Application as Notified 410

INVESTIGATION LOG

TP&SPT113

Report Ref R8468-1

Client	Coordinates (NZTM2000)	Elevation	Location Method (±2m)
Willowridge Developments Ltd			MAP

Location Stage B3, Three Parks Development, Wanaka

Geology	Geological Interpretation (refer to separate Geotechnical and Geological Information sheet for further information)	Samples	Depth (m)	Legend	Vane Shear Strength (Vane No: / Vane Size: 0mm)	Values (kPa)	Scala Penetrometer (Blows / 100mm)	Groundwater
TOPSOIL	TOPSOIL, with some silt and sand, with minor gravel, with trace cobbles; brown. Covering/Rehabilitation TS.			TS T TS T	50 100 150 200		2 4 6 8 10 12 14 16 18 9 12 9 10	
RIVER DEPOSITS	Sandy GRAVEL, with minor cobbles; light grey; bedded. Dense; dry to moist; gravel, fine to coarse, subround to subangular; sand, fine to coarse; cobbles, subround to subangular, up to 100mm; 4x subtle subhorizontal bedding, structures; hard digging.		1					
	GRAVEL, with some sand, with trace cobbles; light grey; bedded. Medium dense to dense; dry; poorly graded; gravel, fine to medium, subround to subangular; sand, medium to coarse; cobbles, subround to subangular, up to 100mm; cross bedding and stratograding throughout, absence of binding fines - minor pit wall collapse; running gravels.		2					
	End of Investigation: 2.2m Geology Established		3					

Investigation Information

Depth	2.2m	**Logged By**	SF/TD	**Start Date**	01/11/22
Termination	ology Establis	**Checked By**	SF	**End Date**	02/11/22
Machine Used		**Test Pit Dimensions**		**Logged Date**	01/11/22

Investigation Type

- ☐ Hand Auger (50mm)
- ☑ Test Pit
- ☐ Scala Penetrometer

Water Legend

- Standing Water Level
- Out flow
- In flow

Log ref: R8468-1 TP&SPT113

Application as Notified 411

INVESTIGATION LOG

TP&SPT114

Report Ref R8468-1

Client	Coordinates (NZTM2000)	Elevation	Location Method (±2m)
Willowridge Developments Ltd			MAP

Location Stage B3, Three Parks Development, Wanaka

Geology	Geological Interpretation (refer to separate Geotechnical and Geological Information sheet for further information)	Samples	Depth (m)	Legend
TOPSOIL	TOPSOIL, with some silt and sand, with minor gravel, with trace cobbles; brown. Covering/Rehabilitation TS.			TS
FILL	FILL comprising, Sandy GRAVEL; light grey; Dense; dry to moist; gravel, fine to coarse, subround to subangular; sand, medium to coarse.			
RIVER DEPOSITS	SAND, with minor gravel; light grey; bedded. Medium dense; dry; poorly graded; sand, medium to coarse; gravel, fine, subround to subangular; absence of binding fines - minor pit wall collapse; running gravels; cross bedding structures.		1	
RIVER DEPOSITS	Sandy GRAVEL; light grey. Medium dense; dry to moist; poorly graded; gravel, fine to coarse, subround to subangular; sand, medium to coarse; minor pit wall collapse - terminated due to pit widening.		2	
	End of Investigation: 2.2m Geology Established		3	

Vane Shear Strength
Vane No:
Vane Size: 0mm
50 100 150 200

Values (kPa)

Scala Penetrometer (Blows / 100mm)
2 4 6 8 10 12 14 16 18
7
14
14
10

Groundwater

Investigation Information

Depth	2.2m	**Logged By**	SF/TD	**Start Date**	01/11/22
Termination	ology Establis	**Checked By**	SF	**End Date**	02/11/22
Machine Used		**Test Pit Dimensions**		**Logged Date**	01/11/22

Investigation Type

- ☐ Hand Auger (50mm)
- ☑ Test Pit
- ☐ Scala Penetrometer

Water Legend

- Standing Water Level
- Out flow
- In flow

Log ref: R8468-1 TP&SPT114

Application as Notified 412

INVESTIGATION LOG

TP&SPT115

Report Ref R8468-1

Client	Coordinates (NZTM2000)	Elevation	Location Method (±2m)
Willowridge Developments Ltd			MAP

Location Stage B3, Three Parks Development, Wanaka

Geology	Geological Interpretation (refer to separate Geotechnical and Geological Information sheet for further information)	Samples	Depth (m)	Legend
TOPSOIL	TOPSOIL, with some silt and sand, with minor gravel, with trace cobbles; brown. Covering/Rehabilitation TS.			TS
FILL	FILL comprising, Sandy GRAVEL; light grey; Dense; dry to moist; gravel, fine to coarse, subround to subangular; sand, medium to coarse.			
ALLUVIUM	Silty sandy GRAVEL; light brown. Medium dense to dense; dry to moist; poorly graded; gravel, fine to coarse, subround to subangular; sand, fine to coarse; Lower portion of the Alluvium horizon.			
RIVER DEPOSITS	GRAVEL, with some sand, with minor boulders, with trace cobbles; light grey. Medium dense to dense; dry to moist; poorly graded; gravel, fine to medium, subround to subangular, lesser amounts of coarse; sand, medium to coarse; boulders, subround to subangular, up to 300mm; cobbles, subround to subangular, up to 100mm; coarse material concentrated in thin layers towards the pit north; minor pit widening occurring. **End of Investigation: 2.2m Geology Established**		1 2 3	

Vane Shear Strength
Vane No:
Vane Size: 0mm
50 100 150 200

Values (kPa)

Scala Penetrometer (Blows / 100mm)
2 4 6 8 10 12 14 16 18
6
9
16
16

Groundwater

Investigation Information

Depth	2.2m	**Logged By**	SF/TD	**Start Date**	01/11/22
Termination	ɔlogy Establis	**Checked By**	SF	**End Date**	02/11/22
Machine Used		**Test Pit Dimensions**		**Logged Date**	01/11/22

Investigation Type

- ☐ Hand Auger (50mm)
- ☑ Test Pit
- ☐ Scala Penetrometer

Water Legend

- Standing Water Level
- Out flow
- In flow

Log ref: R8468-1 TP&SPT115

Application as Notified 413

INVESTIGATION LOG

TP&SPT116

Report Ref R8468-1

Client	Coordinates (NZTM2000)	Elevation	Location Method (±2m)
Willowridge Developments Ltd			MAP

Location Stage B3, Three Parks Development, Wanaka

Geology	Geological Interpretation (refer to separate Geotechnical and Geological Information sheet for further information)	Samples	Depth (m)	Legend	Vane Shear Strength (Vane No: Vane Size: 0mm)	Values (kPa)	Scala Penetrometer (Blows / 100mm)	Groundwater
UNCONTROLLED FILL	UNCONTROLLED FILL comprising sandy GRAVEL						7, 8	
TOPSOIL	TOPSOIL, with some silt and sand, with minor gravel, with trace cobbles; brown. Covering/Rehabilitation TS.			TS			13, 10	
RIVER DEPOSITS	Sandy GRAVEL, with minor boulders, with trace cobbles; light grey; bedded. Dense; dry to moist; gravel, fine to coarse, subround to subangular; sand, medium to coarse; boulders, up to 400mm; cobbles, subround to subangular, up to 150mm; Coarse material contained within Stratograde structures, some dipping gently towards the north.		1					
RIVER DEPOSITS	GRAVEL, with some sand, with trace cobbles; light grey; bedded. Medium dense to dense; dry; poorly graded; gravel, fine to medium, subround to subangular; sand, medium to coarse; cobbles, subround to subangular, up to 100mm; cross bedding and stratograding throughout, absence of binding fines - minor pit wall collapse; running gravels.		2					
	End of Investigation: 2m Geology Established		3					

Vane Shear Strength: 50 100 150 200

Scala Penetrometer (Blows / 100mm): 2 4 6 8 10 12 14 16 18

Investigation Information

Depth	2m	**Logged By**	SF/TD	**Start Date**	01/11/22
Termination	ology Establis	**Checked By**	SF	**End Date**	02/11/22
Machine Used		**Test Pit Dimensions**		**Logged Date**	01/11/22

Investigation Type

- ☐ Hand Auger (50mm)
- ☑ Test Pit
- ☐ Scala Penetrometer

Water Legend

- Standing Water Level
- Out flow
- In flow

Log ref: R8468-1 TP&SPT116

Application as Notified 414

INVESTIGATION LOG

TP110

Report Ref R8468-1

Client	Coordinates (NZTM2000)	Elevation	Location Method (±2m)
Willowridge Developments Ltd			MAP

Location Stage B3, Three Parks Development, Wanaka

Geology	Geological Interpretation (refer to separate Geotechnical and Geological Information sheet for further information)	Depth (m)
TOPSOIL	TOPSOIL; brown. Loose; dry to moist; contains grass rootlets.	
LOESS	Silty SAND; light brown. Medium dense; sand, fine to coarse; integrated basal contact, tending more granular with depth.	
GLACIAL TILL	Sandy GRAVEL, with minor silt; light brown. Medium dense to dense; dry to moist; gravel, fine to medium, subround to subangular, lesser amounts of coarse gravel; sand, fine to coarse; grass rootlets extend 600mm into soil profile.	
	Sandy GRAVEL, with minor cobbles and boulders, with trace silt; light grey. Dense; dry to moist; gravel, fine to coarse, subround to subangular; sand, fine to coarse; cobbles, subround to subangular, up to 150mm, boulders, subround to subangular, up to 300mm; subtle subhorizontal stratograding features throughout.	1 2 3
	End of Investigation: 4m Geology Established	4

Samples | Legend | Vane Shear Strength (Vane No: Vane Size: 0mm; 50 100 150 200) | Values (kPa) | Scala Penetrometer (Blows / 100mm; 2 4 6 8 10 12 14 16 18) | Groundwater

Investigation Information

Depth	4m	**Logged By**	SF/TD	**Start Date**	01/11/22
Termination	ology Establis	**Checked By**	SF	**End Date**	02/11/22
Machine Used		**Test Pit Dimensions**		**Logged Date**	01/11/22

Investigation Type

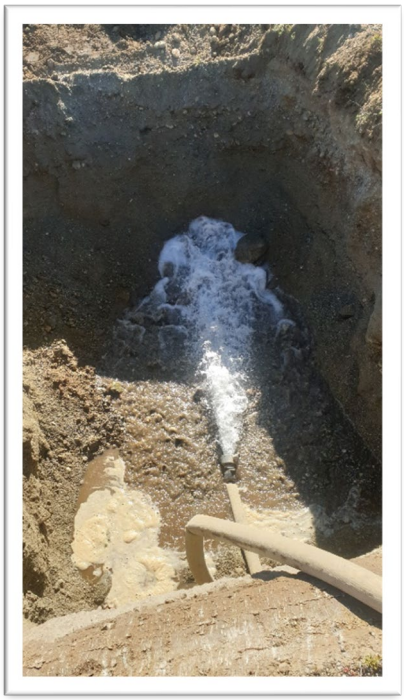
- ☐ Hand Auger (50mm)
- ☑ Test Pit
- ☐ Scala Penetrometer

Water Legend

- Standing Water Level
- Out flow
- In flow

Log ref: R8468-1 TP110

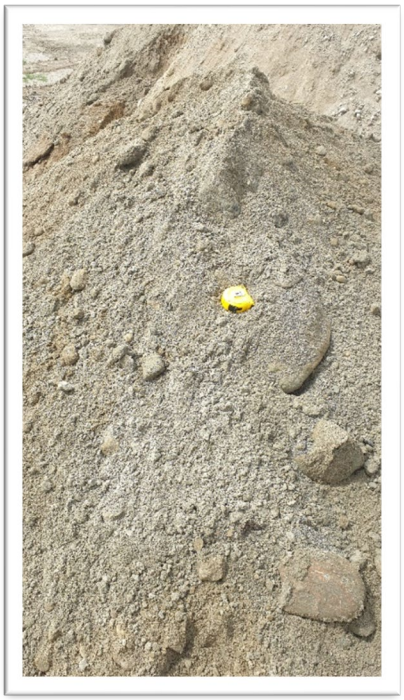
APPENDIX B: INVESTIGATION PHOTOS

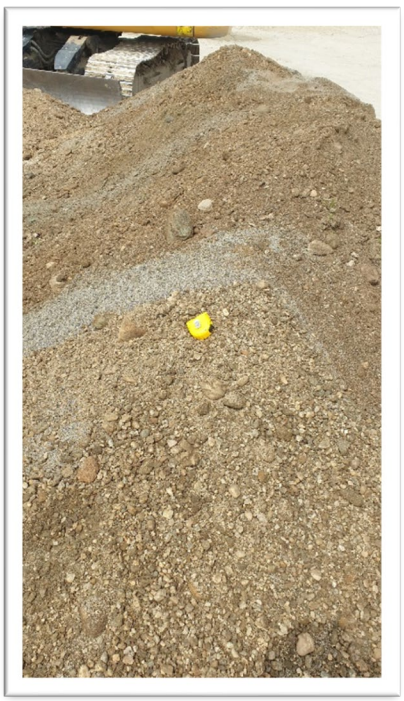
TP101	
PIT EXCAVATION	ARISINGS
	

TP101	
AFTER 8,000L DOSAGE	AFTER 100% INFILTRATION
	

TP102	
PIT EXCAVATION	ARISINGS
	

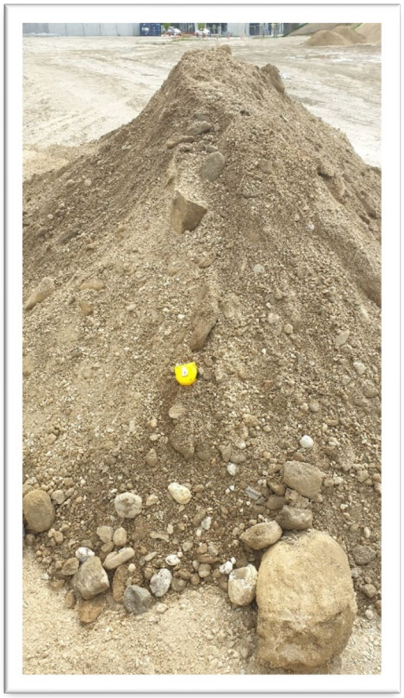
TP103	
PIT EXCAVATION	ARISINGS
	

TP104	
PIT EXCAVATION	ARISINGS
	

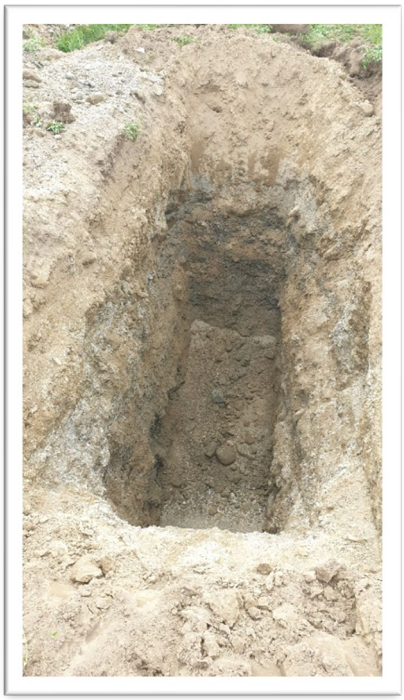
TP105	
PIT EXCAVATION	ARISINGS
	

TP106	
PIT EXCAVATION	ARISINGS
	

TP107	
PIT EXCAVATION	ARISINGS
	

TP108	
PIT EXCAVATION	ARISINGS
	

TP109	
PIT EXCAVATION	ARISINGS
	

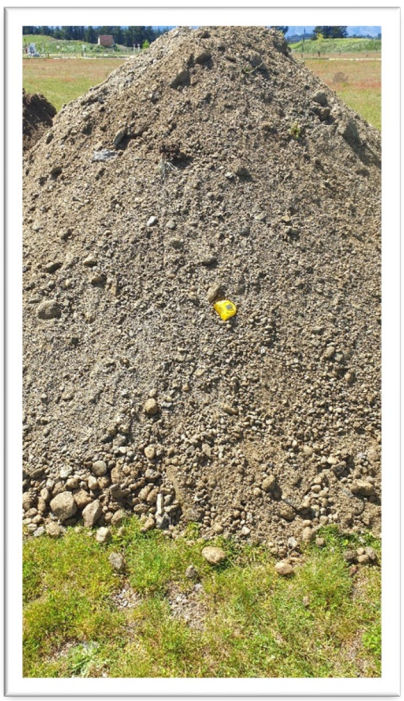
TP110	
PIT EXCAVATION	ARISINGS
	

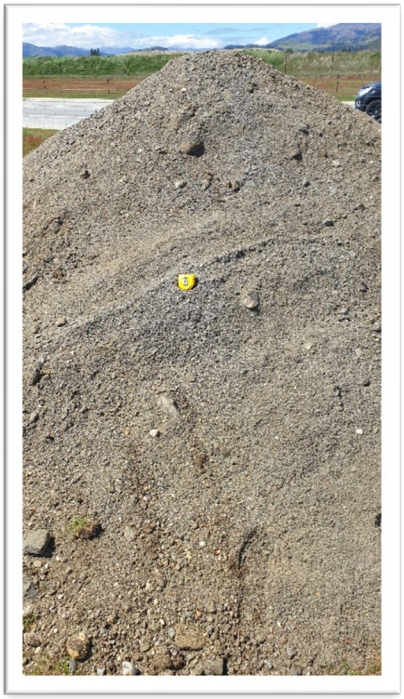
TP110	
AFTER 8,000L DOSAGE	AFTER 100% INFILTRATION
	

TP111	
PIT EXCAVATION	ARISINGS
	

TP111	
AFTER 8,000L DOSAGE	AFTER 100% INFILTRATION
	

TP112	
PIT EXCAVATION	ARISINGS
	

TP113	
PIT EXCAVATION	ARISINGS
	

TP114	
PIT EXCAVATION	ARISINGS
	

TP115	
PIT EXCAVATION	ARISINGS
	

TP116	
PIT EXCAVATION	ARISINGS
	

APPENDIX C: SOAKAGE TEST RESULTS

SOAKAGE TEST RESULTS

GCL Ground Consulting Ltd

1. PROJECT DETAILS

Test Site: TP101
Project: 8468-1A
Property: Stage B3
Date: 1-Nov-22
Calc's by: SF

LEGEND

Inputed parameters
Calculated parameters

2. SOAKAGE TEST DETAILS

Dosage volume =	8,000	L
Start fill time =	9:53:30 AM	h:m:s
Fill duration =	11:30	h:m:s
Stop fill time =	10:05:00 AM	h:m:s
Pit empty time (est) =	10:07:30 AM	h:m:s
Pit empty duration (est) =	0:14:00	h:m:s
Dip stick enbed. =	0	m
Soakage ref depth =	0.00	m

SOAKAGE TEST SUMMARY

Percolation rate UNFACTORED = 4,212 mm/hr
70.2 l/m^2/min

PERCOLATION TEST METHOD

Standard Falling Head Test

3. SOAKAGE TEST

Time	Duration (mins)	Water Height (mm)	Corrected Water Drop (mm)	Note
9:53	0	n/a	n/a	Fill Start
10:05	11.5	n/a	n/a	Fill Finish / Soakage Test Start
10:07	2.5	0.00	0.00	Empty
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	
10:07	0	0.00	0.00	

4. SOAKAGE TEST CALCULATIONS

Pit width =	2.2	m
Pit length =	3.7	m
Total pit area =	8.14	m²
Effective basal test area =	100	%
Calc. basal test area =	8.14	m²
Calculated volume =	8,000	L
Fill duration =	0:11:30	h:m:s
Discharge rate =	696	L/min
Soakage duration =	14	minutes
Percolation rate =	4,212	mm/hr

NOTES

^ Standard Falling Head Percolation Test completed.
^ Water infiltrated subsoils at a rate greater than or equal to fill discharge rate
^Soakage test sited at 1.8m depth BGL

SOAKAGE TEST RESULTS

GCL Ground Consulting Ltd

1. PROJECT DETAILS

Test Site: TP110
Project: 8468-1A
Property: Stage B3
Date: 1-Nov-22
Calc's by: SF

LEGEND

Inputed parameters
Calculated parameters

2. SOAKAGE TEST DETAILS

Dosage volume =	8,000	L
Start fill time =	3:37:00 PM	h:m:s
Fill duration =	12:00	h:m:s
Stop fill time =	3:49:00 PM	h:m:s
Pit empty time (est) =	4:17:00 PM	h:m:s
Pit empty duration (est) =	0:40:00	h:m:s
Dip stick enbed. =	0	m
Soakage ref depth =	0.00	m

SOAKAGE TEST SUMMARY

Percolation rate $_{UNFACTORED}$ = 2,098 mm/hr
35.0 l/m^2/min

PERCOLATION TEST METHOD

Standard Falling Head Test

3. SOAKAGE TEST

Time	Duration (mins)	Water Height (mm)	Corrected Water Drop (mm)	Note
15:37	0	n/a	n/a	Fill Start
15:49	12	n/a	n/a	Fill Finish / Soakage Test Start
16:17	28	0.00	0.00	Empty
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
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16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	
16:17	0	0.00	0.00	

