Land Information Memorandum - Standard - Residential

Queenstown Lakes District Council - Private Bag 50072 - Queenstown 9348 - Tel 03 441 0499 - www.qldc.govt.nz

APPLICANT

SALLY PATCHETT		No.	LM252116
15A MARINA DRIVE		Application date	10/12/2025
FRANKTON		Issue date	17/12/2025
QUEENSTOWN 9300		Phone	0211769241

PROPERTY

Valuation No.	2910327300B
Location	15A MARINA DRIVE FRANKTON QUEENSTOWN 9300
Legal Description	UNIT 2 AU2A-AU2B DP 23919 ON LOT 6 DP 19872
Owner	SALLY LOUISE PATCHETT AND ANDREW WAYNE PATCHETT
Area	0.0770 Hectares

RATES

Government Valuation		
Land	$	560,000
Capital Value	$	970,000
Improvements	$	410,000
Current Rates Year 2025 / 2026		
Annual Rates	$	4,255.50
Current Instalment	$	852.58
Current Balance – Outstanding Rates	$	2,502.02
Arrears for previous years	$	-0.02

Rates are charged in four equal installments for the period commencing 1 July and ending 30 June each year.

Further information regarding rating details may be obtained from Queenstown Lakes District Council Rates Department via email rates@qldc.govt.nz

WARRANT OF FITNESS

The Council has no record of features/systems requiring a Compliance Schedule and annual Building Warrant of Fitness.

PLANNING/RESOURCE MANAGEMENT

Zone: Lower Density Suburban Residential
https://districtplan.qldc.govt.nz/proposed/rules/0/48/0/0/0/142

Full details of the zone requirements are found in the Queenstown Lakes District Council District Plan, which should be read together with any relevant plan changes. See attached map for the zone. District Plan details can be found under Appeals (qldc.govt.nz) or if an operative rule Volume One: Operative District Plan (qldc.govt.nz)

The property is subject to the terms and conditions of the following resource consents:
No record of planning notes, approvals, or resource consents have been located to this property.

Designations: 156, 540, 541 - Recreation Reserve
165 - Frankton Marina Local Purpose Reserve
467 - Booster Water Pump Station
(refer to attached District Plan Map for locations)

Please note that building consents are separate from resource consents. If a Code Compliance Certificate has been issued for a building consent, this does not mean that compliance with any resource consent has been met. Should you require additional information on resource consents, please contact the Duty Planner at dutyplanner@qldc.govt.nz

BUILDING

18/03/2011	BUILDING CONSENT BC110174: Manufacturers installation instructions attached (free standing fire). Code Compliance issued 2 May 2011, copy attached.
30/11/1993	BUILDING CONSENT BC931219: Erect two units. Notice to Rectify issued 9 June 1994. Interim Code Compliance Certificate issued (Unit B only) 11 April 2001. Subsequent Code Compliance Certificate issued 7 June 2001, copies attached.

If there are building consents on this property which do not have a Code Compliance Certificate, the property owner is responsible for ensuring all the building work is completed, Council inspections are undertaken and a Code Compliance Certificate obtained. The property owner is solely responsible for Council fees and charges. Building enquiries to be directed to the Building Department at Queenstown Lakes District Council building@qldc.govt.nz. It is recommended that Council records are viewed and compared with the actual structure(s) and activities on site to identify any illegal or unauthorised building works or activities.

SERVICES

Water - Connected to the public reticulated water supply.

Sewer - Connected to the public reticulated sewage scheme. Drainage in common, drainage plan attached.

Stormwater - Connected to the public reticulated stormwater drainage. Drainage plan attached.

TRANSPORT

Vehicle access over a road reserve requires approval before construction. The installation and maintenance of a vehicle crossing is the responsibility of the owner of the land.

Access – Marina Drive

LAND CLASSIFICATIONS

Unit title development: The Unit Titles Act 2010 and Body Corporate rules create rights and responsibilities for unit owners. Legal advice should be sought to understand these.

Otago Regional Council may have other information in relation to hazards on this property. See Otago Natural Hazards Database for more information and details Natural Hazards (orc.govt.nz).

Otago Regional Council provides guidelines on emission rates permissible for discharge from domestic heating appliances. A flow chart and guide to the rules can be found on their website Air (orc.govt.nz)

SWIMMING AND SMALL HEATED POOLS

No Information located on this property

LAND FEATURES

Information for building code design parameters relating to earthquakes, corrosion, wind, climate and rainfall can be found on the BRANZ Map

Land Stability - The Council has no record of instability of the site. The lack of data should not be interpreted as to the absence of a hazard. D H Bell Engineering Geology Report on subdivision dated 20 February 1985 is attached for your information.

Alluvial Fan - Identified on the Hazard Register Map as an area of alluvial fan (Regional Scale). Refer to legend for category. For further information please visit Otago Regional Council Natural Hazards Alluvial Fans <https://www.orc.govt.nz/managing-natural-hazards/about-natural-hazards/natural-hazards/alluvial-fans/>

Seismic - Refer to hazard maps for seismic hazard-faults. These fault rupture hazards have been updated using the most up to date information on the location of the faults from the Institute of Geological and Nuclear Sciences. The inactive faults are not expected to rupture but may represent area of weaker rock and hence may be of use for consideration during land development.

OTHER HAZARDS
HAIL Register - The Council has no record to suggest this site has been occupied by land use activities associated with hazardous substances.

Liquefaction Category
LIC 1 - Liquefaction Investigation Category 1: Local mapping indicates 'nil to low' liquefaction risk for this property. No further liquefaction assessment required for residential development.
LIC 1(P) - Liquefaction Investigation Category 1 (Provisional): Local mapping indicates 'probably low' liquefaction risk for this property. Residential developments may use 'TC2-type' foundations as outlined in the MBIE (2012) Canterbury foundation guidance without further liquefaction investigation, if other construction is proposed a more detailed liquefaction assessment will be required.

See further information at:
- Queenstown Lakes District 2012 Liquefaction Hazard Assessment Summary Report by Tonkin & Taylor
- Assessment of liquefaction hazards in the Queenstown Lakes, Central Otago, Clutha and Waitaki districts of the Otago Region by GNS Science Consultancy Report June 2019

LICENCES/ENVIRONMENTAL HEALTH

No Information located on this property

NETWORK UTILITY OPERATORS

Information related to the location and availability of supply authorisations etc., can be obtained from the relevant Network Utility Operator in first instance contact the following:

Power - Powernet
Gas – Rockgas
Communications – Chorus

OTHER INFORMATION

It should be noted that Council holds a number of investigative and engineering reports which have been compiled for general Council purposes and are either in relation to particular areas of Council's control and interest and or in respect of various areas, or parts of the Queenstown-Lakes District Council area.

A list of the hazard reports contained in the database is attached. A copy of the report can be requested at LIMinformation@qldc.govt.nz.

The applicant is advised that the Otago Regional Council may have other information in relation to this property including, but not limited to:

a) Discharge consents
b) Well permits
c) Consents to take water
d) The existence of contaminants and/or hazardous sites
e) Flooding
f) Emission rates permissible for discharge from domestic heating appliances

NOTES

1. Final inspections on buildings were not mandatory prior to 1 January 1993 therefore no CCC has been issued. Should an evaluation of the building be required an independent qualified person should be consulted.
2. Every care has been taken to ensure that the information supplied by the Council on this form is accurate. Queenstown Lakes District Council relies on information available to it, and will not be held responsible for incomplete or inaccurate information provided, or for any errors or omissions made in good faith.
3. It is in your interests to locate the boundary pegs by discovery or redefinition before purchasing the property.
4. Where the information indicates the existence of some requisition or Council interest in the land, it is the responsibility of the person seeking the information to follow up.
5. Additional plans and specifications (more detail) are available to be viewed on the property file at http://edocs.qldc.govt.nz/.
6. Any enquiry not accompanied by a fee will be invoiced separately. (All prices are GST inclusive.)
7. The information supplied on this Land Memorandum is sourced information that the Council has available to it from its existing records. The information is supplied, pursuant to Section 44A of the Local Government Official Information and Meetings Act 1987 from such records and relates to particular matters affecting the land, the subject of the application. It should be noted that Council's records may not be complete and that no inspection of the property has been undertaken by the Council or its contractors prior to completing this Memorandum. The Council records may not show illegal or unauthorised building or works on the property.
8. Property boundaries shown on the attached copies of computer generated plans are based on the Digital Cadastral DataBase (DCDB). Topographical information shown (for example, buildings etc.) is captured by photogrammetric methods. The accuracy of the two methods of data capture is different and the relationship of buildings to boundaries cannot be relied on.

9. If a property is cross-leased or unit titled any building alterations undertaken may affect the lease documents. If this is the case, appropriate resource consents pursuant to the Resource Management Act 1991, and amended Certificates of Title, should be obtained to reflect the correct situation.
10. Any subdivision or other further development on this property which requires a new connection or an increased level of usage of Council provided services may be subject to the Council's development contributions policy, ie additional charges may be payable. Council services may include water supply, sewerage, stormwater drainage, reserves, roading and community infrastructure.
11. Property purchasers should ensure particularly with newly constructed dwellings that the vehicle crossing from the road onto the property is fully formed, in accordance with the Councils' specifications. A check can be made with the Engineering Team, if any damage is noted, or if the crossing is not completed.
12. Territorial Authorities have a wide discretion as to the sort of information that is included in the LIM. Section 44A (3) Local Government Act 1987 provides that a Territorial Authority may provide in the LIM such other information concerning the land as the authority considers, as its discretion, to be relevant.

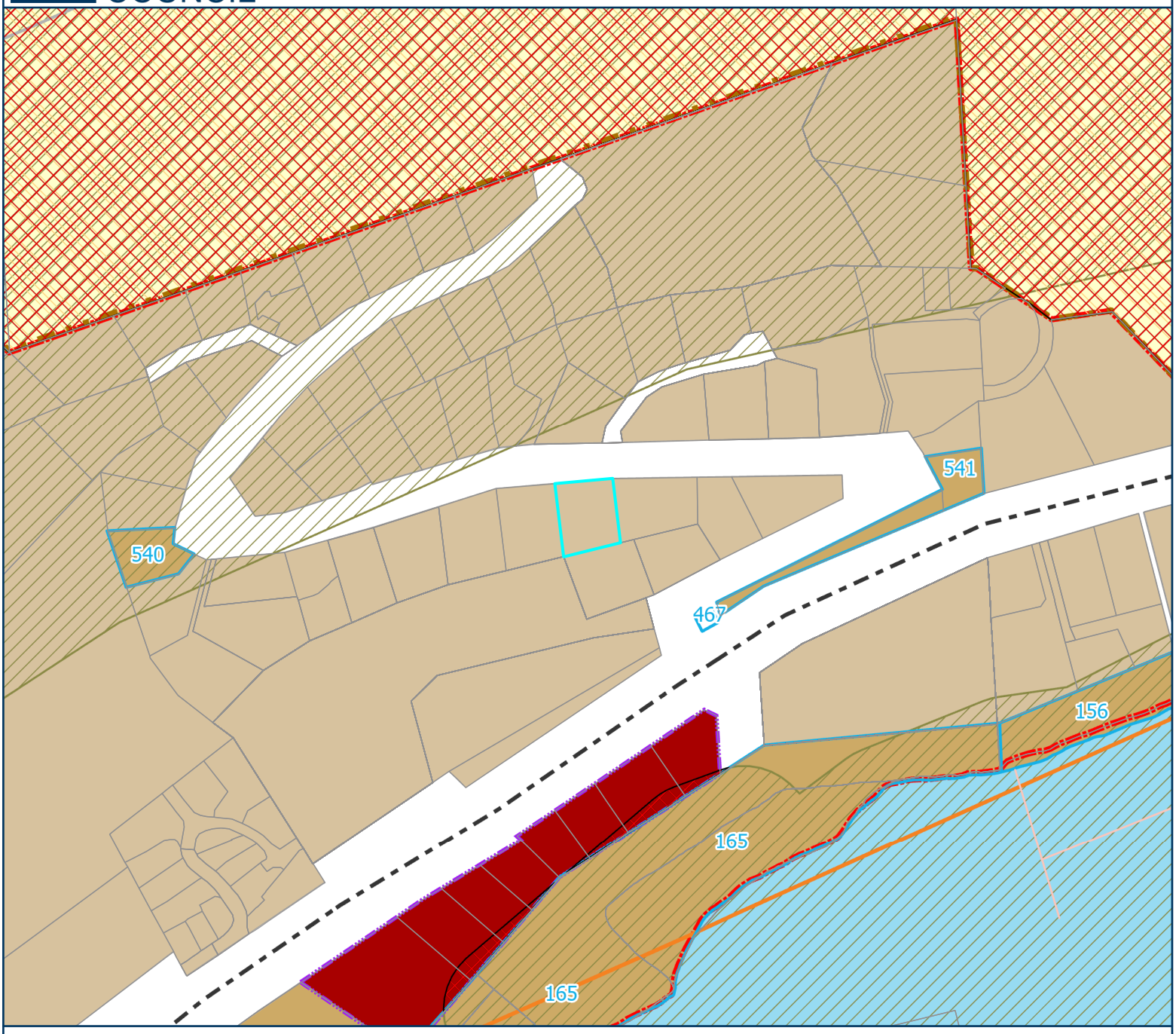
Name:  Date: 17 December 2025

Signed on behalf of the Council
Pam Hughes
LIM Officer

QUEENSTOWN LAKES DISTRICT COUNCIL

District Plan Map

PRINT DATE: 17/12/2025



PDP Appeals

Specific Control Lines

ControlType

Surface Water and Queenstown Trail Annotations

Overlay Lines

Landscape Classification

Aurora Distribution Lines

State Highways

Materials Incorporated by Reference

Type

Landscape Schedule

Designations

Specific Controls

Control Type

Specific Provisions Apply

Overlay Polygons

OverlayType

Landscape Classification Label

Wāhi Tūpuna

Urban Growth Boundary

Queenstown Airport

Zones

Zones

Lower Density Suburban Residential

Rural

Business Mixed Use

Informal Recreation

Road

Water (zone Rural unless otherwise shown)

