



Sunshine Bay - Arawata Terrace

Arawata Terrace Intersection

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Rev. No.	Date	Description	Prepared By	Checked By	Reviewed By	Approved By
1	01/10/2019	Draft	C Rossiter		S Lloyd	
2	04/10/2019	Final	C Rossiter		S Lloyd	C Rossiter
3	23/10/2019	Update – higher density	C Rossiter			C Rossiter

1 Introduction

Sunshine Bay Limited (SBL) owns 6.5ha of land to the south of the existing residential development at Fernhill overlooking Sunshine Bay. The land is bounded to the east by Glenorchy-Queenstown Road and by an unformed legal road to the West. SBL proposes to develop the site for residential activity and also allow for some visitor accommodation. Vehicle access is proposed via a new road to be formed along the legal road alignment to the west with a connection to Arawata Terrace. This report provides a review of the proposed new road and intersection.

2 Existing Transport Environment

Fernhill is a residential suburb of Queenstown located about 2km south of the Queenstown Central Business District. Fernhill Road is classified as a Collector Road in the Queenstown Lakes District Council (QLDC) District Plan and has been formed as a loop road through the suburb. At its northern limit, it meets Lake Esplanade and Glenorchy-Queenstown Road at a roundabout intersection. The southern limit of Fernhill Road meets Glenorchy-Queenstown Road at a priority intersection.



Figure 2-1: Road network and site location (Source: QLDC GIS)

Figure 2-1 shows the site location to the south of the existing residential development. Vehicle access to the site is via the Arawata Track along the legal road alignment which connects to Arawata Terrace, a local road in the District Plan.

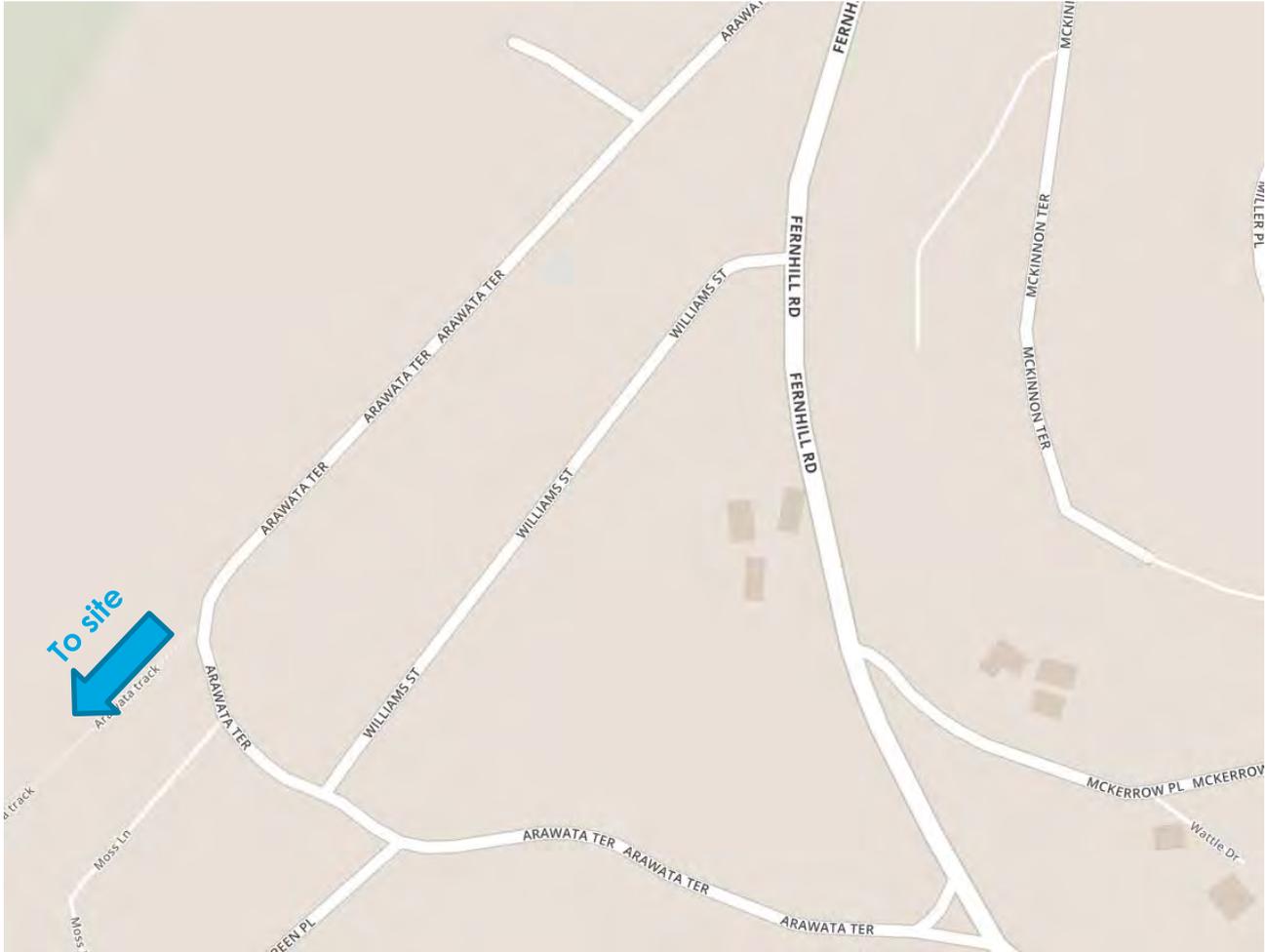


Figure 2-2: Site Location

The Arawata Track currently meets Arawata Terrace at a vehicle crossing as shown in Photograph 1. Photograph 2 and Photograph 3 show views of Arawata Terrace to the north and south of the crossing.

In this location, Arawata Terrace has a formed width of 7.5m with a footpath on the eastern boundary and has a moderate gradient rising towards the north. "No-stopping" lines have been marked around the inside the curve.



Photograph 1: Arawata Track crossing to Arawata Terrace



Photograph 2: Arawata Terrace – View North



Photograph 3: Arawata Terrace – View South

Arawata Track provides vehicle access to one property on the western side of the track. It has been formed with a 4m wide sealed surface from Arawata Terrace to the property access, a distance of about 40m (Photograph 4). The track has a moderate gradient that descends toward the crossing at Arawata Terrace.



Photograph 4: Arawata Track - View north to Arawata Terrace

South of the residential property, the track continues as an unformed road that is used primarily by trampers and mountain bikers. It also provides vehicle access to the electrical pylons that run broadly parallel to the track.



Photograph 5: Arawata Track

3 Existing Travel Patterns

3.1 Traffic Volumes

The Mobile Road website has been used to determine existing traffic volumes on roads close to the site. It indicates that Arawata Terrace carries a daily traffic volume of less than 400 vehicles per day (vpd) beside Arawata Track. The peak hour of traffic generation for residential activity typically represents about ten percent of the average daily traffic generation and on that basis, peak hour volumes on Arawata Terrace are expected to be about 40 vehicles per hour (vph).

The traffic volume on Arawata Terrace rises to nearer 600vpd west of its intersection with Fernhill Road.

Fernhill Road carries an average daily traffic volume of about 2,400vpd east of its southern intersection with Arawata Terrace.

Glenorchy-Queenstown road carries an average daily traffic volume of about 4,400vpd south of Fernhill Road and about 5,700vpd north of Fernhill Road.

3.2 Road Safety

The NZTA Crash Analysis System (CAS) has been used to investigate recent crashes in the area to assess the existing levels of road safety. Figure 3-1 shows the locations of reported crashes over the full five period 2014-2018 and any crashes reported in 2019. 13 crashes were reported over the 2014-18 period with no crashes reported in 2019. Eleven of the crashes involved a single vehicle only and were generally attributed to a loss of control.

One of the crashes involving two vehicles occurred at the Fernhill Road / Glenorchy-Queenstown Road intersection and was attributed to mis-judgement by an inexperienced driver. The other crash was a rear-end collision when the following vehicle was too close to the leading vehicle and the driver did not react to the slowing of the lead vehicle.

Only one crash resulted in injuries (minor) and was attributed to excess alcohol.