4. SOAKAGE TEST CALCULATIONS

Pit width =	2.2	m
Pit length =	2.6	m
Total pit area =	5.72	m²
Effective basal test area =	100	%
Calc. basal test area =	5.72	m²
Calculated volume =	8,000	L
Fill duration =	0:12:00	h:m:s
Discharge rate =	667	L/min
Soakage duration =	40	minutes
Percolation rate =	2,098	mm/hr

NOTES

^ Standard Falling Head Percolation Test completed.
^ Steady infiltration over time
^Soakage test sited at 2.3m depth BGL

SOAKAGE TEST RESULTS

1. PROJECT DETAILS

Test Site: TP111
Project: 8468-1A
Property: Stage B3
Date: 3-Nov-22
Calc's by: SF

LEGEND

Inputed parameters
Calculated parameters

2. SOAKAGE TEST DETAILS

Dosage volume =	8,000	L
Start fill time =	10:30:45 AM	h:m:s
Fill duration =	09:15	h:m:s
Stop fill time =	10:40:00 AM	h:m:s
Pit empty time (est) =	10:42:30 AM	h:m:s
Pit empty duration (est) =	0:11:45	h:m:s
Dip stick enbed. =	0	m
Soakage ref depth =	0.00	m

SOAKAGE TEST SUMMARY

Percolation rate $_{UNFACTORED}$ = 9,726 mm/hr
162.1 l/m^2/min

PERCOLATION TEST METHOD

Standard Falling Head Test

3. SOAKAGE TEST

Time	Duration (mins)	Water Height (mm)	Corrected Water Drop (mm)	Note
10:30	0	n/a	n/a	Fill Start
10:40	10	n/a	n/a	Fill Finish / Soakage Test Start
10:42	2	0.00	0.00	Empty
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
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10:42	0	0.00	0.00	
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10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	
10:42	0	0.00	0.00	

4. SOAKAGE TEST CALCULATIONS

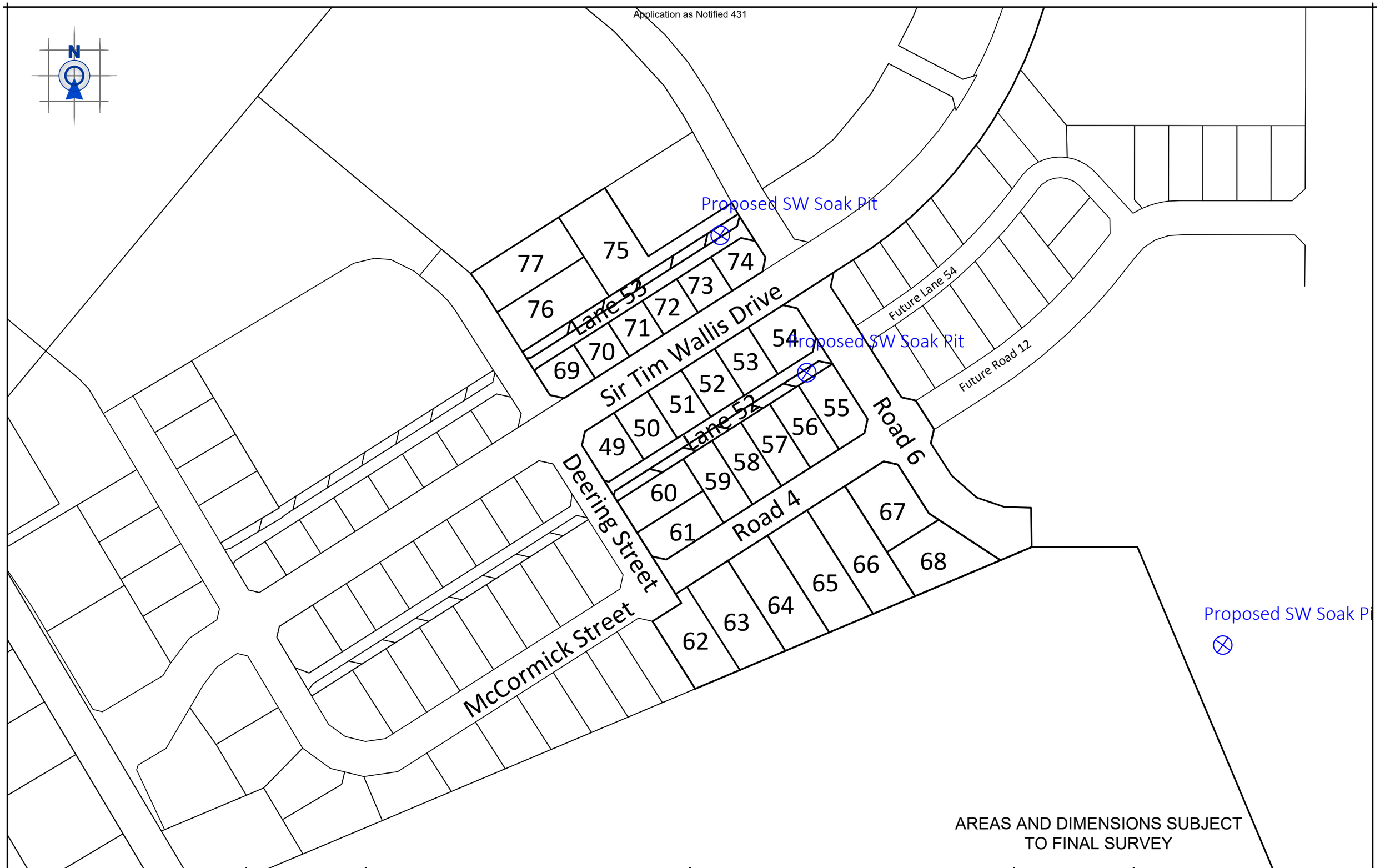
Pit width =	1.2	m
Pit length =	3.5	m
Total pit area =	4.2	m²
Effective basal test area =	100	%
Calc. basal test area =	4.20	m²
Calculated volume =	8,000	L
Fill duration =	0:09:15	h:m:s
Discharge rate =	865	L/min
Soakage duration =	11.75	minutes
Percolation rate =	9,726	mm/hr

NOTES

^ Standard Falling Head Percolation Test completed.
^ Water infiltrated subsoils at a rate greater than or equal to fill discharge rate
^Soakage test sited at 1.8m depth BGL

APPENDIX D: SCHEME PLAN

Application as Notified 431



AREAS AND DIMENSIONS SUBJECT TO FINAL SURVEY

PATERSONPITTSGROUP
Your Land Professionals
www.ppgroup.co.nz
0800 PPGROUP

WANAKA BRANCH
19 Reece Crescent
or P.O. Box 283
Wanaka 9343
T 03 443 0110
E wanaka@ppgroup.co.nz

Client & Location:
Willowridge Developments Limited
Wanaka

Purpose & Drawing Title:
Scheme Plan
Lots 49 - 68, 149-154, 911, 912 & 991
being a subdivision of
Lot 981 LT574876 & Lot 972 LT56741

Surveyed by:	-	Original Size:	Scale:	
Designed by:	-	A3	1:2000 @ A3	
Drawn by:	MC		DO NOT SCALE	
Checked by:	KG			
Approved by:	SD			
Job No:	DWG No:	Sheet No:	Revision No:	Date Created:
W3850-10	003	101a	2	14/09/2022

PUKEKOHE OFFICE
UNIT 2, 4 MANUKAU ROAD, PUKEKOHE
POST: PO BOX 1019, PUKEKOHE, 2120
EMAIL: pukekohe@gcltech.co.nz
TEL: 09 239 2229

QUEENSTOWN OFFICE
157 GLENDA DRIVE, FRANKTON
POST: PO BOX 2963, QUEENSTOWN 9349
EMAIL: queenstown@gcltech.co.nz
TEL: 03 442 5700

AUCKLAND CENTRAL OFFICE
LEVEL 1, KAURI TIMBER BUILDING
104 FANSHAWE STREET, AUCKLAND, 1010
EMAIL: auckland@gcltech.co.nz
TEL: 09 379 0777

GREAT BARRIER IS. OFFICE
6 MOANA VIEW ROAD, OKUPU
POST: PO BOX 1019, PUKEKOHE, 2120
EMAIL: office@gcltech.co.nz
TEL: 09 239 2229

GCL
Ground Consulting Ltd

Appendix D Power Supply Confirmation

AURORA ENERGY LIMITED
PO Box 5140, Dunedin 9058
PH 0800 22 00 05
WEB www.auroraenergy.co.nz

12/07/2024

Andrea Jarvis
Holmes Group

Sent via email only: andreaj@holmesgroup.com

Dear Andrea,

ELECTRICITY SUPPLY AVAILABILITY FOR A PROPOSED 13 LOT DEVELOPMENT.
LOT 981 DEERING STREET, THREE PARKS, WANAKA. LOT 981 DP 574876.

Thank you for your inquiry outlining the above proposed development.

Subject to technical, legal and commercial requirements, Aurora Energy can make a Point of Supply[1] (PoS) available for this development.

Disclaimer

This letter confirms that a PoS **can** be made available. This letter **does not** imply that a PoS is available now, or that Aurora Energy will make a PoS available at its cost.

Next Steps

To arrange an electricity connection to the Aurora Energy network, a connection application will be required. General and technical requirements for electricity connections are contained in Aurora Energy's Network Connection Standard. Connection application forms and the Network Connection Standard are available from www.auroraenergy.co.nz.

Yours sincerely

Niel Frear

CUSTOMER INITIATED WORKS MANAGER

[1] Point of Supply is defined in section 2(3) of the Electricity Act 1993.

Certification Pathways

FOR THE WANAKA FIRST DISTRICT

10022
Wanaka, New Zealand
March 2024 Revision 1

Prepared by
WARREN AND MAHONEY®

Contents

1.0 Executive Summary

"What we do in the next few years, will determine the next few thousand years" - Sir David Attenborough

Global action towards building a better and more sustainable future needs leadership and inspiring projects to showcase what good looks like. To explore methods of validating success on a global scale, we have evaluated three certifications for holistic sustainability for communities. These include Green Star Communities, LEED Cities and Communities, and Living Communities by ILFI.

Within this report two certification pathways have been identified as possible, and compared against the design at a high level. Both Green Star Communities from the New Zealand Green Building Council (NZGBC) and LEED Cities and Communities from the U.S Green Building Council (USGBC) have been analysised and considered appropriate tools for a globally recognisable community certification. Living Communities by the International Living Futures Institute was explored, as the Zero Carbon, CORE, and Living Building Challenge Certifications for buildings are all exciting opportunities for the buildings within this project. However, the formal certification has stopped accepting registrations and can only be used as guidance.

Performance Against Green Star Communities V1.1
The certification awards points within the categories of Governance, Livability, Economic Prosperity, and Environment. Points are also awarded under the Communities Certification for buildings that achieve a Green Star Design and As Built Certification. The current design of the district has the potential to perform well across all categories. Specialist input will be required for credits regarding an urban design review, stormwater and light pollution. The client will need to develop management plans for credits within the governance category. With these a 5 or 6 star rating is possible for the district.

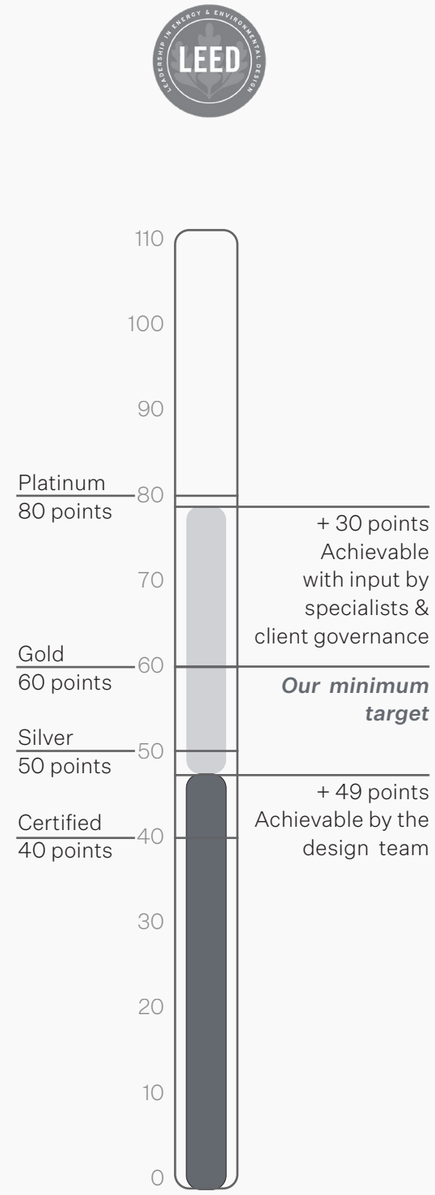
Performance Against LEED Cities and Communities V4.1
The certification awards points within the categories of Integrative Process, Natural Systems and Ecology, Transportation and Land Use, Water Efficiency, Energy and Greenhouse Gas Emissions, Materials and Resources, Quality of Life, Innovation, and Regional Property. Points are also awarded under the Communities Certification for buildings within the district that achieve LEED Building Design and Construction Certification. The design performs well against a broad range of categories. However, due to not having well established public transport in the region the points within this category were not applicable and limit the project's overall performance. Specialist input is required from a geotech, ecologist, electrical engineer, hydraulic engineer and mechanical engineer input the client will need to develop management plans for credits in the integrative process category. With these a Silver or Gold rating is possible for the district. The highest rating of Platinum does not look achievable due to not being able to attempt the points under transportation.

Recommendation for District Scale
To establish a world leading position recognised by sustainability certifications we recommend targeting a 6 Star Green Star Communities rating. This is due to the certifications credit and point structure being in closer alignment with the scale of the project and design strategies.

Recommendation for Building Scale
Both LEED and Green Star include points that recognise the success of building certifications by the same institution. For this reason we recommend also considering Green Star Design and As-Built Certification. To amplify the world leading status of these buildings we also recommend exploring Zero Carbon, CORE, and Living Building Challenge Certifications by the International Living Futures Institute.

Green Star Communities

Expected outcome
5 Stars - Australasian Excellence or
6 Stars - World Leading



LEED Communities

Expected outcome
Silver or Gold rating

1.1 Proposed Overall Certification Strategy

Community Certification for District

Certify the project at a district level to support holistic sustainability success of urban design strategies. The certification of the district informs the strategy for the buildings. For this reason this document compares community certification.

Multi-building Certification

To reduce certification costs, it is recommended to explore multi-building certification for buildings that have similar uses and strategies. In this project all timber office buildings would benefit from this approach.

World Leading Building Certification

To recognise the extra effort put into a single asset it is recommended to target an additional international certification. This can be done to show world leading holistic sustainability or world leading low carbon design.

Single-building Certification

Due to the specialised typology of health care, this building would need to undertake it's own certification.

1.2 Certifications Avaliable

The table below provides an outline of the available certifications for communities and buildings. In both Green Star and LEED there are points awarded for having both a community and building level certification which can support achieving a higher rating.

Multi-building assessments are offered for Green Star Building certifications and may also be available for LEED projects.

To achieve a world leading status at a building level it is recommended to consider one of the 3 certification options from the International Living Future Institute. The easiest to achieve would be the Zero Carbon Certification due to its focused scope on reducing and balancing embodied and operational carbon emissions.

Certification Providers

NZGBC TE KAUNIHERA HANGANGA TAUTAIAO

LEED LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN

LIVING FUTURE INSTITUTE AUSTRALIA

Community Certifications for District

Green Star Communities V1.1 Offered in New Zealand and Australia	LEED Cities and Communities V4.1 Offered worldwide	Living Communities No longer offered

Certifications for Buildings

Green Star Design and As-build Certification V1.1 Offered in New Zealand	LEED Building Design and Construction V4 Offered worldwide	3 options offered Zero Carbon Certification CORE Certification Living Building Challenge All offered worldwide

2.0 Comparing LEED and Green Star

Living in a green community is beneficial for economic growth, social engagement, environmental protection and occupants well-being.

We have completed a high level summary of the certification pathways we believe to be applicable to the Wanaka First District. By understanding the metrics that the district will be certified against allows us to further justify the correct pathway. Through this process we have compared the Green Star Communities v1.1 certification and the LEED v4.1 cities and communities certification tools.

The summary matrix identifies where we believe the project has the potential to achieve the credits. The two certification pathways have been broken down into the areas of criteria. This helps to understand the rigor of sustainable design required to achieve a community certification for the district. We have reviewed each of the pathways and identified areas that we think are achievable, relatively achievable and hard to achieve for the project.

The following high level comparison, credit overviews and credit summaries demonstrate our optioneering and investigation into what we consider to be the best community certification pathway for the Wanaka First District.

Both certifications are based on a points rating system. The below summaries the amount of points required by the design to achieve a rating.

Green Star Ratings

4 Star 45- 59 Best Practice
5 Star 60-74 Excellence
6 Star 75+ World Leadership

LEED Ratings

Certified 40- 49
Silver 50-59
Gold 60-79
Platinum 80+

Green Star Communities v1.1
Certification Credit Categories Summary
Governance (28 Points)
Coordinated and transparent approaches
Commitment to implementation
Stakeholder Engagement
Sustainable cultures and behaviors
Livability (22 Points)
Diversity and accessibility
Healthy, safe and secure communities
Inclusiveness and cohesiveness
Community adaptability
Economic Prosperity (21 Points)
Education and learning
Enhanced Employment Opportunities
Investment
Efficiency and effectiveness
Environment (29 Points)
Enhancements to the natural environment
Reduced Ecological Footprint
Innovation (10 Points)
Innovation

LEED v4.1 Cities and Communities
Certification Credit Categories Summary
Integrative Process (5 Points)
Inclusive process in city or community planning
Natural Systems and Ecology (13 Points)
Analyze and respond to the local ecosystem; prevent or reduce pollution resulting from construction; cater to minimum green spaces essential for community health and well-being; and enhance environmental quality
Transportation & Land Use (18 Points)
Encourages cities to adopt an integrated approach towards urban planning through mixed use development, efficient transportation, better connectivity and engagement with stakeholders
Water Efficiency (12 Points)
Requires a reduction in water consumption and encourages the shift to a net zero water city
Energy and Greenhouse Gas Emissions (31 Points)
Encourages cities to provide equitable access to reliable power while simultaneously reducing the adverse impacts of energy use on environment
Materials and Resources (11 Points)
Eliminate waste from mainstream consumption and instead utilize waste as a resource
Quality of Life (10 Points)
Addresses design and planning interventions to promote prosperity, health, and safety for all
Innovation (6 Points)
To encourage cities to achieve exceptional or innovative performance.
Regional Property (4 Points)
To provide an incentive for the achievement of credits that address geographically specific socio-economic and environmental priorities.

KEY

Achievable
Relatively achievable
Hard to achieve

3.0 Green Star Communities v1.1 Overview

"Green Star Communities assesses the planning, design and construction of large-scale development projects including precincts, neighbourhoods and entire communities."

New Zealand Green Building Council

The Green Star Communities tool has been established by the New Zealand Green Building Council (NZGBC) and helps to deliver and promote sustainable communities that focus on low carbon, holistic, well-being and ethical outcomes. It is an internationally recognised certification and focuses on the importance of human-centric developments that prioritise place and planet.

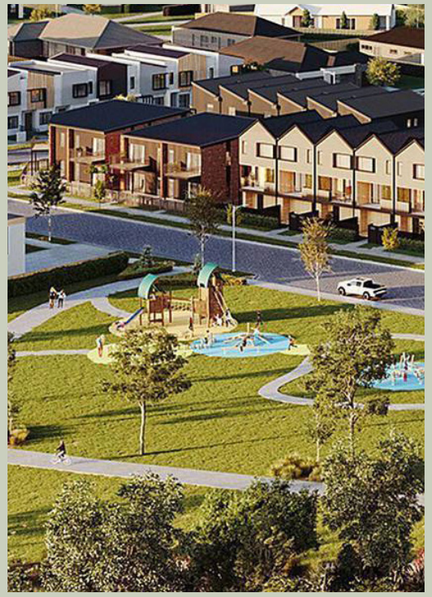
Green Stars mission is to "create sustainable places for everyones." Their aim is to transform the built environment by:

- Reducing the impact of climate change.
- Enhance the health and quality of life of inhabitants and the sustainability of the built environment.
- Restore and protect the planet's biodiversity and ecosystems.
- Ensure the ongoing optimum operational performance of buildings.
- Contribute to market transformation and a sustainable economy.

To achieve this mission there is five categories available to attain credits within the communities tool:

- Governance (28 Points)
- Livability (22 Points)
- Economic Prosperity (21 Points)
- Environment (29 Points)
- Innovation (10 Points)

The certification is based on a 100 point system, with world leadership in sustainable community design 80 points plus. Projects must submit documentation, calculations, and in some cases reports to demonstrate credit compliance for certification.



↑ Peacocke Development - Hamilton
5 Star Green Star Community Registered Development 2022

Green Star has four rating tools that cover all aspects of the built environment. From the communities scale, to design and as built for buildings, interiors and a certification program for building performance.

Certification through Green Star demonstrates a holistic approach to climate conscious design, innovation and global alliance to sustainability initiatives.

↑Henderson Opanuku Precinct - Auckland
5 Star Green Star Community 2019

4.0 LEED v4.1 Cities and Communities Overview

LEED (Leadership in Energy and Environmental Design) is a certification program developed by the U.S Green Building Council. A globally recognised symbol of sustainability LEED has certification programs for Building Design and Construction, Interior Design and Buildings Operations and Maintenance. LEED is the world's most widely used certification program for the built environment. LEED serves as a "catalyst and transformative tool toward more sustainable, equitable and resilient communities around the world."

