Appendix A

NZ Gazette SH94

Situated in Block XIV, Tauranga Survey District (Auckland R.D.). (S.O. 25848.)

In the Auckland Land District; as the same are more particularly delineated on the plan marked P.W.D. 88783, deposited in the office of the Minister of Public Works at Wellington, and thereon coloured as above mentioned.

Given under the hand of His Excellency the Governor-General of the Dominion of New Zealand, and issued under the Seal of that Dominion, this 4th day of May, 1935.

JOHN BITCHENER, Minister of Public Works.

GOD SAVE THE KING!

(P.W. 35/488/1.)

Land proclaimed as a Road in Block XIV, Opaheke Survey District, Franklin County.

[L.S.] GALWAY, Governor-General.

A PROCLAMATION.

IN pursuance and exercise of the powers conferred by section twelve of the Land Act, 1924, I, George Vere Arundell, Viscount Galway, Governor-General of the Dominion of New Zealand, do hereby proclaim as a road the land in Opaheke Survey District described in the Schedule hereto.

SCHEDULE.

APPROXIMATE areas of the pieces of land proclaimed as a road:—

A.	R.	P.	Being Portion of
0	0	14	Part Allotment 229; coloured blue.
1	3	19	Part Allotment 141; coloured red.
0	0	19	Part Allotment 229; coloured blue.
1	1	7	Part Allotment 229; coloured blue.

Situated in Block XIV, Opaheke Survey District (Auckland R.D.), (Mangatawhiri Parish). (S.O. 26395.)

In the North Auckland Land District; as the same are more particularly delineated on the plan marked P.W.D. 88582, deposited in the office of the Minister of Public Works at Wellington, and thereon coloured as above mentioned.

Given under the hand of His Excellency the Governor-General of the Dominion of New Zealand, and issued under the Seal of that Dominion, this 3rd day of May, 1935.

JOHN BITCHENER, Minister of Public Works.

GOD SAVE THE KING!

(P.W. 34/3457.)

Land proclaimed as a Road in Blocks XXIV and XXXII Tokomairiro Survey District, Bruce County.

[L.S.] GALWAY, Governor-General.

A PROCLAMATION.

IN pursuance and exercise of the powers conferred by section twelve of the Land Act, 1924, I, George Vere Arundell, Viscount Galway, Governor-General of the Dominion of New Zealand, do hereby proclaim as a road the land in Tokomairiro Survey District described in the Schedule hereto.

SCHEDULE.

APPROXIMATE areas of the pieces of land proclaimed as a road:—

A.	R.	P.	Being Portion of
0	1	21·6	Section 194, Block XXIV; coloured pink.
0	0	14·6	Section 4, Block XXXII; coloured blue.
0	0	4·8	Section 5, Block XXXII; coloured sepia.

Situated in Tokomairiro Survey District.

In the Otago Land District; as the same are more particularly delineated on the plan marked P.W.D. 89281, deposited in the office of the Minister of Public Works at Wellington, and thereon coloured as above mentioned.

Given under the hand of His Excellency the Governor-General of the Dominion of New Zealand, and issued under the Seal of that Dominion, this 3rd day of May, 1935.

JOHN BITCHENER, Minister of Public Works.

GOD SAVE THE KING!

(P.W. 62/17/101/8.)

Land proclaimed as a Road in Greenstone, Caples, Castlemount, and Milford Sound Survey Districts.

[L.S.] GALWAY, Governor-General.

A PROCLAMATION.

IN pursuance and exercise of the powers conferred by section twelve of the Land Act, 1924, I, George Vere Arundell, Viscount Galway, Governor-General of the Dominion of New Zealand, do hereby proclaim as a road the land in Greenstone, Caples, Castlemount, and Milford Sound Survey Districts described in the Schedule hereto.

SCHEDULE.

ALL that strip of land, approximately 1 chain wide, being portion of Crown land and National Park, in the Lake County, commencing at a point on the southern bank of the Cascade Creek (which point is also the termination of the main highway declared by Order in Council published in the *New Zealand Gazette* No. 71, pages 2503–2505, of the twelfth day of October, 1933), and proceeding thence generally in a north-westerly direction passing through Greenstone, Caples, Castlemount, and Milford Sound Survey Districts, and terminating at or near the Milford Hostel, being a distance of 26 miles 40 chains, more or less. As the same is more particularly delineated on the plan marked P.W.D. 89218, deposited in the office of the Minister of Public Works at Wellington, and thereon coloured red.

In the Otago and Southland Land Districts; as the same is more particularly delineated on the plan marked and coloured as above mentioned, and deposited in the office of the Minister of Public Works at Wellington.

Given under the hand of His Excellency the Governor-General of the Dominion of New Zealand, and issued under the Seal of that Dominion, this 7th day of May, 1935.

JOHN BITCHENER, Minister of Public Works.

GOD SAVE THE KING!

(P.W. 62/18.)

Land proclaimed as a Street, and Street closed, in the Borough of New Plymouth.

[L.S.] GALWAY, Governor-General.

A PROCLAMATION.

IN pursuance and exercise of the powers conferred by section twelve of the Land Act, 1924, I, George Vere Arundell, Viscount Galway, Governor-General of the Dominion of New Zealand, do hereby proclaim as a street the land in the Borough of New Plymouth described in the First Schedule hereto; and also do hereby proclaim as closed the street described in the Second Schedule hereto.

FIRST SCHEDULE.

LAND PROCLAIMED AS A STREET.

APPROXIMATE areas of the pieces of land proclaimed as a street:—

A.	R.	P.	Being Portion of
0	0	2·30	Lot 1, D.P. 534, being part of Subdivision E of N.R. 1; coloured pink.
0	1	23·65	
0	0	16·34	Subdivision D of N.R. 1; coloured pink.

SECOND SCHEDULE.

STREET CLOSED.

APPROXIMATE area of the piece of street closed: 31·93 perches.

Adjoining or passing through part of Subdivision D and parts of Lot 1, D.P. 534, of Subdivision E, being parts of N.R. 1; coloured green.

All situated in Block IV, Paritutu Survey District (Borough of New Plymouth), (Grey R.D.). (S.O. 7346.)

All in the Taranaki Land District; as the same are more particularly delineated on the plan marked P.W.D. 88973, deposited in the office of the Minister of Public Works at Wellington, and thereon coloured as above mentioned.

Given under the hand of His Excellency the Governor-General of the Dominion of New Zealand, and issued under the Seal of that Dominion, this 3rd day of May, 1935.

JOHN BITCHENER, Minister of Public Works.

GOD SAVE THE KING!

(P.W. 51/1964.)

Appendix B

Concession PAC-14-80-40

Waka Kotahi Correspondence with DoC 5 August 2021

SCHEDULE 1

1. **Land**: Parcels of land adjacent to the Milford Road corridor (State Highway 94) and the Lower Hollyford Road in the Eweburn Conservation Area (Conservation Unit No: D430001) and Fiordland National Park (Conservation Unit No: C430001) more particularly set out in the table below and shown on the map attached at Schedule 4.

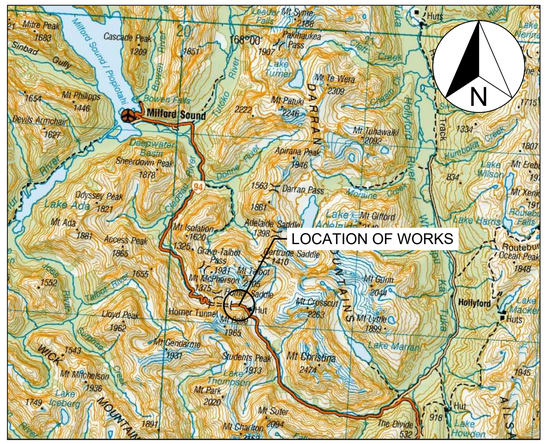
(see definition of Land in clause 1.1)

2. **Concession Activity**: Extraction and storing of gravel, disposing of roading debris, use of helipad and explosives magazine, more particularly set out in the table below.

(see definition of Concession Activity in clause 1.1)

Cons. Unit	Site Name	Activity	Grid Reference
D430001	Lookout Hill	Gravel storage	D43: 998224
D430001	Four Mile Bay Lookout	Gravel storage	D43: 996239
D430001	Seven Mile North	Road debris disposal	D43: 004282
C430001	Ten Mile	Gravel storage	D42: 015322
C430001	Thirteen Mile	Gravel storage	D42: 019372
C430001	Eglinton Flats	Gravel storage	D41: 167624
C430001	Knobs Flat	Gravel storage and processing	D41: 169692
C430001	Kiosk Creek	Gravel extraction	D41: 168694
C430001	Plato Hill	Gravel storage and road debris disposal	D41: 192772
C430001	Cascade Flats	Gravel extraction, processing & storage and road debris disposal	D41: 208787
C430001	Kaka Creek	Gravel storage	D41: 232884
C430001	Lower Hollyford Airstrip/ Deadmans Creek	Gravel extraction, storage and road debris disposal	D40: 248964
C430001	Marian Hill (Sundeck)	Gravel storage	D41: 223879
C430001	Camera Flat	Gravel storage	D41: 204873
C430001	Windfall Creek West	Road debris disposal	D41: 181877
C430001	Lyttles Flat/ Upper Hollyford	Gravel extraction and storage	D41: 163892
C430001	The Chapel	Gravel storage, use of helipad, open ended shed, new maintenance shed (2007) and explosives magazine	D40: 136927
C430001	Homer Tunnel, E. Portal	Gravel storage	D40: 136927
C430001	Murrells Creek	Gravel storage	D40: 110937
C430001	Upper Cleddau	Gravel storage	D40: 101957
C430001	Mackay Creek, Eglinton River	Groynes to protect banks and hence the road.	D42: 157588
C430001	Eglinton Flats, Eglinton River	Groynes to protect banks and hence the road.	D41: 167624
C430001	Lyttles Flat, Hollyford River	Groynes to protect banks and hence the road.	D41: 163892