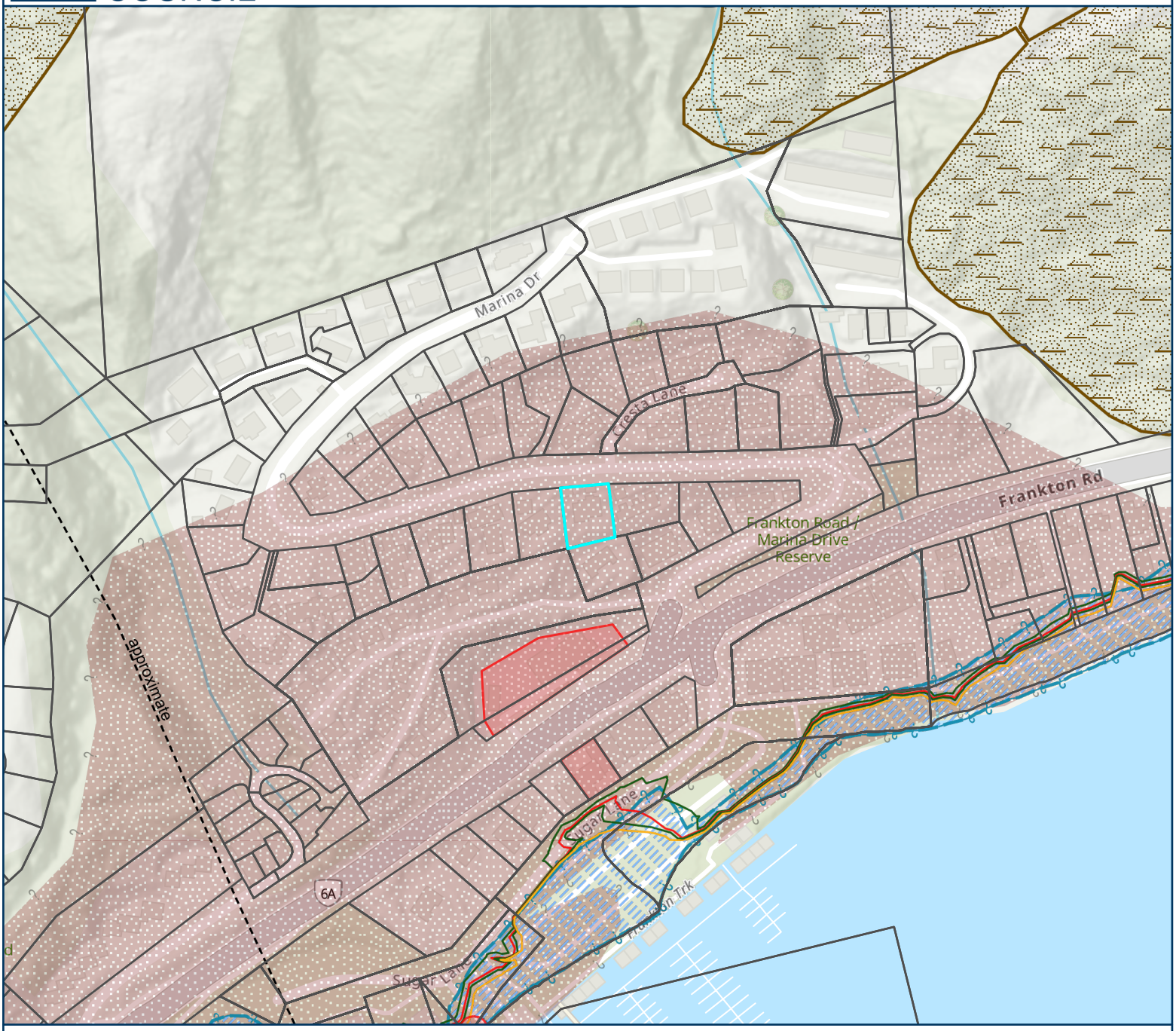
Scale: 1:2,500

0 40 80 Meters

QUEENSTOWN LAKES DISTRICT COUNCIL

Hazard Map

PRINT DATE: 17/12/2025



Otago Selected Land Use Sites (HAIL Register)

- Verified HAIL
- QLDC Boundary

Dangerous Goods License

- POTENTIALLY CONTAMINATED SITE
- Building Act Hazards

Faults 2001 GNS

- Inactive Fault - Location approximate

- 2012 ORC Aggregation - Rainfall Flooding

Return Period of Flood Events

- 150 Year
- 100 Year
- 75 Year
- 50 Year

2007 GNS Regional Analysis - Otago Alluvial Fans Project

- Active, Composite - Location approximate

Landslide Areas - ORC Regional Analysis

- Active Pre-existing Schist Debris Landslides

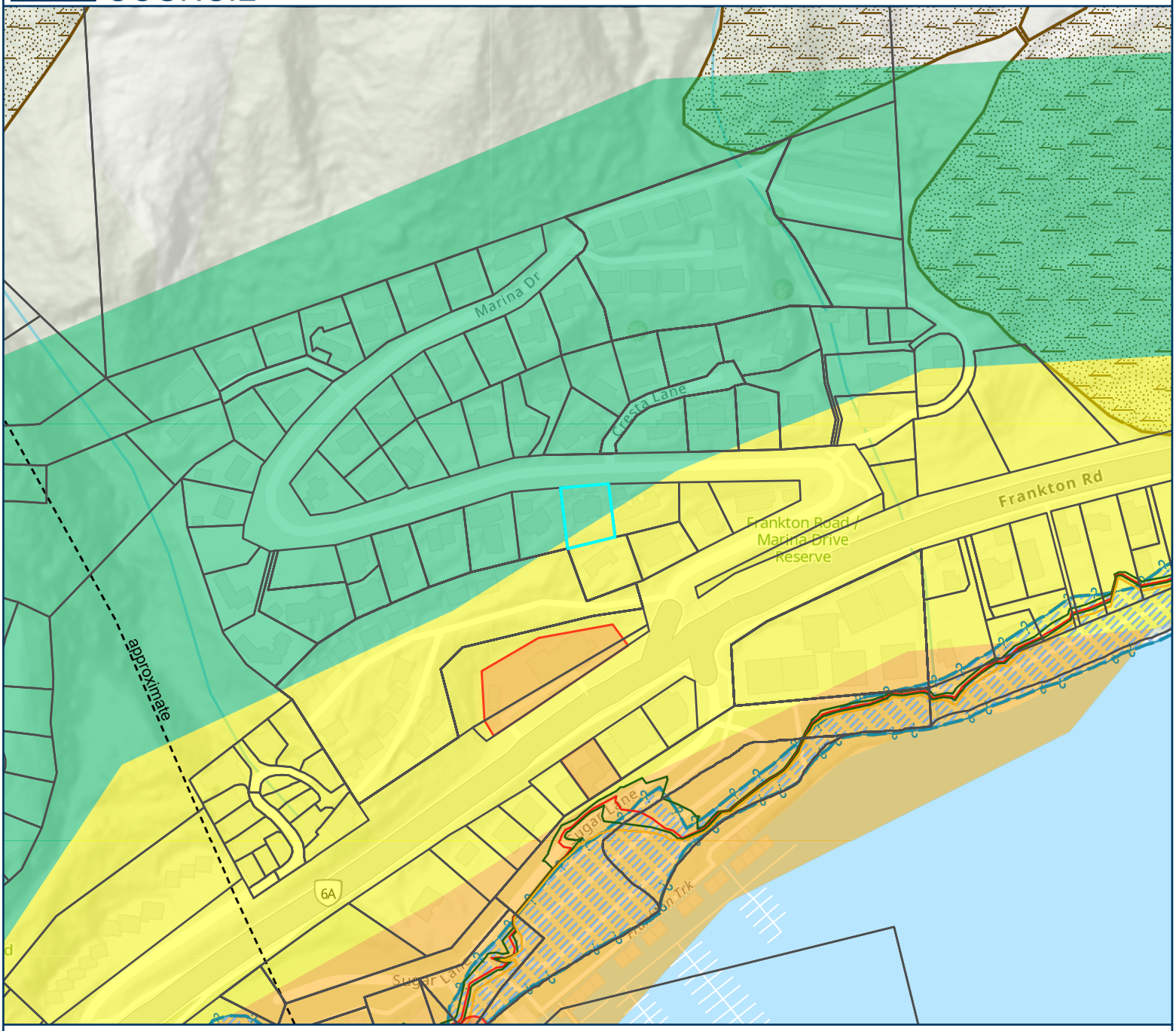
Scale: 1:3,000

0 40 80 Meters

QUEENSTOWN LAKES DISTRICT COUNCIL

Hazard Map

PRINT DATE: 17/12/2025



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- POTENTIALLY CONTAMINATED SITE
- Building Act Hazards

Faults 2001 GNS

- Inactive Fault - Location approximate

- 2012 ORC Aggregation - Rainfall Flooding

Return Period of Flood Events

- 150 Year
- 100 Year
- 75 Year
- 50 Year

2012 Tonkin & Taylor Local Analysis - Aggregation

- LIC 1 - Nil to Low
- LIC 1 (P) - Probably Low
- LIC 2 (P) - Possibly Moderate

Landslide Areas - ORC Regional Analysis

- Active Pre-existing Schist Debris Landslides

Scale: 1:3,000

0 40 80 Meters

Form 7

Code Compliance Certificate 110174

Section 95, Building Act 2004

QUEENSTOWN LAKES DISTRICT COUNCIL

Mailing Address

PATCHETT SALLY LOUISE & PATCHETT ANDREW WAYNE
15A MARINA DRIVE
FRANKTON
QUEENSTOWN 9300

The Building

Street address of building: 15 A MARINA DRIVE, FRANKTON

Legal description of land where building is located: UNIT 2 AU2A-AU2B DP 23919 ON LOT 6 DP 19

Valuation number: 2910327300B

Description of work: **MANUFACTURERS INSTALLATION INSTRCUTIONS ATTACHED**

Building name:

The Owner

Name of owner: PATCHETT SALLY LOUISE & PATCHETT ANDREW WAYNE

Contact person: ANDY PATCHETT

Mailing address: 15A MARINA DRIVE, FRANKTON, QUEENSTOWN 9300

First point of contact for communications with the council/building consent authority:
As above

Building Work

Building consent number: 110174 Issued by: Lakes Environmental Limited

Code Compliance

The building consent authority named below is satisfied, on reasonable grounds, that —

(a) the building work complies with the building consent

Hans Danstedt BO

Signature Position

On behalf of: Lakes Environmental Limited Date: 2/05/11

Limitations of this Code Compliance Certificate

- This Code Compliance Certificate has been issued because the Queenstown Lakes District Council was satisfied, on reasonable grounds, that at the date of its issue, the building work was completed in accordance with the Building Code in force at the date of issuing the Building Consent, (and where applicable, any previously approved waiver or modification of the Building Code contained in the building consent for the work).
- Since the date the Building Consent was granted, the Building Code may have been amended. This certificate is not a representation that the building work meets the requirements of any amendments to the Building Code made since the Building Consent was issued.
- This Code Compliance Certificate is not a guarantee that the whole of the work has been completed in accordance with the Building Code or Building Consent, but that the Council was reasonably satisfied.
- The Code Compliance Certificate relates only to the state of the building work at the date of issue, and is not a statement that the building will remain sound throughout its life.
- Various types of building methods and materials do have specific requirements for ongoing inspection, cleaning & maintenance. The owner needs to be familiar with these standard practices, manufacturers instructions, and warranty conditions which must be complied with in order to maintain the integrity of the building work. All materials and components will deteriorate over time.
- Regular Inspection and maintenance by the building owner is particularly important in the harsh environment and climate experienced in the Queenstown Lakes District. In some cases – complete replacement of building components will be a requirement where they have deteriorated, or have passed their manufacturers warranty period – for example – sealants, waterproofing membranes, paint coatings.
- No representation is made as to the compliance of all items of building work on the specific site to which this Code Compliance Certificate pertains. This certificate relates solely to the building work specifically described in it. It does not relate to any other work. The Queenstown Lakes District Council cannot be held responsible for any other subsequent, or preceding building work, including maintenance, which has been done other than in accordance with an approved building consent.
- Nobody should rely solely upon this Code Compliance Certificate as representing that the building work is weathertight or otherwise sound, fit for its purpose and of acceptable quality. It is a snapshot only, which assesses the Building's compliance with the Building Consent, and Building Code on the date of issue. The soundness of the building will depend, among other things on its subsequent use and the ongoing maintenance performed.