U.S Green Building Council

Six key goals have guided the technical development process for the LEED v4.1 Cities and Communities program:

- Inspire leadership.
- Foster achievement of global goals.
- Ensure continuity of performance from design to development and operation.
- Leverage the large portfolio of complementing systems in GBCI portfolio.
- Expand the market from buildings to cities and communities.
- Focus on quality of life of residents and enhance living standards.

Similar to Green Star LEED is also based on a points system. There are nine categories to achieve points in:

- Integrative Process (5 Points)
- Natural Systems and Ecology (13 Points)
- Transportation & Landuse (18 Points)
- Water Efficiency (12 Points)
- Energy and Green House Gas Emissions (31 Points)
- Materials and Resources(11 Points)
- Quality of Life (10 Points)
- Innovation (6 Points)
- Regional Property (4 Points)

The certification is based on a 110 point system and contains 11 required credits. These outline what you must first achieve in the category to be eligible to obtain the following points.

19 Communities Globally have been Certified through LEED and 50+ inside America.

↑ Sapporo, Japan
A Green City that embraces Sustainable Tourism
Platinum Certification 2020

↑ Savona, Italy
First LEED-certified City in Europe
Gold Certification 2018

5.0 Green Star Communities Credit Summary

Green Star Communities v1.1					
Category	**Credit Description**	**Credits Available**	**Design Action**	**Client Action**	**Comments on Design**
Governance	**1** GSAP contractually engaged	1		1	Client discussion.
	2 Design and urban design review process	8	8		4 points for in-house review, 2 points awards for mixed review, and 2 points for independent review.
	3 Stakeholder engagement strategy and implementation	6	6		Stakeholder engagement to develop strategy and evidence of implementation.
	4 Climate adaptation plan and community resilience plan	4		4	Requires a Climate Adaption Plan and Community Resilience Plan.
	5 Corporate responsibility and sustainability reporting publicly	3		3	Client discussion - Reporting required in alignment with GRI Sustainability Reporting Guidelines.
	6 Community users guide and sustainability education facilities	2		2	Client discussion - Development of Community User Guide and Education.
	7 Community facility management and community service program	2			Not applicable.
	8 Environmental management system and environmental management plan implemented	2		2	Client discussion - requires contractor input.
Points total		**(28 Points)**	**14**	**12**	
Livability	**9** Minimum requirement of footpaths and promotion of active lifestyles	5	5		Achievable, design includes pathways etc. 5 credits possible.
	10 Community development plan implemented and community events considered	4		4	Discussion for a community plan, and scope for community events. Design allows for it.
	11 Percentage of buildings on the site are Green Star Building rated or NatHERS or Homestar	4	4		***Currently aiming for all. Currently investigating Green Star.***
	12 Culture, Heritage and Identity involved in the master planning process	3	3		Cultural engagement, built heritage of Wanaka. Materials related to identity.
	13 All habitable buildings are walkable access to amenities	2	2		Building typologies in the design, hospital/ food and beverage.
	14 All buildings in walkable distance to fresh food	2	2		Yes 800m to New World, residential projects in the future within 800m walking distance.
	15 Visibility of public spaces considered, a crime assessment undertaken and design for safety	2	2		Yes, CPTD will be required for RC (recommended by design team).
		(22 Points)	**18**	**4**	
Economic Prosperity	**16** The surrounding infrastructure is valued at $4000 per residential dwelling or $32 per m^2 of non-	4	4		Health care facility is eligible and ratio to site of benefit to this credit. Confirm calculation with QS.
	17 Residential and non residential affordability strategies implemented	4		4	Discussions around opportunities for start up businesses on site. Further client discussion.
	18 Net percentage increase of jobs, site location and percentage of job types and project location to	4	3		Warning unknown to later in the project, work to prove. Needs to confirm NCC in NZ.
	19 Skill development program of stakeholders and investment in Industry Capacity Development in	2		1	Client discussion on Aspiring House, industry capacity development on timber use.
	20 Analysis of direct cost and benefits for return on investment from optional investment items	2		2	Further work to check roading upgrade and infrastructure, requires cost benefit analysis.
	21 Provision of incentives to encourage sustainable practices that reduce the ongoing cost of living and working	2		2	Commercial client decision.
	22 High speed broadband and wireless local area network provided	2	2		Yes.
	23 A 25% reduction in electricity, 30% onsite energy generation and energy storage for non peak	2	2		Current scheme targeting lower operational energy use reductions.
		(21 Points)	**11**	**9**	
Environment	**24** Minimum requirement for stormwater met and potable water is reduced through water sensitive	7			ECubed to investigate and confirm.
	25 The projects predicted reduction in GHG emissions from energy used on the site compared to a reference	6	4		To be confirmed with a detailed energy assessment. Project to target large reduction. Based on ZC approach.
	26 A whole-of-site LCA is complete and the project has reduced concrete, steel, asphalt timber and PVC use	5	3		Yes, needs detailed LCA assessment required.
	27 Sustainable transport and people-focused transport hierarchy exists, and initiatives to reduce	3	1		Design could achieve a few points in the credit.
	28 **Previously developed land or the site was once significantly contaminated (CR)**	2		1?	Conditional required, achieved. Has contamination survey been complete?
	29 Ecological enhancement of the site and biodiversity enhancement	2	1		Possible with native planting. Check the % to increase amount of native planting.
	30 Construction and operational waste reduced through implementation of management plans	2		2	Yes, requirement on contractor.
	31 50% of project site area comprises landscaping elements that reduce the impact of heat islands	1	1		To be tested by design team. Note large area of solar panels.
	32 Light pollution reduced through lighting design	1		1	Electrical engineer/ client to confirm.
		(29 Points)	**10**	**4**	
Innovation	**33 Innovation**			10	To discuss with client for strategies for different strategies.
		(10 Points)		**10**	
Total Points		**100**	**39**	**55**	

6.0 LEED Communities Credit Summary

LEED v4.1 Cities and Communities					
Category	**Credit Description**	**Credits Available**	**Design Action**	**Client Action**	**Comments on Design**
Integrative Process	Prepare a vision, mission, key goals and objectives of the community.	(Required)		Yes	Client discussion.
	Register and certify buildings, above 5000 square feet (465 square meter), owned by the local government or development authority to LEED, EDGE or an equivalent green building	5		5	Client discussion, if buildings also to be LEED certified.
		(5 Points)		**5**	
Natural Systems and Ecology	Complete and document an ecosystem assessment for the entire community boundary.	(Required)			Ecology report required by an ecologist specialist.
	Create and implement an erosion and sedimentation control plan.	(Required)			Specialist report required by a geotech.
	Provide a percentage of green space per person, or 90% of dwellings must have a green space	(Required)	Yes		Complies (check green area equals 15%).
	Conserve and restore the natural resources within the city.	5	5		Achievable impact, landscape design. Ecology report required. (Mana Whenua).
	Street lighting and sky glow limits must be achieved.	2		2	Electrical Engineer to confirm.
	Identify the local environmental context and conduct a vulnerability and capacity assessment for climate change risks, natural and man-made hazards and extreme events	6	6		Additional specialists reports required from an Ecologist (Mana Whenua).
		(13 Points)	**11**	**2**	
Transportation & Land Use	Design compact and mixed use development, high levels of connectivity and daily walking, biking, and transit use.	6	4		Requires additional measurement of areas and drawings public transport unachievable.
	Design for accessibility.	4	4		
	Design for reduced use of personal vehicles.	2			Dependant on public transport.
	Reduce pollution by promoting alternatives to fossil fuel vehicles.	2	1		EV Vehicle Charging facilities.
	Promote efficient operation of transport systems, user facilitation, behavior change and reduced environmental impact through smart technologies and transportation policies.	2			Not applicable.
	Preserve historic structures and sites and focus growth and redevelopment to infill and other priority locations.	2			Only for existing and previously developed sites. Redeveloping sites.
		(18 Points)	**9**		
Water Efficiency	Support water management, reduce freshwater consumption and encourage to move towards net zero water use.	(Required)			Achievable with an additional Hydraulic specialists reports required.
	Equitable access to clean drinking water and sanitation services and prevent pollution from stormwater runoff.	(Required)			Relevant to the quality of drinking waste water and storm water, specialist report and input required. Requires input from the Council and further clarification from LEED.
	Reduce runoff volume, prevent erosion, flooding and recharge groundwater.	5	4		Proposed bioswails, to confirm percentage storm water retained.
	Use treated wastewater to meet the city water demand.	5			Treated waste water not used in NZ. Not typical in New Zealand, hydraulic engineer to confirm.
	Commit to cover 100% of water connection units with smart water meters to measure the total potable water use at the point of connection.	2	2		Hydraulic engineer to confirm.
		(12 Points)	**6**		
Energy and Greenhouse Gas Emissions	To provide safe, secured, reliable, resilient and equitable access to power.	(Required)			Backup already part of hospital design, will need to consider for offices. Further client discussion required.
	To move towards a zero emissions city and reduce environmental and economic harms associated with excessive energy use.	19	10-19		GHG factor to be confirmed with LEED. Expected to perform well under the condition that the GHG is low.
	To improve the energy efficiency of city services.	4		4	Energy simulation required and specialist report required. Compliance pathway to be discussed.
	To reduce the environmental and economic harms associated with fossil fuel energy and reduce Greenhouse Gas emissions by increasing self-supply of renewable energy, use of grid-source	6	4		Tier 1, 15% of total energy demand produce by onsite renewables. To discuss with client for pathways.
	To improve operational efficiency of the energy system.	2		2	Mechanical engineer report required.
		(31 Points)	**14**	**6**	
Materials and Resources	To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing and recycling materials.	(Required)		Yes	Additional contractor requirement.
	100% coverage of all buildings for segregated waste collection services including but not limited to recyclables and organics.	(Required)		Yes	Specialist waste management plan.
	To encourage diversion of organic matter away from landfill and move towards creation of valuable nutrient rich soil and clean power.	2			Not available in Wanaka.
	To encourage waste diversion of inorganic matter away from landfill and move towards 100% diversion from landfill.	5		3	To be confirmed with council and local recycling operators.
	To encourage the use of products and materials for which life cycle information is available and that have environmentally, economically, and socially preferable life cycle impacts.	2	1		Dependant on material availability. Civil engineer to confirm.
	Provide smart waste management systems.	2			Systems not typical to New Zealand.
		(11 Points)	**1**	**3**	

LEED v4.1 Cities and Communities					
Category	**Credit Description**	**Credits Available**	**Design Action**	**Client Action**	**Comments on Design**
Quality of Life	Provide a comprehensive demographic plan.	(Required)		Yes	Specialist demographic report required. Client action.
	To provide facilities and services to citizens that help meet their social needs, maximize their potential for development, and enhance community well-being.	(Required)		Yes	Health care on site.
	To encourage development that will drive economic well-being of the residents.	2			
	To provide access to housing at reasonable costs to sections of the society which are in need of assistance.	6		6	Air monitoring to be provided, playground or edible garden, and well being spaces in offices to be discussed.
	To create sufficient capacity and capability to respond to emergency incidents and reduce its impact on human life/health.	2		2	Specialist report required (Civil Defense)? Council to confirm.
		(10 Points)		**8**	
Innovation	To encourage cities to achieve exceptional or innovative performance.	6	6	6	Design team and client discussion.
		(6 Points)		**6**	
Regional Property	Regional Priority.	4		4	Further conversations with LEED for New Zealand environment context.
		(4 Points)		**4**	
Total Points		**110**	**49**	**34**	

7.0 Recommendations and Next Steps

Having completed this community certification pathway report we can recommend that Green Star communities is the chosen certification tool for The Wanaka First District. This is based on the following factors:

- Recognised global certification.
- The easy application to the New Zealand environment.
- Increased number of relevant points to the design.
- Less requirement of specialist reports.
- Further initiative to register buildings under Green Star and other rating tools throughout the program.
- Less requirement of conversion through calculations and direct contact to the New Zealand Green Building Council.
- Knowledge pool within local industry.

The next steps for the project are:

- Use the tables provided to give an identification of cost for the certifications.
- Conversations between client, contractors and architects to confirm credits and areas to develop and target within the design.
- Correspondence with the New Zealand Green Building Council to register the project.
- Once a certification is confirmed a more detailed pathway with a difficulty/risk assessment per credit will be undertaken.

"Certification through Green Star demonstrates a holistic approach to climate conscious design, innovation and global alliance to sustainability initiatives."

New Zealand Green Building Council

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Wānaka Health Precinct

Cultural Design Concept Summary

19 November 2024

This document was prepared by Aukaha in collaboration with ROA

For information only

This document summarises mana whenua informed values for **ROA Wānaka Health Precinct**. These core concepts have been derived from a session with a panel of mana whenua representatives, which utilise a cultural values-based system to understand the significance of place, whakapapa and the projects wider context.

Mana whenua, in conjunction with Aukaha, have recognised key opportunities to embed these cultural values throughout the entirety of this project. These cultural values should be treated as preliminary and applicable to this project alone. As such they are not to be used for external publication without the approval of Aukaha, who have prepared this document alongside, and on behalf of mana whenua.

Intellectual Property

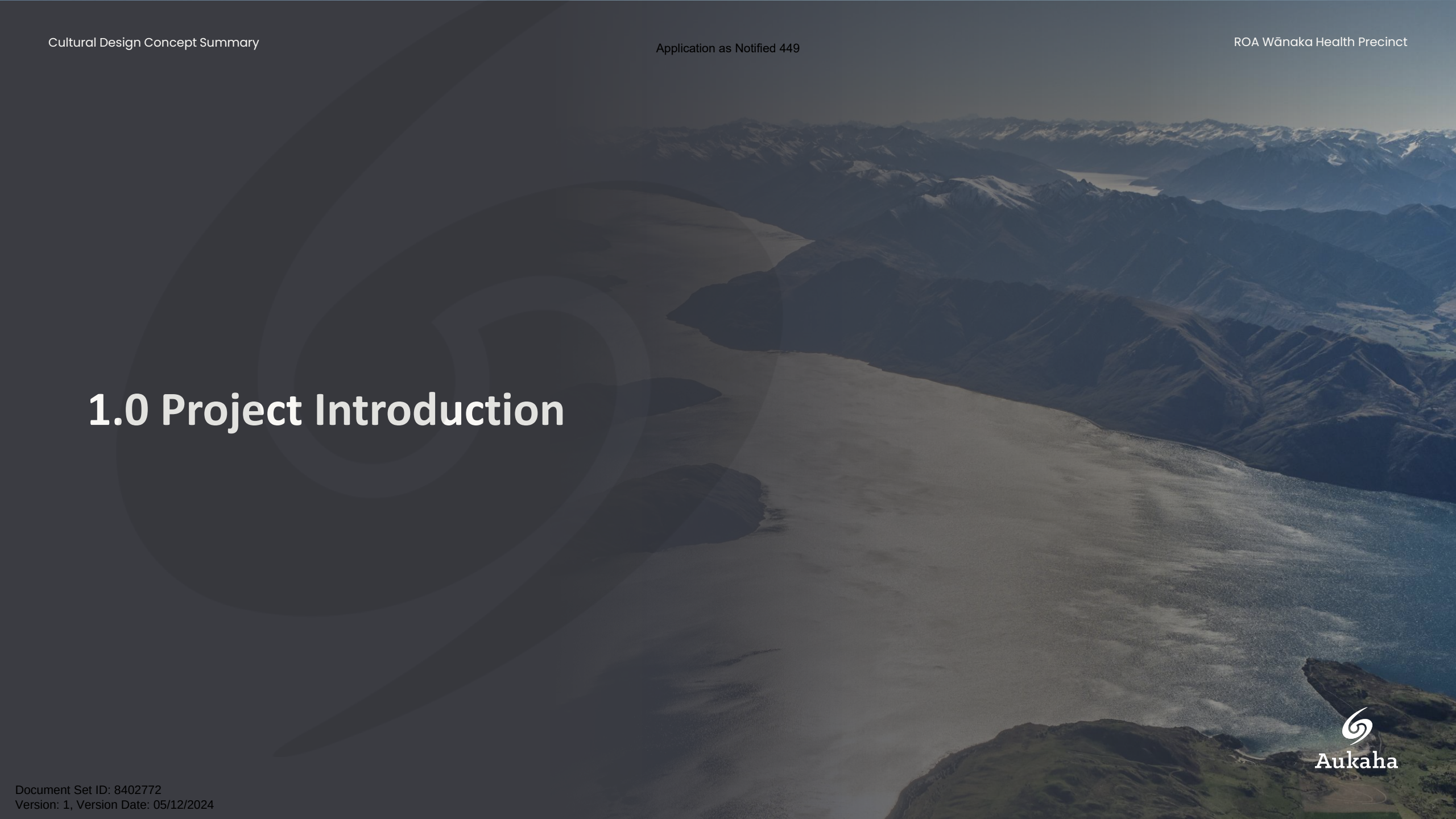
This body of work contains mātauraka Kāi Tahu knowledge and is intellectual property held collectively and represented by Aukaha and mana whenua. It is important that any contractual undertaking acknowledge the **Wai 262 Claim** which address the ownership and use of Māori knowledge, cultural expressions, indigenous species of flora and fauna, all known as taoka (treasure), and inventions and products derived from indigenous flora and fauna and/or utilised Māori knowledge.

As such ownership of any work produced by Aukaha are retained by Aukaha, or by mana whenua as outlined above. Integration of cultural values therefore cannot be subject to re-use, alteration, manipulation, removal without consultation with Aukaha and mana whenua.

It is also our expectation that mana whenua is referenced for their involvement from the outset.

Aukaha

1.0 Project Introduction



Aukaha

1.1 Our Involvement

Ko te Tititea te mauka	Mt Aspiring is the peak
Ko ka Tiritiri o Te Moana te tahuhu	The Southern Alps are the backbone
Ko Hawea, Wānaka me Whakatipu-waimaori nga roto	Hawea, Wanaka and Whakatipu-waimaori are the water bodies
Ko Mataau me Ōrau kā awa	Mataau me Ōrau are the rivers
Ko Rākaihautū te Tūpuna	Rākaihautū is the ancestor
Ko Moana-nui-a-kiwa te moana	Moana-nui-a-kiwa is the ocean
Ko Kāti Mamoe me Waitaha te iwi Kāi Tahu	Kāti Mamoe and Waitaha are the people

Waitaha and Rapuwai were the first people and the earliest ancestors in Te Waipounamu.
Subsequent groups Kāti Mamoe and Ngāi Tahu migrated south and through a mixture of conquest, collaboration and intermarriage these strands became united under one tribal identity now known as Ngāi Tahu or Kāi Tahu.

The intergenerational knowledge of te iwi Kāi Tahu comes from all of these earlier peoples and traditions, it reaches all the way back to creation narrative and stretches into the future as a taonga for mokopuna. The knowledge itself is an intricate understanding of place including use of land, water and environment for kai, shelter, clothing, survival and indeed flourishing.

