezoning is outside of the priority areas and existing urban area of Prebbleton.
(2) All subdivision and development must be located so that it can be economically provided with a reticulated sewer and water supply integrated with a publicly owned system, and appropriate stormwater treatment and disposal	The proposal is able to connect to the Council reticulated systems within Prebbleton, including sewer and water. Stormwater will be treated and disposed of on site. See the Infrastructure Report prepared by Davie Lovell-Smith Ltd for further details.

Policy 6.3.8		**Comment in relation to Proposed Rezoning**
(3)	*Legal and physical access is provided to a sealed road, but not directly to a road defined in the relevant district plan as a Strategic or Arterial Road, or as a State Highway under the Government Roading Powers Act;*	The rezoned land has frontage to two roads. As Shands Road is an arterial road within the Selwyn District Plan, primary access is to be gained from Trents Road.
(4)	*The location of any proposed rural residential development shall:*	
	(a) avoid noise sensitive activities occurring within the 50 dBA Ldn air noise contour surrounding Christchurch International Airport so as not to compromise the future efficient operation of Christchurch International Airport or the health, well-being and amenity of people;	The land to be rezoned is outside of the latest 50dBA Ldn air noise contour for Christchurch International Airport.
	(b) avoid the groundwater recharge zone for Christchurch City's drinking water;	The land to be rezoned is outside of the Christchurch groundwater recharge zone.
	(c) avoid land between the primary and secondary stop banks south of the Waimakariri River;	The land to be rezoned is not between the primary and secondary stopbanks of the Waimakariri River.
	(d) avoid land required to protect the landscape character of the Port Hills;	The land to be rezoned is not located on the Port Hills.
	(e) not compromise the operational capacity of the Burnham Military, West Melton Military Training Area or Rangiora Airfield;	The land to be rezoned is located a substantial distance from the facilities identified and will not compromise their ability to operate.
	(f) support existing or upgraded community infrastructure and provide for good access to emergency services;	The land to be rezoned will provide a housing choice for residents of Greater Christchurch, and therefore will be able to support the existing community infrastructure within Prebbleton. As it is located adjacent to the township, there is good access for emergency services.
	(g) not give rise to significant reverse sensitivity effects with adjacent rural activities, including quarrying and agricultural research farms, or strategic infrastructure;	There is no strategic infrastructure or rural activity within the surrounding environment of the proposed rezoned land that could give rise to reverse sensitivity effects.
	(h) avoid significant natural hazard areas including steep or unstable land;	The subject land is generally flat and is located some distance from the nearest river. The risk of liquefaction from earthquakes is very small – refer Geotechnical Report in Appendix C. On this basis there are no significant natural hazards that could impact on the site.

Policy 6.3.8		**Comment in relation to Proposed Rezoning**
	(i) avoid significant adverse ecological effects;	Given the historic farming use of the site, there are no significant ecological areas that could be impacted by the proposed rezoning.
	(j) not significantly adversely affect ancestral land, water sites, wāhi tapu and wāhi taonga of Ngāi Tahu;	As far as can be ascertained there are no sites of cultural significance to Ngāi Tahu within the application site.
	(k) where adjacent to or in close proximity to an existing urban or rural residential area be able to be integrated into or consolidated with the existing settlement;	The application site is located in close proximity to the existing urban area of Prebbleton. It is effectively an extension of an existing rural residential area that adjoins the Urban Limits. Connections are available primarily via Trents Road through to Springs Road and Lindsay Drive (which will link through to Blakes Road by the end of 2013). The ODP also creates the possibility of a link through the western section of the block to Blakes Road.
	(l) avoid adverse effects on existing surface water quality.	There are waterways in close proximity to the application site that could be impacted by its development
(5)	*An outline development plan is prepared which sets out an integrated design for subdivision and land use, and provides for the long-term maintenance of rural residential character.*	An Outline Development Plan has been prepared for the rezoned land and is included within the Plan Change. This ensures all development will connect to an internal road, that a future link road is available if land to the north is rezoned for rural residential use, that an acoustic fence and building setback is required to mitigate vehicle noise effects from Shands Road and that perimeter trees will be retained.
(6)	*A rural residential development area shall not be regarded as in transition to full urban development.*	The land to be rezoned when combined with Shands Road provides an effective western edge to Prebbleton.

Whilst there is no Rural-Residential Development Plan for the Selwyn District, the proposal to rezone the subject site for rural-residential use is considered to sit comfortably with the intentions of proposed Chapter 6 of the CRPS and as such can be said to implement this policy.

7.2 PC 1 to Canterbury Regional Policy Statement 1998

Proposed Change 1 to the CRPS 1998 provides for the future growth of the Greater Christchurch Area, and helps to implement the outcomes of the Greater Christchurch Area Urban Development Strategy and provide strategic guidance on where and how growth is to occur. This Proposed Change has been appealed and is still before the Environment Court. The Court however, has set aside hearing the appeals while the Land Use Recovery Plan under the Canterbury Earthquake Recovery Act 2011 is prepared.

Proposed Change 1 to the CRPS 1998 is not dissimilar to Chapter 6 prepared under the LURP (See section 7.1 above). The main difference is that Proposed Change 1 contains a policy delineating the number of rural-residential households to be provided within each district. Table 1 of Policy 6

allows up to 600 rural-residential households within the Selwyn District to be provided for by 2041, with 200 households to be provided for between 2007 and 2016. The Anderson Plan Change provides for only approximately 16 households, and therefore fits within the limits set within Policy 6.

Given that the assessment of this proposal in section 7.1 above concludes that the proposal is consistent with, and assists in implementing, Chapter 6 of the CRPS 2013, it is can be inferred that the proposal is also consistent with and implements Proposed Change 1.

8 Draft Land Use Recovery Plan

At the time of writing, a draft Land Use Recovery Plan (LURP) had been put out for public comment by Environment Canterbury, with a final draft to be submitted to the Minister of Earthquake Recovery at the beginning of June 2013. The draft LURP was prepared under the Canterbury Earthquake Recovery Strategy and is intended to provide certainty to the community about where new development will be located and how redevelopment of damaged areas will occur.

The draft LURP sets out ten priorities covering the following matters:

1. a clear and co-ordinated of land use plan for recovery;
2. supporting, facilitating and enabling recovery and rebuilding;
3. development that ensures efficient use of resources and the delivery of core infrastructure;
4. encouraging development that protects and enhances the environment, whilst recognising natural hazards and avoiding environmental constraints;
5. increasing housing supply to meet demand;
6. increasing house choice to support the recovery;
7. restoring and enhancing the quality and sustainability of housing areas;
8. identifying and providing sufficient industrial, office and retail land;
9. ensuring business land makes best use of resources and infrastructure and delivers attractive business premises and urban environments; and
10. maintaining and enhancing access for key freight movements.

The draft LURP then sets out a number of responses to address the priorities identified. Whilst rural-residential development is not specifically identified within the responses to the above priorities, it is acknowledged within the explanation to Priority 6 that such development does satisfy part of the demand for housing generated as a result of the earthquakes.

The proposed Plan Change is considered to be supportive of the intent of the LURP, and through the provision of rural-residential allotments, albeit a small number, it will provide housing and living environment no currently available in the area.

9 Mahaanui - Iwi Management Plan, 2013

The Mahaanui Iwi Management Plan (IMP) sets out Ngāi Tahu's objectives, issues and policies for natural resource and environmental management within the area bounded by the Hurunui River in the north and the Ashburton River in the south. Under Section 74(2A) of the Resource Management Act, a territorial authority must take into account any such plan to the extent that it has a bearing on the resource management issues of the district. The IMP is primarily a tool for

the Rūnanga in the area it covers; the plan also provides guidance to territorial authorities and others. The IMP sets out the broad issues as well as the specifics for particular areas. These matters are considered below, as they are relevant to this proposed Plan Change. It is noted that the IMP does not identify any specific cultural values associated with this land that might be adversely impacted by its development.

Ranginui
The relevant matters identified in IMP are discharges to air and the protection of night time darkness. The proposed Plan Change does not contain controls on these matters. The main discharge to air that could occur through this proposal is the establishment of log burners or similar within individual houses. Such discharges are controlled by Environment Canterbury through the Regional Air Plan. Policy B3.4.3(b) within Plan Change 32 to the Selwyn District Plan notes that a lack of street lighting is expected within new Living 3 zones, except at intersections. The design and placement of any such lighting will be agreed with Council at the time of subdivision.

Wai Māori
Freshwater is of considerable cultural significance to Rūnanga. The main matters of concern relate to water quality and quantity and mixing waters from different waterbodies. The land to be rezoned does not contain any waterways, although a Council water race is located along the Trents Road frontage. With the reticulation of effluent disposal from the proposed new dwellings the potential from adverse impacts on groundwater quality are limited. The site will also be connect to a Council water supply, which is more efficient way to service the development than through a separate well or wells. Stormwater generated by the new road will be treated and disposed of through swales, ensuring that no untreated stormwater will reach the water race or groundwater which is at least 7m below ground level. Further, roof stormwater (generally considered clean) will be disposed of straight to ground. All of these aspects of the development combine to ensure that there will be minimum adverse impact on the freshwater quality or quantity within this locality.

Papatūānuku
The use of land and how it is developmed is of importance to Rūnanga. This section identifies matters such as the urban planning, the subdivision and development of land, stormwater, waste management, and discharges to land. The potential effects of the proposal on the environment have been discussed in Section 5 of this proposed Plan Change. That assessment concludes that there will minimal adverse impacts on the quality of the natural environment as no waste or contamination will be discharged in a manner that will compromise the mauri of surface or groundwater.

Tāne Mahuta
This section addresses the significance of indigenous biodiversity and mahinga kai to Rūnanga. The application site is not located in a known mahinga kai area. The subject land has been used for farming purposes since 1900s, and contains substantial plantings in and around the site, the majority of which are exotic in nature. The proposed Plan Change requires the retention in the main of these existing plantings, and the requirement for additional plantings is a mixture of exotic and native to maintain the character of the site and general area.

Ngā tūtohu whenua
There are no known wāhi tapu, wāhi taonga or mahinga kai sites within the application site or close by.

Te Waihora

The application site sits with the catchment of Te Waihora. The main matters of concern within this area relate to the management of water and waterways within the Te Waihora catchment, and the subsequent impact that can have on the water quality of Te Waihora and its environment. The proposal does not involve an activity that could adversely impact on the lake and its environmental and cultural values.

Summary

It is considered that overall the proposal will not have an adverse impact on the cultural values of iwi as set out within IMP.

10 Part II of the Resource Management Act

The purpose of the Resource Management Act is set out in Section 5 of the Act, being the sustainable management of natural and physical resources. This purpose is subject to Sections 6, 7 and 8 of the Act which set out that matters that are to be taken into consideration in achieving the purpose.

Section 6 identifies the matters of national importance that must be recognised and provided for when exercising a function under the Act. None of the listed matters in section are relevant to this site. As discussed above in relation to section 6 and section 8 matters there are no known wāhi tapu, wāhi taonga or mahinga kai sites within the application site or close by.

In terms of section 7, the matter of most the relevance to the rural residential zoning and development of this site is *maintenance and enhancement of the quality of the environment.* The site is eminently suitable for rural residential elements as it already contains some key elements of quality rural residential development, in particular the treed nature of the site. The trees will provide a high quality setting. This setting, along with the rules that ensure sites are developed with large grassed and treed areas and limited fencing of the rural vernacular, is anticipated to result in a high level of amenity and a boutique rural residential development that will be sought after.

An overall assessment of the proposal to rezoning of this the land for rural-residential purposes is considered to be achieving the purpose of the Resource Management Act. The proposal provides for the social well-being of residents of Selwyn District and the Greater Christchurch area in providing a choice in housing at a time when such choices are needed.

11. Rural Residential Background Report, August 2010

In 2010, the Selwyn District Council released a Rural Residential Background Report (RRBR) that sets out a range of matters to be considered when looking at establishing a rural residential development. This report was prepared as part of the preparation of Proposed Plan Change 17, which was withdrawn by the Council in March 2012.

Council has advised that this background report strongly influenced the preparation of Proposed Plan Change 32, which promotes rural-residential typologies in peri-urban locations adjoining townships. This proposed Plan Change and the other objectives and policies of the Selwyn District Plan have been considered in Section 5 of this assessment.

12. Prebbleton Structure Plan

The Prebbleton Structure Plan (PSP) adopted by the Selwyn District Council in 2010, provides guidance on the growth of the township and in particular the land inside of the urban limits set in PC 1 to the CRPS 1998. Whist this document concentrates on the urban area of Prebbleton, it does acknowledge the potential for rural-residential development around Prebbleton. However, the PSP does not provide any specific guidance on rural-residential development, other than that the Plan should be co-ordinated with the Rural-Residential Background Report discussed above. There is nothing within this proposed Plan Change that would prevent the implementation of the Structure Plan as adopted.

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Appendix A – Davie Lovell-Smith Infrastructure Report

Infrastructure Report

D J & S J Anderson
Proposed Private Plan Change

April 2013

DAVIE LOVELL·SMITH

PLANNING SURVEYING ENGINEERING

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Revision History

Rev Number:	Prepared By:	Description:	Date:
1	David Maclean		09/04/13

Table of Contents

1. GENERAL

1.1 Introduction

This infrastructure report addresses servicing of the proposed rural residential development located at the north-eastern corner of Trents and Shands Roads, Prebbleton as described in the Plan Change Request by David and Suzanne Anderson. The plan change area is approximately 9.2 hectares. The proposed Plan Change seeks Living 3 zoning for this area, which is expected to provide approximately 16 rural residential lots with sizes ranging from 5000m^2 and 6000m^2.

This report primarily addresses the servicing of the proposed development that would follow the rezoning of the site including stormwater treatment and disposal, sewage reticulation and disposal, water supply, earthworks, groundwater, roading, pavements, power and telecommunications. In addition, the suitability of the soils over the site to accommodate rural residential development is addressed.

Considerable consultation has occurred with Selwyn District Council regarding the infrastructure requirements for the site. This consultation has included preliminary correspondence and meetings with individual staff. Consultation has been undertaken with Orion and Chorus to ensure the coordinated provision of these services.

While the request being made is for rezoning of the land, on the basis of the size and orientation of the property and the proposed Outline Development Plan, it is considered that the layout in the Davie Lovell-Smith Plan P.16845 'Possible Subdivision of Lot 2, D.P. 51743' Option D dated May 2012, is a logical subdivision of the land. It has therefore been used as the basis of the infrastructural needs of the site and this assessment. It is understood that the mixture of lot sizes could vary from that under the proposed subdivision. However, in our opinion, any variances are unlikely to change the conclusions reached in the proposed servicing of the site or this assessment.

1.2 The Site

The Plan Change site is located at the eastern side of Shands and Trents Roads' intersection. The site currently contains a dwelling and buildings/outdoor areas ancillary to horse training purposes. Kingcraft Drive Existing Development Area (EDA) is located to the southeast of the application site. This EDA currently allows for rural residential allotments with a minimum area of 1ha.

A request to ECan for information on the Listed Land Use Register reveals that the site is not listed.

2. SITE CONDITIONS

2.1 Soils

The Canterbury Plains consist of intermingled alluvial and glacial fans composed of clays, silts, sands, gravels and graded combinations of these soils. The geotechnical assessment carried out for the development of this site describes the general geological profile of this site as:

- topsoil (0.2-0.25m deep) consisting of dark brown silty fine to medium sand with some organic materials
- fine alluvium consisting of sandy silt to silty fine sand ranging from 0.35m to 1.6m in depth

- Q1a alluvium deeper than 15m (estimated to be up to 100-300m deep), typically consisting of sandy gravel with some to minor silt with local cobbles up to 0.2m in length.

The Environment Canterbury GIS database indicates that the soils underlying the site are Templeton deep and moderately deep silt loam and Templeton deep sandy loam on sand of variable depths and proportions. Further information on the soil profile is included in the geotechnical report prepared by Riley Consultants Ltd and included in **Appendix C** of the Plan Change report.

2.2 Geotechnical Assessment

General Conclusions

Riley Consultants Ltd carried out a geotechnical assessment on the basis of a future subdivision for rural residential development for this site. This report titled *311 Trents Road, Prebbleton, Canterbury – Geotechnical Assessment for Subdivision Consent* dated 28 February 2013 is attached as **Appendix C** of the main Plan Change documentation. As part of this assessment of geotechnical conditions and hazards ta desktop study of available data, walkover inspection of the site, subsurface investigation including mechanically dug inspection pits to 5m, dynamic probe profiles (refusal at 4.5m and 7.5m), and infiltration tests were undertaken.

The Geotechnical Assessment Report concludes that

a. The ground has performed well during the recent earthquake sequence
b. Ground conditions consist of topsoil underlain by generally loose silty sand to a maximum depth of 1.95m over competent gravel with subordinate sand, silt and cobbles.
c. Design groundwater level of 7m is appropriate
d. The ground is suitable stratum for any foundation type (fine alluvium with variable bearing capacity approx. 200kPa, gravel with geotechnical ultimate bearing capacity of at least 300kPa)
e. Based on the interpreted geology and design groundwater conditions, there is minor risk of liquefaction from future design earthquake events. The risk of liquefaction induced ground damage is consistent with a TC1 zoning.

Liquefaction Potential

Riley Consultants consider that the information from their desktop study of regional geology provided and adequate basis for assessment of site geology and liquefaction risk, as such they did not propose or undertake deep investigations. The deep sequence of competent gravel under the near-surface soils, combined with deep groundwater table suggests that liquefaction is not a significant hazard to this site (Section 2 of the geotechnical report).

The report further notes that similar soils in Canterbury have performed well under recent seismic loading and no land damage was observed on site. The site is not likely to be subject to any lateral spreading. Refer to Section 5 of the Geotechnical Report for more detail.

A geotechnical per review for Selwyn District Council was undertaken by Ian McCahon of Geotech Consulting Ltd, who agreed that investigation philosophy as suitable for the anticipated ground conditions.

Ground Suitability

Riley Consultants consider that the site is likely to have ground conditions similar to Technical Category 1 as classified by Department of Building and Housing (DBH). The regional geology and site investigations suggest that the site meets the bearing capacity criteria for 'good ground'

according to NZ3604. They suggest that as top soil is not a suitable stratum for dwelling foundations it should be removed prior to building. Due to variability of finer alluvium further investigations are recommended at time of individual building development to ascertain the most appropriate, cost-effective solution for each building platform.

2.3 Contaminated Soil Risk

An assessment has been made by Davie Lovell-Smith Ltd as to whether the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 apply. This Preliminary Soil Investigation Report is attached to the Plan Change Report as **Appendix D.** As this proposal is for a change in land use, ultimately resulting in subdivision, it is considered that the future activity is covered by the Regulations. An assessment was then carried out to determine if the land was covered. Pursuant to Section 6 of the Regulations, a desktop investigation was carried out to establish whether or not a piece of land is more likely than not to have had a HAIL (Hazardous Activities and Industries List) activity or industry undertaken on it.

The report reveals that the site has been used generally for horse breeding and pastoral farming purposes since 1900s and since at least 1982 as a horse training facility/stud. It is believed that there was little, if any, use of agrichemicals on the land, based on local knowledge of the farming practices of the owner prior to 1980s. Since then, the use of agrichemicals has been limited to well known, non-persisting products such as “Round-Up”.

The preliminary site investigation has found that the presence of a small aboveground diesel storage tank in the eastern corner of the site has had the potential to contaminate the land. It is recommended that further investigation around the diesel storage tank be conducted. There is low risk of contamination for the remaining land, and it is recommended that further investigation is not warranted.

2.4 Groundwater

The site is located over the unconfined/semi confined aquifer. The local groundwater depths vary between 7 to 11 metres based on calculated minimum ground water depths on the ECan GIS database and some actual records on ECan well data. Site inspections carried out by Riley Consultants as part of their geotechnical testing did not reveal any shallow groundwater.

2.5 Surface Water

There is no localised flood risk applicable to this site. There are no notable surface waterways on or near this site. A small pond exists in the northwest of the site at the Shands Road boundary and a water race runs along the Trents Road berm adjoin the site.

3. EARTHWORKS

The site is essentially flat and bulk earthworks will not be required. However there will be general site shaping and excavation of the topsoil layers to form pavements and foundations.

The general earthworks operation will involve the clearing of the site and then the incremental stripping of the topsoil and engineered cut and fill. The site will not be fully stripped in one

operation but will be stripped and finished in stages to ensure better control of the sediment and dust from the site.

Any dust generated on the site will be mitigated with the use of water dampening by sprinkler or water cart. The sediment control will be dealt with in terms of the Environment Canterbury Erosion and Sediment Management Guidelines.

All earthworks will be undertaken in accordance with NZS4431:1989.

4. ROADING

Shands Road is an arterial route and Trents Road is deemed to be a local road. It is proposed that all lots are accessed from Trents Road, avoiding any direct access from Shands Road. There is currently direct access from Trents Road to the existing buildings. The allotment located at the corner of Shands and Trents Roads may either obtain direct access via Trents Road or access the internal road via a right of way. Note that the possible subdivision plan on which this infrastructure report is based is an indicative layout only.

All roads created as part of development of this block will be vested in Selwyn District Council. This comprises of an 18m wide main internal road allotment and another allotment of the same width connecting to the property to the north. The latter provides for any future roading connections to the north should they be required.

Unless otherwise approved by Council, the roads will be constructed in terms of the Selwyn District Council Engineering Code of Practice, to a rural/residential standard the same as or similar to the Living 3 cross section in Appendix 41 to proposed Plan Change 32. The carriageway formation width will be 6.0 – 7.0 metres in width with swales both sides and a berm for walking. Stormwater running off the roads and any proposed rights of way can be collected by a swale and disposed of via a soak pit.

The additional traffic generated by this development is expected to be approximately 130 trips per day on the basis of the commonly accepted trip generation of rural residential households of about 8 trips per day. This increase in traffic can safely be accommodated on Trents Road without the need for upgrading.

5. SEWAGE TREATMENT AND DISPOSAL

The pressure main currently situated in Trents/Shands is likely to be decommissioned when Prebbleton-Lincoln-Rolleston pipeline is commissioned. On the basis of discussions with Council officers an acceptable alternative reticulated system involves pumping sewage from the development to the Trents Road – Lindsay Drive intersection. Preliminary design shows an Ø75mm rising main will be required with an additional pump station near the site. This rising main would convey waste water from a Ø150mm gravity fed sewer system within the subdivision. The pressure main would be installed within the berm along Trents Road pumping waste water to the existing pump station at the entrance of Waratah Park. Installation of the rising main has the option of mole ploughing or chain trench digging to reduce cost and disturbance within the road reserve.

The gravity fed system within the subdivision would also have capabilities of servicing further development of land on the northern boundary. However this may not be economic, unless other landowners are involved to reduce the external reticulation costs. Nevertheless we note that Selwyn District Council has advised the applicant that they would be open to discussions regarding reticulated sewerage options for the site.

While it is proposed to connect to a reticulated system, it is noted that the site's characteristics are such that sewage could be satisfactorily be treated and disposed of to land via on-site systems and without the need for resource consent.

6. STORMWATER RETICULATION AND DRAINAGE

6.1 Local Infrastructure

It is proposed to treat and dispose of stormwater onsite. Stormwater from roofs will be directed straight to soak pits and stormwater from hardstand and roads will be collected and either treated and disposed by a soak pit or discharged directly to soak pits. The groundwater levels in this area range between 7m to 11m based on ECan records. Based on this information, no consents are required from Environment Canterbury for the proposed treatment and disposal of stormwater.

6.2 Discharge Consents

The Land and Water Regional Plan (LWRP) and Natural Resources Regional Plan (NRRP) contain rules pertaining to stormwater discharge. The proposed stormwater disposal methods comply with all of conditions under the Land and Water Regional Plan so no consent is required under this plan.

Under the NRRP, Rule WQL7 allows the discharge of stormwater to surface water subject to conditions. The roof discharges meet these conditions if it is a sealed system. Stormwater from hardstand surfaces and grassed areas within Road reserve will be collected by kerb and channel and discharged to ground via roadside soak pits. Most of the conditions can be complied with; however condition 6 limits the area of disturbed land the discharge can be from to 2ha, which can be achieved with staging of the subdivision.

6.3 Stormwater Control during Construction

Prior to earthworks and site construction an Erosion and Sediment Control Plan will be prepared and presented to both the Regional and District Councils for approval. An off line sediment retention basin or other method of silt control will be installed where required. All erosion and sediment control will be in terms of the Environment Canterbury Erosion and Sediment Control Guidelines.

It is not anticipated that dewatering will be required during the construction phase.

7. WATER RETICULATION

Currently there is an existing 150mm diameter uPVC water main which terminates at the south-eastern corner of the site. Selwyn District Council has advised that connection to the existing line can be made.

The water supply will be designed in accordance with Selwyn District Council specifications and SNZ PAS 4509:2008, New Zealand Fire Service Fire Fighting Water Supplies Code of Practice. Fire Hydrants will be placed in accordance with this standard. All watermain construction will be completed to Council standards. The watermain within the subdivision will extend to the northern boundary and provide connection for future development.

Submains will be laid along the frontage of the existing and new roads, with connections installed at the subdivision stage. The pipe sizing is subject to network analysis modelling that will be undertaken by SDC during the detailed design.

8. ELECTRICITY SUPPLY

All power cabling will be constructed underground in the berms of the street network. Subject to design, high voltage cabling will be laid to kiosk sites within the subdivision and from there, low voltage connections will be laid to the frontage of each new house site and street light.

The cable networks will be constructed and installed by Orion approved contractors and paid for by the developer.

9. TELECOMMUNICATIONS

Chorus will be requested to provide telecommunications reticulation to service the proposed development. The service will be provided via a common service trench with electricity reticulation, and in accordance with the standard guidelines for subdivisions. A service pedestal will be installed at the road frontage boundary of each lot.

10. CONCLUSION

This report has addressed the servicing of the proposed rural/residential development that would follow the rezoning of the site including stormwater treatment and disposal, wastewater treatment and disposal, water supply, earthworks, groundwater, roading, power and telecom. In addition, the suitability of the soils over the site to accommodate urban development with particular interest in liquefaction and potential contamination has been assessed.

The infrastructure proposed for this development has been investigated in association with Council Engineers and specific Utility Service Companies. The methodologies and proposals presented in this Plan Change are based on standard engineering practice.

On the basis of our investigations, preliminary calculations and consultations with Council Officers, we have concluded that the infrastructure proposed for this development is sufficient to meet all future servicing requirements.

Prepared by
David Maclean
Engineer
Davie Lovell-Smith Ltd

Appendix B – Graham Densem Landscape and Visual Assessment

D.J.& S.J.Anderson

PROPOSED PLAN CHANGE
331 TRENTS ROAD PREBBLETON
LANDSCAPE & VISUAL ASSESSMENT

GRAHAM DENSEM
Landscape Architect

v.03
2 MAY 2013

GRAHAM DENSEM
LANDSCAPE ARCHITECTS

CONTENTS

D.J. & S.J. ANDERSON
331 TRENTS ROAD PREBBLETON:
LANDSCAPE & VISUAL ASSESSMENT

1. INTRODUCTION

1.1 This assessment has been prepared by Graham Densem landscape architect, in conjunction with Davie Lovell-Smith Ltd, planners, surveyors and engineers of Christchurch.

1.2 It concerns rural land at the intersection of Trents and Shands Road, Prebbleton. The owners intend to submit a Plan Change application, with the ultimate aim of subdividing the land for rural-residential housing. The applicants are D.J. & S.J. Anderson. They have owned the land for 20 years and operated it as a horse-training establishment.

1.3 The land is in the Inner Plains Zone of Selwyn District. Plan which does not provide for rural-residential activity. Under the RMA, District Plan and Regional Policy Statement consideration of any such change would include its effects on landscape and visual amenity. This assessment addresses those effects.

1.4 While the request being made is for rezoning of the land, on the basis of the size and orientation of the property and the proposed Outline Development Plan, I consider the layout in the Davie Lovell-Smith Plan P.*16845 'Possible Subdivision of Lot 2, D.P. 51743'* Option D dated May 2012, is a logical subdivision of the land. I have therefore used this as the basis of my assessment. I understand that the mixture of lot sizes could vary from that under the proposed rezoning and ODP. However, in my opinion, any variances are unlikely to change the conclusions I have reached in this assessment. A Landscape Concept Plan prepared by me accompanies this assessment.

1.5 I am a Non-Registered Landscape Architect practising under my own name in Christchurch. I have 38 years experience in landscape planning and design and have been a member of the NZ Institute of Landscape Architects for that length of time.

1.6 I am familiar with the Prebbleton area generally from previous involvement with rural-residential and urban-edge issues during the Selwyn Plan Review. In preparing this assessment I visited the site on 24th and 30th October 2012 and viewed recent developments around Prebbleton.

1.7 This assessment is accompanied by a **Graphic Attachment** containing 32 photographs of the site and locality with commentary.

2. SITE & SETTING: DESCRIPTION

APPLICATION SITE

2.1 The plan change application site comprises 9.2 ha of rural land in Selwyn District. It is on the north-east corner of Trents and Shands Roads, west of Prebbleton. It has frontages of 225m approximately on Shands Road and 400m approximately on Trents Road and is in the Inner Plains zone of the Selwyn District Plan.

Photographs of the site are found in the Graphic Attachment accompanying this assessment.

2.2 The property is run as a horse training facility. Its prominent features are

- an 880 metre (4 furlong) sand-surfaced horse training oval;
- paddocks and shelter trees surrounding and within the track;
- the applicants' house and a stables area
- Perimeter trees about 8 – 10m tall, trimmed to hedge-like form on three boundaries but growing more freely on the Trents Road boundary.

2.3 The site aligns generally north-west to south-east. Away from the perimeter trees, it has distant views south-east to the Port Hills (8 – 9 kms) and in suitable light conditions, north-west to the Canterbury foothills (70 kms approximately). Beyond these distant views, the visual landscape is internal to the site, being limited by the perimeter trees. Internal views extend to 200 – 400 metres within the training track area plus attractive smaller-scale views of 50 – 100 metres within tree-lined paddocks and the stables/house area on the Trents Road side of the property. (Photos 2 – 7).

2.4 Access to the site is off Trents Road in the vicinity of the house.

2.5 The site trees are visually prominent, comprising shelter belts on its margins and shelter and amenity trees in the house and stables areas and adjacent paddocks. Mostly these trees are not of significant value as individual specimens but collectively they create an attractive environment of rural shelter and enclosure.

2.6 The Shands Road frontage of the application site is lined with a continuous belt of evergreen trees about 6 – 8 metres high. These have been trimmed into a hedge on both their road and internal side and in width extend approximately 2 metres into the road reserve, beyond the property boundary. (Photos 33, 34).

2.7 The Trents Road frontage also is lined with trees about 8 – 10 metres tall. From the site entrance to the Shands Road intersection these differ from the Shands Road frontage trees in that they mostly are deciduous broadleaves and are not trimmed, but have crowns that spread above the road berm. This gives an attractive enclosed, leafy, rural feel to this section of Trents Road. From the site entrance to the Prebbleton end of the property, the frontage trees are a more regular conifer screen. (Photos 1, 6, 32).

