Additional information submitted by Applicant

Campbell Thomson

From: Liz Hislop <Liz.Hislop@beca.com>
Sent: Tuesday, 12 July 2022 04:48 p.m.
To: Laura Mulder
Subject: FW: 317 Chain Hills Road Update
Attachments: Alternative Water Supplies - Residential Property Info Sheet DCC Area (1).pdf; A Discreet Fire Sprinkler System for Rural Homes.pdf; HAIL-Soil-Contamination-Search-Request-Form (1).pdf; 317 Chain Hills Road - Prelim. Design.pdf; Re: 317 Chain Hills Road

For the file.

From: Jessica Thompson <thompjessica@gmail.com>
Sent: Tuesday, 12 July 2022 9:34 am
To: Liz Hislop <liz.hislop@beca.com>
Subject: 317 Chain Hills Road Update

Morning Liz,

I hope this email finds you well, we have been slowly chipping away at getting the additional documentation to present to you and as you can probably appreciate we have had to wait significantly for some expert advice due to the nature of the industry. It seems now that the residential house market has slowed down, people are able to now pick up our work. Anyway I have attached the following for you to review:

Guidance from FENZ re alternative water supply for fire fighting purposes
Fire Sprinkler System Specs -attached in this email
Soil Contamination Report -attached in this email | 1. Refer Note below
Prelim Design for access to utilities - attached in this email
Confirmation email from Delta confirming access to utilities - attached in this email
Prelim drawings from our architect
Update Biodiversity plan from Ahika Consultancy | 2. Refer Note below
Prelim Geotech Report from Geosolve

We are still waiting on the following to come in:
Landscape Architect for around the house
Property entrance photos and driveway excavation plan
Affected party approvals
Confirmation from ORC re storm water & waste water treatment.

I will need to send the attached documents in two emails and possibly use a zipped file for our prelim plans from our architect.

We do hope we can get the rest of the documentation to you by the end of the month and get some momentum on building our dream home and raising our kids in a more sustainable lifestyle,

Kind regards
Jessica Thompson

DCC File Note.

1. HAIL search request processed as HAIL-2022-73. No evidence of HAIL activity identified in Council records.
2. The drawings and plant referred to were both superseded by later documents submitted to Council.

Firefighting Water Supplies

Dunedin City Council Area

April 2019 v1.1

Executive Summary

This document is intended to aid builders, developers, and homeowners in meeting conditions of consent regarding water storage for domestic firefighting purposes within the Dunedin City Council (DCC) territorial district. The document is a guide only and must be read in conjunction with the New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ PAS 4509:2008).

Water for firefighting purposes is usually provided by fire hydrants installed within a reticulated potable water supply. Where this is not available, an alternative water supply for firefighting is to be provided by the homeowner, containing the following:

- A tank or pond set aside specifically for the supply of firefighting water must contain a minimum storage capacity of 45,000 litres
- The tank or pond is located within 90 metres but no closer than six metres to the structure being protected
- Suitable access to the water within the pond or tank is provided i.e. couplings, hatches, suction hose placement
- Suitable fire appliance access to the pond or tank to establish the supply of water to a fire is assured
- Suitable hard standing for a fire appliance to be parked prior to commencement of firefighting activities is constructed

It is recommended that advice be sought from Fire and Emergency New Zealand (FENZ) prior to the construction of the necessary infrastructure. Where existing assets are provided, FENZ can also advise on any necessary amendments required to meet the provisions of SNZ PAS 4509:2008.

Provision of Water Supplies for Firefighting

Many councils in consultation with FENZ now require land or building owners to provide a water supply for firefighting purposes for a new dwelling not covered by a reticulated water supply. In this case, rural properties being developed within the DCC area require water supplies in line with the Second-Generation District Plan (2GP). Having access to sufficient quantities of water in the early stages of fire may have a significant effect on the outcome of firefighting activities, however compliance with SNZ PAS 4509:2008 does not guarantee that in each and every case FENZ staff can control or extinguish a fire with the water supply available.

Dunedin City Council – 2GP Rule 9.3.3

Paragraph 2 of Section 9.3.3 of the 2GP outlines the criteria for firefighting water supplies:

1) *Subdivision activities must ensure resultant sites have access to sufficient water supplies for firefighting consistent with the SNZ/PAS:4509:2008 New Zealand Fire Service firefighting water supplies code of practice, except sites created and used solely for the following purposes are exempt from firefighting requirements:*
    a) *reserve;*
    b) *Scheduled ASBV or QEII covenant;*
    c) *access;*
    d) *network utilities; or*
    e) *road.*
2) *New residential buildings must either:*
    a) *connect to the public water supply (where it is provided); or*
    b) *provide an area of minimum dimensions of 4.5m x 11m with suitable fire engine access, water storage of 45,000 litres (45m^3) or equivalent firefighting capacity, and have the water supply located within 90m of the fire risk or otherwise provide for water supply and access to water supplies for firefighting purposes consistent with the SNZ/PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice.*
3) *Activities that contravene this performance standard are restricted discretionary activities.*

Public Water Supplies

Where a residential building can connect to a public water supply, firefighting water will be provided to the homeowner through the same supply for the purposes of firefighting in line with the provisions of SNZ PAS 4509:2008.

Alternative Water Supplies for Firefighting

Where the above provision is not available, an alternative firefighting water supply must be provided by the homeowner.

A suitable means of complying with the requirements of the 2GP relating to an alternative supply of water for firefighting include, but are not limited to, the following options.

Home Sprinkler Systems

Firefighters take longer to reach rural locations by virtue of travel distance. With a home sprinkler system installed, fire damage will be reduced significantly through early suppression of the fire.

Sprinkler systems are designed to suppress fire after sensing an increase in temperature above a certain trigger point, providing water directly to a seat of fire in the vicinity of the sprinkler.

A sprinkler-controlled fire will typically use between 340 and 720 litres of water; therefore, the required firefighting water supplies volume based on SNZ PAS 4509:2008 is significantly less. Based on an average sized home, a dedicated firefighting water supply volume of 7,000 litres is sufficient for the operation of a home sprinkler system.

It is the best form of protection for your property and Fire and Emergency New Zealand strongly recommend the installation of home sprinklers in rural houses.

Further information is available through NZS4517:2010 - Fire Sprinkler Systems for Houses.

Water Storage Tanks

An uncontrolled fire doubles in size every 30 seconds. While the timely arrival of firefighting crews will begin to reduce the effect of the fire, approximately 30 minutes of active firefighting activities will be required after the arrival of firefighting staff to subdue the fire sufficiently to prevent further fire damage. A significant amount of water is required to:

- protect firefighters entering a structure to account for any missing persons
- protect nearby exposures from the effects of the fire, or
- directly undertake firefighting activities in or around the structure.

Without a home sprinkler installation, sufficient water to allow any or all of the above criteria to be satisfied must be provided by the homeowner. SNZ PAS 4509:2008 defines a residential house without sprinklers in a non-reticulated area as requiring 45,000 litres of dedicated firefighting water.

Consideration must be given to the effects of radiant heat when siting the tank, particularly if plastic tanks are used. Ideally, the stored water is to be accessible to attending fire crews along the path of travel between the entrance to the property and the structure being protected.

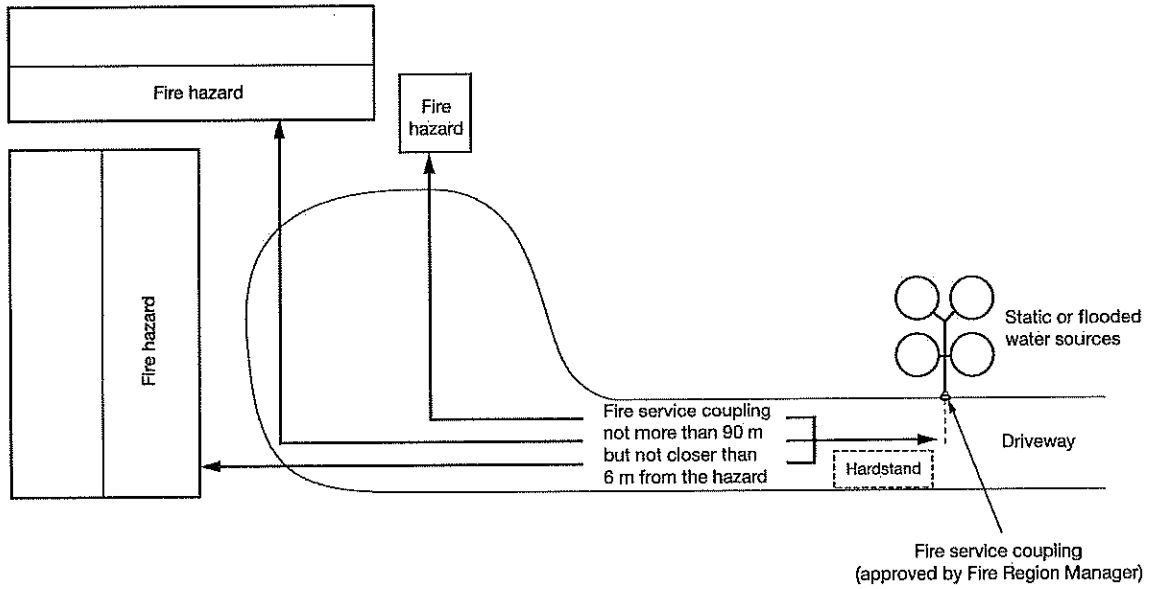


Figure 1: Tank location example (Figure B4 of SNZ4509:2008)

Ground Level Tanks

Ground level tanks (fitted with a coupling approved by the Fire Region Manager) are often the most common type of water storage. An example of a suction coupling outlet is included below.

Hard standing must be provided to ensure that the pump inlet of the attending firefighting appliance is no more than five metres from the coupling of the water source. The coupling must also be no closer than six metres to, and no further than 90 metres from, the structure being protected.

The tank or tanks are to be arranged so that no less than 45,000 litres of water can be made available when required.

Open Water Sources

Where applicable, an open water source such as a pond, stream or pool may be considered as an alternative firefighting water supply. These may either have a fixed suction pick up fitted with an approved coupling or allow direct access for suction hose.

The coupling or direct access must be no closer than six metres to, and no further than 90 metres from, the structure being protected, and hard standing must be provided to ensure that the pump inlet of the attending firefighting appliance is no more than five metres from the coupling or direct access.

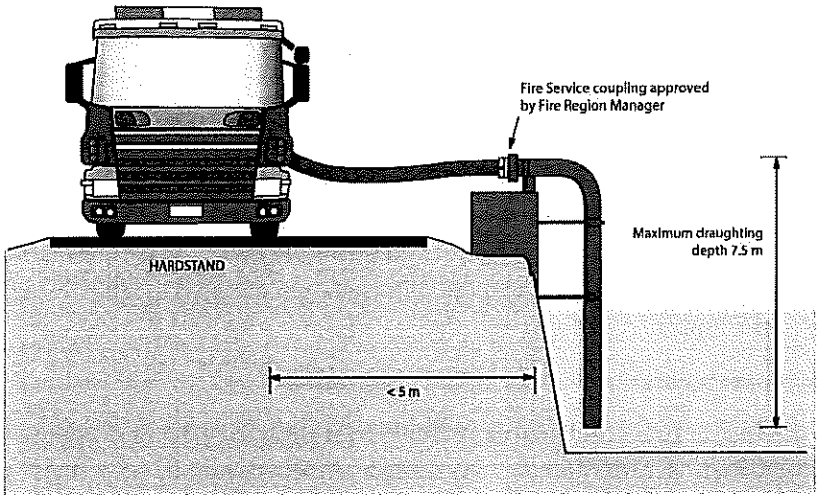


Figure 4: Open water source through fixed suction pick up (App B2 of SNZ4509:2008)

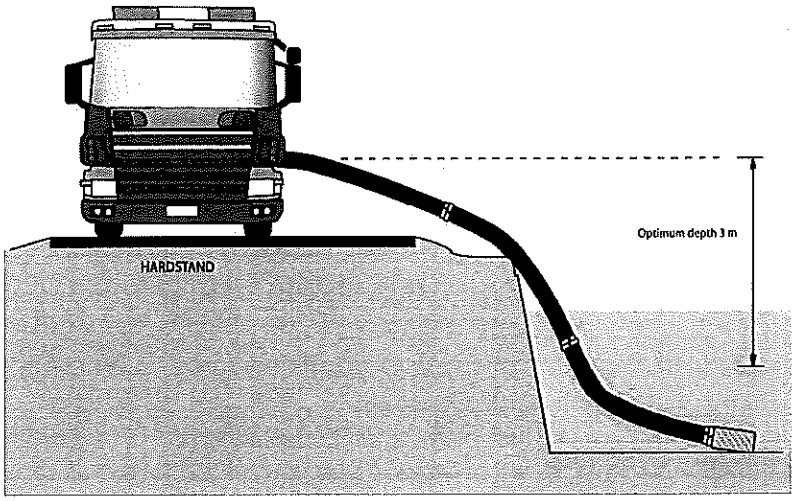


Figure 5: Open water source through suction hose (App B3 of SNZ4509:2008)

The coupling or hatch must be no closer than six metres to, and no further than 90 metres from, the structure being protected, and hard standing must be provided to ensure that the pump inlet of the attending firefighting appliance is no more than five metres from the coupling or hatch.

Where the tank is partially buried, and access is via a hatch, the hatch may be no higher than one metre above the ground level. The tank/tanks are to be arranged so that no less than 45 000 litres is available at all times.

Other Considerations

Landscaping and future development

Any future development on the section needs to be considered in terms of accessing the firefighting water supply. Items like fences, gates, garden beds, plants and peripheral structures such as garages or garden sheds can often be established to the detriment of accessing the water supply. Tree growth over time can also restrict the access to the hard-standing area that was once freely available.

Vehicle Access

Firefighting appliances require a corridor four metres high and four metres wide along a surface capable of withstanding a load of twenty tonnes. When positioned on the hard-standing area, there will also need to be sufficient space around the appliance to conduct firefighting activities.

In any situation where it is impractical to reach the location of a water source with a firefighting appliance, a buried pipe leading from the tank to an approved coupling adjacent to the hard stand area is recommended.

Visibility

Tanks, couplings and/or water access points need to be visible to attending firefighting crews. The use of signs, marker posts, or other suitable identifiers are encouraged to aid in expediting access to the firefighting water supply.

Shared Firefighting Water Supplies

Shared water supplies for firefighting purposes that cover several adjacent residential properties may also be constructed. In order to meet the criteria of the relevant building consent the continuity of the water supply, the volume of storage and permanent access to the source must be consented to by all parties. The maximum distance of 90 metres from the hard-standing area to all houses covered by the firefighting water supply will also mean a centrally placed location is required.

Agreement to maintain the firefighting water supply and any relevant cost sharing exercise pertaining to the source must also be taken into consideration. Legal arrangements for easements to access firefighting water supplies is highly recommended for shared water supplies held on privately owned land.

Reduced volumes of firefighting water

It is considered *highly undesirable* to hold less than 45,000 litres of firefighting water on site where an alternative firefighting water supply is required.