Te Rūnanga o Ngāi Tahu (Statutory Claim)

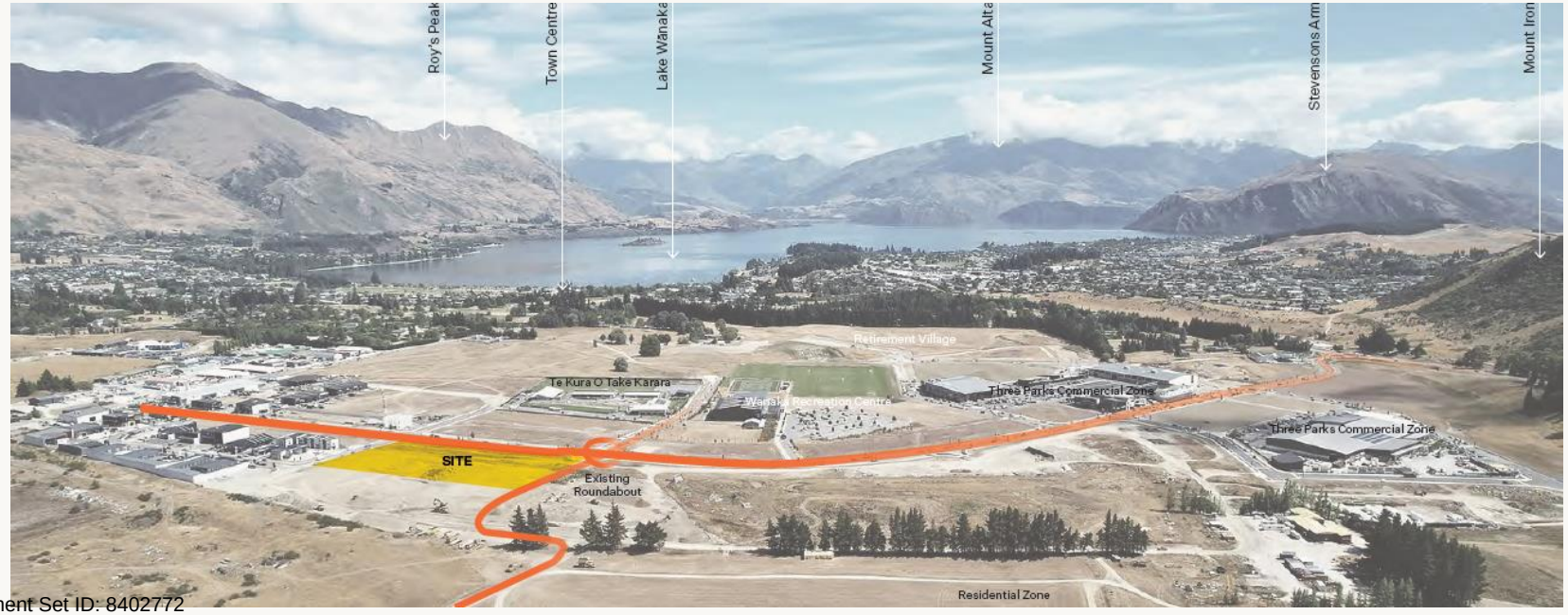
Aukaha

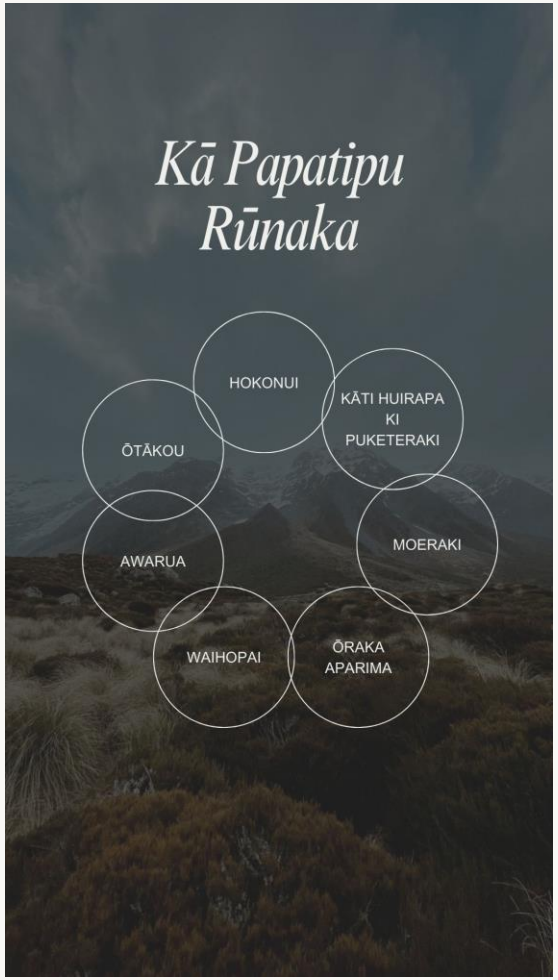
1.2 Background

Wānaka Health Precinct – Roa

The First District is a unique opportunity to develop a block-wide urban strategy that generates positive synergies for tenants and will set a high benchmark for the surrounding Three Park commercial developments. The resulting vision is for a vibrant urban realm precinct with pedestrian laneways, public squares, attractive landscaping, and outdoor eating areas that will greatly enhance the wellbeing and character of the local community.

The precinct will eventually be home to an inspirational series of health facilities designed to serve the growing inland population around Wānaka.
Mana Ahurea have been engaged to represent mana whenua in this shared takiwā project as a design partner for the urban realm design.





Warren & Mahoney
Wānaka First District
Design Report

Aukaha

2.0 Cultural Concept Overlay

Aukaha

2.1 Kā Uru / Core Values

The development of mana whenua cultural values and narrative links for this project steam from our four core values of mana, whakapapa, mauri and tapu.

Mana
Ensuring the indigenous authority of mana whenua is recognised and upheld within all projects happening within tribal territories.

- Mana whenua hold authority within their region.
- Use of Māori knowledge and reflections of Māori identity is lead and approved by Mana Whenua to ensure all cultural material is correctly represented and proceeds with the approval of Mana Whenua.
- Implementing consultative engagement and reciprocal relationships increases the mana of the project, relationship, and outcome.

Whakapapa
Genealogy, history, layers.

- Mana whenua names and places are celebrated to enhance sense of place and identity.
- Mana whenua consultation and research on the use of correct ancestral names, including macrons.
- Recognition of traditional place names through signage and wayfinding.
- Use of appropriate names and their provenance to inform design processes.

Mauri
Life Principle, vital essence.

- Mana Whenua acknowledge the existence of mauri, an active phenomenon within all things. This sustaining spiritual source plays an integral part in developing process and projects.

Tapu
Sacred, prohibitive, restrictive.

- Mana whenua will identify and lead the appropriate procedures and protocols regarding things tapu such as wahi tapu sacred sites, archaeological.

Aukaha

2.2 Kā Uru / Related Values

Our values workshop turned up many values and ideas held by mana whenua for the site at Wānaka, the kaupapa of the ROA development and narrative directions to lead us in the design.
Above is a substantive list of values that apply to mana whenua thinking for this project, in the pages to follow we unpack how these values can align with design principles.

Accessibility
Mamae + Utu
Maumaharataka
Mahika Kai
Ahi Kaa
Wānaka + Mātauraka
Mana
Taoka tuku iho
Manaaki
Whakapapa

Mana Motuhake
Tautoko
Aroha
Whakamana
Whakahaumaru
Arahonohono
Kaitiakitaka
Hauora
Waiora

Mauri
Tapu/noa
Whakanoa
Tīkaka
Rokoa
Karakia
Tūpapaku
Pēpi hou
Whānau

Wairua
Ka hua o te tau
Ōraka
Taiao
Ora
Atua Māori
Mātauraka

Ko te wai te toto o te whenua, ko te whenua te toto o te tangata
Water is the blood of the land, and land is the blood of the people.

Aukaha

2.3 Kā Uru / Values and design principles

The development of mana whenua cultural values and narrative links for this project stem from our four core values of mana, whakapapa, mauri and tapu.

Mana
Manaaki, whakamana, Whānau, Kāi Tahutaka, Mana motuhake, Auahataka, Aroha, Tautoko, Pēpi hou

To elevate and inspire visitors by:

- Having an inspirational and uplifting environment that is inclusive, Uplifting, colour use, lighting, sculpture, art, storytelling,
- scales, low lying through to height, flexible space, view shafts, Gathering place for community, Play interactive, hospitality, market access, accessibility, Social spaces, pop up retail spaces

Taiao
Mahika kai, ka hua o te tau, Waiora, kaitiakitaka

To work with best practice to ensure that the environment is considered and cared for by:

- Considering Birdlife and biodiversity.
- Using aspects of Biophilic design. Thriving green planting, seasonal planting, appropriate plants for climate, layered planting,
- Intergrated furniture
- Roof use, Offsetting building and planting, balcony use, climbers' green grooves and solar panels.

Whakapapa
Matauraka, Taoka tukuiho, maumaharataka, atua Maori, Ahi kaa, Mamae Utu

Making the space to learn new stories of place and wellbeing by:

- Embedding a strong sense of the history of the area that expresses mana whenua stories and values.
- Understanding the significance of the whakaapa of the Wanaka creation stories so we can learn from them and the values that they hold.
- Having planting and features that can educate on wellbeing.

Aukaha

2.4 Kā Uru / Values and design principles

The development of mana whenua cultural values and narrative links for this project stem from our four core values of mana, whakapapa, mauri and tapu.

Tapu/ Noa
Tikaka, Karakia, Tupapku, Pēpi hou

Consider cultural needs and cultural practice by:

- Having plants for cultural practice.
- Flow of the space to consider tīkaka and cultural needs.
- Considering view shafts to important parts of landscape.
- Having access to water features to whakanoa when leaving the area.

Mauri
Waiora, Wairua, Oraka, Hauora, Whakamana, Mahika kai, Ora, Rokoā

To enhance and uplift visitors experience and wellbeing by:

- Having tranquil pockets that provide for visitor recuperation, wellness and health, including sensory experiences such as water features, smell and sound features.
- Considering connectivity and flow through the spaces, cycling and active travel.
- Using of local resources and materials.

Water symbolises the spiritual link between the present and the past, the never-ending source of life, for generations that have gone before and those to follow. *From the Kāi Tahu Water Perspective paper 2012*

Aukaha

2.5 Narrative Link to Mana Motuhake me Kaitiakitaka

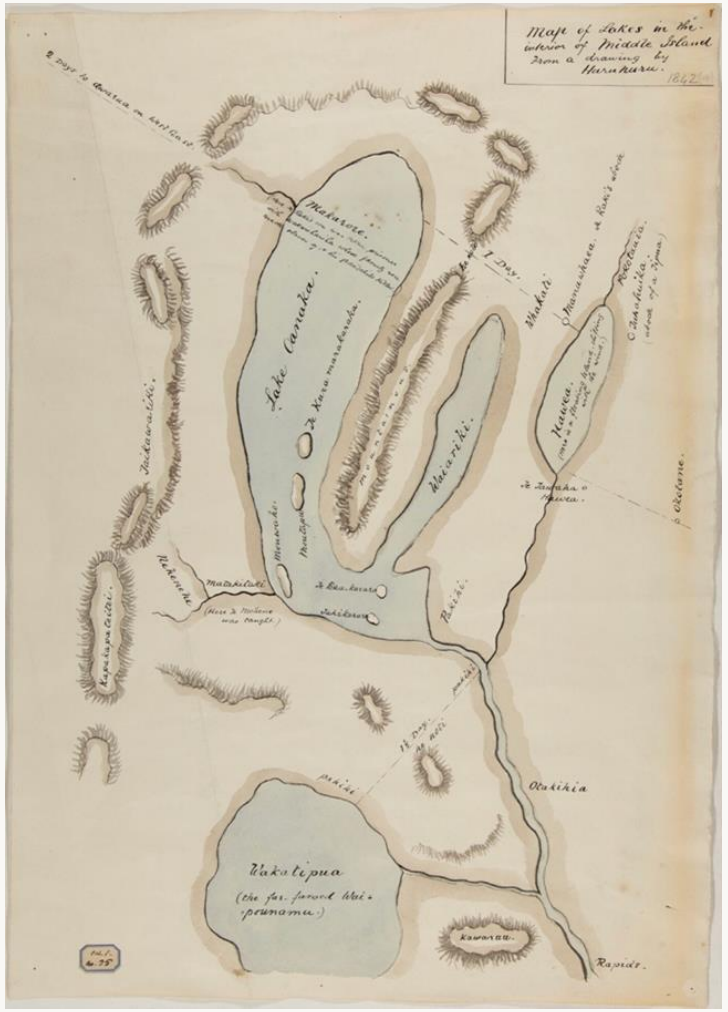
Wānaka is one of the iconic lakes of cultural significance to Kāi Tahu. It first features in the Waitaha iwi oral tradition of "Kā Puna Wai Karikari o Rākaihautū" which tells how the principal lakes of Te Waipounamu (the South Island) were dug by the founding ancestor Rākaihautū.

The name "Wānaka" is a South Island variant of the word "wānanga" which refers to ancient schools of learning. In these schools Kāi Tahu tohuka (men of learning) would be taught whakapapa (genealogies) which stretched back to over a hundred generations and karakia (incantations) for innumerable situations. All of this learning they would be required to commit to memory. The name tells us that Wānaka was the premier place of such deep learning in Te Waipounamu.

The crystal waters of the mountains and the lake were fundamental in this learning experience and through the metaphor of water the stories of Kāi Tahu, Kāti Mamoe and Waitaha can be remembered and reasserted on this landscape.

The name "wānaka" is associated with knowledge, tribal lore and learning. On the journey of discovery, Rakaihautu and his party are said to have camped at Wānaka to rejuvenate their spiritual and mental strength. This would have been in the form of wānaka or learning to fortify their spiritual well through customary ceremony to ensure divine guidance and safe passage, led by tohunga or spiritual leaders. The name "wānaka/wānanga" is in common use today and applied today to schools of learning and universities.

He pukenga wai, he pukenga kōrero
A body of water, is a body of knowledge



Kāi Tahu rakatira (a Kāi Tahu chief) Te Huruhuru drew one of the first maps of Lake Wānaka for Edward Shortland during his 1843-44 visit.

Aukaha

2.6 Narrative Link to te mana o te wai

Ōrau

Ōrau (Cardrona River) was a traditional ara tawhito linking Whakatipu Waimāori (Lake Wakatipu) with lakes Wānaka and Hāwea. During the 1879 Smith-Nairn Royal Commission of Inquiry into the Ngāi Tahu land claims, Ngāi Tahu kaumātua recorded Orau as a kāinga mahinga kai (food-gathering place) where tuna (eels), pora ('Māori turnip') and weka were gathered.

Mata-au

Mata-au (the Clutha River) flows from Lake Wānaka in a south-easterly direction through Central Otago into Te Moana-nui-a-Kiwa (the Pacific Ocean) at Molyneux Bay. The mouth of Mata-au was heavily populated with many permanent and temporary kāika (settlements) located throughout the lower stretches of the river. Murikauhaka, a kāika near the mouth of the Mata-au, was at one stage home to an estimated two hundred people. The river itself was an important trail, providing direct access into lakes Wānaka, Hāwea and Whakatipu Waimāori (Lake Wakatipu) from coastal Otago.

Wai māori

For Māori reverence for mountains is an important belief, often personified, representing foundational figures in the annals of iwi or hapū.
The rain, hail and snow that falls on these mountains is of the purest form of moisture, associated with mountains that carry such mana, the rivers and streams descending to the lakes being of a wai tapu nature, carrying a special force, an intact mauri.

Hence the water that flows from the mountains to the great inland lakes was of the highest quality, ensuring that the receiving lakes' water quality was pristine, supporting a rich and healthy mahika kai resource. The lakes and their environs supported abundant mahika kai, in the shallows, in the depths and at river mouths, an intact mauri that the people could identify with and treasure.

Aukaha

2.7 The Story of Rakaihautū

Rakaihautū was in command of the star waka Uruao, the journey of the Uruao originated in the eastern Pacific islands, making landfall on the Nelson Banks, Rakaihautū sent his son Rokohouia on an eastward journey around Te Waipounamu, whilst he led an exploration party through the centre of the island on foot.
The journey of Rakaihautū is remembered through his great feats and use of his kō (digging implement) "Tū Whakaroria," and 'kā puna karikari o Rakaihautū', the digging of the great fresh water resevoirs of the interior.
Digging and naming nearly all the significant fresh water reservoirs and principal mountains in the South Island, including the inland lakes Takapō, Ōhou, Hāwea, Wānaka, Whakatipu-wai-māori.

Rakaihautū dug three initial pools that were to give him a sign as to what the South Island had in store for them. In these pools, or puna, he saw:

He Puna Waimarie (Pools of bounty)
He Puna Hauaitu (Pools of Freezing Cold)
He Puna Karikari (Pools Dug by the Hand of Man)

These were, in effect, prophecies foretelling that the Waitaha people would encounter waterways full of food for the people, lakes that would be freezing beyond all belief – the glacial pools, and the lakes excavated by man himself.

According to Kāi Tahu tradition nearly every lake in the South Island is a product of the shovel of Rakaihautū and they are poetically known as Kā Puna Karikari o Rakaihautū.

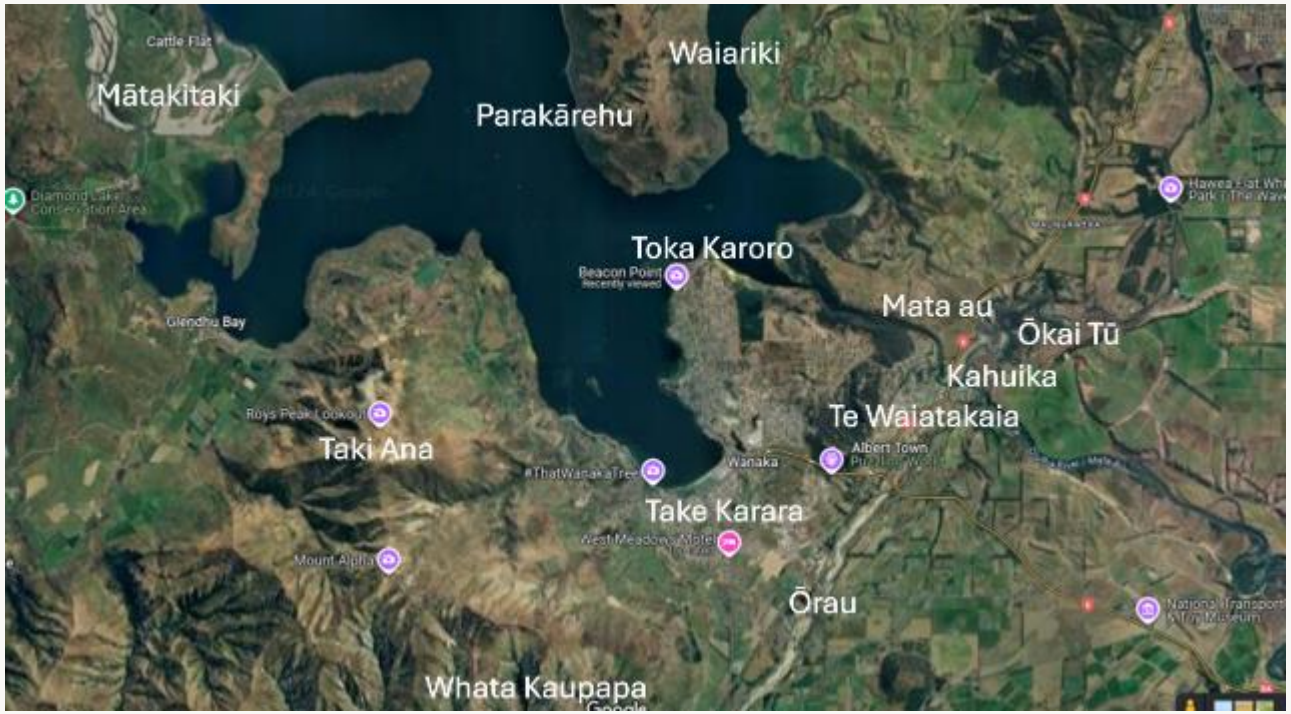
The lakes are the source of the South Island's freshwater and the traditions link the earliest ancestors discovering and naming these great sources of pure water.

(Ellison, Te Mana o te Wai)

Aukaha

2.8 Kāi Tahu Placenames

Ikoa Kāi Tahu	English Name	Context
Taki Ana	Roys Peak	Mauka
Te Waiatakaia	Mt Iron	Mauka
Kahuika		Merging point of Te Mata au me te Ōrau
Mata au	Clutha River	Ara tūpuna
Ōrau	Cardrona River	Ara tūpuna
Mātakitaki	Matukituki River	Ara tūpuna
Manuhaea		Nohoaka/Mahika kai
Ōrokotewhatu	The neck	
Waiariki	Unamed	Stretch of wai between the mainland and the Parakārehu (Stephenson's Peninsula.)
Parakārehu	Stephenson's Peninsula	Nohoaka/Mahika kai
Ōkai Tu		Nohoaka/Mahika kai
Toka Karoro		Nohoaka/Mahika kai
Whata kaupapa		Nohoaka/Mahika kai



2.9 Waiora Way – Naming for laneway

Wai - water

Te Aka Māori Dictionary

1. (personal noun) who? whom?

2. (noun) water, liquid, juice.

The kupu (word) **wai** is interchangeably used in Te Reo Māori for both water and as an identifier for oneself and other humans. Humans requiring water for their health and in turn the essence of their identity.

In the Wānaka area rain, hail and snow that fall on the mountains is the purest form of moisture. The water is associated with revered mountains that carry mana, the rivers and streams descending to the lakes is considered tapu (sacred) in nature, carrying a special force, an intact mauri (lifeforce).

Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community.

Te Mana o te Wai is Aotearoa's world leading policy framework for governing the management of freshwater systems.

Ora

1. (verb) to be alive, well, safe, cured, recovered, healthy, fit, healed.

2. (verb) to survive, escape

3. (verb) to be satisfied with food, satiated, replete.

4. (verb) to recover, revive.

5. (modifier) healthy, fit, well, alive - in a state of wellbeing or just being alive.

6. (noun) life, health, vitality.

Ora is the Te Reo Māori term for general health and vitality.

Waiora

These two terms together are often used by Māori to indicate a healthy system in general for humans and/or water. This is because if the water is healthy, the people will be healthy too.

Way

(noun)

1. a method, style, or manner of doing something; an optional or alternative form of action.

2. a road, track, or path for travelling along.