3. **Term**: 25 years commencing on 1st. March 2005 *(see clause 3.1)*

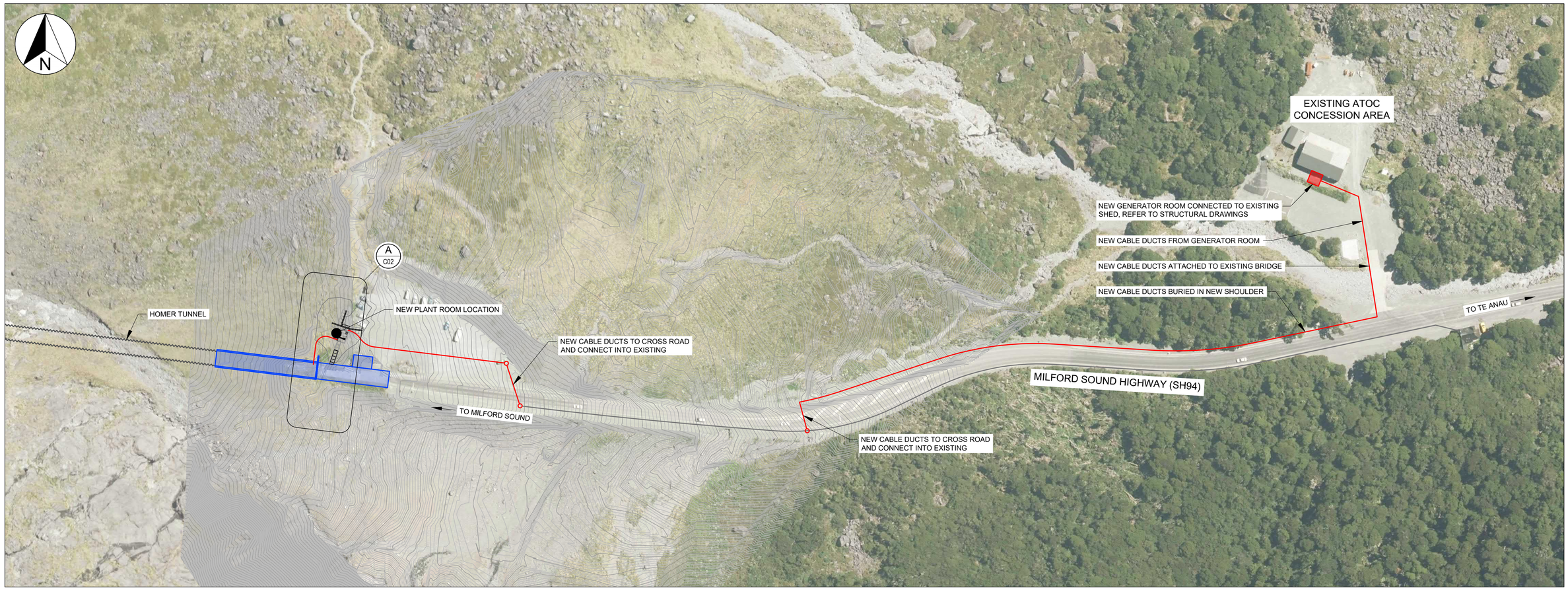


LOCATION PLAN

EASTERN TUNNEL PARKING AREA

EXISTING AVALANCHE SHELTER AND GENERATOR ROOM

PROPOSED GENERATOR BUILDING LOCATION



SITE PLAN
SCALE: 1:1000

1:1000 @ A1
1:2000 @ A3
0 10 20 30 40 50 60 70 80 90 100 m

REVISION	AMENDMENT	APPROVED	DATE
A	PRELIMINARY DESIGN	GL	2.09.2021

WAKA KOTAHI NZ TRANSPORT AGENCY

wsp
Christchurch Office
+64 3 363 5400
PO Box 1482
Christchurch 8140
New Zealand

CIVIL

SCALES: AS SHOWN
ORIGINAL SIZE: A1

DRAWN	DESIGNED	APPROVED
T. BERRYMAN	J. JENNINGS	G. LARCOMBE

DRAWING VERIFIED	DESIGN VERIFIED	APPROVED DATE
J. JENNINGS	M. COWAN	2.09.2021

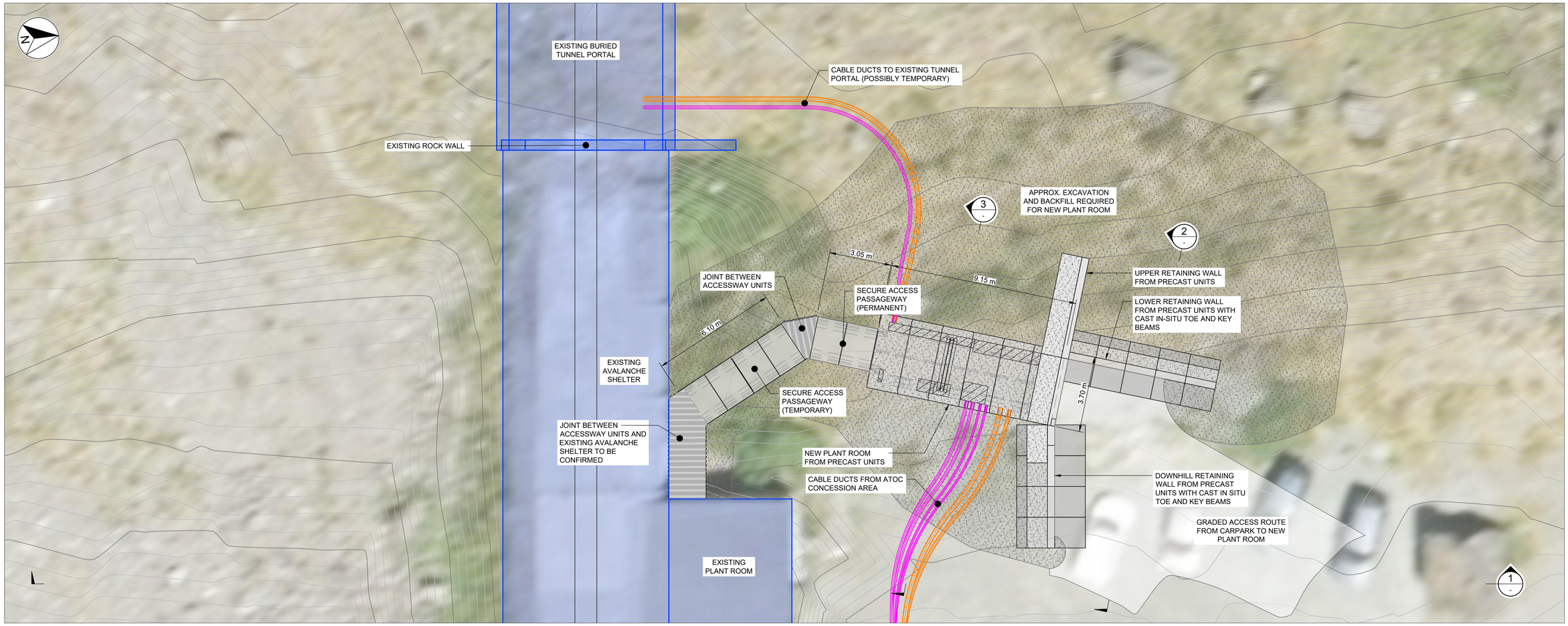
PRELIMINARY

PROJECT
WAKA KOTAHI (NZ TRANSPORT AGENCY)
HOMER TUNNEL - SH94 RP 240 / 0.00
RESILIENCE IMPROVEMENTS - PHASE 1

TITLE
SITE PLAN

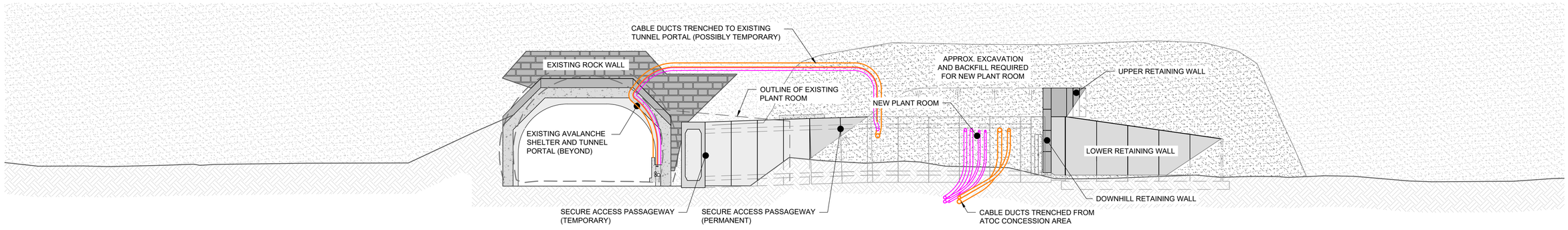
WSP PROJECT NO. (SUB-PROJECT): 6-DC734.00 (001)
SHEET NO.: C01
REVISION: A

Original sheet size A1 (841x594) Plot Date 2021-09-02 at 2:58:36 PM U:\ProjectsNZ\6d\6-DC734.00 SH94 Homer Tunnel Fire Life Safety\Home\014 Enabling Works\Drawings\6-DC734.00_001 HOMER TUNNEL IMPROVEMENTS - PHASE 1.dwg C01 - SITE PLAN



PLAN - NEW PLANT ROOM AND ACCESSWAY

SCALE: 1:100



1 SECTION - NEW PLANT ROOM AND ACCESSWAY

SCALE: 1:100

1:100 @ A1
1:200 @ A3
0 1 2 3 4 5 6 7 8 9 10 m

REVISION	AMENDMENT	APPROVED	DATE
A	ISSUED FOR CONSENT	M.C.	2021-11-03

WAKA KOTAHI NZ TRANSPORT AGENCY

wsp
Christchurch Office
+64 3 363 5400
PO Box 1482
Christchurch 8140
New Zealand

CIVIL

SCALES: 1:50
ORIGINAL SIZE: A1

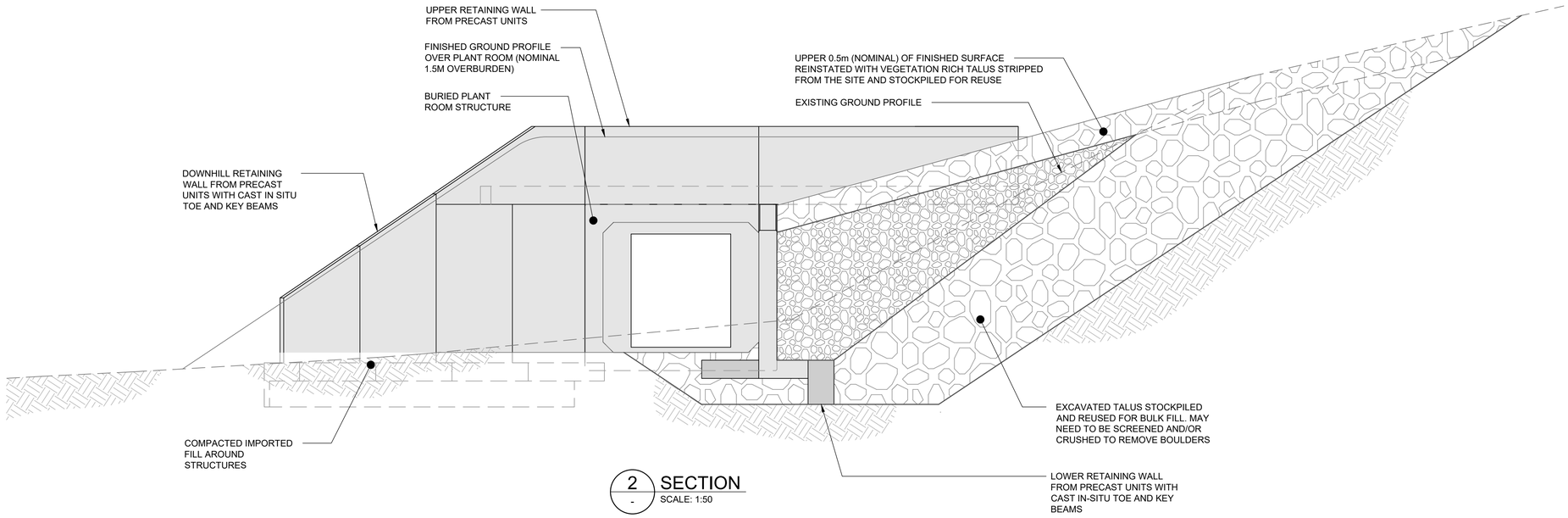
DRAWN	DESIGNED	APPROVED
J. MACDONALD	J. JENNINGS	M. COWAN
DRAWING VERIFIED	**DESIGN VERIFIED**	**APPROVED DATE**
B. MCHAFFIE	B. MCHAFFIE	2021-11-03