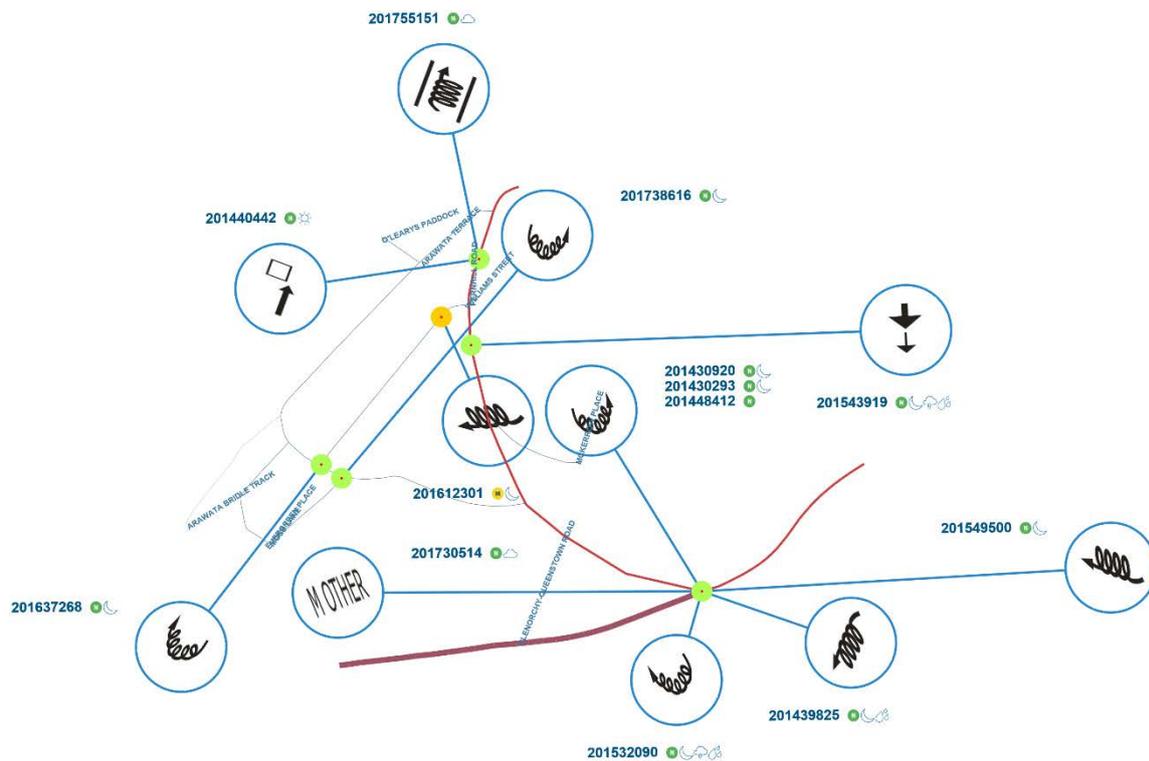


Figure 3-1: Reported Crash Locations 2014-19 (See Appendix 1 for key)

The loss of control crashes have a wide variety of contributing factors including loose surfaces, animals, excessive speed and excessive alcohol. The crashes occurred at different times of the day and different days of the week. This does not raise any particular concerns with the road network.

4 Proposed Development

SBL propose that a range of housing types are constructed within the site included detached housing, low density and high-density terrace housing plus short-term visitor accommodation. New roads will be constructed through the site to connect to a new road along the Arawata Track legal road alignment.

The preliminary development plans suggest that the site would enable 100-200 new residential dwellings to be constructed. The dwellings would comprise a mix of detached houses, terraced units and integrated units.

The new roads for the subdivision will be constructed largely in accordance with the QLD Engineering Code of Practice (COP) road design standard for an E12 type road. Proposed differences from the design standard include:

1. 6m wide carriageway to provide more space for emergency vehicles to pass any parked vehicles;
2. 1.5m wide footpath on one side of the road only because of topographic constraints;
3. Centre-line gradient marginally exceeds 12.5% in two locations over a distance of about 10m; and,
4. Reduced road reserve width.

The COP includes a requirement for residential subdivisions to provide a minimum on-street parking supply of one space per dwelling based on permitted density. The steep topography of the site and consequential winding nature of the new roads will constrain the number of opportunities to provide on-street parking and it is unlikely that the number of on-street parking spaces that could be provided will achieve the supply rate of one space per dwelling set out in the COP. This aspect of the road design is under review and will be refined

through the detailed design to ensure that the supply rate is as high as practical in accordance with the COP requirement.

The design of the new road leading to the residential development will allow the access to the one existing property located off Arawata Track to be maintained.

Appendix A to this report includes drawings that show the proposed new intersection on Arawata Terrace. It shows that a new intersection can be formed that provides sufficient space for a NZS2890.2 medium-sized, rigid vehicle to negotiate the intersection. This size of design vehicle has been adopted because it is representative of a typical waste collection vehicle and of a fire truck.

5 Expected Traffic Generation

The QLDC Engineering Code of Practice requires that new residential developments are assessed using a traffic generation rate of 8vpd per unit. Since the current development concept will provide 100-200 new dwellings, full development of the site could generate up to 1,600vpd on Arawata Track.

During the morning and evening peak hours, residential activity will typically exhibit an average traffic generation rate of 1vph per dwelling and on this basis, the site could generate about 160vph during the peak periods. During the morning peak, the dominant movement is expected to be outbound and account for about 85 percent of all movements. The directional flows are expected to be more balanced in the evening with about 65 percent being inbound and 35 percent being outbound.

6 Expected Traffic Effects

Since the most direct route from the site to Queenstown is via the southern sections of Arawata Terrace and Fernhill Road respectively, it is likely that the majority of vehicle movements from the site will use these roads. This means that during the morning peak period, there could be up to 135vph turning right onto Arawata Terrace and an additional 135vph turning right from Arawata Terrace into Fernhill Road.

With the low volume of existing vehicle movements on Arawata Terrace, it is expected that the right turn movement from Arawata Track into Arawata Terrace could be undertaken with negligible delays and would not be expected to generate any queues.

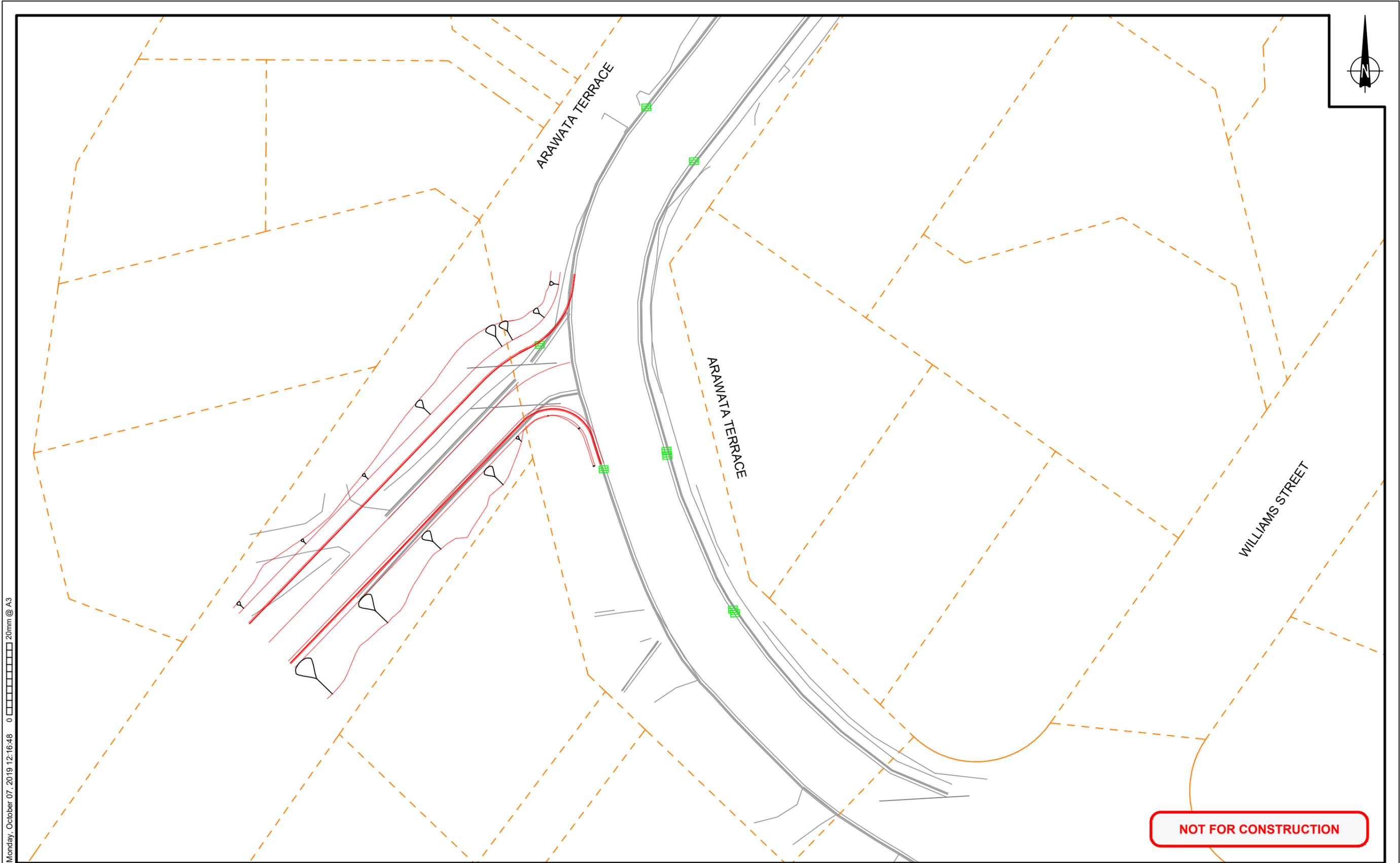
Although the development will increase the right turn volumes in the morning peak at the Arawata Terrace / Fernhill Road intersection and also the left turn volumes at the Fernhill Road / Glenorchy-Queenstown Road intersections, the existing traffic volumes are low and it is expected that the intersections will continue to operate with Level of Service B or better.