An existing firefighting water supply falling below the required volume will most likely need to be augmented to meet the required volume of firefighting water, depending on the assessment of available information, building consent review and/or any on-site investigations.

In exceptional circumstances a FENZ Region Manager may consider and accept an application for a smaller volume of firefighting water to be held, as assessed on a case-by-case basis.

How to get assistance

While specific queries relating to building consents should be directed to the resource management staff at the Dunedin City Council in the first instance, FENZ staff remain accessible to anyone requiring guidance or advice on any aspect of firefighting water supplies in line with 2GP Rule 9.3.3.

A visit to the site and a check against the requirements of SNZ PAS 4509:2008 can also be arranged where applicable.

FENZ staff can be contacted through the East Otago Area Office.

85 Castle Street
PO Box 341
Dunedin

(03) 467 7551

BLAZE STOP

A DISCREET FIRE SPRINKLER SYSTEM FOR RURAL HOMES

The BLAZESTOP home fire sprinkler system saves time in the event of a fire while limiting water damage - and with LEAP taking care of compliance and design, it's an easy choice for rural homes.

When designing homes on rural sites it's important to consider fire protection. In order to meet NZBC requirements, homes located beyond fire brigade call-out services must either have a minimum of 45,000L dedicated water supply on site or a sprinkler system installed in the home.

While a large water supply may seem the less intrusive option, this does mean losing space on the property to extra water tanks. In the case of a fire, this option also leaves residents waiting for the fire service to arrive and connect to that water supply in order to put out the fire. A wait of just ten minutes could result in harm to residents and extensive damage to property.

The BLAZESTOP home fire sprinkler system from LEAP is a simple and effective alternative. Meeting NZS: 4517: 2010 Fire sprinkler systems for houses, the BLAZESTOP home fire sprinkler system is activated by heat — providing a rapid response to household fires. The system can run off either a pump and tank or main water supply — eliminating the need for an additional water supply.

SAVES TIME

The automatic activation of BLAZESTOP saves crucial time in the event of a fire — a key benefit for properties in remote areas which can save lives and property.

MINIMISES WATER DAMAGE

With heat sensors identifying the location of the fire, only the sprinkler in the affected area is activated. This minimises water damage in the building and reduces the amount of water used to put out the fire.

DISCREET DESIGN

The BLAZESTOP system features concealed sprinklers with discreet 60mm cover plates — some of the smallest on the market. With white, black and chrome options available, the system can be subtly incorporated into any design. Sidewall and pendent sprinklers are also available as required.

DESIGN AND COMPLIANCE SERVICE

LEAP provides time savings for architects through their expert design service. The team at LEAP enjoy working on challenging projects and designing to the requirements of each particular home. They also remove the hassle of compliance by providing architects with a full design calculation and the documentation needed for building consent.

ACCURATE SUPPLY AND SIMPLE INSTALLATION

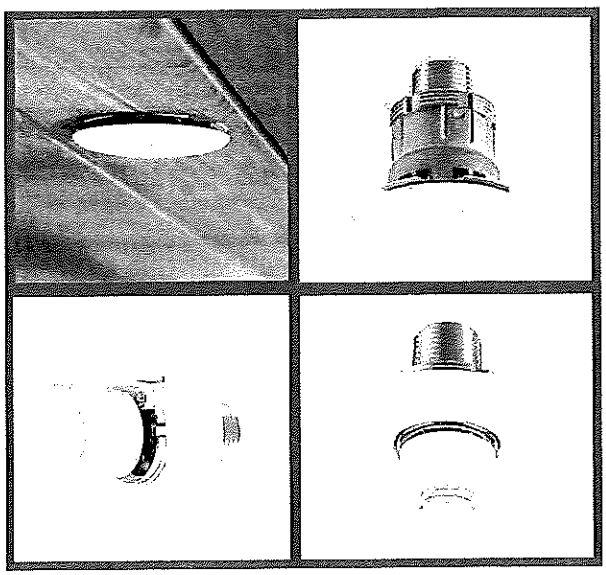
LEAP makes installation simple by supplying their system in labelled kits with drawings and detailed info for installers. By supplying the full system rather than parts, LEAP also ensures an accurate custom-designed system.

KEY FEATURES

- Unobtrusive and discreet with hidden piping — sprinkler heads may be concealed or exposed depending on design
- Links to normal domestic water supply with no special piping or separate supply needed
- Can be installed by any registered plumber trained in the system
- Affordable for both existing and new homes
- Flexible piping prevents sound transmission, makes installation easier — even in existing homes
- Pipework is made from either polybutylene or cross linked polyethylene which are not effected by scaling, corrosion or microbiological growth
- Three to five minutes is all it takes for BlazeStop to contain and control most fires, giving occupants time to escape and minimising fire and water damage
- Each sprinkler works independently and activates only where it detects a fire, leaving the rest of the house safe and dry
- 25 year guarantee

SCOPE OF USE

- Residential applications — existing or new builds
- Ideal for houses — urban or rural areas
- BlazeStop can cater for any sized residential home — the pump size may differ from a small 2 bedroom single level home to a 6 bedroom multilevel home with a buried water supply tank
- Sprinkler pipework is generally concealed in the roof space. Occasionally pipework or sprinklers maybe exposed due to design restrictions
- If the sprinkler is charged by a pump/tank, the pump would be located near the tank in a weatherproof enclosure or shed
- If the sprinkler is charged by a pump/tank, then power is required for the pump
- Pipework and sprinklers are mounted in the roof space. The 'cover plates' are installed from inside the room – fixed to the sprinklers at the ceiling



- BlazeStop sprinklers are automatic — activated by heat
- The sprinkler system is designed to include a WC which is an instant red flag that there's a problem with the water supply if the toilet won't flush

Limitations on Use

- Residential use only
- Registered Plumber trained in BlazeStop Fire Sprinkler System installation

PERFORMANCE

Statement of Building Code Compliance

- Leap BlazeStop Systems are designed to meet NZS 4517:2010 Fire Sprinkler Systems for houses and comply with New Zealand Building Code (NZBC) Clause G12 water supplies and acceptable solution C/AS1

In-Service History

- Leap BlazeStop Fire Sprinkler Systems have been designed, supplied and installed in New Zealand homes since 2004 — from existing Historical homes to modern new builds

Other Performance Attributes

- 25 year guarantee
- The sprinkler system is designed to include a WC which is an instant red flag that there's a problem with the water supply if the toilet won't flush

FOR MORE INFORMATION ABOUT BLAZESTOP CALL:

0800 246 810

LEAP Australasia Ltd • 61 Port Road, PO Box 38-159, Lower Hutt 5045, New Zealand • t: + 64 4 568 9424 • f: + 64 4 568 9423 • www.leapltd.co.nz

LEAP

APPLICATION REQUEST HAIL/SOIL CONTAMINATION SEARCH

Only information held on Council files will be supplied. This is not a comprehensive history of the site as Council files may not be complete. Interpretation of the information is the responsibility of the applicant.

Please provide a marked up aerial photo with your request.

X I can confirm an aerial photo has been attached.

Applicant details

Full Name: Jessica Thompson and Joe Taylor

Mailing Address: 32 Paterson Road, Mosgiel Postcode: 9024

Telephone (Day): 0211225976 Mobile: 0211225976

Email: Thompjessica@gmail.com

Property details

Address: 317 Chain Hills Road, Chain Hills

Legal Description: Lot 2 DP 23164

Method of delivery

Mail out Pick up x Email

Fee

Industrial/Commercial X Rural/Residential

Are there any applications associated with this search?

X Yes, Number: LUC-2021-619 No

Applicant Signature and Date

Signature *(Fill & Sign)*: J Thompson Date: 19/04/2022

City Planning Staff can be contacted as follows:

In Writing: Dunedin City Council, PO Box 5045, Dunedin 9054

In Person: Customer Service Centre, Ground Floor, Civic Centre, 50 The Octagon, Dunedin

By Phone: (03) 477 4000

By Email: planning@dcc.govt.nz

There is also information on our website at *www.dunedin.govt.nz*.

OFFICE USE ONLY

Application Number:

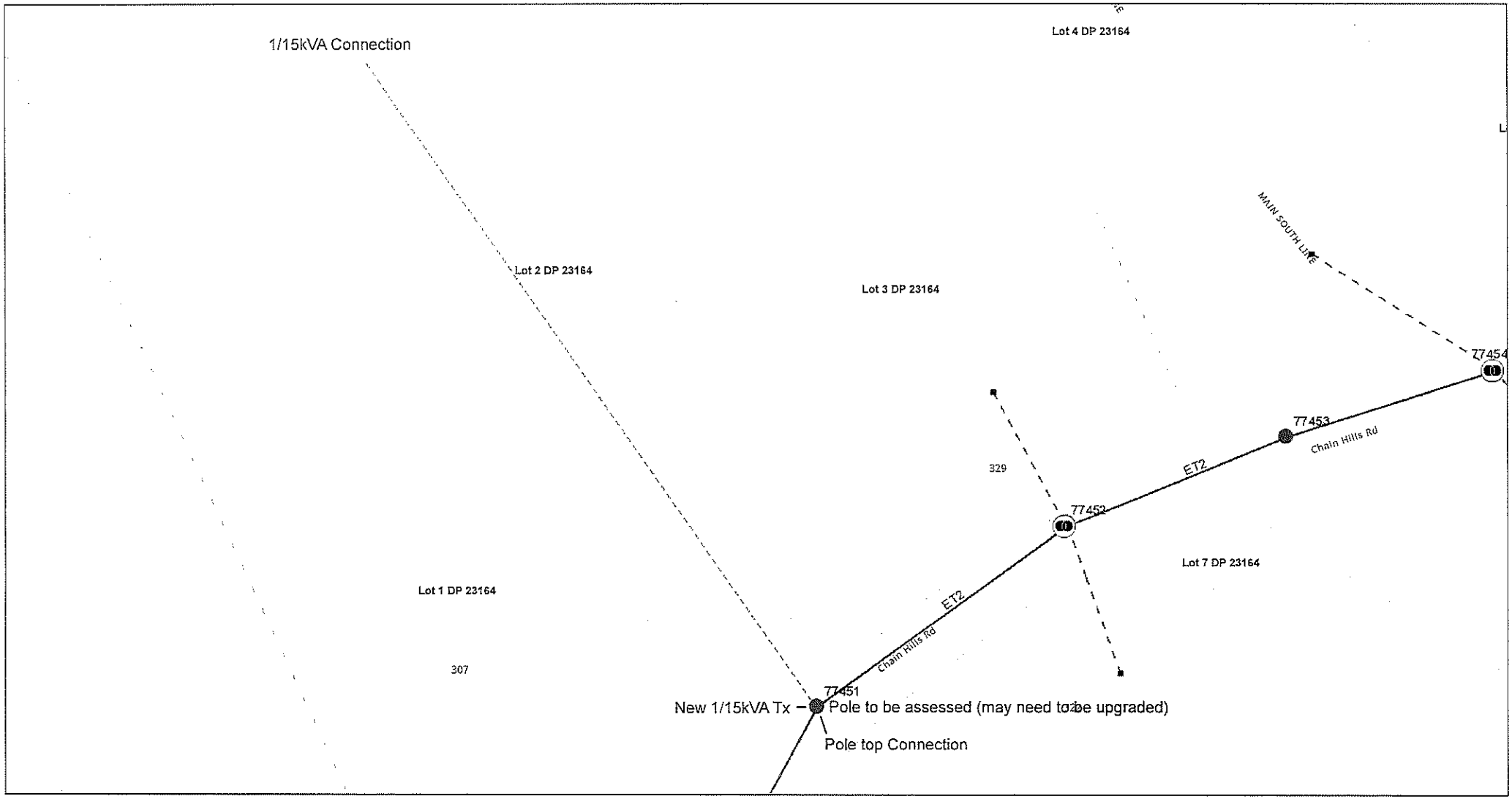
Planner:

Due Date: Completed Date:

Information scanned into Pātaka? Yes No

Once search is completed, give this completed form and Pathway coversheet to a planning administrator for auditing.

317 Chain Hills Road



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LINZ Properties

Fibre Sub Ducts

Fibre Ducts

Underground Fibre

Fibre Overhead CommunicationCable

Fibre Communication Cable

Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors., Aurora Energy Ltd

Kerry Hamilton

From: Jessica Thompson <thompjessica@gmail.com>
Sent: Tuesday, 28 June 2022 11:57 a.m.
To: Stefan Ducrot
Subject: Re: 317 Chain Hills Road

Hi Stefan

Yes we are still planning to build a dwelling at 317 Chain Hills road which is why we initially requested the plan. Once we have confirmation of the plan etc we can add it to our proposal submission to council, who had asked us to check power was available for a our dwelling, along with a whole list of other things, before approving our proposal. No dramas re delay, as you can imagine there has be multiple delays with the other documentation required as well. Thankyou for the time you have put into our request to date. Do you have a copy of the plan etc or confirmation of the required work that we can include in our proposal to council for them to tick their box?

Regards
Jess

Sent from my iPhone

> On 28/06/2022, at 11:49 AM, Stefan Ducrot <Stefan.Ducrot@thinkdelta.co.nz> wrote:
>
> Hi Jessica,
>
> We have finally confirmed a plan for this installation if it is still required?
>
> I do extend my apologies as this has taken far too long.
>
> Let me know if you wish to progress,
>
> Thanks,

DELTA
THINK.INFRASTRUCTURE

STEFAN DUCROT
PROJECT MANAGER

stefan.ducrot@thinkdelta.co.nz
DDI +64 (21) 225 8576
MOB +64 (21) 225 8576

WEB THINKDELTA.CO.NZ

GeoSolve Ref: 210885
22 November 2021

Jessica Thompson and Joe Taylor
32 Paterson Road
Wingatui
Dunedin

Preliminary Geotechnical Assessment
317 Chain Hills Road, Dunedin

Dear Jessica and Joe,

Introduction

In accordance with our Agreement dated 15 November 2021 we have undertaken a preliminary pre-purchase geotechnical assessment at the above property, to evaluate a proposed building platform. Our investigation has comprised a site inspection and desktop review of existing information.