FOR CONSENT

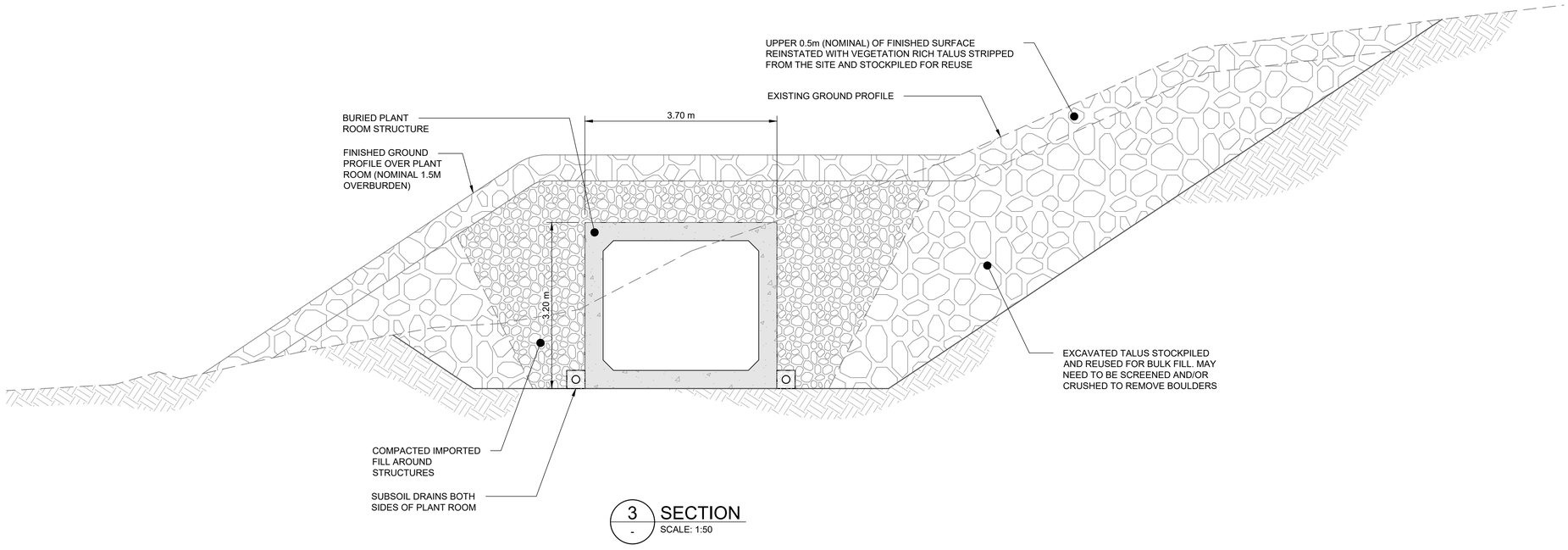
PROJECT
WAKA KOTAHI (NZ TRANSPORT AGENCY)
HOMER TUNNEL - SH94 RP 240 / 0.00
RESILIENCE IMPROVEMENTS - PHASE 1

TITLE
PROPOSED PLANT ROOM AND ACCESSWAY PLAN

WSP PROJECT NO. (SUB-PROJECT): 6-DC734.00 (003)
SHEET NO.: C01
REVISION: A



2 / - SECTION
SCALE: 1:50



3 / - SECTION
SCALE: 1:50

300 mm
200
100
50
0 10 mm

1:50 @ A1
1:100 @ A3
0 1 2 3 4 5 m

REVISION	AMENDMENT	APPROVED	DATE
A	ISSUED FOR CONSENT	M.C.	2021-11-03

WAKA KOTAHI NZ TRANSPORT AGENCY

wsp
Christchurch Office
+64 3 363 5400
PO Box 1482
Christchurch 8140
New Zealand

CIVIL

SCALES: 1:50
ORIGINAL SIZE: A1

DRAWN	DESIGNED	APPROVED
J. MACDONALD	J. JENNINGS	M. COWAN

DRAWING VERIFIED	DESIGN VERIFIED	APPROVED DATE
B. MCHAFFIE	B. MCHAFFIE	2021-11-03

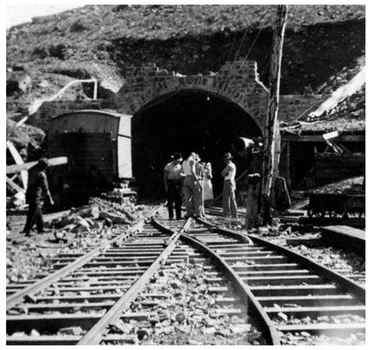
FOR CONSENT

PROJECT
WAKA KOTAHI (NZ TRANSPORT AGENCY)
HOMER TUNNEL - SH94 RP 240 / 0.00
RESILIENCE IMPROVEMENTS - PHASE 1

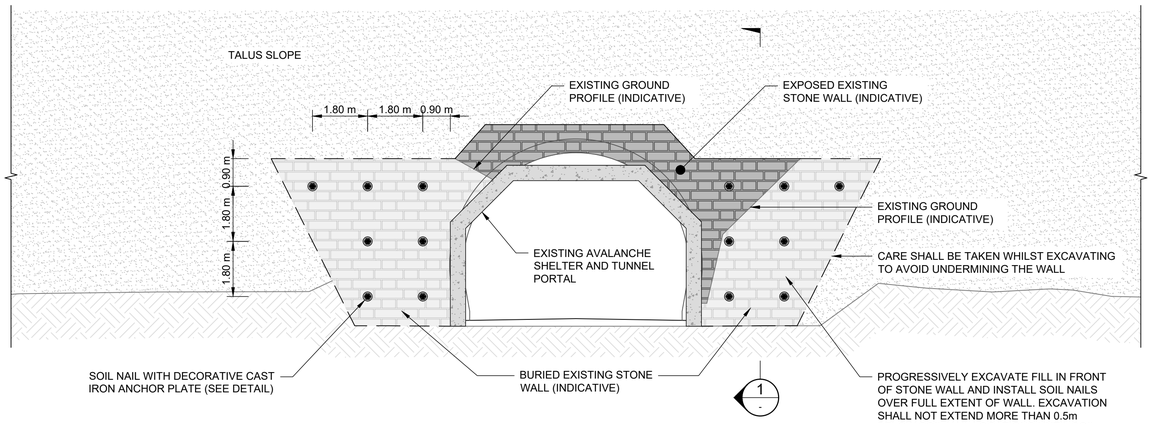
TITLE
PROPOSED PLANT ROOM AND ACCESSWAY SECTIONS

WSP PROJECT NO. (SUB-PROJECT): 6-DC734.00 (003)
SHEET NO.: C02
REVISION: A

CURRENT WALL PHOTO



HISTORIC WALL PHOTOS



EXISTING STONE WALL ELEVATION

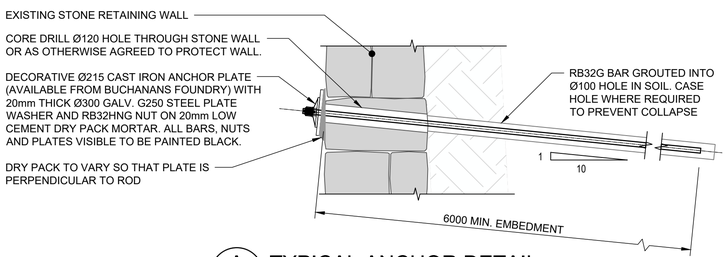
SCALE: 1:100

SOIL NAIL NOTES:

1. THE PROPOSED ANCHOR SYSTEM FOR STABILISING THE EXISTING WALL CONSISTS OF DRILLED AND GROUTED REIDBAR SOIL NAILS (GROUND ANCHORS).
2. DRILLED HOLES FOR SOIL NAILS SHALL BE CASED WHERE REQUIRED TO PREVENT HOLE COLLAPSE.
3. THE SOIL NAILS ARE TO BE INSTALLED TO DEVELOP THE ULTIMATE DEPENDABLE CAPACITIES OUTLINED BELOW FOR PROOF LOADING REQUIREMENTS.
4. PROOF LOADING SHALL BE UNDERTAKEN ON INSTALLED ANCHORS TO THE FOLLOWING LOADS:
   - 30KN FOR THE UPPER SOIL NAILS;
   - 100KN FOR THE CENTRAL CENTRAL SOIL NAILS; AND
   - 165KN FOR THE LOWER SOIL NAILS.
4. TESTING SHALL BE UNDERTAKEN AS DESCRIBED IN THE PROJECT SPECIFICATION.

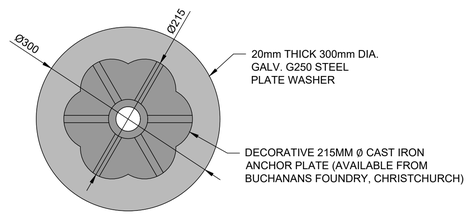
EXCAVATION NOTES:

1. EXCAVATION SHALL BE UNDERTAKEN TO DETERMINE THE EXTENTS OF THE EXISTING STONE WALL.
2. EXCAVATION SHALL BE CAREFULLY PROGRESSED TO ENSURE THE EXISTING WALL IS NOT DAMAGED OR DESTABILISED.
3. SOIL NAILS SHALL BE INSTALLED AS EXCAVATION PROGRESSES. THE EXTENT OF EXCAVATION BELOW A ROW OF SOIL NAILS SHALL BE LIMITED TO THE ABSOLUTE MINIMUM REQUIRED FOR INSTALLATION (NOMINALLY 0.5m) UNTIL THE SOIL NAILS ARE FULLY INSTALLED AND THE GROUT HAS CURED FOR AT LEAST 72 HOURS.
4. MECHANICAL EXCAVATION MAY BE USED UP TO WITHIN 1.0m OF THE WALL FACE. EXCAVATION WITHIN 1.0m OF THE WALL FACE SHALL BE UNDERTAKEN WITH NON-POWERED HAND TOOLS.
5. CARE SHALL BE TAKEN TO NOT UNDERMINE THE WALL.