QUEENSTOWN LAKES DISTRICT COUNCIL

Code Compliance Certificate

Section 43(3), Building Act 1991

Application

DE REUS BUILDERS PO BOX 185 QUEENSTOWN	No. Issue date	**931219** 7/06/01

Project

DESCRIPTION	NEW CONSTRUCTION BEING STAGE 1 OF AN INTENDED 1 STAGES ERECT UNITS
INTENDED LIFE	INDEFINITE, BUT NOT LESS THAN 50 YEARS
INTENDED USE	RESIDENTIAL
ESTIMATED VALUE	$220,000
LOCATION	15 MARINA DRIVE, FRANKTON
LEGAL DESCRIPTION	LOT 6 DP 19872
VALUATION NO.	2910327300

This is a final code compliance certificate issued in respect of all the building work under the above building consent.

Signed for and on behalf of the Council:

Name: Hans Denerkell **Date:** 2.6.01

QUEENSTOWN LAKES DISTRICT COUNCIL

Interim Code Compliance Certificate

Section 43(3), Building Act 1991

Application

DE REUS BUILDERS PO BOX 185 QUEENSTOWN	No. Issue date	**931219** 11/04/01

Project

DESCRIPTION	NEW CONSTRUCTION BEING STAGE 1 OF AN INTENDED 1 STAGES ERECT UNITS
INTENDED LIFE	INDEFINITE, BUT NOT LESS THAN 50 YEARS
INTENDED USE	RESIDENTIAL
ESTIMATED VALUE	$220,000
LOCATION	15 MARINA DRIVE, FRANKTON
LEGAL DESCRIPTION	LOT 6 DP 19872
VALUATION NO.	2910327300

This is an interim code compliance certificate in respect of part only, as specified in the following particulars, of the building work under the above building consent.

This certificate is issued subject to the following conditions:

UNIT B HAS NOW BEEN COMPLETED IN ACCORDANCE WITH THE NZ BUILDING CODE. ON THE COMPLETION OF THE INSTALLATION OF MECH.VENT TO THE LAUNDRY AND THE ADDITION OF BARRIERS TO THE THE CARPORT OF UNIT A THE FINAL CCC CAN BE ISSUED.

2.6.01 The above has been completed

Signed for and on behalf of the Council:

Name: Hans Demerdell **Date:** 11-4-01

CivicCorp, Private Bag 50077, Queenstown, Tel 03-442 4777, Fax 03-442 4778

QUEENSTOWN LAKES DISTRICT COUNCIL

PRIVATE BAG 50072 QUEENSTOWN, NEW ZEALAND

NOTICE TO RECTIFY BUILDING WORK

Section 42, Building Act 1991

APPLICANT

DE REUS BUILDERS
PO BOX 185
QUEENSTOWN

CONSENT DETAILS

Consent/PIM No.: 931219
Date issued: 9/06/94

Valn No: 2910327300

PROJECT DESCRN: NEW CONSTRUCTION
BEING STAGE 1 OF AN INTENDED 1 STAGES
ERECT UNITS

INTENDED LIFE: INDEFINITE, BUT NOT LESS THAN 50 YEARS

INTENDED USES: RESIDENTIAL

PROJECT LOCATION: 15 MARINA DRIVE

LEGAL DESCRIPTION: LOT 6 DP 19872

ESTIMATED VALUE: $ 220,000

You are hereby notified to rectify building work on the project described above that was not done in accordance with the Building Act 1991 or the building code, as detailed in the attached page(s) headed Particulars of Contravention.

1 The barriers to both decks in both units do not comply with the provisions of NZBC F4, Safety from falling. Specifically the minimum barrier height shall be 1000mm.

2 At least one handrail shall be provided to the stairway in both units in accord with NZBC D1/AS1 6.0 Handrails.

3 In unit A the hot water cylinder in the ceiling space to be seismically restrained in accord with NZBC G12/AS1 4.10(b). Right Hand Unit

4 The laundry cupboard in both units shall be ventilated in accordance with NZBC G12, Ventilation G4.3.3.(b)

Stanley Street Queenstown Tel (03) 442-7330 Fax (03) 442-7339

QUEENSTOWN LAKES DISTRICT COUNCIL

PRIVATE BAG 50072 QUEENSTOWN, NEW ZEALAND

PARTICULARS OF CONTRAVENTION 931219 [Continued]

5 The paint finish around sanitary fittings and laundry facilities to be impermiable and easily washable in both units.

SIGNED FOR AND ON BEHALF OF THE COUNCIL:

NAME: _____ **BUILDING CONTROL OFFICER** **DATE:** 9.6.94

Stanley Street Queenstown Tel (03) 442-7330 Fax (03) 442-7339

5123

ENGINEERING GEOLOGY REPORT

ON PROPOSED SUBDIVISION

BISHOP PROPERTY - FRANKTON

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written by: D.H. BELL
Senior Lecturer in Engineering Geology
Geology Department
University of Canterbury
CHRISTCHURCH

prepared for: J.R. BISHOP
at the request of Mr N. McDonald
Clark Brewster McDonald & Associates
Registered Surveyors
P.O. Box 1707
INVERCARGILL

date: 20 February 1985.

TABLE OF CONTENTS

SYNOPSIS

1. SCOPE OF REPORT

This report is concerned with the property adjacent to the Queenstown-Frankton highway that is owned by Mr J.R. Bishop, as well as land immediately to the west for which title is being sought. My *engineering geology assessment* has been prepared at the request of Mr N. McDonad, Clark Brewster McDonald & Associates, Registered Surveyors, Invercargill.

2. SUMMARY AND CONCLUSIONS

2.1. Site Description

Schist bedrock underlies the entire area, and is exposed in steep (35^0+) slopes in the upper central and eastern parts of the Property. *Glacial till* typically 3-5m deep overlies ice-shorn bedrock in the upper parts of the proposed subdivision, and two *"high-angle" fan surfaces* are cut into the till deposits. The Property is dominated by the *fan-delta complexes* which built into an enlarged Lake Wakatipu approximately 48m above its present level, and into which have been cut a series of *beach terraces* as the lake episodically lowered: the eastern stream appears to have graded to progressively lower lake levels. There are *no landslides* present within the property boundaries, and *spring seepages* are confined to the "high-angle" fan surfaces.

2.2. Suitability for Residential Subdivision

The land in question is *stable*, there are *no flooding or erosion hazards*, and given sound geotechnical practices with regard to site drainage, batter design and fill compaction, the Property is suited to residential subdivision at "traditional" densities. *The foundation materials* consist predominantly of non-plastic gravelly soils, which are suitable for extensive landscaping by earthworks on the lower slopes, and the *Concept Plan* prepared by Mr McDonald takes realistic account of the site engineering geology.

3. RECOMMENDATIONS

3.1. Concept Plan

I recommend 1) that the Concept Plan prepared by Mr McDonald be approved as the basis for site development, and 2) that particular attention be paid to the following aspects during *engineering design* of the subdivision:-

1. an integrated stormwater and groundwater drainage system;
2. cut and fill batters, including compaction practices;
3. precautionary measures against possible rockfalls; and
4. minor layout modifications to lot boundaries in some areas of bedrock exposure.

3.2. Further Investigations

I recommend that *no further engineering geology investigations* be undertaken in connection with the Bishop Property because 1) the site is suitable for residential subdivision as proposed, and 2) sufficient subsurface data are now available to enable staged development of the land.

REPORT

4. INTRODUCTION

This is an *engineering geology report* on the property adjacent to the Queenstown-Frankton highway that is now owned by Mr J R Bishop, and which was formerly known as the "Findlay Stewart Estate". The report has been prepared at the request of Mr N McDonald, Clark Brewster McDonald & Associates, Registered Surveyors, Invercargill, and it has the following objectives:-

1. to describe the engineering geology of the property.

2. to assess its suitability for residential subdivision.

3. to comment specifically on the Concept Plan prepared by Clark Brewster McDonald & Associates.

4. to recommend any additional engineering geology investigations that are considered either necessary or desirable.

I first inspected the property on 23 November 1984 in company with Mr Bishop and Mr McDonald, and at that time I prepared an interim engineering geology assessment (Bell 1984b) prior to exercise of the option to purchase. I again visited the site on 15 & 16 January 1985 in order to carry out my detailed engineering geology assessment of the property, and I also supervised the excavation of 17 backhoe trenches to provide subsurface data. I am familiar with residential subdivisions in the Queenstown area, having now prepared six engineering geology reports on Fernhill Subdivision (Bell 1980 a → d; 1981; 1985), two on the so-called "Kattenbelt Area" (Bell 1984a & c), and one on the "Richards Park Lane Property" (Bell 1982b).

5. SITE DESCRIPTION

5.1. Engineering Geology Data Sources

I have now spent some 10 hours on site in compiling my *engineering geology plan and sections*, and in logging both the 17 backhoe excavations and various natural bank or outcrop exposures. In addition, I have stereoscopically examined *aerial photographs* of the area provided by Mr McDonald, specifically Run SN 3857 Photos C/14 & 15 (flown on 17/2/1976) and Run SN 8180 Photos H/1 & 2 (flown on 17/2/1983). All field plotting was carried out using *base plans* at a scale of 1:500 and contour interval of 1.5m, which had been provided by Mr McDonald from pre-existing surveys: subsequently he has provided me with a revised base plan that covers the entire

property, and on which had been plotted the locations of all backhoe excavation sites. For compilation purposes the engineering geology plan and sections have been drafted at 1:1000, with a contour interval of only 3m used, and the following data are shown on Fig 1 (attached):-

A. Engineering Geology Plan (1:1000)

B. Engineering Geology Section A-A^1 (1:1000)

C. Engineering Geology Section B-B^1 (1:1000)

D. Summary Logs of Excavations (1:100)

E. Engineering Geology Legend

The following *engineering geology mapping units* have been adopted in the compilation of Fig 1:-

Class	Unit	Comment
SURFICIAL*	i. *schist colluvium*	derived from bedrock outcrop weathering (not mapped separate
	ii. *"high-angle" fan*	gravels and sands deposited fro streams grading tc higher lake levels (and now essentially "inactive")
	iii. *beach deposits*	principally gravels deposited a higher shorelines of L.Wakatipu (+45m to +6m above present)
	iv. *fan-delta deposits*	gravelly sediments deposited fr major streams draining into an expanded (i.e. higher) L.Wakati (fan = subaerial; delta = sub-aqueous)
	v. *glacial till*	predominantly sandy till ⩽ 5m thick showing typical post glac weathering profile
BEDROCK	vi. *schist*	in situ schist, generally ice-shorn or water-modified (areas of colluvial cover not differ-entiated)

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* One area of filled ground (from sidecasting during access track construction) was identified near Test Pit 17 (Fig 1), but no attempt has been made to systematically locate other (very local) areas of "made" ground.

The only *geomorphic features* shown on Fig 1. relate to water, specifically the existing (eastern) stream position, the interpreted directions of fan sediment movement, and local seepages (subsurface only). No landslide areas have been identified on the property, nor are any present on immediately adjacent land: air-photo interpretation does, however, show relatively large schist bedrock slope movements (probably wedge failures consequential on ice withdrawal) some hundreds of metres to the north and east of the respective property boundaries.