7 Conclusions

SBL propose to establish a new residential subdivision on 6.5ha of land at the southern end of Fernhill with vehicle access provided along the alignment of an existing legal road, Arawata Track. The new roads for the subdivision can be largely formed in accordance with the QLDC COP design standards.

A concept design for the new intersection linking Arawata Track to Arawata Terrace has been developed and provides sufficient space to accommodate the tracking of a medium sized rigid truck.

Although the new development will increase the volume of movements on Arawata Terrace and Fernhill Road, these roads currently carry low volumes of traffic and have sufficient capacity to accommodate the additional movements with no noticeable effects on intersection performance.



Monday, October 07, 2019 12:16:48 0 20mm @ A3



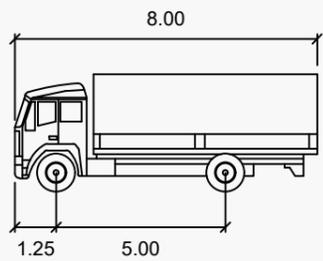
REV	DATE	DRN	DESCRIPTION	CHK	APPR
0	07/10/2019	AKJ	ISSUED FOR INFORMATION	N/A	N/A

SUNSHINE BAY LIMITED
ARAWATA TERRACE
SITE PLAN

DRN: AKJ | DATE: 07/10/2019 | REV: 0
 SCALE: 1:400 @ A3
 STATUS:
 DWG NO: 310203375_C2A



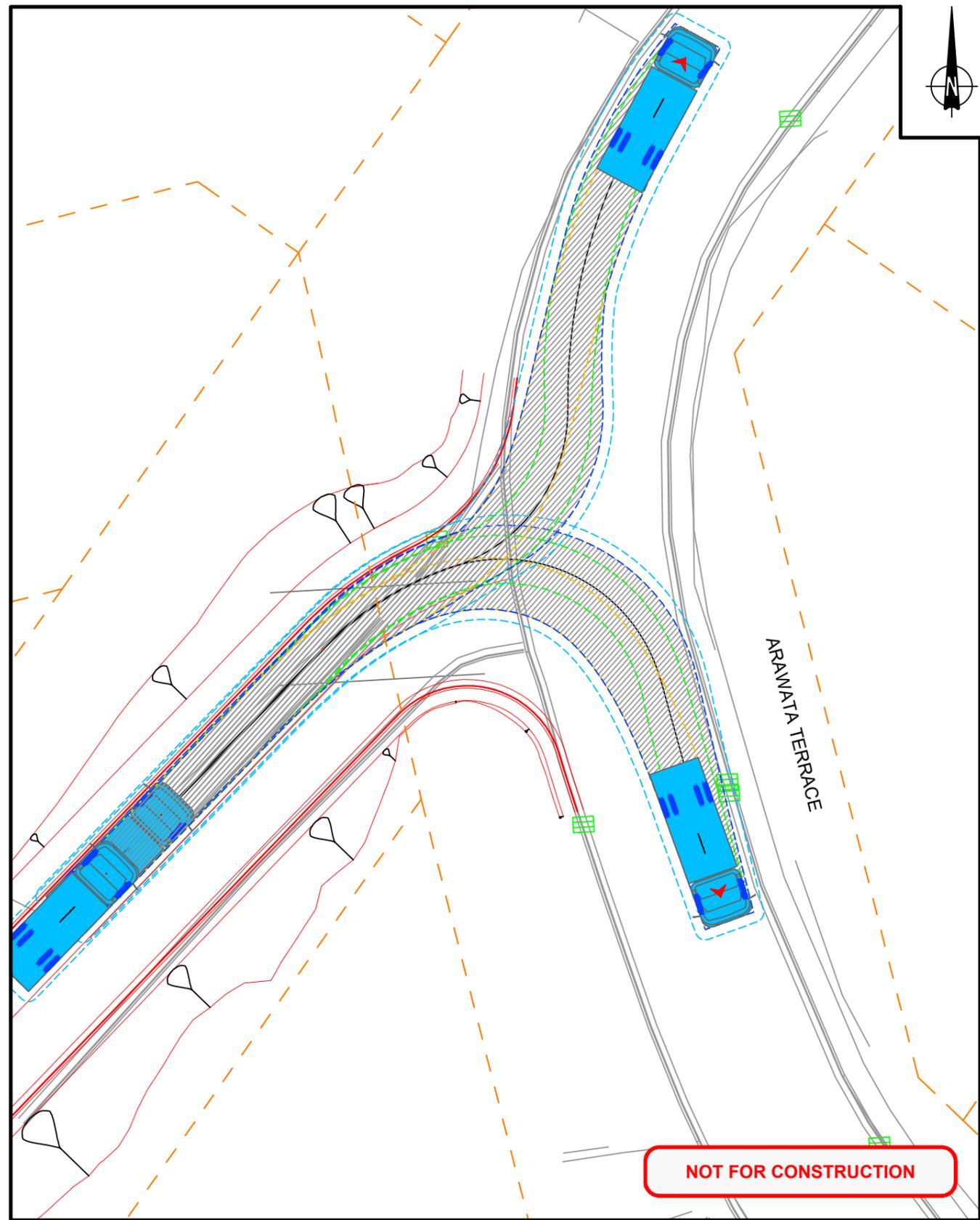
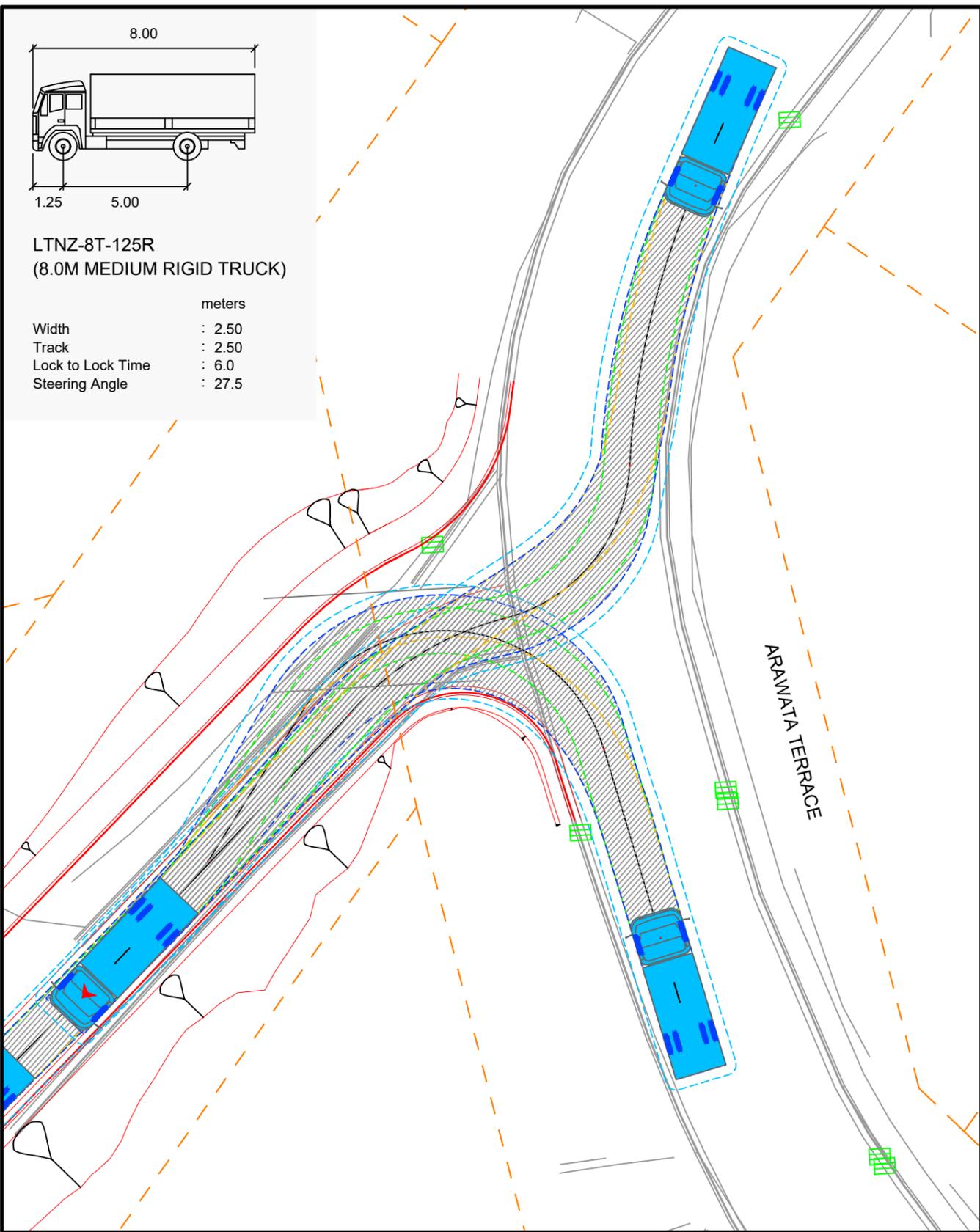
1
 SHT 1 OF 2