A
-
TYPICAL ANCHOR DETAIL

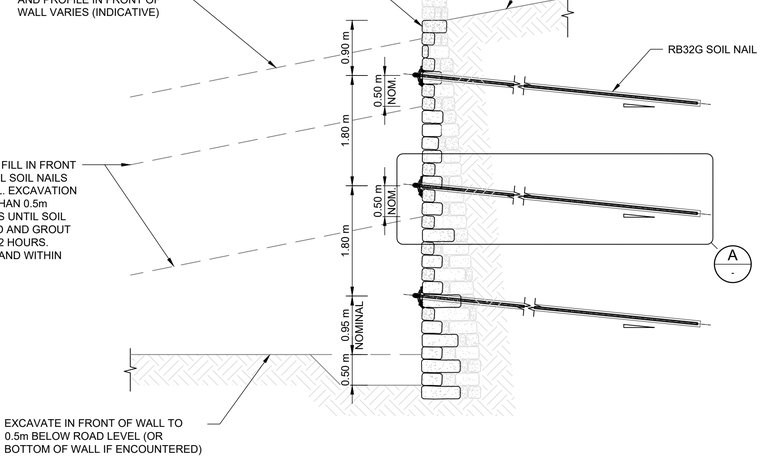
SCALE: 1:20



FRONT VIEW OF ANCHOR PLATE ARRANGEMENT

SCALE: 1:5

DETAILING OF STONE MASONRY WORK IS INDICATIVE ONLY AND AY VARY FROM ACTUAL STONE SIZES AND LAYOUT ON SITE.



1
-
SECTION THROUGH STONE WALL

SCALE: 1:50

1:50 @ A1
1:100 @ A3
0 1000 2000 3000 4000 5000 mm

1:20 @ A1
1:40 @ A3
0 200 400 600 800 1000 1200 1400 1600 1800 2000 mm

1:5 @ A1
1:10 @ A3
0 50 100 150 200 250 300 350 400 450 500 mm

REVISION	AMENDMENT	APPROVED	DATE
A	PRELIMINARY DESIGN		

WAKA KOTAHI NZ TRANSPORT AGENCY

wsp
Christchurch Office
+64 3 363 5400
PO Box 1482
Christchurch 8140
New Zealand

CIVIL

SCALES: AS SHOWN
ORIGINAL SIZE: A1

DRAWN	DESIGNED	APPROVED
T. BERRYMAN	B. McHAFFIE	G. LARCOMBE

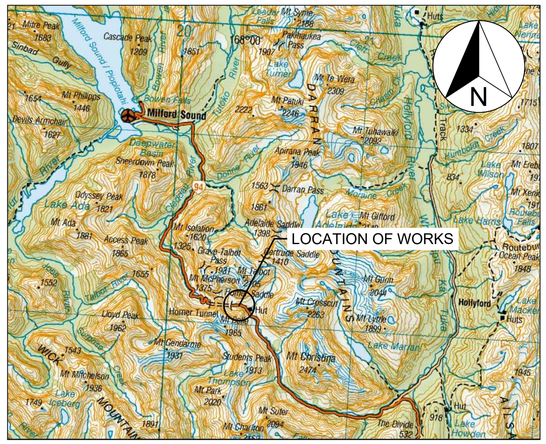
DRAWING VERIFIED	DESIGN VERIFIED	APPROVED DATE
J. JENNINGS	J. JENNINGS	

PRELIMINARY

PROJECT
WAKA KOTAHI (NZ TRANSPORT AGENCY)
HOMER TUNNEL - SH94 RP 240 / 0.00
RESILIENCE IMPROVEMENTS - PHASE 1

TITLE
EXISTING PORTAL
MASONRY HEADWALL STRENGTHENING

WSP PROJECT NO. (SUB-PROJECT): 6-DC734.00 (001)
SHEET NO.: C11
REVISION: A

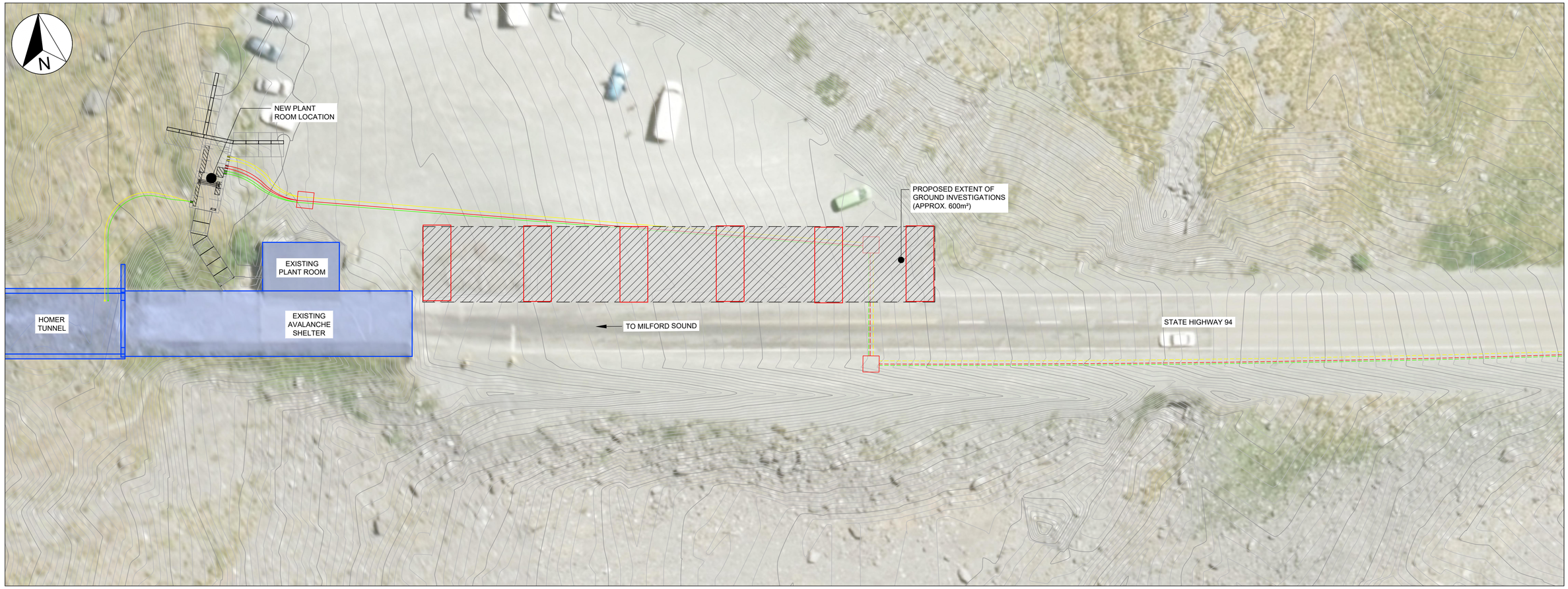


LOCATION PLAN

EASTERN TUNNEL PARKING AREA

EXISTING AVALANCHE SHELTER AND GENERATOR ROOM

PROPOSED GENERATOR BUILDING LOCATION



SITE PLAN
SCALE: 1:250

1:250 @ A1
1:500 @ A3
0 4 8 12 16 20 24 m

REVISION	AMENDMENT	APPROVED	DATE
A	ISSUED FOR CONSENT	G.L.	2021-11-18

WAKA KOTAHI NZ TRANSPORT AGENCY

Christchurch Office
+64 3 363 5400

PO Box 1482
Christchurch 8140
New Zealand

CIVIL

SCALES: AS SHOWN
ORIGINAL SIZE: A1

DRAWN	DESIGNED	APPROVED
T. BERRYMAN	J. JENNINGS	G. LARCOMBE

DRAWING VERIFIED	DESIGN VERIFIED	APPROVED DATE
J. JENNINGS	B. McHAFFIE	2021-11-18

FOR CONSENT

PROJECT
WAKA KOTAHI (NZ TRANSPORT AGENCY)
HOMER TUNNEL - SH94 RP 240 / 0.00
RESILIENCE IMPROVEMENTS - PHASE 1

TITLE
SITE PLAN
PROPOSED EXTENT OF GROUND INVESTIGATIONS

WSP PROJECT NO. (SUB-PROJECT): 6-DC734.00 (004)
SHEET NO.: C02
REVISION: A

Original sheet size A1 (841x594) Plot Date 2021-11-18 at 1:02:11 PM \\corp.pbwan.net\ANZ\ProjectsNZ\6d\6-DC734.00 SH94 Homer Tunnel Fire Life Safety\Home\014 Enabling Works\Drawings\6-DC734.00_004-C01(A).dwg C02 - SITE PLAN

300 mm
200
100
50
0 10 mm

Appendix D

Visual Assessment

Landscape Advice Note

To	Sarah Hamilton
Copy	Michael Cowan
From	David McKenzie
Office	Christchurch
Date	3 November 2021
File/Ref	6-DC734.00
Subject	SH94: Homer Tunnel Proposed Plant Room - Landscape Advice Note

1 Introduction

As noted in the Executive Summary of the Homer Tunnel Resilience Improvements: Plant Room Preliminary Structure Design Statement[1]

> *Waka Kotahi and the Milford Road Alliance (MRA) intend to replace the existing avalanche shelter at the eastern portal of the Homer Tunnel. In preparation for the replacement works, it is necessary to relocate existing plant and equipment currently located within the plant room adjoined to the existing avalanche shelter. This is within the anticipated construction footprint of the proposed shelter and the proposed plant room is to be constructed at the eastern portal to be located outside the anticipated construction area. Importantly, the plant room is being relocated and reconstructed to provide improved resilience to this building situated at a site exposed to avalanche and rockfall hazard. The proposed plant room is proposed as a buried structure within the talus slope to provide protection and to also minimise the visual impact of this structure at this sensitive site.*
>
> *The site, located on State Highway 94 (SH94) at the eastern portal of the Homer Tunnel, approximately 100 km north of Te Anau, is generally underlain by material excavated during tunnel construction and talus. On site observations indicate the talus material is highly variable, typically comprising boulders and gravels with frequent boulders reaching several metres in diameter.*
>
> *The intended function of the proposed plant room is to house electrical equipment relocated from existing plant room excluding the generators which are to be replaced with new generators located at the Alpine Tunnel Operation Centre (ATOC) concession area. Flexibility is required to add further equipment to the plant room and to extend the plant room building in the future. The main entrance is accessed via the former parking area with secondary access via an enclosed passageway connecting to the avalanche shelter. Waka Kotahi's security requirements and the NZ Building Code also need to be met.*
>
> *The proposed plant room structure comprises precast concrete units (similar to proprietary precast culvert units) tied together with shear keys and post-tensioning, and in-situ concrete to form a rigid box structure with wing walls and a head wall.*

[1] Homer Tunnel Resilience Improvements: Plant Room Preliminary Structure Design Statement, WSP, Christchurch, September 2021

WSP
Christchurch
12 Moorhouse Avenue
Christchurch 8011
New Zealand
+64 3 363 5400
wsp.com/nz

The proposed plant room will be connected via a buried passageway to the proposed avalanche shelter. This reduces site disturbance (extent of excavation) and effect on the portal, such as avoiding a larger penetration in the side of the concrete arch portal plus potential disturbance to the stone masonry entrance wall that demarks the end of the portal structure. A temporary passageway will be provided between the proposed plant room and existing avalanche shelter.