5.2. Schist Bedrock

Schist bedrock is extensively exposed in the steeper (up to 40^0) face immediately upslope of the main (+45-48m) beach level, and also in the heavily overgrown eastern stream bed (Figs 1A & C): no attempt has been made to differentiate schist bedrock from schist colluvium, in large part because of access difficulties to these steeper, overgrown slopes. The *rock material* can be described as:-

> *fresh to slightly weathered; moderately hard to hard; moderately strong to strong; olive grey SCHIST; foliation spacing 1-5mm, with joints very closely to moderately spaced; Haast Schist Group.*

Weathering effects were minimal in the schist bedrock exposures in Test Pits 12 to 15, typically being restricted to iron-staining of defect surfaces: in the till-covered areas, where bedrock was not encountered in any of the excavations to a maximum depth of 2.5m, it is possible that (based on experiences in the Fernhill area) there will be locally slight to moderate weathering of schist in the uppermost 0.5m (see, for example, Bell 1982b).

The *rock mass* shows a remarkably consistent schistosity (or foliation) attitude, typically striking 300 ± 10^0 (True) and dipping south-west at $20-25^0$. The relatively close joint spacing, and the numerous defect "sets", mean that relatively small joint-controlled blocks (maximum volume about $0.3m^3$) may become detached from steep outcrop or cut faces: there is, however, no evidence for any larger-scale bedrock instability on the property, and I certainly would not expect any. The schist bedrock surface has been effectively "trimmed" by ice action, thereby removing any weaker (i.e. weathered) schist prior to till deposition: some modification of the glaciated bedrock surface by water has also apparently taken place during the higher lake level "stands", but this is much more localised than was the "over-riding" by the Kawarau lobe of the Wakatipu Glacier (Bell 1982a).

No further investigation of the schist bedrock is warranted, although particular attention will be needed

during residential development to i. schist colluvium on the steeper bedrock slopes, ii. localised (i.e. very small) wedge instability in cut batters, and iii. possible rock-falls above the north-western corner of the property. These aspects are further discussed in Section 7.2.

5.3. Glacial Deposits

Glacial till is present on the upper slopes of the property above the +48m lake beach level, and is locally present as reworked colluvium in foot slope positions at the back of this beach. The till exposed in Test Pits 2,3,5,6 and 7 is very similar to the *sandy till* deposits previously logged in the Fernhill area (see, for example, Bell 1982b), and can be described as:-

> *light grey-green; homogeneous; slightly weathered to fresh; SANDY fine GRAVEL with minor silt and some coarse gravel (GW/GM)*

Moderate to slight weathering is invariably present to a depth of 0.8-1.2m below the ground surface, and is the result of post-glacial weathering and soil formation. The principal effect of this is to render the fine soil fraction slightly to moderately plastic, although this does not in any way affect the suitability of the site for residential development. No *silty till* was encountered in any of the five Test Pits that were excavated into glacial deposits, nor were any *groundwater seepage* zones found associated with lenses of water-sorted sediments within the till profiles: it is still possible, however, that either or both may be locally present on the site, with the need for appropriate engineering practices (see, for example, Bell 1982b) during development.

5.4. Post-Glacial Deposits

The property is dominated by the major terrace at about 48m above the present level of Frankton Arm, and this is in fact a very prominent former shoreline position of Lake Wakatipu in the Queenstown area (see, for example, Bell 1981; 1982b). The terrace surface itself consists of *beach gravels* up to about 3m in thickness, which are underlain by an interlayered sequence of fine to medium schistose gravels that were deposited principally as a delta front into an enlarged (i.e. higher) Lake Wakatipu: these sediments probably exceed 20m in thickness (Fig 1B), and represent an extensive *fan-delta complex* that formed where the stream to the immediate west of the property "originally" entered the lake. As the level of Lake Wakatipu progressively (and episodically) lowered, other beaches were formed at elevations down to about 8m above the present level of Frankton Arm (refer Fig 1A): in the western part of the property these beach surfaces are cut into the deltaic gravels, whilst in the central part schist bedrock is present at shallow depth and the veneer of gravels is mostly less than 1m thick. As the lake progressively lowered, the stream draining the eastern part of the property formed a series of fan-delta complexes, with coarse (up to 0.6m)

fan gravels being deposited subaerially: in Test Pit 16 their thickness exceeded 2.5m. The extent and thickness of the *deltaic* (i.e. subaqueous) *gravels* are shown approximately in Figs 1A, B and C: the fine to medium gravels and their associated fine sandy gravels typically vary between 200 and 600 mm in layer thickness, and dip generally toward (and below) the present lake shoreline at angles between 10 and 25°.

"High-angle" fan deposits have been mapped in the upper part of the property (Fig 1A), and these were probably contemporaneous in formation with the + 48m lake level. In the west Test Pits 1, 3 and 4 penetrated fine to medium gravels (with rare schist "blocks" exceeding 1m) which vary in thickness from 1m(in Test Pit 3, where the gravels directly overlie glacial till - Fig 1D) to more than 2.5m (base not exposed). The gravels are crudely layered parallel to the ground slope, and lenses of fine to medium sand are present between layers of sandy gravels and more open-textured ("fines-free") gravels: these *fan gravels* are typically damp to moist, and locally seepage inflows occurred, for example below 2.3m in Test Pit 1. To the east of the property, Test Pit 7 revealed more than 2.5m of generally open-textured fine to medium gravels of predominantly angular to subangular schist: the excavation was dry at the time of my field investigations, although there can be little doubt that significant groundwater seepage flows would occur during wetter times of the year. Both of these "high-angle" fans originated as "gully-mouth" deposits above the +48m lake level, probably building down to the water's edge: neither of these fans now appears to carry any significant surface flows of water from the rather limited catchments above the property, although clearly groundwater seepages persist. A very small "high-angle" fan has also been mapped adjacent to the proposed vehicular entry to the subdivision off State Highway 6A (Fig 1A): this is most probably a small fan contemporaneous with the +8m lake level, but it is also possible that bedrock is present at shallow depth (1-2m) because the feature has not been investigated by backhoe excavation.

Schist colluvium derived from shallow or exposed bedrock will occur over parts of the property, specifically above the former +48m lake level (Fig 1A): no attempt has been made, however, to differentiate schist colluvium from in situ schist bedrock, in part because of access difficulties (due to steepness and thick vegetation cover) and partly because it is more appropriate to identify such areas as consisting of rock at shallow depth (i.e. within about 1m of the ground surface). At the back of the +48m beach level in Test Pit 13 a 1.5m "talus apron" has been identified (Fig 1C): this consists of both schist colluvial debris and eroded glacial till which has accumulated at the foot of the very steep (35°+) bedrock-controlled slope. *Filled ground,* derived from side casting during access track construction, was identified in the north-east of the property near Test Pit 17: this material, comprising both topsoil and associated vegetation, will require removal or appropriate recompaction during site development. Other

small areas of filled or made ground exist on the property, for example along the former alignment of State Highway 6A: in the adjacent road metal quarry there is clearly an "apron" of gravel debris that has accumulated from the cut batters, and this would also require either removal or recompaction during site development.

5.5. Geomorphic Development

In summary, the following sequence of geomorphic development has been reconstructed for the proposed sub-division area:-

1. The Frankton Arm was excavated by the Kawarau Lobe of the Wakatipu Glacier, the ice extending through to the northern end of Lake Hayes during the most recent advance. In earlier ice advances the shoulders and summit of Queenstown Hill were overridden by the Glacier, and in fact the whole of the Arrowtown Basin displays "freshly" glaciated topography (i.e. largely unmodified by water or subsequent erosion).

2. As the Wakatipu Glacier began to retreat about 15,000 years ago, sandy "ablation" till was deposited as a discontinuous veneer (up to 5m thick) over the irregular ice-shorn bedrock surfaces. As with the Fernhill area, it is likely that basal silty till deposits are locally present beneath some of the glaciated parts of the Bishop Property (although none were identified during my subsurface investigations). Glacial till deposits are only exposed above the prominent +48m lake shoreline (although some may be preserved beneath the fan-delta gravels), and post-glacial weathering which commenced some 10-12,000 years ago has developed the typical brown soil profiles that grade into fresh sandy till below a depth of 800-1200mm.

3. An enlarged Lake Wakatipu formed during the early stages of ice retreat, with the +48m shoreline being particularly well developed in the Queenstown area. Tributary streams draining into the lake at this higher elevation formed fan-delta complexes, and the major Shotover River delta (on which Frankton Airport is now located) was also constructed at this time. On the Bishop Property some erosion of schist bedrock is evident accompanying beach formation at the +48m level, and up to 3m of beach gravels overlie the fan-delta gravels to the west: contemporaneous "high-angle" fan development is also present locally.

4. As the Kingston outlet of Lake Wakatipu episodically lowered a series of lake beach terraces were formed by wave action, and surfaces at +45m, +40-42m, +35m and +25m have been mapped (Fig 1A). The eastern stream appears to have graded to successively lower lake levels, building out a sequence of fan-delta complexes.

5. By the time the lake elevation had reached the +25m level it is likely that the Kawarau outlet had become established, and subsequent lowering is therefore related to

incision of the Kawarau River into the Shotover delta sediments. The abandonment of the Kingston outlet may have occurred as recently as 5,000 years ago (Bell, 1982a), and the +6-8m lake shoreline at the base of the Bishop Property is probably not older than 1-2,000 years before present.

6. Although there has been minor modification of the lower slopes of the Bishop Property during highway construction and realignment, the site clearly reflects the geomorphic processes responsible for its development. There is certainly no evidence for slope instability within the area proposed for subdivision, not is the land subject to any continuing erosion from either the lake itself or the "eastern" and "western" tributary streams.

6. ENGINEERING GEOLOGY ASSESSMENT

6.1. "Constraints" to Residential Development

6.1.1. Foundation Materials: The following foundation materials have been identified on the Bishop Property:-

A. *Schist Bedrock*, which typically dips 20-25° to the south-west and underlies the entire property at variable depths.

B. *Schist Colluvium*, which varies in thickness up to about 2m, and is derived from bedrock outcrops with a component of till-derived "talus" in some footslope positions.

C. *Glacial Till*, which varies in thickness up to about 5m over an irregular ice-shorn bedrock surface, and which predominantly consists of sandy gravels and gravelly sands, with non-plastic fines except in the weathered topmost metre of the profile.

D. *"High-Angle" Fan Gravels*, which consist of crudely layered fine to medium open-textured gravels (with rare schist blocks to 1m) and sandy gravels with lenses of fine to medium sand.

E. *Fan-Delta Sediments*, which consist of interlayered fine to medium gravels and sandy gravels (with rare schist boulders to about 400mm).

F. *Beach Deposits*, which consist of interlayered open-textured fine gravels and sandy fine to medium gravels containing discoidal schist fragments to about 75mm and rare rounded Caples Group "greywacke" particles up to 50mm.

G. *Filled Ground*, which is very local in extent and includes the former highway foundations as well as uncompacted sidecast topsoil.

All of the above foundation materials are entirely suitable for house construction and subdivision access roading given i) adequate control of water, both surface and sub-surface; ii) due attention to cut and fill batter design; and iii) appropriate compaction practices. I do not consider that any of these essentially gravelly materials will present foundation problems, although some care should be taken when dealing with schist colluvium and the rare large schist blocks within the fan gravels: certainly I have not identified any potentially compressible, erodible or expansive soil types on the site.

6.1.2. Water: The eastern stream is quite deeply entrenched (up to about 10m) into schist bedrock across the Property, whilst the western stream is also entrenched into bedrock and fan-delta gravels but lies beyond the limits of any proposed subdivision. Although no other *surface flows* were observed on the site, it is possible that during prolonged rainstorms these could occur on either of the "high-angle" fans: the more westerly showed *spring seepages* when examined on 23 November 1984, but during the site mapping (on 15 and 16 January 1985) these had dried up completely. The only *groundwater seepage* encountered in the backhoe excavations was in Test Pit 1, where significant inflows occurred from open-textured gravels at a depth of about 2.3m: this water has a source higher up the more westerly "high-angle" fan, and from which seasonal spring seepages have already been noted. Experience with glacial till deposits in the Fernhill area suggests that *groundwater seepages* may also be encountered on the Bishop Property, but no surface discharges from till or bedrock sources were observed: if such seepages are in fact present, I would not expect any difficulties with drainage control measures. Similar comments apply to the fan-delta gravels, which were found to be dry or only slightly damp where exposed, but which could be expected to carry some groundwater flows in the more permeable, open-textured layers.

6.1.3. Topography: Topography provides certain constraints to residential subdivision of the Bishop Property, most notably the existence of i) 30-40^0 (+) bedrock-controlled slopes at the back of the +48m shoreline position in the central part; and ii) schist bedrock slopes steeper than 45^0 (and locally up to 60^0) adjacent to the entrenched part of the eastern stream (between RL 340 and 360m). Steeper (18-28^0) till-covered slopes exist in the extreme north-west of the Property, whilst the partly eroded slopes in deltaic gravels between the +40m and +8m beach levels typically vary between 15 and 25^0. The degraded batters of the former road metal quarry in the north-west of the Property now stand at stable angles between about 35 and 55^0, but clearly will require modification prior to any residential subdivision. The above *topographic "constraints"* are further discussed in Section 6.2 in relation to the proposed Concept Plan.