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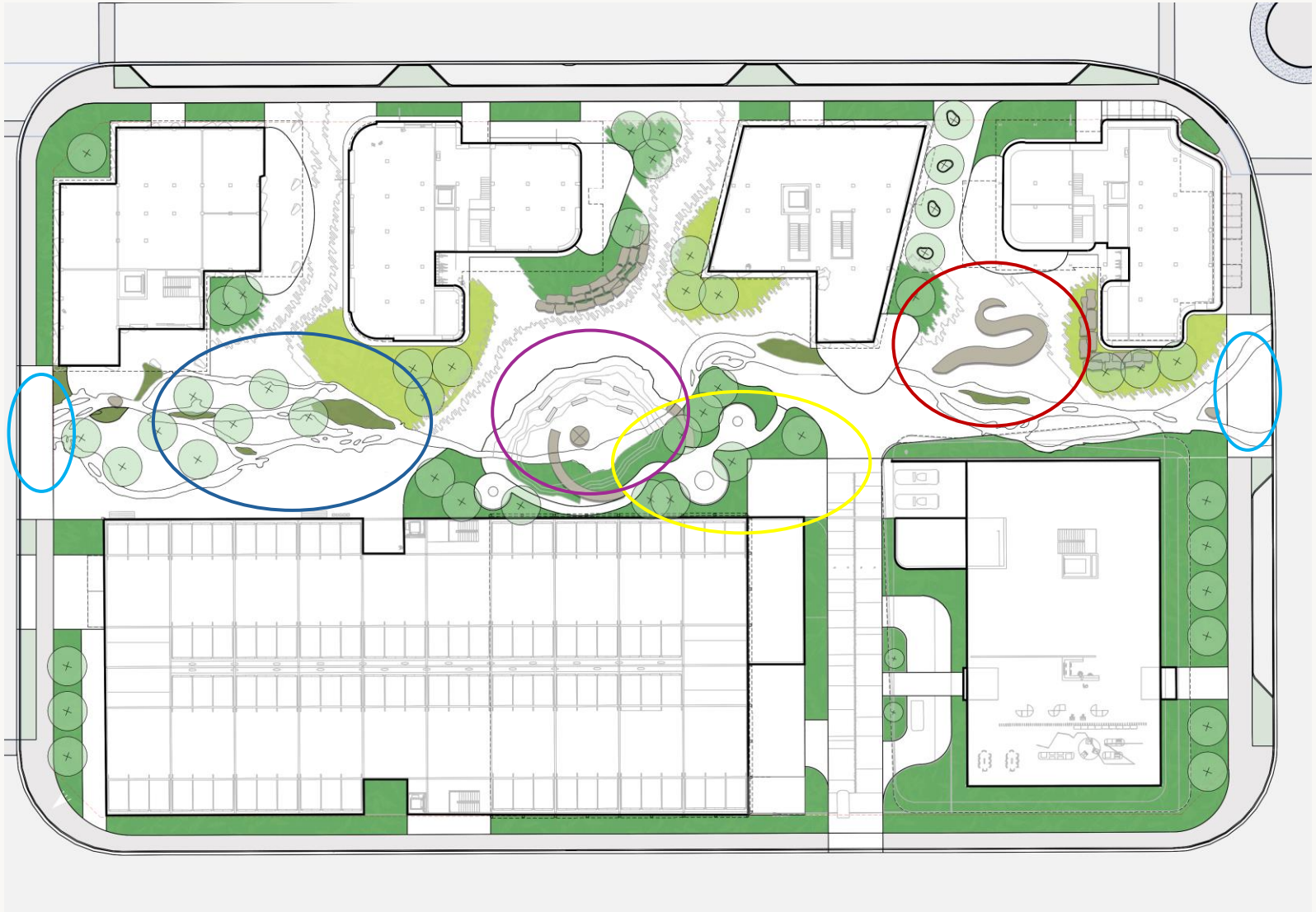
2.10 Cultural Values Concept Overlay – Waiora Way



Tomokaka – Entry Thresholds

Tākaro – Interactive space

Rokoā – Healing Gardens

Te Ngākau – Heart centre

Manaaki – Community Space

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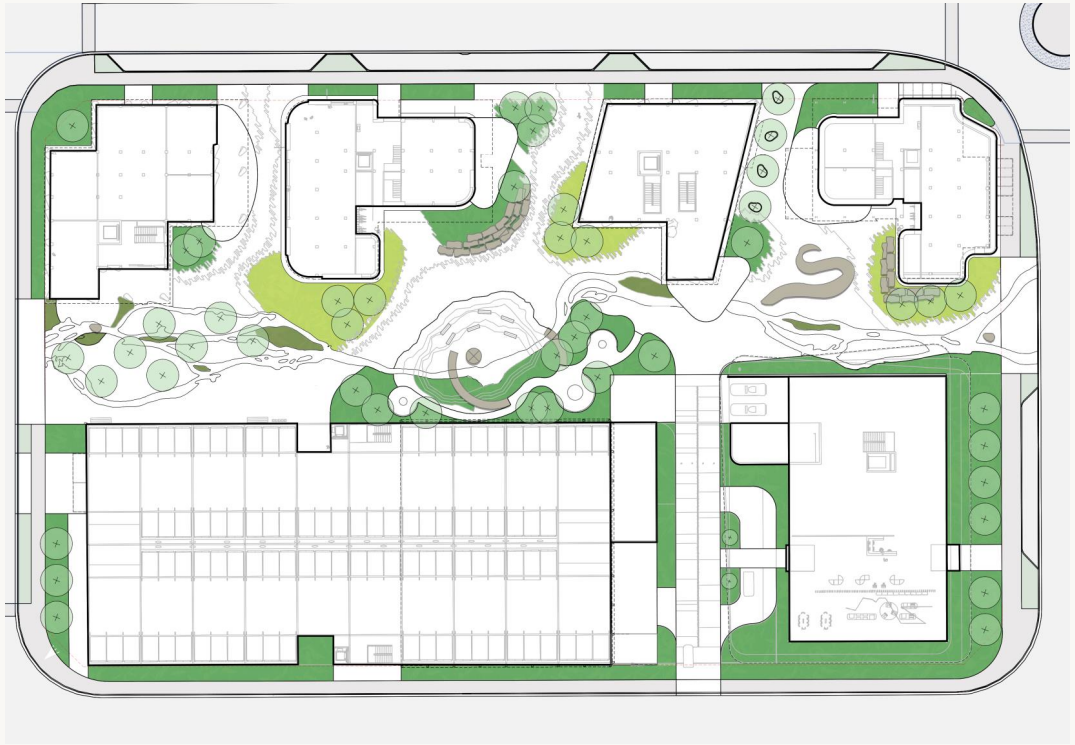
3.0 Cultural Design Opportunities

3. Design Opportunities Matrix

Narrative Design Approach - Ara Tupuna - River Travel

The ways in which Kāi Tahu travelled and utilised the river for traditional lifeways associated with Mahika kai and Kai hau kai. Traditional forms of travel like mokihi and traditional forms of architecture utilised on the rivers and within nohoaka. These could include lightweight and temporal forms, built for purpose, useful and locally resourced examples like whata, tīrewa, rakau kōrero, whararau. The material palette responds to values and narrative. Storytelling and sculptural elements include Ngāi Tahu visual culture, narrative and artistry.



Element	Material	Narrative Links
Signage & Interp	TBC	Whakamahere
Touchstones	Boulders/Etching	Whakamahere
Large Scale Sculptural - Interactive	TBC	Ara Tupuna
Large Scale Sculptural – Centrepeice	TBC	Rakaihautu
Paving – Ground plane	Motif design	Ara Tupuna
Motif for furniture/panels/feature elements	Motif design	
Entrance ways and Pergola structures	Built structures, mixed materials, timber, steel	Ara Tupuna
Naming		
Lighting		
Sounds		
Reflection pools	Applied Motif	He Pūna Karikari

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3.1 Kāi Tahu Plant Species

Māori Name	Common Name	Use
Māpou or Matipo	Red Matipo	Sacred – ceremonial
Kōwhai		Medicinal, seasonal indicator, tāoka species
Koromiko/Kōkōmuka	Hebe	Medicinal, tāoka species
Korokio	Corokia Cotoneaster	Medicinal, multi use
Kōhūhū	Pittosporum	Fragrance, ceremonial
Houhi/Hoeheria	Lacebark	Medicinal, weaving, multi use
Horopito	Pepper Tree	Medicinal, seasoning
Horoeka	Lancewood	Multi use
Harakeke	Flax (Tenax)	Multi use, Weaving
Kawakawa		Medicinal
Karamu	Coprosma	Medicinal
Mikimiki	Coprosma	
Panakenake	Pratia	
Ngaio		
Rarauhe	Bracken	Food source
Rata	Southern Rata	Medicinal, timber
Tawai	Beech	
Tarata	Lemonwood	Medicinal, Fragrance
Toetoe		Insulation, medicinal
Tī Kouka	Cabbage Tree	Food source, medicinal, wayfinder, taoka species
Mānia	Sedge	Insulation, bedding, weavings
Manuka/Kanuka		Multi use, medicinal
Tikumu	Mountain Daisy	

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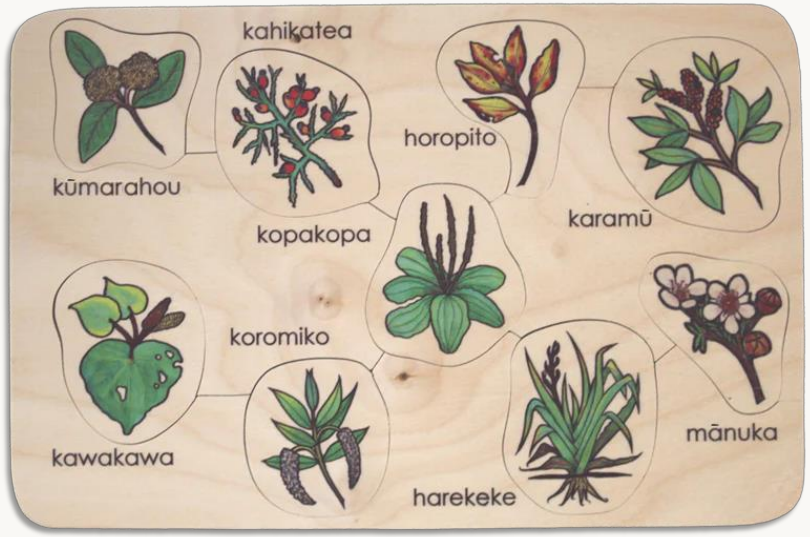
3.2 Planting Precedents

Planting Priorities

- Prioritise layered and dense planting bays which include lots of native plants and some complimentary exotic plants.
- Include varied scales, colours and height planes.
- Priortise taoka species for statement trees such as Kōwhai and Horoeka
- Include lots of good rokoā māori plants that can be identified in interpretation signage



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3.3 Sculptural Opportunities – Centrepiece Sculpture

Ross Hemera

Lonnie Hutchinson

Areta Wilkinson

Ngāi Tahu artists working within the visual language and with the cultural history of Te Waipounamu are best placed to respond to the landscape and projects that interact with place. Each of these senior Ngāi Tahu artists have the skill and experience to respond to brief and can work to integrate elements of sound, movement with wind, shadow and light. Importantly thier work will tell the authentic stories of mana whenua.

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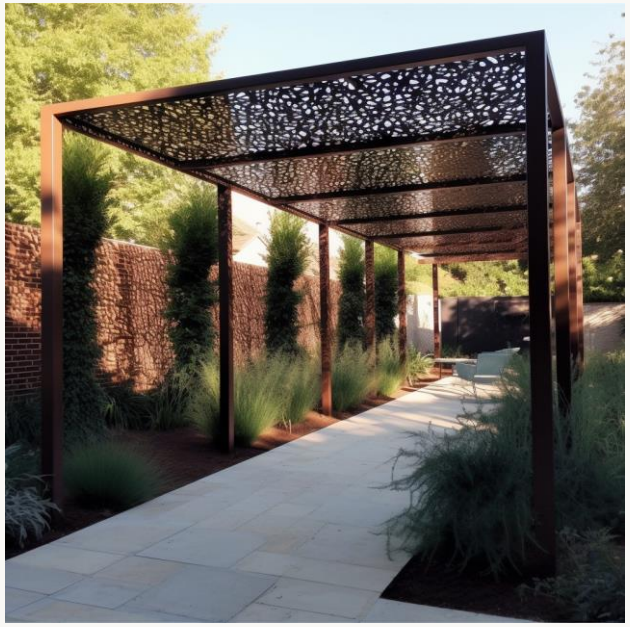
3.4 Sculptural Opportunities - Tomokaka

Tomokaka – Entry point sculptures could be placed at one or more of the entrances for the precinct.

These examples carry the light and temporal aesthetic of Kāi Tahu river architecture.

A Kāi Tahu artist could be engaged to design these signature pieces.



A similar aesthetic could be applied where we need a pergola style intervention.

This could be good for the rokoā healing garden and/or the community Garden spaces.

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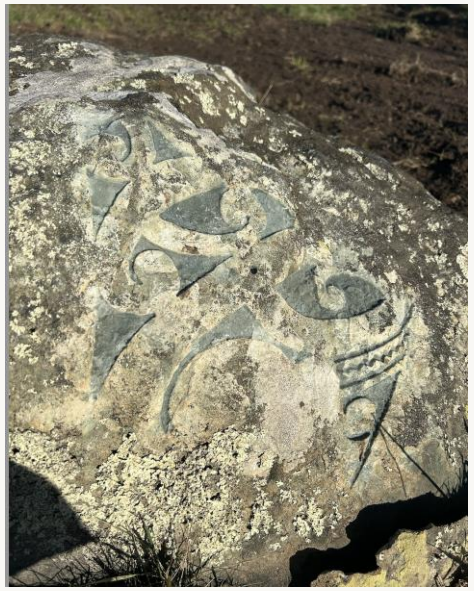
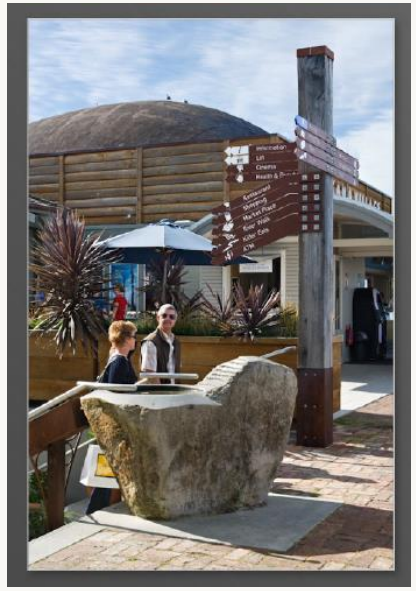
3.5 Sculptural Opportunities contd.

Giant Mokihi education sculptures
Exemplar by Ross Hemera





Wai touchstone boulders
Sand/vapour blast detail by Fayne Robinson

Reflection pools for the Rokoā healing gardens

Ngāi Tahu artists working within the visual language and with the cultural history of Te Waipounamu are best placed to respond to the landscape and projects that interact with place. These are some of the sulptural opportunities identified for this Project.

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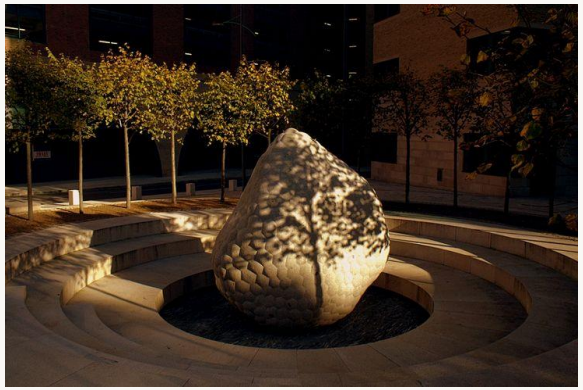
3.6 Lighting & Sound



Lighting design can offer a different identity and point of interest to the space and sculptural works at night time.




Sound design and artwork precedents by Madison Kelly (Kāi Tahu). We propose an exploration of integration of the sounds from Te Taiao (nature) through the work of this gifted artist.

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3.7 Signage

Signage and interpretation can be integrated to provide both wayfinding and storytelling opportunities.

These pieces can be both sculptural, artistic and informative.

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3.8 Ground Plane

Drain and channel covers can carry design that reflects the Waiora Way story. Reinforcing the values and narrative to visitors.

The unique permeable surfaces of the resin bonded gravel paving can carry design narrative in colour and motif.

The reflection pools in the rokoā could hold motif design within their depths.

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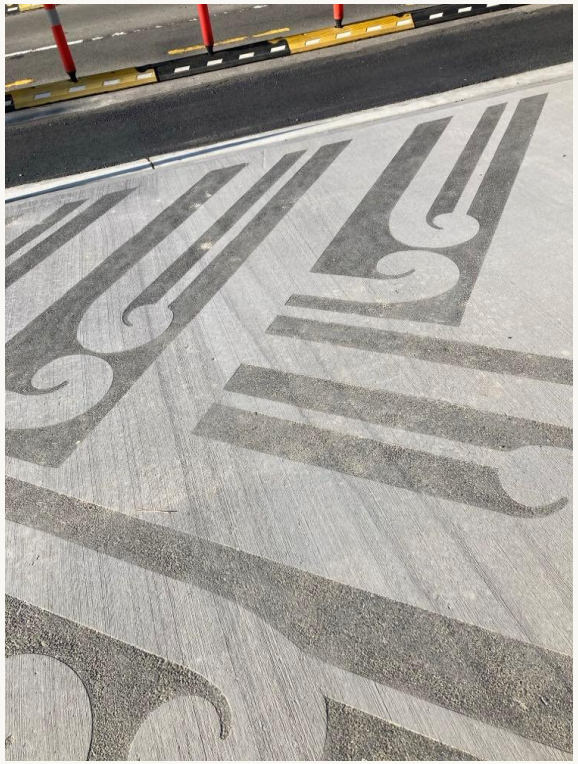
3.9 Motif in Design

Vapour blasted planters – George Street – Fayne Robinson - Artist



Vapour blasted concrete – Pipitea Marae - Wgtn

Lasercut in powdercoated steel – George – Fayne Robinson - Artist

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TE AO MĀRAMA INC.

Cultural impact Statement ROA

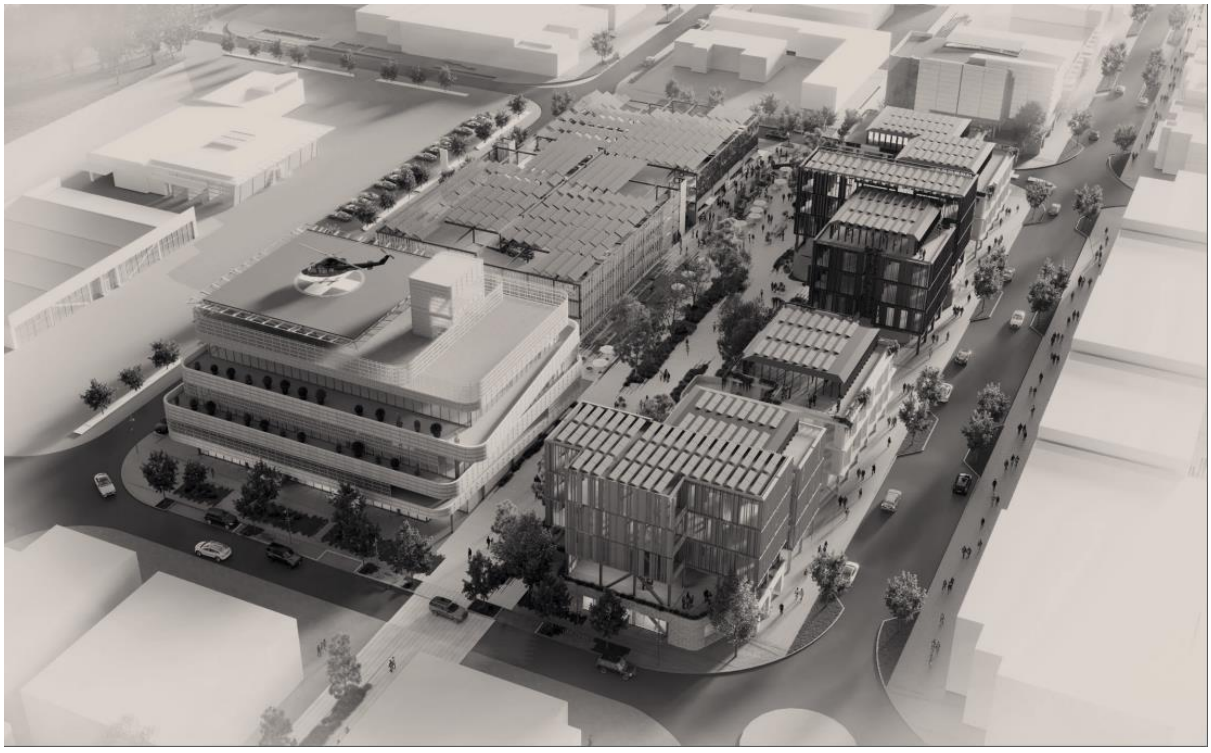
TE AO MĀRAMA INC.

Cultural Impact Statement

To:	ROA
Attention:	Jo Fyfe
Date:	21 August 2024
Project:	For the integrated regional hospital and allied health/commercial buildings project on behalf of ROA
Project Location:	Lots 49 – 61 of subdivision RM230084 of lot 981 DP 587232, Wānaka

Purpose

To provide a Cultural Impact Statement (CIS) to assess Rūnanga values within the landscape and potential effects of the integrated regional hospital and allied health/commercial buildings project on behalf of ROA. This Statement will provide recommendations and outcomes sought by rūnanga.



TE AO MĀRAMA INC.

Background

ROA has embarked on a considered project to establish a new comprehensive health precinct in Wānaka, which will be an integrated regional hospital and allied health/commercial buildings

Te Ao Mārama Inc. (Te Ao Mārama) have been engaged to provide a cultural impact statement on behalf of Nga Runanga ki Murihiku.