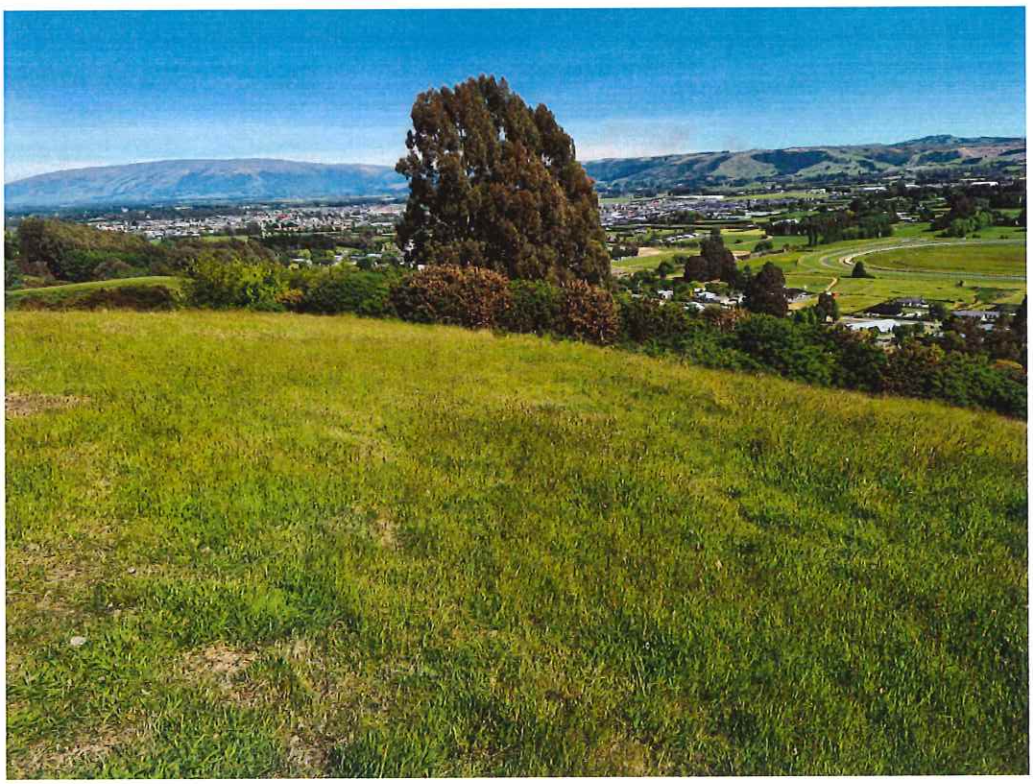


Photo 1 - Proposed Building Platform, 317 Chain Hills Road

We have reviewed the documentation supplied and we note that you are currently at the pre-purchase stage, with a view to residential development of 317 Chan Hills Road. Part of this process involves a Resource Consent application to Dunedin City Council seeking approval to construct a dwelling on the approximately 6.2 ha site. We understand that Council require geotechnical review of the site, focusing on the preferred building platform to ensure there are no issues with ground stability, given the presence of a nearby mapped landslide. We have carried out an engineering geological appraisal of the proposed building platform with respect to the nearby mapped landslide. No subsurface investigations have been carried out at this stage.

Site Description and Proposed Development

The site is located on the north-western flanks of the Chain Hills, immediately upslope of Wingatui (see Fig 1). Access is via Chain Hills Road along a ridge that provides easy access to the proposed building platform. The site is currently a mixture of pasture, various trees and scrub with no structures currently on site.

The proposed building platform is shown in Figure 1 and we note that this occupies slopes of approximately 17 degrees. We understand that the dwelling would be a split-level structure with relatively minor cuts and fills contained by foundation walls, although no specific plans are currently available. On-site wastewater disposal is proposed, and water supply would be via collection to tanks. Access would be via a gently to moderately sloping ridge crest from Chain Hills Road.

We understand that the dwelling will be set back by at least 15 m from a recognised likely prehistoric landslide feature (see below).

Figure 1 – site location with proposed building platform and site contours

Slope Stability Considerations

The site partly contains a large landslide feature which also extends onto at least 3 neighbouring sites, as shown on Figure 2. We have reviewed available Council Hazard mapping and published geological mapping.

Figure 2 – site location with proposed building platform and landslide feature.

The main geotechnical consideration at this site relates to mapped landslide. There is some variability in hazard mapping interpretations as described below:

Dunedin City Council: The DCC 2GP land instability hazard designation for Dunedin shows that no land instability hazard overlay zones are applicable to the site.

Otago Regional Council: The ORC hazard mapping is however based on more recent stereoscopic aerial photographic mapping carried out by GNS Science (GNS Science Consultancy Report 2007/41, July 2017). This updates earlier 2014 mapping which showed a less extensive landslide at this general location.

It is important to note that many of the mapped landslides around the Dunedin area are ancient features upon which residential development has already successfully taken place for many decades. They do not necessarily imply active landsliding (where damage to

structures or land is possible). However, some are active or partially active and the hazard mapping provide a useful basis for identifying where geotechnical issues may apply. For example, areas of ancient debris can be more prone to reactivation (e.g. smaller lobes of landslide activity can develop). Spring flows or softening of soils can also be present and this can sometimes promote localised reactivation. Consequently, areas that are mapped as landslide would generally have a greater sensitivity to future movement. Areas near mapped landslides should also be assessed to determine whether similar subsurface and topographical conditions prevail in terms of potential adjacent risk considerations.

In this case the GNS Science mapping indicates that the subject landslide is *"likely"* in terms of certainty and of *"probably prehistoric initiation"*, with the last movement and activity status both noted as *"unknown"*. This suggests that the feature is unlikely to be highly active. The feature is large and likely to be a translational bedrock slide.

The area may however be more sensitive to destabilising influences and a *medium sensitivity* is assigned by GNS Science. This generally means *"potential geomorphic modifiers are present, such as one or more of: stream channel or valley along slide toe; indications of seepage or swampy ground on the slide or at the slide margins; streams or gullies draining into the slide head; presence of steep or very steep slopes; human modifications including material added at the slide head, material removed at slide toe, or water storage (open or enclosed) on or adjacent to the slide area."*

Published geological mapping (Benson map, 1968, McKellar 1990) indicates that the area is underlain by basement schist rock (below overburden soils). This rock type can be susceptible to deep-seated failures along foliation shears etc. No outcrop was observed on site, however, the available mapping shows that foliation generally dips to the south within the Chain Hills area, and this would be favourable with respect to any potential for foliation shearing at the proposed building platform.

The landslide appears to have been promoted by movement in a north-easterly direction towards a major valley that coincides with the portal of the Chain Hills Rail tunnel. The undisturbed slopes towards the valley axis are approximately 25-30 degrees. Consequently, it is likely that slope angle is the fundamental trigger for slope instability in this area, potentially promoted by prehistorical valley erosion at the toe.

However, at the location of the proposed building platform is on a distinctive ridgeline where slopes are much less, i.e. approximately 17 degrees and the overall ridge slope to Wingatui is approximately 14 degrees, with no current alluvial erosion at the toe of the slope.

Our engineering geological assessment indicated that the landslide morphology is highly subdued and there were no tension cracks or scarplets that are typically associated with active landsliding. In addition, relatively mature trees within the landslide extents have straight growth patterns and fences that cross the landslide are undeformed. No spring flows or highly saturated soils were encountered during our assessment, including within the landslide extents. We note that the toe of the landslide coincides with the NW portal of the active Wingatui Railway tunnel which is not adversely affected by landslide activity as far as we are aware.

The medium sensitivity assigned to the landslide by GNS Science is likely to be a result of the stream channel, a minor farm pond on neighbouring land and possibly the railway tunnel, however we note that the site appears to have been stable for many decades and we note that the current owner reports no evidence of movement during their ownership since 1993.

The soils on site are not likely to be susceptible to liquefaction and we note that the area is mapped as Domain A with respect to liquefaction hazard (i.e. ground predominantly underlain by rock or firm sediments).

No active faults are mapped on the property, however the Titri Fault is mapped at Wingatui, some 350 m north of the site.

Conclusions and Recommendations

Based on our desktop review and site inspection by an engineering geologist, we consider that the location of the proposed building platform on a subdued moderately-sloping ridge is likely to present a low risk of landslide activity. The site is likely to be underlain by schist rock and we note that the dwelling would be set back by 15 m from the lateral scarp and headscarp of the ancient landslide that shows no evidence of current activity.

We recommend that subsurface test pitting investigations are carried out to determine the full ground model and to support detailed design of the dwelling, when plans become available. Some specific recommendations may be prescribed following this investigation.

However, in general, construction on slopes greater than 15 degrees, such as apply at this site, should be carried out with additional standard precautions, including best practice disposal of stormwater and wastewater, cut-off drains, sufficient connection of foundations to competent soils/rock, and engineering design or overview of any earthworks and retaining walls.

We recommend that the setback from the ancient landslide should be confirmed following these investigations, however the current proposal of 15 m appers likely to be suitable.

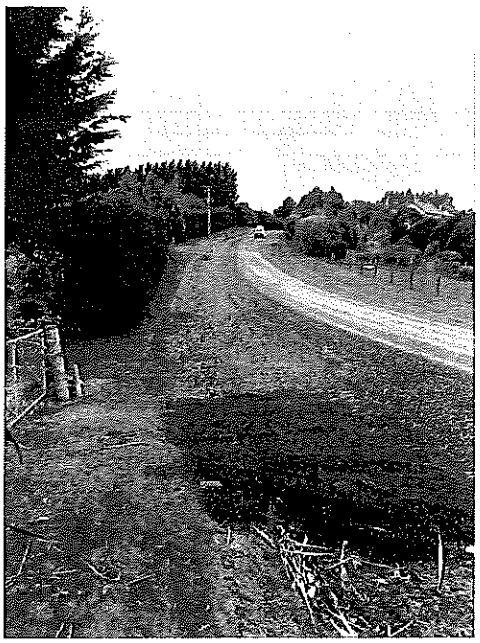
Provided that the recommendations of this report are followed, we consider that the proposed site is generally suitable for residential land use and that the development can be carried out without exacerbating instability on the site or any neighbouring site.

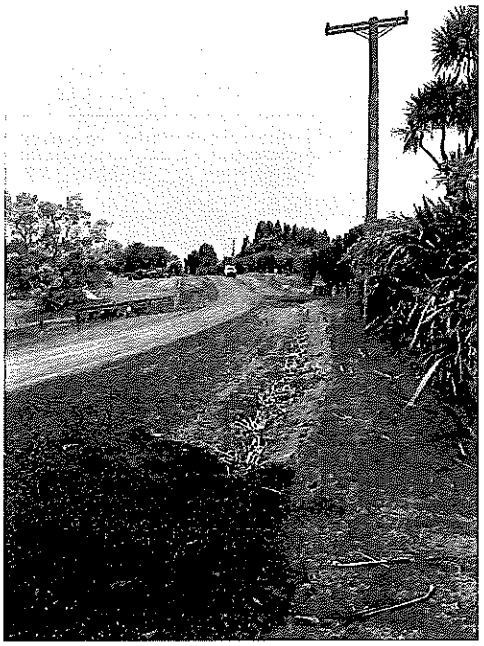
Applicability

This report has been prepared for the sole use of our client, Jessica Thompson and Joe Taylor, with respect to the particular brief and on the terms and conditions agreed with our client. It may not be used or relied on (in whole or part) by anyone else, or for any other purpose or in any other contexts, without our prior review and written agreement.

Yours faithfully,

Mark Walrond
Senior Engineering Geologist
GeoSolve Limited





Vehicle Access Plan – 317 Chain Hills Road

Kerry Hamilton

From: Liz Hislop <Liz.Hislop@beca.com>
Sent: Friday, 17 February 2023 04:44 p.m.
To: Campbell Thomson
Cc: Laura Mulder
Subject: FW: 317 Chain Hills rd driveway
Attachments: images (2).zip

From: AllPlumb Korere Wai <allplumbkorerewai@gmail.com>
Sent: Sunday, 28 August 2022 9:21 pm
To: Liz Hislop <Liz.Hislop@beca.com>
Subject: Fwd: 317 Chain Hills rd driveway

Hi Liz

Please find the attached images for the proposed driveway at 317 Paterson road along with an email outlining the proposed method of construction. This will be constructed with the required width at the entrance to comply with the speed of the road.

Regards
Joe Taylor

All Plumb Korere Wai Ltd
Plumbing Services
Mob. 021 587 521
Email. allplumbkorerewai@gmail.com

---------- Forwarded message ---------
From: **Rotadig Excavation Dunedin** <cam@rotadigexcavation.com>
Date: Mon, 15 Aug 2022 at 06:41
Subject: 317 Chain Hills rd driveway
To: AllPlumb Korere Wai <allplumbkorerewai@gmail.com>

In relation to the new driveway ay 317 Chain Hills rd, I propose to excavate topsoil to stockpile to be used as cover on batters etc, excavate the drive down to clay subgrade 4.5 metres wide allowing for appropriate water tables and culverts to be installed.
The road will then be built up from subgrade using Saddle Hill Quarries AP100 at 200mm layer, AP65 at 150mm layer and then capped with AP20.
The aggregate on driveway will be 3 metres wide.
Filter fabric and draincoil will be used in areas that may be damp.

--
Kind regards

Cameron Sim

ROTADIG EXCAVATION DUNEDIN
021 129 0957

Vehicle Access Design and Location for 317 Chain Hills Road

SECOND GENERATION DISTRICT PLAN

DUNEDIN CITY COUNCIL | kaunihera ā-rohe o ōtepoti

6.6.2.4 Lighting of loading areas

a. Loading areas, including associated access and manoeuvring areas, that are used at night must be illuminated to a minimum maintained level of 2 lux, with high uniformity, during the hours of operation.

b. Activities that contravene this performance standard are restricted discretionary activities.

6.6.2.5 Access to loading areas

a. Required vehicle loading spaces must be designed to allow vehicles using the spaces to enter and exit the site without the need to move a vehicle occupying any other parking or vehicle loading space on the site.

b. New vehicle loading areas must not be accessed across a **primary pedestrian street frontage mapped area.**

c. Loading areas that contravene Rule 6.6.2.5.a are restricted discretionary activities.

d. Loading areas that contravene Rule 6.6.2.5.b are non-complying activities.

6.6.3 Vehicle Access Design and Location

6.6.3.1 Maximum number of vehicle crossings

a. The maximum number of vehicle crossings permitted on each road frontage of any site is:

Frontage length		1. Local road and Industrial road	2. Collector road	3. Arterial road (less than 100kmh) and Urban High Density Corridor	4. Strategic road
i.	0m - 18m	1	1	1	1
ii.	>18m - 60m	2	1	1	1
iii.	>60m - 100m	3	2	1	1
iv.	>100m - 200m	3	3	2	1
v.	>200m	3	3	2	2

b. No new vehicle crossings are permitted onto a commercial centre street except for fire stations.