2.8 A Selwyn District Council water race flows along the frontage of the plan change site in the berm of Trents Road. It is part of a system established decades ago for agricultural use and carries a healthy flow. Alongside the application site the race is incised a metre or more below berm levels, with steep sides. Dead grass indicates the sides are maintained by spraying. The berm itself comprises mown grass. (Photos 1, 24, 25).

2.9 The Report *'Soils of New Zealand Part 1'* (1968) shows the Prebbleton surrounds to be of Templeton-Eyre soil type and rates their potential as *'Class 1, 'slight limitations to pastoral use'.* The Canterbury Regional Policy Statement 2013 defines 'versatile soils' as those 'having *few limitations for use, and suitable for primary production with few inputs such as additional nutrients or water.'* (CRPS 2013, Chapter 15, p.145). The soils of the Plan Change site thus are seen to be of value, as part of a belt through this part of Selwyn District.

2.10 **Summary:** The application site displays rural character typical of the Inner Plains of Selwyn District. This consists of a pattern of shelter hedging around horticultural or small stock holdings that is more-densely planted and of smaller scale than traditional mixed farming properties further out on the Plains. Properties are typically 4 – 10 hectares in size, compared to 50 – 200 hectares on the wider plains. Paddock sizes also are smaller, leading to the more-enclosed visual character. District-wide it is of above average value in terms of its soil type and productive capacities, although the soil type is common around Prebbleton.

SETTING OF APPLICATION SITE:

2.11 The application site is located west of Prebbleton Township, at the western end of a block enclosed by Shands, Trents, Springs and Blakes Roads ('the Trents-Blakes Block').

Prebbleton Township

2.12 Prebbleton was one of the earliest rural settlements outside Christchurch. Since World War 2 it has grown as a dormitory township and in the last 15 years its residential margins have grown exponentially on all sides. This is summarised in the Selwyn District Council document *'The Future of Prebbleton: Prebbleton Structure Plan'* of February 2010. The planning context of Prebbleton's growth will be discussed in s.5 below.

2.13 The school and shops, and to a lesser extent the churches, hall, pub, Domain, 'Meadow Mushrooms' factory, and the Springs Road bus routes are the focus of today's Prebbleton and the Structure Plan seeks to retain this focus.

Rural Surroundings

2.14 Since 1945 the rural surrounds of Prebbleton have undergone an intensification of land uses. The former mixed cropping-livestock farms have been subdivided into properties of 10 or 20 acres, typically comprising agricultural, horticultural and equestrian operations. As a result the visual landscape, while still rural, has become 'closed up' by the planting of tall perimeter shelter hedging, compared to the open paddocks of the previous larger grazing properties. These intensive rural areas generally form the 'Inner Plains' zone of the District Plan.

2.15 In the 'Trents-Blakes Block' west of Prebbleton, many intensified agricultural properties have over the last 15 years experienced further subdivision for residential growth. These have sections ranging from 2500m^2 to 3.5hectares. For example, the Kingcraft development near the application site has lots ranging from 1 to 2 hectares. (Photo 18)

2.16 The Selwyn Proposed Plan Change 32, discussed in section 4 below, defines 'rural residential' as *'residential units at an average density of between one and two households per hectare ...'* Under this definition, anything under 0.5ha is not considered rural, whereas anything above 1 ha is primarily considered a productive unit, as opposed to a residential one.

2.17 This size-based definition will be adopted throughout the following assessment. The 'Intensive Rural' land referred to above contains properties in the range from 1 - 8 ha, many being 4 ha (10 acres), which was the old Plan minimum. The

further-subdivided land is in a range of sizes but will now be used to refer to the narrowed-down range of residential lots between 0.5 and 1.0 ha in size, or 'rural residential', proposed in Plan Change 32.

2.18 In the 'Trents/Blakes Block' and land north of Blakes Road, rural residential further subdivision has occurred on a property-by-property basis, with some intervening properties remaining rural while others are subdivided for housing.

2.19 In the piecemeal further subdivision process little provision has been made for access between developments in the 'Trents-Blakes Block'. An inflexible development pattern has emerged, particularly in the western half of the block, with no provision for connections to the Prebbleton School or commercial area, except along Trents or Blakes Roads. There also is a lack of provision for social links between existing and future residents in adjacent developments within the block.

2.20 Opportunities remain for links between Trents and Blakes Road within the westernmost part of the Trents-Blakes Block, where the properties are still rural, if the Council can co-ordinate the layouts as each of these comes up for development in the future.

2.21 Selwyn District Council (SDC) policies for rural-residential development will be discussed in s.4 below.

Shands Road

2.22 Shands Road, bordering the application site, is a busy arterial road carrying commuter and business traffic between Lincoln-Springston-Leeston and Christchurch. Vehicles travel at open-road speeds and there is significant traffic noise in the north-western quarter of the application site, although the traffic itself is unseen behind the boundary trees.

2.23 Many frontages along this part of Shands Road are lined with tall trimmed hedges or boundary trees. Views from the road are generally confined within the road corridor, with only occasional open views across paddocks. This section of Shands Road, including the application site, has a somewhat featureless rural character, due to the unvarying and enclosing nature of the hedging.

2.24 On Shands Road adjacent to the application site there is a grassed verge approximately 3 metres wide between the boundary trees and carriageway. A power line with wooden poles runs down the opposite side of Shands Road but there are no overhead lines on the application site side. There are however believed to be underground lines or pipes beneath the verge on the application site side.

2.25 A Transpower pylon line runs parallel to but west of Shands Road. It is about 250 metres north-west of the application site frontage and does not affect it directly, but is partly visible above the hedges, although of little significant visual impact.

2.26 The following Photos illustrate the issues raised: 12 – 18, 20, 22, 26 – 29, 33, 34.

2.27 Given developments in the 'Trents – Blakes Block' and the lack of natural barriers, it may be logical to consider Shands Road as a sustainable edge between the rural

residential area west of Prebbleton and the Inner Plains 'Intensive Rural' area between Shands Road and Templeton.

Trents Road

2.28 Traffic on Trents Road is less heavy than Shands Road but still moderate, this being one of several local routes into Prebbleton from the west. Trents Road has less noise impact on the application site than Shands Road because although also an area of open-road speed limit, vehicle speeds are slower due to the compulsory stop at Shands Road.

2.29 Trents Road is bordered by intensive rural properties between Shands Road and Prebbleton. Adjacent to the application site the frontages on both sides generally are lined with trees, not trimmed into hedges but growing in their normal forms and spreading above the road verge (Photo 1). In places these trees are limbed up, allowing views into adjacent properties. The verges are grassed and without kerbs or footpaths, and this section of Trents Road has a more pleasant rural character than Shands Road (Photos 26 – 29).

2.30 The distance from Shands Road to Springs Road along Trents Road is about 1.6km. The 50km speed limit is about halfway along this distance and from here to the Springs Road intersection, Trents Road has an urban character, with a widened carriageway, kerbing and footpaths, and residential housing alongside.

2.31 A Council water race runs in the verge of Trents Road, on its north side (Photos 20, 23-30). This is an active race originating far to the west and continuing to the east of Prebbleton. It is for agricultural water supply and as far as possible it is kept separate from the runoff of adjacent properties (Photos 24 – 29)

Christchurch City

2.32 The boundary between Selwyn District and Christchurch City is located on Marshs Road, 1700m north-east of the application site. Visually and functionally the boundary has no effect on the application site.

2.33 It has been a policy of the previous CRPS and Selwyn District Plan to maintain Christchurch and Prebbleton as separate settlements, with a belt of rural land between the two. Currently along Shands Road this rural belt is 850m wide, measured from factories in Christchurch City to the Aberdeen subdivision in Selwyn District. Partly this belt comprises open paddocks and partly hedged properties. While minimal, the rural belt currently maintains a sense of separation between Christchurch City and Prebbleton on Shands Road.

Motorway

2.34 Stage 1 of the Christchurch Southern Motorway has been recently been opened as far as Halswell Junction Road and Stage 2 to Robinsons Road is currently in the consenting process. In the future the motorway stage 2 will cross Shands Road 1.2 kms north-east of the application site, with entrances and exits on Shands Road giving convenient vehicle access to central and southern Christchurch.

2.35 The motorway will not affect the application site visually but will affect rural character between Prebbleton and Templeton, with a lessening of naturalness and

change to the rural patterns. A lessened area of rural landscape will remain between Prebbleton and Templeton.

Christchurch Earthquakes

2.36 On-line earthquake maps shows 16 epicentres of Richter 3.8 – 5.2 within 3.5 kms of the application site during the 2010 – 2012, all shallow. The application site has not been affected more than Prebbleton generally and the landscape values of the site have not altered.

2.37 **Summary, Inner Plains:** The application site is within a rural-intensive area which has recently seen significant subdivision for rural-residential uses. The layout of these rural-residential developments does not provide for future access to Prebbleton within the Trents-Blakes Block and access from the plan change site to Prebbleton will be via Trents Road for the foreseeable future. Opportunities still exist for coordinated development within the westernmost part of the Trents-Blakes block.

2.38 The application site is bordered by Shands Road, a busy Arterial Road. This creates a noise issue for the site but no functional or visual issues so long as the boundary hedging remains. Shands Road is a hedged corridor but Trents Road more pleasantly open and 'leafy'.

2.39 The soil fertility of the area creates an ability to maintain rural character by healthy trees and gardens if rural-residential development occurs.

3. SITE & SETTING: LANDSCAPE CHARACTER

Application Site

3.1 **Landscape character:** The plan change site can be characterised as part of an 'Intensive Rural' landscape. It remains a rural landscape although towards the urban end of that range. It remains rural because the land use of grazing and training horses is that of rural areas. Also because its land surface, while modified from the original state, predominantly comprises pasture, in a sustainable management regime. The developments are a small proportion of the site character, compared to the natural parts. There is significant tree planting, creating a landscape scale that, while reduced from the open spaces of the outer Plains, remains that of an intensive rural property and not the small spaces of an urban area.

3.2 **Landscape Values (site):** Landscape values can be grouped into the three categories 'Natural', 'Aesthetic' and 'Cultural', and each rated on a seven-point scale as follows:

SCALE OF LANDSCAPE VALUES

Very High	*High*	*Moderate-High*	*Moderate*	*Moderate-Low*	*Low*	*Very Low*

MOST VALUE — **I** — ***halfway*** — **LEAST VALUE**

3.3 On this scale the application site falls a little below the border between 'Moderate' and 'Moderate-High' in its combined natural, aesthetic and cultural values.

3.4 In **natural values,** nothing on this site is pristine or of high value, but the natural contours, drainage, pasture, soil, trees, bird life and fauna comprise a 'Moderate' level of value.

3.5 In **aesthetic values** the site is attractive, with its trees, spaciousness, ambience, horses, the distant mountain and Port Hills views, and leafy frontage on Trents Road. Nothing is dramatic or particularly memorable but the pleasant rural feel comprises a 'Moderate' level of aesthetic value.

3.6 In **cultural values** also this site is 'Average'. It supports a viable rural economy and has a general value to the rural 'ambience' for passers-by and neighbours. No specific Tangata Whenua or heritage values are known. These issues are not 'out of the ordinary' and this site as of 'average' cultural values.

3.7 **Assessment, Site:** Combining these three measures of landscape value, on the seven-point scale, the application site should be regarded as in the 'Moderate' range, for its rural character and natural attributes.

Rural Character around Prebbleton:

3.8 The baseline character of the surrounding rural landscape is 'Intensive Rural'. GoogleEarth shows about 60% of properties within a 1.5km radius of the plan change site appear to be small rural enterprises. Of the remainder, about 20% appear to be 'Rural-Residential' housing and 20% traditional mixed cropping/grazing farms.

3.9 Rural-Residential sites around Prebbleton generally are smaller than Intensive Rural ones, being 0.5 – 1 ha, compared to 4ha. They also have a developed internal infrastructure of streets, intersections, lighting and services, compared to Intensive Rural sites, as well as a greater density of houses. The traditional rural character of the wider Plains comprises larger mixed cropping-livestock farms of 50ha and up, with open pastures and views and a lesser density of trees than intensive properties.

3.10 There is a tension between the three land use types around Prebbleton, with urban pressures for intensification of rural land balanced by District Plan measures to maintain rural productivity.

3.11 The district around Prebbleton is of value for its rural character, naturalness and soils. The character derives from the sense of rural space and uses in contrast to Christchurch City and Prebbleton. The naturalness derives from the pastures, soil and groundwater processes and the trees. It also derives from the uncluttered character of the rural roadsides, the distant views to Port Hills and mountains, and the bird and animal life that co-exists with humans. The rural surrounds of Prebbleton can be characterised as pleasant but not notable, and its landscape values as moderate.

3.12 In these respects the values stated for the application site in 3.2 – 3.7 above also relate to the surrounding district. The application site can be considered typical of its surrounding area. It possesses some distinct values but none so important as to

demand preservation or to rule out change. It is desirable however that rural character and soil values be retained in any future change.

Rural-Residential Character in Prebbleton

3.13 A range of different housing environments and section sizes has been established around Prebbleton, from regular and low density housing within the town to a range of rural-residential sizes. These are summarised in Table 4 of the SDC discussion *document 'The Future of Prebbleton, Prebbleton Structure Plan'*, of 2010 (p. 13), noting that at 8.5 the 0.5 – 1.0 ha range is referred to as 'rural residential' development. The CRPS and subsequent work by SDC now defines rural residential development as that which has an average density of between 1 and 2 households per hectare.

3.14 A significant difference exists between the residential character of rural and the urban developments, although this is not clear-cut as some rural elements are found in urban areas and some urban elements in Rural-Residential areas. Around Prebbleton the following differences distinguish rural-residential areas from urban residential areas:

- Lesser built **Densities**, leading to greater feeling of spaciousness and greater naturalness in rural-residential areas;
- Greater **Setback** of houses from carriageway in rural-residential areas, also leading to a more spacious feel in streets;
- Greater **Tree Numbers** in rural areas, leading to a balancing of built elements (buildings, roading) by natural ones, in the visual environment;
- **Tree Sizes:** The space for larger-sized trees to coexist with housing in rural-residential areas, making for a more varied visual and natural environment;
- **Street Hardware** (paving, kerbs, drains, poles, lighting) is more visually-dominating in urban streets than rural-residential, because they occupy a greater proportion of the scene within towns;
- **Frontages,** particularly fencing, more likely to be of open character in rural-residential areas, because privacy can be maintained by separation rather than barriers;
- **Land use** likely to be more diverse, with space for a garden, horse paddock etc in rural-residential areas.

3.15 These differences provide the design basis for the plan change now proposed, seeking to maintain all possible rural character and avoid unnecessary urban elements. They are itemised within notes attached to the photos in the Graphic Attachment with this assessment. These establish the following principles:

- Generous numbers of trees will maintain a rural feel;
- Careful selection of tree types and locations, particularly small-medium broadleaf deciduous trees, will maintain a rural feel while avoiding shaded environment near houses, particularly in winter;
- Spaciousness of the ground plane can be achieved by keeping it open and mown, and by 'limbing up' trees so views are maintained below their canopies;
- Integrating open swale drainage and holding ponds with streets, will maximise the sense of open space and add to the effect of openness;
- Avoiding urban-type kerbing where possible;
- The Trents Road water race diversifies natural character for adjacent sites;

- Social processes will be promoted by providing non-vehicle circulation (pedestrian, cycle) within rural-residential sites, by non-vehicle connections to Prebbleton on Trents Road, and by requiring links between neighbouring developments in the future;
- By generally retaining existing trees on the Trents Road frontage;
- On the Shands Road boundary of the plan change site, by reinforcing existing planting with a second row of trees, and incorporating a sound absorbent barrier (fence, bund) between the two rows.

4. PLANNING PROVISIONS FOR RURAL RESIDENTIAL AREAS

CANTERBURY REGIONAL POLICY STATEMENT 2013

4.1 The Regional Policy Statement 2013 has the following policies relevant to this landscape assessment:

4.2 **Policy 5.3.1 Regional Growth (p.33-4)**

To provide, as the primary focus for meeting the wider region's growth needs, sustainable development patterns that:

(1) Ensure that any

(a) urban growth; and

(b) limited rural residential development

occur in a form that concentrates, or is attached to, existing urban areas and promotes a coordinated pattern of development.

(2) .....

4.3 **Policy 5.3.2 Development Conditions (pp. 34-5)**

To enable development and regionally significant infrastructure which:

(1) Ensures that adverse effects are avoided or mitigated, including where these would compromise or foreclose:

(a) Existing or consented regionally significant infrastructure;

(b) options for accommodating the consolidated growth and development of existing urban areas;

(c) the productivity of the region's soil resources, without regard for the need to make appropriate use of soil which is valued for existing or foreseeable future primary production, or through further fragmentation of rural land;

(d) the protection of sources of water for community supplies;

(e) significant heritage, cultural, or landscape values, and areas of high natural character;

(2) ....

Principal reasons and Explanation

...

Rural residential development is typified by clusters of small allotments usually in the size range of up to 2ha zoned principally for residential activity. Rural residential development will need to be well planned and coordinated in order to minimise adverse effects on such matters as: rural character and resources; rural infrastructure including the road network; and not foreclose development options in the vicinity of urban areas.

... Within the wider region it is important that areas zoned for rural residential development are located close to existing towns and villages so as to ensure efficient utility servicing and patterns of transport.

4.4 Policy 5.3.12 Rural Production (pp.43-4)

Maintain and enhance natural and physical resources contributing to Canterbury's overall rural productive economy in areas which are valued for existing or foreseeable future primary production, by:

(1) avoiding development, and/or fragmentation which:

(a) forecloses the ability to make appropriate use of that land for primary production; ....

...

(3) ensuring that rural land use intensification does not contribute to significant cumulative adverse effects on water quality and quantity.

Principal reasons and explanation

... Versatile soils (Classes I and II under the Land-use capability system) are that part of the soil resource that will support the widest range of productive uses with the least inputs. ...notwithstanding the current use of these soils, options for their future use for rural productive purposes should not be unnecessarily foreclosed. ... In order to maintain the rural productive base of Canterbury, separation and management of the interface between rural production and other activities sensitive to the effects of rural production, is necessary.'

SELWYN DISTRICT PLAN

4.5 The proposed plan change site is in the Rural (Inner Plains) zone of Selwyn District. The District Plan seeks to manage Rural-Residential development in the zone through the recently proposed Plan Change 32 to the District Plan. This seeks to incorporate more detailed objectives and policies for assessing privately requested changes seeking a Living 3 zone, and general rules for managing rural residential activities.

4.6 **Proposed Plan Change 32** in paragraph 4.82 states that the **aesthetic values** of the Lower Plains section of Canterbury arise from *'the strong geometric patterning and the vastness of the plains, where the long uninterrupted views to the Alps provide a visual contrast. ...* [In the Canterbury Regional Landscape Study Review , 2010] *... the Lower Plains are identified as being important but not identified as an Outstanding Natural Feature or Landscape ...'*

4.7 Regarding **rural residential character**, paragraphs 4.83 – 4.87 indicate a density of 1 household per hectare is the minimum required to deliver the character, amenity values and rural context that maintains rural residential character although scope for higher densities exists in the interests of choice, efficiency and better use of the rural resource.

4.8 The elements of rural residential character are stated as resulting from *'a myriad of factors, including the bulk, location, form and appearance of activities within any given area.*' The ability to achieve them is stated to be dependant on such factors as the number, size and orientation of lots, along with the configuration or proportions of subdivision layout and servicing requirements.

4.9 An emphases is placed on avoiding the collective effects of to extensive or too high a density of development within predominantly low density rural settings, so residents of the rural residential development can truly experience the character and amenity of the setting in which they reside.

4.10 **Attachment 1** of the Plan Change document is a schedule of proposed amendments to the Partially Operative Selwyn District Plan, to incorporate the Living 3 zone into the Plan. These include an 'Indicative Road Cross Section – Living 3 Zone' and 'Fencing Typologies – Living 3 Zone' (Appendix 41 in Attachment 1). The following relevant amended Rules are proposed:

Amendment 79: Residential Density, Anticipated Results:
'Living 3 zones are low density rural residential areas that contain a lower ratio od built form to open space than low density residential environments to achieve the character elements that are commensurate with rural residential areas, such as panoramic views, rural outlook and a sense of open space.'

Amendment 93: Preferred Growth Option Prebbleton; Policy B4.3.65:
'Consider any potential adverse effects of rezoning land for new residential, rural residential or business development at Prebbleton on the 'rural-urban landscape contrast of the area with Christchurch City, as identified in the RPS.'

Amendment 94: Preferred Growth Option Prebbleton: Policy B4.3.65 Explanation and Reasons:
'Rural residential forms of development represent a change in character and land use attributes from rural activities that contribute to the rural landscape and amenity contrast with Christchurch City. It is therefore important that any additional living activities located outside the Urban Limits of Townships in the Greater Christchurch Urban Development Strategy area in the form of the Living 3 zone are managed to retain the 'rural-urban character and amenity contrast between rural zoned land and the territorial authority boundary with Christchurch City.'

Amendment 107: Buildings and Landscaping Reasons for Rules:
'The expectation of residents choosing to live in the Living 3 zone is for all to experience a semi-rural outlook that is distinct from low density residential areas provided for within townships. A key element to ensuring the sense of openness associated with rural residential character is achieved through the form and function of fencing. Rule 4.2.3 restricts opaque fencing in favour of more transparent designs, with a preference for the rural design vernacular that serves a practical function in the context of rural residential living environments. Fencing with high transparency achieves high levels of openness and reduce the appearance of land fragmentation, which helps to create the sense of ruralness that is expected of the Living 3 zone. Flexibility to construct solid fencing within 10 m of the side or rear of the principal building is considered appropriate for screening and privacy purposes. The setback provides for the establishment of a curtilage area for outdoor living purposes that will be linked to the dwelling from a visual perspective.'

Amendment 109: Permitted Activities – Buildings and Building Position: Rule 4.9.32:
4.9.32 Any building in the Living 3 Zone shall have:

(i) A setback from any road boundary of not less than 20m
(ii) A setback from any other boundary of not less than 15m'

Amendment 119: Restricted Discretionary Activities – Subdivision – Assessment Matters:

Add new Living 3 zone assessment matters to Rules 12.1.1.79-12.1.4.89, as follows:

Rule 12.1.4.79 *The extent to which significant open space has been maintained and features that contribute to rural character have been retained;*

...

Rule 12.1.4.81 *Whether fencing achieves a high standard of transparency, with a preference for designs that express a rural vernacular, according with the typologies outlined in Appendix 41, and formulating mechanisms to ensure this fencing remains on an ongoing basis (such as consent notices);*

...

Rule 12.1.4.83 *Whether overall densities based on the level of development and open space anticipated for rural residential living environments have been achieved*

Rule12.1.4.84 *Principal through roads, connections and integration with the surrounding road network and strategic infrastructure are provided, including the extent to which the proposal accords with the road cross sections and typologies provided within Appendix 42 and reflect the semi-rural nature of service appropriate for rural residential areas;*

Rule 12.1.4.85 *The extent to which site analysis using a comprehensive design process and rationale has been undertaken to recognise, and where appropriate, protect, maintain and enhance the following elements:*

- *existing water courses, water bodies and springs*
- *existing vegetation such as shelter belts, hedgerows and habitats for indigenous fauna*

  ...
- *preserve view shafts to the Port Hills*
- *provision of green linkages, ecological corridors and interface treatments on boundaries with rural or urban forms of development where appropriate*

  ...
- *indicate how the form and layout of the subdivision fits into the wider setting and is able to be integrated into these surrounds, including in particular, the provision of measures to retain rural landscape elements and view shafts to rural and landscape reference points*

Rule 12.1.4.86 *whether subdivision design:*

- *encourages dwellings and ancillary buildings to be well integrated into the surrounding context of the site*
- *avoids urban elements, such as street lights (except at intersections), formed kerb and channel, sealed footpaths, or prominent entrance features*

- *maintains rural residential character through the retention of a low ratio of built form to open space*

...

Amendment 121: Part D: Definitions

'Insert a new definition for 'rural residential activities

'Rural Residential Activity' means residential units at an average density of between one and two households per hectare, which are located within the Greater Christchurch Urban Development Strategy area of the District and outside the urban limits prescribed in the Regional Policy Statement.'

4.11 The above Plan provisions will be considered in Section 6 below.

5. PROPOSED PLAN CHANGE

5.1 The applicants seek to rezone their land to Living 3 to provide for rural residential development which is anticipated to create 16 lots of 0.5ha each approximately, with roads and services. A possible subdivision plan of the land accompanies the Plan Change Request, (refer Appendix E of the Request) showing a generalised proposed layout and other essential features.

5.2 Derived from the above analysis, the following list sets out matters which are important in maintaining rural character and environmental values of the site and its surroundings. They also provide for future non-vehicle linkages with Prebbleton and surrounding communities in the Trents-Blakes block. The matters of note are as follows:

1. Spaciousness:
   (a) section sizes shall be no less than 0.5ha, which enables wide separation between neighbouring houses;
   (b) site coverage shall be no greater than 10% on any given lot, ensuring the majority of the lot remains open for trees, gardens and natural processes;
   (c) no structures shall be erected within 15m of the property frontage;
   (d) no fences hedging or screen planting shall be erected on private street frontages or side boundaries within the 15m setback zone;
   (e) rural character shall be maintained in street design through openness at ground level, continuous grassed surfaces and tree planting.
2. Urban Character:
   (a) all surface drainage shall be by grassed swales and according to natural drainage principles;
   (b) street cross-sections shall emphasise grassed surfaces, avoiding kerbs and upstanding hardware in providing for essential services;
   (c) signage such as entrance identifiers and street names shall be coordinated in a rural style.
   (d) Fences, where erected, shall be of the farming vernacular, retaining a sense of openness.
3. Trees:

(a) Extensive plantings of deciduous, evergreen and native trees will occur in streets and reserves, to establish a leafy skyline for the development;
(b) Tree Covenant Areas will be defined on private sections where the development borders neighbouring properties (north and east) and Trents or Shands Roads. No buildings will be permitted within these areas and existing boundary trees must be retained and maintained by the owner. New trees may be planted in these areas so long as they do not inconvenience neighbours;
(c) It is expected most owners will undertake further amenity plantings within their properties;
(d) Where appropriate, suitable existing trees within the site will be retained, including those which will be on private sections.

4. Water race:
   (a) The district water race on the Trents Road frontage will be regarded as an amenity asset and its banks rounded as far as possible within SDC requirements and the need to retain frontage trees;
5. Shands Road Frontage:
   (a) For the purpose of noise control, a noise absorbent fence will be constructed along the length of the new zone, immediately behind the existing frontage trees. A second line of amenity trees will then be planted on the residential side of the fence, to screen it from view. The trees will be within a designated 'Tree Area' as in 3(b) above;
6. Trents Road Frontage:
   (a) Where suitable, existing trees on the Trents Road frontage will be retained, to maintain the leafy rural feel of the road. This refers particularly to the half of the frontage nearest to Shands Road.
7. Linkages to Prebbleton:
   (a) A footpath/cycle route is possible along the north side of Trents Road, beside the water race. This would provide non-vehicle access to Prebbleton, in combination with other property owners and the SDC.
   (b) Non-vehicle linkages could be established with future developments on neighbouring land. One could connect northwards to Blakes Road, which could cater for school children. Another could connect eastwards to the Kingcraft Drive area, which could link with surrounding communities and the Prebbleton Commercial area.

6. ASSESSMENT OF EFFECTS

INTRODUCTION:

6.1 Landscape effects occur in three forms:

(i) those that affect the physical landscape of topography, soils, vegetation, flora, fauna etc (Physical Effects); and
(ii) those that affect what people see in the landscape, or Visual Effects; and
(iii) those that affect people's interpretations of what they see, or Landscape Character.

6.2 This section will identify and then assess the effects under these three categories. It also will discuss the effects in relation to the Selwyn District Plan and Canterbury Regional Policy Statement.

PHYSICAL EFFECTS

6.3 The proposed development would change the ground surface and lessen naturalness through construction of roading, services, housing and hard paving on site. The site's natural values are moderate and not high and there are no significant natural values. Its versatile soils are Moderate-to-High in values but the majority will be retained in domestic lots, except where built on or paved. Natural soil processes and drainage will continue over a majority of the land surface. Streets will be modified through paving and the forming of swales but soil will remain an important element in supporting tree growth, natural drainage and the planned rural residential character.

6.4 Existing animal, insect and bird life will be disrupted but can be expected largely to adapt to the subdivided environment, given the high levels of natural surface and natural groundwater processes that will remain, compared to the relatively small proportion of built and paved surface.

6.5 Existing boundary trees will be retained except where clearance for the new access road will be necessary. Clearance of internal trees near the training track will be necessary to accommodate the new layout but trees around the existing house will be retained. Substantial new plantings are anticipated throughout the site, including those which future owners will initiate on each section. The overall tree count within the property will increase following subdivision, creating increased habitat and photosynthetic/carbon processes.

6.6 The roadside environments on Trents and Shands Road will remain largely unchanged, but with the possible addition of a paved footpath along Trents Road.

Conclusions, Physical Effects

6.7 Effects on the natural environment will be significant but on balance not significantly negative. Large numbers of trees will be retained and new ones planted. Soil processes will be changed but will remain in a sustainable form over much of the land surface. The soil versatility will benefit tree growth in the proposed rural residential environment. The proposed rural residential environment would maintain most rural natural processes and would be sustainable.

VISUAL EFFECTS

6.8 Lessening of the 'Inner Plains' rural scale will occur because of greater subdivision of the visual environment. However through the design devices proposed the rural residential environment will retain important elements of rural scale, openness and a predominance of vegetation (trees and grass), and a significantly spacious new rural residential environment will result.

6.9 The currently open horse paddocks will be replaced by a visual environment of houses, streets and sections. This will be a significant change but will be internal to the site, and an attractive, comprehensively planned rural residential environment will result.

6.10 Views to the Port Hills and Alps will be retained along roads and as glimpses within sections. This will be a decrease from the wide views currently available in the open horse paddocks, but will be a sustainable retention of key views along the roads.

6.11 Boundary trees will mostly remain within covenant areas and apart from tree clearance and intersection formation at the new entrance, the proposed living environment will remain internal to the site, visually. Externally the development will create no visual change for road users or neighbours, apart from the net positive change on Trents Road. A proposed noise barrier on the Shands Road frontage will be unseen from the road, behind existing trees. A planned second line of trees within the site will screen it from the general view of residents.

6.12 The roadside on Shands Road will be unchanged visually. If possible changes to the water race banks and footpath construction are agreed, some opening up of the Trents Road frontage would occur. However a majority of trees would be retained, the ground surface would be improved and new trees planted, with a net gain in visual environment once re-established. The new roadside also would be visually attractive and rural in appearance.

Conclusions, Visual Effects

6.13 There will be a significant change to the visual environment internally, within the site, with both positive and negative aspects. The proposed design ensures the environment will retain significant proportions of rural elements, namely trees, grass and a limitation on urban elements in the streets and frontages.