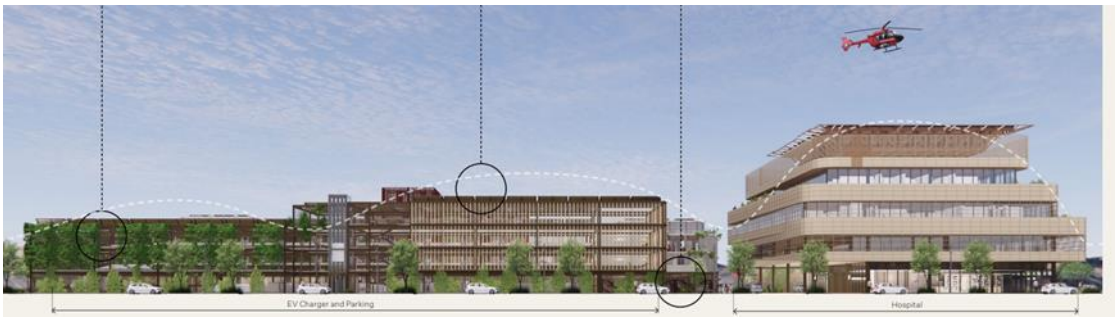
This assessment documents the impacts of the activities on those values that are held by mana whenua. This document will improve the understanding of those activities on mana whenua values and assist further engagement

This statement is not a Cultural Values Statement or complete Cultural Impact Assessment. It does not include a detailed explanation of values or associations. This statement will inform ROA of the impacts of the proposed project, as well as recommendations and outcomes to mitigate those impacts.

This report provides some context and information that aids the Kaitiaki Papatipu Rūnanga (via Te Ao Mārama on these issues. It may assist further discussions on the wider project. However, this report simply provides background information and cannot be considered to represent any decisions by the Kaitiaki Papatipu Rūnanga (via Te Ao Mārama Inc.).

Information within this document is based on existing documents and conversations held with Ngā Rūnanga ki Murihiku, Te Ao Mārama staff and local experts. It has been subject to internal peer review.

Disclaimer: Cultural information contained within this report cannot be distributed or used without the permission of Ngāi Tahu ki Murihiku. This assessment is to be used for the current consenting process. If decisionmakers require any information for other purposes they need to contact Te Ao Mārama. Use of the report by decisionmakers, or any other party, in any other circumstances (for example, subsequent applications for other projects) will be subject to written approval by Papatipu Rūnanga.



TE AO MĀRAMA INC.

Mana Whenua

The Te Rūnanga o Ngāi Tahu Act 1996 establishes Te Rūnanga o Ngāi Tahu (Te Rūnanga), consisting of each of the Papatipu Runanga of Ngāi Tahu Whānui (section 9).

In Murihiku there are four Papatipu Rūnanga whose members hold mana whenua status within the region. Te Ao Mārama represents the interests of three of these rūnanga on matters particularly those matters pertaining to the management of natural resources under the Resource Management Act, 1991 and the Local Government Act, 2002.

Te Rūnanga o Ngāi Tahu (Declaration of Membership) Order 2001 describes the takiwā of those rūnanga. Refer to appendix one for a description of the respective takiwā of Papatipu Rūnanga representing Ngāi Tahu ki Murihiku, particular to Te Rūnanga o Awarua, Waihopai Rūnaka, Hokonui Runanga and Te Rūnanga o Ōraka-Aparima.

The rohe (area) that the application is within is in the takiwā of ngā Rūnanga which includes the lakes and mountains of Whakatipu-Waitai and Tawhititarere.

TE AO MĀRAMA INC.

Context

- To Ngāi Tahu, the land and water confers dignity and rank, provides the means of manaakitanga, is the resting place for the dead, a spiritual base for traditional beliefs and a heritage for future generations.
- The association of Ngāi Tahu to this rohe is historical and contemporary and includes, whakapapa, place names, ara tawhito, kaimoana, mahinga kai, and wāhi tapu.
- Wānaka is one of the lakes referred to in the tradition of "Ngā Puna Wai Karikari o Rakaihautu" which tells how the principal lakes of Te Wai Pounamu were dug by the rangatira (chief) Rakaihautu. Rakaihautu was the captain of the canoe, Uruao, which brought the tribe, Waitaha, to New Zealand. Rakaihautu beached his canoe at Whakatū (Nelson). From Whakatū, Rakaihautu divided the new arrivals in two, with his son taking one party to explore the coastline southwards and Rakaihautu taking another southwards by an inland route. On his inland journey southward, Rakaihautu used his famous kō (a tool similar to a spade) to dig the principal lakes of Te Wai Pounamu, including Wānaka. Ngāi Tahu moved around Te Waipounamu hunting and gathering the island's resources. Movements were and still are according to the seasons following the breeding cycles, migration times and feeding habits of animals and plants, in particular Seasonal hunting of Moa and Weka by highly mobile Coastal communities were common in the central lakes area and mobile Moa butchery sites were quite common
- The name "Wānaka" is considered by some to be a South Island variant of the word "wānanga" which refers to the ancient schools of learning. In these schools Ngāi Tahu tohunga (men of learning) would be taught whakapapa (genealogies) which stretched back to over a hundred generations and karakia (incantations) for innumerable situations. All of this learning they would be required to commit to memory.
- Wānaka was traditionally noted as a rich tuna (eel) fishery, with many thousands of the fish once being caught, preserved and transported back to the kainga nohoanga (settlements) of coastal
- In 1836 an eeling party was attacked by Te Puoho, a rangatira (chief) of the North Island Ngāti Tama iwi. Te Puoho had plans of conquering Te Wai Pounamu, beginning his campaign at the southern end of the island. He compared his strategy to boning an eel which is started at the tail end of the fish. Having travelled down Te Tai Poutini (the West Coast) to Jackson Bay, Te Puoho crossed Haast Pass into Wānaka and Lake Hawea where he found a Ngāi Tahu eeling party which he captured at Makarora. Two infant girls were captured and eaten. Te Puoho suspected this family was an outpost and so he gave instructions for two guards to follow a young teenager called Pukuharuru who was ordered to show them where the main camp was. However, Pukuharuru managed to escape after dark and alert his father, Te Raki. Te Raki killed the two guards, who were lost without their guide, and the Wānaka families managed to escape the region.Te Puoho continued his campaign at Tuturau where there were other families fishing.

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- Tribal history is embedded in the landscape, rivers and the lands that it flows through. This association is expressed through the metaphorical understanding of land and waters as our ancestors – our whakapapa, which connects us to place.
- Māori were alienated from their land in the latter half of the 1800s due to pastoralisation and mining efforts. During this time, the land scape was greatly modified with the introduction of pest plants and animals.
- To date Ngāi Tahu continue to argue that the Whakatipu area was never sold, Ta Tipene O'Regan refers to the area as "the hole in the middle"
- Due to disrupted presence in Whakatipu and the surrounding area, key mechanisms such as the Ngāi Tahu settlement act,1996 and Te Tangi a Tauira,2008 help to uphold Mana Whenua aspirations in the area.
- The Ngāi Tahu whakataukī/ proverb: Mō tātou, ā, mō ngā uri ā muri ake nei (For all of us and the generations that follow) – *Te Tangi a Tauira 2008,* Articulates the aspirations for Mana Whenua to:
    - Protect the ability for our future generations to engage with ancestral land and the surrounding environment as their ancestors did and continue to do.
    - Ensure that water quality continues to be protected to a standard that allows for mahinga kai to be diverse, abundant, and safe to eat.
    - Be able to exercise rangatiratanga over Whakatipu and the surrounding environment.

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Key Values

Ki Uta Ki Tai

"Ki Uta Ki Tai" or "mountains to the sea" is a fundamental pillar of the strategy employed by Ngāi Tahu within the environmental space, this philosophy emphasises the holistic nature of our environment, elements interact and affect one another.

Following is an excerpt from Te Tangi a Tauira that outlines the fundamental concept of Ki Uta Ki Tai:

Ki Uta Ki Tai is based on the idea that if the realms of Tāwhirimatea (God of the winds), Tāne Mahuta (God of all living things), Papatūānuku (mother earth) and Tangaroa (god of the sea) are sustained, then the people will be sustained. The kaupapa reflects the knowledge that resources are connected, from the mountains to the sea, and must be managed as such. Furthermore, the kaupapa reflects that we belong to the environment and are only borrowing the resources from our generations that are yet to come. It is considered our duty to leave the environment in as good or even better condition than received from our tūpuna. The historical practices were established by our tūpuna and must be passed on to ngā uri kei te heke mai, the generations to come.

While this project proposal is located on low lying land, Mana Whenua consider the environment and its resources holistically, as such consideration should be taken regarding the consumptive nature of such a large project on the surrounding resources.

Te Ao Mārama recognise that ROA have ensured that the water take is within the limits delegated to the location of the proposal, additionally, the power will be generated via solar panels installed on the parking structure, again avoiding the potential risk of overwhelming the Wānaka power grid.

Whakapapa

Whakapapa establishes links that maintain relationships between our people, language and their environment. All things whether animate or inanimate are connected and have mauri, a life force. Therefore, the welfare of any part of our environment determines the welfare of our people.

The cultural identity of Ngāi Tahu ki Murihiku stems from their relationship with their whenua, maunga, awa, and taonga species. These relationships originate in whakapapa. People are from a junior line (Ira Tangata line) from Ranginui (sky father) and Papatūānuku (earth mother). The environment and all the flora and fauna are from the senior line (Ira Atua line) from this union. This relationship between tangata and the environment requires respect and appropriate behaviour in gathering resources otherwise negative consequences can result.

With the alienation of māori presence in the Wānaka area, mana whenua connection has relied on the inanimate and spiritual connection we have to the landscapes and water bodies, the inclusion of Mana Whenua throughout this project, particularly regarding the landscaping and design, will provide a physical presence of māori culture within Wānaka

Through oral history, Mana Whenua have intimate knowledge of the traditional use of the environment this project sits within and while development must occur it should be in balanced and cautious way.

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Mauri

Protecting and restoring mauri is the responsibility of Kaitiaki Papatipu Rūnanga, as described in Te Tangi a Tauira as follows:

The central component of the Māori perspective on the environment is the recognition of mauri, the life principal in all objects, animate and inanimate. The presence of mauri in all things entrusts people to appreciate and respect that resource. In this way, overuse, depletion or desecration of natural resources is not an accepted practice. Tikanga regulate activities concerning the conservation and sustainable use of natural resources to protect the mauri.

Te Ao Mārama recognise the commitment by ROA to ensure the inclusion of Mana Whenua to work towards a plan that respects the cultural environmental needs of the location, ensuring the mauri of the area is not negatively impacted.

Hauora

Hauora is not just a reference to one's health but to a state of health. Hauora is defined in English as meaning 'fit, well, healthy, vigorous, robust.' A human analogy for Hauora is that you can take a knock, such as have a cold, and have the resilience to bounce back to a healthy and vigorous state

The overarching objective of Ngāi Tahu ki Murihiku is to see Hauora restored wherever degradation is present.

The need for a hospital within the Queenstown Lakes District area is high, with the residents often having to seek medical care in Invercargill and Dunedin, creating a strain on the wider systems and possible risk to the community.

Ensuring the communities health needs are meet to a higher standard, a greater level of Hauora will be achieved.

Manakitanga

Manaakitanga means to extend aroha to others as well as a sense of welcome and comfort to those visiting.

Manaakitanga is one of the most important concepts to Māori people as it secures the strength of relationships, as nomadic people, whanau would rely greatly on the ability to manaaki manuhiri into their home or area.

Te Ao Mārama recognise that a hospital is a physical representation of Manaakitanga.

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Project Description

ROA has embarked on a considered project, known as Wānaka Integrated Regional Hospital and Health Precinct, to establish a new comprehensive health precinct in Wānaka, which will be an integrated regional hospital and allied health/commercial buildings to meet the future health needs of Central Otago's rapidly growing population.

The five-level hospital will provide four operating theatres, imaging services, a 24-hour emergency department and 71 inpatient, emergency, and post anaesthetic care beds.

The hospital is designed to provide for both public and private patients.

A helicopter landing area is provided on the hospital roof as required by the emergency department.

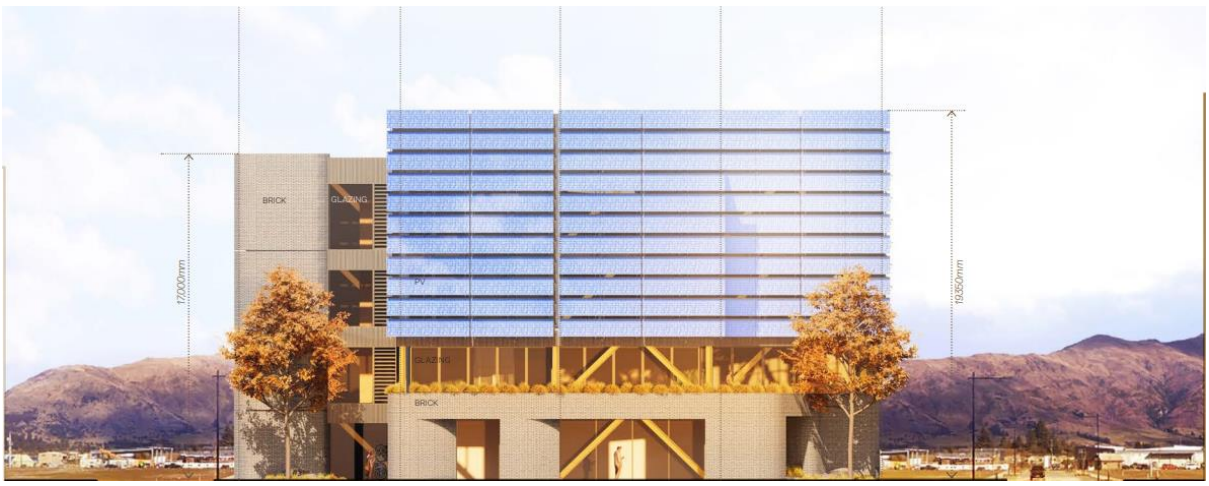
An electric vehicle (EV) charger parking building is proposed to provide parking for the activity, in addition

the rooftops of all buildings (with exception to the hospital where a helipad will be located) will be the location of the solar panels needed for electricity supply.

The development itself will take a three-stage approach, with the Hospital itself taking priority.

The project will be located within the Wānaka industrial sub-division, "Three Parks Development".

The design and landscaping of the precinct has been greatly influenced by the surrounding outstanding natural landscape, with cultural Values also influencing the projects appearance.



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Assessment of ROA

It is acknowledged that the applicant has started engagement with Mana Whenua early, prior to any consents being applied for. Te Ao Mārama and Aukaha have been engaged individually to ensure all Runanga affected are represented in this space.

The area in which the project is proposed is highly sensitive due to its surrounding natural beauty.

Te Ao Mārama are providing this Cultural Impact Statement on behalf of rūnanga in good faith and are doing so to help the application envisage the expectations Papatipu Rūnanga have to balance; the use and protection/improvement of our Taiao.

Mana whenua are clear that there is a high risk involved in adding infrastructure to intentionally underdeveloped areas, however there is clear policy within Te Tangi a Tauira, 2008 (appendix 3), promoting the balance between the use and protection of the environment.

"The effects of climate change are becoming evident in everyday actions. How we choose to manage the balance between use and protection of the environment, and this includes the impacts of climate change, underpin many of the policies throughout this document and are endorsed by Ngāi Tahu ki Murihiku. It is therefore important to read this section alongside other policy sections (many of which are cross referenced)." – Te Tangi a Tauira 2008, section3.1

It is acknowledged that ROA have worked hard to ensure that cultural values were of a high priority, resulting in a project that Mana Whenua are comfortable with.

Te Tangi a Tauira

In 2008, Te Tangi a Tauira – the Cry of the People: Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan was published. This plan consolidates Ngāi Tahu ki Murihiku values, knowledge and perspectives on natural resource and environmental management issues. It builds on earlier documents, including Te Whakatau Kaupapa ki Murihiku 1997 and Ngāi Tahu Freshwater Policy 1999.

The primary purpose of Te Tangi a Tauira is to assist Ngāi Tahu ki Murihiku in carrying out kaitiaki roles and responsibilities, and as such is relied upon by Te Ao Mārama to support Papatipu Rūnanga.

Specific sections and policies in Te Tangi a Tauira that are relevant to the ROA proposal can be found in Appendix 2.

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Recommendations

As Wānaka is surrounded by mountains and any development within the town impacts them, we must consider this that the same protections must be given to the surrounding landscape.

Papatipu Rūnanga wish to see actions that support the protection of the mountain ranges and their surrounding landscapes. Te Tangi a Tauira – Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan, 2008 set objectives for the management of Mountain landscapes and cultural value protection which include:

- All Ngāi Tahu Whānui, current and future generations, must have the ability to access, use and protect mountain landscapes, and the history and traditions that are part of such landscapes
- Require that the relationship between the history and identity of Ngāi Tahu ki Murihiku and mountains and mountain ranges is recognised and provided for in all decisions related to such places
- Encourage respect for Ngāi Tahu's association with culturally significant mountains, including those recognised as Tōpuni.

Recommendation 1: ROA provides Te Ao Mārama with annual updates regarding the project, including photos.

Recommendation 2: ROA enacts and complies with all Accidental Discovery Protocol; ROA are to notify Te Ao Mārama directly and provide permission to access the site.

Recommendation 3: Should the project proposal vary, ROA should engage with Te Ao Mārama to ascertain if the variation is significant and requires further review.

Recommendation 4: Te Ao Mārama encourage an on-going relationship with ROA.

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Summary

Ngāi Tahu has a long association with the Murihiku region. Ngāi Tahu led a nomadic lifestyle, following resources throughout the region. The use of the areas was extensive rather than intensive. Intimacy with and knowledge of the terrain was built up over generations and passed from one generation to the next.

The potential adverse effects are associated with mauri, hauora, and ki uta ki tai. Ngāi Tahu values need to be respected when dealing with any activity that poses risks. These values and beliefs are central to Ngāi Tahu existence. Any impact upon one value will impact upon all including and inevitably putting the health and wellbeing of humans at risk.

Through proper planning and management these risks may be reduced or eliminated. Te Ao Mārama on behalf of all four papatipu rūnanga have identified the risks that are to be avoided to ensure the sustainability of the whenua.

Te Ao Mārama have identified the risks that are to be avoided to ensure the sustainability of the whenua.

The ROA have worked closely with Te Ao Mārama to ensure the best possible outcome for this project. The collaboration has ensured the cultural impact of the project has been discussed, negotiated and agreed upon. The continuation of the relationship is encouraged throughout the duration of the proposed works to ensure the appropriate cultural sensitivity is achieved.

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Appendix 1 - Papatipu Runanga

- Awarua Rūnaka – centres on Awarua and extends to the coasts and estuaries adjoining Waihopai sharing an interest in the lakes and mountains between Whakatipu-Waitai and Tawhititarere with other Murihiku Rūnanga and those located from Waihemo southwards.
- Hokonui Rūnanga – centres on the Hokonui region and includes a shared interest in the lakes and mountains between Whakatipu-Waitai and Tawhitarere with other Murihiku Rūnanga and those located from Waihemo southwards.
- Te Rūnanga o Oraka Aparima – centres on Oraka and extends from Waimatuku to Tawhititarere sharing an interest in the lakes and mountains from Whakatipu-Waitai to Tawhititarere with other Murihiku Rūnanga and those located from Waihemo southwards.
- Waihōpai Rūnaka – centres on Waihopai and extends northwards to Te Mata-au sharing an interest in the lakes and mountains to the western coast with other Murihiku Rūnanga and those located from Waihemo southwards.

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Appendix 2 – Te Tangi a Tauira

Reference	Statement	Page
Section 3.1: Huringa Ahua o Te Rangi – Climate Change	Support sustainable energy systems (for houses, water and transport) to meet social and cultural needs while minimising environmental impacts.	69
Section 3.1: Huringa Ahua o Te Rangi – Climate Change	Support improvement of existing technologies to reduce emission and discharge levels and support movement toward new and efficient forms of technology as they develop. Support development of more efficient use of renewable energy sources.	73
3.2.2 Amenity Values	Where there may be visual impacts on the natural and cultural landscapes as a result of development, encourage the integration of landscaping techniques which utilise reserve planting or vegetation screens to soften intrusion	82
3.4.14 Protecting Sites of Significance in High Country and Foothill Areas	Ensure that Ngāi Tahu ki Murihiku are able to effectively exercise their role as kaitiaki over wāhi tapu and wāhi taonga in Murihiku	129
3.4.14 Protecting Sites of Significance in High Country and Foothill Areas	Avoid compromising unidentified, or unknown, sites of cultural significance as a consequence of ground disturbance associated with land use, subdivision and development.	130
3.5.4 Industry	Encourage industry to set an example through demonstrating a commitment to best practice, new technology, environment, community and public health. The use of resources in industrial operations must be balanced with investments in the community and the environment	141
3.5.4 Industry	Require industry to develop and maintain, where required, working relationships with iwi, through mechanisms such as yearly site visits, progress reports, or monitoring results	141

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3.5.7 Subdivision and Development	Encourage developers to be proactive, and to seek views of iwi in the early stages of project development, particularly when the proposed subdivision is located in an area of cultural significance	143
3.5.7 Subdivision and Development	Assess subdivision applications in terms of the current subdividing activity, and in terms of future uses of the land, including associated building, stormwater, sewage, and water supply consent applications.	144
3.5.7 Subdivision and Development	Recommend that developers consult with Ngāi Tahu ki Murihiku with regard to providing Ngāi Tahu names for new roads and areas created by subdivision.	144
3.5.8 Earthworks	Consent applicants who are undertaking earthworks may be required to enter into Accidental Discovery Protocol and monitoring agreements with Ngāi Tahu ki Murihiku, stating that any earthworks, fencing, landscaping or other such activity has the potential to uncover archaeological sites. Procedures and processes associated with such an occurrence should also be outlined.	145
3.5.8 Earthworks	Any understandings or agreements between companies/ applicants and Ngāi Tahu ki Murihiku must also be reflected in the contractors who are working on the ground.	145
3.5.8 Earthworks	Recommend the planting of indigenous species as an appropriate mitigation measure for any adverse impacts as a result of earthworks activity	145
3.5.10 General Water Policy	Protect and enhance the mauri, or life supporting capacity, of freshwater resources throughout Murihiku	148
3.5.22 Wāhi Ingoa – Place Names	Promote the use of Ngāi Tahu ki Murihiku ancestral wāhi ingoa on the landscape	170
3.5.22 Wāhi Ingoa – Place Names	To encourage, where identified by Ngāi Tahu ki Murihiku as culturally appropriate, the use of Ngāi Tahu wāhi ingoa for new developments (e.g. street or road names)	170

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Appendix 3 - Statutory acknowledgement

Statutory area

The statutory area to which this statutory acknowledgement applies is the lake known as Wānaka, the location of which is shown on Allocation Plan MD 38 (SO 24719).