6.1.4. "Active" Geomorphic Processes: Because the eastern and western streams are deeply entrenched in their courses, I do not consider that either constitutes an *erosion hazard.* Likewise, given an integrated stormwater system for site drainage, I do not consider that any *flooding hazard* exists

on the property: the lowermost part of the proposed subdivision is approximately 10m above the "normal" level of Frankton Arm, and there is certainly no historic evidence of flooding. The "high-angle" fan surfaces show no field or air-photo evidence of "recent" activity, and again given adequate control of subsurface waters by appropriate drainage measures, I cannot envisage any *sediment transfer* within or onto the Property: it may be necessary, however, to extend the drainage system into gullies above the northern title boundary by agreement with the adjacent landholder. There are no landslides present on the Property, and given due attention to batter design and control of water, I cannot anticipate any *landslip hazard:* I draw attention, however, to the presence of upslope-derived, large (up to $\sim 0.3m^3$) schist "blocks" near the northern boundary of Lots 69 and 70, and the implications regarding *potential rockfalls* are further discussed in Section 7.3. No *fault zones* have been mapped on the Property, and the only *seismic hazard* is that attributable to ground shaking accompanying earthquakes generated on the Alpine Fault (some 75km to the west of Queenstown), or on one of the known faults in Central Otago to the east (see, for example, Wood 1962; Bell 1982a): as discussed briefly in an earlier report (Bell 1982b), the 150 year design spectral acceleration for the Queenstown area is about 0.7g.

6.2. Proposed Concept Plan

The residential subdivision proposed for the Bishop Property by Mr. McDonald is shown in Fig 1A, and relevant aspects of the layout have been projected onto the engineering geology cross sections (Figs 1B & 1C). It should also be noted that the *Concept Plan* includes the area of land to the west of the Bishop Property that is presently owned by the New Zealand Forest Service: in my view this additional area should logically be developed for residential purposes as part of the present proposal, and every effort should therefore be made to obtain title as this will facilitate earthworks modifications planned in the south-west of the subdivision. Apart from layout considerations (right-of-way grades, etc), however, the inclusion of the New Zealand Forest Service land is not essential, and my engineering geology assessment would not be influenced by its later exclusion.

The Concept Plan developed by Mr. McDonald is similar in many respects to that originally proposed for the "Findlay Stewart Estate" in 1976-8, and for which I understand planning approval was subsequently granted. The principal *roading access* follows the existing vehicular track onto the site, and to obtain a grade of 1 on 8 should not require major cuts or retained fills: the 1:1000 engineering geology plan (Fig 1A) provides sufficient subsurface information for initial design purposes. Access to the south-west and north-west corners of the subdivision are to be provided by appropriately designed access lots, and the lower crossing of the eastern stream will presumably require culverting and at least 6m of filling. In my opinion the proposed *roading pattern and lot access provisions* take realistic account of the site engineering geology, and the topographic

"constraints" that this locally imposes on development options.

I understand from discussions with both Mr. McDonald and Mr. Bishop that *extensive earthworks* are being considered for the lower parts of the Property, and specifically on or within the fan-delta gravels. Subject to appropriate drainage measures and compaction practices (see also Section 7) I believe that such an approach is entirely reasonable, and that in terms of foundation materials and topography the site is well suited to the slope modifications that are envisaged. I would caution against any major earthworks on the steeper till and fan-covered slopes above the +48m beach level, where lot access and drainage requirements are more critical: suitably engineered filling against the lower western part of this slope is, however, certainly feasible. The topographic "constraints" to lot development on the upper central part of the Property have been largely overcome in the Concept Plan by the location of the common boundaries through the steepest part of the slope: this in effect provides a building platform either above or below the schist bedrock face, and, subject to my comments in Section 7.4, is realistic in terms of engineering geology. The foundation conditions for *individual building lots* are summarised in Appendix 1 attached to this report.

7. ENGINEERING GEOLOGY GUIDELINES

7.1. Drainage Considerations

Three aspects only of *site drainage* require comment at this early stage of subdivision planning:-

1. *Eastern Stream Culverting:* The crossing proposed to gain access to Lot 53 (and the till-covered slopes above) is technically feasible, and I would envisage an appropriate diameter Armco culvert placed on stream grade, with locally-derived schist gravel and/or bedrock as fill. The engineering design and construction details of the culvert lie outside the scope of this assessment.

2. *"High-Angle" Fan Drainage:* It is important that any surface or subsurface flows associated with the two "high-angle" fans identified (Fig 1A) are controlled by appropriate drainage measures. As noted in Section 6.2, it may be necessary to extend or construct cut-off drains into the land above the northern boundary of the Bishop Property. Again, design details of an integrated drainage system lie outside the scope of this report, but I would certainly expect that subsurface flow interception would prove necessary to depths of at least 2-3m, for example by installing field tile lines: the development of building sites such as Lots 70, 71, 79 and 54 is critically dependent on appropriate drainage installation.

3. *Localised Seepage Flows:* Experience at Fernhill Subdivision has shown the importance of controlling localised ground-water seepages within the glacial till deposits, for

example using commercially available PVC drainage coil and pit-run gravel as backfilling. Whilst seepages originating within the glacial till have not been identified on the Bishop Property, it is still possible that some may be located during site development and/or after clearance of the extensive exotic scrubby vegetation.

In summary, the installation of an integrated *stormwater and groundwater drainage system* is an essential requirement, particularly for the sound development of steeper building sites on the Bishop Property. Planning for this should be carried out at the same time as the access roading pattern is finalised, with provision for the later interception of any localised spring seepages that may be located during residential development.

7.2. Site "Landscaping" and Batter Design

The possibility of relatively extensive *earthworks* during subdivision development has already been noted (refer Section 6.2), and it is envisaged that this would involve cutting and filling to modify at least part of the area below the +48m shoreline. Providing that this is confined to the areas underlain by fan-delta gravels, I cannot anticipate any problems given sound engineering practices with regard to batter design and drainage. I have elsewhere suggested (Bell 1984b) *cut batters* at 1 on 1 (45^0), and uncompacted *fill batters* at 1 on 1.5 (34^0): with toe benching and suitable compaction fill batters at about 1 on 1.2 (40^0) should be achievable. These batter angles are based on site observation of stable slope angles, and my experiences in the Queenstown area with gravelly schistose soils: the suggested batters apply both to the fan-delta gravels and to the sandy till deposits, whilst thicker (>3m) schist colluvium soils should display similar stability criteria. In schist bedrock, batters can probably be cut vertically to heights of 5m or more, but due attention must be paid to the orientation of rock mass defects on which small planar or wedge failures could be initiated: in some situations the in situ gravelly soils may also stand near-vertically to heights of about 3m, but the above criteria are considered to be more realistic (albeit probably conservative) for the landscaped site.

In summary, the Bishop Property (and the adjacent land to the west owned by the New Zealand Forest Service) is well suited to extensive *landscaping* by means of various earthworks because it consists of gravelly soils which can be readily excavated and recompacted to form stable slopes. Due attention must of course be paid to site drainage, batter design and compaction practices: I would also recommend that extensive earthworks be avoided on the till-and colluvium-covered slopes above the +48m formed lake shoreline, and that the bench provided by the former alignment of State Highway 6A be utilised either for construction access or as a "platform" for fill placement during landscaping.

7.3. Potential Rockfalls

Schist blocks up to about $0.3m^3$ in volume were identified overlying glacial till near the north-western

corner of the property, and these have presumably been derived from the steep (near-vertical) rock "bluffs" about 50m above the property boundary. Side-slopes in this vicinity exceed 30^0 as the ice-shorn bedrock exposures are approached, and the local bluffs reveal near-vertical joint sets on which the schist blocks have been released: once initiated, such *rockfall debris* would move downslope under gravity, both "bouncing" and sliding until block momentum was lost. Whilst the risk to any house located on the till-covered slopes below is minimal (because of the very rare release of such rockfall debris), I would nevertheless recommend that the boundary be reinstated as a chain-link fence at least 1m high above Lots 69 and 70: some consideration could also be given to scaling "loose" blocks from the schist bluffs above the Bishop Property in this vicinity.

In summary, some precautions are advisable to ensure that the occupiers of the subdivision are not placed at any risk from potential rockfalls originating in the schist bluffs above the property. I reiterate, however, that I do not consider that a *rockfall hazard* exists to any part of the site: it is simply prudent to anticipate any such possibility, and this comment applies equally to the very steep bedrock-controlled slopes adjacent to the eastern stream course (refer Fig 1A).

7.4. Layout Modifications

Whilst I have previously endorsed the subdivision layout proposed in the Concept Plan, particularly with regard to the basic roading pattern adopted, I would nevertheless suggest the following minor modifications:-

1. *Lots 52 and 45:* These two relatively large building lots are each located adjacent to the deeply incised course of the eastern stream, where steep ($35-60^0$) bedrock-controlled slopes are present to heights of 10 and 15m above its bed. I am not satisfied that a satisfactory building platform exists on either lot, and I would suggest instead that a. Lot 45 be incorporated into the adjacent Lots 44, 46 and 47; and b. Lots 51 and 55 be enlarged to include Lot 52, possibly with consequential adjustments to the boundaries and dimensions of adjacent lots to the west. In my view the stream bed should be used as the common boundary between lots on either side of the stream (if it is not in fact feasible to create a reserve that incorporates these steeper bedrock-controlled slopes), and the positioning of Lot 53 should be used as a "model".

2. *Lot 61:* Lot 61 has an average slope of 25^0, and an area of only $720m^2$. It will prove difficult to develop a satisfactory building platform on this lot without substantial earthworks, and it may well be preferable to incorporate Lot 61 into the adjacent lots, thereby enlarging each of these. I would stress, however, that I am not concerned in any way with stability of this building site, but only with the practicalities of dwelling construction: it is certainly feasible to build on the site as presently defined.

Whilst the above two layout modifications would reduce by three the total number of building lots, I believe that my suggestions would in fact improve the subdivision proposal and should be considered at the Scheme Plan stage of development. The Concept Plan itself is still most satisfactory in terms of engineering geology, and approval should not be delayed for what are essentially minor improvements to layout. Likewise, the question of a minimum siting distance for dwellings adjacent to the western stream erosion scarp (Fig 1A) must await the outcome of negotiations for title to this land, and its incorporation into the final subdivision proposal.

8. FURTHER INVESTIGATIONS

I do not consider that any further *engineering geology investigations* are necessary for residential subdivision of the Bishop Property, as the land in question is inherently stable and the site is suited to extensive landscaping by earthworks on the lower slopes. I have drawn attention to various aspects of section layout and site construction that should be further considered at either the Scheme Plan or Building Permit stages of development, but these are essentially minor and are in large part dependent on obtaining title to the land (presently owned by New Zealand Forest Service) immediately west of Mr Bishop's property. Given *sound geotechnical practices* (with regard to site drainage, batter design and fill compaction), the Bishop Property can be developed at "traditional" densities as proposed in the Concept Plan.