EFFECTS ON LANDSCAPE CHARACTER

6.14 The landscape character of the site will change from 'intensive rural' to 'rural residential', from the addition of residential uses and streets to what are currently horse paddocks. This is a significant change but would be almost entirely internal to the site, with little effects on neighbours or surrounding areas of the Inner Plains.

6.15 The existing environment has general values but no particular notable ones that would be lost. The District Plan identifies rural character as an element of value in the Inner Plains and, while changed, this would be retained in the planned rural residential environment. The new residential landscape is planned to comprehensively integrate the natural, visual and social elements, and is intended to ensure an attractive and sustainable rural living environment.

6.16 The net effect on rural character thus is concluded to be neutral in that, while one attractive sustainable environment is lost, another is created.

6.17 The new environment would be in keeping with its situation beside Shands and Trents Roads, and with the general pattern of development between Shands Road and Prebbleton. It keeps open the possibility of linkages to neighbouring land and Prebbleton, if these should be possible in the future. It therefore is regarded as positive to the future community patterns that could develop in the surrounds.

6.18 The current simple rural roadside character on Trents Road would be changed with the addition of footpath, earth shaping and tree changes, but with the comprehensive approach proposed, a sustainable rural character would continue.

Conclusions, Effects on Landscape Character

6.19 The changes to character are significant but with positive and negative elements, are neutral on balance. The new rural residential area is planned as an integrated development that will maintain rural character elements within the new residential use. The existing site environment has no particular notable character elements beyond its simple rural spaciousness. This will be lessened but not extinguished in the proposed environment.

6.20 In terms of landscape character, the proposed rural residential environment would be entirely suited to the area between Shands Road and Prebbleton, given the effects of Shands Road on one side, and Prebbleton Township plus its rural residential surrounds on the other.

EFFECTS UNDER CANTERBURY REGIONAL POLICY STATEMENT

6.21 The proposal fulfils the requirements for Regional Growth in **Policy 5.3.1 (1).** It is a limited rural residential development that would be within a defined area west of Prebbleton, for which Shands Road is a most appropriate limit. No other obvious natural or cultural barriers exist between Shands Road and Prebbleton, that could form such a limit. Should some other limit closer to Prebbleton be maintained, there is no particular advantage in landscape character to maintaining land east of Shands Road as 'Inner Plains' rural. With coordinated planning over the coming years, the subject property could be effectively linked to, and thereby 'attached to' Prebbleton in the sense intended by Policy 5.3.1(1).

6.22 Regarding **Policy 5.3.2 (1),** the proposal mitigates or potentially mitigates adverse effects on the following items that would be compromised or foreclosed:

(b) options for consolidated urban growth are potentially maintained by providing for future linkages to Prebbleton, and by the natural barrier to further growth of Prebbleton that would be formed by Shands Road;

(c) Options for future soil productivity are not maintained in the form of the existing paddocks. However a potential for residential productivity is maintained at the development densities proposed, and the soil resource will support a thriving rural residential environment through tree growth;

(e) No particular notable heritage or landscape values are affected. The existing natural character is moderate, and no areas of high natural character are affected. Also, a sustainable new form of rural residential natural character would result.

6.23 Regarding **Policy 5.3.12** 'Rural Production', the proposal would fragment and lessen the potential of the versatile soils for primary production in the traditional sense, However there is potential for small scale production of food or flower crops within each 1ha property, should the owners choose. It is expected that local produce will continue to grow in value in the future, and the versatile soils would be suited to such enterprise.

6.24 **Conclusion Regional Policy Statement:** The proposed development would substantially achieve or mitigate effects on the provisions of the Regional Policy Statement as regards urban growth, the soil resource and natural character. It is not contrary to those provisions.

EFFECTS UNDER SELWYN DISTRICT PLAN

6.25 The effects are assessed under the provisions of Proposed Plan Change 32. While not operative, those provisions are taken as representing the Council's intentions for managing rural residential development through a Living 3 zone.

6.26 The Plan Change document in **paragraph 4.82** identifies the geometric patterning, vastness and long views to the Alps as the basis of aesthetic values of the Lower Plains. It also identifies Lower Plains of Selwyn as being aesthetically important but not an Outstanding Natural Feature or Landscape. (paragraphs 4.6 – 4.9 above refer).

6.27 In its current state the application site has strong geometric patterning from the rectangular lot boundaries emphasised by perimeter planting, and from the oval training track. Externally, there would be little change to this patterning, with the overall lot boundaries and perimeter being unchanged. However within the site significant change would occur through removal of the training track and establishment of a new internal road and lot pattern. The change is significant internally but not significant outside the site.

6.28 Regarding 'vastness and long views' of the Plains, this currently is represented on site by the spaciousness of the internal paddocks and the long views to the Port Hills particularly, and less prominently, to the Alps. The existing site could hardly be called 'vast' but the spaciousness of the internal paddocks would be significantly lessened by the development. In Plan Change 31 the Council determined that rural residential sites retain rural spaciousness down to the 0.5 – 1.0 hectare size and on that basis the proposed development is within the range of aesthetic environments envisaged by the Council for a Living 3 zone.

6.29 While the size environment within sections will be reduced, long views to the Port Hills and Alps will be retained along the roadways, which are aligned in those directions, and in occasional glimpses within sections.

6.30 For these reasons it is concluded the proposal is in general accord with the Council's intentions under the Living 3 zone.

6.31 Plan Change 32, in Attachment 1, presents a schedule of **proposed amendments** to the partially operative District Plan, to establish a Living 3 zone. These are set out above in paragraph 4.10 of my Report. An assessment of the proposed development in relation to each amended clause now follows, stating Amendment Number and Topic (e.g. Am 79, Residential Density, etc), but without restating the wording. The wording can be seen in paragraph 4.10 above.

6.32 **Am 79, Residential Density:** The proposed development would maintain 'panoramic views', 'rural outlook' and 'a sense of open space' as envisaged for rural residential areas. This is not to the extent they exist currently on the site, but is commensurate with the range anticipated in the Living 3 zone.

6.33 **Am 93, Am 94: Preferred Growth Option Prebbleton:** The current site has no visual effects outside its perimeter plantings and neither would the proposed development. It therefore would not directly affect the 'rural-urban landscape contrast' with Christchurch City. As an outer limit to future Living 3 growth west of Prebbleton, the site would be a logical part of the Prebbleton surrounds. By maintaining Living 3 space standards, it would maintain a contrast with areas of the Inner Plains rural belt separating Prebbleton from Christchurch and Templeton.

6.34 **Am 107, Am 109: Buildings and Landscaping:** The development seeks to maintain a semi-rural sense of space by requiring transparent fencing types as set out in Appendix 41 of the Plan Change, and building setbacks of 20m from road boundaries or 15m from internal boundaries. It would comply with these amendments.

6.35 **Am 119: Assessment Matters, Subdivision:** The development would comply with the following: matters:

- A significant sense of open space is maintained by building setbacks from roads, by section sizes and by building separation. Other features retaining or creating rural character are the existing perimeter trees, the numbers, type and 'limbed up' form of proposed street trees, the expansive grassed surfaces, the natural drainage swales and the street paving details, including absence of kerbing. (Rule 12.1.4.79);
- Fencing will comply with Appendix 41 (Rule 12.1.4.81);
- Overall densities of no more than 2 households per ha have been achieved (Rule 12.1.4.83);
- Semi-rural Road and service designs are proposed, in accordance with the types in Appendix 42 (Rule 12.1.4.84);
- The water race, existing boundary trees, views to the Port Hills are integrated comprehensively into the subdivision layout (Rule 12.1.4.85);
- Within the confines of the perimeter plantings, the houses will integrate well with their sites, will retain low ratios of built form to open space, and will avoid unduly urban street designs (Rule 12.1.4.86).

6.36 Conclusions, Selwyn District Plan: The proposed development would be a sustainable rural residential environment that substantially achieves the proposed policies and Rules for Living 3 activities regarding trees numbers, fencing, frontage setbacks, street environments, natural drainage, spaciousness and provisionally, linkages to Prebbleton.

7. CONCLUSIONS

7.1 The following conclusions were reached above:

- The site is suited to further subdivision into rural residential lots.
- The site has moderate natural values but no particular distinctive landscape values would be lost through the development proposed.
- Rural residential development on the site would fit in with the pattern of residential and rural residential developments on the west side of Prebbleton.
- Shands Road forms a natural barrier to expansion west of Prebbleton.

- Effects on surrounding roads and neighbours will be minimal due to retention of existing perimeter plantings within covenant areas.
- Rural character would be maintained through section size, low site coverage, tree planting and an integrated approach to street, setback and fencing design.
- The development would not compromise rural-urban contrast between Prebbleton and Christchurch City.
- A noise wall along the Shands Road frontage will lessen traffic noise from that road.
- The development envisages footpath connection to Prebbleton along Trents Road and future connections within the Blakes/Trents Roads block as rural residential developments occur in the future

Graham Densem

Landscape Architect
g.densem@xtra.co.nz
2 May 2013

DJ & SJ Anderson
331 Trents Road
Prebbleton

GRAPHIC ATTACHMENT FOR LANDSCAPE ASSESSMENT

GRAHAM DENSEM
landscape architects

DAVIE LOVELL-SMITH LTD
Planners, surveyors, engineers

APRIL 2013

GRAHAM DENSEM
LANDSCAPE ARCHITECT

ENVIRONMENTAL APPROACHES TO SELWYN DISTRICT PLAN POLICIES & CANTERBURY REGIONAL POLICY STATEMENT

TREES
Generous tree numbers to maintain rural feel

SPACIOUSNESS
Avoid closed-in feel of urban subdivisions

WATER RACE
If possible, run water race through subdivision roads, for 'added value'

NON-VEHICLE CIRCULATION
As far as possible, establish or provide for pedestrian & bike links to Prebbleton, particularly shops and school

SHANDS ROAD
Provide for traffic noise and individual identity from road

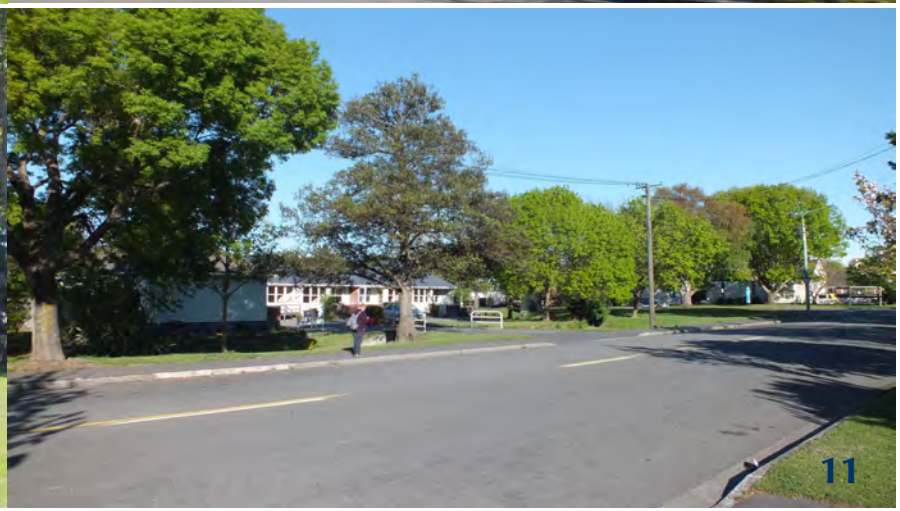
PHOTO 1

Trents Road approaching Shands Road, view away from Prebbleton. A application site frontage on right.

PHOTOS 2, 3 ***GENERAL VIEWS WITHIN APPLICATION SITE***
Upper: Towards Port Hills from Shands Road end
Lower: Towards Southern Alps from Prebbleton end

PHOTOS 4 – 7 ***LOCALITIES WITHIN APPLICATION SITE:***

top left:	***House area and existing entrance from Trents Road.***
top right:	***Trees, Shands Road frontage, view north from within the property.***
lower left:	***Trees, Trents Road frontage (Prebbleton end), view west from within the property. Frontage trees in distance***
lower right:	***Trees between House Block (on left) and horse paddocks, view westwards.***



PHOTOS 8-11 BROADLEAF TREES OF SUITABLE SCALE TO MAINTAIN RURAL CHARACTER WITHOUT UNDULY SHADING A RESIDENTIAL ENVIRONMENT

Trees limbed up maintaining views beneath, open canopy above, not too tall, deciduous trees maintain winter light.

In these views are Alder; Ash; Ribbonwood; Chinese Elm; S.I. Lacebark; Pinoak; Kowhai (Upper Riccarton Domain; Villa Grove Upper Riccarton; Brookside Terrace, Bryndwr)

TREES

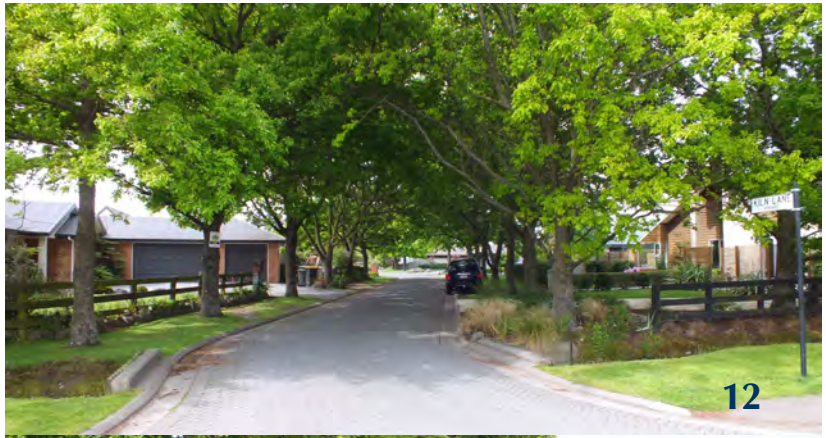
ESTABLISHING GENEROUS TREE NUMBERS WILL MAINTAIN A RURAL FEEL IN RESIDENTIAL AREAS

- *Small areas on subdivision margins and streets heavily planted in double rows;*
- *Small-medium-sized trees, mostly deciduous, some natives and evergreens;*
- *Trees limbed up to maintain openness at ground level;*
- *Trees carefully positioned to avoid shading houses and living areas;*
- *Requires space for tree roots and canopies during and following subdivision, e.g. wider berms on streets, covenants on margins of residential sections;*
- *A careful planting plan & investment in plants as mitigation;*
- *Emphasis on tree planting rather than shrubs and ground covers*

PHOTOS 12 - 14

Upper & middle
Kilne Lane & Trents Road, Prebbleton

Lower
Ludecke Place, Upper Riccarton



PHOTOS 15 - 17

Upper & middle
Sense of rural spaciousness maintained by wide grassed areas at ground level (Lindsay Drive & Cairnbrae, Prebbleton)

Lower
Sense of rural spaciousness broken by too much planting at ground level (Aberdeen, Prebbleton)

IN THE UPPER VIEW, ENVIRONMENTAL FILTERING OF RUNOFF IS ACHIEVED BY THE GRASS, IN THE LOWER BY THE FLAX.

ALTHOUGH THE MIDDLE VIEW IS AN URBAN AREA, A SENSE OF SPACIOUSNESS STILL IS MAINTAINED

SPACIOUSNESS

- *Grassed ground plane with minimal underplanting gives continuity;*
- *Trees limbed up to maintain long views*
- *Manage fences, frontages & waterway;*
- *Manage kerbs and street hardware;*
- *Wide berms;*
- *Simple & uncluttered.*

PHOTOS 18 – 19

Upper
Wide berm and absence of kerbing maintains rural feel (Kingcraft Place)

Lower
Incorporating local stream into roadside increases sense of space and naturalness (Waiiti Stream, Brookside Tce, Bryndwr)

PHOTOS 20 - 23

Streetside streams and waterways.
Trents Road, Prebbleton & Brookside Terrace, Bryndwr

WATER RACE

- ***Aim to use existing water flow to enliven streets, roads & entrances, while maintaining SDC functions;***
- ***If possible, divert into subdivision & down street margins, under trees, keeping in public areas (street berm) as far as possible and small 'village ponds' at two turning points;***
- ***Stormwater needs to be kept separate from water race;***
- ***Gradient of banks should be eased down and grassed where possible, and maintenance by weed killers minimised.***

).

PHOTOS 24 – 25
Two views of water race on Anderson frontage, Trents Road. See also Photo 1

TO MAINTAIN RURAL CHARACTER THE ROAD EDGE SHOULD AVOID KERBING OUTSIDE SPEED-RESTRICTED AREA, & AS FAR AS POSSIBLE FOOTPATH BE SEPARATED FROM THE ROAD FORMATION BY A GRASS STRIP.

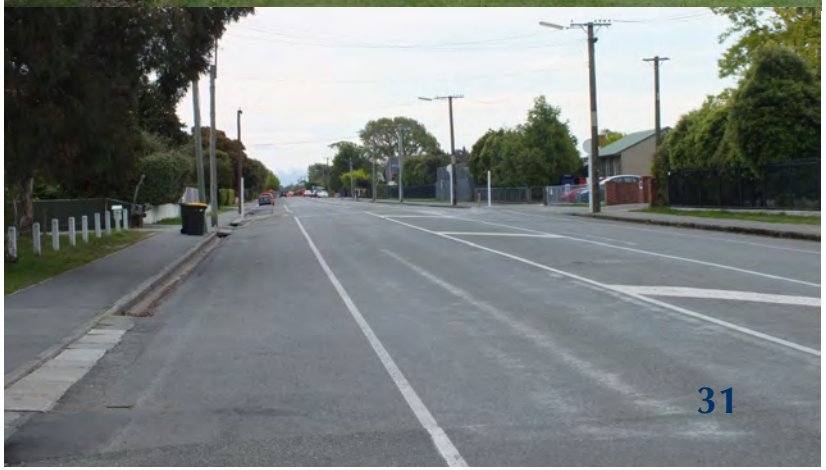
PHOTOS 26 - 28

Three views of the Trents Road environment to be traversed by pedestrians/cyclists between application site & Prebbleton.

Upper
View towards Prebbleton from edge of application site frontage

Middle
View away from Prebbleton at edge of speed restricted area.

Lower
View towards Prebbleton at commencement of formed footpath & kerbing within 50kph area. Kerbing and the footpath location adjacent to the carriageway introduce an urban character.



NON-VEHICLE CIRCULATION

- *Developments within the Shands/Trents/Springs/Blakes Roads block have not provided for pedestrian or cycle circulation between properties or into Prebbleton shops and school;*

- *Within the Plan Change site, provision should be made for future links within the surrounding block;*

- *On part of the Plan Change frontage a footpath should be formed under trees beside the water race, as the start of a link to Prebbleton, noting this is a 100kph speed area;*

- *On road berms within proposed subdivision, keep generous widths, visual openness & convenient layout, to encourage walking.*

PHOTOS 29 - 31

upper:
Footpath, waterrace, grass and trees maintain aspects of rural character within 50kph area of Trents Road

Middle &Lower:
Blakes Road in 100kph area (middle) and 50kph area (lower). These would be the areas to be traversed between the application site & Prebbleton School if access through the rural-residential block were achieved in the future.

SHANDS ROAD

Existing trees provide wind shelter, rural character, and visual separation between Shands Road traffic and private land.

Existing 'hedge' trees should be maintained in medium term, with a second row of mixed deciduous trees planted on private land behind. A 10-year programme should then be begun, to selectively remove short hedge lengths and establish new mixed trees in their place. The aim is a long-term 'leafy' frontage, compared to the existing 'hedge. Not all existing 'hedge' trees need removing';

A new noise wall or bund to be 'buried' (visually) between the two tree rows, to lessen road noise for adjacent residents;

'Leafy' tree character will maintain a rural identity for the subdivision and road users on both Shands and Trents Roads;

Consider a corner 'icon' to add identity to the intersection, e.g. a setback and large copper beech + pond from water race, or similar.

PHOTOS 32 - 34

33, 34 (this page)
Shands Road frontage of the Plan Change Site. Upper(33) is view towards Christchurch, with Trents Road intersection and application site on right. Lower (34) is view towards Springston, with application site on left.

32 (facing page)
Trents Road seen from Shands Road intersection, application site on left.


GRAHAM DENSEM
LANDSCAPE ARCHITECTS

Appendix C – Riley Consultants Geotechnical Assessment

E-MAILED
28/1/13

RILEY
CONSULTANTS

311 TRENTS ROAD, PREBBLETON, CANTERBURY - GEOTECHNICAL ASSESSMENT FOR SUBDIVISION CONSENT

Engineers and Geologists

E-MAILED 28/2/13

311 TRENTS ROAD, PREBBLETON, CANTERBURY - GEOTECHNICAL ASSESSMENT FOR SUBDIVISION CONSENT

Report prepared for: Mr & Mrs D & S Anderson

Report prepared by: Kate Corcoran, Geologist

.....

Edwyn Ladley, Senior Engineering Geologist

.....

Report reviewed by: pp Don Tate, Director (CPEng)

.....

Report Reference: 12876-A

Date: 28 February 2013

Copies to:

Mr & Mrs D & S Anderson C/- Davie Lovell-Smith Ltd	1 PDF copy
Riley Consultants Ltd	1 copy

Revision:	Details:	Date:
1.0	Geotechnical assessment – for Client review	20 December 2012
2.0	Geotechnical assessment	28 February 2013

Riley Consultants Limited, Ground Floor, 395 Madras Street
PO Box 4355, Christchurch 8140, New Zealand
Telephone 64 3 379 4402, Facsimile 64 3 379 4403
rileychch@riley.co.nz www.riley.co.nz

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Appendices

311 TRENTS ROAD, PREBBLETON, CANTERBURY - GEOTECHNICAL ASSESSMENT FOR SUBDIVISION CONSENT

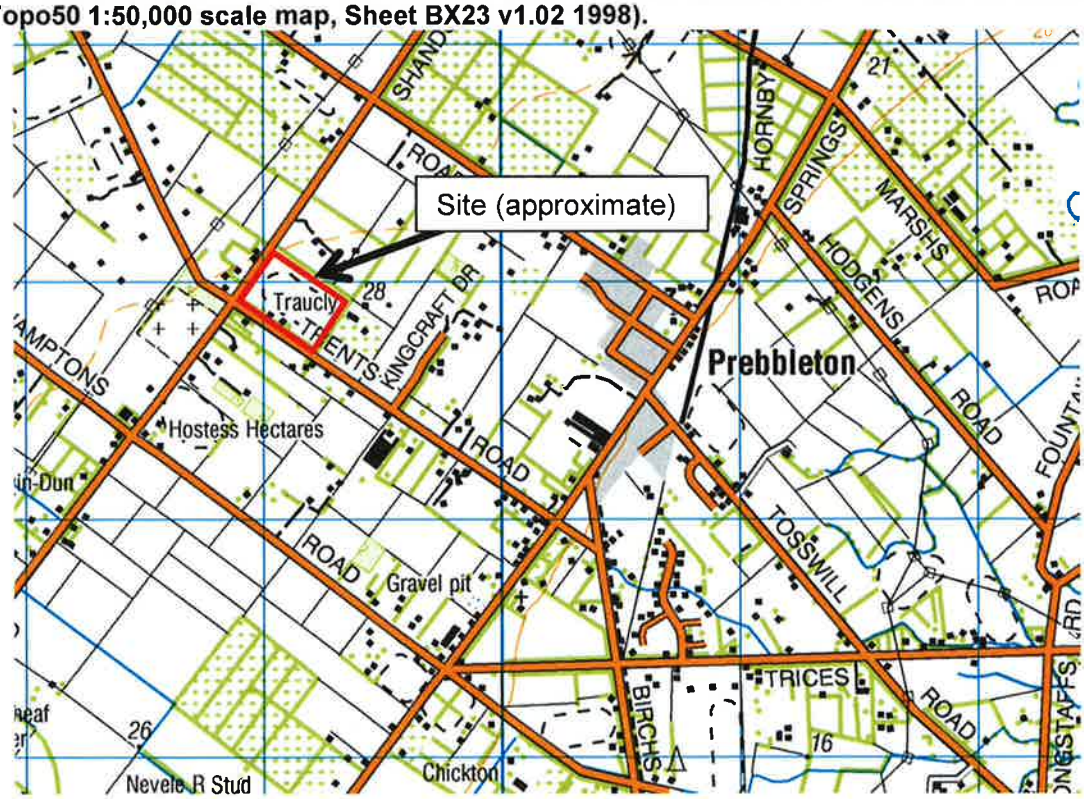
1.0 Introduction

As requested by David and Sue Anderson, via Davie Lovell-Smith Ltd, Riley Consultants Ltd (RILEY) has undertaken a geotechnical assessment for subdivision at the above property. This report is intended to provide supporting information for a subdivision consent application (by others) to subdivide the current 9.2 ha property into 16 lots, ranging in size from approximately 5,000m² to 6,100m² (refer Davie Lovell-Smith Ltd Dwg: P06845, May 2012).

The main objectives of this assessment are:

- Document geotechnical investigations undertaken by RILEY to confirm the site geology and any geological hazards potentially affecting the site.
- Comment on the likely extent and variation of the principal soil types.
- Comment on the seismic hazard and liquefaction risk, and any other geological hazards associated with the site.
- Comment on foundation options for development of the new lots.

Figure 1. Location plan – north vertical to the page and blue gridlines are 1km spaced (extract from Topo50 1:50,000 scale map, Sheet BX23 v1.02 1998).



Riley Consultants Limited, Ground Floor, 395 Madras Street
PO Box 4355, Christchurch 8140, New Zealand
Telephone 64 3 379 4402, Facsimile 64 3 379 4403
rileychch@riley.co.nz www.riley.co.nz

1.1 Site Description

The property is located approximately 12.7km south-west of Christchurch city, and the property borders Trents Road and Shands Road, just outside of Prebbleton township (Figure 1 and RILEY Dwg: 12876-01). The site (Lot 2 DP 51743) is 9.2ha in size, and generally slopes gently to the southeast (ground slope estimated at 2m over 400m).

A degraded alluvial terrace, less than 1m high, trends north – south across the west of the site (Dwg: 12879-01). The site is predominantly covered with grass and local trees and shrubs. There are no nearby watercourses, although a small pond exists in the north-west of the site at the Shands Road boundary. We understand that the land has been used for horse breeding and farming since the early 1900s. This property has been subdivided from an original 440 acre block that was bound by Shands Road, Blakes Road, Springs Road, and Trents Road.

Currently there are several single storey buildings on the property, including a private residence and stables. These buildings are approximately 25 years old and are supported by a concrete slab on grade foundation system.

No evidence of land damage associated with the recent Canterbury earthquake sequence was observed at the site (i.e. to cracking or liquefaction-induced sand boils etc.).

1.2 Scope of works

The investigation has been completed in general accordance with the 'Guidelines for the Geotechnical Investigation and Assessment of Subdivisions in the Canterbury Region' released by the Department of Building and Housing (DBH) in November 2011. Specific tasks included:

1. Desk study of available published, publicly available, and in-house geological data.
2. Walkover inspection of the site and surrounds, completed by RILEY engineering geologists on 6 and 7 November 2012 (refer RILEY Dwg: 12876-01, Appendix A).
3. Subsurface investigation consisting of:
    - Eight mechanically dug inspection pits to a maximum depth of 5m (completed on 7 November 2012), with associated Scala penetrometer and Clegg hammer testing.

      The pits were logged, and photographed, by a RILEY engineering geologist in general accordance with the New Zealand Geotechnical Society Guidelines for soil description (2005). Logs and photographs are attached as Appendix B.
    - Two dynamic probe profiles (DPH3 and DPH4) that were terminated due to practical refusal at 7.5m and 4.5m depth, respectively.
    - Two infiltration tests in inspection pits TP3 and TP6 after geological logging was completed.
4. Assessment of geotechnical conditions and hazards and report production.

2.0 Council Requirements for Subdivision Assessment

The Department of Building and Housing (DBH) has recently released *Guidelines for the Geotechnical Investigation and Assessment of Subdivisions in the Canterbury Region* (14 September 2012). This document provides guidelines as to what is likely to be required by councils in assessing applications for plan change and subdivision consent. Key points of relevant to the proposed subdivision include:

- Appropriate geotechnical investigations shall be carried out to enable the characterisation of ground forming materials to at least 15m below ground level, unless the ground is known to be of acceptable quality from lesser depths (for example, in areas known to be underlain by competent gravels and deep groundwater profiles, or in hillside areas).
- If initial investigations demonstrate a lack of liquefaction potential then the Engineer may judge fewer test locations or shallower depths of investigation to be appropriate.

We consider that the information gathered from our desk study of regional geology provides an adequate assessment of the site geology and liquefaction risk. As such, we have not proposed any deep investigations as the regional geology indicates that there is a thick sequence of competent gravel beneath near-surface soils. This, combined with a deep groundwater table (approximately 9m below ground level) suggests that liquefaction is not a significant hazard to the site.

Geotechnical peer review for Selwyn Council (Ian McCahon of Geotech Consulting Ltd) agreed that this investigation philosophy was suitable for the anticipated ground conditions.

3.0 Regional Geology and Groundwater

A review of the published geological map of the area (Christchurch QMAP, 1:250,000 scale), publicly available Canterbury Geotechnical Database information and nearby Environment Canterbury (ECan) online well logs has been completed for this geotechnical assessment. The ECan well logs for the area indicate the water level at between 7m and 11m below ground level. Well number M35/3775 was drilled on the property itself when the house and buildings were constructed and records the water level at 9.3m below ground level in July 1987.

The general geological profile of the area is:

- Topsoil (typically less than 250mm thick) consisting of loose, silty fine to medium SAND with some organics and rootlets.
- Fine sandy SILT to silty fine SAND deposited during the last glacial advance (ca. 10,000 years). This material may infill buried channels in the underlying River Alluvium.
- 'Q1a' Alluvium (totalling 100 to 300m thick). The QMAP indicates the site to be underlain by a sequence of glacial outwash alluvium associated with glacial advance and retreat in the Late Quaternary. This typically consists of moderately thick to very thick bedded gravel to sandy GRAVEL. The ECan well logs indicate that the alluvium has a minor clay content (often noted as "claybound gravel", e.g. M3/5606 and M36/4677).

- Bedrock geology to the site is likely to comprise a sequence of weakly indurated Tertiary conglomerates, limestone, and siltstone. These strata are approximately 1.5km thick beneath the site and are underlain by greywacke sandstone and siltstone bedrock correlated to the Torlesse composite terrane.