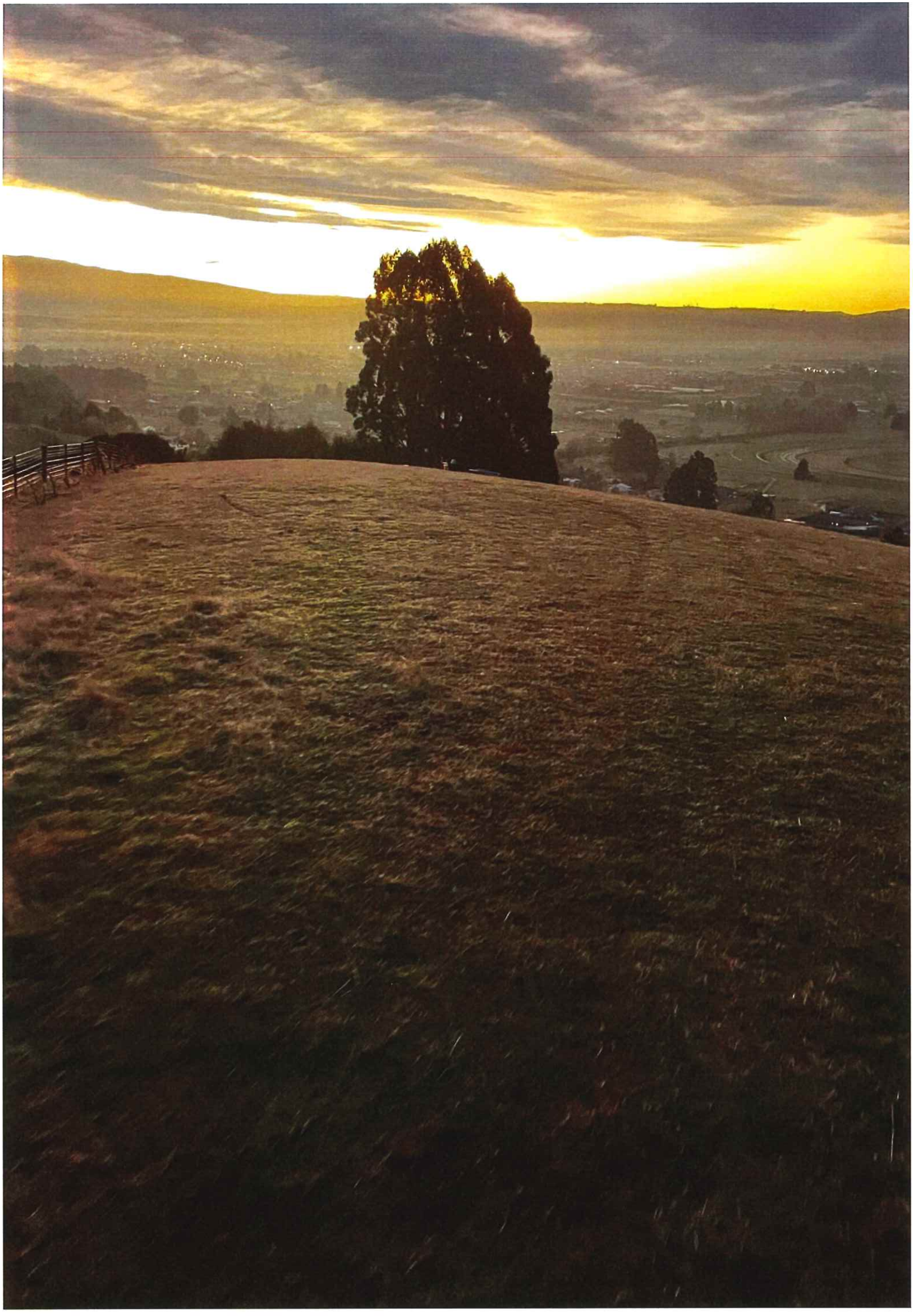
c. For fire stations, the maximum number of vehicle crossings on each road frontage is two for all sites, except where three vehicle crossings are otherwise permitted.

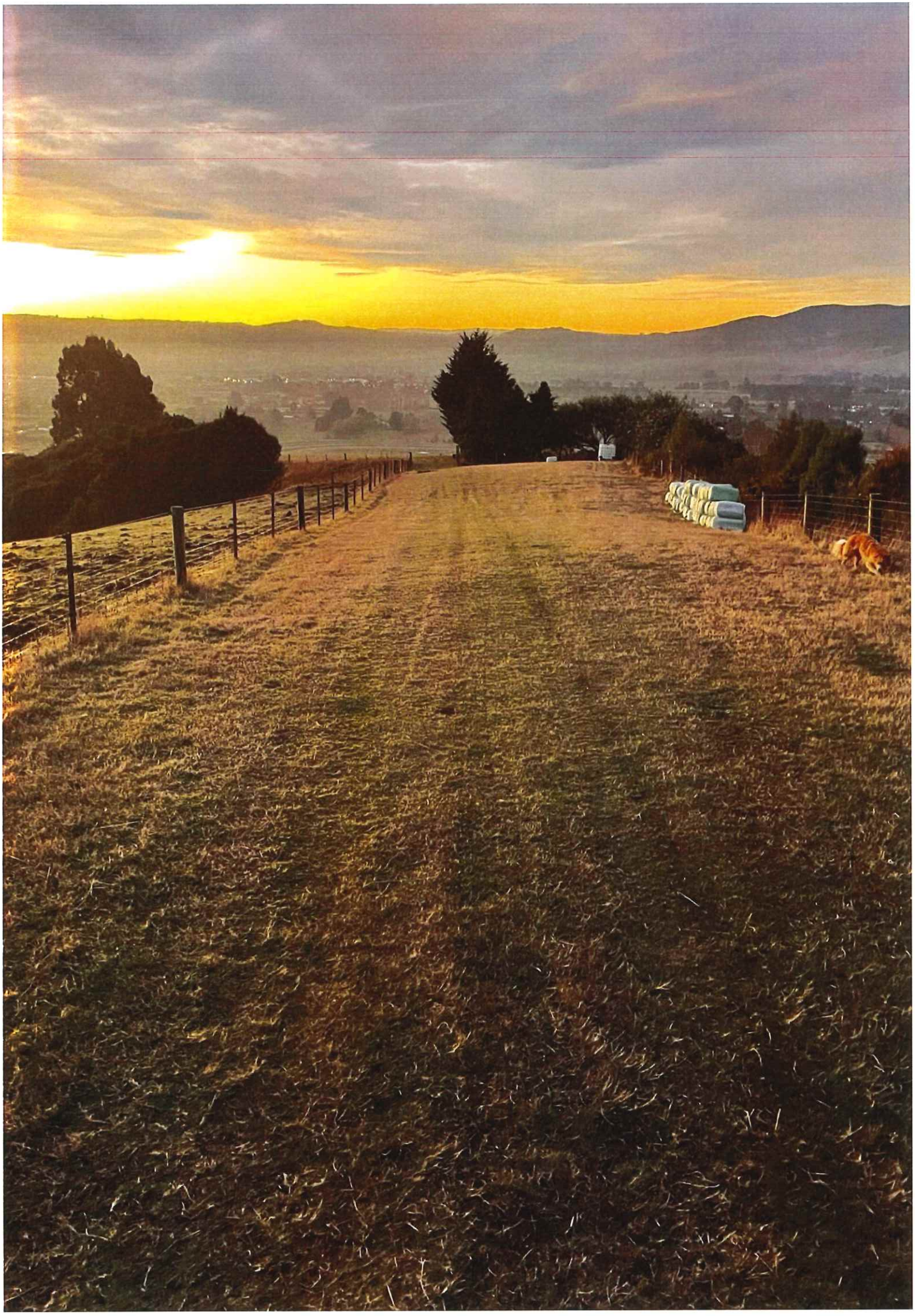
d. Activities that contravene this performance standard are restricted discretionary activities.

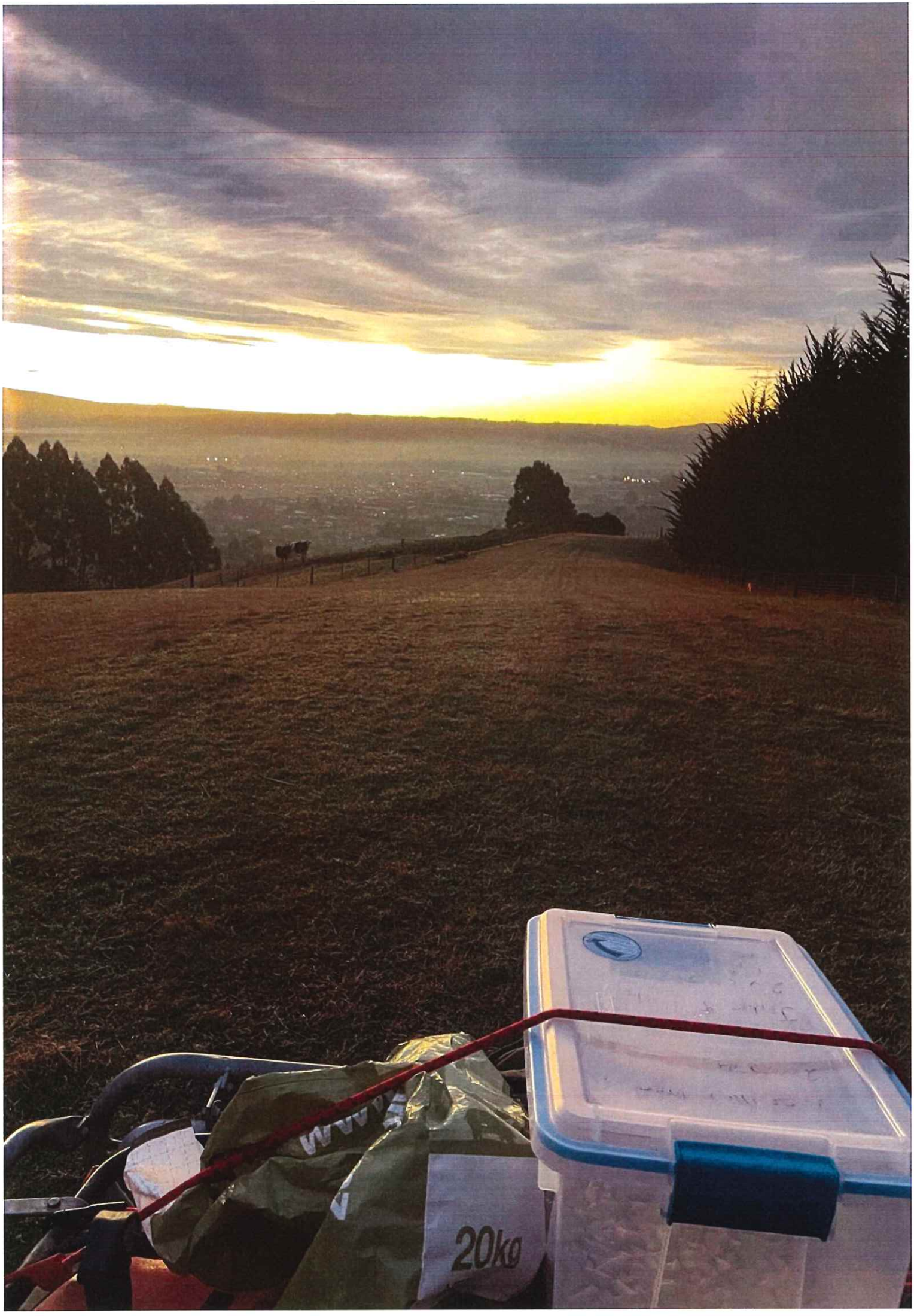
Note 6.6.3.1A - Other relevant District Plan provisions

1. New vehicle crossings are not allowed across **primary pedestrian street frontage mapped areas** (see Rule 18.6.14.2).

As per 6.6.3.1-a.ii. the new vehicle access at 317 Chain Hills road will comply with the maximum number of vehicle crossings permitted on each road frontage of any site >18m-60m for a local road. There will be two vehicle crossings located at 317 Chain Hills road to allow for safe entry and exit. Please note these are marked 1 & 2 on the site plan.






20kg

Campbell Thomson

From: Liz Hislop <Liz.Hislop@beca.com>
Sent: Friday, 17 February 2023 04:45 p.m.
To: Campbell Thomson
Cc: Laura Mulder
Subject: FW: Septic Tank plan for 317 Chain Hills Road
Attachments: Clutha Septic Tank Design Guide[2997943].pdf; Septic 1.jpg; IMG_3522.jpg; IMG_3514.jpg; IMG_3513.jpg; IMG_3512.jpg

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From: AllPlumb Korere Wai <allplumbkorerewai@gmail.com>
Sent: Sunday, 28 August 2022 9:28 pm
To: Liz Hislop <Liz.Hislop@beca.com>
Subject: Septic Tank plan for 317 Chain Hills Road

Hi Liz

Please find the attached septic tank plan for 317 Chain Hills road, we will be using design method 4as outlined in the attached document. The images show where onsite this will be located.

Regards
Joe Taylor

All Plumb Korere Wai Ltd
Plumbing Services
Mob. 021 587 521
Email. allplumbkorerewai@gmail.com

Clutha District Council

Septic Tank Design Guide

For residential septic tanks and disposal fields only. This guide can be used for new systems, for extensions to existing systems and for replacement systems. It is not to be used in unstable or floodable zones.

This is intended as a guide only, but if used correctly will be accepted by Clutha District Council as a means of compliance with the New Zealand Building Code. Council will accept that septic tanks and effluent systems designed using this guide will reasonably comply with AS/NZS 1547:2012 or other guidelines acceptable to Council. Other designs complying with AS/NZS 1547:2012 or ARC TP-58 3rd Edition (with appropriate design information provided) will also be accepted as a means of compliance with the New Zealand Building Code.

A site specific engineers design with producer statements will be required for effluent systems on 4000m^2 or less of usable land area per household unit.

For holding tanks or greywater only systems, please use the greywater disposal and holding tank guide.

Total daily flowrate less than 2000 litres per day	Y	N	Property greater than 4000m^2 usable land area per household unit	Y	N
Ground slope less than 15°	Y	N	System able to be accessed for maintenance	Y	N
Depth to groundwater more than 600mm from bottom of effluent field at all times	Y	N	Disposal field more than 50m from any bore, spring, watercourse, or water body	Y	N
No waste disposal units connected to system	Y	N	No spa pool, swimming pool or stormwater connected	Y	N
Site is not unstable or in flood area	Y	N	Septic tank fitted with solids control filter	Y	N
All parts of system more than 3m from all buildings and 1.5m from all boundaries	Y	N	System clear of 45° line between the bottom of any building foundations and the tank	Y	N
Max length of disposal field 20m for non-dosed systems	Y	N	Disposal field gradient max 1:200	Y	N
Non-dosed disposal field constructed in 2 parts, with alternating use	Y	N	Disposal field width maximum of 2m for single distribution pipe	Y	N
Secondhand tank (if yes, must be certified by an engineer as meeting AS/NZS 1546.1:2008	Y	N	Non-concrete tank (if yes, producer statement will be required from tank installer)	Y	N
Existing septic tank in same position (if yes, tank must be cleaned, checked and have a minimum remaining life of 15 years)	Y	N		Y	N
	Y	N		Y	N

If any of the above conditions cannot be met, then a registered engineer must design the wastewater treatment and effluent disposal system.

I certify that all information I have entered in the guide is correct.

Signed _____ Name: _____ Date _____

Sub-Soil Type Evaluation

This information is for use with this design guide only. The information is a very simplified version of a complex process.

The selection of the sub-soil category is vital for the design of the septic tank and effluent trench. If there is any doubt about the sub-soil category, then use the next highest category for the design. This will give longer trench lengths and will help avoid premature effluent trench failure.