Preamble

Under section 206, the Crown acknowledges Te Rūnanga o Ngāi Tahu's statement of Ngāi Tahu's cultural, spiritual, historic, and traditional association to Lake Wānaka, as set out below.

Ngāi Tahu association with Lake Wānaka

Wānaka is one of the lakes referred to in the tradition of "Ngā Puna Wai Karikari o Rakaihautu" which tells how the principal lakes of Te Wai Pounamu were dug by the rangatira (chief) Rakaihautu. Rakaihautu was the captain of the canoe, Uruao, which brought the tribe, Waitaha, to New Zealand. Rakaihautu beached his canoe at Whakatū (Nelson). From Whakatū, Rakaihautu divided the new arrivals in two, with his son taking one party to explore the coastline southwards and Rakaihautu taking another southwards by an inland route. On his inland journey southward, Rakaihautu used his famous kō (a tool similar to a spade) to dig the principal lakes of Te Wai Pounamu, including Wānaka.

For Ngāi Tahu, traditions such as this represent the links between the cosmological world of the gods and present generations, these histories reinforce tribal identity and solidarity, and continuity between generations, and document the events which shaped the environment of Te Wai Pounamu and Ngāi Tahu as an iwi.

The name "Wānaka" is considered by some to be a South Island variant of the word "wānanga" which refers to the ancient schools of learning. In these schools Ngāi Tahu tohunga (men of learning) would be taught whakapapa (genealogies) which stretched back to over a hundred generations and karakia (incantations) for innumerable situations. All of this learning they would be required to commit to memory.

Wānaka was traditionally noted as a rich tuna (eel) fishery, with many thousands of the fish once being caught, preserved and transported back to the kainga nohoanga (settlements) of coastal Otago.

The tūpuna had considerable knowledge of whakapapa, traditional trails and tauranga waka, places for gathering kai and other taonga, ways in which to use the resources of Wānaka, the relationship of people with the lake and their dependence on it, and tikanga for the proper and sustainable utilisation of resources. All of these values remain important to Ngāi Tahu today.

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In 1836 an eeling party was attacked by Te Puoho, a rangatira (chief) of the North Island Ngāti Tama iwi. Te Puoho had plans of conquering Te Wai Pounamu, beginning his campaign at the southern end of the island. He compared his strategy to boning an eel which is started at the tail end of the fish. Having travelled down Te Tai Poutini (the West Coast) to Jackson Bay, Te Puoho crossed Haast Pass into Wānaka and Lake Hawea where he found a Ngāi Tahu eeling party which he captured at Makarora. Two infant girls were captured and eaten. Te Puoho suspected this family was an outpost and so he gave instructions for two guards to follow a young teenager called Pukuharuru who was ordered to show them where the main camp was. However, Pukuharuru managed to escape after dark and alert his father, Te Raki. Te Raki killed the two guards, who were lost without their guide, and the Wānaka families managed to escape the region.

Te Puoho continued his campaign at Tuturau where there were other families fishing. However, some of the people managed to escape to Tiwai Point near Bluff where they lit a warning fire. This fire alerted the southern forces and, under the leadership of Tuhawaiki, Ngāi Tahu prepared to meet Te Puoho at Tuturau. After discussing the situation with the tohunga, Ngāi Tahu were assured of victory. While the priests chanted their karakia to the gods of war, the heart of the enemy chief appeared before Ngāi Tahu in the firelight, carried by the wings of a bird. With this omen that the gods of war were on the side of Ngāi Tahu, they attacked Te Puoho the next morning.

Te Puoho was shot by a young Ngāi Tahu called Topi and his army was taken captive. The head of Te Puoho was cut from his body and stuck on a pole facing his home in the north. Wānaka is therefore noted in history for its part in what was to be the last battle between North and South Island tribes.

The mauri of Wānaka represents the essence that binds the physical and spiritual elements of all things together, generating and upholding all life. All elements of the natural environment possess a life force, and all forms of life are related. Mauri is a critical element of the spiritual relationship of Ngāi Tahu Whānui with the lake.

MARSHALL DAY Acoustics

WĀNAKA INTEGRATED REGIONAL HOSPITAL EMERGENCY HELICOPTER LANDING AREA
ASSESSMENT OF NOISE EFFECTS FOR RESOURCE CONSENT

Rp 002 20240305 | 9 September 2024

MARSHALL DAY Acoustics

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Report No.: **Rp 002 20240305**

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Cover: Warren and Mahoney Drawing Package

MARSHALL DAY Acoustics

TABLE OF CONTENTS

1.0 INTRODUCTION

Marshall Day Acoustics (MDA) has been engaged by Roa to consider noise emissions from a potential helicopter landing area at a new integrated regional hospital in Wānaka.

The purpose of our report is to provide an assessment of effects to accompany an application for resource consent.

This report:

- provides an overview of the potential Wānaka Hospital Emergency Helicopter Landing Area.
- Discusses applicable legislation and standards
- Summarises calculated noise levels from the proposed operation
- Assesses noise effects on the environment.

A glossary of terminology is provided in Appendix A.

2.0 SITE AND SURROUNDS

The subject site is located at Sir Tim Wallis Drive, Wānaka. This area of Wānaka area is known as Three Parks (Figure 2).

The site is a large greenfield site on the south-eastern side of the road. The wider site extends to Riverbank Road on the banks of the Cardrona River. A subdivision has been approved within the wider site for 28 commercial lots (QLDC reference RM230084). The application site subject to this assessment consists of 13 of these approved commercial lots.

The site is largely flat, as is the surrounding area. Distant mountains and foothills form the wider landscape.

The site is located in a commercial area which is undergoing development. Land further to the north and west comprises the predominantly residential Wānaka township, while land to the south-east (across the Cardrona River) is largely rural. The Mount Iron reserve is located to the north-east.

3.0 PROPOSED DEVELOPMENT

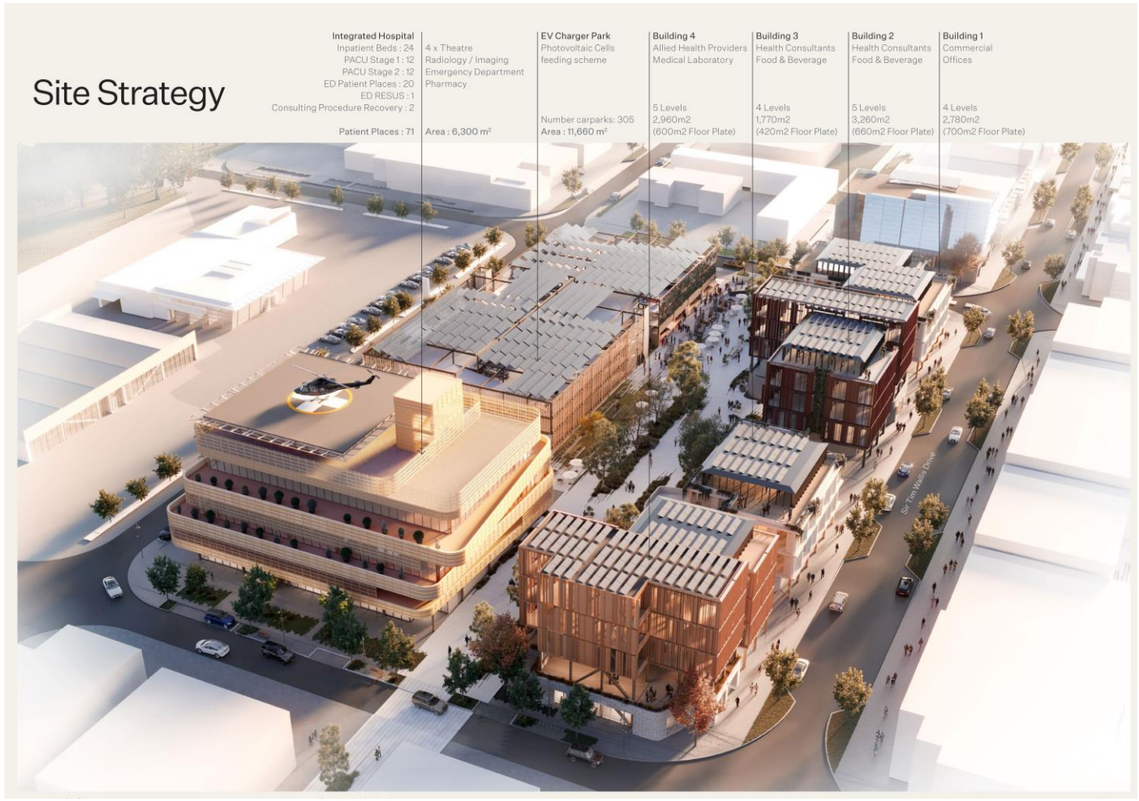
The proposal is to develop an integrated hospital on the site. The hospital will comprise a range of clinics and services, one of which will be an emergency department operating 24-hours per day.

Part of the proposal is to provide an emergency helicopter landing area on or near the emergency department. This will be used to accept patients transferred by emergency helicopter, typically from the local Wānaka area and the wider Queenstown Lakes District. The emergency helicopter landing area would also be used to transfer patients to Dunedin hospital when required.

Figure 1: Photo showing site and surrounds (From Warren and Mahoney Masterplan). The site is located at "01"

Figure 2: Indicative Location and General Surrounding Land Use

Figure 3: Health District Masterplan and Elevations (from Warren and Mahoney Plans)



4.0 PROPOSED HELICOPTER OPERATIONS

The main integrated hospital building and helicopter landing pad will be at the eastern end of the site as shown in Figure 4.

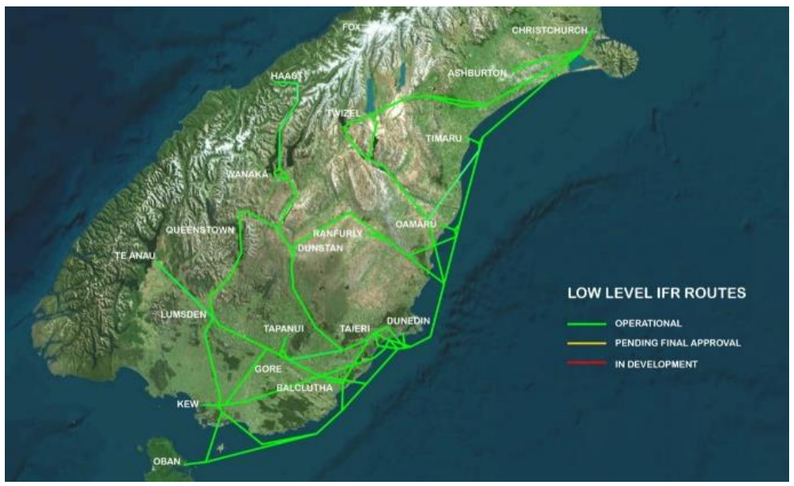
Figure 4: Helicopter Landing Area and Predominant Wind (from Warren and Mahoney Plans)

We have obtained information from the main emergency helicopter operator, Heli Otago, to inform this assessment and have used the following information in our assessment:

- Emergency helicopters will typically travel to Wānaka from a base in Queenstown. There will be two alternative **arrival** approaches, depending on the weather:

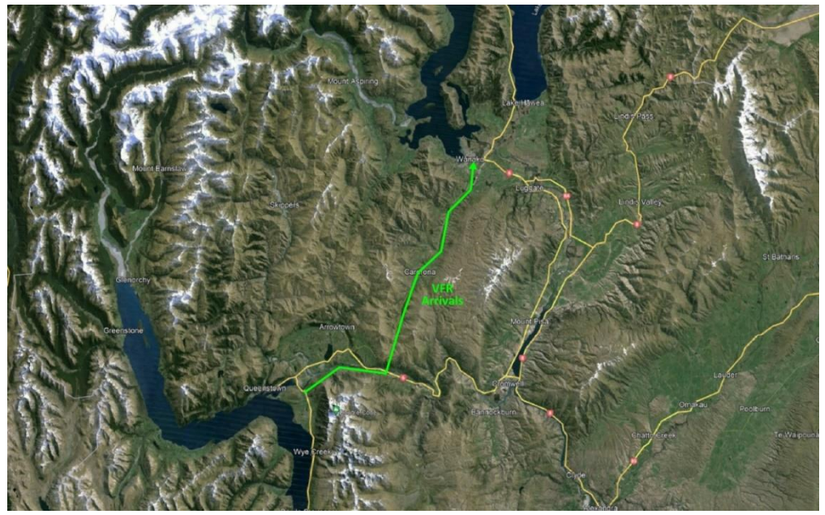
➢ When visibility is affected (such as in low cloud), **Instrument Flight Rules (IFR)** will be used. This means that a precise preassigned track will be flown which is supported by GPS and other instrumentation. As shown in the following figure, the IFR arrival flight track to Wānaka flows the Clutha River via Luggate, approaching Wānaka from the east.

Figure 5: IFR Routes



➢ When visibility is unaffected (generally clear weather), **Visual Flight Rules (VFR)** will typically be used. In this situation helicopters will typically arrive to Wānaka via a flight path broadly along the Cardrona Valley, approaching Wānaka from the south-west as shown in the following figure:

Figure 6: VFR Routes



- For safety, the helicopter would **arrive** into the wind when on final approach. As the predominant Wānaka wind directions are south-west and south-east, final arrival approaches would be from the north-east or south-west. Regardless of the IFR or VFR track used to approach Wānaka, the helicopter would split from its approach path in order to land into the wind. This may result in the final approach being over the Industrial Lane / Ballantyne Road commercial area (SW), or over the McCormick Street / Massey Drive area (NE). The combination of wind and weather factors will result in four somewhat different final approach paths. This is illustrated in Figure 7 and Figure 8 overleaf.
- **Departures** from the proposed emergency helicopter landing area will also be into the wind. This will result in two different initial departure paths as helicopters leave the site: either over the Industrial Lane / Ballantyne Road commercial area (to SW of hospital), or over the McCormack Street / Massey Drive area (to NE of hospital). All helicopters would fly over Luggate after departing Wānaka, broadly following the IFR route[1], generally to Dunedin.
- Aircraft using the base will typically be H145[2], EC145 or BK117 aircraft as used by the Heli Otago (Otago Southland Rescue Helicopter Trust) and Canterbury West Coast Air Rescue. These aircraft have a maximum take-off mass of up to 4,000 kg. Although different in appearance, all are variants of the same model (the BK-117), although the more recent EC145 and H145 variants have generally reduced noise levels. It is expected that the H145 will largely replace the BK-117 in the future as Heli Otago / Otago Rescue Helicopter is currently in a replacement programme to replace their BK117B2 to H145D3 over the next three years.
- There is a helipad providing emergency helicopter use to the front of the existing medical centre, at 23 Cardrona Valley Road. The following emergency helicopter missions have occurred to Wānaka from Heli Otago. Some variation in weekly operation during the visitor seasons (e.g. ski season and tourist season) is expected.

Table 1: Number of emergency helicopter movements to / from Wānaka from 2018 to 2024

		Number of Helicopter Movements	
Year	**Number of months**	**Day**	**Night**
2018 (Nov and Dec)	*2*	18	10
2019	*12*	154	52
2020	*12*	116	68
2021	*12*	136	78
2022	*12*	104	66
2023	*12*	162	50
2024 (Jan to Apr)	*4*	78	34

Note that a "flight" or "mission" generates two movements. Halve the above movements to obtain the "missions"

- Based on these historical movements, the future operation of the landing pad has been assessed. We have allowed for growth of close to 200% of the historic average of Heli Otago maximum day movements, and around 250% of the historic average night movements. This is 160% (day) to 220% (night) higher than the maximum annual level of Heli Otago use that occurred since 2019.

Table 2: Future Number of emergency helicopter movements to / from Wānaka

Expected future number of movements per YEAR		**Expected future average movements per 7-DAY period**	
Day	Night	Day	Night
260	156	5	3

- Using the above data, the potential helicopter movements have been split over each proposed vector:

Table 3: Movements split over relevant vectors

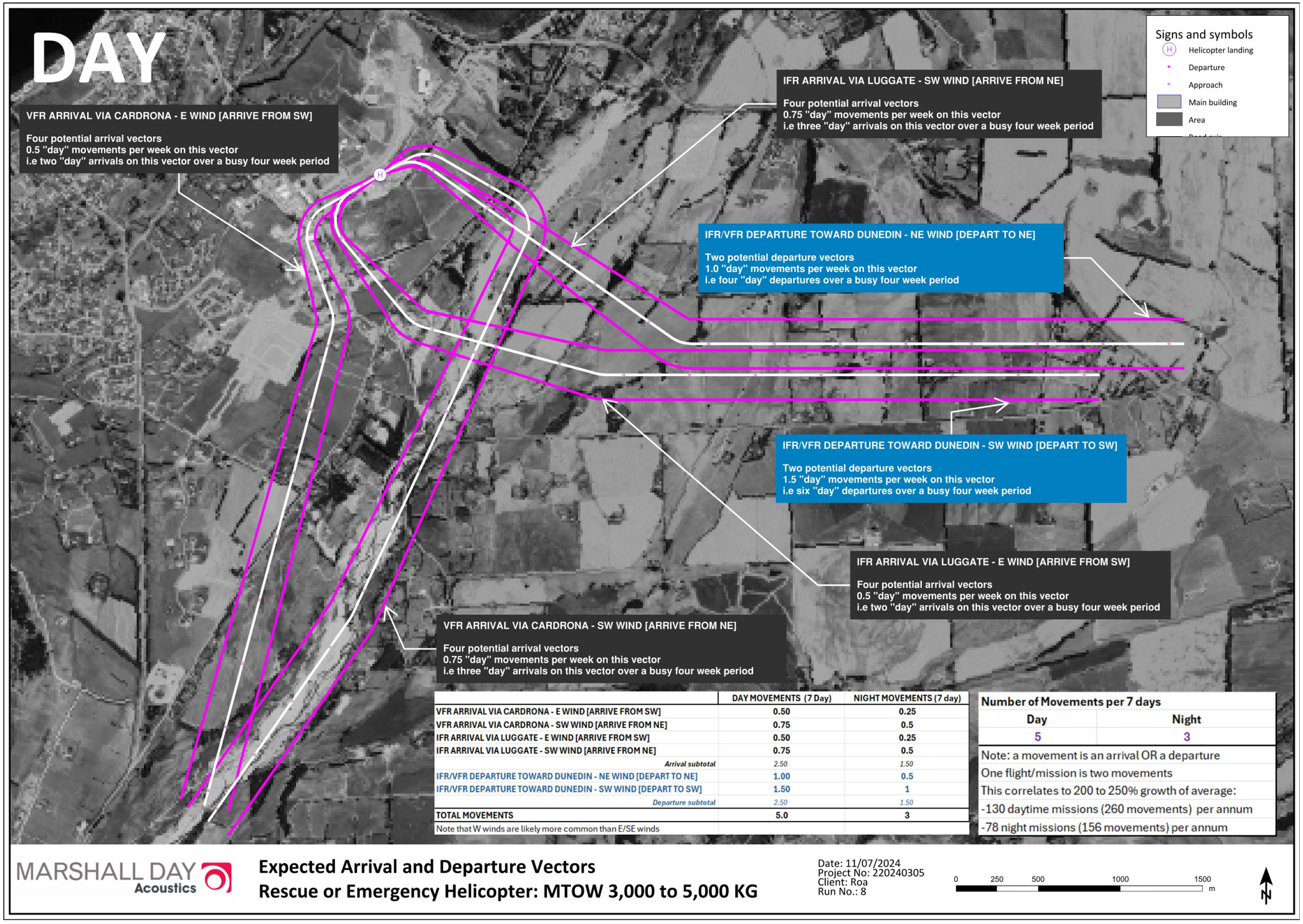
	DAY MOVEMENTS (7 day)	**NIGHT MOVEMENTS (7 day)**
VFR arrival via Cardrona - E wind [arrive from SW]	0.5	0.25
VFR arrival via Cardrona - SW wind [arrive from NE]	0.75	0.5
IFR arrival via Luggate - E wind [arrive from SW]	0.5	0.25
IFR arrival via Luggate - SW wind [arrive from NE]	0.75	0.5
Arrival subtotal	*2.5*	*1.5*
IFR/VFR departure toward Dunedin - NE wind [depart to NE]	1.0	0.5
IFR/VFR departure toward Dunedin - SW wind [depart to SW]	1.5	1.0
Departure subtotal	*2.5*	*1.5*
TOTAL MOVEMENTS	**5.0**	**3.0**

- It is important to note that the movements in **Table 1 already occur to the Wānaka area.** The movements in **Table 3** are intended to represent a future increase in helicopter noise that may occur as a result of future population and visitor growth, not necessarily as related to the establishment of the integrated regional hospital. It is probable that the above helicopter movements would occur to Wānaka in the future regardless of whether the regional hospital is established, and the presence of the regional hospital may not result in significant increased helicopter noise, other than to concentrate noise over the area around the subject site somewhat. It is probable that the existing helipad at Cardrona Valley Road medical centre will remain in place for the foreseeable future and that movements may be distributed between the helipads. The above is therefore a "worst case" scenario with regard to helicopter use at the integrated regional hospital

[1] The IFR route will be followed when conditions require. Under VFR, the IFR route may still be broadly (or exactly) followed.