4.0 Encountered Ground Conditions and Groundwater Conditions

The encountered geology is in general accordance with that anticipated from our desktop study. Investigations identified three soil layers at the site, the characteristics of which are described below:

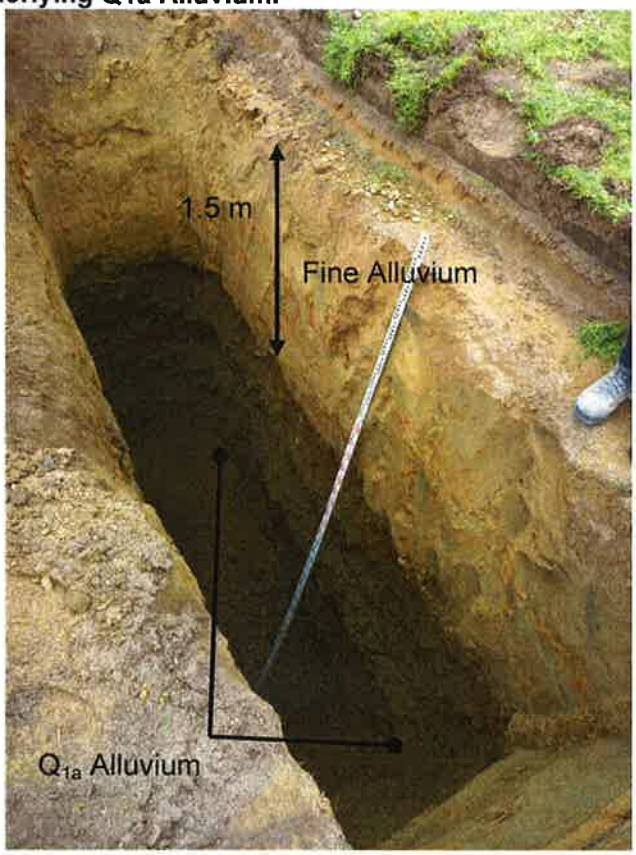
- Layer 1 - Topsoil:

  Topsoil is typically 0.2m to 0.25m thick, consists primarily of dark brown silty fine to medium sand with organics. This material is loose to dense from Scala penetrometer test results.

- Layer 2 - Fine Alluvium:

This unit typically consists of silty SAND and underlies Topsoil. Its thickness ranges between 0.35m (TP8) and 1.6m (TP1) (Figure 2). The variable thickness reflects undulations in the ground surface, and an irregular/channelled surface in the underlying Q1a Alluvium.

Figure 2. Photograph of inspection pit TP2 showing the contact between the Fine Alluvium and underlying Q1a Alluvium.



The Scala penetrometer blow counts indicate variable relative densities within the layer, typically loose to medium dense (Appendix B). Clegg hammer tests were completed at selected depths in inspection pits in the Fine Alluvium. Clegg impact values (IV) from the tests are summarised in Table 1. The impact values ranges between 3 and 15, with a mean of approximately 7.

Table 1: Clegg hammer impact values (IV) in Fine Alluvium

Inspection Pit	Depth (m)	Clegg Impact Value (IV)		
		test 1	test 2	test 3
TP4	0.3	8	10	10
TP4	0.6	11	11	15
TP5	0.3	9	9	10
TP5	0.6	7	7	8
TP6	0.3	9	8	9
TP6	0.6	6	5	5
TP6	0.85	4	4	3
TP6	1	3	4	3
TP7	0.3	6	6	5
TP7	0.6	5	5	5
TP7	0.9	6	7	5

- Layer 3 - Q1a Alluvium:

This unit consists of sandy GRAVEL with some to minor silt with local cobbles up to 0.2m in length. In some of the inspection pits thin sand lenses and orange (iron) and purplish black (manganese) stained lenses occur. This material is typically tightly packed with the inspection pit walls standing vertical. The dynamic probe-heavy tests were terminated early (target depth 15m) due to practical refusal. The calculated SPT N_{60} values from the dynamic probe-heavy profiles suggest the Q1a Alluvium is dense to very dense.

Free groundwater was not encountered in any of the inspection pits; moist soils were logged from ground level. Based on ECan well logs, a minimum groundwater level of 7m below ground level is considered appropriate for the purposes of this assessment. This depth is taken as a conservative estimate from expected seasonal variability of the water level.

5.0 Geotechnical Assessment

5.1 Recorded Peak Ground Accelerations (2010 to 2011 Canterbury Earthquake Sequence)

Recorded peak ground accelerations (PGAs) for the Canterbury Earthquake Sequence have been made publicly available by GNS. A review of these PGAs from the nearest recording devices located in Templeton and Lincoln, approximately 3.5km north and 5.4km south of the of the site respectively indicate that the property is likely to have been subject to a PGA in the order of 0.9g in the Mw 7.1 September 2010 earthquake. This equates to a load exceeding the current DBH Guidelines for a design load Serviceability Limit State (SLS) earthquake (Mw 7.5). Lower PGAs were likely to have occurred for the February and June 2011 aftershocks, below the SLS design load.

5.2 Qualitative Liquefaction Risk Assessment

At least 7m of non-liquefiable/non-saturated material underlies the site as a result of the inferred minimum groundwater table. This minimised the potential for liquefaction-induced ground surface damage at the site in a Serviceability Limit State earthquake event.

Liquefaction typically occurs in recent (i.e. less than 10,000 years old), normally consolidated, and saturated (i.e. beneath the groundwater table) silt, sand and gravel. The susceptibility of a soil to liquefaction depends primarily on material density, grain size and soil composition.

Dense granular soils are generally not liquefiable (Youd et al, 1996 & 1998), and the Q1a Alluvium encountered on site is typically dense. Similar soils in Canterbury have generally performed well under recent seismic loading. No land damage was observed, and no ejected sands or lateral spreading were reported by the landowner across the site as a result of the recent Canterbury earthquake sequence.

Although no deep in situ soil tests are available for the Q1 Alluvium (or any older underlying material) it is reasonable to expect that this material is competent to considerable depth. Local looser sand and silt layers and lenses are likely to be interbedded within the gravel alluvium sequence, and these may be susceptible to liquefaction in a future design earthquake event. However, when considering the high-energy deposition environment of the alluvium these layers are likely to be relatively thin and laterally discontinuous – similar to those encountered in the inspection pits. The surrounding and overlying denser gravel is likely to minimise and bridge any local liquefaction induced settlement of these looser layers/lenses at depth (i.e. below the water table).

5.2.1 Foundation Technical Category

The Department of Building and Housing (DBH) has provided a guidance document whereby land is placed into one of three technical categories based on liquefaction deformation limits. In terms of these guidelines, we consider that the subject site is likely to be similar to those sites that fall into technical category TC1. TC1 estimated foundation settlements due to liquefaction are 15mm in an SLS earthquake event and 25mm in a ULS (Ultimate Limit State) earthquake event. The site is not likely to be subject to any lateral spreading.

5.3 Suitability of Ground for Development

It is desirable for new subdivisions on flat or gently sloping ground to provide building platforms that meet the NZS 3604 definition of "good ground", as such building platforms do not require specific engineering design of foundations for residential development. NZS 3604 defines the criteria for "good ground" as that which has an ultimate bearing capacity of 300 kPa, and excludes:

- Potentially compressible ground
- Expansive soils
- Ground which could foreseeably experience movement of 25 mm or greater for any reason

The Department of Building and Housing (DBH) has included liquefiable soils in the ground conditions, for which NZS 3604 is not applicable. On the basis of regional geology, and inspection pit investigations, the site soils, other than the topsoil, are considered unlikely to be expansive or compressible.

The thick sequence of gravelly soils (Q1a Alluvium), which underlies the site from depths of 0.6m to 1.8m, is considered to meet the bearing capacity criteria for "good ground" according to NZS 3604.

The topsoil is not a suitable bearing stratum for dwelling foundations and should be removed from the building platform pre-construction.

The lots do not appear to be at risk from erosion, falling debris, or slippage. From our assessment it is considered that the site is at minor risk of liquefaction-induced settlement. Accordingly, under Section 106 of the RMA, we consider there to be no geotechnical reasons preventing the subdivision of the property provided the appropriate engineering and construction industry standard measures, and recommendations in this report, are carried out.

5.4 Static Bearing Capacity

NZS 3604 provides a Scala penetrometer test criteria whereby if a certain blow count over a measured depth is met, an ultimate bearing capacity of 300kPa may be assumed (5 blows per 100mm). The gravel dominant Q1a Alluvium is considered to have a geotechnical ultimate bearing capacity of greater than 300 kPa. However, a geotechnical ultimate bearing capacity of 200kPa is considered appropriate for the finer alluvium, which overlies the gravel, due to encountered lateral and vertical variability in the strength of this unit.

5.5 Foundation Development Options

In terms of the DBH Guidelines, where the ultimate bearing capacity meets the 200kPa requirement either enhanced slab solutions or other specific engineering design is applicable. At a conceptual level, enhanced house foundation solutions could comprise the following:

- A shallow concrete slab foundation (thickened over the existing site soils, or built over a compacted granular fill raft). It may be possible to excavate and re-compact the fine alluvium to construct a densified surface raft. This would reduce the volume of imported material but would require more engineering design and quality control.
- A deeper piled foundation founded on the Q1a Alluvium soils (e.g. shallow driven timber piles with an integral concrete raft).

Due to the variability of the depth in the fine alluvium further investigations are recommended at the time of individual building development, as outlined in the DBH Guidelines, to assess the most appropriate and cost-effective solution for each building platform.

5.6 Further Development Considerations

5.6.1 Roads

Roads are not subject to the same design criteria as foundations; however, subgrade layers are required to provide appropriate strength and stiffness for pavement design. Following removal of the topsoil/silt (generally 250mm thick), a design California Bearing Ratio (CBR) of 4% is considered appropriate for the underlying fine alluvium sandy soils.

5.6.2 Services

Buried service trenches are not likely to encounter groundwater at shallow depths throughout the site. However, it is likely that trenching works will likely encounter non-cohesive soils at shallow depth, which may unravel into trenches. It is recommended that buried services be designed detailed with flexibility and resilience in mind.

6.0 Soil Infiltration Testing

We understand that on-site disposal of clean stormwater will be via soakage pits. To assist the preliminary design (by others) of the soakage pits two infiltration tests were completed in TP3 and TP6. The tests were undertaken in general accordance with the Auckland City Soakage Design Manual.

Key points to note about the tests include:

- Each pit was pre-soaked twice prior to the commencement of a falling head percolation test. After pre-soaking, each pit was then re-filled with water to the top of the gravel alluvium and the drop in water recorded at regular intervals.
- The two tests were carried out at different depths below the fine alluvium to assess any change in geological conditions resulting in variability in the permeability rates, and as such the percolation rates calculated range in value. (refer Table 2 and Figure 3, with further calculation details in Appendix D).
- The results were calculated using a formula from Digest 365 of the British Research Establishment, and are limited by the fact that the inspection pits excavated were assumed to be perfectly rectangular and the precision of the measuring devices used (stopwatch and survey staff).

Table 2: Soil infiltration tests summary

Inspection pit number	TP3	TP6
Infiltration test number	1	2
Excavated depth	2.7 m	3.2 m
Depth to Q1a Alluvium	1.6 m	1.75 m
Water depth above base of pit, at beginning of test	0.925 m	0.7 m
Flow rate into the pit	1.826 l/s	1.826 l/s
Adopted permeability (of Q1a Alluvium)	2.95×10^{-5} m/s	2.7×10^{-4} m/s
Adopted infiltration rate	105mm/hr	980mm/hr

Figure 3. Photograph of infiltration test of gravelly Q1a Alluvium in inspection pit TP3

From the soil infiltration tests undertaken in the (Q1a Alluvium) gravel we the infiltration rates calculated differ by a factor of 10, and that this is most likely due to differences in the geology between the pit locations. Further testing is advised when during detailed design (by others) of the stormwater system for the subdivision.

7.0 Conclusions

RILEY has completed a geotechnical assessment for the subdivision at 311 Trents Road, Prebbleton. Key points are summarised below:

1. The ground has performed well during the recent Canterbury earthquake sequence.
2. Ground conditions typically consist of topsoil underlain by generally loose, fine alluvium (silty sand) to a maximum depth of 1.95m over competent gravel with subordinate sand, silt and cobbles. A design groundwater level of 7m is considered appropriate for the site. The encountered ground conditions correspond well with the regional geology from published information.
3. The fine alluvium has a variable bearing capacity of approximately 200kPa. The gravel has a geotechnical ultimate bearing capacity of at least 300kPa, and is a suitable stratum for any foundation type. Specific investigations for each individual development are recommended in line with the DBH Guidelines.
4. The proposed subdivision is considered acceptable from a geotechnical perspective provided the recommendations outlined in this report are followed.
5. Based on the interpreted geology and design groundwater conditions, the site is considered to have a minor risk of liquefaction from future design earthquake events. The risk of liquefaction-induced ground damage is consistent with a TC1 zoning.
6. Inspections of ground conditions during the construction phase should be undertaken in accordance with accepted practice. RILEY should be informed if there are any changes from the conditions described in this report.

8.0 Limitation

This report has been prepared solely for the benefit of David and Sue Anderson as our clients, with respect to the brief provided. The reliance by other parties on the information or opinions contained in the report shall, without our prior review and agreement in writing, be at such parties' sole risk.

Recommendations and opinions in this report are based on data from limited test positions. The nature and continuity of subsoil conditions away from the test positions are inferred, and it must be appreciated that actual conditions could vary considerably from the assumed model.

During excavation and construction the site should be examined by an engineer or engineering geologist competent to judge whether the exposed subsoils are compatible with the inferred conditions on which the report has been based. It is possible that the nature of the exposed subsoils may require further investigation and the modification of the design based upon this report.

Riley Consultants Ltd would be pleased to provide this service to David and Sue Anderson and believes the project would benefit from such continuity. In any event, it is essential Riley Consultants Ltd is contacted if there is any variation in subsoil conditions from those described in the report as it may affect the design parameters recommended in the report.

9.0 References

Department of Building and Housing, November 2011. *Revised guidance on repairing and rebuilding houses affected by the Canterbury earthquake sequence.*

Department of Building and Housing, 27 April 2012. *Appendix C to the Guidance Document: Revised guidance on repairing and rebuilding houses affected by the Canterbury earthquake sequence (November 2011).*

Forsyth, P.J., Barrell D.J.A, Jongen R. (compilers), 2008. *Geology of the Christchurch Area.* Institute of Geological & Nuclear Sciences 1:250,000 geological map 16. One sheet + 67 p. Lower Hutt, New Zealand. GNS Science.

New Zealand Geotechnical Society, 2005. *Field description of soil and rock – guidelines for the field classification and description of soil and rock for engineering purposes.*

Youd, T.L. et al, 1996 & 1998, *Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils.* Journal of Geotechnical and Geoenvironmental Engineering, October 2001.

APPENDIX A

Drawings

LEGEND

TP1 — TEST PIT LOCATION

DPH1 — DYNAMIC PROBE (HEAVY) TEST LOCATION

SITE BOUNDARY

APPROXIMATE DEGRADED ALLUVIAL TERRACE – TYPICALLY LESS THAN 1.0m

SCALE 1: 2000

0 20 40 60 80 120 (m)

NOTES:-

1. PHOTO SOURCED FROM GOOGLE EARTH (28TH MARCH 2011)
2. ORIGINAL SCALE A3

NOT FOR CONSTRUCTION

REV	DESCRIPTION	BY	DATE
2	DRAWING AMENDED	HN	13.12.12
1	DPH's ADDED	HN	22.11.12
0	FIRST ISSUE		

DESIGN KC | CHECKED
DRAWN HN | CHECKED
DATE DRAWN 14 NOV 2012

APPROVED FOR ISSUE: DRAFT
DATE: / /

RILEY CONSULTANTS
P.O.BOX 4355
CHRISTCHURCH
TEL. 03-3794402
FAX. 03-3794403

TITLE

DJ ANDERSON

311 TRENTS ROAD, PREBBLETON

GEOTECHNICAL INVESTIGATION SITE LOCATION PLAN

CADFILE 12876-01
SCALES (A3) AS SHOWN
ACENZ
DRAWING No. 12876-01
REV. 2

APPENDIX B

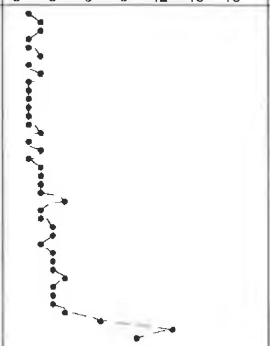
Subsurface Investigation Logs

RILEY CONSULTANTS
Riley Consultants Limited
395 Madras Street
Christchurch 8011
Tel: +64 3 3796 4402
Fax: +64 3 3794403

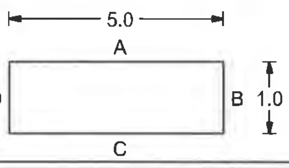
TEST PIT LOG

Project: 311 Trents Road	Location: Prebbleton, Canterbury	Hole position: Refer to site plan	No.: TP1
Job No.: 12876	Start Date: 06-11-12 Finish Date: 06-11-12	Ground Level (m Lyttelton): 28.00	Co-Ordinates (NZTM2000): E 1,559,112.6 N 5,174,889.9
Client: D & S Anderson	Hole Depth: 4.80 m		Sheet: 1 of 1

Elevation (m Lyttelton)	Depth (m)	Geological Description	Symbolic Log	Weathering	Field Strength (Soil / Rock)	Scala Penetrometer (blows / 50 mm)	Samples	Tests
+28.00		Soil Description: subordinate, particle size, MAJOR, minor; colour, structure; strength; moisture condition; grading; bedding; plasticity; sensitivity; major qualifications, weathering of clasts; subordinate qualifications; minor qualifications; additional structure; (GEOLOGIC UNIT). Rock Description: weathering; colour; texture; fabric and orientation; NAME; strength; additional description, (GEOLOGIC UNIT).		RS CW HW MW SW	VS/VL S/L F/MD St/D VSt/VD H/EW VW W MS S VS ES	0 3 6 9 12 15 18		
+27.80	0.20	Fine to medium silty SAND, with some rootlets, brown. (TOPSOIL)						No. 1: 1, 2, 2, 1, 1, 2, 1, 2, 1, 1, 1, 1, 1, 1, 2, 1, 2, 1, 2, 2
+26.20	1.80	Silty fine to medium SAND, mottled yellowish brown. Loose; moist. (FINE ALLUVIUM)						No. 2: 2, 2, 4, 2, 2, 3, 3, 2, 3, 3, 3, 4, 3, 3, 3, 4, 7, 13, 10
+23.50	4.50	Sandy GRAVEL with minor silt, greyish brown local orange mottling. Tightly packed; moist; gravel, fine to coarse, subangular to rounded, slightly weathered greywacke sandstone; local cobbles and boulders up to 300 mm; local sand lenses (200mm) and orange (iron) and purplish black (manganese) stained lenses. (Q1a ALLUVIUM)						
		EOH @ 4.80 m						



SKETCH:



MAP

1:1,000

Shoring/Support: None
Stability:

- ● Small Disturbed Sample
- ☐ Large Disturbed Sample
- ■ U100 Undisturbed Sample
- Permeability Test
- Clegg Hammer; test repetitions (IV)
- Insitu Vane Shear Strength (kPa) P=Peak, R=Residual, UTP=Unable to penetrate
- Scala Penetrometer - blows/50mm

GROUNDWATER: [X] None
[ ] Slow Seep (depth)
[ ] Rapid Inflow (depth)

PIT TERMINATED DUE TO:
[ ] Target depth [ ] Collapse
[ ] Refusal [X] Machine limit

Remarks
1. Inspection pit location and elevation is approximate and subject to survey confirmation.

All dimensions in metres Scale 1:42	Contractor: Fulton Hogan	Rig/Plant Used: Machine Excavator (16 tonne)	Logged by: AvD	Checked by: AvD

RILEY CONSULTANTS
Riley Consultants Limited
395 Madras Street
Christchurch 8011
Tel. +64 3 3796 4402
Fax +64 3 3794403

TEST PIT LOG

Project: 311 Trents Road	Location: Prebbleton, Canterbury	Hole position: Refer to site plan	No.: TP2
Job No.: 12876	Start Date: 06-11-12 Finish Date: 06-11-12	Ground Level (m Lyttelton): 27.00	Co-Ordinates (NZTM2000): E 1,559,213.3 N 5,174,710.6
Client: D & S Anderson	Hole Depth: 5.00 m		Sheet: 1 of 1

Soil Description: subordinate, particle size, MAJOR, minor; colour, structure; strength; moisture condition; grading; bedding; plasticity; sensitivity; major qualifications; weathering of clasts; subordinate qualifications; minor qualifications; additional structure; (GEOLOGIC UNIT).
Rock Description: weathering; colour; texture; fabric and orientation; NAME, strength; additional description, (GEOLOGIC UNIT).

Elevation (m Lyttelton)	Depth (m)	Geological Description
+26.80	0.20	Fine to medium silty SAND, with some rootlets, brown. (TOPSOIL)
+25.30	1.70	Silty fine to medium SAND, light greyish brown with orange mottling. Loose, moist. (FINE ALLUVIUM) 0.80 m Grades to nil rootlets
+22.00	5.00	Sandy GRAVEL with minor silt, greyish brown. Tightly packed; moist; gravel, fine to coarse, subangular to rounded, slightly weathered greywacke sandstone; local cobbles and boulders up to 300 mm; local sand and silt lenses, and orange (iron) and purplish black (manganese) staining. (Q1a ALLUVIUM) 3.20 m Grades to nil silt.

Scala Penetrometer (blows / 50 mm): 0 3 6 9 12 15 18

Tests:
No. 1: 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 1, 1, 2, 1, 2, 2, 2, 3, 2, 3
No. 2: 3, 1, 2, 2, 2, 3, 3, 3, 3, 3, 3, 4, 3, 3, 3, 2, 2, 30

SKETCH: EOH @ 5.00 m

MAP

1:1,000

Shoring/Support: None
Stability:

5.0 A, B 1.0, C, D

- ● Small Disturbed Sample
- ☐ Large Disturbed Sample
- ■ U100 Undisturbed Sample
- Permeability Test
- Clegg Hammer; test repetitions (IV)
- Insitu Vane Shear Strength (kPa) P=Peak, R=Residual, UTP=Unable to penetrate
- Scala Penetrometer - blows/50mm

GROUNDWATER: [X] None; [ ] Slow Seep (depth); [ ] Rapid Inflow (depth)

PIT TERMINATED DUE TO: [ ] Target depth; [ ] Collapse; [ ] Refusal; [X] Machine limit

Remarks
1. Inspection pit location and elevation is approximate and subject to survey confirmation.

All dimensions in metres Scale 1:42	Contractor: Fulton Hogan	Rig/Plant Used: Machine Excavator (16 tonne)	Logged by: KC	Checked by: AvD

RILEY CONSULTANTS

Riley Consultants Limited
395 Madras Street
Christchurch 8011
Tel: +64 3 3796 4402
Fax: +64 3 3794403

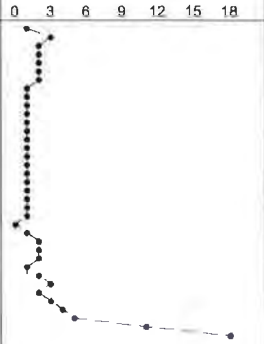
TEST PIT LOG

Project: 311 Trents Road	Location: Prebbleton, Canterbury	Hole position: Refer to site plan	No.: TP3
Job No.: 12876	Start Date: 06-11-12 / Finish Date: 06-11-12	Ground Level (m Lyttelton): 28.00 / Co-Ordinates (NZTM2000): E 1,559,220.0 N 5,174,853.8	
Client: D & S Anderson	Hole Depth: 4.50 m		Sheet: 1 of 1

Elevation (m Lyttelton)	Depth (m)	Geological Description	Symbolic Log	Weathering	Field Strength	Scala Penetrometer (blows / 50 mm)	Samples	Tests
+28.00								
+27.80	0.20	Fine to medium silty SAND, with some rootlets, brown. Earthworms present. (TOPSOIL)						No. 1: 1, 3, 2, 2, 2, 2, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1
+26.40	1.60	Silty fine to medium SAND, light greyish brown. Loose, moist, low cohesion.						No. 2: 1, 1, 1, 0, 1, 2, 2, 2, 1, 2, 3, 2, 3, 4, 5, 11, 18
+23.50	4.50	Sandy GRAVEL with minor silt, greyish brown mottled orange. Tightly packed; moist; gravel, fine to coarse, subangular to rounded, slightly weathered greywacke sandstone; local cobbles and boulders up to 300 mm; local sand and silt lenses, sand lenses (100 mm thick) and orange (iron) and purplish black (manganese) stained lenses. (Q1a ALLUVIUM)						
		EOH @ 4.50 m						

Geological Description key: Soil Description: subordinate, particle size, MAJOR, minor; colour, structure; strength; moisture condition; grading; bedding; plasticity; sensitivity; major qualifications; weathering of clasts; subordinate qualifications; minor qualifications; additional structure; (GEOLOGIC UNIT). Rock Description: weathering; colour; texture; fabric and orientation; NAME; strength; additional description, (GEOLOGIC UNIT).

Weathering: RS, CW, HW, MW, SW, UW. Field Strength: Soil: VS/VL, S/L, F/MD, St/D, VSt/VD, H; Rock: EW, VW, W, MS, S, VS, ES.

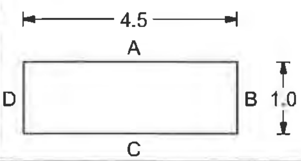


SKETCH:

MAP

1:1,000

Shoring/Support: None
Stability:



- ● Small Disturbed Sample
- ☐ Large Disturbed Sample
- ■ U100 Undisturbed Sample
- Permeability Test
- ▼ Clegg Hammer; test repetitions (IV)
- Insitu Vane Shear Strength (kPa) P=Peak, R=Residual, UTP=Unable to penetrate
- Scala Penetrometer - blows/50mm

GROUNDWATER: [X] None
- [ ] Slow Seep (depth)
- [ ] Rapid Inflow (depth)

PIT TERMINATED DUE TO:
- [ ] Target depth
- [ ] Collapse
- [ ] Refusal
- [X] Machine limit

Remarks
1. Inspection pit location and elevation is approximate and subject to survey confirmation.
2. Soil infiltration test carried out at this location.

All dimensions in metres, Scale 1:42	Contractor: Fulton Hogan	Rig/Plant Used: Machine Excavator (16 tonne)	Logged by: KC	Checked by: AvD

RILEY CONSULTANTS
Riley Consultants Limited
395 Madras Street
Christchurch 8011
Tel: +64 3 3796 4402
Fax: +64 3 3794403

TEST PIT LOG

Project: 311 Trents Road	Location: Prebbleton, Canterbury	Hole position: Refer to site plan	No.: TP4
Job No.: 12876	Start Date: 06-11-12 Finish Date: 06-11-12	Ground Level (m Lyttelton): 28.00	Co-Ordinates (NZTM2000): E 1,559,314.8 N 5,174,868.6
Client: D & S Anderson	Hole Depth: 3.80 m		Sheet: 1 of 1

Elevation (m Lyttelton)	Depth (m)	Geological Description	Symbolic Log	Weathering	Field Strength	Scala Penetrometer (blows / 50 mm)	Samples	Tests
+28.00		Soil Description: subordinate, particle size, MAJOR, minor; colour, structure; strength; moisture condition; grading; bedding; plasticity; sensitivity; major qualifications; weathering of clasts; subordinate qualifications; minor qualifications; additional structure; (GEOLOGIC UNIT). Rock Description: weathering; colour; texture; fabric and orientation; NAME; strength; additional description, (GEOLOGIC UNIT)						
+27.80	0.20	Fine to medium silty SAND, with some rootlets, brown. Earthworms present. (TOPSOIL)						No. 1: 4, 2, 2, 2, 2, 3, 2, 2, 2, 1, 2, 2, 2, 1, 8, 10; IV: 0.3m 8, 10, 10
+27.30	0.70	Silty fine to medium SAND, light greyish brown. Loose, moist. (FINE ALLUVIUM)						IV: 0.6m 11, 11, 15
+24.20	3.80	Sandy GRAVEL with minor silt and trace rootlets, greyish brown. Tightly packed; moist; gravel, fine to coarse, subangular to rounded, slightly weathered greywacke sandstone; local cobbles and boulders up to 300 mm; local lenses of fines-free fine to medium gravel. (Q1a ALLUVIUM) 3.20 m Becomes wet						
		EOH @ 3.80 m						

SKETCH:

MAP

1:1,000

Shoring/Support: None
Stability:

Pit dimensions: A 3.5, B 1.0, C, D

Legend:
- Small Disturbed Sample
- Large Disturbed Sample
- U100 Undisturbed Sample
- Permeability Test
- Clegg Hammer; test repetitions (IV)
- Insitu Vane Shear Strength (kPa) P=Peak, R=Residual, UTP=Unable to penetrate
- Scala Penetrometer - blows/50mm

GROUNDWATER: [X] None
[ ] Slow Seep (depth)
[ ] Rapid Inflow (depth)

PIT TERMINATED DUE TO:
[X] Target depth [ ] Collapse
[ ] Refusal [ ] Machine limit

Remarks
1. Test Pit locations approximate and subject to survey confirmation.

All dimensions in metres Scale 1:42	Contractor: Fulton Hogan	Rig/Plant Used: Machine Excavator (16 tonne)	Logged by: KC	Checked by: AvD

TEST PIT LOG

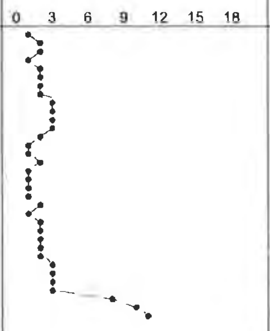
Riley Consultants Limited
395 Madras Street
Christchurch 8011
Tel: +64 3 3796 4402
Fax: +64 3 3794403

Project: 311 Trents Road	Location: Prebbleton, Canterbury	Hole position: Refer to site plan	No.: TP5
Job No.: 12876	Start Date: 07-11-12 Finish Date: 07-11-12	Ground Level (m Lyttelton): 28.00	Co-Ordinates (NZTM2000): E 1,559,166.3 N 5,174,977.6
Client: D & S Anderson	Hole Depth: 4.00 m		Sheet: 1 of 1

Geological Description: Soil Description: subordinate, particle size, MAJOR, minor; colour, structure; strength; moisture condition; grading; bedding; plasticity; sensitivity; major qualifications, weathering of clasts; subordinate qualifications; minor qualifications; additional structure; (GEOLOGIC UNIT). Rock Description: weathering; colour; texture; fabric and orientation; NAME, strength; additional description, (GEOLOGIC UNIT).

Elevation (m Lyttelton)	Depth (m)	Geological Description	Tests
+28.00			
+27.75	0.25	Fine to medium silty SAND, with some rootlets, brown. Earthworms present. (TOPSOIL)	No. 1: 1, 2, 2, 1, 2, 2, 2, 2, 3, 3, 3, 3, 2, 1, 1, 2, 1, 1, 1, 1; IV: 1 9, 9, 10; IV: 2 7, 7, 8
+27.15	0.85	Silty fine to medium SAND, light greyish brown. Loose, moist. (FINE ALLUVIUM)	
+24.00	4.00	Sandy GRAVEL with minor silt and trace rootlets, greyish brown. Tightly packed; moist; gravel, fine to coarse, subangular to rounded, slightly weathered greywacke sandstone; local cobbles and boulders up to 300 mm; local and sand and silt lenses. (Q1a ALLUVIUM)	No. 2: 2, 1, 2, 2, 2, 2, 2, 3, 3, 3, 3, 8, 10, 11
		EOH @ 4.00 m	

Scala Penetrometer (blows / 50 mm)



SKETCH:

MAP

Shoring/Support: None
Stability:

A 5.0; B 1.0; C; D

- Small Disturbed Sample
- Large Disturbed Sample
- U100 Undisturbed Sample
- Permeability Test
- Clegg Hammer; test repetitions (IV)
- Insitu Vane Shear Strength (kPa) P=Peak, R=Residual, UTP=Unable to penetrate
- Scala Penetrometer - blows/50mm

GROUNDWATER: [X] None; [ ] Slow Seep (depth); [ ] Rapid Inflow (depth)

PIT TERMINATED DUE TO: [X] Target depth; [ ] Collapse; [ ] Refusal; [ ] Machine limit

Remarks
1. Inspection pit location and elevation is approximate and subject to survey confirmation.