This Landscape Advice Note outlines the likely landscape and visual effects associated with this project and recommends landscape mitigation treatment. Figures 1 and 2 show the location and general context of the existing plant room.

Figure 1 Location plan

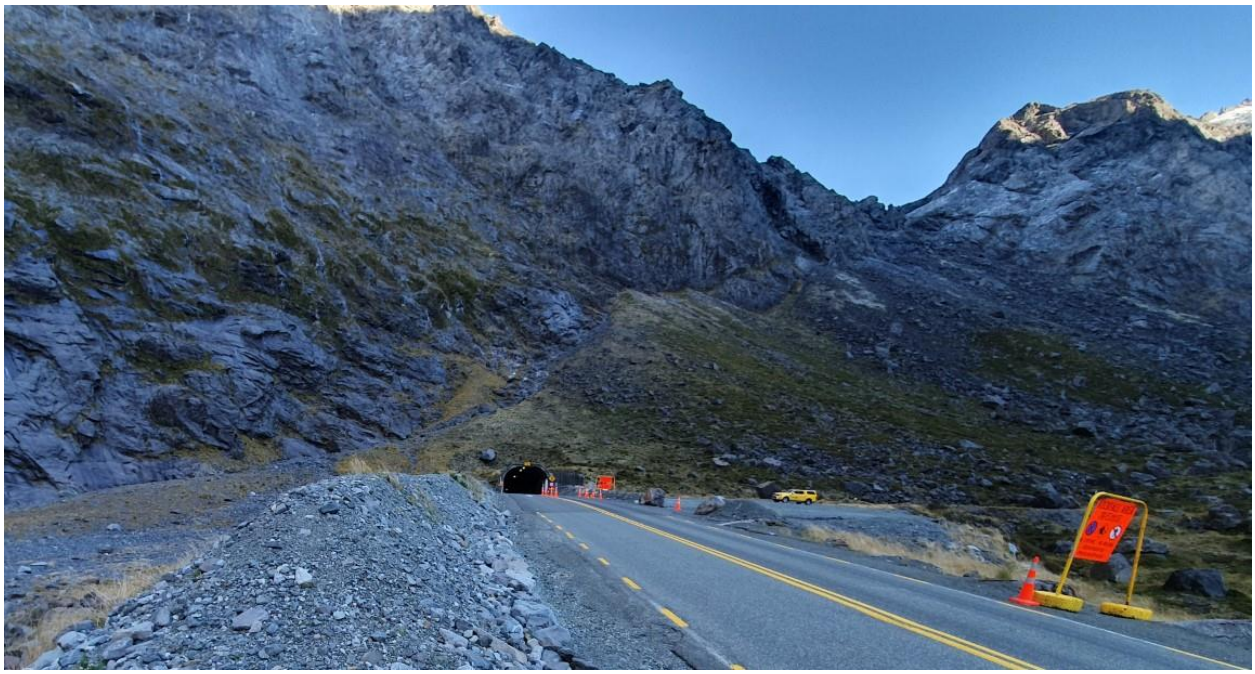


Figure 2: Approaching the eastern portal and avalanche shelter, with the concrete plant room just visible to the right of the tunnel entrance. There are earth bunds either side of the carriageway; that on the left side provides rockfall protection and the one on the right side prevents access to the now-closed car park

2 Landscape Context

The project area is in a remote alpine environment within the Fiordland National Park and the South West New Zealand World Heritage Area, Te Wāhipounamu.

The Fiordland National Park Management Plan[2] at 4.2 Assessment of Values and Places; 4.2.1 Landform states that:

> *"Assessed at a landscape level, Fiordland National Park is in excellent condition, essentially still in its natural state except for the very small areas where development has occurred. The long Fiordland coastline is unique in New Zealand because the landscape has not been greatly modified by agriculture, fire, or other such human impacts.*
>
> *The landform has been created by the uplift of hard plutonic rocks such as granite and diorite, which have been subsequently carved into their present shape by successive periods of heavy glaciation.*
>
> *Most erosion since the last glaciation period has been by way of rock falls and slips. Effects are local and minor so that the glacial landforms are usually well preserved, other than where rivers have cut deep narrow gorges into the valley floors.*
>
> *Snow avalanches can occur throughout the alpine areas of Fiordland National Park mainly during the winter and spring. Major avalanche zones exist in the high Darran Mountains. Monitoring of snowfields for avalanche hazard is undertaken along State Highway 94, and to a lesser extent on the Milford and Routeburn tracks. Artificial release of avalanches is carried out when necessary to avoid harm to visitors or facilities."*
>
> *Relatively recent sedimentary deposits are present at the base of slopes and in the valley floors which were formed by past glaciation and include postglacial alluvium, till, rockfall and avalanche debris. Also present are talus (debris fans and scree slopes) that progress downslope into valley alluvium deposits. These sediments comprise eroded volcanic and metamorphic rock types.*

Further at 4.2.2 Vegetation - Significant Features of the park's management plan:

> *"Important in the subalpine zone are species of Dracophyllum, Hebe, Olearia and Coprosma species. Also found are three podocarps: snow tōtara, pink pine and mountain toatoa; most other subalpine plants are woody members of the daisy family and tussock grasses. Tussock grasses of the genus Chionochloa dominate the alpine zone. Common herbs include alpine daisies (Celmisia), native carrots, buttercups, speargrasses and many other species."*

These descriptions of landform and vegetation are directly applicable to the immediate area of the eastern portal of the Homer Tunnel.

This was confirmed by a site visit on 7 October 2021.

The terrestrial ecology of the proposed Plant Room area is further defined in the Project's ecology assessment[3].

As noted in the Project's heritage assessment[4]:

> *The Homer Tunnel is a significant landmark on the road to the Milford Sound/Piopiotahi. It forms a crucial link on the Milford Road, providing the only road access to the Milford Sound.*

---

[2] Fiordland National Park Management Plan, Department of Conservation, June 2007

[3] Homer Tunnel Avalanche Shelter Improvement Works: Proposed Plant Room – Terrestrial Ecology Assessment (draft). Beale Consultants, October 2021

[4] Homer Tunnel Eastern Shelter Alterations, Milford Sound – Te Anau Road: Heritage Impact Assessment & Advice. Origin Consultants, August 2021

The eastern portal tunnel entrance is composed of a semi-circular concrete arch, with a construction date of 1936/1937. It has a bonded course stone façade with a parapet to the external face.

The eastern portal (on the Te Anau side) avalanche shelter is constructed in reinforced concrete and is semi-octagonal in section. It was constructed from 1938 to 1941 and truncated following avalanches in 1945 and 1996. The avalanche shelter is in poor condition, with cracks (exceeding 10mm) throughout the roof and walls. While the shelter has previously been repaired, ongoing rockfall continues to further damage the existing shelter, exposing reinforcing and increasing the risk to the public. The shelter in its current condition likely has between 20-30 years of lifespan remaining until the structural integrity of the shelter is compromised. However, the existing structure provides little protection from rockfall or avalanche debris, which is the primary purpose of the shelter.

There is a small concrete building attached to the northern side of the eastern portal. This was originally built as a shed for drill sharpening and replaced an earlier timber building destroyed in an avalanche in 1945. It is now used as a plant room. This building is located within an area of high rockfall and known avalanche paths and is the building that is proposed to be replaced.

Figure 3: Existing plant room, avalanche shelter and talus slope viewed from car park

3 Proposal

As noted in the Project's draft Design Philosophy Statement[5]:

> *An options assessment "Homer Tunnel Avalanche Shelter Preliminary Options Assessment" completed by WSP in April outlined several options for remediation/retrofit and replacement of the avalanche shelter with replacement of the avalanche shelter being preferred. One of the challenges with replacing the shelter is that the tunnel needs to be kept fully operational during the deconstruction of the existing avalanche shelter and reconstruction of the future avalanche shelter. In particular, the equipment in the existing plantroom including generators and all other technical equipment that power and run the tunnel, need to be relocated before the avalanche shelter and existing plant room can be deconstructed.*
>
> *Due to avalanche risk, construction at the eastern end of the Homer Tunnel is limited to the 5 month periods between the avalanche seasons each year, which typically extend from the beginning of December until the beginning of May. To align with these timeframes, this work has been separated into two distinct phases. The first includes relocating the plant room and all its contents. The second includes replacing the avalanche shelter. Each phase is to be undertaken between avalanche seasons in 2021/2022 and 2022/2023. This DPS includes provisions for first phase of the works. Phase 1 of the improvements are intended to facilitate future upgrades of the avalanche shelter and include:*
>
> - *Construction of the proposed Plant Room.*
> - *Relocation/replacement of existing generators and cabling.*
> - *Construction of a generator shed near the ATOC facility.*
>
> *The existing plant room is a weathered, reinforced concrete building that sits alongside the tunnel's existing avalanche shelter. The plant room is a critical piece of infrastructure that is paramount to the ongoing operation of the tunnel. Loss of the structure would have major operational consequences including loss of existing fire life safety measures and inhibiting the safe operation of the tunnel during the avalanche season.*
>
> *The proposed plant room stands alone as a safety and resilience improvement project. Building the proposed plant room, buried below the talus slope, will protect it from avalanche and rockfall. Moving the diesel generators to the ATOC area removes the need for more regular access for refuelling at the eastern tunnel entrance that's exposed to avalanche and rockfall hazard. The ATOC area is more secure and a purpose-built facility will be provided to house new generators and diesel storage, which consolidates operations and provides environmental benefits (risk reduction).*

The location of these various components and the proposed connecting cable route is shown at Figure 4.

[5] Homer Tunnel Improvements: Design Philosophy Statement (draft). WSP, September 2021

WSP
Christchurch
12 Moorhouse Avenue
Christchurch 8011
New Zealand
+64 3 363 5400
wsp.com/nz

3.1 Proposed Plant Room

The proposed plant room needs to be located outside the anticipated construction footprint of the proposed avalanche shelter. It is expected that excavations will be required for the shelter foundations which will require appropriate working room, batters and setbacks, meaning the proposed plant room needs to be located beyond this zone within the adjacent talus slope.