[2] "H145" refers to H145D3, "BK117" refers to BK117B2, the "EC145" is based on the BK117C2. These are all evolutions on the BK117, although with significant changes over time such as fenestrated tail rotors and five bladed rotors to reduce noise and vibration.

Figure 7: Expected Daytime Future Daytime Operation (at 200 to 250% increase in existing operations)

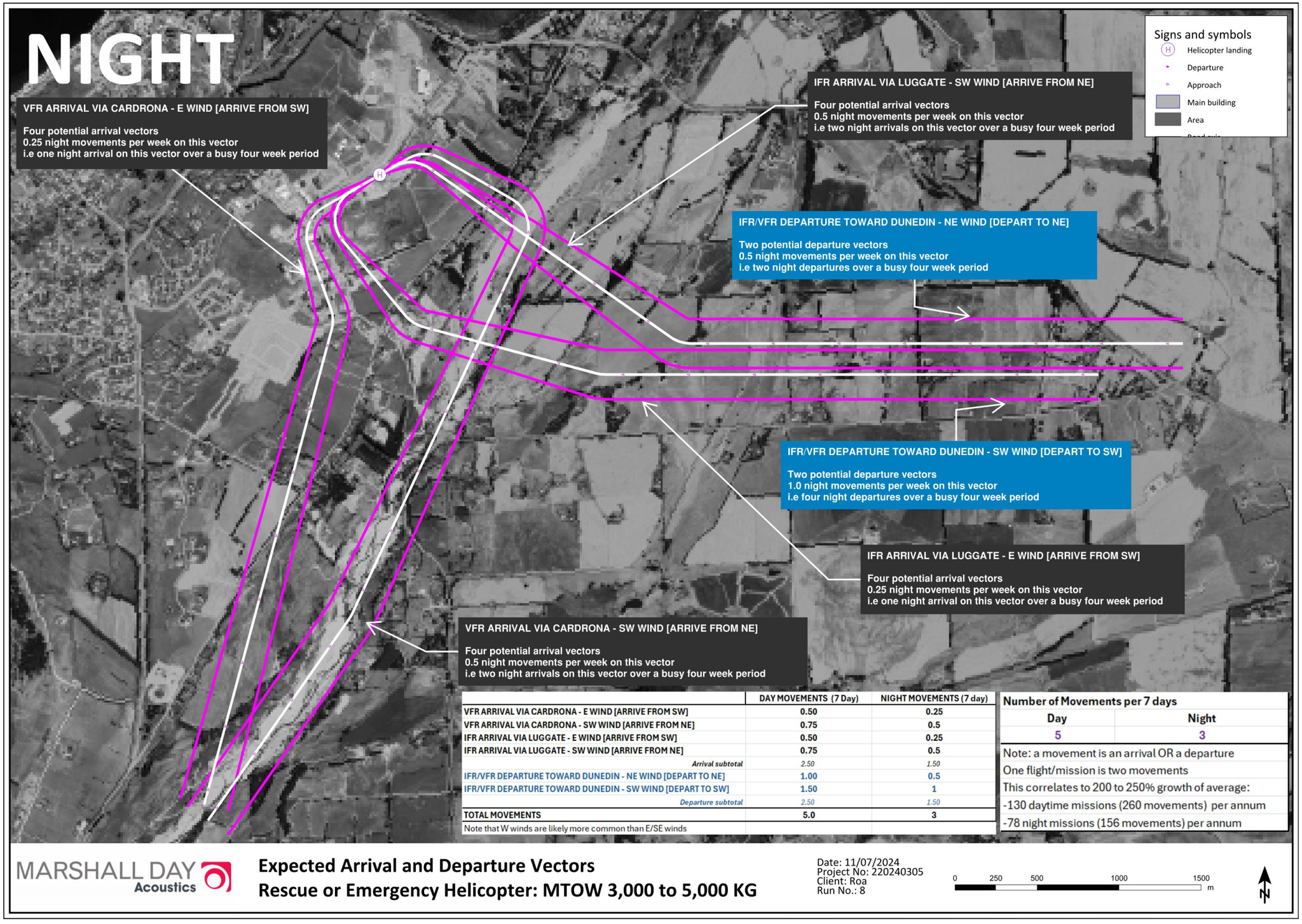


	DAY MOVEMENTS (7 Day)	NIGHT MOVEMENTS (7 day)
VFR ARRIVAL VIA CARDRONA - E WIND [ARRIVE FROM SW]	0.50	0.25
VFR ARRIVAL VIA CARDRONA - SW WIND [ARRIVE FROM NE]	0.75	0.5
IFR ARRIVAL VIA LUGGATE - E WIND [ARRIVE FROM SW]	0.50	0.25
IFR ARRIVAL VIA LUGGATE - SW WIND [ARRIVE FROM NE]	0.75	0.5
Arrival subtotal	*2.50*	*1.50*
IFR/VFR DEPARTURE TOWARD DUNEDIN - NE WIND [DEPART TO NE]	1.00	0.5
IFR/VFR DEPARTURE TOWARD DUNEDIN - SW WIND [DEPART TO SW]	1.50	1
Departure subtotal	*2.50*	*1.50*
TOTAL MOVEMENTS	5.0	3
Note that W winds are likely more common than E/SE winds		

Number of Movements per 7 days	
Day	Night
5	3
Note: a movement is an arrival OR a departure	
One flight/mission is two movements	
This correlates to 200 to 250% growth of average:	
-130 daytime missions (260 movements) per annum	
-78 night missions (156 movements) per annum	

MARSHALL DAY Acoustics

Figure 8: Expected Daytime Future Nighttime Operation (at 200 to 250% increase in existing operations)



	DAY MOVEMENTS (7 Day)	NIGHT MOVEMENTS (7 day)
VFR ARRIVAL VIA CARDRONA - E WIND [ARRIVE FROM SW]	0.50	0.25
VFR ARRIVAL VIA CARDRONA - SW WIND [ARRIVE FROM NE]	0.75	0.5
IFR ARRIVAL VIA LUGGATE - E WIND [ARRIVE FROM SW]	0.50	0.25
IFR ARRIVAL VIA LUGGATE - SW WIND [ARRIVE FROM NE]	0.75	0.5
Arrival subtotal	*2.50*	*1.50*
IFR/VFR DEPARTURE TOWARD DUNEDIN - NE WIND [DEPART TO NE]	1.00	0.5
IFR/VFR DEPARTURE TOWARD DUNEDIN - SW WIND [DEPART TO SW]	1.50	1
Departure subtotal	*2.50*	*1.50*
TOTAL MOVEMENTS	5.0	3
Note that W winds are likely more common than E/SE winds		

Number of Movements per 7 days	
Day	Night
5	3
Note: a movement is an arrival OR a departure	
One flight/mission is two movements	
This correlates to 200 to 250% growth of average:	
-130 daytime missions (260 movements) per annum	
-78 night missions (156 movements) per annum	

MARSHALL DAY Acoustics

Expected Arrival and Departure Vectors
Rescue or Emergency Helicopter: MTOW 3,000 to 5,000 KG

Date: 11/07/2024
Project No: 220240305
Client: Roa
Run No.: 8

0 250 500 1000 1500 m

5.0 DISTRICT PLAN PERFORMANCE STANDARDS

The area of the site where the hospital is proposed is zoned *Three Parks Business* in the proposed Queenstown Lakes District Plan (consolidated decisions version). There are also areas of *Business Mixed Use and Three Parks Commercial* along Sir Tim Wallis Drive. An *Active Sport and Recreation Area* is located to the south, and a *Community Purposes* zone is located to the North. There are areas of *Lower Density Suburban, Medium Density and High Density Residential* land to the north of the site. An area of *Lower Density Suburban Residential* is to the east.

Helicopter rule (Rule 36.5.11 of the Queenstown Lakes District Proposed Plan) is relevant to the site. This rule states:

36.5.11 Activity or sound source: Helicopters

Sound from any helicopter landing area must be measured and assessed in accordance with NZ 6807:1994 Noise Management and Land Use Planning for Helicopter Landing Areas.

In assessing noise from helicopters using NZS 6807: 1994 any individual helicopter flight movement, including continuous idling occurring between an arrival and departure, shall be measured and assessed so that the sound energy that is actually received from that movement is conveyed in the Sound Exposure Level (SEL) for the movement when calculated in accordance with NZS 6801:2008.

For the avoidance of doubt this rule does not apply to Queenstown Airport and Wānaka Airport.

Advice Note: See additional rules in Rural Zone Chapter at 21.10.1 and 21.10.2.

Assessment Location

At any point within the notional boundary of any residential unit, other than residential units on the same site as the activity.

Noise Limits

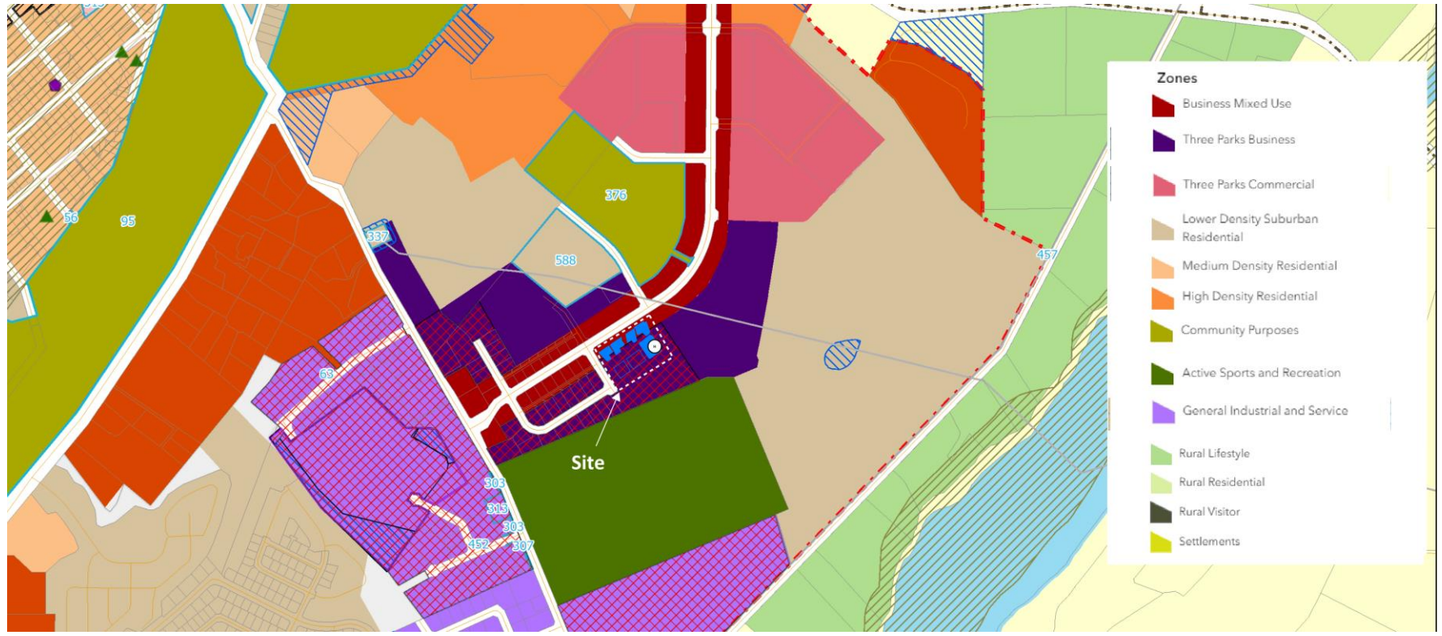
36.5.11.1 All locations except identified in 36.5.11.2:	***50 dB L_{dn}***
***36.5.11.2** Lower Density Suburban Residential Zone, Medium Density Residential Zone, High Density Residential Zone, Arrowtown Residential Historic Management Zone, Large Lot Residential Zone, Rural Zone, Rural Residential Zone and Rural Lifestyle Zone.*	***40 dB L_{dn}***

The above rule would require a noise limit of **40 dB L_{dn}** to be met at any existing dwelling in the *Rural Lifestyle zone.* The *Medium Density Suburban Residential* zones to the north and south-east of the subject site and the *High Density Residential Areas* to the north do not appear to have dwellings at present, and thus the limit would only apply to future dwellings established in the future.

The District Plan rule states that New Zealand Standard *NZS 6807:1994 "Noise Management and Land Use Planning for Helicopter Landing Areas"* must be used to assess noise from helicopters. The NZS6807:1994 standard is discussed in the next section.

The District Plan noise limits are set relatively low: significantly lower than NZ standards state can be acceptable. Emergency helicopters are a necessary part of hospital operations, particularly emergency departments. The community will accept higher noise levels than they would for a private helicopter operation.

Figure 9: Zoning



5.1 NZS6807:1994 Details of Noise Standard

The QLDC helicopter noise limits are much more stringent than the upper limits of acceptability given in *NZS 6807:1994 "Noise Management and Land Use Planning for Helicopter Landing Areas".* NZS 6807:1994 recommends the following noise limits:

Table 4: NZS 6807 Limits of Acceptability

Land Use		L_{dn} day-night average sound level (dB)	L_{AFmax} night-time maximum sound level (dB)
i.	Industrial	75	n/a
ii.	Commercial	65	n/a
iii.	Residential	50	70
iv.	Rural (at notional boundary)	50	70
v.	Residential (internal)	40	55

NZS 6807 recommends an upper limit of helicopter noise of 50 dB L_{dn} in rural and residential areas. The QLDC rural and residential zone noise limit of 40 dB L_{dn} is ten decibels more restrictive. Such a stringent noise limit would provide for a very high standard of rural and residential amenity from helicopters but may mean that rescue helicopters cannot operate if the limits must be achieved.

The District Plan also provides a stringent noise limit for commercial and industrial areas. NZS 6807 recommends noise limits of 65 and 75 dB L_{dn} respectively for these areas, however the District Plan requires helicopters to meet 50 dB L_{dn} for dwellings in these zones. This is a very stringent noise limit, given these zones are intended to be used for noise insensitive activity, rather than for residential purposes.

The District Plan rule of 40 dB L_{dn} will not be possible for a hospital emergency landing area to meet at some existing and future dwellings. Given the frequency of landings and take-offs, the wider community benefits of the emergency department, and the NZ Standard setting out helicopter noise levels of up to 50 dB L_{dn} in residential and rural areas being acceptable, this is a matter that needs to be carefully balanced in any decision making.

5.2 Other Noise Criteria

As discussed above, this consent will need to consider helicopter noise levels which may technically breach the stringent District Plan noise limits at some locations.

In order to balance the potential adverse noise effects against the wider positive benefits of the integrated health facility, the noise effects will need to be considered against other environmental guidance. We consider that the noise levels in Table 5 correlate to the associated noise effect – we have used this guidance previously when evaluating emergency helicopter use around hospitals.

Table 5: Noise Effects vs Noise Level

Day-Night Noise Level dB $L_{dn(7\ day)}$	Description of Noise Effect
<45	Insignificant effect on amenity, not typically of any concern to majority of community
45 to 50	Few people are highly annoyed. Limited effects on amenity. Noise levels within this band typically considered "reasonable" or "acceptable" for permitted helicopter use in residential and rural areas.
50 to 55	Approximately 5 to 27% of people highly annoyed[3] by "typical" aircraft noise (fixed wing annoyance data, not specific to rotary wing aircraft). Typically, residential amenity effects are considered as potentially occurring when noise is within (or above) this threshold.
55 to 60	10 to 36% of people highly annoyed by "typical" aircraft noise (fixed wing annoyance data, not specific to rotary wing aircraft). Residential amenity effects considered likely to occur at this level and noise sensitive activities in this area not recommended Dwelling sound insulation typically required to reduce (but not eliminate) amenity effects on residents Commercial and industrial land-use activities experience little noise effect at this level (or at lower levels of noise)
65	Aircraft noise levels above this level are problematic and result in appreciable noise effects for residential activities. Noise sensitive activities above this noise level are recommended to be prohibited. This noise level is considered the upper level of acceptability for "commercial" activities
75	This level of noise is unacceptable for residential and commercial activities. At above this noise level, even industrial activities may experience aircraft noise effects.

[3] Thie data in this table gives the range provided by the Miedema and Oudshoon (2001) study through to the Guski (2017) study. The Miedema and Oudshoon (2001) data suggests annoyance of 5 to 11% whereas the more recent Guski data suggests 18 to 27% between 50 to 55 dB L_{dn}.

6.0 HELICOPTER SOUND LEVELS

Emergency helicopter services typically use BK-117, EC-145 or H-145 helicopters. These are twin engine helicopters with a maximum take-off mass of between 3,000 and 4,000 Kg. The H145 will gradually replace the BK-117 as the active helicopter for emergency work, and it is likely that by the time the hospital is constructed that the H145 will be the dominant helicopter in use. Other helicopters that operate commercially in the Queenstown Lakes area are typically smaller single engine aircraft (e.g. EC130, H130, AS350, etc). These are not typically used for emergency services work. If these did land at the hospital, they are likely to generate lower noise levels than the typical rescue helicopter models.

Marshall Day Acoustics has measured noise emissions from the BK117 and H145 models at other sites. We have also developed a comprehensive helicopter noise database informed by over 200 individual measurements of various helicopter models operating in different environments. This data has been used to refine and confirm the noise levels calculated for this project. Measured L_{AE} and L_{AFmax} data for the H145 is summarised in the following table.

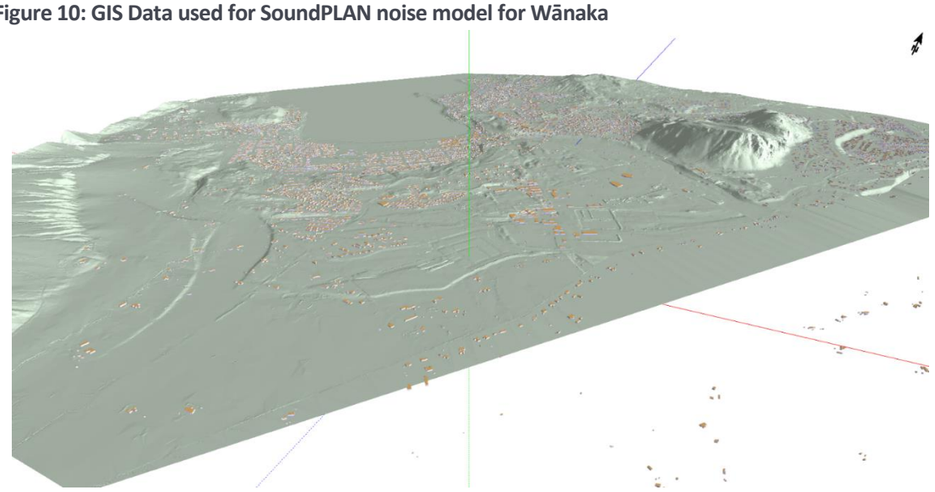
Table 2: H145 Noise Emission Summary

Distance to vector	Measurement Orientation[4]	Sound Exposure Level dB L_{AE} (rounded to nearest whole number)			Maximum Noise level dB L_{AFmax}
		Average Departure	Average Arrival	Overall Average	
165m	180°	90	89	**89**	79
180m	20°	89	88	**88**	81
155m	270°	90	89	**89**	82

7.0 CALCULATED NOISE LEVELS

Noise levels associated with helicopter operations have been calculated for this site using GIS input information for the area. The noise model is illustrated in the figure below. Calculations have been performed in SoundPLAN and verified against the L_{AE} sound levels as discussed above. The *DIN45684 Acoustics – Determination of aircraft noise exposure at airfields – Calculation Method* has been used in the calculation. Our verification of this noise model shows that it is the appropriate noise model to use for the calculation of helicopter noise from this type of operation. Noise levels have been calculated for helicopter class H1.2 of the DIN45684 standard (emergency helicopters with 3000 to 5,000 kg Maximum Take-off Mass). However, as it is expected that helicopters at the Wānaka site will largely consist of the H145 when the project is completed, we have used a slightly revised noise emission signature for the H1.2 class of helicopter as calibrated to the measured operation of an H145 operating at another site in New Zealand (refer Table 2 above). This gives an accurate, but still slightly conservative output for the H145.

Figure 10: GIS Data used for SoundPLAN noise model for Wānaka



[4] The measurement orientation refers to the orientation from the outward vector (departure) measured clockwise in degrees. A dwelling at 0 degrees would be under the aircraft as it arrives or departs the site, 180 degrees would be behind the helipad