All dimensions in metres Scale 1:42	Contractor: Fulton Hogan	Rig/Plant Used: Machine Excavator (16 tonne)	Logged by: KC	Checked by: AvD

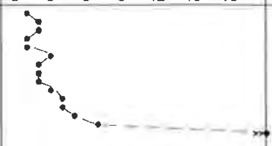
Riley Consultants Limited
395 Madras Street
Christchurch 8011
Tel: +64 3 3796 4402
Fax: +64 3 3794403

TEST PIT LOG

Project: 311 Trents Road	Location: Prebbleton, Canterbury	Hole position: Refer to site plan	No.: TP6
Job No.: 12876	Start Date: 07-11-12 Finish Date: 07-11-12	Ground Level (m Lyttelton): 29.00 / Co-Ordinates (NZTM2000): E 1,559,026.7 N 5,175,010.0	
Client: D & S Anderson	Hole Depth: 3.35 m		Sheet: 1 of 1

Elevation (m Lyttelton)	Depth (m)	Geological Description	Tests
+29.00		Soil Description: subordinate, particle size, MAJOR, minor; colour, structure; strength; moisture condition; grading; bedding; plasticity; sensitivity; major qualifications; weathering of clasts; subordinate qualifications; minor qualifications; additional structure; (GEOLOGIC UNIT). Rock Description: weathering; colour; texture; fabric and orientation; NAME; strength; additional description, (GEOLOGIC UNIT)	
+28.80	0.20	Fine to medium silty SAND, with some rootlets, brown. (TOPSOIL)	No. 1: 1, 2, 2, 1, 1, 3, 2, 2, 2, 3, 4, 4, 5, 7, 23
+27.25	1.75	Silty fine to medium SAND, light greyish brown. Loose, moist. (FINE ALLUVIUM)	IV: 1 9, 8, 9; IV: 2 6, 5, 5; IV: 3 4, 4, 4
+25.80	3.20	Sandy GRAVEL with minor silt and trace rootlets, greyish brown. Moist; gravel, fine to coarse, subangular to rounded, slightly weathered greywacke sandstone; local cobbles and boulders up to 300 mm; local sand and silt lenses. (Q1a ALLUVIUM)	
		EOH @ 3.35 m	

Symbolic Log | Weathering (RS, CW, HW, MW, SW, UW) | Field Strength: Soil (VS/VL, S/L, F/MD, St/D, VSt/VD, H/EW) / Rock (VW, W, MS, S, VS, ES) | Scala Penetrometer (blows / 50 mm): 0 3 6 9 12 15 18 | Samples



SKETCH:

MAP

Shoring/Support: None
Stability:

A: 5.0, B: 1.0, C, D

- ● Small Disturbed Sample
- ☐ Large Disturbed Sample
- ■ U100 Undisturbed Sample
- Permeability Test
- ▼ Clegg Hammer; test repetitions (IV)
- ✓ Insitu Vane Shear Strength (kPa) P=Peak, R=Residual, UTP=Unable to penetrate
- ▼ Scala Penetrometer - blows/50mm

GROUNDWATER: [X] None
- [ ] Slow Seep (depth)
- [ ] Rapid Inflow (depth)

PIT TERMINATED DUE TO:
- [X] Target depth
- [ ] Collapse
- [ ] Refusal
- [ ] Machine limit

Remarks
1. Inspection pit location and elevation is approximate and subject to survey confirmation.
2. Soil infiltration tests also carried out at this location.

All dimensions in metres Scale 1:42	Contractor: Fulton Hogan	Rig/Plant Used: Machine Excavator (16 tonne)	Logged by: KC	Checked by: AvD

RILEY CONSULTANTS

Riley Consultants Limited
395 Madras Street
Christchurch 8011
Tel: +64 3 3796 4402
Fax: +64 3 3794403

TEST PIT LOG

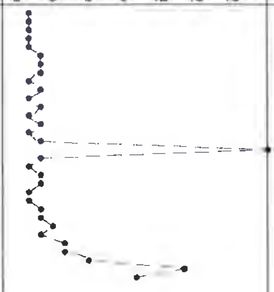
Project: 311 Trents Road	Location: Prebbleton, Canterbury	Hole position: Refer to site plan	No.: **TP7**
Job No.: 12876	Start Date: 07-11-12 Finish Date: 07-11-12	Ground Level (m Lyttelton): 27.00	Co-Ordinates (NZTM2000): E 1,559,014.8 N 5,175,090.2
Client: D & S Anderson	Hole Depth: 4.50 m	Sheet: 1 of 1	

Geological Description
Soil Description: subordinate, particle size, MAJOR, minor; colour, structure; strength, moisture condition; grading; bedding, plasticity; sensitivity; major qualifications, weathering of clasts; subordinate qualifications, minor qualifications; additional structure; (GEOLOGIC UNIT).
Rock Description: weathering; colour; texture; fabric and orientation; NAME; strength; additional description, (GEOLOGIC UNIT).

Elevation (m Lyttelton)	Depth (m)	Geological Description
+27.00		
+26.75	0.25	Fine to medium silty SAND, with some rootlets, brown (TOPSOIL)
+25.40	1.60	Silty fine to medium SAND, light greyish brown. Loose, moist. (FINE ALLUVIUM)
+22.50	4.50	Sandy GRAVEL with minor silt and trace rootlets, greyish brown. Tightly packed; moist; gravel, fine to coarse, subangular to rounded, slightly weathered greywacke sandstone; local cobbles and boulders up to 300 mm; local sand and silt lenses. (Q1a ALLUVIUM)
		EOH @ 4.50 m

Columns: Symbolic Log; Weathering (RS, CW, HW, MW, SW, UW); Field Strength – Soil (VS/VL, S/L, F/MD, St/D, VSt/VD, H), Rock (EW, VW, W, MS, S, VS, ES); Samples.

Scala Penetrometer (blows / 50 mm): 0 3 6 9 12 15 18



Tests

No. 1: 1, 1, 1, 1, 1, 2, 2, 2, 1, 2, 1, 2, 1, 2, 1, 2, 21, 2, 1, 2

IV: 1 – 6, 6, 5
IV: 2 – 5, 5, 5
IV: 3 – 6, 7, 5

No. 2: 2, 1, 1, 2, 2, 3, 2, 4, 4, 6, 14, 10

SKETCH:

MAP

1:1,000

Shoring/Support: None
Stability:

Sketch dimensions: A 7.5; B 1.0; C; D

Legend:
- ● Small Disturbed Sample
- ☐ Large Disturbed Sample
- ■ U100 Undisturbed Sample
- Permeability Test
- ▼ (red) Clegg Hammer; test repetitions (IV)
- ∨ Insitu Vane Shear Strength (kPa) P=Peak, R=Residual, UTP=Unable to penetrate
- ▼ Scala Penetrometer - blows/50mm

GROUNDWATER: [X] None
[ ] Slow Seep (depth)
[ ] Rapid Inflow (depth)

PIT TERMINATED DUE TO:
[X] Target depth [ ] Collapse
[ ] Refusal [ ] Machine limit

Remarks
1. Inspection pit location and elevation is approximate and subject to survey confirmation.

All dimensions in metres Scale 1:42	Contractor: Fulton Hogan	Rig/Plant Used: Machine Excavator (16 tonne)	Logged by: KC	Checked by: AvD

RILEY CONSULTANTS

Riley Consultants Limited
395 Madras Street
Christchurch 8011
Tel: +64 3 3796 4402
Fax: +64 3 3794403

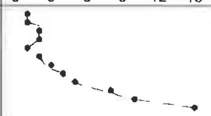
TEST PIT LOG

Project: 311 Trents Road	Location: Prebbleton, Canterbury	Hole position: Refer to site plan	No.: **TP8**
Job No.: 12876	Start Date: 07-11-12 Finish Date: 07-11-12	Ground Level (m Lyttelton): 28.00 Co-Ordinates (NZTM2000): E 1,558,942.8 N 5,174,899.3	
Client: D & S Anderson	Hole Depth: 4.50 m		Sheet: 1 of 1

Geological Description
Soil Description: subordinate, particle size, MAJOR, minor; colour, structure; strength; moisture condition; grading; bedding; plasticity; sensitivity; major qualifications, weathering of clasts; subordinate qualifications; minor qualifications, additional structure; (GEOLOGIC UNIT).
Rock Description: weathering; colour; texture; fabric and orientation; NAME, strength; additional description, (GEOLOGIC UNIT).

Elevation (m Lyttelton)	Depth (m)	Geological Description	Symbolic Log	Weathering	Field Strength (Soil / Rock)	Scala Penetrometer (blows / 50 mm)	Samples	Tests
+28.00								
+27.75	0.25	Fine to medium silty SAND, with some rootlets, brown. (TOPSOIL)						No. 1 1, 1, 2, 2, 1, 2, 3, 4, 5, 8, 10, 15
+27.40	0.60	Silty fine to medium SAND, light greyish brown. Loose; moist. (FINE ALLUVIUM)						
+23.50	4.50	Sandy GRAVEL with minor silt and trace rootlets, greyish brown. Tightly packed; moist; gravel, fine to coarse, subangular to rounded, slightly weathered greywacke sandstone; local cobbles and boulders up to 300 mm; local sand and silt lenses. (Q1a ALLUVIUM)						
		EOH @ 4.50 m						

Weathering: RS, CW, HW, MW, SW, UW
Field Strength (Soil): VS/VL, S/L, F/MD, St/D, VSt/VD, H/EW; (Rock): VW, W, MS, S, VS, ES
Scala Penetrometer scale: 0 3 6 9 12 15 18



SKETCH:

MAP

1:1,000

Shoring/Support: None
Stability:

A = 5.0, B = 1.0, C, D

- Small Disturbed Sample
- Large Disturbed Sample
- U100 Undisturbed Sample
- Permeability Test
- Clegg Hammer; test repetitions (IV)
- Insitu Vane Shear Strength (kPa) P=Peak, R=Residual, UTP=Unable to penetrate
- Scala Penetrometer - blows/50mm

GROUNDWATER: [X] None
[ ] Slow Seep (depth)
[ ] Rapid Inflow (depth)

PIT TERMINATED DUE TO:
[X] Target depth
[ ] Collapse
[ ] Refusal
[ ] Machine limit

Remarks
1. Inspection pit location and elevation is approximate and subject to survey confirmation.

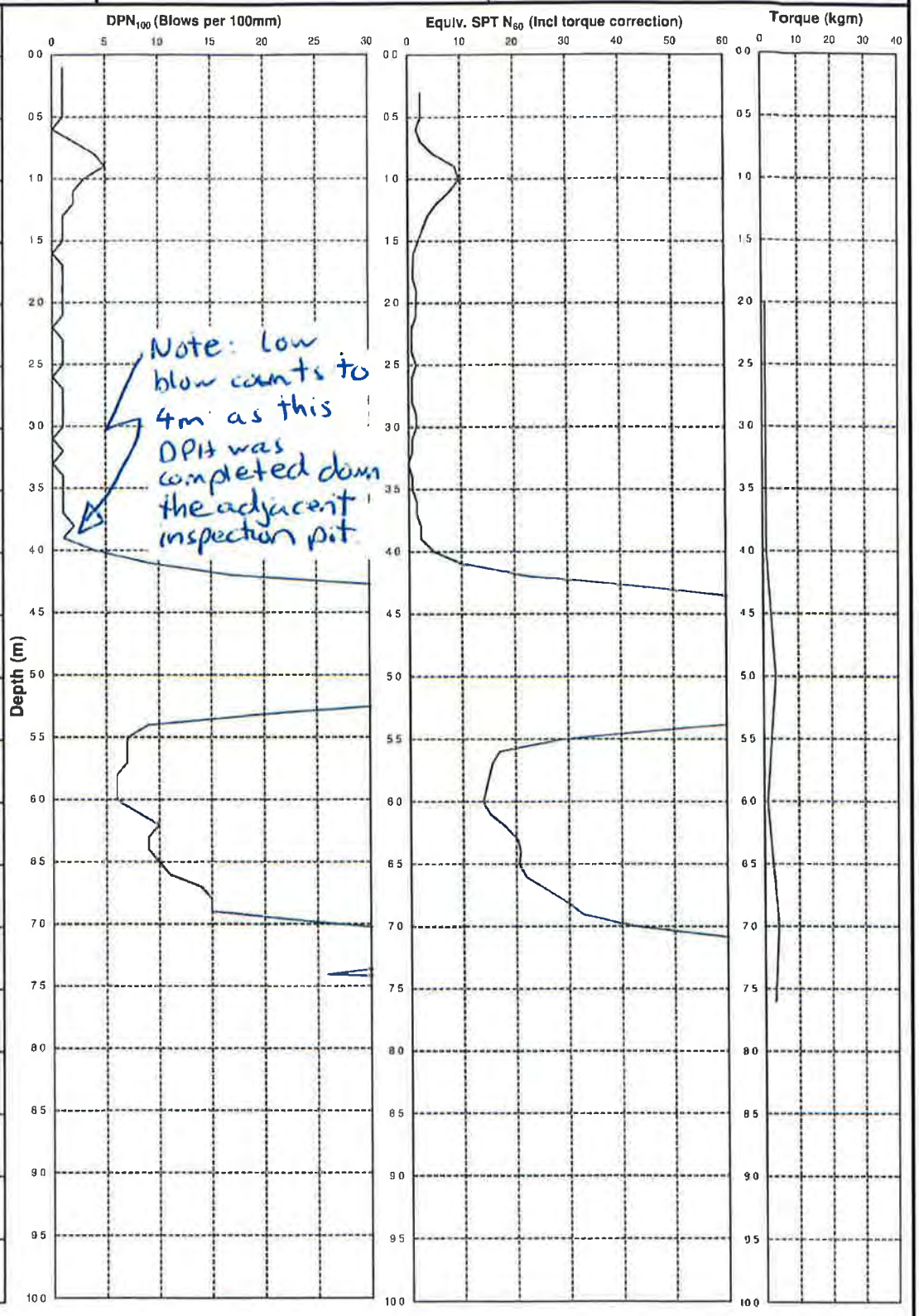
All dimensions in metres Scale 1:42	Contractor: Fulton Hogan	Rig/Plant Used: Machine Excavator (16 tonne)	Logged by: KC	Checked by: AvD

DYNAMIC PROBE TEST

DPH 3

Project Number	12876	Hammer Weight	50 kg
Project:	311 Trents Road	Hammer Drop	500 mm
		Tip Diameter	43.7 mm
Location:	Prebbleton	Hammer Efficiency	70%

Depth (m)	DPN_{100}	Equiv. SPT N	Torque
0.1	1		
0.2	1		
0.3	1	2.5	
0.4	1	2.5	
0.5	1	2.5	
0.6	0	1.6	
0.7	2	2.5	
0.8	4	4.9	
0.9	5	9.0	
1.0	3	9.8	
1.1	2	8.1	
1.2	2	5.5	
1.3	1	3.8	
1.4	1	2.9	
1.5	1	2.0	
1.6	0	1.1	
1.7	1	1.0	
1.8	1	0.9	
1.9	1	1.8	
2.0	1	1.5	1
2.1	1	1.5	
2.2	0	0.7	
2.3	1	0.7	
2.4	1	0.7	
2.5	1	1.5	
2.6	0	0.7	
2.7	1	0.7	
2.8	1	0.7	
2.9	1	1.5	
3.0	1	1.5	1
3.1	0	0.7	
3.2	1	0.7	
3.3	0	-0.1	
3.4	1	0.7	
3.5	1	0.7	
3.6	1	1.5	
3.7	1	1.5	
3.8	2	2.3	
3.9	1	2.3	
4.0	4	4.8	1
4.1	9	10.3	
4.2	17	23.1	
4.3	35	48.2	
4.4	35	69.2	
4.5	35	83.7	
4.6	33	81.8	
4.7	36	82.4	
4.8	41	87.1	
4.9	43	95.0	
5.0	40	98.0	3.5
5.1	47	103.2	
5.2	39	100.1	
5.3	22	65.7	
5.4	9	54.0	
5.5	7	28.9	
5.6	7	16.9	
5.7	7	15.5	
5.8	6	14.9	
5.9	6	14.4	
6.0	6	13.6	1
6.1	8	15.1	
6.2	10	18.1	
6.3	9	20.3	
6.4	9	20.8	
6.5	10	20.5	
6.6	11	21.9	
6.7	14	25.7	
6.8	15	29.5	
6.9	15	32.5	
7.0	27	42.8	4
7.1	40	63.3	
7.2	38	82.0	
7.3	36	89.4	
7.4	26	76.0	
7.5	56	92.7	
7.6	100	151.5	3
7.7			
7.8			
7.9			
8.0			
8.1			
8.2			
8.3			
8.4			
8.5			
8.6			
8.7			
8.8			
8.9			
9.0			
9.1			
9.2			
9.3			
9.4			
9.5			
9.6			
9.7			
9.8			
9.9			
10.0			



Date Logged	8/11/2012
Logged By	SB/SM
Testing Based on BS 1377	

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FAX. 03-379 4403

DYNAMIC PROBE TEST — DPH 4

Project Number	12876	Hammer Weight	50 kg
Project:	311 Trents Road	Hammer Drop	500 mm
		Tip Diameter	43.7 mm
Location:	Prebbleton	Hammer Efficiency	70%

Depth (m)	DPN_{100}	Equiv. SPT N	Torque
0.1	3		
0.2	4		
0.3	4	9.0	
0.4	6	11.4	
0.5	8	14.7	
0.6	10	19.6	
0.7	10	22.9	
0.8	19	31.9	
0.9	14	35.1	
1.0	10	35.1	
1.1	10	27.7	
1.2	10	24.3	
1.3	10	24.2	
1.4	10	24.1	
1.5	9	23.2	
1.6	10	23.1	
1.7	12	24.7	
1.8	14	28.7	
1.9	9	27.7	
2.0	6	22.8	1
2.1	6	16.1	
2.2	7	14.4	
2.3	9	16.8	
2.4	9	19.1	
2.5	12	23.1	
2.6	16	28.7	
2.7	15	33.5	
2.8	18	38.3	
2.9	17	39.1	
3.0	23	45.5	2
3.1	30	55.3	
3.2	29	65.1	
3.3	30	70.8	
3.4	29	70.0	
3.5	26	67.6	
3.6	22	61.0	
3.7	22	55.3	
3.8	19	49.6	
3.9	18	46.3	
4.0	26	49.6	2
4.1	33	61.0	
4.2	29	70.0	
4.3	53	92.1	
4.4	84	133.7	
4.5	78	173.7	
4.6	101	212.9	3
4.7			
4.8			
4.9			
5.0			
5.1			
5.2			
5.3			
5.4			
5.5			
5.6			
5.7			
5.8			
5.9			
6.0			
6.1			
6.2			
6.3			
6.4			
6.5			
6.6			
6.7			
6.8			
6.9			
7.0			
7.1			
7.2			
7.3			
7.4			
7.5			
7.6			
7.7			
7.8			
7.9			
8.0			
8.1			
8.2			
8.3			
8.4			
8.5			
8.6			
8.7			
8.8			
8.9			
9.0			
9.1			
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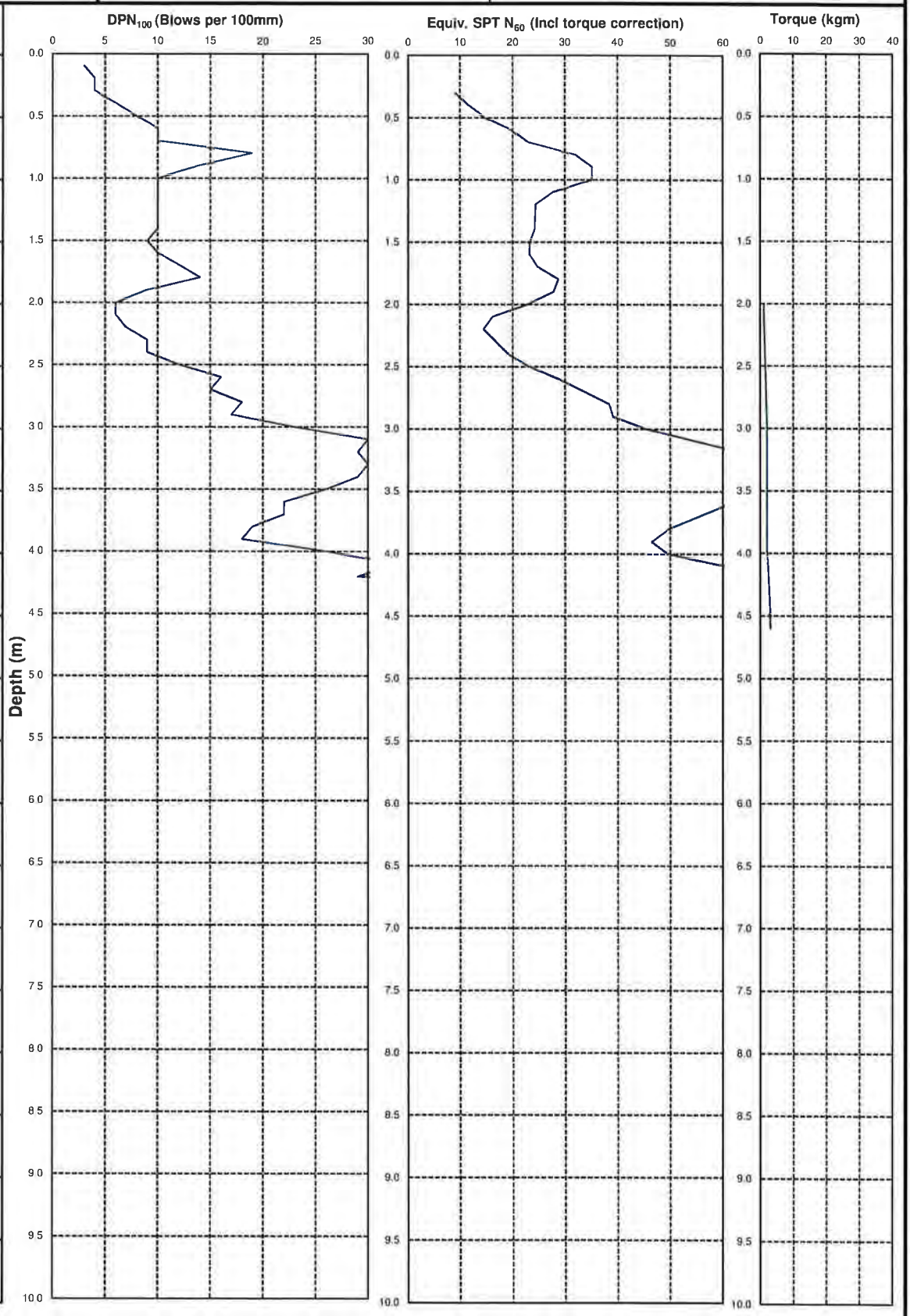
9.5			
9.6			
9.7			
9.8			
9.9			
10.0			



Date Logged	8/11/2012
Logged By	SB/SM
Testing Based on BS 1377	

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FAX. 03-379 4403

APPENDIX C

Ecan Well Logs

Bore or Well No: M36/8391
Well Name:
Owner: MR G J & MRS J L TOD

Environment Canterbury
Your regional council

Street of Well: TRENTS ROAD
File No: CO6C/4838
Locality: PREBBLETON
Allocation Zone: Selwyn-Waimakariri
NZGM Grid Reference: M36:6935-3628 QAR 3
NZGM X-Y: 2469350 - 5736280
Location Description:
Uses: Domestic Supply
ECan Monitoring:
Well Status: Active (exist, present)

Drill Date: 08 Jun 2007
Water Level Count: 0
Well Depth: 22.00m -GL
Strata Layers: 6
Initial Water Depth: -22.30m -MP
Aquifer Tests: 0
Diameter: 150mm
Isotope Data: 0
Yield/Drawdown Tests: 1

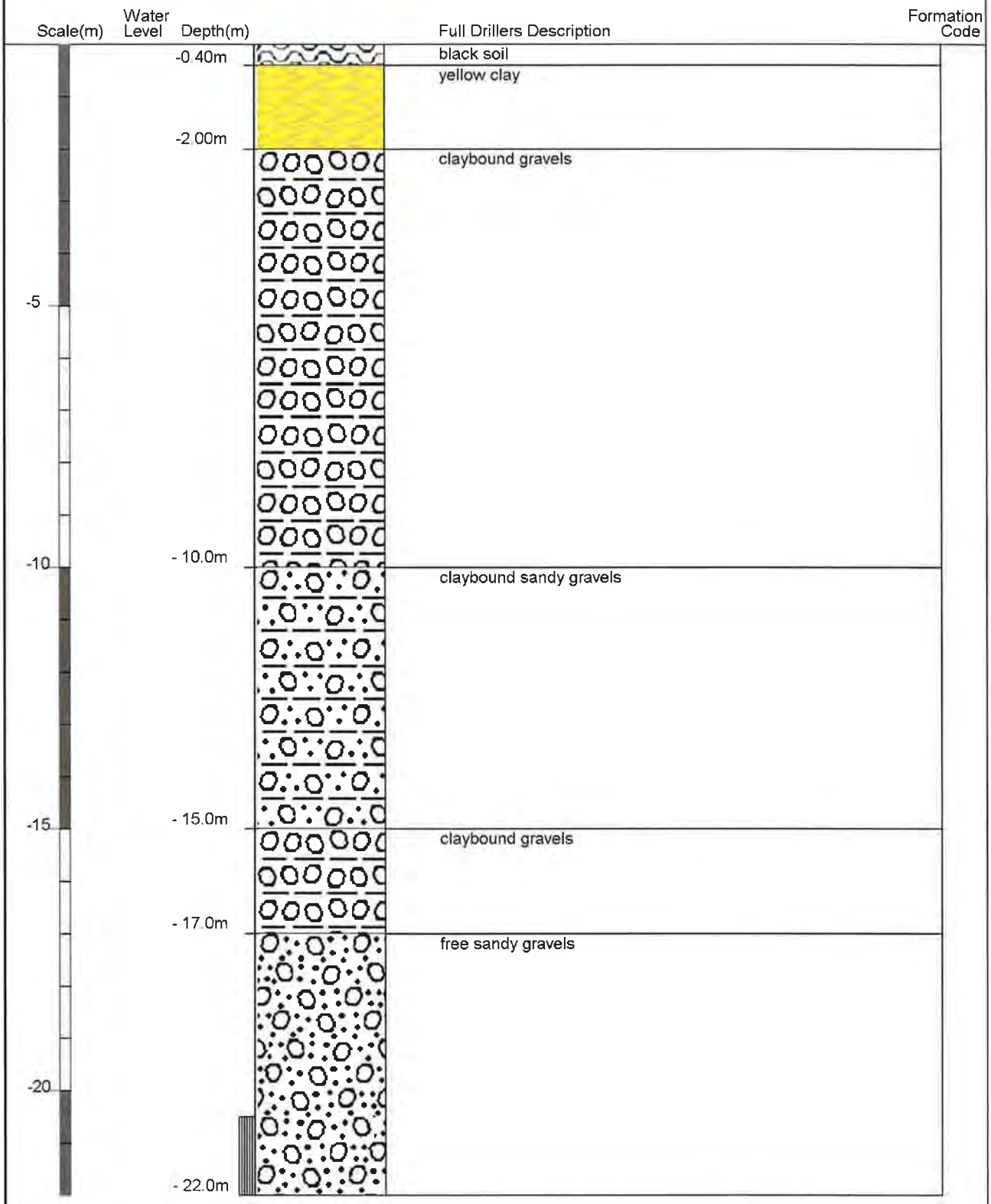
Measuring Point Ait: 27.66m MSD QAR 4
Highest GW Level:
GL Around Well: -0.30m -MP
Lowest GW Level:
MP Description: ToC
First Reading:
Last Reading:
Driller: Smiths Welldrilling
Calc. Min. GWL:
Drilling Method: Rotary/Percussion
Last Updated: 05 Sep 2007
Casing Material: Steel
Last Field Check:
Pump Type:
Yield: 3 l/s
Screens:
Drawdown: 2 m
Screen Type: Stainless steel
Specific Capacity: 1.71 l/s/m
Top GL: 20.50m
Bottom GL: 22.00m
Aquifer Type:
Aquifer Name:

Date	Comments
09 Aug 2007	Gridref changed from: M36:6936-3627, BCR confirms

Borelog for well M36/8391

Gridref: M36:6935-3628 Accuracy : 3 (1=high, 5=low)
Ground Level Altitude : 27 +MSD
Driller : Smiths Welldrilling
Drill Method : Rotary/Percussion
Drill Depth : -22m Drill Date : 8/06/2007

Environment Canterbury



Bore or Well No: M36/5606
Well Name:
Owner: GARDINER, HJ

Environment Canterbury
Your regional council

Street of Well: CNR SHANDS AND TRENTS ROAD
Locality: HORNBY
NZGM Grid Reference: M36:6890-3645 QAR 4
NZGM X-Y: 2468900 - 5736450
Location Description:
ECan Monitoring:
Well Status: Active (exist, present)

File No: CO6C/14410
Allocation Zone: Selwyn-Waimakariri
Uses: Domestic and Stockwater

Drill Date: 02 Apr 1998
Well Depth: 31.50m -GL
Initial Water Depth: -11.53m -MP
Diameter: 150mm

Water Level Count: 0
Strata Layers: 10
Aquifer Tests: 0
Isotope Data: 0
Yield/Drawdown Tests: 1

Measuring Point Ait: 28.00m MSD QAR 3
GL Around Well: 0.00m -MP
MP Description:

Highest GW Level:
Lowest GW Level:
First Reading:
Last Reading:

Driller: McMillan Water Wells Ltd
Drilling Method: Rotary/Percussion
Casing Material: STEEL
Pump Type:
Yield: 2 l/s
Drawdown: 2 m
Specific Capacity: 1.52 l/s/m

Calc. Min. GWL: -10.40m -MP
Last Updated: 29 Jan 2003
Last Field Check:

Screens:
Screen Type: Stainless steel
Top GL: 28.60m
Bottom GL: 31.50m

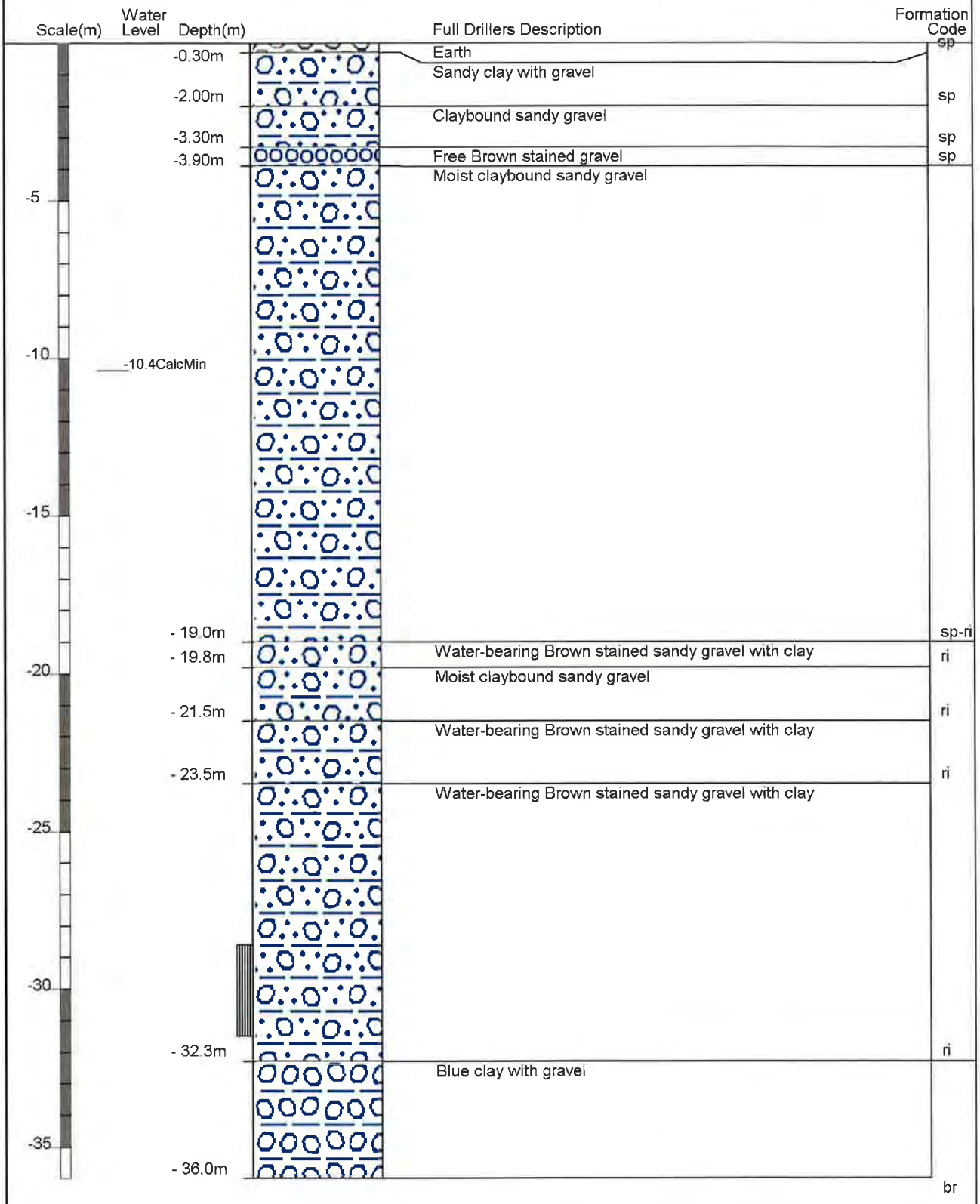
Aquifer Type:
Aquifer Name: Riccarton Gravel

Date	Comments
01 Mar 2000	Dev 2hrs, pumped 2hrs

Borelog for well M36/5606

Gridref: M36:6890-3645 Accuracy : 4 (1=best, 4=worst)
Ground Level Altitude : 28 +MSD
Driller : McMillan Water Wells Ltd
Drill Method : Rotary/Percussion
Drill Depth : -36m Drill Date : 2/04/1998

Environment Canterbury
Your regional council



Bore or Well No: M36/5356
Well Name:
Owner: VERSEY, R & J

Environment Canterbury
Your regional council

Street of Well: TRENTS ROAD
Locality: PREBBLETON
NZGM Grid Reference: M36:6945-3618 QAR 4
NZGM X-Y: 2469450 - 5736180
Location Description: ADJACENT TO HOUSE
ECan Monitoring:
Well Status: Active (exist, present)

File No: CO6C/03685
Allocation Zone: Selwyn-Waimakariri
Uses: Domestic Supply
Irrigation

Drill Date: 05 Nov 1997
Well Depth: 24.00m -GL
Initial Water Depth: -8.50m -MP
Diameter: 150mm

Water Level Count: 0
Strata Layers: 6
Aquifer Tests: 0
Isotope Data: 0
Yield/Drawdown Tests: 1

Measuring Point Ait: 27.00m MSD QAR 3
GL Around Well: -0.20m -MP
MP Description: ToC

Highest GW Level:
Lowest GW Level:
First Reading:
Last Reading:

Driller: Smiths Welldrilling
Drilling Method: Rotary Rig
Casing Material: STEEL
Pump Type:
Yield: 4 l/s
Drawdown: 2 m
Specific Capacity: 1.56 l/s/m

Calc. Min. GWL: -8.70m -MP
Last Updated: 29 Jan 2003
Last Field Check:

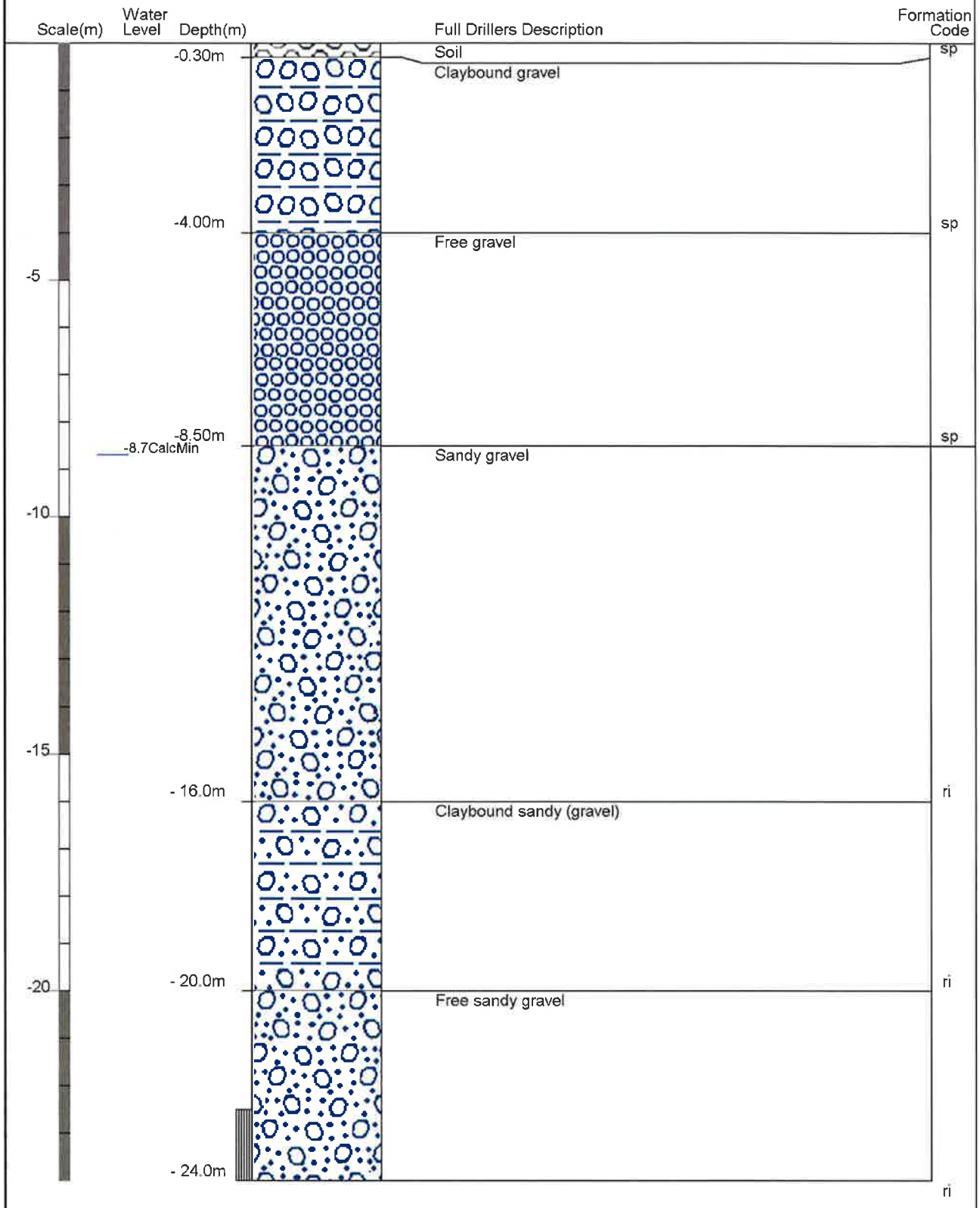
Screens:
Screen Type: Stainless steel
Top GL: 22.50m
Bottom GL: 24.00m

Aquifer Type:
Aquifer Name: Riccarton Gravel

Borelog for well M36/5356

Gridref: M36:6945-3618 Accuracy : 4 (1=best, 4=worst)
Ground Level Altitude : 27 +MSD
Driller : Smiths Welldrilling
Drill Method : Rotary Rig
Drill Depth : -24m Drill Date : 5/11/1997

Environment Canterbury
Your regional council



Bore or Well No: M36/4677
Well Name:
Owner: MILLS, K.

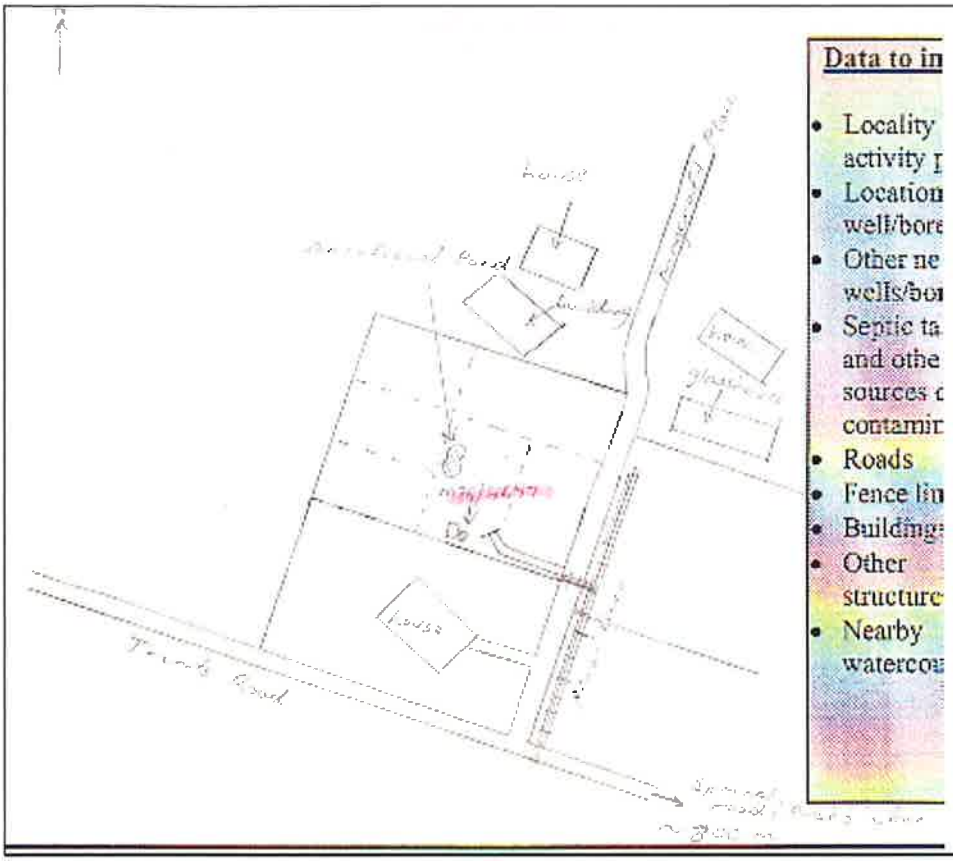
Environment Canterbury
Your regional council

Street of Well: TRENTS ROAD
File No: CO6C/03946
Locality: PREBBLETON
Allocation Zone: Selwyn-Waimakariri
NZGM Grid Reference: M36:69518-36217 QAR 2
NZGM X-Y: 2469518 - 5736217
Location Description:
Uses: Domestic Supply
Irrigation
ECan Monitoring:
Well Status: Active (exist, present)

Drill Date: 16 Oct 1996
Water Level Count: 0
Well Depth: 46.00m -GL
Strata Layers: 9
Initial Water Depth: -5.80m -MP
Aquifer Tests: 0
Diameter: 150mm
Isotope Data: 0
Yield/Drawdown Tests: 1

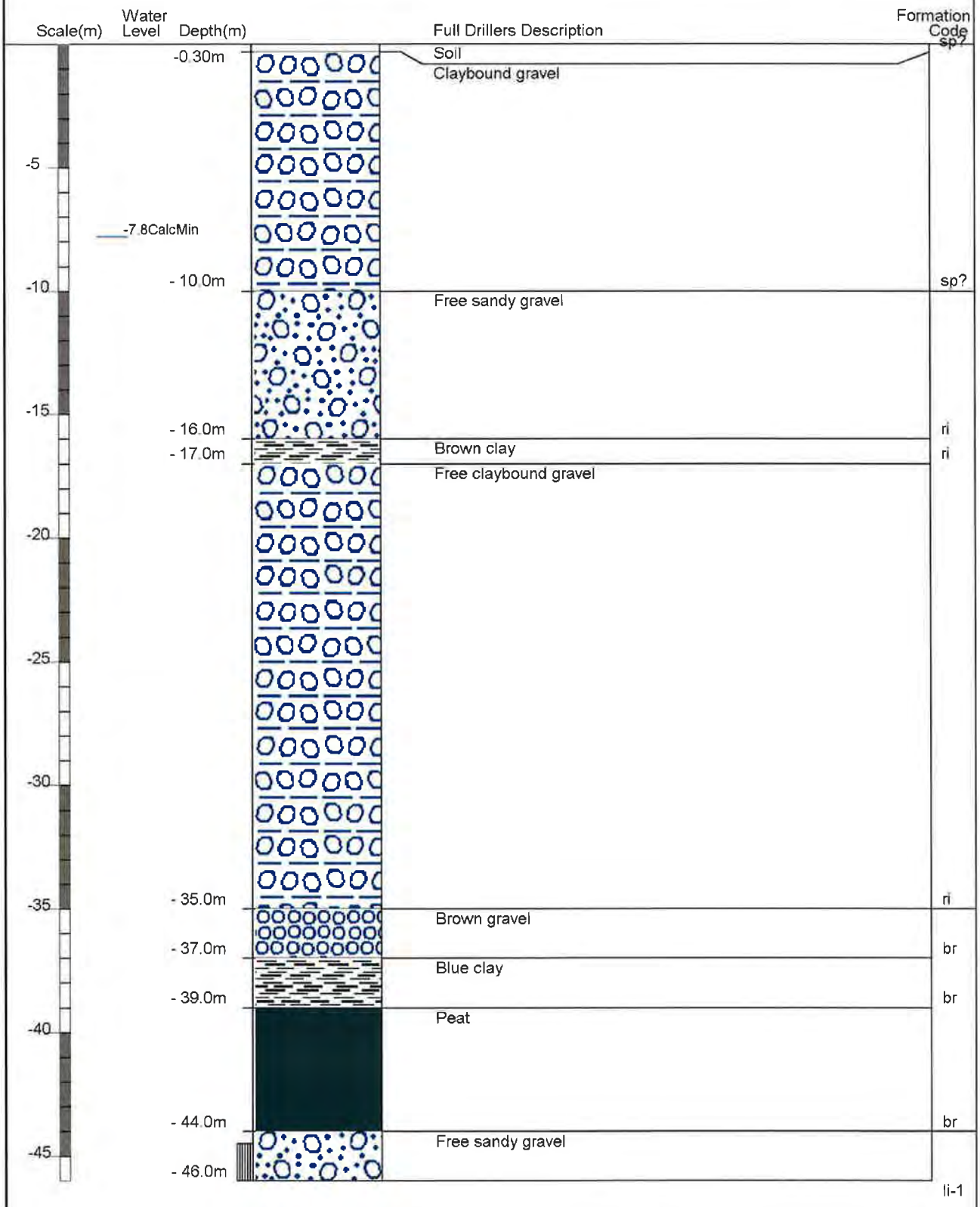
Measuring Point Ait: 27.07m MSD QAR 4
Highest GW Level:
GL Around Well: 0.00m -MP
Lowest GW Level:
MP Description:
First Reading:
Last Reading:
Driller: Dynes Road Drilling
Calc. Min. GWL: -7.80m -MP
Drilling Method: Cable Tool
Last Updated: 31 Jan 2007
Casing Material:
Last Field Check: 13 May 1997
Pump Type: Submersible
Yield: 4 l/s
Screens:
Drawdown: 25 m
Screen Type: Stainless steel
Specific Capacity: 0.15 l/s/m
Top GL: 44.50m
Bottom GL: 46.00m
Aquifer Type: Non-Flowing Artesian
Aquifer Name: Linwood Gravel

Date	Comments
16 Aug 2002	Same log as M36/4728


Data to in
• Locality
activity
• Location
well/bore
• Other ne
wells/bo
• Septic ta
and othe
sources
contamin
• Roads
• Fence lin
• Building
• Other
structure
• Nearby
watercou

Borelog for well M36/4677

Gridref: M36:69518-36217 Accuracy : 2 (1=best, 4=worst)
Ground Level Altitude : 26 +MSD
Driller : Dynes Road Drilling
Drill Method : Cable Tool
Drill Depth : -46m Drill Date : 16/10/1996



Bore or Well No: M36/3775
Well Name:
Owner: Mr & Mrs D J & S J Anderson

Environment Canterbury
Your regional council

Street of Well: 311 TRENTS RD
Locality: PREBBLETON
NZGM Grid Reference: M36:69030-36450 QAR 2
NZGM X-Y: 2469030 - 5736450
Location Description:
ECan Monitoring:
Well Status: Active (exist, present)

File No: CO6C/00048
Allocation Zone: Selwyn-Waimakariri
Uses: Domestic and Stockwater Irrigation

Drill Date: 12 Jul 1987
Well Depth: 46.00m -GL
Initial Water Depth: -7.50m -MP
Diameter: 100mm

Water Level Count: 0
Strata Layers: 13
Aquifer Tests: 0
Isotope Data: 0
Yield/Drawdown Tests: 2

Measuring Point Ait: 28.18m MSD QAR 4
GL Around Well: 0.00m -MP
MP Description:

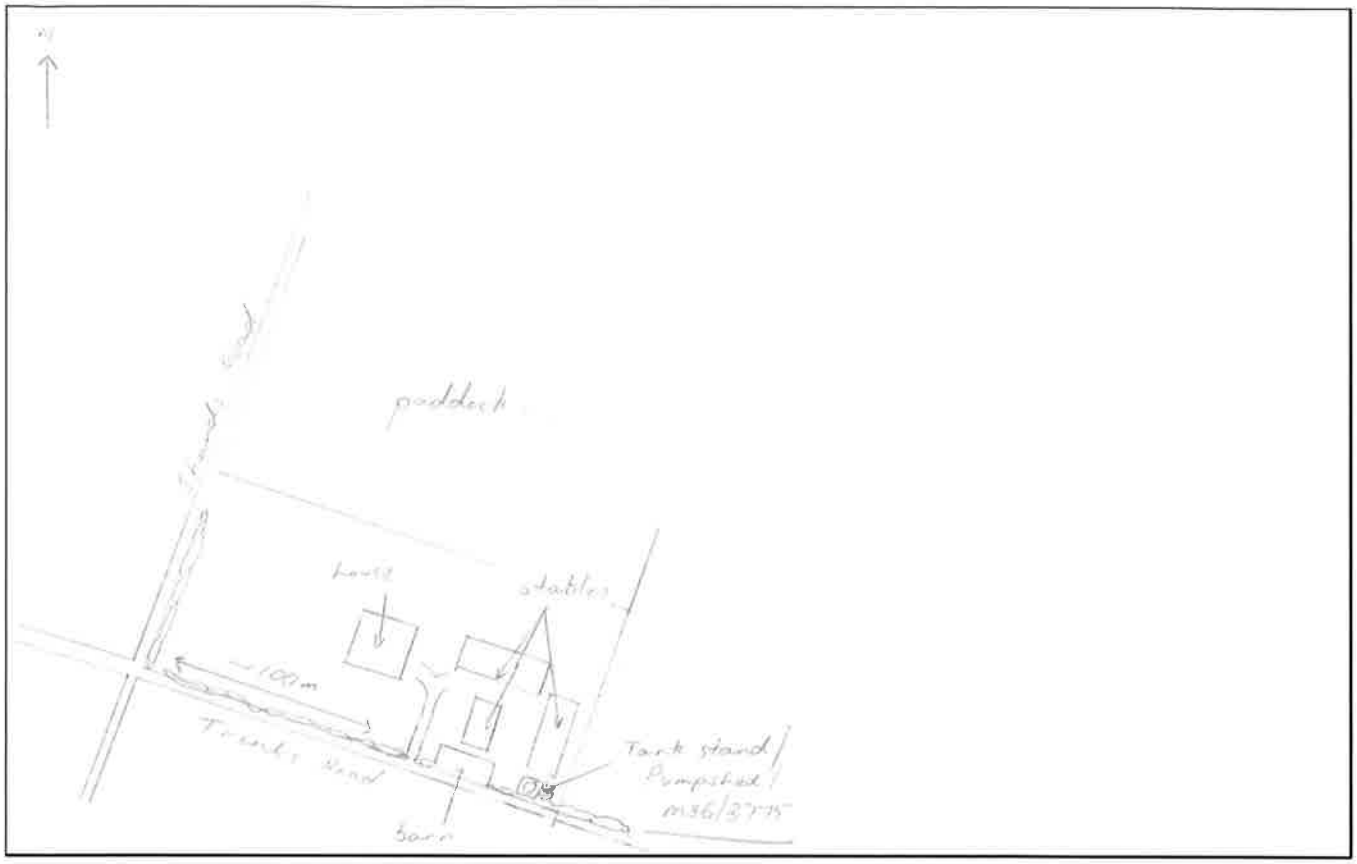
Highest GW Level:
Lowest GW Level:
First Reading:
Last Reading:

Driller: Smith, J R & I G
Drilling Method: Cable Tool
Casing Material: STEEL
Pump Type: Unknown
Yield: 6 l/s
Drawdown: 2 m
Specific Capacity: 2.85 l/s/m

Calc. Min. GWL: -9.30m -MP
Last Updated: 30 Mar 2010
Last Field Check: 11 Mar 2010

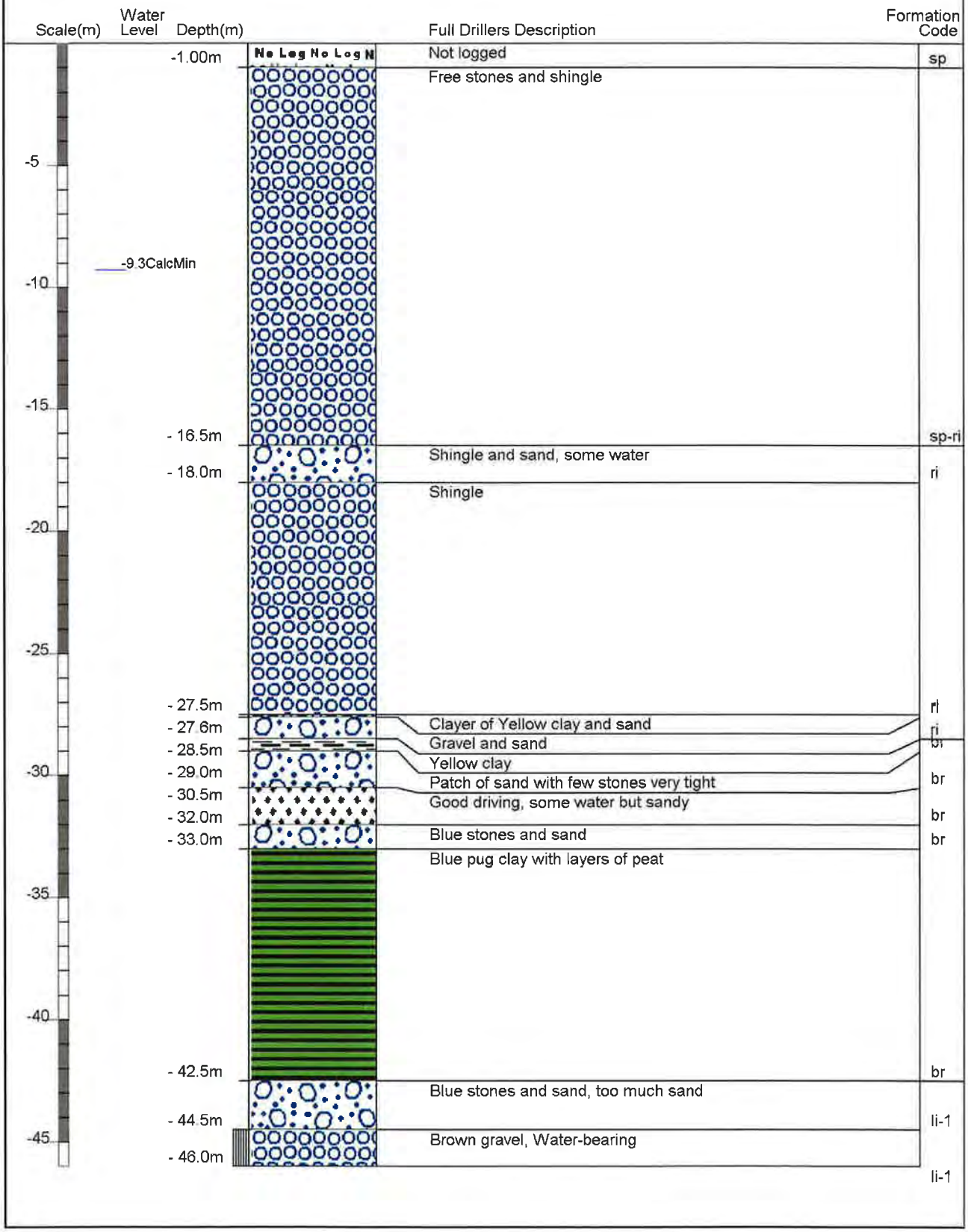
Screens:
Screen Type: Stainless steel
Top GL: 44.50m
Bottom GL: 46.00m

Aquifer Type: Non-Flowing Artesian
Aquifer Name: Linwood Gravel


N
paddock
house
stables
~100m
Tank stand/
Pumphead/
M36/2775
bore

Borelog for well M36/3775

Gridref: M36:69030-36450 Accuracy : 2 (1=best, 4=worst)
Ground Level Altitude : 28 +MSD
Driller : Smith, J R & I G
Drill Method : Cable Tool
Drill Depth : -46m Drill Date : 12/07/1987



APPENDIX D

Infiltration Test Results and Calculations

RILEY CONSULTANTS

Job No: 12076	Page: 1 of 1	Pages	
Project: 311 TRENTS ROAD PREBBLETON			
Calc:	Date: 7/12/12		
Check:	Date:		

Description: Soil Infiltration Rate Calculations

Soil Infiltration rate : $f = \frac{V_{p25-25}}{apso \times t_{p75-25}}$

where :

V_{p75-25} : the effective storage volume of water in the pit between 75% and 25% effective depth

apso : the internal surface area of the final pit up to 50% effective depth and including the base area.