9. REFERENCES

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APPENDIX 1

SUMMARY OF INDIVIDUAL BUILDING LOTS

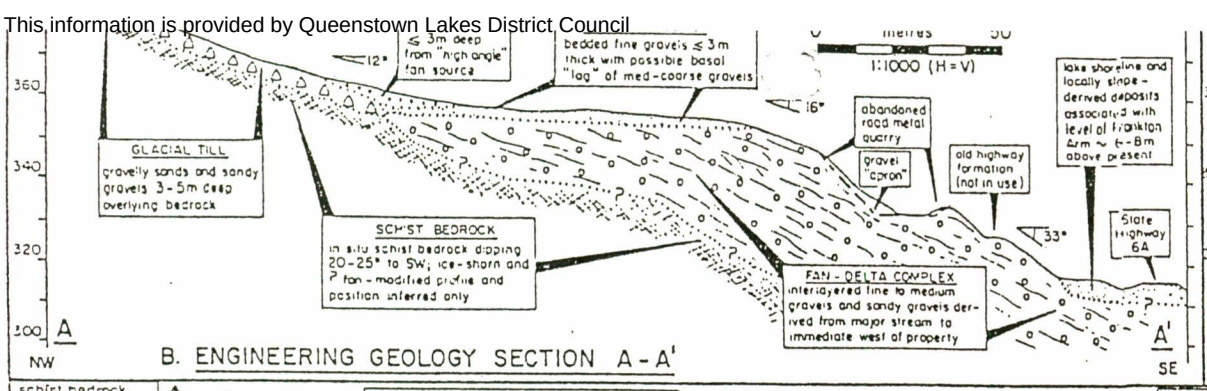
Lot No.	Area (m^2)	Existing Slope (^{0})	Comments
1	830	13/32*	Fan or deltaic gravel foundations; suited to retained filling and lot modification from lower (southern) boundary.
2	710	18/34*	
3	710	17/36*	
4	710	9/36*	Deltaic gravel foundations; suitable building platforms near old road metal quarry site.
5	660	7/39*	
6	880	15/33*	Deltaic gravel foundations with local beach veneer; suited to cut-and-fill development but NB proximity to western scarp.
7	880	18	
8	840	12/20*	Deltaic and beach gravels; suitable building platform.
9	605	21/55*	Deltaic (and minor beach) gravel foundations; adjacent to former road metal quarry (→steep batters) and requiring backfilling
10	830	18/52*	
11	860	6/37*	
12	910	23	Fan or deltaic gravel foundations; generally steep side-slopes except for former highway alignment; suitable for cut-and-fill slope modification to form suitable building platforms.
13	670	23	
14	802	18	
15	630	20	
16	700	18	
17	605	15	
18	670	24	Shallow (≤1m deep) schist bedrock over most of lot; site modification necessary to form suitable platform
19	660	21	Deltaic and/or beach gravel foundations; suited to slope modification by cut-and-fill methods if required
20	715	21	
21	780	18	
22	690	15	

Lot No.	Area (m^2)	Existing Slope (^{0})	Comments
52	1200	18/50(+)*	very steep schist bedrock slopes, with localised fan gravel and till cover; no suitable building platforms
53	1360	8/40*	Fan gravels, with schist bedrock or colluvium exposed in banks of eastern stream; suitable building platforms on each Lot
54	960	16/42*	
55	730	7/29*	Sandy till, with schist bedrock/colluvium in lower steep parts of each lot; suitable building platform on till-covered portions of each lot NB dense vegetation cover to be removed
56	740	15/45*	
57	1000	6/37*	
58	1200	6/44*	
59	730	16	
60	710	15/34*	
61	720	14/39*	schist bedrock overlain by fan gravels and possible colluvium; site modification necessary to form building platform
62	900	<5/33/18*	schist bedrock face at rear of lots, beach gravels at front provide suitable building platforms
63	640	9/50*	
64	780	11	lower fan and/or beach gravels with suitable building platforms; upper slopes till-covered
65	900	<5/26*	
66	680	13	fan gravels, with sandy till exposed in west of Lot 67; suitable for building platform formation
67	860	14	
68	800	20	steeper lots underlain by glacial till; caution with batter construction and drainage control; possible rockfall barrier above Lot 69
69	1460	18/28*	
70	750	12	fan gravels in gully-mouth position, sandy till on shoulder to west; seepage control important

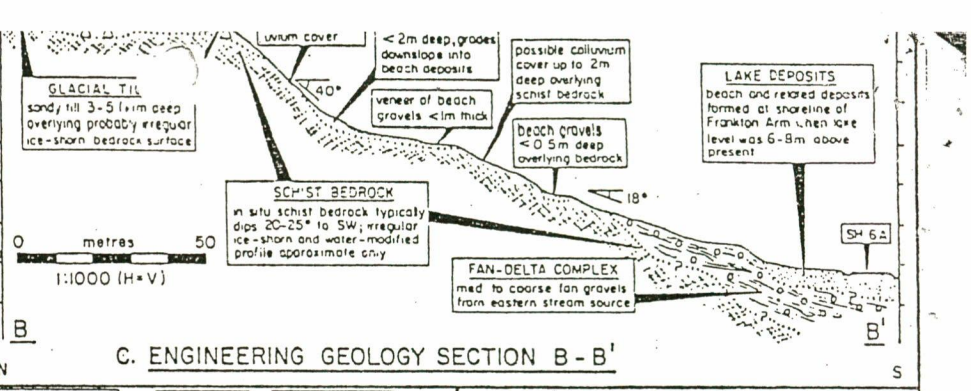
Lot No.	Area (m^2)	Existing Slope (^{0})	Comments
23	690	5/14*	Essentially flat-lying beach surface, with front "scarp" in deltaic gravels; each lot suited to dwelling construction without significant site modification
24	710	5	
25	770	5/12*	
26	610	<5	Essentially flat beach surface, with local exposure of fan (Lot 31) or delta (Lot 28) gravels; suitable for dwelling construction without site modification, but suited also to large-scale earthworks (cutting and/or filling) if required; NB possible need for building restriction adjacent to scarp head in Lots 28 to 31
27	560	<5	
28	680	<5/20*	
29	750	<5	
30	710	<5	
31	750	<5/15*	
32	560	<5	
33	700	<5	
34	650	<5	
35	630	<5	
36	650	<5	
37	750	<5/32*	Beach veneer overlying deltaic gravels or bedrock; suitable building platform on each lot; steep bedrock-controlled face at rear of each lot
38	900	9/43*	
39	1030	14/47*	
40	880	18/37*	
41	892	17	Beach veneer overlying schist bedrock, with local deltaic gravels; steeper lots requiring some site modification for building platforms
42	800	24	
43	760	22	
44	840	19	Fan-delta gravels, with extensive schist colluvium or bedrock on Lot 45; eastern stream crosses Lots 45-48; few suitable building platforms without site modification
45	1150	16/42*	
46	1027	14	
47	896	19	
48	730	8	
49	1020	11/38*	as for Lots 37 to 40
50	1020	12/39*	
51	860	14/35*	

Lot No.	Area (m^2)	Existing Slope (^{0})	Comments
71	760	17	fan gravels overlying glacial till and/or schist bedrock; relatively steep lots require drainage control and formation of suitable building platforms
72	820	22	
73	650	18	
74	630	21	sandy till ⩾3m deep overlying schist bedrock; suitable for dwelling construction, but care with drainage control and batter design on steeper lots
75	620	17	
76	670	15	
77	720	12	
78	720	12	
79	1300	13/30*	fan gravels >3m deep, with suitable building platform; surface and subsurface water control critical
80	1480	23	sandy till ⩾3m deep, with suitable building platforms on Lots 82 & 83; seepage control and care with batter design particularly required on Lots 80 & 81
81	1250	23	
82	730	8/30*	
83	880	17/32*	

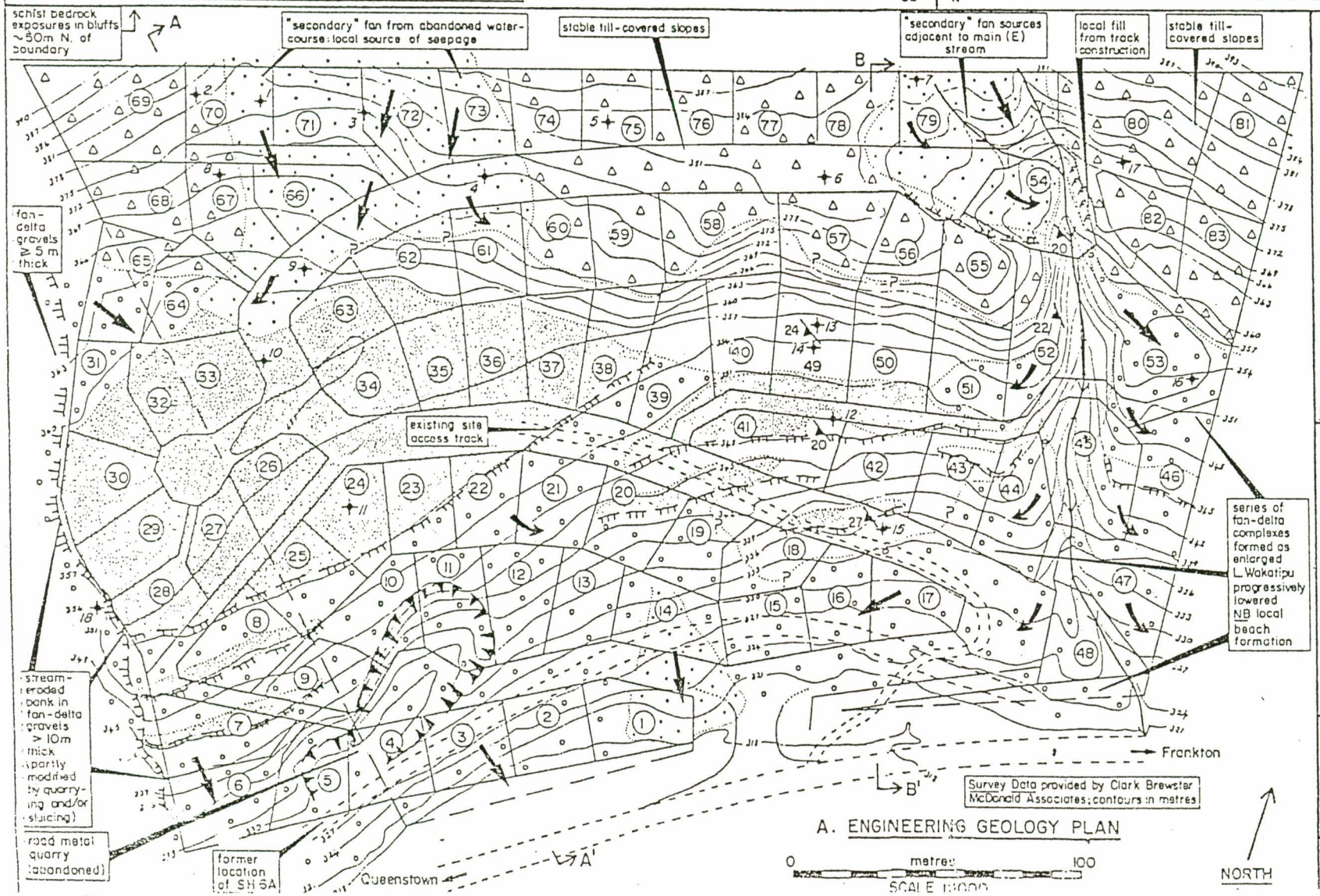
* indicates more than one slope segment present on lot



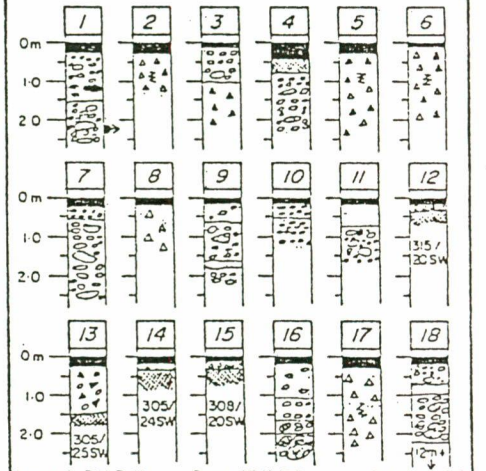
B. ENGINEERING GEOLOGY SECTION A-A'



C. ENGINEERING GEOLOGY SECTION B-B'



A. ENGINEERING GEOLOGY PLAN



D. SUMMARY LOGS OF EXCAVATIONS

E. ENGINEERING GEOLOGY LEGEND

- organic-rich "topsoil"
- micaceous sands with some silt; sandy gravels or gravelly sands; "fines-free" gravels — BEACH / FAN
- "reworked" sandy till; weathered sandy till; fresh sandy till — GLACIAL
- schist bedrock (includes colluvium/ rare large boulders) — SCHIST
- scarp or terrace edge; quarry limits; 20 schist attitude (strike & dip); flow direction (fan); excavation site; 16 lot number; approx geological boundary; water course; seepage