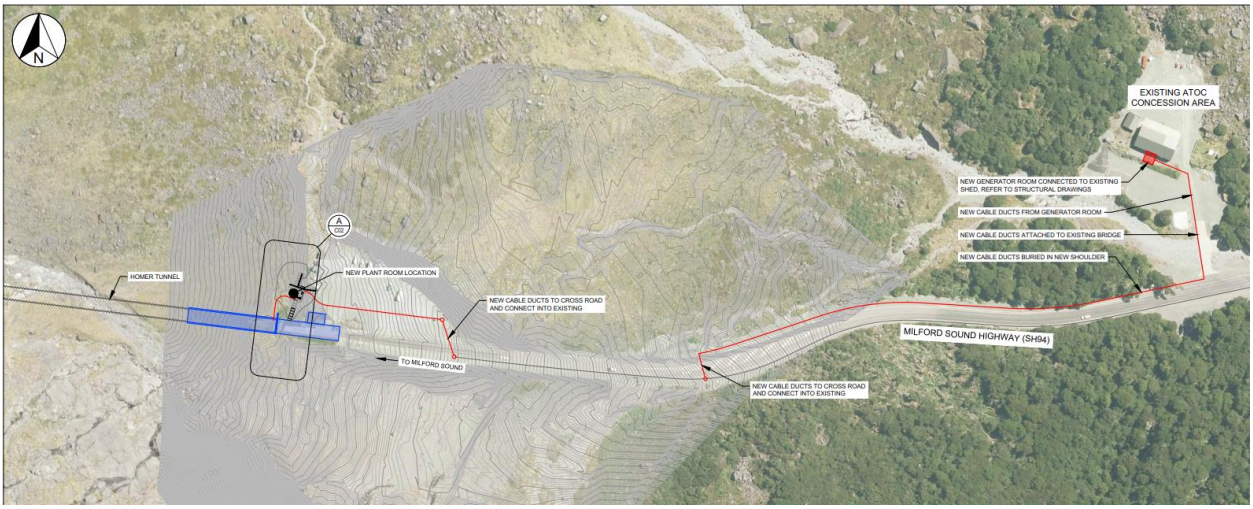


Figure 4: Site Plan[6]

There is a stone masonry (*bonded course stone façade)* wall at the existing tunnel portal which is identified as having significant heritage value. The plant room location needs to consider the implications of disturbing or damaging the stone masonry wall including additional consenting requirements which may impact on programme. A photo of the rock wall is shown in Figure 3.

Figure 5: Rock wall at tunnel portal

In terms of location, the appearance of the plant room is an important consideration though this needs to be considered in the context of the site where a large avalanche shelter will be constructed. There is a desire for the plant room to be obscured from road users, who would be the primary viewing audience.

[6] Source: WAKA KOTAHI (NZ TRANSPORT AGENCY) HOMER TUNNEL - SH94 RP 240 / 0.00 RESILIENCE IMPROVEMENTS - PHASE 1 SITE PLAN (PRELIMINARY) 2.09.2021 Further Plant Room drawings are shown at Homer Tunnel Resilience Improvements Plant Room Preliminary Structure Design Statement - Appendix A: Plant room general arrangement drawings.

In terms of structural form, a reinforced concrete box is the only viable option for the plant room as it is proposed to bury the plant room in the talus slope. The box is proposed to be constructed from precast concrete units to reduce the extent of in-situ concrete work.

3.1.1 Plant Room Location

The primary consideration with respect to the plant room is its location within the site. Three options have been considered:

- Option A – Plant room buried in talus slope immediately adjacent to tunnel portal.
- Option B – Plant room buried in talus slope with access tunnel connecting plant room to tunnel portal.
- Option C – Plant room buried in talus slope with tunnel connecting plant room to the proposed avalanche shelter.

Option C is preferred for the following reasons:

- The impact on existing heritage features is minimised.
- The location is not immediately adjacent to the avalanche shelter construction envelope and additional clearance can be readily provided, if required.
- It is more readily constructible than the other options and safety risks are more readily addressed during construction.
- The plant room is more readily modified to meet future demands than the other options.
- The cost is likely to be significantly lower than the other options.

The construction process would include:

- Excavation into the talus slope.
- Construction of the proposed plant room.
- Construction of temporary access passageway to the proposed avalanche shelter.
- Relocation of equipment and rerouting of cables to the proposed plant room.
- Backfilling over the structure.

As part of the avalanche shelter replacement works, excavation would be undertaken to expose the temporary passageway. It would then be removed and reinstalled to form a permanent, buried access passageway between the proposed avalanche shelter and plant room.

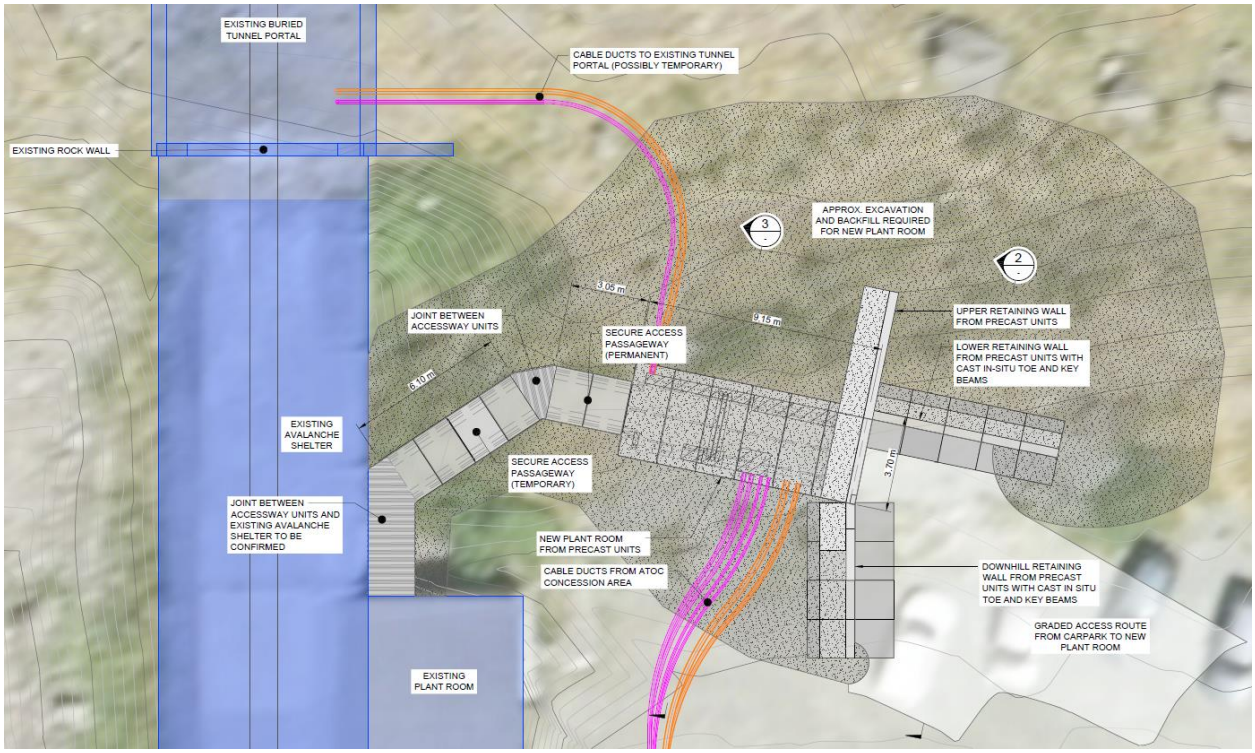


Figure 6: Plant room location

For this option as shown in Figure 6, cables between the proposed plant room and the tunnel would run through ducts trenched into the talus slope and through a penetration near the

apex of the existing tunnel portal. This option presumes that an access passageway remains preferable connecting the proposed plant room to the tunnel providing a means of alternative access. The cables could be rerouted through the proposed access tunnel as part of the avalanche shelter replacement works or at a later date if required.

3.1.2 Design considerations

The structure needs to be robust and designed to be capable of resisting loading from being buried in the talus slope, to resist rockfall impact and inundation by avalanche debris. Treatments such as dark colour pigmentation will utilised so that exposed concrete has an appearance that is sympathetic to the environment.

Concrete is use predominantly for the plant room construction. Finishes should be consistent with those of the proposed avalanche shelter. The proposed concrete structure is highly durable and maintenance requirements are expected to be minimal.

3.1.3 Landscape and Visual Effects of the Proposed Plant Room

Constructing the proposed plant room will entail a 'cut and cover' process, where the existing talus slope is excavated, the plant room is constructed within the resultant void and then the majority of the plant room is covered over with the excavated talus material. The north-facing entrance to the plant room and associated retaining walls will be the only components of the plant room that will remain visible.

There will be a localised, temporary landscape effects during the construction phase, most of which will be curtailed when the plant room is 'covered over' and the disturbed surface is rehabilitated and revegetated. The degree of landscape effect at this point will be Very Low[7].

In terms of potential visual effects, these will relate to how much of the proposed plant room can be seen and from where. Only the north-facing plant room entrance, a section of north-facing retaining wall and an adjacent section of east-facing retaining wall will be visible, once the plant room has been constructed. It is also proposed that talus material will be 'wrapped around' the toe or outer portion of the east facing retaining 'wing walls', while still allowing maintenance and operations vehicle access to the plant room entrance.

With the Homer Tunnel carpark closed to public use, the main 'viewing audience' is confined to SH94 and traffic travelling upslope towards the tunnel. A smaller potential viewing audience to the north will be climbers/trampers accessing the somewhat informal track up to the Homer Saddle.

The traffic lights that control the one-way flow of vehicles through the tunnel are located approximately 200 m east of the tunnel portal and approximately 230 m from the proposed plant room. This is the one location where vehicles will be stationary and motorists at the front of the queue may potentially see part of the entrance to the plant room. Refer to Photo 1 and its associated visual simulation at Appendix 1: Attachment 1. The degree of visual effect on this view would be Very Low due to the diminishing effect of distance and reinstated talus slope covering the proposed plant room.

As SH94 ascends towards the tunnel, it may be possible to see the top edge or outline of the plant room 'wing walls', but the carpark 'exclusion bund' on the north edge of the road will obscure this view, especially when closing in on the tunnel. Refer to Photo 2 and its associated visual simulation at Appendix 1: Attachment 2.

The degree of visual effect on this view would be Low, especially once vegetation has established on the reinstated talus slope covering the proposed plant room.

---

[7] Te Tangi a te Manu - Aotearoa Landscape Guidelines Assessment Guidelines; Prepared by New Zealand Institute of Landscape Architects (NZILA) April 2021 (Final Draft) – Refer Appendix 1 for the seven point Scale of Effects.

For trampers accessing the Homer Saddle track, it will be possible to get a clear view of the plant room entrance and its pair of 'wing walls', though this may be from some distance. It is understood that given that there is no longer parking allowed in the tunnel area, trampers access the Homer Saddle track via the creek bed at the ATOC Building and follow the creek up to the head of the valley.

At its closest, the creek is approximately 250 m northeast of the proposed plant room across open, undulating ground that falls away towards the creek and contains some shrubby vegetation. Both the change in topography and the intervening vegetation will screen views back towards the proposed plant room.

Refer to Photo 3A and Photo 3B and its associated visual simulations at Attachment 3A & 3B which shows the potential view towards the plant room entrance from the closed carpark and the outer edge of the 'carpark' area. The retaining walls associated with the plant room entrance would be visible. However, their potential visual effect would be diminished due to having a scale, angular form and colour that is similar to the large rockfall boulders in the immediate vicinity. The degree of visual effect on this 'near' view would be Low, due to these mitigating factors and especially once vegetation has established on the reinstated talus slope covering the proposed plant room. It is also expected that very few people will access these 'near' viewpoints, given that the carpark is closed. The potential visual effect relative to the track to the Homer Saddle via the local creek bed will be Nil.

3.1.4 Landscape Mitigation

Mitigation measures proposed include:

- The use of the 'cut and cover' process, and
- The use of colour and texture within the exposed concrete work.
- The rehabilitation including revegetation of the disturbed talus slope.