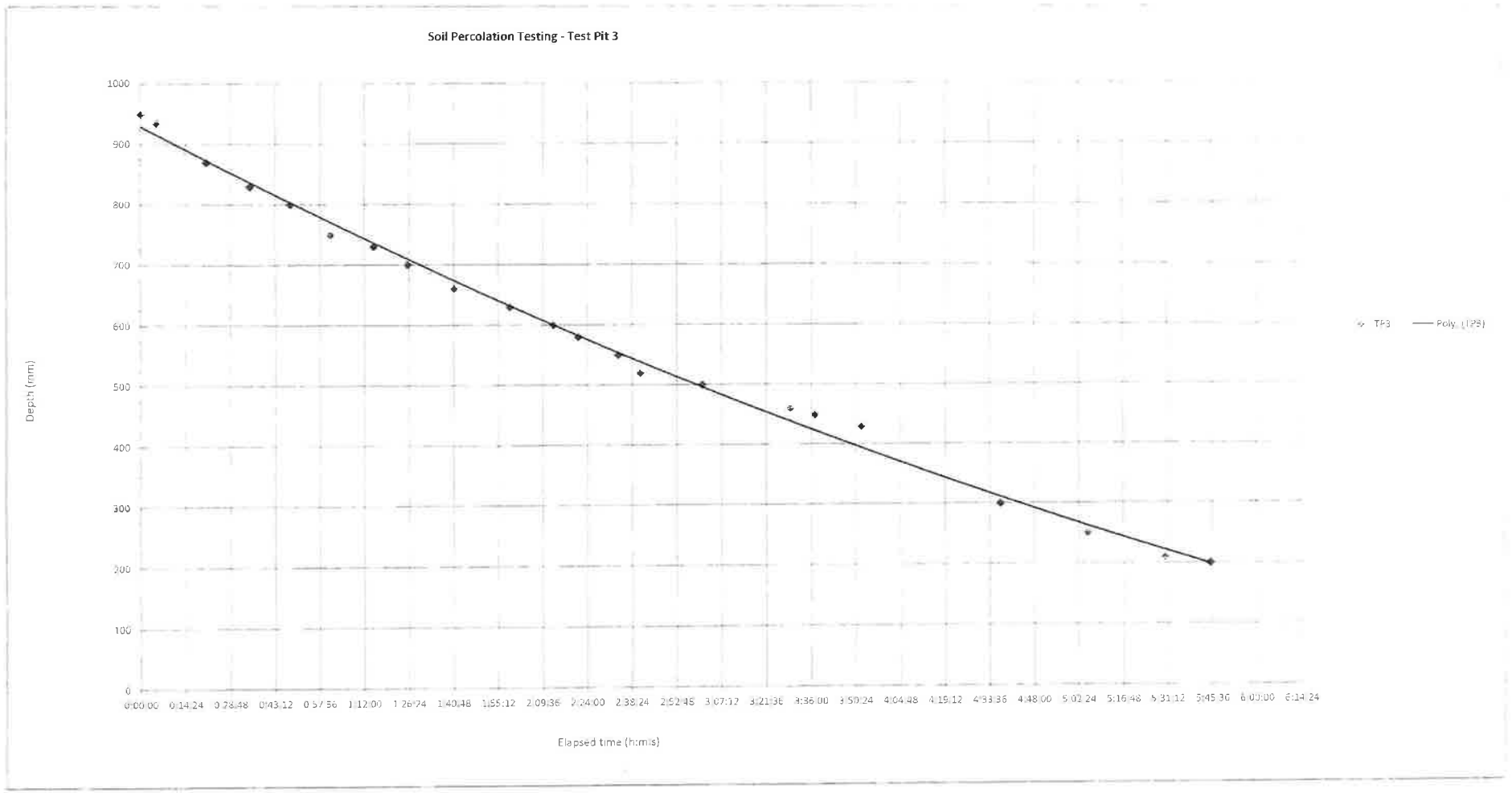
t_{p25-25} = the time for the water level to fall from 75% to 25% effective depth

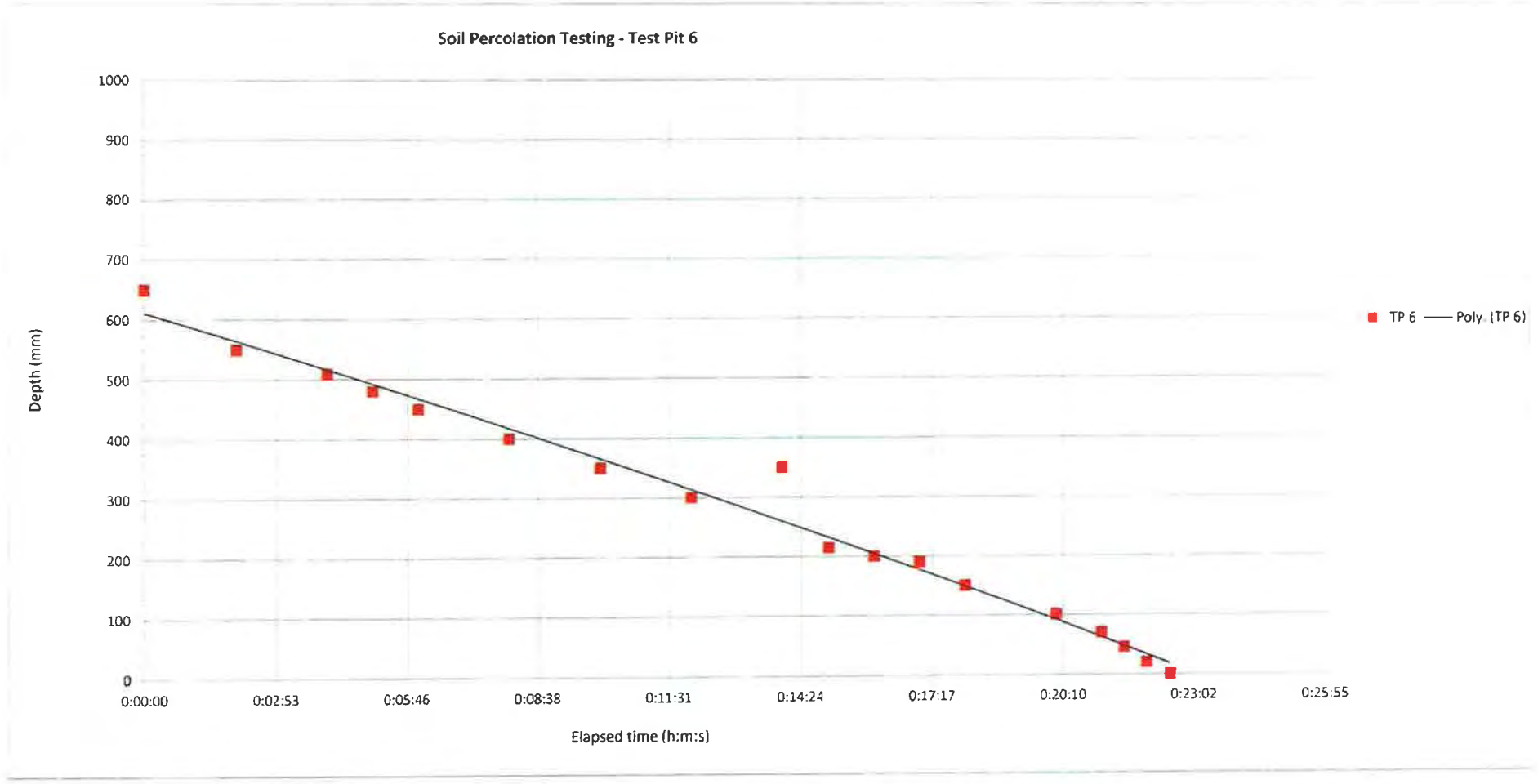
Test Pit No. 3

$$f = \frac{1.89\ m^3}{4.68\ m^2 \times 13643\ s} = 2.96 \times 10^{-5}\ m/s$$

Test Pit No. 6

$$f = \frac{2.09\ m^3}{10.49\ m^2 \times 720\ s} = 2.72 \times 10^{-4}\ m/s$$


Soil Percolation Testing - Test Pit 3
Depth (mm)
1000
900
800
700
600
500
400
300
200
100
0
0:00:00
0:14:24
0:28:48
0:43:12
0:57:36
1:12:00
1:26:24
1:40:48
1:55:12
2:09:36
2:24:00
2:38:24
2:52:48
3:07:12
3:21:36
3:36:00
3:50:24
4:04:48
4:19:12
4:33:36
4:48:00
5:02:24
5:16:48
5:31:12
5:45:36
6:00:00
6:14:24
Elapsed time (h:mm:ss)
TP3
Poly. (TP3)


Soil Percolation Testing - Test Pit 6
Depth (mm)
1000
900
800
700
600
500
400
300
200
100
0
0:00:00
0:02:53
0:05:46
0:08:38
0:11:31
0:14:24
0:17:17
0:20:10
0:23:02
0:25:55
Elapsed time (h:m:s)
TP 6
Poly. (TP 6)

AUCKLAND
Riley Consultants Limited
4 Fred Thomas Drive, Takapuna
PO Box 100 253, NSMC, Auckland, New Zealand
Telephone 64 9 489 7872, Facsimile 64 9 489 7873
riley@riley.co.nz

www.riley.co.nz

CHRISTCHURCH
Riley Consultants Limited
Ground Floor, 395 Madras Street
PO Box 4355, Christchurch, New Zealand
Telephone 64 3 379 4402, Facsimile 64 3 379 4403
rileychch@riley.co.nz

www.riley.co.nz

ACENZ

ISO 9001 CERTIFIED GCS

Appendix D – Davie Lovell-Smith Preliminary Site Investigation, Soil Contamination

Soil Contamination Risk

Stage 1 Preliminary Site Investigation Report

Revision 1

Mr. D J Anderson

311 Trents Road • Prebbleton
P16845

June 2013

DAVIE LOVELL·SMITH

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CONTENTS

APPENDICES

1 Executive Summary

The subject site is located in Prebbleton, 12.7km southwest of Christchurch. There is a proposal to rezone the land and subsequently subdivide the land prior to being developed for use as rural residential sections. This will change the use of the land and disturb soils.

The objective is to determine whether there is any risk of potential contamination of the soil that would warrant further investigation. The scope of the work has included all requirements for a Stage 1 preliminary site investigation report.

The subject site has been used generally for horse breeding and pastoral farming purposes since 1900s and in recent times (since at least 1982) as a horse training facility/stud. Prior to the 1980s, it is believed that there was little, if any, use of agrichemicals on the land, based on local knowledge of the farming practices of the owner at that time. Since the 1980s, the use of agrichemicals has been limited to well known, non-persisting products such as “round-up”.

The preliminary site investigation has found that the presence of a small aboveground diesel storage tank has the potential to have contaminated the land. It is recommended that further investigation around the diesel storage tank be conducted. There is low risk of contamination for the remaining land, for which it is recommended that further investigation is not warranted.

2 Objectives of the Investigation

This report has been prepared for the purposes of rezoning and subsequent subdivision consent and future associated earth disturbing and building activities related to that subdivision, and has been completed in accordance with the Ministry for the Environment’s “Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand”. The objective is to determine whether there is any risk of potential contamination that would warrant further investigation. This is one of the methods described in Section 6(3) of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Health) Regulations 2011 (NES) to establish whether the regulations apply.

3 Scope of Work Undertaken

This report includes all requirements for a Stage 1 preliminary site investigation report, detailing the work undertaken to assess the risk of potential contamination of the soil, and has been completed in accordance with the Ministry for the Environment’s “Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand”.

The scope of the work undertaken has included:

- Review of Selwyn District Council property information provided in a LIM and on property files
- Obtaining ECan data from the Listed Land Use Register (LLUR)
- Review of ECan GIS data
- Review of 4 historic aerial photos from circa 1940 to current
- Review of historical ownership history
- Review of local knowledge of site history
- Site visit
- Preparation of report in accordance with MfE guidelines

4 Site Identification

The site is located at 311 Trents Road, Prebbleton, Christchurch. It is legally described as Lot 2 DP 51743, with a total area of 9.2ha. A location plan is attached as **Appendix A**. Certificates of Title are included in **Appendix B.**

5 Activity Description

This report is limited to the following proposed activities as described and indicated on the attached subdivision plan in **Appendix C.**

- Rezoning the land as rural residential
- Future residential subdivision and use of the land for residential or recreational purposes
- Earth disturbing activities associated with the development of the subdivision and future buildings

6 Site Condition and Surrounding Environment

The site is generally flat and slopes slightly to the southeast. It contains a residential dwelling and a number of other buildings predominantly used as stables. A large horse training track occupies the northern and eastern part of the site. Established shelter belts and fences divide the site into smaller paddocks and specific use areas.

The site is bounded on the south/ southwest by Trents Road and to the west by Shands Road. To the north is agricultural land and to the east the land is used as rural residential.

A small block adjacent to the eastern boundary has been identified on the LINZ orchard layer (Copy in **Appendix F**) as having been used in the past as an orchard. The site has been used as an olive orchard since the early 2000's. An established shelter belt of large, tall trees along the property and a driveway, approximately 8m wide, exists between the site boundary and the location of the olive orchard. A 2004 aerial indicates the edge of the tree crown at that time was approximately 20m from the boundary and that the shelter belt crown was approximately 8m wide.

The land is currently zoned as Rural. It is proposed to rezone this land as Living 3 – Rural Residential. Generally the surrounding land has mixed use as agricultural and rural residential.

7 Site Visit

A site visit was carried out and the following points were noted:

- The buildings on the site include stables and farm buildings for storage of feed and horse racing equipment, as well as farm machinery.
- An above ground fuel tank was located at the eastern corner of the training track.
- It was noted the site is well maintained and kept very clean and tidy.
- Use and storage of agrichemicals under current ownership were discussed. The owner stated that the use of agrichemicals is limited to well known, products such as "round-up", which are stored in a safe and proper manner on a concrete slabs in covered buildings.
- History of the site was discussed with current owners.

8 Site History

8.1 Sources of Information Used in Assessment

- Aerials (sourced from LINZ, NZ Aerial Mapping and Google Maps)
- LINZ Mapping Layers – Orchard Layer
- ECan LLUR Statement and GIS records
- Selwyn District Council LIM
- Geotechnical Report (311 Trents Road, Prebbleton, Canterbury – geotechnical assessment for subdivision consent by Riley Consultants, Dec 2012)

8.2 Previous Site Ownership and Use

Historic Certificates of Title were searched and the following history was able to be recorded:

- 1948 - Owned by A.J. Halkett, farmer
- 1948 to 1987 - Owned by Grice family, farmers
- 1987 to present – D.J. Anderson and S.J. Anderson, current owners

8.3 District Council Records

The LIM and property files held for the property were reviewed and the following information was recorded:

- Various building permits from 1987 – 1988 for erecting stables, hay barn and a dwelling
- 2009 resource consent for subdivision

8.4 Regional Council Records

The ECan Listed Land Use Register Statement does not list the site and does not identify any sites within 100m as a nearby site of interest or investigation.

The site is over an unconfined/semi confined aquifer system. A well (M36/3775) exists on the site located between the dwelling and the stables.

8.5 Local knowledge of site

The current owners of the site advise that the above ground fuel tank, noted on the site visit, has been in place for approximately 8 years, with an approximate capacity of 400 litres. It has never been sited anywhere else on the property. No other potential risk areas were identified.

The current owners also state that the previous owners, the Grice family - horse breeders, were locally known for not using agrichemicals as the farm was overrun with weeds. To their knowledge, the land has been solely used historically for horse breeding/training.

An olive orchard exists on the adjacent site.

8.6 Historical Uses of Adjacent Land

A small block adjacent to the eastern boundary has been identified on the LINZ orchard layer as being used since the early 2000s as an orchard.

The surrounding land appears to have been in rural use.

8.7 Review of Historical Aerial Photographs

A total of four aerial photos (see copies in **Appendix E**) have been used to assess the historical use of the site as detailed below:

- The earliest photo reviewed is from 1965, sourced from NZ Aerial Mapping Ltd. The scale of the photo is 1:16000 which makes detail difficult to discern. The use of the subject land appears to be general pasture/grazing. There are no buildings on-site.
- A photo from 1973 also sourced from NZ Aerial mapping, is at a more readable scale of 1:5000. It shows that there has been no change in use of the site.
- A photo from 2000/01 (sourced from LINZ) shows a horse training track, stables and associated buildings, and a dwelling.
- A photo from 2004 (sourced Google Maps) shows an orchard on the adjacent site to the east.

8.8 Geology and Hydrology

The site is over the semi confined or unconfined aquifer system and ground water levels measured in the onsite well indicate the groundwater level is approximately 7-11m deep. The soils are described as Templeton moderately deep and deep loam silts, and Templeton deep fine sandy loams on sand. The direction of ground water flow is generally in a southeasterly direction.

8.9 Hazardous Activities and Industries List (HAIL)

The Hazardous Activities and Industries List (HAIL) compiled by The Ministry for the Environment include the following categories (*in italics*) that could be associated with the historical use of horse breeding/ training, with a summary of the associated activities below.

- ***A Chemical manufacture, applications and storage***

  1. *Agrichemicals including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application*

  17. Storage tanks or drums for fuel, chemicals or liquid waste

Current use as a horse training facility and the original use as a farming block for pasture and horse breeding have associated uses of agrichemicals.

An aboveground diesel storage tank is present on site.

- ***G Cemeteries and waste recycling, treatment and disposal***

  6. Waste recycling or waste or wastewater treatment

There are two septic tanks on site. One serves the residential dwelling and the other serves the stables. Where required, these will be removed in accordance with Council requirements.

- ***H Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment***

The LLUR statement (copy in **Appendix D**) does not identify any nearby sites or investigations in the vicinity of the subject site.

Since the early 2000's, the adjacent land to the east of the site of interest has been used as an olive orchard. Orchards have associated activities listed under HAIL. Activities on the adjacent orchard have the potential to give rise to migration of contaminants to the subject site.

8.10 Possible Types of Contaminants Associated With Past Use

Possible types of contaminants associated with activities carried out onsite are detailed in the table below:

Activity	Possible types of contaminants associated
Use of agrichemicals	OCP_1; Heavy Metals
Diesel storage tank	TPH_2; Heavy Metals; PAH_3; $Btex_4$
Olive Orchard	OCP; Heavy Metals

Note 1: Organochlorine Pesticides
Note 2: Total Petroleum Hydrocarbons
Note 3: Polycyclic Aromatic Hydrocarbons
Note 4: Benzene, Toluene, Ethylbenzene and Xylenes

9 Discussion and Site Characterisation

With the previous and current use of grazing on a large portion of the site over an extended period it is possible that the soil may have been subjected to irrigation, fertilisation and pesticide application at low levels. The use of agrichemicals is likely to have only been in place since the 1980s. The agrichemicals used are unlikely to contain contaminants that persist in the soil and were stored in a safe and proper manner on a concrete slabs in covered buildings. The normal use of these chemicals does not generally give rise to contamination levels of concern.

The existing farm buildings have all been constructed in the late 1980's which is after the time that the use of persistent agrichemicals and the common use of lead paint ceased. On the site visit it was evident that the farm buildings and surrounding concrete pads and yard areas were all very well maintained and clean. There was no evidence of fuel storage in or around the farm buildings and the owner advised that refueling occurred in the eastern corner where the diesel tank is located. Therefore it is considered that the risk of soil contamination with persistent chemicals or fuels is unlikely to have occurred in and around the farm buildings.

The adjacent land identified as an orchard in the LINZ orchard layer was used as an olive orchard since the early 2000's. (Copy in **Appendix F**) Olives are generally relatively resistant to pests and disease in New Zealand. If sprays were used on this orchard, they were likely to have been modern copper based sprays which do not persist in the environment. The shelter belt on the site boundary will have provided a barrier to any spray drift. Due to the orchard being established many years after the last permitted use of the types of chemical sprays that persist in the environment, the recent use as an olive orchard, and the significant shelter belt and

distance between the trees and the adjacent site, it is considered highly unlikely that migration of contaminants will have occurred.

The use of an above ground fuel storage tank poses the risk of minor leakages or spillages during refueling. This use has the potential to contaminate the soils below and around the tank. There is potential for contamination of the soil under and around the tank, where spillages or leaks may have occurred. Further investigation is recommended, to determine the levels, if any, of contamination of the soil associated with the fuel storage tank.

10 Recommended Further Investigation

The area below and around the above ground diesel tank should have further investigations carried out including soil sampling. The plan included in **Appendix C** identifies the area that should have further investigations carried out.

11 Conclusions

The investigations undertaken have revealed that the majority of the site is unlikely to have been used in a manner that would have resulted in soil contamination of concern; however the site has had a confirmed HAIL use carried out on it, with the use of an above ground diesel storage tank. The risk of contamination is limited to the area around the tank. A detailed site investigation will be required to determine the level and type of any contaminants present and the possible risks to human health and the environment. The site appears to be well maintained and it is therefore envisaged that the diesel storage tank was used in a proper and safe manner. If a detailed site investigation reveals soil contamination associated with the fuel storage tank, it is likely that this contamination would be minor and could be easily and economically remediated.

12 Planning Status

In terms of the NES the land is considered to be covered if:

"5(7)(c) it is more likely than not that an activity or industry described in the HAIL is being or has been undertaken on it."

The investigation has shown that an activity or industry described in the HAIL has been carried out on the site now or in the past and on this basis it is considered that the NES does apply to a small part of the site.

Section 8 of the NES describes the requirements for permitted activities. Section 8(4) Subdividing or changing use states:

"*Subdividing or changing the use of the piece of land is a permitted activity while the following requirements are met:*

(a) A preliminary site investigation of the land or piece of land must exist;
(b) The report on the preliminary site investigation must state that it is highly unlikely that there will be a risk to human health if the activity was done to the land;
(c) The report must be accompanied by a relevant site plan to which the report is referenced;
(d) The consent authority must have the report and the plan."

For Lot 4 of the proposed subdivision (see **Appendix C.**) this report cannot state that it is highly unlikely that there will be a risk to human health if the activity described in Section 3 was done to the land and accordingly cannot meet the requirements to be considered a permitted activity in terms of the NES for Assessing and Managing Contaminants in Soil to Protect Human Health. As a detailed site investigation does not yet exist the proposal will also not meet the controlled or restricted discretionary conditions and is therefore considered to be a discretionary activity.

It is recommended that further detailed investigation, including soil testing, be carried out on the site in the identified risk area shown on the plan in **Appendix C**.

For the remainder of the site this report states that it is highly unlikely that there will be a risk to human health if the activity described in Section 5 was done to the land, and accordingly meets the requirements to be considered a permitted activity in terms of the NES for Assessing and Managing Contaminants in Soil to Protect Human Health. The proposal is considered as a permitted activity for the site with the exception of Lot 4 of the proposed subdivision.

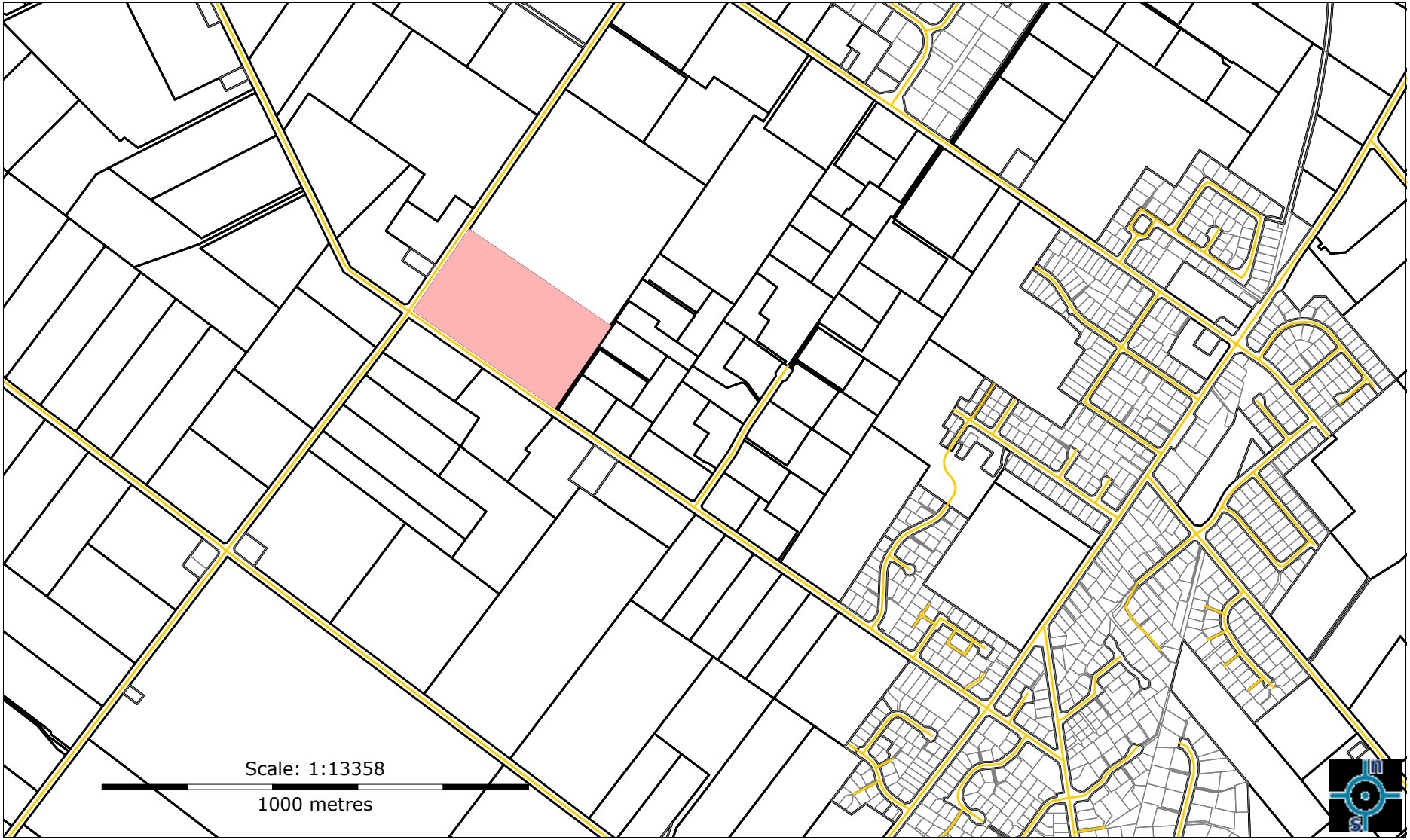
Report prepared by:

Kate Stafford BSc
Environmental Scientist

Report reviewed and certified by
a suitably qualified and experienced
practitioner as prescribed under the NES (soil):

Nicola Malloch CEnvP
Senior Environmental Engineer

Appendix A – Location Plan


Scale: 1:13358
1000 metres

Appendix B – Certificates of Title

CANCELLED

[Land and Deeds—3.

[SCHEDULE 1.

NEW ZEALAND.

Reference: Warrant No. 6C.87
P.R. Vol90 folio 62
Transfer No.

Register-book,
Vol. 512 , folio 169

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT.

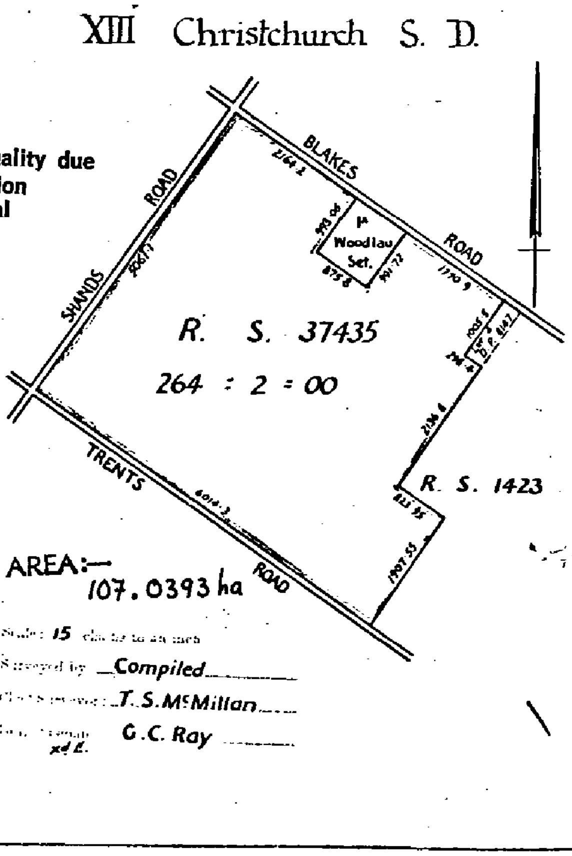
This Certificate, dated the Seventh day of July, one thousand nine hundred and Forty-eight under the hand and seal of the District Land Registrar of the Land Registration District of Canterbury being a Certificate in lieu of Grant, under Warrant of His Excellency the Governor-General, in exercise of the powers enabling him in that behalf, Witnesseth that ALFRED JAMES HALKETT of Prebbleton Farmer

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial under written or endorsed hereon; subject also to any existing right of the Crown to take and lay off roads under any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon bordered green, be the several admeasurements a little more or less, which said land, is in the said Warrant expressed to have been originally acquired by the said ALFRED JAMES HALKETT

as from the Thirteenth day of June, one thousand nine hundred and forty-six under Section 16 of the Land Laws Amendment Act 1944, that is to say: All that parcel of land containing TWO HUNDRED AND SIXTY-FOUR ACRES AND TWO ROODS or thereabouts situated in Block XIII of the Christchurch Survey District being Rural Section 37435 Woodlau Farm Settlement (Deposited Plan 13222)

Assistant ~~District~~ Land Registrar.

Image Quality due to Condition of Original



Subject to Part XIII of the Land Act 1924 and subject also to the same restrictions as are imposed in the case of leases by Section 206 of the said Act and subject further to the restrictions imposed by Section 16 (6) of the Land Laws Amendment Act 1944

A.L.R.

Mortgage 230684 produced [illegible] 1947 at 10.10 a.m. Alfred James Halkett to The State Advances Corporation of New Zealand

DISCHARGED 16/4/1951

A.L.R.

338371. Transfer Alfred James Halkett to Benjamin Thomas Grice and Desmond Peter Grice both of Lincoln Farmers as tenants in common in equal shares produced [illegible] April 1951 at 2.4 pm

DISCHARGED

410627 Mortgage [illegible] Desmond Peter Grice to Benjamin Thomas Grice produced [illegible] June 1951 at 9.40 a.m.

A.L.R.

THIS REPRODUCTION (ON A REDUCED SCALE) CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL REGISTER FOR THE PURPOSES OF SECTION 215 OF THE LAND TRANSFER ACT 1952.

L.R.

No. 445048/1 Order vesting the one-half share of Desmond Peter Grice in Roma Lyon Gabrille Grice of Prebbleton, Married Woman and Desmond Peter Grice, above-named as tenants in common in equal shares - 26-7-1983 at 9.43a.m.

for A.L.R.

- OVER -

Transmission 675631/1 of the share of Benjamin Thomas Grice to Desmond Peter Grice of Prebbleton, farmer and studmaster and Geoffrey George Grice of Nelson, electrical engineer as executors - 15.4.1987 at 10.45am

for A.L.R.

Transmission 675631/1 of Mortgage 460627 to Desmond Peter Grice and Geoffrey George Grice as executors - 15.4.1987 at 10.45am

A.L.R.

X CAVEAT 685263/1 BY DAVID JOHN HUTTON and VALERIE MARGARET HUTTON (affects part) - 8.6.1987 at 11.44am

for A.L.R.

Plan 51743 deposited 20/8/1987

No.697995/2 Compliance Certificate pursuant to Section 306(1)(f)(i) Local Government Act 1974 - 20.8.1987 at 9.15am

A.L.R.

OCT 697995/3 - 20.8.1987 Cancelled and new CsT 30B/234,235 issued for Lots 1 and 2 DP 51743 and new CT 30B/236 issued for balance herein

A.L.R.