Sub-Soil Category	Sub-Soil Type	Drainage Quality	Guidance Notes
1	Gravels and sands	Rapidly drained	Typically includes sand and fine gravelly soil. Most commonly located along coastal strips and river borders. If rolled in the hand will not stick together. Not ideal for effluent trenches.
2	Sandy loams	Drained well	Mainly sand or fine gravel but containing traces of loam. Will slightly stick together when rolled but will not form a ball. Sand grains can be felt.
3	Loams	Moderately well drained	Generally described as top soil. Feels spongy when squeezed. Will form a thick ribbon 25mm long when squeezed between thumb and finger. May feel greasy. Good farming and gardening soil.
4	Clay Loams	Imperfectly drained	Clayey soils with some top soil mixed. Can be rolled into a ball with a spongy feel. Will form a ribbon 40-50mm long when squeezed between thumb and finger.
5	Light Clays	Poorly drained	Forms a smooth ball that can be rolled into a rod. Will form a ribbon 50-75mm long when squeezed between thumb and finger. Not ideal for effluent trench disposal.
6	Medium to heavy clays		Handles like plasticine. Can be rolled into rods without fracture. Will form a ribbon 75mm long or more when squeezed between thumb and finger. Not suitable for effluent trenches.

Percolation Test

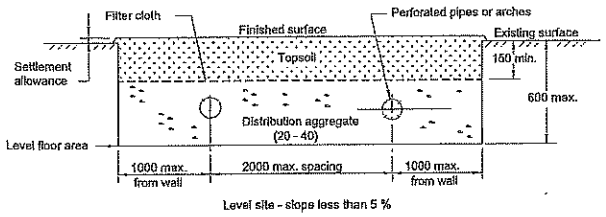
(For assessing suitability of site for sub-surface disposal of septic tank effluent)

1. Several test holes to be spaced over intended absorption area.
2. Holes to be of at least 100mm diameter with vertical sides and dug or bored to depth of proposed trench. Sides should be scratched with a sharp tool to remove any smeared soil surfaces.
3. Hole to be filled with water to ground level. This level to be maintained for at least 4 hours but preferably overnight.
4. Top up level of water to reach original level and then measure the drop in the water level every 30 minutes for 4 hours – refilling if necessary for rapidly draining soil. If soil has good drainage, measurements should be taken at 5 – 10 minute intervals for the first hour.
5. Results to be entered below:

TIME PERIOD (MINS)	HOLE NO.							
	1	2	3	4	5	6	7	8
30 minutes								
1 hours								
1 hour 30 minutes								
2 hours								
3 hours								
3 hours 30 minutes								
4 hours								

Option 1

Conventional bed / trench disposal field designed in accordance with AS/NZS 1547:2012. 100% reserve area must be shown on the plans. Inspection port required in each disposal area.



Design calculations

1	Sub-Soil category (see back page) at depth of disposal field base	
2	Number of bedrooms	
3	Average daily flowrate (from Table A)	litres
4	Minimum septic tank size (from Table A)	litres
5	Design loading rate (from Table B)	
6	Calculate total disposal area size Area = daily flowrate / design loading rate	m^2
7	How many parts of disposal field	
8	Calculate area of each part of disposal field Total area / number of parts = area each field	m^2
9	Disposal field width selected	m
10	Calculate disposal field length L=area/width	m

Example option 1

3 bedroom home in category 2 sub-soil, water from roof only, 1.2m wide trench selected.

1	Sub-soil category	2
2	Number of bedrooms	3
3	Average daily flowrate (from Table A)	900 liters
4	Minimum septic tank size (from Table A)	3000 liters
5	Design loading rate (from Table B)	20
6	Calculate disposal area size Area = daily flowrate / design loading rate	900 / 20 = 45 m^2
7	How many parts of disposal area	2
8	Calculate area of each part of disposal field Total area / number of parts = area each field	45 / 2 = 22.5 m^2
9	Disposal field width selected	1.2 m
10	Calculate disposal field length L=area/width	22.5 / 1.2 = 18.75 m

Option 2

Conventional bed / trench system designed using NZS 4610:1982 with some updating. Suitable for sub-soils with reasonable drainage only. Soakage testing must be carried out, and results given on back page of guide. Installation of additional disposal fields may be needed for satisfactory performance. 100% reserve area must be shown on plans. Inspection port required in disposal area.

Design calculations

1	Minimum soakage per hour from soakage test	Mm/hr
2	Sub-soil category (see back page) at depth of disposal field base	
3	Number of bedrooms	
4	Average daily flowrate (from Table A)	litres
5	Minimum septic tank size (from Table A)	litres
6	Minimum disposal area size (from Table A)	m^2
7	Number of parts of disposal field	
8	Calculate area of each part of disposal field Total area / number of parts = area each field	m^2
9	Disposal field width selected	m
10	Calclulate disposal field length L=area/width	m

Example option 2

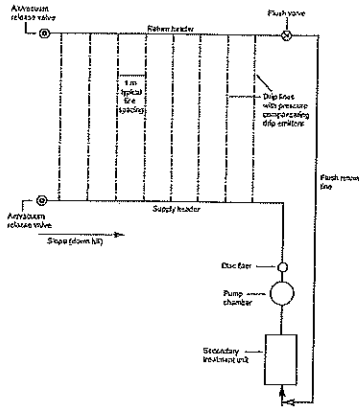
3 bedroom home in category 4 soil, water from water scheme, 2m wide disposal bed selected, in 2 parts

1	Minimum soakage per hour from soakage test	Mm/hr
2	Sub-soil category (see back page) at depth of disposal field base	4
3	Number of bedrooms	3
4	Average daily flowrate (Table A)	1000 litres
5	Minimum septic tank size (from Table A)	3000 litres
6	Minimum disposal area size (table A)	90 m^2
7	Number of parts of disposal field	2
8	Calculate area of each part of disposal field Total area / number of parts = area each field	90 / 2 = 45 m^2
9	Disposal field width selected	2.5 m
10	Calculate disposal field length L=area/width Two disposal fields of 2.5m x 18m needed	45 / 2.5 = 18 m

TABLE A				Option 2		Option 4	
No. of bedrooms	Septic tank capacity	Average Daily Flow Litres Roof water only	Average Daily Flow Litres Water scheme area / bore	Minimum disposal area m^2 Roof water only	Minimum disposal area m^2 Water scheme area / bore	Minimum disposal area m^2 Roof water only	Minimum disposal area m^2 Water scheme area / bore
Up to 3	3000	900	1000	80	90	400	450
4	3500	1200	1300	100	110	540	580
5	4000	1450	1600	125	140	650	720
6	4500	1700	1900	150	165	760	850

Option 3

Secondary treatment system with subsurface drip irrigation. 100% reserve area required. Irrigation area must be increased by 20% for slopes of 10-20%, and increased by 50% for slopes of 20-30%. Unsuitable for slopes of greater than 30%.



Design calculations

1	Sub-soil category (see back page)	
2	Number of bedrooms	
3	Average daily flowrate (from Table A)	
4	Minimum septic tank size (from Table A)	litres
5	Design irrigation rate (from Table B)	
6	Calculate irrigation area Area = daily flowrate / design irrigation rate	m^2
7	Increase area if sloping site to give total area required area x 1.2 if slope is 10-20% area x 1.5 if slope is 20-30%	m
8	Irrigation area length selected	m
9	Irrigation area width selected (Check length x width = total area required)	m

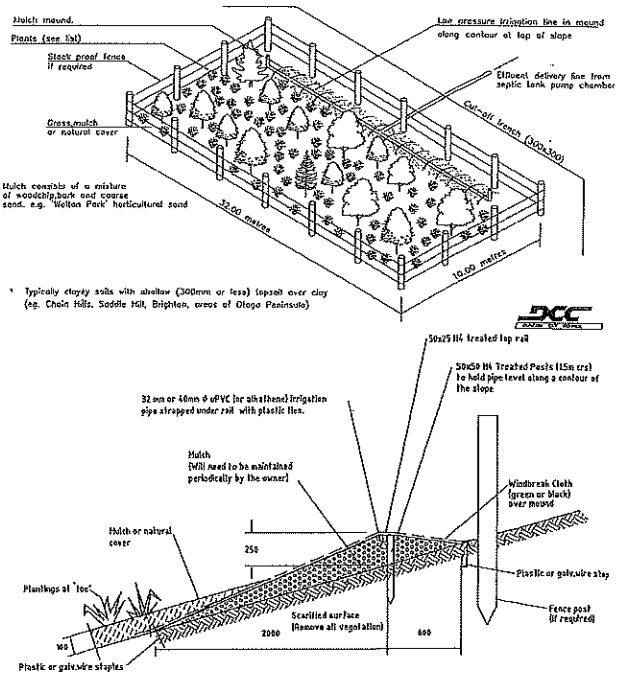
Example option 3

3 bedroom home in category 4 sub-soil, water from roof only, 45 m long garden area suitable for irrigation, 15% slope.

1	Sub-soil category	4
2	Number of bedrooms	3
3	Average daily flowrate (from Table A)	900 liters
4	Minimum septic tank size (from Table A)	3000 liters
5	Design irrigation rate (from Table B)	3.5
6	Calculate irrigation area Area = daily flowrate / design irrigation rate	900 / 3.5 = 257 m^2
7	Increase irrigation area for slope Area x 1.2 for slope 10-20%	257 x 1.2 = 308m^2
8	Irrigation area length selected	45 m
9	Irrigation area width selected (Check length x width = irrigation area)	7 m 45 x 7 = 315, area OK

Option 4

Evapotranspiration system for sub-soils of low permeability. Requires plantings to aid evapotranspiration. Unsuitable for areas close to houses or neighboring properties, as system may smell. Boundary separation of 20m preferred.



Design calculations

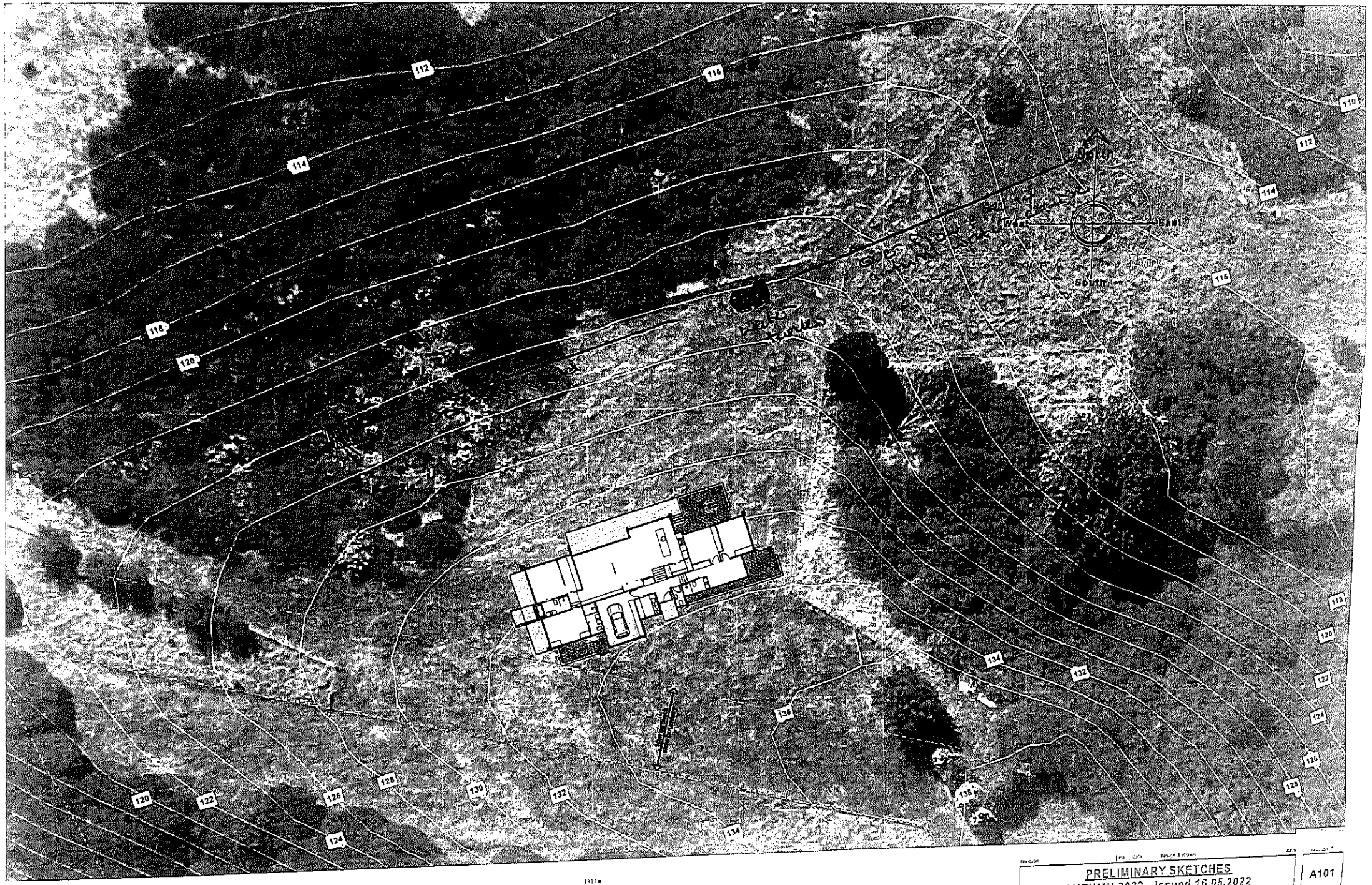
1	Sub-soil category (see back page)	
2	Number of bedrooms	
3	Average daily flowrate (from Table A)	
4	Minimum septic tank size (from Table A)	litres
5	Minimum disposal area (from Table A)	m^2
6	Disposal field width selected	m
7	Disposal field length selected (check length x width = area needed)	m

Example option 4

4 bedroom home in category 3 sub-soil, water from water scheme, 50m long garden area suitable for effluent disposal.