In excavating the talus slope to place the plant room, it is intended to disturb as little as possible of the slope and its vegetation cover, larger rocks on the surface of the slope will be uplifted and placed aside with their lichen-cover kept exposed, areas or clumps of vegetation will also be uplifted intact and placed aside. Figure 7 provides a typical view of the vegetation and rock cover on the existing talus slope.

Figure 7: Existing vegetation and lichen-covered rocks on talus slope

The excavated talus, rock and plant material will be stockpiled in the immediate area and after the plant room has been built. It will subsequently be placed to cover what will essentially become an underground building. The local rock will be placed across the slope, lichen side up, along with clumps of replaced vegetation.

The uplifted vegetation to be used in this direct transfer method will be screened/protected from the sun and the wind and frequently watered to maintain its viability while in temporary storage on site. Should the uplifted clumps of vegetation not survive this process, they will still constitute organic material being returned to the slope, much in the same way smashed vegetation within avalanche debris is the starting point for the regrowth of the subalpine vegetation. Additional eco-sourced vegetation will also be planted as part of the revegetation of the slope.

As can be seen in Figure 3, the concrete of the existing tunnel shelter and plant room is weathered and quite dark in colour; presumably as the aggregate for the concrete was won from locally occurring rock and gravels. As the proposed plant room 'wing walls' will be pre-cast at a site outside the national park, all the exposed concrete work will be pigmented to an equivalent dark colour.

As previously mentioned, talus material will be 'wrapped around' the outer edge or toe of both wing walls to help visually 'tie' the walls back into the slope.

In regard to the height of the retaining walls, New Zealand Building Code F4 (safety from falling) does not apply as:

- Barriers would be incompatible with the intended use of the area.
- There is no need to access the areas above the walls, whether for operation or maintenance.
- The tops of the walls are generally not accessible as the rocky talus material makes climbing the slope difficult, i.e. the slope forms a natural barrier.
- Any barrier would be subject to damage from rockfall and avalanche and would require repair, inspection and maintenance access to an area where access would not normally be needed.
- The general area presents similar natural hazards.

3.2 Proposed Cable Route

Relocating the diesel generators to the implement shed adjacent to the ATOC Building will entail trenching the connecting power and data cables through the closed carpark to the edge of SH94 following the route shown in Figure 4: Site Plan.

The exact location and alignment of these services within the carpark area will be confirmed during detailed design. However, the location will be close to the envelope for the proposed avalanche shelter footprint but far enough away to avoid clashing with the future avalanche shelter works. As this route traverses alongside an existing service trench (on the left-hand side) there is far less risk of encountering the avalanche shelter remains that likely sit within the roadway and its margin.

Descending to the ATOC, the cable route follows the margin of SH94; a section of which is to be widened as a separate MRA project with the cable routing incorporated into that project. The resource consent application[8] for the 'widening' project covers landscape matters at 5.3.3 Landscape & Visual Amenity:

The potential landscape and visual effects of the cable routing through the previously disturbed ground of the closed carpark will be 'Very Low' during the brief period of trenching and then 'Nil'.

[8] Resource Consent Application - Downer for the NZ Transport Agency – East Homer Widening, State Highway 94 WSP, March 2020

4 Conclusion

The construction of the proposed plant room will result in a localised change to the landscape immediately adjacent to the eastern portal of the Homer Tunnel.

Though the proposal is in a remote alpine environment within the Fiordland National Park and the South West New Zealand World Heritage Area, Te Wāhipounamu, its potential landscape **effect will be 'Very Low'** due to the limited extent of the disturbance to the talus slope and the proposed mitigation of that disturbance.

In terms of potential visual effects, relative to the limited visibility of the proposed plant room from accessible public viewpoints and the transient nature of the main viewing audience on SH94, coupled with the mitigation measures proposed, **the overall visual effect will be, at worst, be 'Low', but from where most people will see the proposal, the effects will be 'Very Low'.**

Homer Tunnel Improvements Works 2021/22 | New Plant and Equipment Facilities

Landscape and Visual Assessment

APPENDICES

DRAFT FOR COMMENT

Scale of Effects (7 Point)

From the Te Tangi a te Manu - The Aotearoa Landscape Guidelines Assessment Guidelines; Prepared by New Zealand Institute of Landscape Architects (NZILA) prepared April 2021 (currently in draft form). The below definitions come from NZILA national workshop discussions prior to the publication of the guidelines and are based on the Boffa Miskell effects descriptions.

The below seven-point scale is used to describe effects:

Very High: Total loss to the key attributes of the receiving environment and/or visual context amounting to a complete change of landscape character

High: Major change to the characteristics or key attributes of the receiving environment and/or visual context within which it is seen; and/or a major effect on the perceived amenity derived from it.

Moderate-High: A moderate to high level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate-high level of effect on the perceived amenity derived from it.

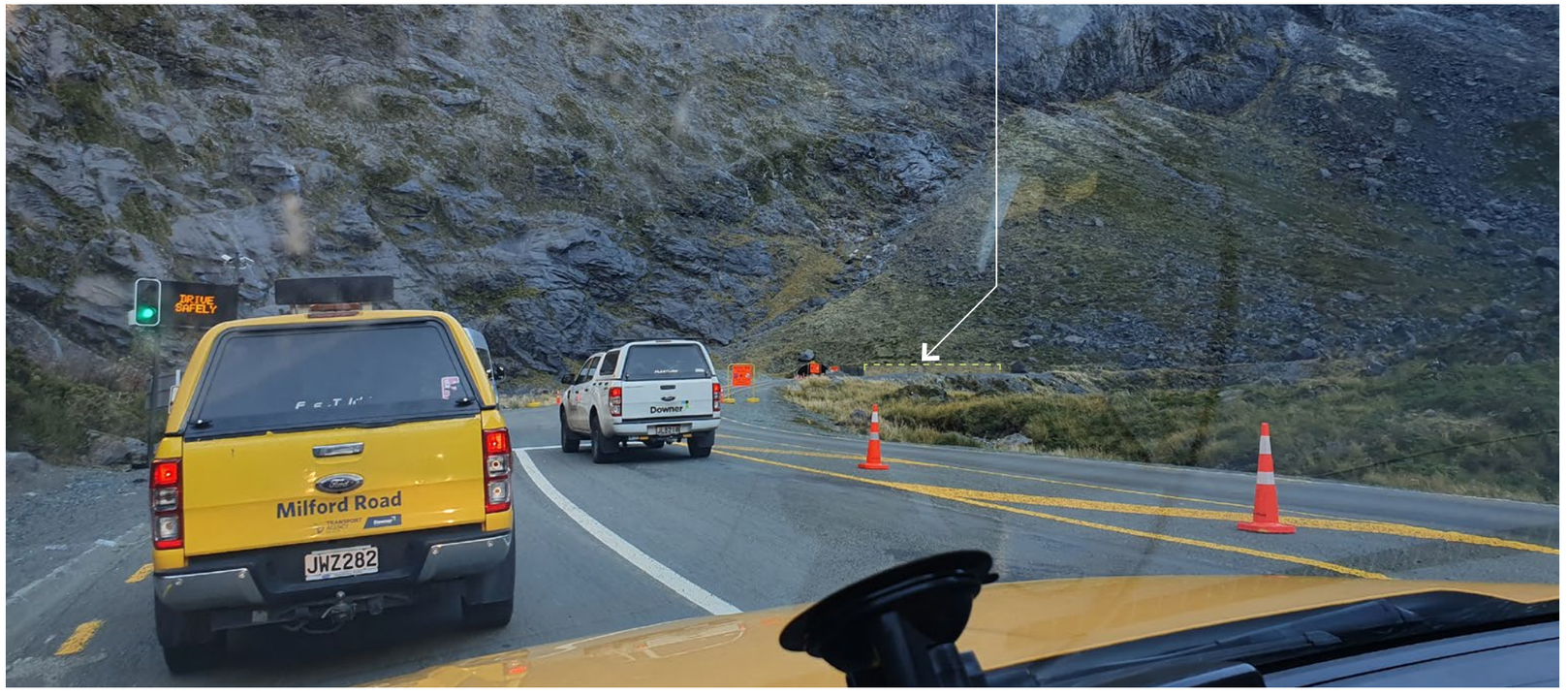
Moderate: A moderate level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate level of effect on the perceived amenity derived from it. (Oxford English Dictionary Definition: Moderate: adjective-average in amount, intensity or degree).

Moderate-Low: A moderate to low level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate to low level of effect on the perceived amenity derived from it.

Low: A low level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a low level of effect on the perceived amenity derived from it. (Oxford English Dictionary Definition: Low: adjective-below average in amount, extent, or intensity).

Very Low: Very low or no modification to key elements/features/characteristics of the baseline or available views, i.e. Approximating a ‘no-change’ situation.