LTNZ-8T-125R
(8.0M MEDIUM RIGID TRUCK)

	units
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 27.5

Monday, October 07, 2019 12:16:48 0 20mm @ A3



REV	DATE	DRN	DESCRIPTION	CHK	APPR
0	07/10/2019	AKJ	ISSUED FOR INFORMATION	N/A	N/A

SUNSHINE BAY LIMITED
ARAWATA TERRACE
VEHICLE TRACKING

DRN: AKJ	DATE: 07/10/2019	REV: 0
SCALE: 1:250 @ A3		
STATUS:		
DWG NO: 310203375_C2A		



2
SHT 2 OF 2



ARAWATA TERRACE ALIGNMENT
 Length 520m
 Approx Volumes STRIP 2210m³
 CUT 2050m³
 FILL 2790m³
 Max Depths CUT 4.9m
 FILL 3.5m
 Earthworks Area 7210m²

ALIGNMENT #2
 Length 110m
 Approx Volumes STRIP 360m³
 CUT 820m³
 FILL 450m³
 Max Depths CUT 4.5m
 FILL 2.8m
 Earthworks Area 1210m²

ALIGNMENT #1
 Length 550m
 Approx Volumes STRIP 2280m³
 CUT 3365m³
 FILL 4840m³
 Max Depths CUT 4.8m
 FILL 5.9m
 Earthworks Area 7725m²

REV	DATE	DESCRIPTION	APPROVED
B	18.09.19	ALIGNMENTS REVISED	JFM
A	27.08.19	DRAFT	JFM

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DESIGN	DATE
JDR	27.08.19
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JFM	27.08.19
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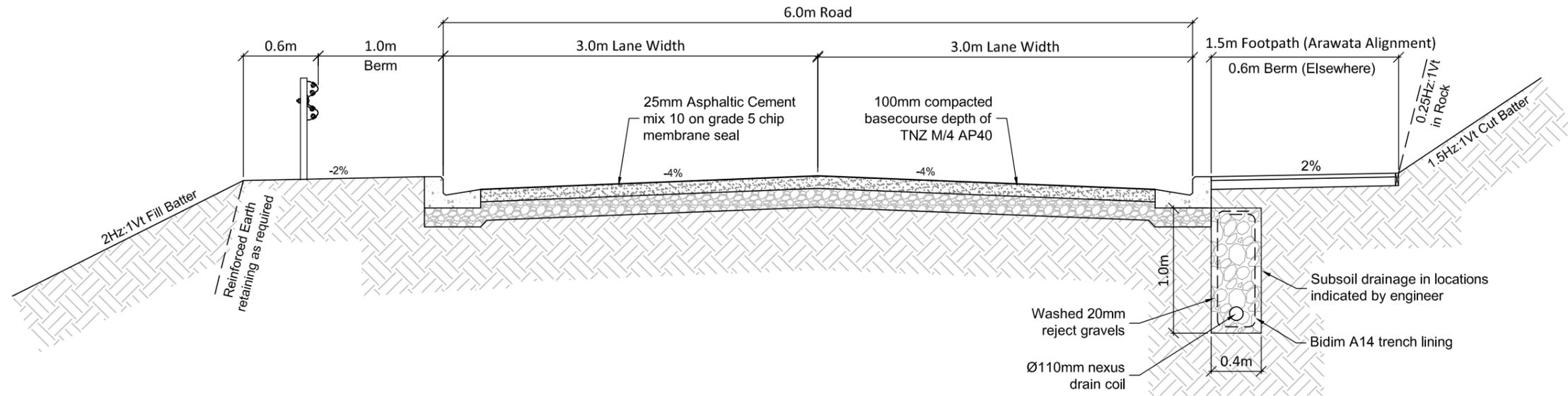
PROJECT & LOCATION