PLAN

ENGINEERING GEOLOGY PLAN AND SECTIONS

Bishop Property - Frankton QUEENSTOWN

GEOLOGY: DH Bell	SCALES
DATE: Jan-Feb. 1985	1:1000
DRAWN: JVL 9/2/85	B 1:100

FIG. 1

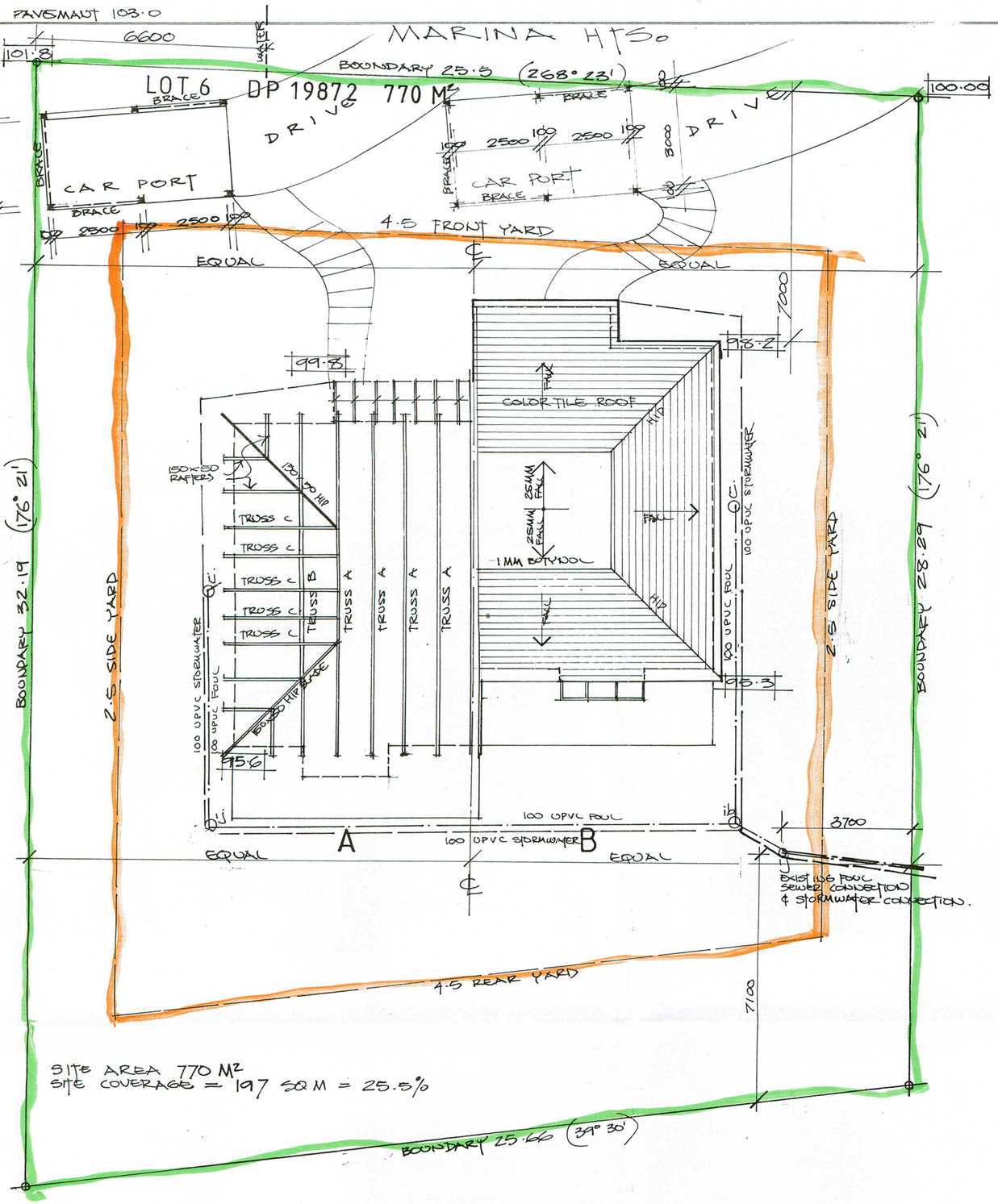
QUEENSTOWN LAKES DISTRICT COUNCIL

Aerial Map

PRINT DATE: 17/12/2025

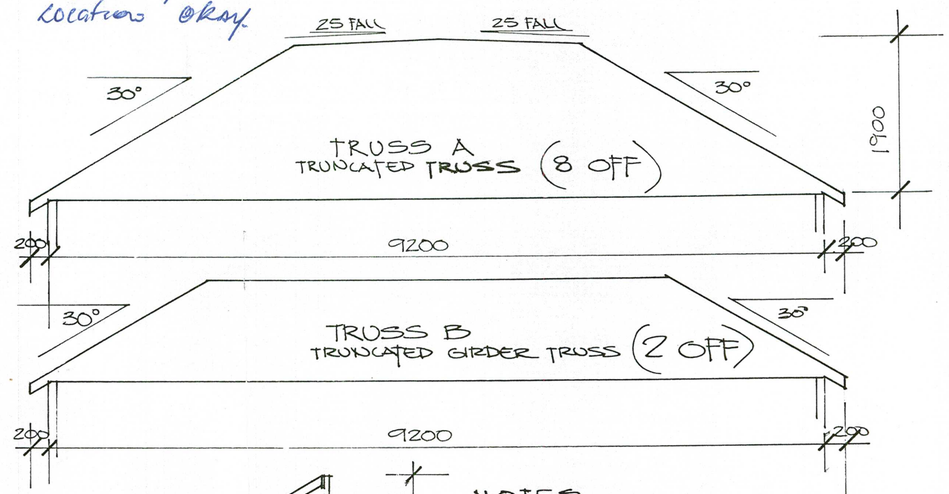
Scale: 1:450

0 7 14 Meters



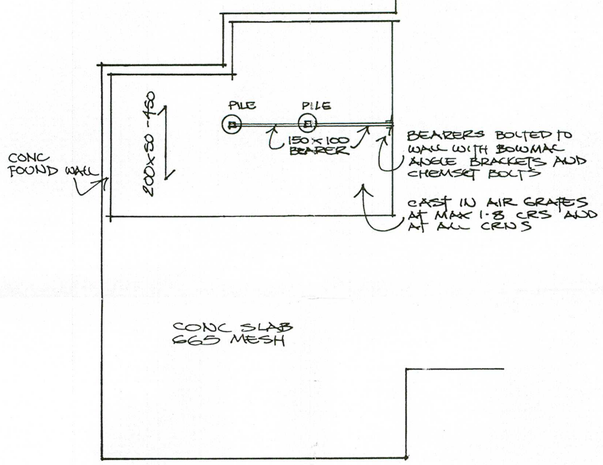
SITE - ROOF PLAN. 1·100

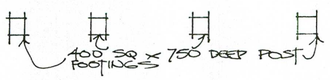
Parking
Height okay Just !!!
Location okay



NOTES
CHECK DIMENSIONS ON SITE PRIOR TO MANUFACTURE
TRUSSES TO BE DESIGNED FOR 1·0 KPa SNOW LOAD AND HIGH WIND
MANUFACTURER TO PROVIDE DESIGN CERTIFICATE TO Q.L.D.C.

SCHEDULE OF TRUSSES 1·50





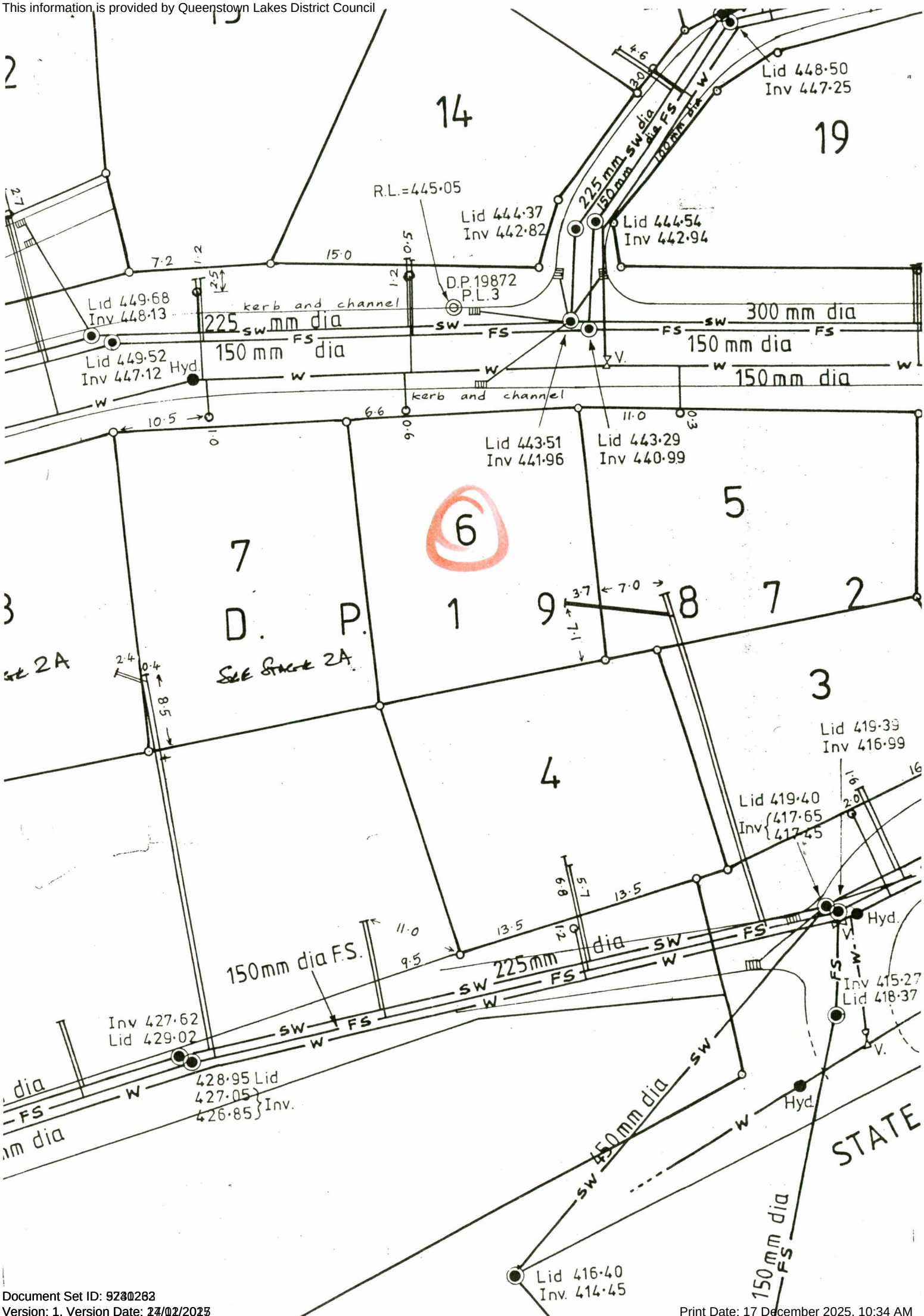
FOUNDATION PLAN
1·100

N

UNITS AT LOT 6, MARINA DRIVE, QUEENSTOWN

SITE PLAN
FOUNDATION PLAN
ROOF & ROOF FRAMING
TRUSS SCHEDULE
SCALE AS SHOWN
NOV 1993 93/9
2

PETER RAFFERTY
ARCHITECTURAL
DRAUGHTSMAN
QUEENSTOWN
(03) 4426470



FRANKTON ROAD

AS BUILT PLAN OF MARINA HEIGHTS SUBDIVISION STAGE 1
MARINA DRIVE, CRESTA LANE

FR/2

Marina Heights - As Built Services

EQUIPMENT DEALERS

MARK FORTUNE McDONALD & ASSOCIATES
REGISTERED LAND SURVEYORS LAND DEVELOPMENT APPLANNING CONSULTANTS
Ist Floor, Beaumont House, 49 Beaumont Street Queenstown
P.O. Box 2001 Telephone (03) 442 6...
Ist Floor, Beaumont House, 49 Beaumont Street Queenstown
P.O. Box 1707 Telephone 1536
4a Tweed Ave Invercargill
P.O. Box 1707 Telephone (021) Bardd