1	Sub-soil category	3
2	Number of bedrooms	4
3	Average daily flowrate (from Table A)	1300 liters
4	Minimum septic tank size (from Table A)	3500 liters
5	Minimum disposal area (from Table A)	580 m2
6	Disposal field length selected	50 m
7	Disposal field width selected (check length x width = area)	12 m 50 x 12 = 600, area OK

TABLE B (Refer to last page for information on soil)			**Option 1**	**Option 3**
Sub-Soil Category	Sub-Soil Type	Indicative Drainage Class	Design Loading Rate DLR mm/day	Design Irrigation Rate DIR mm/day
1	Gravels and sands	Rapidly drained	20	5
2	Sandy loam	Well drained	20	5
3	Loams	Moderately well drained	15	4
4	Clay loams	Imperfectly drained	10	3.5
5	Light clays	Poorly drained	5	3
6	Medium to heavy clays	Very poorly drained	N/A – unsuitable for septic tanks	2



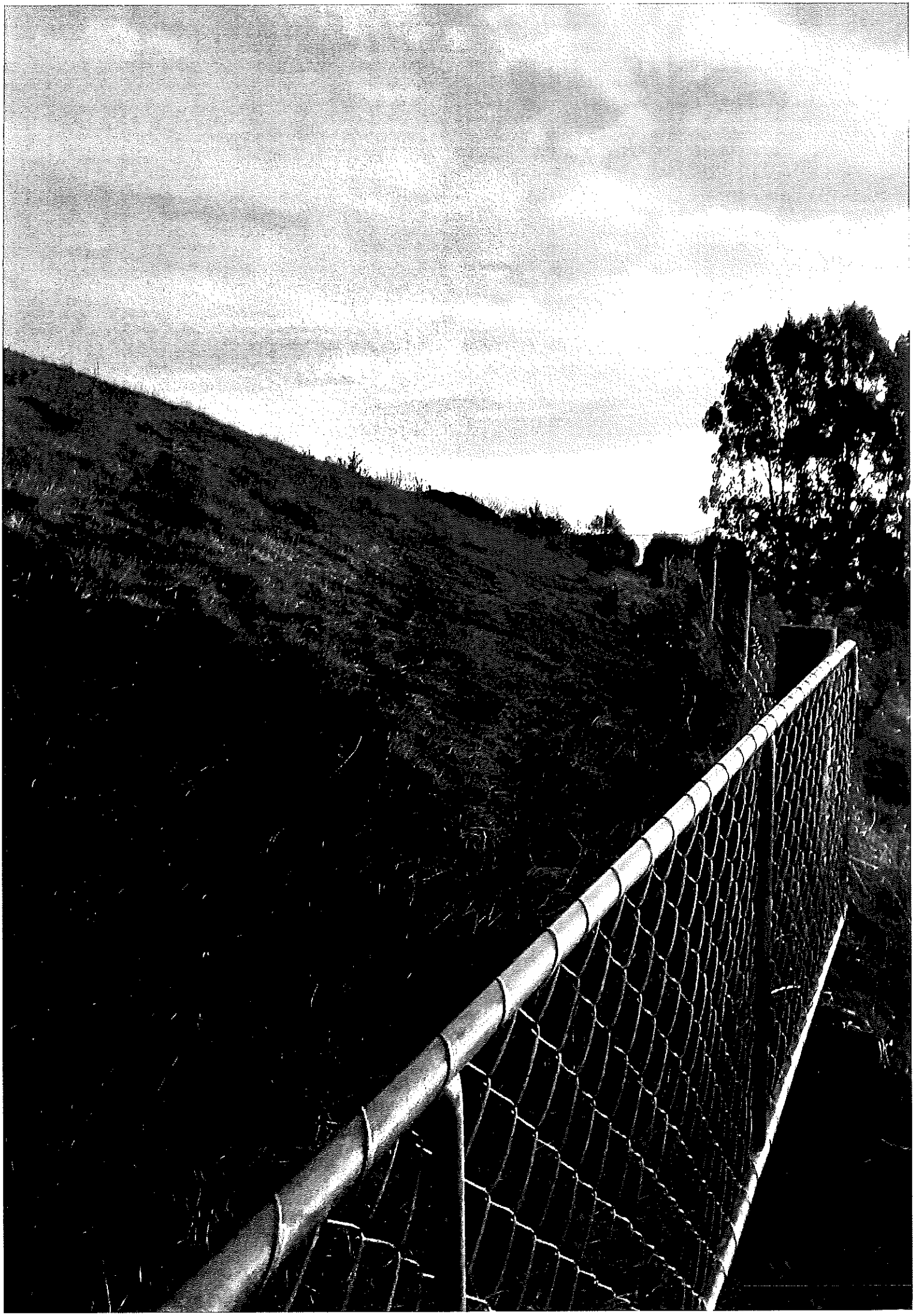
taylored SPACES

Job
New Dwelling - Dunedin
317 Chain Hills Road

Title
Site Plan
Scale 1:200 on A1 sheet or 1:400 on A3 sheet

PRELIMINARY SKETCHES
AUTUMN 2022 - Issued 16.05.2022

A101



Kerry Hamilton

From: Liz Hislop <Liz.Hislop@beca.com>
Sent: Friday, 17 February 2023 04:45 p.m.
To: Campbell Thomson
Cc: Laura Mulder
Subject: FW: Proposed Septic Tank and Driveway

From: AllPlumb Korere Wai <allplumbkorerewai@gmail.com>
Sent: Sunday, 28 August 2022 9:33 pm
To: Liz Hislop <Liz.Hislop@beca.com>
Subject: Fwd: Proposed Septic Tank and Driveway

Hi Liz,

Please see the noted email from ORC outlining the regulations we have discussed in regards to the wastewater and storm water overflow plan for 317 Chain Hills Road. The planned method I sent to you in my previous email was discussed with ORC and once our proposal to build our residential dwelling is approved then we can then apply for the cert of compliance with the ORC.

Regards
Joe

All Plumb Korere Wai Ltd
Plumbing Services
Mob. 021 587 521
Email. allplumbkorerewai@gmail.com

---------- Forwarded message ---------
From: **Isabella Smith** <Isabella.Smith@orc.govt.nz>
Date: Mon, 25 Jul 2022 at 13:11
Subject: Proposed Septic Tank and Driveway
To: allplumbkorerewai@gmail.com <allplumbkorerewai@gmail.com>

Hi Joe

Thanks for coming into the office this morning and for your time on the phone earlier.

Discharge of Wastewater:

The rules you will need to be aware of for the discharge of wastewater is as follows:

ii. *Provision is made for the interception and removal of any contaminant which would give rise to the effects identified in Condition (d) of this rule; and*

b. *The discharge does not contain any human sewage; and*
c. *The discharge does not cause flooding of any other person's property, erosion, land instability, sedimentation or property damage; and*
d. *The stormwater discharged, after reasonable mixing, does not give rise to all or any of the following effects in the receiving water:*

i. The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials; or

ii. Any conspicuous change in the colour or visual clarity; or

iii. Any emission of objectionable odour; or

iv. The rendering of fresh water unsuitable for consumption by farm animals; or

v. Any significant adverse effects on aquatic life.

Unfortunately, I am unable to give formal confirmation that the proposal will definitely meet the permitted activity rules without a full assessment of the proposal. This would require applying for a certificate of compliance – I have discussed with colleagues and a certificate of compliance can be applied for before the system is in place. This way, the certificate of compliance will instead be based on the proposal. Please note, the deposit for this is $1,750. (Certificate of compliance form can be found here.)

Feel free to share this email with the DCC. If a more formal confirmation is needed from ORC, we can go ahead with applying for a certificate of compliance for the proposal.

If there's anything further I can help with in the meantime, please don't hesitate to either give me a call or email.

Ngā mihi

Issy

Otago Regional Council

Isabella Smith
CONSENTS OFFICER – PUBLIC ENQUIRES

P 0800 474 082 | M 027 288 2284
isabella.smith@orc.govt.nz

Campbell Thomson

From: Liz Hislop <Liz.Hislop@beca.com>
Sent: Friday, 17 February 2023 04:46 p.m.
To: Campbell Thomson
Cc: Laura Mulder
Subject: FW: Driveway Design and Access for 317 Chain Hills Road
Attachments: Driveway Design and Access 317 Chain Hills Road.pdf

---

From: Jessica Thompson <thompjessica@gmail.com>
Sent: Monday, 26 September 2022 6:34 pm
To: Liz Hislop <liz.hislop@beca.com>
Cc: AllPlumb Korere Wai <allplumbkorerewai@gmail.com>
Subject: Driveway Design and Access for 317 Chain Hills Road

Hi Liz,

Please find the driveway access plan attached for 317 Chain Hills Road. House plans with heights, edited Biodiversity plan and Landscape architect plan to come.

Regards
Jess Thompson

Vehicle Access Design and Location for 317 Chain Hills Road

SECOND GENERATION DISTRICT PLAN

DUNEDIN CITY COUNCIL | kaunihera a-rohe o Otepoti

6.6.2.4 Lighting of loading areas

a. Loading areas, including associated access and manoeuvring areas, that are used at night must be illuminated to a minimum maintained level of 2 lux, with high uniformity, during the hours of operation.

b. Activities that contravene this performance standard are restricted discretionary activities.

6.6.2.5 Access to loading areas

a. Required vehicle loading spaces must be designed to allow vehicles using the spaces to enter and exit the site without the need to move a vehicle occupying any other parking or vehicle loading space on the site.

b. New vehicle loading areas must not be accessed across a **primary pedestrian street frontage mapped area.**

c. Loading areas that contravene Rule 6.6.2.5.a are restricted discretionary activities.

d. Loading areas that contravene Rule 6.6.2.5.b are non-complying activities.

6.6.3 Vehicle Access Design and Location

6.6.3.1 Maximum number of vehicle crossings

a. The maximum number of vehicle crossings permitted on each road frontage of any site is:

	Frontage length	1. Local road and industrial road	2. Collector road	3. Arterial road (less than 100kmh) and Urban High Density Corridor	4. Strategic road
i.	0m - 18m	1	1	1	1
ii.	>18m - 60m	2	1	1	1
iii.	>60m - 100m	3	2	1	1
iv.	>100m - 200m	3	3	2	1
v.	>200m	3	3	2	2

b. No new vehicle crossings are permitted onto a commercial centre street except for fire stations.

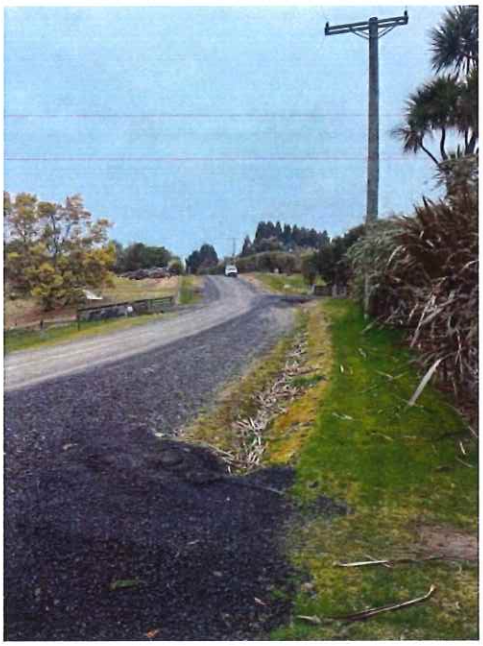
c. For fire stations, the maximum number of vehicle crossings on each road frontage is two for all sites, except where three vehicle crossings are otherwise permitted.

d. Activities that contravene this performance standard are restricted discretionary activities.

Note 6.6.3.1A - Other relevant District Plan provisions

1. New vehicle crossings are not allowed across **primary pedestrian street frontage mapped areas** (see Rule 18.6.14.2).

As per 6.6.3.1-a.ii. the new vehicle access at 317 Chain Hills road will comply with the maximum number of vehicle crossings permitted on each road frontage of any site >18m-60m for a local road. There will be two vehicle crossings located at 317 Chain Hills road to allow for safe entry and exit. Please note these are marked 1 & 2 on the site plan.



Vehicle Access Plan – 317 Chain Hills Road

Kerry Hamilton

From: Stu Casey <scasey@dnairport.co.nz>
Sent: Tuesday, 8 November 2022 12:07 p.m.
To: Jessica Thompson
Subject: FW: Proposal of new dwelling in Dunedin airport flight fan

Hi Jess,

Please see the email response below from Patterson Pitts for your proposed dwelling at 317 Chain Hills Rd.

Dunedin Airport have no objection under designation 274 for your building project to go ahead. We wish you well with the building process.

Regards Stu

dunedin AIRPORT

Stu Casey
AIRSIDE OPERATIONS MANAGER

PHONE: +64 3 470 0400
MOBILE: +64 27 436 1012
EMAIL: scasey@dnairport.co.nz
WEB: www.dunedinairport.co.nz

From: Mark Wylie <Mark.Wylie@ppgroup.co.nz>
Sent: Tuesday, 8 November 2022 11:57 am
To: Stu Casey <scasey@dnairport.co.nz>
Subject: RE: Proposal of new dwelling in Dunedin airport flight fan

Hi Stu,

The new dwelling & shed proposed for 317 Chain Hills Road are below the 1.2 % flight fan & will pose no operational issues
for flight operations at DAIL.

From: Jessica Thompson <thompjessica@gmail.com>
Sent: Friday, 21 October 2022 9:55 am
To: Stu Casey <scasey@dnairport.co.nz>
Subject: Proposal of new dwelling in Dunedin airport flight fan

Kiaora Stu,

My friend Jason Ballantyne passed me your details and thought you might be able to help me with the following information.

We are currently working with DCC to gain approval to build a new dwelling at 317 Chain Hills Road, and because this dwelling is situated within the Dunedin airport flight fan we must provide a letter of notice to the airport outlining the work we wish to carry out.

I have attached a letter of notice along with concept plans of the proposed dwelling to this email, hoping you might be able to steer me in the right direction. We do not see any inherent risk posed by the proposed dwelling as it is going to be built within residential dwelling height restrictions and well below neighbouring house heights and established trees in the area.

Any support with this would be greatly appreciated,

Ngā mihi
Jess Thompson

Ideas for sustainable futures

Ahikā Consulting
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2 Dowling St, Dunedin
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Joe Taylor & Jessica Thompson

317 Chain Hills Road Restoration Plan

10 October 2022

ENERGY, CARBON & WASTE IN BUSINESS

BIODIVERSITY & CONSERVATION

FOOD, FARMS & FRESHWATER

CARBON FORESTS & BIOENERGY

PEOPLE & COMMUNITY

Report prepared for client by Sarah Wright & Mike Thorsen

Date: 10 October 2022

2 Dowling Street

Dunedin 9016

New Zealand

Reliance and Disclaimer

The professional analysis and advice in this report has been prepared by Ahikā Consulting Ltd for the use of the party or parties to whom it is addressed (the addressee) and for the purposes specified in it. This report is supplied in good faith and reflects the knowledge, expertise and experience of the consultants involved. Ahikā Consulting Ltd accepts no responsibility whatsoever for any loss occasioned by any person acting or refraining from action as a result of reliance on the report, other than the addressee.

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Contents

1 Background

Joe Taylor and Jessica Thompson engaged Ahika Consulting Ltd to carry out an ecological assessment and write a restoration plan for 317 Chain Hills Rd. The site is a 6.2 ha property in the Chain Hills, about 100m a.s.l. It is located 4km north-east of Saddle Hill and overlooks Wingatui Racecourse. This site falls in two ecological districts: Dunedin and Tokomairiro. The original vegetation of this area has been categorised as kahikatea, matai and totara forest mixed with broadleaf species[1].

The property has had some restoration work previously in the form of fencing and restoration plantings.

The new owners of the property are intending on building a dwelling, grazing some of the land and restoring areas of gorse shrubland back into native forest. However, the property under the 2GP does not meet minimum site size requirements to build and to build the owners must meet the specific exemption listed under Policy 16.2.1.7.Y.ii: a significant contribution to the enhancement or protection of biodiversity values.

The purpose of this document is to provide an ecological assessment of the proposed areas for restoration and to advise on restoration options that promote native biodiversity at these sites to meet this exemption (Figure 1).

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[1] Otago Regional Council online vegetation map and: Singers, N. J., & Rogers, G. M. (2014). *A classification of New Zealand's terrestrial ecosystems*. Publishing Team, Department of Conservation.