PROPOSED SUBDIVISION
 GLENORCHY RD / ARAWATA TCE - QUEENSTOWN

TITLE

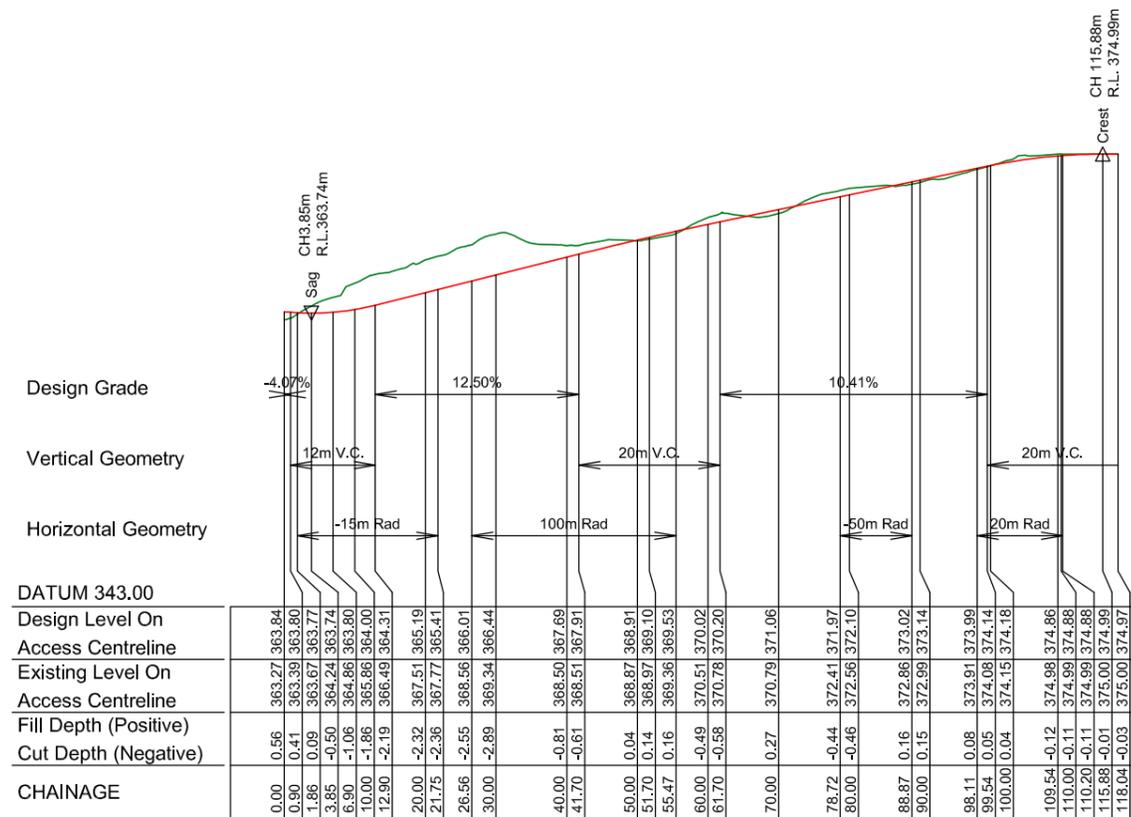
PROPOSD ACCESS FEASIBILITY - ARAWATA TCE
 OVERALL PLAN

CONTRACT NUMBER	-
SCALE (AT A3)	1:1500
DRAWING NUMBER	QV029-F-1200
REVISION	B



TYPICAL ROAD CROSS SECTION

Scale 1:40



LONGITUDINAL SECTION ALIGNMENT 2

Horizontal scale 1:1000

Vertical scale 1:500

REV	DATE	DESCRIPTION	APPROVED
B	18.09.19	ALIGNMENTS REVISED	JFM
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PROJECT LOCATION

**PROPOSED SUBDIVISION
GLENORCHY RD / ARAWATA TCE - QUEENSTOWN**

TITLE

**PROPOSD ACCESS FEASIBILITY - ARAWATA TCE
TYPICAL SECTION & ALIGNMENT 2 LONG SECTION**

CONTRACT NUMBER	-
SCALE (AT A3)	As Shown
DRAWING NUMBER	QV029-F-1205
REVISION	B

Centreline Data
 X = 417654.95
 Y = 809771.08
 Z = 399.07

Datum 396

DESIGN HEIGHT	398.44	398.44	399.01	399.02	399.04	398.97	399.07	399.07	401.17
EXISTING SURFACE	398.44	398.79	398.96	399.04	399.09	399.04	399.33	399.07	401.17
DESIGN OFFSET	-5.75	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65

CHAINAGE 40.000

Centreline Data
 X = 417669.86
 Y = 809784.4
 Z = 397.3

Datum 396

DESIGN HEIGHT	397.13	397.24	397.25	397.27	397.19	397.30	397.19	397.27	397.30	401.53
EXISTING SURFACE	397.13	397.16	397.20	397.25	397.27	397.39	398.23	398.44	397.27	401.53
DESIGN OFFSET	-4.82	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	11.00

CHAINAGE 20.000

Centreline Data
 X = 417686.89
 Y = 809794.13
 Z = 395.59

Datum 393

DESIGN HEIGHT	394.60	394.60	395.53	395.54	395.56	395.48	395.59	395.48	396.35
EXISTING SURFACE	394.60	394.87	394.95	395.06	395.13	395.48	395.54	395.59	396.35
DESIGN OFFSET	-6.45	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	5.79

CHAINAGE 0.000

Centreline Data
 X = 417618.58
 Y = 809723.78
 Z = 395.03

Datum 392

DESIGN HEIGHT	394.08	394.08	394.97	394.98	394.99	394.92	395.03	394.98	395.02	396.82
EXISTING SURFACE	394.08	394.16	394.35	394.61	394.99	394.76	394.98	394.99	395.02	396.82
DESIGN OFFSET	-4.82	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.10

CHAINAGE 100.000

Centreline Data
 X = 417630.2
 Y = 809740.03
 Z = 396.58

Datum 392

DESIGN HEIGHT	393.98	393.98	396.52	396.54	396.55	396.48	396.58	396.48	396.55	396.58	400.04
EXISTING SURFACE	393.98	395.79	396.08	396.54	396.55	396.43	396.60	396.48	396.55	396.58	400.04
DESIGN OFFSET	-9.69	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	9.84	

CHAINAGE 80.000

Centreline Data
 X = 417640.88
 Y = 809756.94
 Z = 398.6

Datum 394

DESIGN HEIGHT	395.68	395.68	398.54	398.55	398.57	398.49	398.60	398.49	398.57	399.27
EXISTING SURFACE	395.68	398.36	398.45	398.55	398.57	398.45	398.45	398.49	398.57	399.27
DESIGN OFFSET	-10.32	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.66

CHAINAGE 60.000

Centreline Data
 X = 417581.62
 Y = 809676.52
 Z = 391.65

Datum 389

DESIGN HEIGHT	389.91	391.59	391.60	391.61	391.54	391.65	391.54	391.61	391.64	395.22
EXISTING SURFACE	389.91	390.03	390.20	390.58	391.61	391.70	392.80	393.32	391.64	395.22
DESIGN OFFSET	-5.02	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.54

CHAINAGE 160.000

Centreline Data
 X = 417593.93
 Y = 809692.27
 Z = 393.75

Datum 389

DESIGN HEIGHT	390.74	393.69	393.70	393.72	393.65	393.75	393.65	393.72	393.75	396.02
EXISTING SURFACE	390.74	391.21	391.59	393.70	393.72	393.48	393.69	393.72	393.75	396.02
DESIGN OFFSET	-5.34	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.22

CHAINAGE 140.000

Centreline Data
 X = 417606.26
 Y = 809708.03
 Z = 394.66

Datum 391

DESIGN HEIGHT	392.51	394.60	394.61	394.62	394.55	394.66	394.55	394.62	394.65	397.03
EXISTING SURFACE	392.51	392.72	392.97	394.61	394.62	394.62	394.62	394.62	394.65	397.03
DESIGN OFFSET	-5.12	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.24

CHAINAGE 120.000

REV	DATE	DESCRIPTION	APPROVED
B	18.09.19	ALIGNMENTS REVISED	JFM
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DRAWN	DATE
JFM	27.08.19
CHECKED	DATE

CLIENT

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PROJECT LOCATION

PROPOSED SUBDIVISION
 GLENORCHY RD / ARAWATA TCE - QUEENSTOWN

TITLE

PROPOSD ACCESS FEASIBILITY - ARAWATA TCE
 ARAWATA TRACK CROSS SECTIONS Sheet 1

CONTRACT NUMBER	-
SCALE (AT A3)	1:200
DRAWING NUMBER	QV029-F-1220
REVISION	B

Centreline Data
 X = 417546.7
 Y = 809628.34
 Z = 394.24
 Datum 391

DESIGN HEIGHT	393.17	393.17	394.18	394.20	394.21	394.14	394.24	394.14	394.21	394.24	395.69
EXISTING SURFACE	393.17	393.25	393.38	393.53	393.62	394.14	394.12	394.64	394.75	394.21	395.69
DESIGN OFFSET	-4.85	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.01	

CHAINAGE 220.000

Centreline Data
 X = 417560.28
 Y = 809643.01
 Z = 394.08
 Datum 392

DESIGN HEIGHT	393.79	393.79	394.02	394.03	394.05	394.08	394.08	393.97	394.05	394.08	398.16
EXISTING SURFACE	393.79	393.84	394.00	394.00	394.05	394.01	394.64	393.97	394.05	394.08	398.16
DESIGN OFFSET	-4.66	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.67	

CHAINAGE 200.000

Centreline Data
 X = 417572.08
 Y = 809658.99
 Z = 392.71
 Datum 391

DESIGN HEIGHT	392.89	392.89	392.65	392.66	392.68	392.71	392.71	392.60	392.68	392.71	395.29
EXISTING SURFACE	392.89	392.95	392.95	392.98	392.98	392.42	393.31	393.81	392.68	392.71	395.29
DESIGN OFFSET	-4.96	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.30	