CANCELLED DUPLICATE DESTROYED

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**CB30B/235**
Land Registration District	**Canterbury**
Date Issued	20 August 1987

Prior References
CB512/169

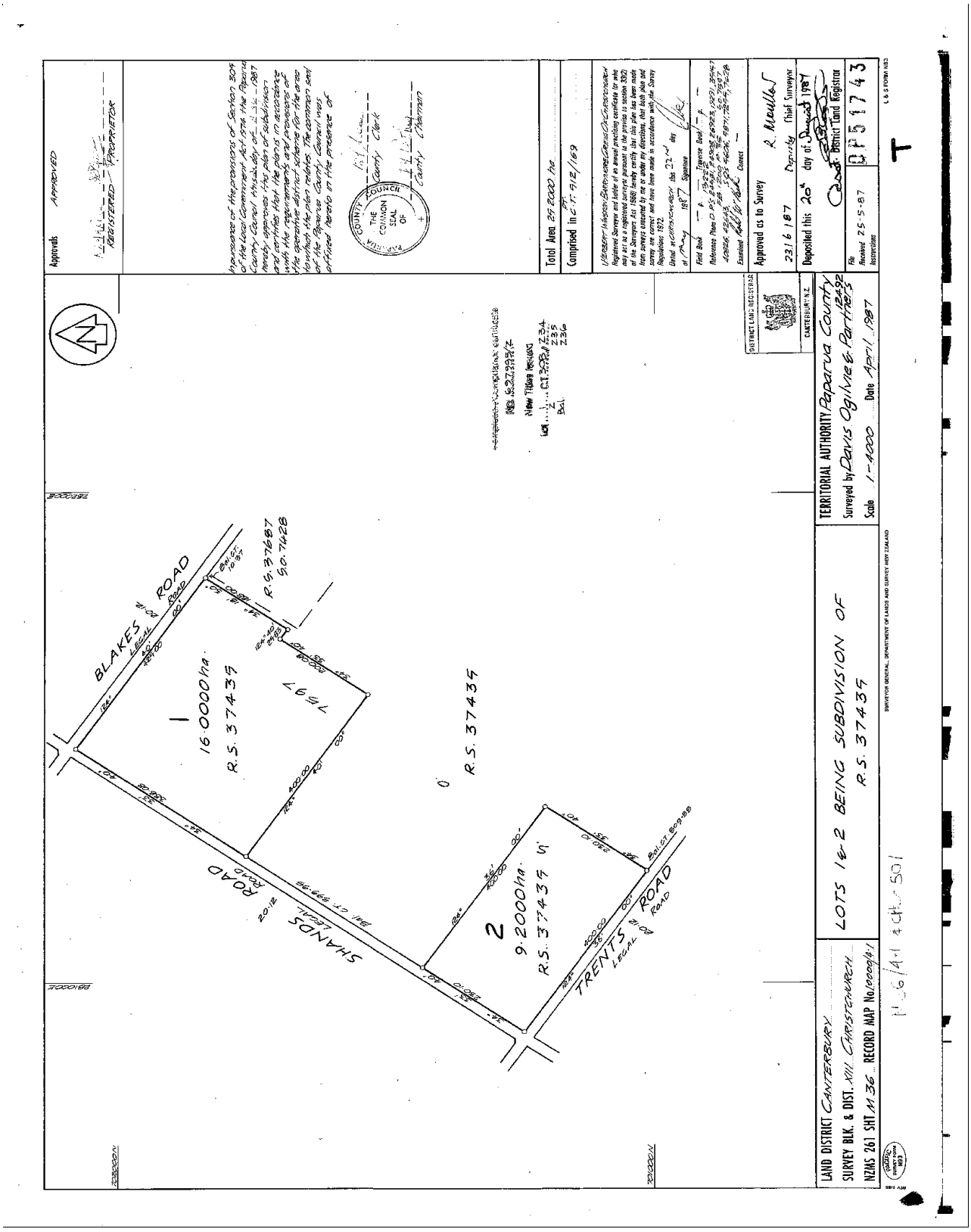
Estate	Fee Simple
Area	9.2000 hectares more or less
Legal Description	Lot 2 Deposited Plan 51743

Proprietors
David John Anderson, Suzanne Joan Anderson and WF Trustees 2007 Limited

Interests

Subject to Section 206 Land Act 1924
7567280.3 Mortgage to Westpac New Zealand Limited - 1.11.2007 at 12:20 pm

Identifier **CB30B/235**



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**CB30B/235**
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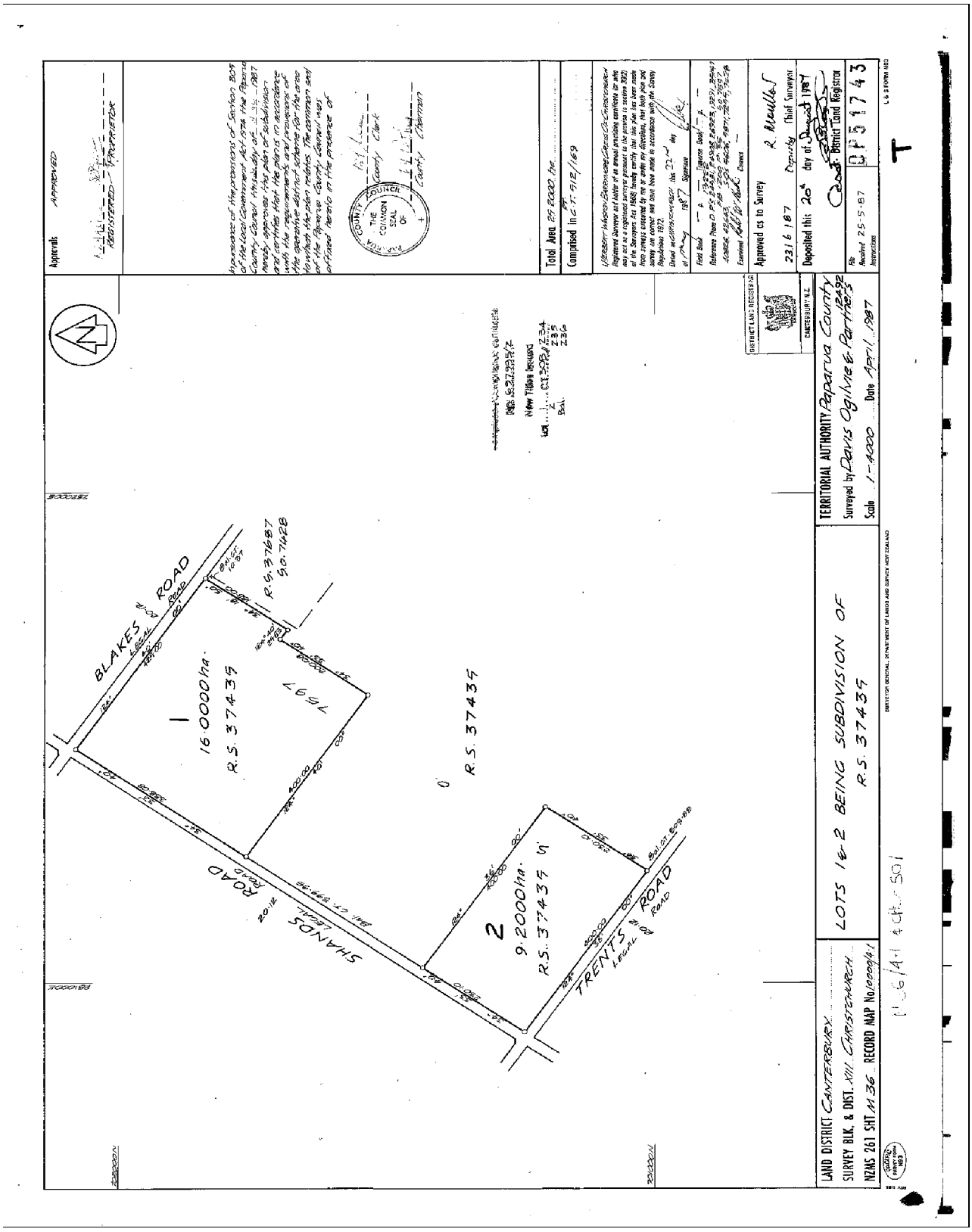


Appendix C – Proposed Subdivision Plan

AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION

NOTES :

1) Areas and dimensions are approximate and subject to final survey and deposit of plans.

2) Service easements to be created as required.

3) This plan has been prepared for subdivision concept purposes only. No liability is accepted if the plan is used for any other purpose.

4) Any measurements taken from information which is not dimensioned on the electronic copy are at the risk of the recipient.

5) This plan is subject to the granting of subdivision and/or resource consents and should be treated as a proposal until such time as the necessary consents have been granted by the relevant authorities.

Option D

DAVIE LOVELL·SMITH

PLANNING SURVEYING ENGINEERING

79 Cambridge Terrace P O Box 679 Christchurch 1. New Zealand
Telephone: 03 379-0793 Fax: 03 379-5664 E-mail: office@daviels.co.nz

JOB TITLE:

Mr D J Anderson
Trents Road

SHEET TITLE:

Possible Subdivision of Lot 2 DP 51743

DRAWING STATUS

For Discussion Purposes

SCALE : 1:1000@A1 1:2000@A3 **DATE :** March 2013

CAD FILE : J:\16485\optionD.dwg **REVISION :** R0

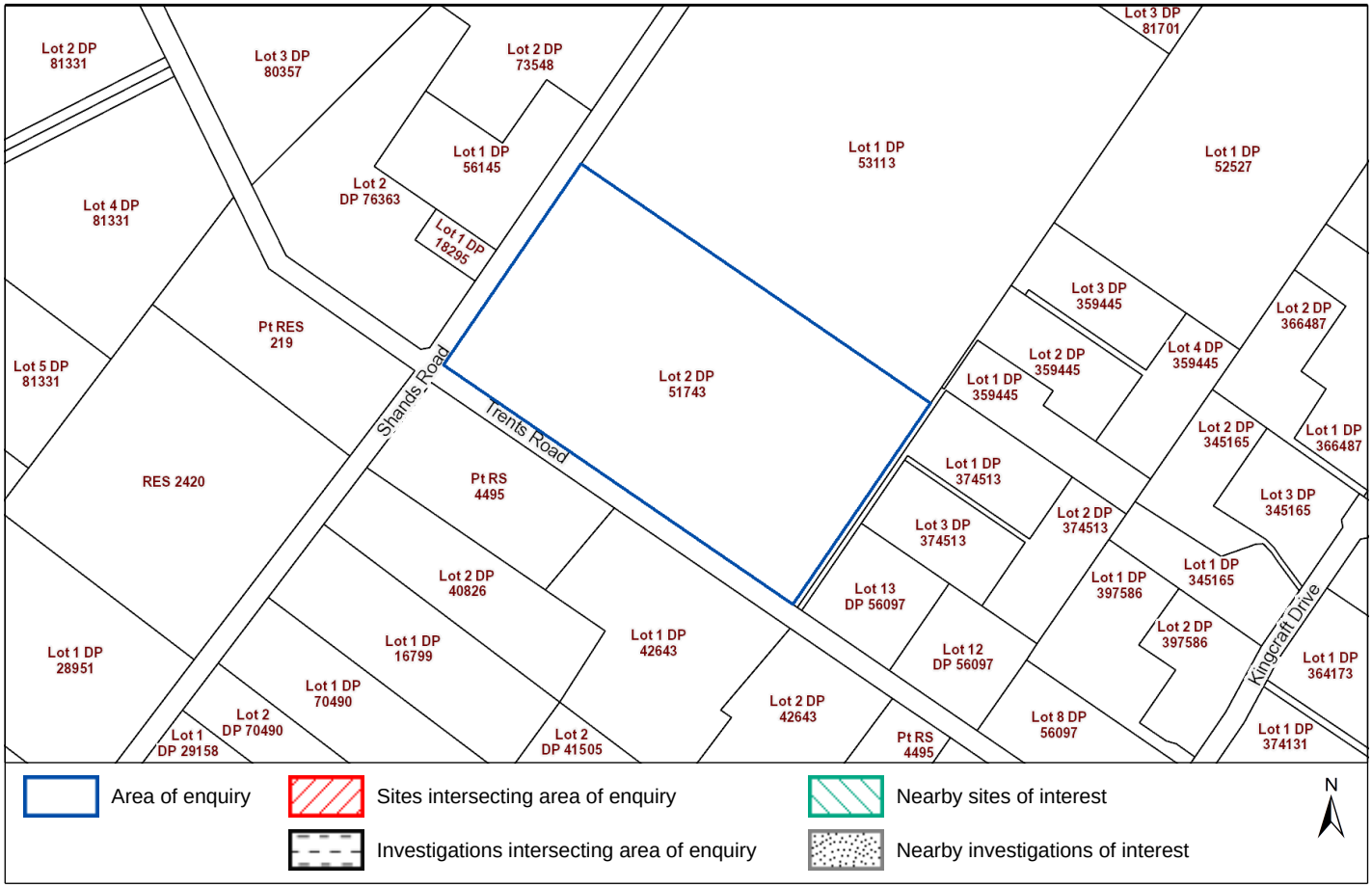
DRAWING No : P.16845 **SHEET No:**

Appendix D – LLUR

Statement from the Listed Land Use Register

58 Kilmore Street, PO Box 345, Christchurch
General enquiries: 03 365 3828 Customer services: 03 353 9007
Fax: 03 365 3194 or: 0800 EC INFO (0800 324 636)
Email: ecinfo@ecan.govt.nz Website: www.ecan.govt.nz

Date:	8 March 2013
Land Parcels:	• Lot 2 DP 51743 Valuation No(s): 2355204700



Summary of sites:

There are no sites associated with the area of enquiry.

Please note that the above table represents a summary of sites intersecting the area of enquiry within a 100m buffer.

For further information from Environment Canterbury, contact the Contaminated Sites Officer and refer to enquiry number 15566.

Disclaimer:

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987 and Environment Canterbury's Contaminated Land Information Management Strategy (ECan 2009).

This information reflects Environment Canterbury's current understanding of this site, which is based only on the information thus far obtained by it and held on record concerning this site. It is released only as a copy of those records and is not intended to provide a full, complete or totally accurate assessment of the site. As a result, Environment Canterbury is not in a position to warrant that the information is complete or without error and accepts no liability for any inaccuracy in, or omission from, this information.

Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

Appendix E – Aerial Photos

N

Source Linz 2000/2001

Appendix F – LINZ Mapping Layers – Orchard Layer

Source LINZ Orchard Layer

Appendix E – Novo Group Acoustic Assessment

novogroup
Planning · Traffic · Development

Novo Group Limited,
PO Box 38 123
Christchurch 8842

P: 03 365 5570
E: info@novogroup.co.nz

9 August 2013

Craig Friedel
Strategy and Policy Planner
Selwyn District Council
P O Box 90
ROLLESTON 7643

By email: ***Craig.Friedel@selwyn.govt.nz***

Cc. ***Patricia.Harte@dls.co.nz***

Dear Craig

RE: PLAN CHANGE 41 – PROPOSED NOISE MITIGATION

This letter presents my assessment of the provisions in draft Plan Change 41 that are proposed to mitigate traffic noise effects on the Plan Change area, for the purpose of avoiding reverse sensitivity effects on the road network.

In my email of 1 July 2013, I advised you that I considered that the draft application did not provide sufficient information relating to building setback, physical barriers and acoustic insulation to support proposed permitted activity rule 4.9. My reasons were as follows:

1. Referring to section 5.5 on page 12, it is stated incorrectly that the proposed internal levels are the same as those that apply to the Rolleston Living 3 zone where it adjoins State Highway 1. The proposed new rule applies separate limits for daytime and night-time periods, expressed as Leq 1 hr, whereas Townships Volume rule 4.9.4 applies a single figure limit expressed as Leq 24 hr. The equivalence of these limits, and the relationship of the proposed limits to guidelines of acceptability (e.g. AS/NZS 2107:2000) is not discussed.

2. Referring to point 4(a) of the table on page 11, which mentions a proposed "noise absorbent fence", and section 5.5 second bullet point on page 12, there is insufficient detail to provide the Council or future developers certainty that the proposed acoustic fence would be effective in fulfilling the noise barrier requirements of the proposed new rule.

3. There is also insufficient information to demonstrate that the acoustic fence would achieve sufficient noise attenuation to support the proposed 25 m minimum setback, instead of the 40 m and 100 m setbacks that apply to the Rolleston Living 3 zone.

4. The requirement for acoustic insulation should include a further requirement, that any building consent application for a new residential development or an

extension to an existing residential development shall include a report from an experienced acoustic engineer which verifies the proposed construction will satisfy the internal noise limits in the proposed rule.

5. There is no assessment of the effectiveness of the proposed rule to address effects of traffic noise on outdoor living areas that would result from the projected increase in traffic.

Following your instructions on 5 July, I met with the applicant's Planning consultant Patricia Harte, Planning Manager for Davie Lovell-Smith Ltd on 8 July, and I have prepared the following assessment which I consider addresses the above matters raised in my email.

PC 41 NOISE ASSESSMENT

Introduction

I have examined the proposed methods for mitigation of road traffic noise described in section 5.5 of the draft Plan Change document.

The new rule in clause 3.3.6 of the Plan Change document propose that, to achieve prescribed internal noise standards for daytime and night-time within Bedrooms and Living Rooms of buildings used for residential purposes, such buildings shall be set back at least 25 m from Shands Road and either insulated or protected by an acoustic barrier.

Section 5.5 of the Plan Change states that the proposed internal limits are the same as those that apply to the Rolleston Living 3 zone where it adjoins State Highway 1. However the proposed new rule applies separate limits for daytime and night-time periods, expressed as Leq (1 hour assessment period), whereas Townships Volume Part C rule 4.9.4 (as applied by PC12) applies single-figure limits of 35 dBA Leq for bedrooms and 40 dBA Leq for Living Area Rooms (24 hour assessment period) with doors and windows closed, in the Rolleston Living 3 zone. I understand that the proposed limits in draft PC 41 came from a pre-PC12 version of Part C, rule 4.9.2.6, and as such they are no longer relevant. Therefore in this assessment, the appropriateness of the current 24-hour Leq limits for the Rolleston Living 3 zone are considered for the PC 41 land area in respect of outdoor noise levels generated by traffic on Shands Road and limits of acceptability in relevant standards and guidelines.

The Table in section 5.3 of the Plan Change states that a "noise absorbent fence" shall be installed in the location shown in the Outline Development Plan (ODP)within the road boundary of the site, behind an existing line of trees which will be retained. However as the acoustic performance of a traffic noise barrier relies principally on its physical mass and height to intercept and diffract noise, and not on noise-absorption, it is more appropriate to refer to the proposed fence as an "acoustic barrier fence". The location, height and specifications of an acoustic barrier fence in conjunction with the proposed 25 m setback are examined in this assessment, with regard to achieving appropriate indoor and outdoor noise levels.

Assessment

Examination of traffic count data supplied by Selwyn District Council taken on Shands Rd between Blakes Rd and Trents Rd from 25 June – 2 July 2011 indicates that traffic counts on weekdays range between approximately 6700 and 7100 vpd (vehicles per day, Average Daily Totals or ADT), with approximately 5000 on Saturdays and 4100 on Sundays. Because 95% occurs between 6 am and 10 pm, most of the noise would be generated in that period, and perceived as relatively constant except during peak hours at 7 am and 5 pm when noise would be about 3 dBA higher than the rest of the day. Between 10 pm and 6 am, night-time noise would be at least 10 dBA lower than during daytime, and perceived as intermittent vehicle movements rather than constant traffic noise. It should be noted that the traffic noise characteristics of this site are significantly different to those of the Living 3 zone at Rolleston, where noise from State Highway is at much higher levels and continues through into the night.

As noted in the discussion of the Wider Traffic Environment in section 5.7 of the Plan Change document, NZTA's assessment of traffic impacts for the CSM2 project indicates that traffic flows on this section of Shands Road are predicted to increase from current levels by no more than 9% by the year 2041. 9% change would slightly increase the level of existing daytime traffic noise by 1 dBA which would not be noticeable. However for completeness I have adopted a year 2041 figure of 7704 vpd for noise calculations in this assessment, adjusted from a 2011 highest weekday count of 7068.

Traffic volumes on Trents Road can be disregarded, as they are much lower than Shands Road, and would not contribute significantly to traffic noise received in the Plan Change area.

Calculations on NZTA's calculator for road traffic noise, using the adjusted year 2041 value of 7704 vpd for Shands Road, have produced predicted free-field noise levels (dBA Leq 24 hr) that would be received at the proposed dwelling setback of 25 m. The predicted levels are set out in Table 1 below for the following scenarios:

No acoustic barrier fence, and 3 m and 4 m high acoustic barrier fence heights, for each of the following receiver heights:

- 1.8 m (i.e. ground floor level and outdoors)
- 3 m (i.e. first floor level)

For these calculations I have assumed the acoustic barrier fence would be located approximately 10 m from the road edge behind the existing boundary trees (i.e. at the position indicated in the ODP). To provide satisfactory noise reduction, the surface mass of the fence must be 8-10 kg/m2 with no gaps in the barrier construction or at ground level.

Table 1

Predicted noise level (dBA Leq 24hr) at 25 m from Shands Rd, for stated receiver heights and acoustic barrier fence heights

Receiver height	No barrier fence	Barrier fence 3m height	Barrier fence 4m height
1.8 m (ground floor/outdoors)	65	54	52
3 m (first floor level)	65	55	53

In terms of outdoor noise levels, Table 2 indicates that,:

1. A level of 65 dBA Leq (24 hr) would be received at 25 m from the road, if no acoustic barrier fence is installed. At locations closer to the road, levels would be higher. These levels significantly exceed 55 dBA Leq (24 hours) which NZTA's Planning Policy Manual Appendix 5 suggests is an upper limit of acceptability. They also exceed 55 dBA Leq (16 hours), which is recommended by WHO and NZS 6802:2008 for the avoidance of serious annoyance and protection of amenity in outdoor residential situations. This indicates that a physical barrier is needed to provide a satisfactory level of noise in outdoor areas.

2. An acoustic barrier fence height of at least 3 m would be sufficient to reduce daytime traffic noise to 55 dBA Leq (24 hr) outdoors at the 25 m setback. Levels at locations closer to the fence would be lower, due to greater screening.

With regard to internal levels at ground and first floor levels of new dwellings, an external level of 55 dBA Leq (24 hr) would ensure that internal sound levels in the dwellings with doors and windows closed would be at least 5 dBA lower than required by the current District Plan limits in the Rolleston Living 3 zone, i.e. 35 dBA Leq for bedrooms and 40 dBA Leq (24 hr). Taking into account that typical building construction achieves 15 dBA noise attenuation with windows open, then internal levels with windows open might exceed the 35 dBA limit for bedrooms by 5 dBA; however this would occur only during daytime and the levels would still be consistent with the maximum internal design sound level of 40 dBA Leq (24 hr) recommended in AS/NZS 2107:2000 *Acoustics – Recommended design sound levels and reverberation times for building interiors*.

On this basis, I consider that the proposed setback and a 3 metre high acoustic barrier fence can achieve acceptable outdoor and indoor noise levels for the reasonable protection of residential amenity and avoidance of serious annoyance. However to ensure that all parts of the proposed residential properties are protected, I consider that the acoustic barrier fence should extend 25 m along each of the side boundaries from the road boundary corners (as indicated in Attachment 1 of this report).

The mass of the acoustic barrier fence should be 8 -10 kg/m2 with no gaps in the barrier construction or at ground level. This is achievable with 20 - 25mm thick timber, or other materials such as concrete, Hardiflex or Titan Board. A common solution is H3 treated timber, nailed through overlaps or "board and batten", with a H4 fillet along the base at ground level to stop gaps.

An earth mound or mound and acoustic barrier fence combination at least 3 m high would be equally effective.

Conclusions and Recommendations

This assessment shows that a 3 metre high acoustic barrier fence at the road and side boundaries, as described above, in combination with the proposed 25 m setback and typical building construction, can achieve acceptable outdoor and indoor noise levels for the reasonable protection of residential amenity and avoidance of serious annoyance. I do not consider that it is necessary to require acoustic insulation or to specify noise standards that otherwise apply to State Highway noise in this instance.

I therefore recommend that the proposed rule in clause 3.3.6 of the Plan Change document should be amended as follows:

Living 3 Rural Residential – Shands Road Traffic Noise Mitigation

4.9.XX For the purpose of protection against traffic noise intrusion from Shands Road, any dwelling, family flat and any rooms within accessory buildings used for sleeping or living shall be located no closer than 25 metres from Shands Road and shall be ~~acoustically insulated and/or~~ subject to physical acoustic barriers in the locations indicated in the ODP. ~~so that noise from traffic from on Shands Road does not exceed the levels set out below, with all external doors and windows closed.~~

… (delete proposed internal noise limits)

The finished height of any acoustic barrier shall be no less than 3 metres above the adjacent ground level of any proposed residential lot. The mass of any acoustic barrier shall be 8 -10 kg/m2 and it shall be constructed and maintained with no gaps in the barrier construction or at ground level.

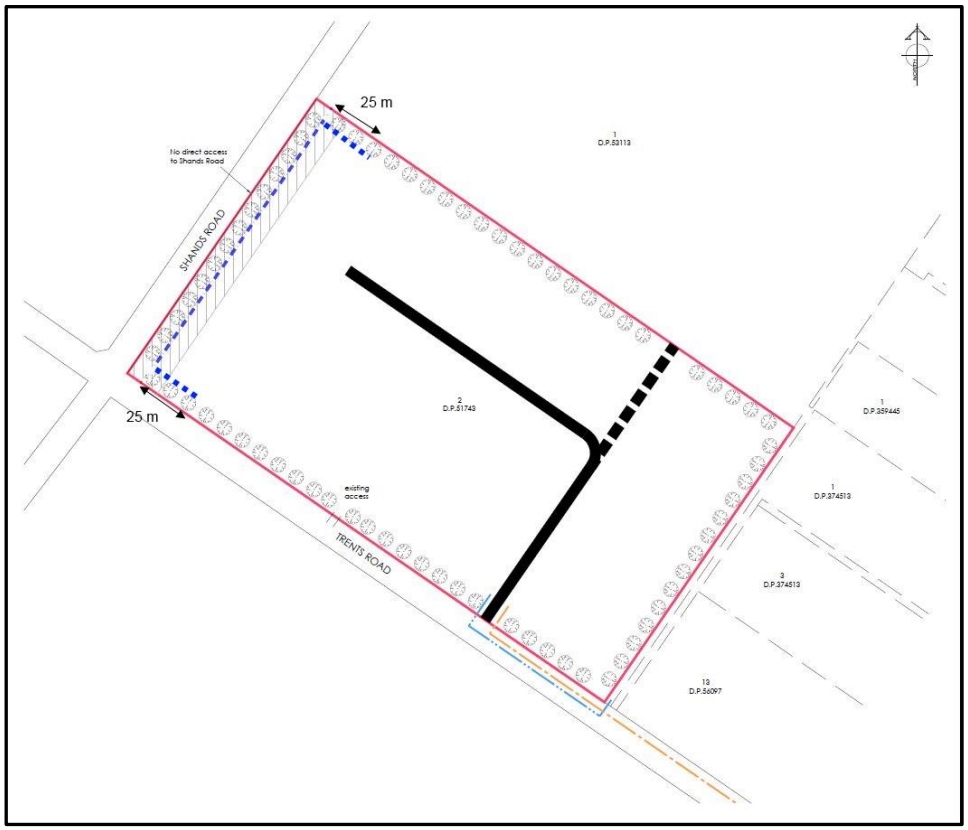
Yours sincerely,

Novo Group Limited

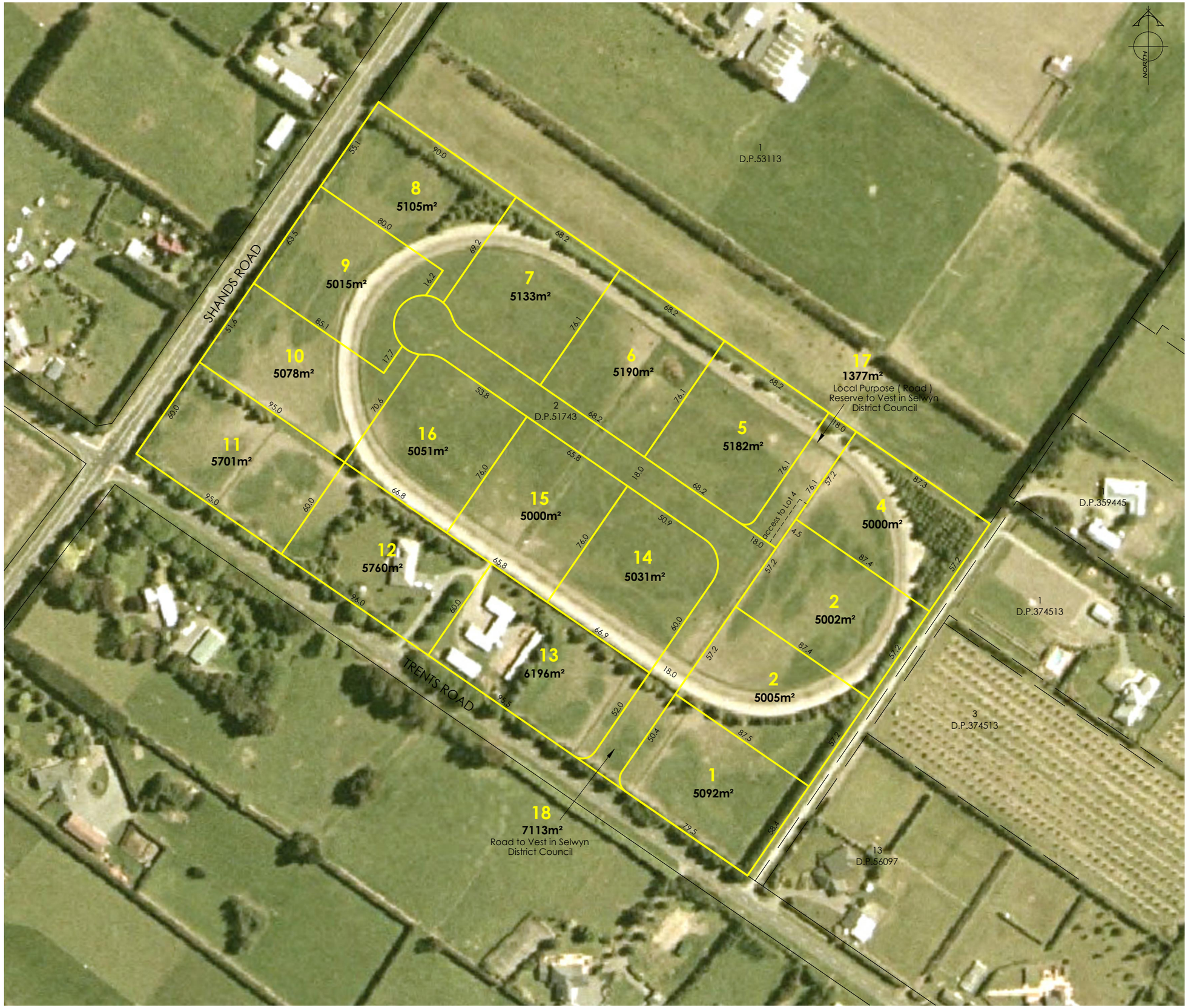
Russell Malthus
Senior Environmental Health Consultant
T: 03 365 5595
M: 027 242 5574
E: russell@novogroup.co.nz
W: www.novogroup.co.nz

ATTACHMENT 1

Indicative extension of the acoustic barrier by 25 m at side boundaries



Appendix F - Possible Subdivision of Lot 2 DP 51743



AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION

NOTES :

1) Areas and dimensions are approximate and subject to final survey and deposit of plans.

2) Service easements to be created as required.

3) This plan has been prepared for subdivision concept purposes only. No liability is accepted if the plan is used for any other purpose.

4) Any measurements taken from information which is not dimensioned on the electronic copy are at the risk of the recipient.

5) This plan is subject to the granting of subdivision and/or resource consents and should be treated as a proposal until such time as the necessary consents have been granted by the relevant authorities.

Option D

DAVIE LOVELL•SMITH

PLANNING SURVEYING ENGINEERING

79 Cambridge Terrace P O Box 679 Christchurch 1. New Zealand
Telephone: 03 379-0793 Fax: 03 379-5664 E-mail: office@daviels.co.nz

JOB TITLE:

Mr D J Anderson
Trents Road

SHEET TITLE:

Possible Subdivision of Lot 2 DP 51743

DRAWING STATUS

For Discussion Purposes

SCALE : 1:1000@A1
1:2000@A3

DATE : May 2012

CAD FILE : J:\16485\optionD.dwg

REVISION : **R0**

DRAWING No : **P.16845**

SHEET No:

Appendix G – Certificate of Title

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**CB30B/235**
Land Registration District	**Canterbury**
Date Issued	20 August 1987

Prior References
CB512/169

Estate	Fee Simple
Area	9.2000 hectares more or less
Legal Description	Lot 2 Deposited Plan 51743

Proprietors
David John Anderson, Suzanne Joan Anderson and WF Trustees 2007 Limited

Interests

Subject to Section 206 Land Act 1924
7567280.3 Mortgage to Westpac New Zealand Limited - 1.11.2007 at 12:20 pm

Identifier **CB30B/235**