AS-BUILT PLAN OF MARINA HEIGHTS SUBDIVISION STAGE 1

PT. SEC 12

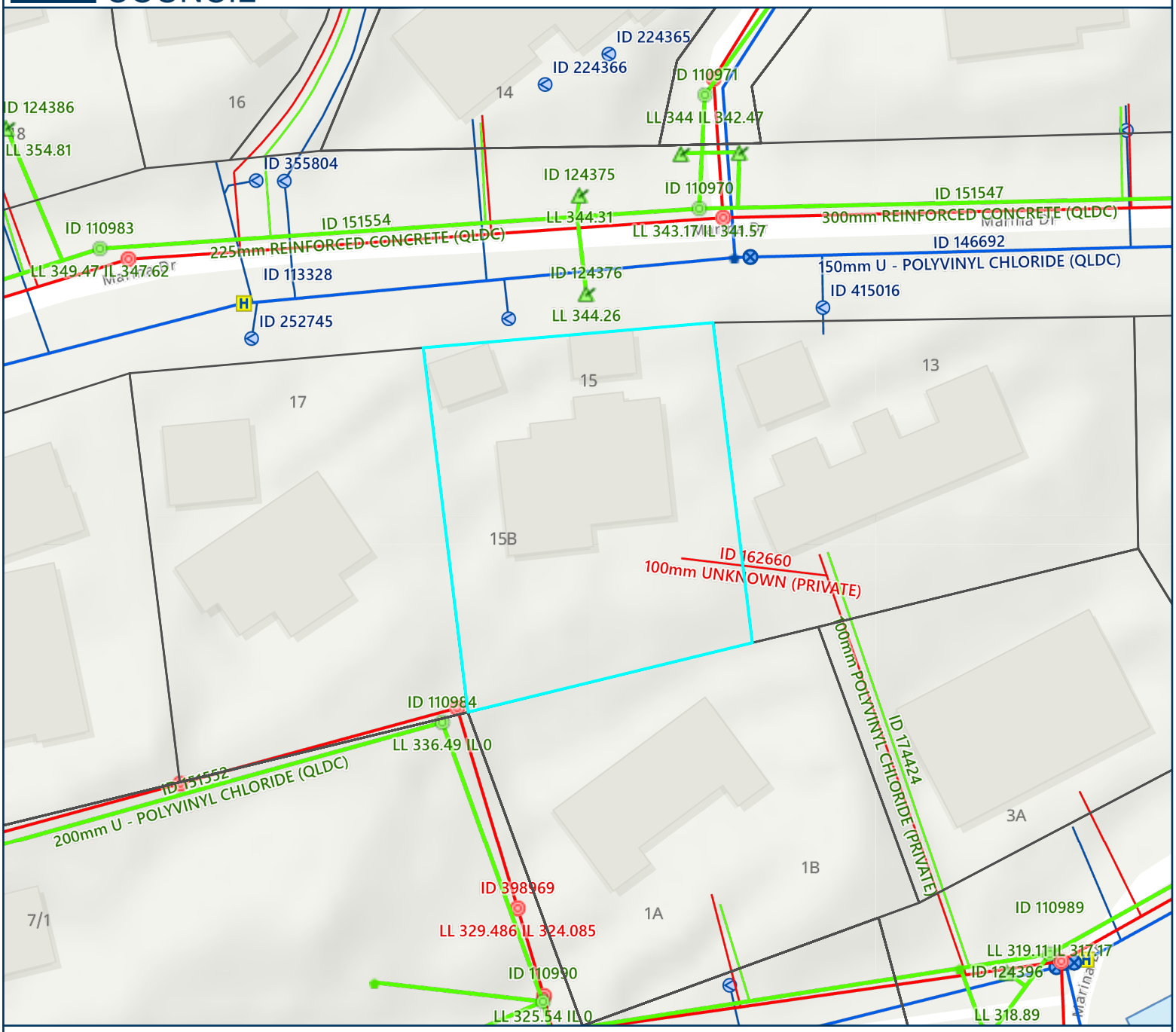
STATE HIGHWAY No. 6A

DRAWN P D
TRACED P D
CHECKED
DATE 5/11/87
SCALES 1:500
SERIES OF
REF 104/4002
SHEET

QUEENSTOWN LAKES DISTRICT COUNCIL

Services Map

PRINT DATE: 17/12/2025



- Stormwater Manhole
- Stormwater Inlet
- Stormwater Node
- Stormwater Main

Stormwater Lateral

- ACTIVE
- Wastewater Manhole

Wastewater Main

- Sewer Main

Wastewater Lateral

- ACTIVE

Watersupply Valve

- OPEN-NETWORK VALVE
- SERVICE VALVE

- Watersupply Hydrant
- Watersupply Node

Watersupply Main

- Principal Supply Main

Watersupply Lateral

- Active
- Watersupply Pumpstation

Scale: 1:500

0 8 16 Meters

Hazard Reports

15A MARINA DRIVE FRANKTON QUEENSTOWN 9300

Note: Copies of these reports can be obtained by contacting the LIM Team on LIMinformation@qldc.govt.nz

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Enginering Geology Report on Proposed Subdivision

Location:	Bishop Property Frankton - MARINA HEIGHTS
Details:	This report decribes the engineering geological assessment pertaining to the property owned by Mr J.R. Bishop.
Date:	20/02/1985
Author:	"Bell, D. H."
Comments:	For MR JR Bishop. Geological Site Plan included. Also includes letter regarding Earthworks Construction Quality Control (10/04/86)

"Marina Heights (1), Batter Stability"

Location:	Marina Heights
Details:	copy available from Resource Consent file at Civic Corp.
Date:	28/02/1995
Author:	"Bell, D. H."
Comments:	CP/2367 to Clark Fortune McDonald & Associates

Preliminary Geological Appraisal

Location:	Oak Tree Landslide
Details:	
Date:	10-Jul-00
Author:	"Thomson, R."
Comments:	Report taken from SH 6A Carriageway Improvement Scheme Assessment Report

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The Wakatipu Landscape

Location:	Wakatipu Basin
Details:	
Date:	Mar-91
Author:	Boffa Miskell Partners Ltd
Comments:	

Land use planning and development suitability in Queenstown New Zealand

Location: Queenstown & Environs

Details: "Figures with this report include Engineering Data Sheet, Map of Development Suitability, Bore Hole Logs, Queenstown Urban Area Cross Sections, & Engineering Geology."

Date: 1994

Author: Virginia Cunningham

Comments:

Water Supply Strategic Planning Review

Location: Queenstown Lakes District

Details: The aim of this report is to identify strategic issues relevant to forward planning of the water scheme's overall capacity to cope with the much increased predicted demand.

Date: Dec-94

Author: Royds Consulting Ltd

Comments:

Queenstown Water Supply Peak Demand Monitoring

Location: Queenstown

Details: "This report describes the demand monitoring study of the Queenstown water supply system. The results of the analysis are presented, followed by a discussion of these results."

Date: Mar-97

Author: Tonkin & Taylor Ltd

Comments:

Queenstown Water Supply Network Analysis & Reticulation Report

Location: Queenstown

Details: "The revision of the network analysis (Qtn Water Supply Reticulation Report, T&T, Aug 96) was prompted by the determination of demand peaking factors from flow records in the 1996-97 Christmas-New Year period (Qtn Peak Demand Monitoring Report - T&T, Mar

Date: Aug-97

Author: Tonkin & Taylor Ltd

Comments:

Water Supply Design Review

Location: Queenstown

Details: The report details the design review work for Queenstown Water supply that has been undertaken by Montgomery Watson.

Date: Dec-99

Author: Montgomery Watson NZ Ltd

Comments:

New Zealand Geological Survey Report

Location: "Geology of Urban Subdivision Areas: Kelvin Heights, Frankton Arm, & Fernhill, Queenstown"

Details: This report outlines the principal rock types encountered in the various subdivisions and briefly describes their properties.

Date: 18/05/1979

Author: "Barry, JM & Turnbull, IM "

Comments:

Plan of Mass Earthworks

Location: Marina Heights Subdivision

Details: This Plan identifies the location of mass earthworks on this subdivision.

Date: Mar-86

Author: CFMc

Comments:

"Concept Plan Marine Heights Subdivision, Frankton"

Location: "Marina Heights, Frankton"

Details: Staff have inspected the site of this proposal and the following comments are provided for Council pursuant to s.278 Local Government Act 1974.

Date: 11-Mar-85

Author: Otago Catchment and Regional Water Boards

Comments:

Queenstown Sewerage Design Review

Location: Queenstown

Details: A design review of Queenstown's sewerage system has been undertaken for the period from 1999 to 2019. The review has focussed on the capacity of key system

components to handle an increasing volume of sewage resulting from a growing population.

Date: Aug-99

Author: Montgomery Watson NZ Ltd

Comments:

Queenstown Sewerage Scheme Strategic Plan

Location: Queenstown

Details: The aim of this study is to identify strategic issues relevant to forward planning of the sewerage scheme overall capacity to cope with the much increased predicted demand.

Date: Aug-94

Author: Royds Consulting Ltd

Comments:

Queenstown Water Supply Strategic Planning Review

Location: Queenstown

Details: The aim of this report is to identify strategic issues relevant to forward planning of the water scheme's overall capacity to cope with the much increased predicted demand.

Date: Dec-94

Author: Royds Consulting Ltd

Comments:

Tomorrows Queenstown - Final Report

Location:

Details:

Date: 2002

Author: QLDC

Comments:

Queenstown Catchment Stormwater Management Plan

Location:

Details:

Date: 2002

Author: Opus

Comments:

Queenstown Peak Demand Monitoring

Location:

Details:

Date: 1997

Author: Tonkin and Taylor

Comments:

Queenstown Water Supply - Reticulation Report - Update

Location:

Details:

Date: 1997

Author: Tonkin and Taylor

Comments:

Queenstown Water Supply - Design Review

Location:

Details:

Date: 1999

Author: MWH

Comments:

Briefing Paper - Future Sewage Treatment and Disposal from Queenstown

Location:

Details:

Date: 2002

Author: MWH

Comments:

"ABS Pumps, Queenstown"

Location:

Details:

Date: 1999

Author: Mono Pumps

Comments:

Upgrading of Hawea and Albert Town Oxidation Ponds - Review of Upgrading Options

Location:

Details:

Date: 1999

Author: MWH

Comments:

Queenstown Urban Land Use Capability Study

Location: "Kelvin Heights, Frankton Road, Queenstown, Fernhill"

Details: Following concern expressed at the level of residential development occurring around the Queenstown area Board moved to undertake a study to assess the hazards which could influence the safety of future developments. This study will assist developers to

Date: 1989

Author: Otago Catchment and Regional Water Boards

Comments: "See also ""Preliminary Assessment of Queenstown Land-Use Capability Survey"", D Bell, 15/05/1988. Copy not avail at Council, contact author directly."

SH6A-Queenstown Hazard Register GIS Package

Location: Frankton Road, Queenstown Arthurs Point, Frankton

Details: Collates existing information on hazards to update the QLDC Hazard Register and also define specific hazards relating to state Highway 6A

Date: June 2008

Author: Tonkin & Taylor Ltd

Comments: GIS data was used to update the hazard maps

Seismic Risk in the Otago Region (2005)

Location: District wide

Details: Saul Dale for the proposed sub-division development located 108 Main Road Luggate

Date: March 2005

Author: Opus

Comments: Liquefaction susceptibility maps used to update QLDC hazard register maps. Source data map scale 1:100,000 Supersedes liquefaction data from Opus (2002)

Hazards Register Part II Stage 2 Risk Management Study Report

Location: District wide

Details: Review of Councils hazard responsibilities. Review of the hazards and consequential risks to the community

Date: 2002

Author: Opus

Comments: Includes a review of the following hazards: Flooding, Erosion, Landslides, Avalanche, Seismic hazards, Landfills and Contaminated Sites, Mine Workings. Includes Hazard maps

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Queenstown Lakes District 2012 liquefaction hazard assessment

Location: Queenstown Wanaka Glenorchy Kingston

Details: Refine the current QLDC liquefaction hazard maps using existing available ground investigation data. Further information with respect to the expected liquefaction risk, and an appropriate level of ground investigation, has been determined.

Date: 2012

Author: Tonkin & Taylor Ltd

Comments: This data has been combined with OPUS 2002 data to create a combined layer of Liquefaction risk.

Queenstown Lakes District Floodplain Report Nov 1999

Location: District wide

Details:

Date: 1999

Author: ORC

Comments:

Otago Alluvial Fans Project Report

Location: District wide

Details: Stage I, In some cases more accurate informating will be available in subsiquent investigations

Date: 2002

Author: Opus

Comments: Includes a review of the following hazards: Flooding, Erosion, Landslides, Avalanche, Seismic hazards, Landfills and Contaminated Sites, Mine Workings. Includes Hazard maps

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QUEENSTOWN LAKES DISTRICT COUNCIL

The information displayed is schematic only and serves as a guide. It has been compiled from Queenstown Lakes District Council records and is made available in good faith, but its accuracy or completeness is not guaranteed. Cadastral Information has been derived from Land Information New Zealand's (LINZ) Core Record System Database (CRS).

Date: 17/12/2025

TAX INVOICE

GST No: 49-635-680

PAID

SALLY PATCHETT
15A MARINA DRIVE
FRANKTON
QUEENSTOWN 9300

Application Reference:	Land Information Memorandum - LM252116
Site Address:	15A MARINA DRIVE FRANKTON QUEENSTOWN 9300
Tax Invoice Number	2025219235
Invoice Date:	17 December 2025

CHARGE SUMMARY

Charge Description	Qty	Comment	Exclusive amount	Disc	GST Amount	Inclusive Amount
Residential LIM Charge	1		$259.13	$0.00	$38.87	$298.00
Total Amount Due			$259.13	$0.00	$38.87	$298.00

TOTAL AMOUNT DUE. PLEASE PAY THIS AMOUNT WITHIN 30 DAYS.

Payments can be made at **www.qldc.govt.nz/online-payments** and select **Application Payment**
Online payments made via credit card incur a 2% processing fee.

Please email account enquiries to: debtors@qldc.govt.nz

Direct payments can be made to: BNZ Queenstown **02-0948-0002000-00**
Please note LM252116 and 2025219235 as references on any payments
Remittance advices can be emailed to accounts@qldc.govt.nz

For internal use only:

Receipt No

Payment Method: Cash ☐ Card ☐