CHAINAGE 180.000

Centreline Data
 X = 417503.6
 Y = 809587.3
 Z = 398
 Datum 395

DESIGN HEIGHT	397.94	397.94	397.95	397.97	397.89	398.00	398.00	397.89	397.97	398.00	398.92
EXISTING SURFACE	396.84	397.28	397.46	397.70	397.89	398.30	398.58	398.61	397.97	398.88	398.92
DESIGN OFFSET	-4.60	-3.15	-2.65	0.00	2.65	3.15	4.65	4.88			

CHAINAGE 280.000

Centreline Data
 X = 417518.22
 Y = 809600.5
 Z = 395.58
 Datum 394

DESIGN HEIGHT	395.52	395.52	395.53	395.55	395.47	395.58	395.58	395.47	395.55	395.58	399.16
EXISTING SURFACE	395.27	395.46	395.55	395.81	395.47	395.97	396.68	395.47	395.55	395.58	399.16
DESIGN OFFSET	-4.60	-3.15	-2.65	0.00	2.65	3.15	4.65	5.55			

CHAINAGE 260.000

Centreline Data
 X = 417533.11
 Y = 809613.66
 Z = 394.37
 Datum 392

DESIGN HEIGHT	394.04	394.04	394.31	394.33	394.34	394.27	394.37	394.27	394.34	394.37	398.14
EXISTING SURFACE	394.04	394.10	394.17	394.27	394.34	394.65	394.97	394.34	394.37	394.37	398.14
DESIGN OFFSET	-5.15	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.59	

CHAINAGE 240.000

Centreline Data
 X = 417469.38
 Y = 809538.47
 Z = 403.41
 Datum 396

DESIGN HEIGHT	403.35	403.35	403.36	403.38	403.30	403.41	403.41	403.30	403.38	403.41	404.52
EXISTING SURFACE	402.01	402.25	402.59	402.79	403.30	403.32	403.70	403.75	403.38	404.28	404.52
DESIGN OFFSET	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	4.93		

CHAINAGE 340.000

Centreline Data
 X = 417482.46
 Y = 809553.61
 Z = 401.86
 Datum 394

DESIGN HEIGHT	401.80	401.80	401.81	401.82	401.75	401.86	401.86	401.75	401.82	401.86	405.79
EXISTING SURFACE	400.56	400.92	401.10	401.16	401.75	401.48	401.93	402.06	401.82	405.04	405.79
DESIGN OFFSET	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.63		

CHAINAGE 320.000

Centreline Data
 X = 417494.56
 Y = 809569.46
 Z = 400.21
 Datum 399

DESIGN HEIGHT	400.24	400.15	400.16	400.18	400.10	400.21	400.10	400.18	400.21	404.52	
EXISTING SURFACE	400.24	400.26	400.33	400.42	400.47	400.76	401.71	402.23	400.18	403.79	404.52
DESIGN OFFSET	-4.74	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	4.65	5.73	

CHAINAGE 300.000

REV	DATE	DESCRIPTION	APPROVED
B	18.09.19	ALIGNMENTS REVISED	JFM
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JFM	27.08.19	CLIENT
DESIGN	DATE	SUNSHINE BAY Ltd
JDR	27.08.19	
DRAWN	DATE	
JFM	27.08.19	35
CHECKED	DATE	

CLIENT

SUNSHINE BAY Ltd

35

PROJECT LOCATION

PROPOSED SUBDIVISION
 GLENORCHY RD / ARAWATA TCE - QUEENSTOWN

TITLE

PROPOSD ACCESS FEASIBILITY - ARAWATA TCE
 ARAWATA TRACK CROSS SECTIONS Sheet 2

CONTRACT NUMBER

SCALE (AT A3)

1:200

DRAWING NUMBER

QV029-F-1225

REVISION

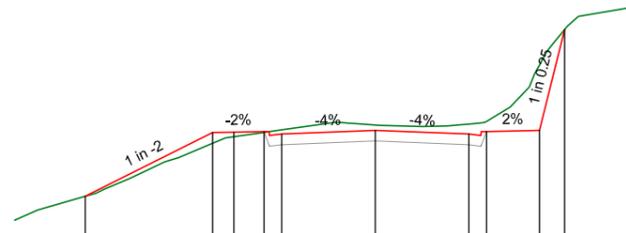
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Centreline Data
 X = 417438.72
 Y = 809488.15
 Z = 407.78

Datum 404

DESIGN HEIGHT	405.91	407.72	407.73	407.74	407.67	407.78	407.67	407.74	410.63
EXISTING SURFACE	405.91	407.41	407.60	407.74	407.79	407.93	407.96	408.03	410.63
DESIGN OFFSET	-8.21	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	5.36

CHAINAGE 400.000

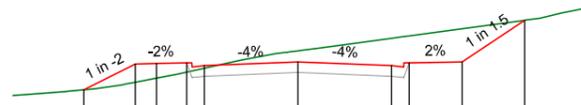


Centreline Data
 X = 417425.57
 Y = 809409.62
 Z = 404.76

Datum 403

DESIGN HEIGHT	403.97	404.70	404.72	404.73	404.66	404.76	404.66	404.73	405.94
EXISTING SURFACE	403.97	404.19	404.30	404.73	404.66	405.08	405.43	405.50	405.94
DESIGN OFFSET	-6.06	-4.60	-4.00	-3.15	-2.65	-0.00	2.65	3.15	6.42

CHAINAGE 480.000

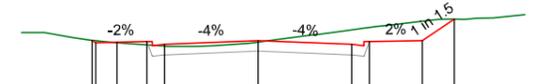


Centreline Data
 X = 417424.89
 Y = 809369.62
 Z = 399.77

Datum 398

DESIGN HEIGHT	399.78	399.71	399.73	399.74	399.67	399.77	399.67	399.74	400.38
EXISTING SURFACE	399.78	399.77	399.72	399.74	399.67	399.73	400.08	400.14	400.38
DESIGN OFFSET	-4.70	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	5.55

CHAINAGE 520.000

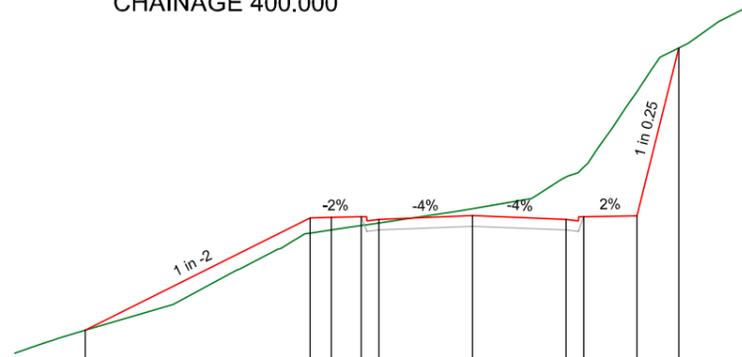


Centreline Data
 X = 417444.57
 Y = 809507.24
 Z = 406.51

Datum 402

DESIGN HEIGHT	403.27	406.45	406.47	406.48	406.41	406.51	406.41	406.48	411.26
EXISTING SURFACE	403.27	406.02	406.11	406.24	406.31	406.71	407.61	407.89	411.26
DESIGN OFFSET	-10.97	-4.60	-4.00	-3.15	-2.65	-0.00	2.65	3.15	5.84

CHAINAGE 380.000

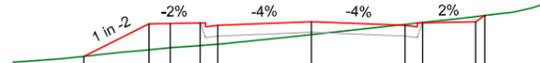


Centreline Data
 X = 417425.97
 Y = 809429.61
 Z = 406.73

Datum 405

DESIGN HEIGHT	405.75	406.67	406.69	406.70	406.63	406.73	406.63	406.70	406.91
EXISTING SURFACE	405.75	405.94	405.99	406.06	406.10	406.37	406.66	406.71	406.91
DESIGN OFFSET	-6.45	-4.60	-4.00	-3.15	-2.65	-0.00	2.65	3.15	4.91

CHAINAGE 460.000

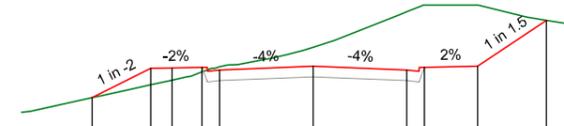


Centreline Data
 X = 417425.23
 Y = 809389.62
 Z = 402.27

Datum 400

DESIGN HEIGHT	401.39	402.21	402.23	402.24	402.17	402.27	402.17	402.24	403.57
EXISTING SURFACE	401.39	401.75	401.88	402.11	402.24	402.81	403.82	404.00	403.57
DESIGN OFFSET	-6.26	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	6.60