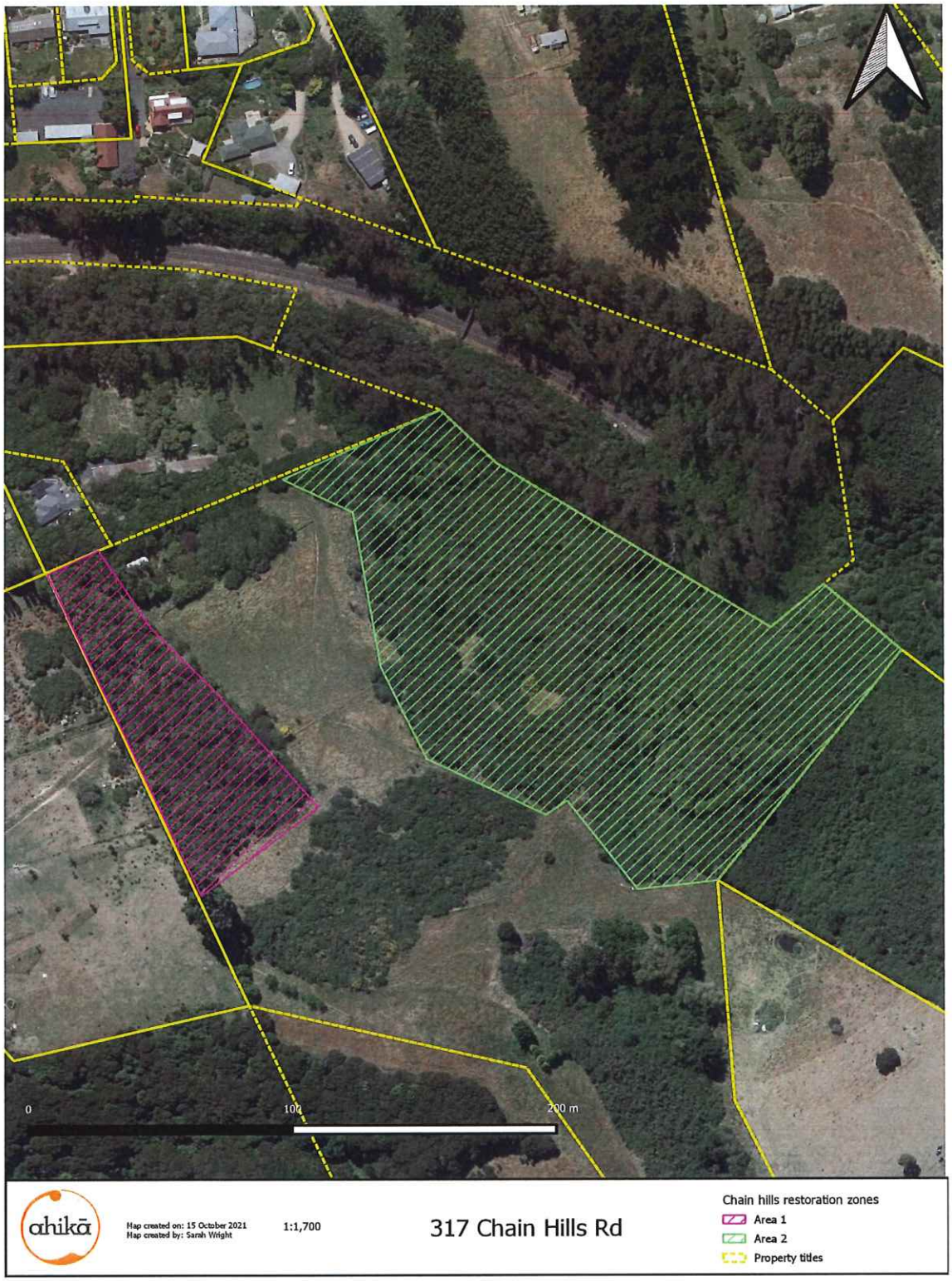

Figure 1: Areas for restoration at 317 Chain Hills Rd

2 Site Ecological Assessment

Two areas within the property were previously identified as opportunities for restoration by the Dunedin City Council marked as Area 1 (0.5ha) and Area 2 (2.2ha) (Figure 1). Both areas are currently fenced.

Area 1 and Area 2 are both largely gorse-dominated scrub, with scattered emergent native and non-native trees and patches where native species have previously been planted (Table 1). Area 1 has historically had more intensive planting of both native and exotic trees and has less cover of gorse, while Area 2 has some larger trees (mainly exotic species) presumed reflective of earlier planting (Figure 2). It is unlikely that any of the larger or emergent native species in Area 1 or 2 are remnants of original vegetation, as they are more likely to have originated from planted individuals. The restoration sites are both near remnants of indigenous vegetation: secondary kānuka/broadleaf forest that are themselves part of a patchwork of remnants (some extensive) located in gullies of the Chain Hills.

Both areas have *Muehlenbeckia australis* scrambling through the scrub and along with the gorse make the vegetation hard to move through. A mixture of native and exotic trees has been planted elsewhere on the property.

No indigenous fauna were observed at the site. Local indigenous fauna found in the Chain Hills area includes common forest birds (bellbird, tui, silvereye, tomtit, kereru), and two types of skink: the New Zealand grass skink and McCanns skink. It is probable that the restoration sites will be occupied by the forest bird species as the habitat quality improves. It is possible that the restoration sites and lizard habitat area will be occupied by both grass skink and McCanns skink as these species are known to turn up at sites some distance from known populations.

Both areas 1 & 2 can be managed with the same methods as they are of a similar character.

Table 1: Species observed within the Areas 1 & 2 during the survey. *not native to the area.

Species	Common name	Restoration Suggestion
Aristotelia serrata	Makomako	Plant more
*Chamaecytisus palmensis**	Tree lucerne	Remove
Coprosma robusta	Karamu	Naturalising

Cordyline australis	Ti kouka	Naturalising
*Cytisus scoparius**	Broom	Remove
Hoheria spp.*	Lacebark	Remove
Muehlenbeckia australis	Large-leaf pohuehue	Performs a natural function of sealing edges of remnants. May need cutting back from around young plantings until they are old enough to support the vine's weight.
*Pinus radiata**	Monterey pine	Remove
Pittosporum eugenioides	Tarata	Naturalising
Pittosporum tenuifolium	Kohukohu	Naturalising
*Rubus fruticosus agg**	Blackberry	Remove
*Salix matsudana**	Tortured willow	Remove
Solanum laciniatum	Poroporo	Naturalising
Sophora microphylla	Kowhai	Plant
Sorbus aucuparia subsp. *aucuparia**	Rowan	Remove
*Ulex europaeus**	Gorse	Use as shelter for new plantings, but slowly remove
Veronica salicifolia	Koromiko	Naturalising

3 Alignment with exemption listed under Policy 16.2.1.7.Y.ii

Currently, the vegetation types at the property have low ecological value and do not meet any of the significance criteria in Policy 2.2.3.2 of the Dunedin City Council 2GP (Table 2). this is because it is unlikely that they represent original or regenerating remnants of indigenous vegetation communities inhabiting the area.

Table 2. Current and possible future alignment of restoration sites with DCC significance criteria.

Significance Criteria	**Current alignment of sites with criteria**	**Probable future alignment of sites with criteria**
(a) Existing protected areas: habitat or indigenous vegetation that has been specially set aside by statute or covenant for protection and preservation.	Nil	Areas 1 & 2 will be protected by a covenant
(b) Wetlands: including wetlands that are listed in the WERI inventory by virtue of their ecological and representative importance or that are listed in the schedules of the Otago Regional Council's Regional Plan: Water.	NA	NA
(c) Sites within the Dunedin City boundaries that are listed in an Otago Regional Council Regional Plan as having significant conservation value. For sites listed in the Regional Plan: Coast, including the Marine Mammal and Bird Sites in Schedule 3.1, the Dunedin City Council will establish the	NA	NA

extent to which these sites extend inland of the Coastal Marine Area		
(d) Rarity/distinctiveness: the degree to which vegetation and habitat types that were formerly common are now reduced in extent, or are naturally rare, or support native species (plants or animals) that are uncommon, in decline or threatened with extinction within an ecological district/subdistrict, ecological region or nationally, including those listed in Appendix 16A.	Nil	Recreating an example of forest habitat similar to that which would have been widespread in the area and including plant species now rare in the area. Providing a safe place for lizard and bird species that are now uncommon in the area by habitat creation and predator control.
(e) Representativeness: the degree to which vegetation is representative of that which formerly covered Dunedin City's ecological districts. Representativeness is defined by the percentage present of the native plant species that are known to have been in that vegetation type in the Dunedin district since European settlement (the 'characteristic' species), and the	Nil	Recreating an example of forest habitat similar to that which would have been widespread in the area and including plant species now rare in the area.

percentage contribution of native species to the plant cover.		
(f) Viability: the degree to which existing natural habitat or vegetation is capable of maintaining or recovering its structure and composition in the absence of additional management, or is subject to a formal restoration programme.	Nil	The restoration efforts are part of a restoration plan and the outcomes will be protected through a covenant.
(g) Context in the Ecological Landscape: the degree to which an area of native habitat or vegetation links other such areas or contributes to the ecological significance of the immediate vicinity. Such areas have a significant ecological function if they are within flying distance for the majority of native birds, a maximum of approximately 500m, or if they increase habitat suitability for terrestrial and aquatic flora and fauna by providing cover, shelter, food, nesting sites, a buffer from harmful influences, etc.	Small areas within Areas 1 & 2 are a result of natural regeneration due to linkages to surrounding area.	Areas 1 & 2 are part of natural regeneration and also contribute to the natural regeneration in other areas

(h) Diversity/pattern: the number of species of native vascular plants and animals, and the number of vegetation/habitat types, contained in an area.	Minor diversity	Greatly increased diversity of native plant species through a planting programme and natural regeneration (as habitat quality improves).
(i) Naturalness/intactness: the degree of absence of disturbance and damage by human activity and the activity of introduced animals.	Nils.	An area that increasingly becomes more natural as natural processes become established in the planted and regenerating areas.
(j) Size and shape: the size of an area of vegetation or habitat and the degree to which its shape influences the viability of the site	Nil or minor	Good size (particularly for Area 2) and reasonably even boundaries will minimise edge effects.

Therefore, restoring these two areas to a native bush end state will add to the extent of indigenous vegetation and vegetation corridors of the Chain Hills Rd area - a considerably increase in the biodiversity value of the site beyond its current gorse-dominated and patchily planted state. The proximity of native bush on this property to forest in adjacent properties will provide habitat and food for native fauna in the area and allow natural regeneration to occur. CHiRP, the Chain Hills Restoration Project, is aiming to reintroduce South Island Robin and rifleman to this area and the planned trapping on this property will support this effort.

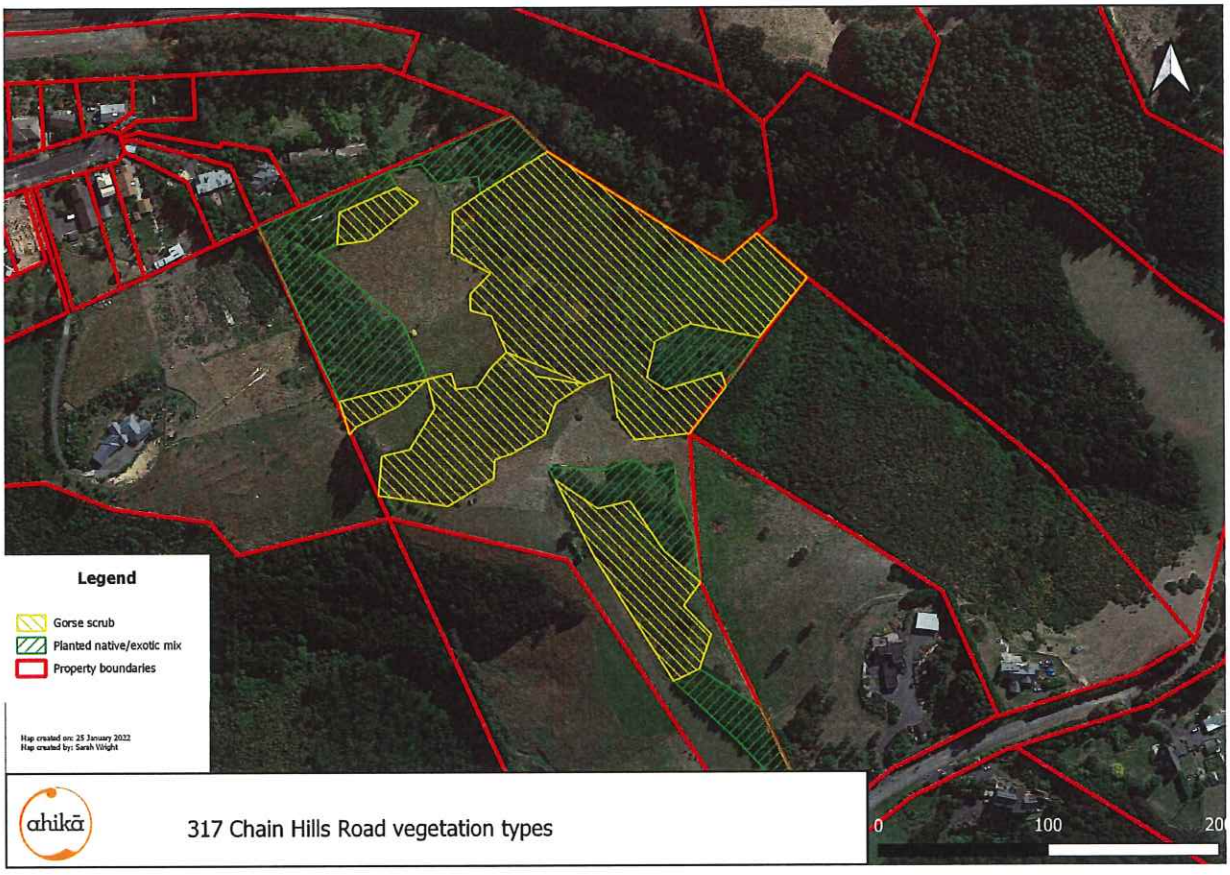

Figure 2: Dominant vegetation types at 317 Chain Hills Road.

4 Recommended Restoration

In order to meet the exemption in Policy 16.2.1.7.Y.ii of the 2GP, the landowners need to follow a plan that will result in a significant contribution to the enhancement or protection of local biodiversity, this is planned to be achieved by implementing the following Restoration Objectives:

4.1 Restoration Objectives:

The following are the objectives that will be achieved over the next 10 years by implementing the actions described in this plan.

- Transition existing areas of gorse shrubland into vegetation that more closely represents the natural indigenous vegetation of the area by plantings in gaps in gorse in Years 1-10.
- Establish enough density and diversity of indigenous vegetation to promote natural successional processes.
- Introduce rare plant species naturally found in the eastern Otago Region.
- Control the proliferation of problematic weeds when they occur.
- Create an area of habitat for local lizard species.
- Ongoing control of introduced predators to levels that encourage native fauna to flourish.
- Covenant Areas 1 and Area 2.