CHAINAGE 500.000

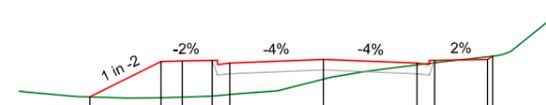


Centreline Data
 X = 417428.98
 Y = 809449.35
 Z = 407.89

Datum 406

DESIGN HEIGHT	406.83	407.83	407.84	407.86	407.79	407.89	407.79	407.86	407.98
EXISTING SURFACE	406.83	406.81	406.82	406.85	406.89	407.33	407.73	407.79	407.98
DESIGN OFFSET	-6.61	-4.60	-4.00	-3.15	-2.65	-0.00	2.65	3.15	4.79

CHAINAGE 440.000

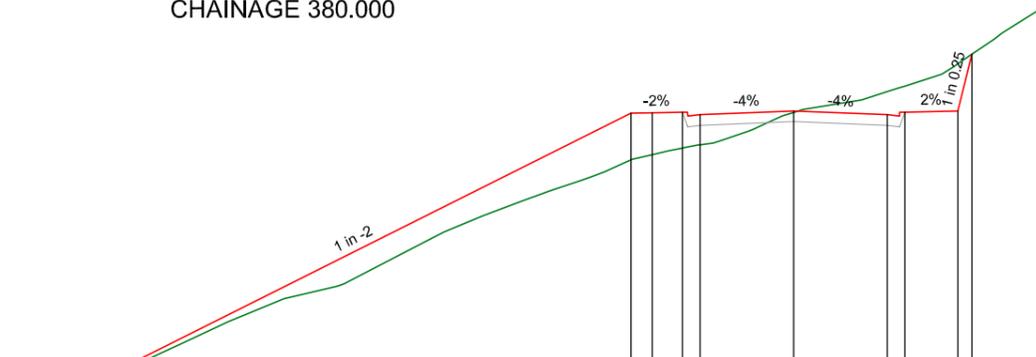


Centreline Data
 X = 417456.3
 Y = 809523.34
 Z = 404.96

Datum 395

DESIGN HEIGHT	397.17	404.90	404.91	404.93	404.86	404.96	404.86	404.93	406.57
EXISTING SURFACE	397.17	403.58	403.73	403.91	404.00	404.92	405.51	405.67	406.57
DESIGN OFFSET	-20.05	-4.60	-4.00	-3.15	-2.65	-0.00	2.65	3.15	5.05

CHAINAGE 360.000

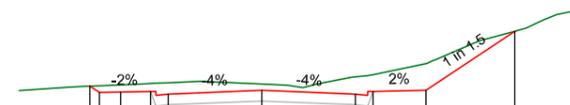


Centreline Data
 X = 417433.85
 Y = 809468.75
 Z = 408.24

Datum 407

DESIGN HEIGHT	408.36	408.18	408.19	408.21	408.13	408.24	408.13	408.21	409.91
EXISTING SURFACE	408.36	408.37	408.40	408.43	408.46	408.42	408.62	408.68	409.91
DESIGN OFFSET	-4.87	-4.00	-3.15	-2.65	-0.00	2.65	3.15	4.65	7.16

CHAINAGE 420.000



REV	DATE	DESCRIPTION	APPROVED
B	18.09.19	ALIGNMENTS REVISED	JFM
A	27.08.19	DRAFT	JFM

CONSULTANT



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JFM	27.08.19
DESIGN	DATE
JDR	27.08.19
DRAWN	DATE
JFM	27.08.19
CHECKED	DATE

CLIENT

SUNSHINE BAY Ltd

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PROJECT LOCATION

PROPOSED SUBDIVISION
 GLENORCHY RD / ARAWATA TCE - QUEENSTOWN

TITLE

PROPOSD ACCESS FEASIBILITY - ARAWATA TCE
 ARAWATA TRACK CROSS SECTIONS Sheet 3

CONTRACT NUMBER	-
SCALE (AT A3)	1:200
DRAWING NUMBER	QV029-F-1230
REVISION	B

Centreline Data
 X = 417556.89
 Y = 809548.9
 Z = 373.33

Datum 372

DESIGN HEIGHT	380.03									
EXISTING SURFACE	380.03									
DESIGN OFFSET	-13.83									

CHAINAGE 220.000

Centreline Data
 X = 417549.44
 Y = 809530.46
 Z = 375.83

Datum 374

DESIGN HEIGHT	379.16									
EXISTING SURFACE	379.16									
DESIGN OFFSET	-8.77									

CHAINAGE 200.000

Centreline Data
 X = 417538.41
 Y = 809513.77
 Z = 378.33

Datum 376

DESIGN HEIGHT	379.10									
EXISTING SURFACE	379.10									
DESIGN OFFSET	-4.94									

CHAINAGE 180.000

Centreline Data
 X = 417527.38
 Y = 809497.09
 Z = 380.83

Datum 379

DESIGN HEIGHT	382.16									
EXISTING SURFACE	382.16									
DESIGN OFFSET	-5.78									

CHAINAGE 160.000

Centreline Data
 X = 417563.15
 Y = 809567.75
 Z = 370.83

Datum 369

DESIGN HEIGHT	375.00									
EXISTING SURFACE	375.00									
DESIGN OFFSET	-10.04									

CHAINAGE 240.000

Centreline Data
 X = 417593.51
 Y = 809559.76
 Z = 365.83

Datum 364

DESIGN HEIGHT	364.98									
EXISTING SURFACE	364.98									
DESIGN OFFSET	-5.41									

CHAINAGE 280.000

Centreline Data
 X = 417581
 Y = 809573.88
 Z = 368.33

Datum 367

DESIGN HEIGHT	369.82									
EXISTING SURFACE	369.82									
DESIGN OFFSET	-6.01									

CHAINAGE 260.000

Centreline Data
 X = 417593.86
 Y = 809479.77
 Z = 355.83

Datum 351

DESIGN HEIGHT										
EXISTING SURFACE										
DESIGN OFFSET										

CHAINAGE 360.000

Centreline Data
 X = 417593.92
 Y = 809499.77
 Z = 358.33

Datum 355

DESIGN HEIGHT										
EXISTING SURFACE										
DESIGN OFFSET										

CHAINAGE 340.000

Centreline Data
 X = 417593.83
 Y = 809519.77
 Z = 360.83

Datum 358

DESIGN HEIGHT										
EXISTING SURFACE										
DESIGN OFFSET										

CHAINAGE 320.000

Centreline Data
 X = 417593.75
 Y = 809539.77
 Z = 363.33

Datum 361

DESIGN HEIGHT										
EXISTING SURFACE										
DESIGN OFFSET										

CHAINAGE 300.000

REV	DATE	DESCRIPTION	APPROVED
B	18.09.19	ALIGNMENTS REVISED	JFM
A	27.08.19	DRAFT	JFM

CONSULTANT



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JFM	27.08.19
DESIGN	DATE
JDR	27.08.19
JDR	DATE
JFM	27.08.19
JFM	DATE

CLIENT

SUNSHINE BAY Ltd

38

PROJECT LOCATION

PROPOSED SUBDIVISION
 GLENORCHY RD / ARAWATA TCE - QUEENSTOWN

TITLE

PROPOSD ACCESS FEASIBILITY - ARAWATA TCE
 ALIGNMENT 1 CROSS SECTIONS Sheet 2

CONTRACT NUMBER	-
SCALE (AT A3)	1:200
DRAWING NUMBER	QV029-F-1245
REVISION	B

Centreline Data
 X = 417569.81
 Y = 809426.16
 Z = 351.26

Datum 348

DESIGN HEIGHT		349.59		351.20	351.21		351.26	
EXISTING SURFACE		349.59		350.13	350.27	351.23	351.15	
DESIGN OFFSET		-7.82		-4.60	-4.00	-3.15	-2.65	-0.00

CHAINAGE 420.000

Centreline Data
 X = 417540.65
 Y = 809375.04
 Z = 353.94

Datum 348

DESIGN HEIGHT		350.47		353.88	353.89		353.94	
EXISTING SURFACE		350.47		350.99	351.34	353.91	353.83	
DESIGN OFFSET		-5.45		-4.60	-4.00	-3.15	-2.65	-0.00