4.2 Weed Control

Weed control is important for the management of Areas 1 and 2 in order to ensure restoration planting success and protect the integrity of forest corridors. In Area 1, any exotic trees including those listed in Table 1 (except gorse), should be removed. Weed control should be prioritised in sections where restoration planting is happening. First by clearing gorse, to make room for plantings and secondly by maintaining plantings until trees are tall enough to out-shade any weeds. It is likely that there will be a degree of weed reinvasion from surrounding sites (including of new species) and therefore weed control

will be ongoing throughout the term of the restoration and beyond (weed control is a common condition of acceptance of covenants). If a new or unfamiliar weed is found then a sample should be taken to the DCC and/or DOC and advice obtained on control approach.

All pine trees will be poisoned standing using a drill and fill approach. This will be undertaken once planting is completed to minimise the risk of dead branches falling on people as the trees decay. Currently there are no pine seedlings known, but if they are found they should be either hand-pulled or cut below the level of lowest pine needle (for larger saplings).

Gorse (*Ulex europaeus*) is the dominant shrub in Area 2. Eventually if left alone, native forest will outcompete the gorse and shade it out. Because it is so abundant and provides good shelter for native plantings, control of it can be minimal at first but the owners should aim to remove in entirety over ten years.

Blackberry and broom are at such low numbers on the property that controlling them is worthwhile. Small patches and plants can be removed by hand. All roots and rhizomes of each species needs to be completely removed for effective eradication. Control methods for larger patches using herbicide are listed below in Table 3.

Any Rowan or Sycamore trees when seen, should be cut down and removed as they have potential to persist under mature native forest.

See photos below to assist in identification of these species. For further information, go to https://pesthub.es.govt.nz/

Figure 3: Blackberry

Figure 4: Broom

Figure 5: Sycamore has helicopter seeds

Figure 6: Rowan has bright red berries

Table 3: Herbicide control for blackberry, broom and gorse

Species	Control
Blackberry	Cut and paste stumps with glyphosphate (200ml/L)
	Spray December to May with metsulfuron-methyl (7.5g per 15L water)
Broom	Spray November to May with metsulfuron-methyl 5g + 1ml/L penetrant per 10L water.
Gorse	Cut and paste stumps with glyphosphate (250ml/L)
	Spray March to August with metsulfuron-methyl (5g/10 L + penetrant)

4.3 Planting

Planting native trees at c. 1.5 m spacing into 25 m^2 areas (this will require c. 416 plants per area) cut into the gorse in both Area 1 and Area 2 will help speed up natural succession processes to establish a diverse forest canopy (Figure 7). Planting should be staged by clearing areas next to other plantings until the whole area is planted in natives.

Cutting tracks into Area 2 is recommended as it will make it easier to access planting sites and plant throughout the entire area (Figure 7).

It is recommended that exotic trees on the property be gradually removed and replanted in species typical of the natural forests originally found in the area. Some native species are naturalising on the property readily and therefore do not need to be prioritised for planting (Table 1).

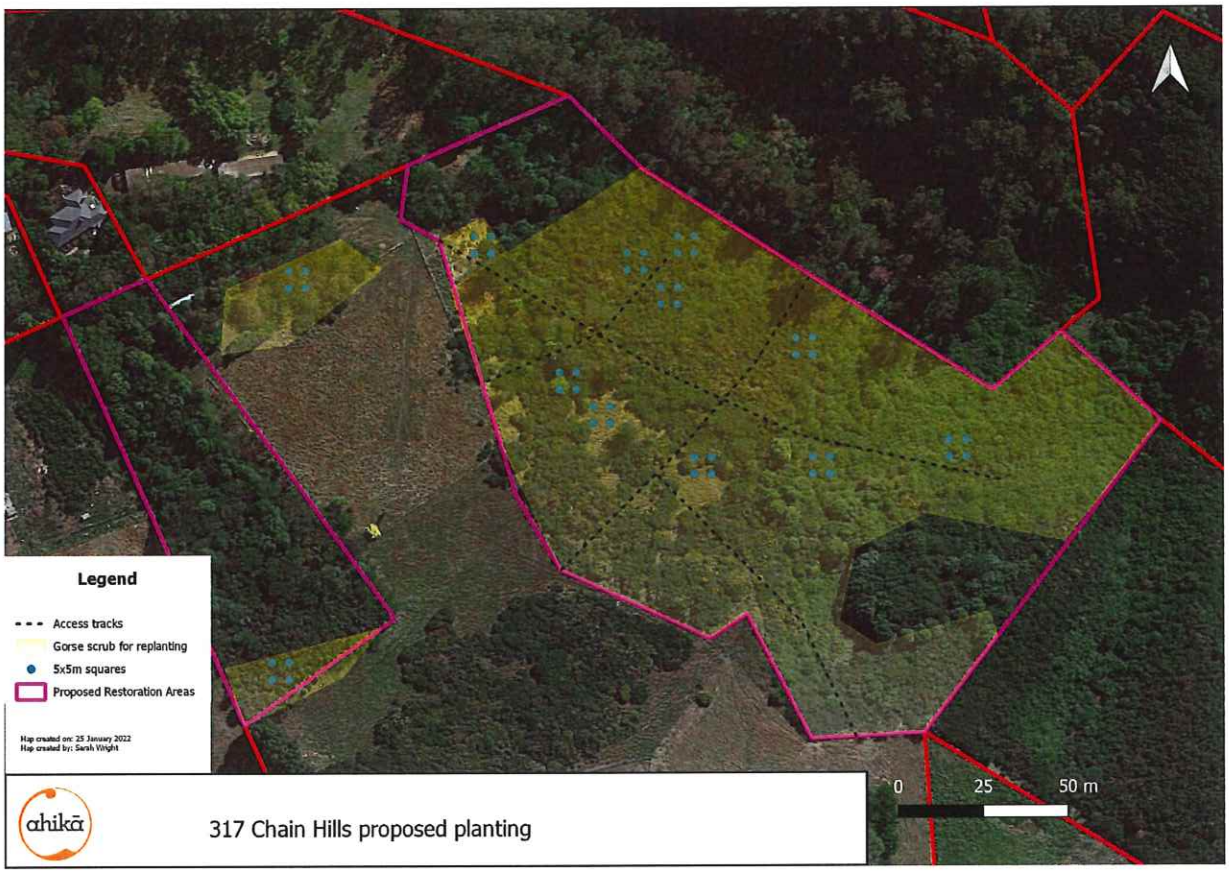

Figure 7: Areas to be prioritised for restoration planting. The blue dots represent one 25 m^2 area.

Recommendations for best practice planting:

- Buy one litre grade plants. These are about $4 each.
- Plant care will increase the likelihood of the plants surviving. Use fertiliser tabs, plant guards, coconut fibre mats and bamboo canes or similar.
- Advance Landscape Systems: Fibreguard 300 (plant guard) $1.33. EcoCoir Mulch Mats 250mm $0.46 or KBC TriGuard Combo 450mm $2.8 (includes stake and mat).
- Night shooting of rabbits would help with planted seedling's survival.
- Fence any planted areas to prevent access by stock.

It is planned to grow the bulk of the plants on site from seed collected in the area. For the other species (in Table 3) it is planned to work with a reputable community or commercial nursery to source quality stock, preferably stock that has been grown from seeds sourced from the Dunedin area (eco-sourced).

Planting timelines are primarily driven landowner funds and resources, however it is aimed to have a continuous canopy of native species in each of the 25m^2 sites and for natural regeneration to be common in the remaining gorse stands within 10 years. The native forest on adjacent properties (Figure 8) will provide a seed source to help natural succession.

Plants will be release weeded if weed growth is threatening to overtop the plantings (may be needed for the first 3 years since planting) using either chemicals or by strimming around plant protectors. Dead plants will be replaced within 2 years.

It is planned to plant at least one 25 m^2 site each year for 10 years.

The planting will have been considered a success when a near-intact natural-looking canopy is visible on aerial photographs of the site.

Figure 8: Native bush on adjacent properties

Species selection:

Table 3 shows proposed species for 317 Chain Hills Rd. All species listed were likely in the original forests of the Tokomairiro Ecological District and Dunedin Ecological District. Some native species as outlined in Table 1, are well established at the site and are naturalising in the shrubland. Species selection may need to be altered depending on plant survival at the site (plant more of the specie that are growing well as this reflects species that are better suited to the site conditions). The target is to plant at least 80% of the species on Table 3 over 10 years.

Table 3: Recommended trees and shrubs for planting at 317 Chain Hills Rd. Planting abundance scale is relative. High means plant relatively more. Low= few.

Species	Common name	Conservation status	Planting abundance
Aristotelia serrata	Makomako	Not Threatened	Moderate- plant around the edges
Carpodetus serratus	Putaputaweta, marbleleaf	Not Threatened	High
Coprosma dumosa	Coprosma	Not Threatened	Moderate
Coprosma linarifolia	Coprosma	Not Threatened	Moderate
Coprosma rhamnoides	Coprosma	Not Threatened	High
Coprosma propinqua	Mingimingi	Not Threatened	High
Coprosma virescens	Coprosma	At Risk- Declining	Moderate
Dacrydium cupressinum	Rimu	Not Threatened	Moderate
Dacrycarpus dacrydioides	Kahikatea	Not Threatened	Low
Fuchsia excorticata	Kotukutuku	Not Threatened	Moderate
Griselinia littoralis	Broadleaf, kāpuka, pāpāuma	Not Threatened	High
Helichrysum lanceolatum	Niniao	Not Threatened	Moderate
Kunzea robusta	Rawirinui, kanuka	Threatened- Nationally Vulnerable	Low
Leptospermum scoparium	Manuka	At Risk- Declining	Low
Lophozonia menziesii	Tawhai	Not Threatened	Low
Melicytus ramiflorus	Mahoe	Not Threatened	High
Myrsine australis	Mapou	Not Threatened	High
Myrsine divaricata	Weeping mapou	Not Threatened	Moderate

Pennantia corymbosa	Kaikomako	Not Threatened	Moderate
Olearia fragrantissima	Fragrant tree daisy	At Risk-Declining	Moderate
Podocarpus totara	Totara	Not Threatened	Moderate
Phormium tenax	Flax, harakeke	Not Threatened	Moderate-on edges
Prumnopitys taxifolia	Matai	Not Threatened	Low
Pseudopanax crassifolius	Horoeka, lancewood	Not Threatened	Moderate
Pseudopanax ferox	Fierce lancewood	At Risk- Naturally Uncommon	Low
Pseudowintera colorata	Horopito	Not Threatened	Moderate
Sophora microphylla	Kowhai	Not Threatened	Low

4.4 Predator control

Establish and maintain trap lines for possums, mustelids and rats on the property to keep their numbers low and allow an increase in local bird and lizard populations. Trapping is the most appropriate pest control for smaller areas. Initially the traps will need to be checked every 3 days. Work with local group the Chain Hills Restoration Project (CHiRP) to establish these lines, decide on the traps to be used, and to identify which predators you will be targeting. The target is one line of traps traversing the site from top to bottom with a trap every 50 m.

4.5 Lizards

In a sunny, dry patch near the house build a skink rock garden of at least 25m^2. Stack large (30 cm to 1 m diam.) rocks loosely, in a way that provides tunnels and places for them to hide from cats and hedgehogs. Plant a variety of plants from Table 4 quite densely around the rock pile to create lizard habitat. Include a small water bowl somewhere for drinking.

Table 4: Suggested plant species for lizard habitat (if available in nursery)

Species	Common name	Life form
Asplenium spp.	Spleenwort	Fern
Astelia fragrans	Bush lily	Herb
Coprosma crassifolia		Shrub
Coprosma propinqua	Mingimingi	Shrub

Festuca spp.	Native Fescue	Grass
Gaultheria spp.	Snowberry	Low lying shrub
Leucopogon fraseri	Patotara	Low lying shrub
Melicytus alpinus	Porcupine shrub	Shrub
Muehlenbeckia complex	Small-leaved pohuehue	Climber
Phormium tenax	Harakeke	Herb
Poa cita	Native Poa	Grass

4.6 Funding and land protection options

It is recommended that removal of all exotic trees and that native revegetation plantings within Areas 1 and 2 should be completed within ten years. Even if planting is not undertaken as planned it is likely that moderate planting and natural succession will produce a near natural young forest over 20-30 years. The land should then be protected using land covenants and fenced to protect forest from any stock. Covenanting the land will require ongoing monitoring to ensure weedy species are not affecting the integrity of the covenant. Any weeds found will need to be controlled.

Ngā Whenua Rāhui Fund has one round per year (between 1 July to 30 September). It supports the protection of indigenous forest on Māori-owned land. Information is available on the Department of Conservation website.

QEII open space covenant is a legal agreement between the QEII Trust and the landowner to protect the covenanted area. The covenants are bound to the title of the land. QEII can help with fencing costs and ongoing advice and monitoring.

A possible use of the planting programme is that it may be possible to get carbon credits for the area. The native forest needs to meet certain criteria such as being one hectare or more, with at least 30% of the forest over 5m in height. Professional advice is needed if this option is pursued.

5 Conclusion

If the actions in this plan are undertaken as described over the next 10 years, we would expect Area 1 and Area 2 to become covenanted areas of natural secondary forest over a 20-30 year time period. This, together with the gains achieved through managing weeds, trapping of predators, and creation of lizard habitat will provide significant enhancement and protection of local biodiversity and will meet the requirement of the biodiversity exemption in Policy 16.2.1.7.Y.ii.

References

Singers, N. J., & Rogers, G. M. (2014). *A classification of New Zealand's terrestrial ecosystems*. Publishing Team, Department of Conservation.

Report prepared for client by Sarah Wright & Mike Thorsen

Date: 10 October 2022

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extent to which these sites extend inland of the Coastal Marine Area		
(d) Rarity/distinctiveness: the degree to which vegetation and habitat types that were formerly common are now reduced in extent, or are naturally rare, or support native species (plants or animals) that are uncommon, in decline or threatened with extinction within an ecological district/subdistrict, ecological region or nationally, including those listed in Appendix 16A.	Nil	Recreating an example of forest habitat similar to that which would have been widespread in the area and including plant species now rare in the area. Providing a safe place for lizard and bird species that are now uncommon in the area by habitat creation and predator control.
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(h) Diversity/pattern: the number of species of native vascular plants and animals, and the number of vegetation/habitat types, contained in an area.	Minor diversity	Greatly increased diversity of native plant species through a planting programme and natural regeneration (as habitat quality improves).
(i) Naturalness/intactness: the degree of absence of disturbance and damage by human activity and the activity of introduced animals.	Nils.	An area that increasingly becomes more natural as natural processes become established in the planted and regenerating areas.
(j) Size and shape: the size of an area of vegetation or habitat and the degree to which its shape influences the viability of the site	Nil or minor	Good size (particularly for Area 2) and reasonably even boundaries will minimise edge effects.