CHAINAGE 480.000

Centreline Data
 X = 417501.45
 Y = 809330.87
 Z = 354.61

Datum 350

DESIGN HEIGHT		351.31		354.55	354.56		354.61	
EXISTING SURFACE		351.31		352.66	353.02	354.58	354.50	
DESIGN OFFSET		-11.07		-4.60	-4.00	-3.15	-2.65	0.00

CHAINAGE 540.000

Centreline Data
 X = 417581.97
 Y = 809442.01
 Z = 351.88

Datum 349

DESIGN HEIGHT		350.85		351.82	351.84		351.88	
EXISTING SURFACE		350.85		351.20	351.27	351.85	351.78	
DESIGN OFFSET		-6.55		-4.60	-4.00	-3.15	-2.65	0.00

CHAINAGE 400.000

Centreline Data
 X = 417546.46
 Y = 809394.01
 Z = 352.69

Datum 348

DESIGN HEIGHT		350.85		352.63	352.64		352.69	
EXISTING SURFACE		350.85		351.05	351.27	352.66	352.59	
DESIGN OFFSET		-5.04		-4.60	-4.00	-3.15	-2.65	0.00

CHAINAGE 460.000

Centreline Data
 X = 417512.53
 Y = 809347.52
 Z = 355.38

Datum 349

DESIGN HEIGHT		350.71		355.32	355.33		355.38	
EXISTING SURFACE		350.71		353.15	353.48	355.35	355.27	
DESIGN OFFSET		-13.81		-4.60	-4.00	-3.15	-2.65	0.00

CHAINAGE 520.000

Centreline Data
 X = 417590.29
 Y = 809460.14
 Z = 353.45

Datum 348

DESIGN HEIGHT		350.38		353.39	353.40		353.45	
EXISTING SURFACE		350.38		350.57	350.72	353.42	353.34	
DESIGN OFFSET		-5.35		-4.60	-4.00	-3.15	-2.65	-0.00

CHAINAGE 380.000

Centreline Data
 X = 417557.07
 Y = 809410.74
 Z = 351.57

Datum 348

DESIGN HEIGHT		350.21		351.51	351.52		351.57	
EXISTING SURFACE		350.21		350.30	350.49	351.53	351.46	
DESIGN OFFSET		-4.92		-4.60	-4.00	-3.15	-2.65	-0.00

CHAINAGE 440.000

Centreline Data
 X = 417524.93
 Y = 809363.06
 Z = 355.09

Datum 349

DESIGN HEIGHT		350.55		355.03	355.04		355.09	
EXISTING SURFACE		350.55		352.71	353.02	355.06	354.99	
DESIGN OFFSET		-13.57		-4.60	-4.00	-3.15	-2.65	0.00

CHAINAGE 500.000

REV	DATE	DESCRIPTION	APPROVED
B	18.09.19	ALIGNMENTS REVISED	JFM
A	27.08.19	DRAFT	JFM

CONSULTANT



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JFM	27.08.19
DESIGN	DATE
JDR	27.08.19
DRAWN	DATE
JFM	27.08.19
CHECKED	DATE

CLIENT

SUNSHINE BAY Ltd

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PROJECT LOCATION

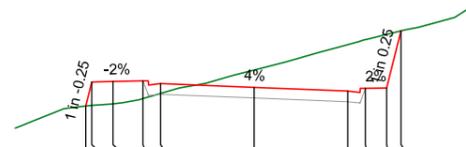
PROPOSED SUBDIVISION
 GLENORCHY RD / ARAWATA TCE - QUEENSTOWN

TITLE

PROPOSD ACCESS FEASIBILITY - ARAWATA TCE
 ALIGNMENT 1 CROSS SECTIONS Sheet 3

CONTRACT NUMBER		-
SCALE (AT A3)		1:200
DRAWING NUMBER	REVISION	
QV029-F-1250	B	

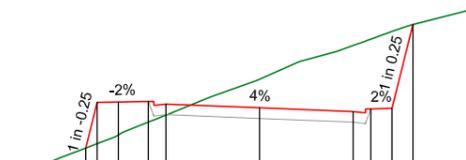
Centreline Data
 X = 417563.13
 Y = 809497.12
 Z = 370.02
 Datum 368



DESIGN HEIGHT	369.49	370.17	370.18	370.20	370.12	370.02	369.91	369.99	370.00	371.62
EXISTING SURFACE	369.49	369.50	369.55	369.70	369.85	370.51	371.23	371.37	371.52	371.62
DESIGN OFFSET	-4.77	-4.60	-4.00	-3.15	-2.65	-0.00	2.65	3.15	3.75	4.16

CHAINAGE 60.000

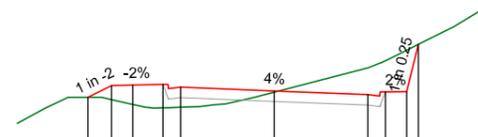
Centreline Data
 X = 417572.16
 Y = 809514.93
 Z = 367.69
 Datum 365



DESIGN HEIGHT	366.55	367.85	367.86	367.87	367.80	367.69	367.59	367.66	367.67	370.04
EXISTING SURFACE	366.55	366.68	366.92	367.29	367.49	368.50	369.45	369.63	369.85	370.04
DESIGN OFFSET	-4.92	-4.60	-4.00	-3.15	-2.65	-0.00	2.65	3.15	3.75	4.34

CHAINAGE 40.000

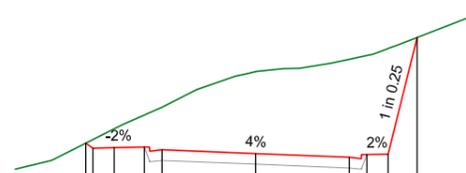
Centreline Data
 X = 417545.82
 Y = 809461.23
 Z = 374.18
 Datum 372



DESIGN HEIGHT	374.00	374.33	374.35	374.36	374.29	374.18	374.08	374.15	374.16	375.50
EXISTING SURFACE	374.00	373.94	373.80	373.70	373.72	374.15	374.83	375.04	375.33	375.50
DESIGN OFFSET	-5.27	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	3.75	4.08

CHAINAGE 100.000

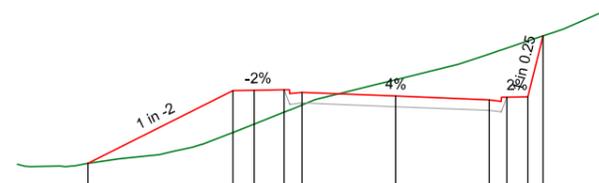
Centreline Data
 X = 417577.88
 Y = 809534.07
 Z = 365.19
 Datum 364



DESIGN HEIGHT	365.48	365.35	365.36	365.37	365.30	365.19	365.09	365.16	365.17	368.48
EXISTING SURFACE	365.48	365.59	365.89	366.28	366.50	367.51	367.86	367.96	368.17	368.48
DESIGN OFFSET	-4.81	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	3.75	4.58

CHAINAGE 20.000

Centreline Data
 X = 417553.04
 Y = 809479.84
 Z = 372.1
 Datum 369



DESIGN HEIGHT	370.20	372.25	372.27	372.28	372.21	372.10	372.00	372.07	372.08	373.80
EXISTING SURFACE	370.20	371.07	371.31	371.65	371.85	372.56	373.29	373.46	373.66	373.80
DESIGN OFFSET	-8.71	-4.60	-4.00	-3.15	-2.65	0.00	2.65	3.15	3.75	4.18

CHAINAGE 80.000

REV	DATE	DESCRIPTION	APPROVED
B	18.09.19	ALIGNMENTS REVISED	JFM
A	27.08.19	DRAFT	JFM

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JFM	27.08.19
DESIGN	DATE
JDR	27.08.19
DRAWN	DATE
JFM	27.08.19
CHECKED	DATE

CLIENT

SUNSHINE BAY Ltd

40

PROJECT LOCATION

PROPOSED SUBDIVISION
 GLENORCHY RD / ARAWATA TCE - QUEENSTOWN

TITLE

PROPOSD ACCESS FEASIBILITY - ARAWATA TCE
 ALIGNMENT 2 CROSS SECTIONS Sheet 1

CONTRACT NUMBER	-
SCALE (AT A3)	1:200
DRAWING NUMBER	QV029-F-1255
REVISION	B