BEFORE: PHOTO 1



AFTER: VISUALISATION 1

BEFORE: PHOTO 2

Proposed Structure

Proposed mounding

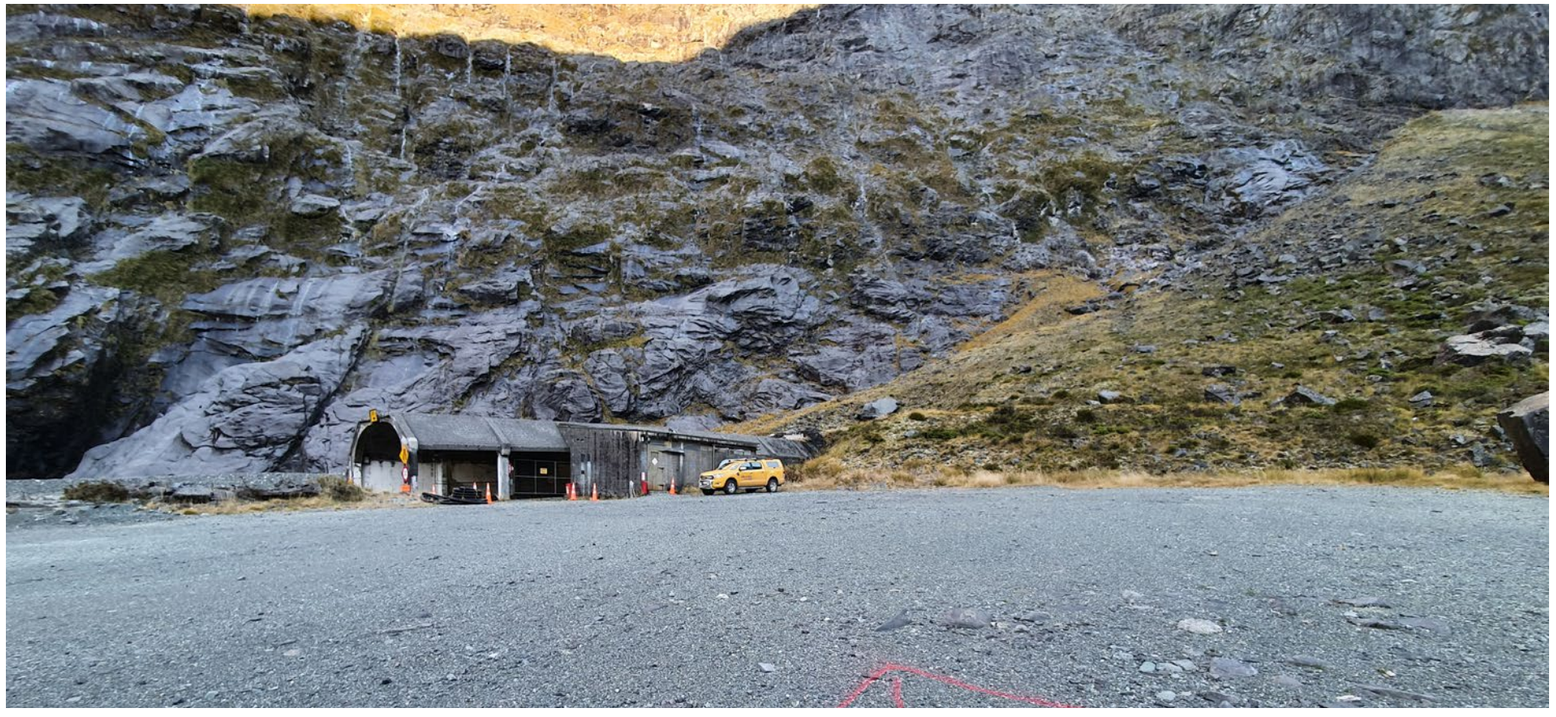
AFTER: VISUALISATION 2

Tunnel

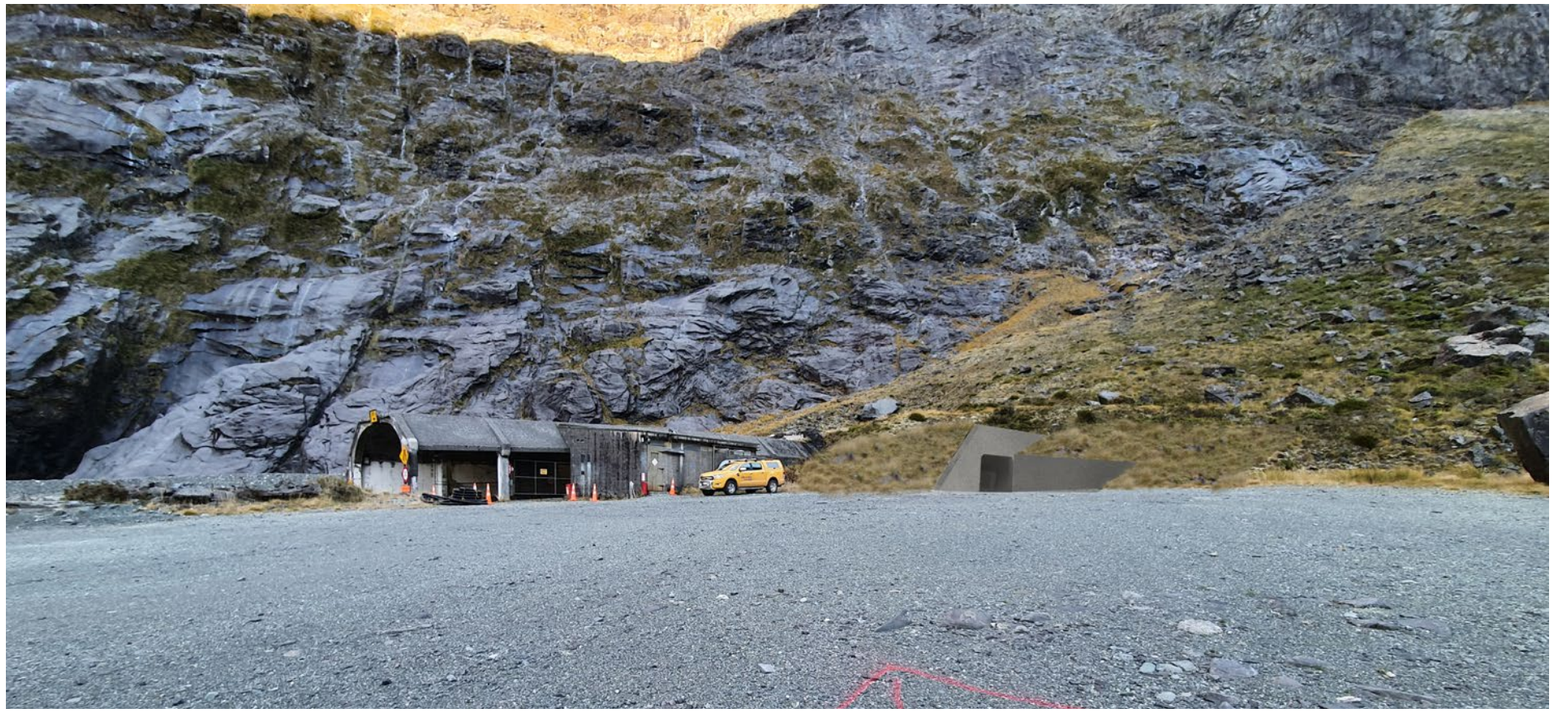
Historic debris

BEFORE: PHOTO 3A

AFTER: VISUALISATION 3A



BEFORE: PHOTO 3B



AFTER: VISUALISATION 3B

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Appendix E

Ecological Assessment

BEALE
CONSULTANTS

Homer Tunnel Avalanche Shelter Improvement Works
Proposed Plant Room
Terrestrial Ecology Assessment

Prepared for WSP Limited
November 2021

Contact Details

Name: Simon Beale
Beale Consultants Ltd
PO Box 113, Queenstown 9348
New Zealand

Telephone: Pirvacy
Mobile: Pirvacy

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Prepared by:

Pirvacy

Simon Beale | Senior Ecologist

Reviewed by:

Pirvacy

Glenn Davis | Director and Senior Ecologist
e3Scientific Limited

Contents

1. Introduction

1.1. Background

Waka Kotahi and the Milford Road Alliance intend to replace the existing avalanche shelter at the eastern portal of the Homer Tunnel. In preparation for the replacement works, it is necessary to relocate existing plant and equipment currently located within the plant room adjoined to the existing avalanche shelter. The plant room is being relocated and reconstructed to provide improved resilience to this building, owing to exposure to avalanche and rockfall hazards. The new plant room building is proposed as a buried structure within the talus slope to provide hazard protection and to also minimise the visual impact of this structure at this sensitive site. A new tunnel will connect the new plant room to the new avalanche shelter.

1.2. Purpose and Scope of Assessment

The ecology assessment includes:

- a description of the vegetation and indigenous fauna affected by the proposed works;
- a description of the ecological values and ecological significance of the affected indigenous vegetation and habitats of indigenous fauna;
- an assessment of the magnitude and level of ecological effects arising from the works,
- measures required to avoid, remedy and mitigate adverse ecological effects of the works.

An assessment of the ecological values and ecological significance of the affected indigenous vegetation and habitats of indigenous fauna has been undertaken in accordance with the criteria set out in the Environment Institute of Australia and NZ (EIANZ) Guidelines for Ecological Impact Assessment (2018) and in Appendix 3 of the Southland Regional Policy Statement.

The assessment of ecological effects follows the criteria set out in the EIANZ guidelines for describing the magnitude of and level of ecological effects.

Plant species recorded at the site are listed in Appendix 1.

2. Description of Proposal

2.1. Design

Waka Kotahi have assessed three design options for the new plant room with the preferred design Option C selected on the basis of cost, constructability, lesser impact on heritage features and capacity to be more readily modified to meet future demands.

2.2. Construction Footprint

The construction footprint encompasses the new avalanche shelter construction envelope as shown on the Proposed Plant Room and Accessway Plan (Figure 2-1: WSP Plan 6-DC734.00-C02). The shaded area on the plan indicates the extent of earthworks required for construction of the buried plant on the northern side of the avalanche shelter, including the connecting tunnel and cabling. The construction footprint spans an area of approximately 1,000 m^2.

Figure 2-1: Proposed Plant Room and Accessway Plan

2.3. Vegetation Clearance and Reinstatement

Vegetation clearance will occur within the construction footprint at the outset of the earthworks affecting mixed sub-alpine tussock grassland-shrub vegetation. The actual area of vegetation to be cleared is smaller than the construction footprint as this extends across the gravelled surface of the carpark adjacent to the Milford Highway beyond the existing shelter. The area to be cleared of indigenous vegetation is approximately 600 m^2.

Patches of the snow tussock *Chionochloa pallens* subsp. *cadens,* blue tussock *(Poa colensoi)* and turfs comprising of a mixture of grasses, herbaceous plants, sub-shrubs and ferns, as described in Section 4.2 will be carefully uplifted and temporarily stored at a nearby designated site. During the uplifting of this vegetation, it is important that as much as possible of the root bed and encrusting soil is retained to maximise survival of the uplifted plants. Survival will also be dependent on regular watering of the uplifted plants and turfs over the construction period.

During the uplifting of the tussocks and turfs, whatever 'organic' material that is available on site is put aside and then re-spread over disturbed ground at the completion of works. This would include 'lifting' boulders and the like and placing them 'sunny'/lichen side up and then placing them back onto the disturbed slopes at completion. Placement of the 'organic material' across the site will provide a suitable planting medium for the uplifted tussocks and turfs during re-instatement as well as providing a seed source for natural regeneration to assist in regeneration of the site.

2.4. Timing of Works

The portal improvement works will take place between February and April to avoid the breeding seasons of rock wren and kea. Further details on these species are provided in Section 6.1.

2.5. Assessment Methodology

A review of literature was undertaken in advance of the site investigation. This involved a review of the WSP Plant Room preliminary structure design statement, published and unpublished scientific literature and Google Earth imagery. The imagery was used to broadly identify the vegetation and habitat types in the area in advance of the site investigation.

A site investigation was conducted on 16 September 2021 involving walk over survey of the construction footprint and surrounding area.

During the site inspection the indigenous vegetation communities and habitat types occurring in and surrounding the construction footprint were recorded along with native bird species, either observed or heard in the general area. No systematic sampling of vegetation was undertaken.

3. Ecological Setting

3.1. Overview

The site is located in the sub-alpine zone at *c.* 920 m a.s.l. at the head of the Hollyford River within the Darran Ecological District and Fiord Ecological Region. Aspects of the Darran Ecological District as described by McEwen (1987) that typify the general area are:

"Very steep glacier-carved mountains and valleys, mostly igneous intrusive and metamorphic rocks, very high rainfall, mainly shallow, stony, very strongly leached and podzolised steepland soils, steep slopes, slips, screes, bare rock, extensive; altitudinal sequence; forest, subalpine scrub; tussocklands, alpine zone".

The climate is typical of the conditions encountered in the alpine and sub-alpine zones with frequent strong winds from westerly quarter and sub-zero temperatures encountered and lengthy snow cover lie which contribute to a high avalanche hazard, especially during the early spring months.

The site lies within an area affected by the construction of the Homer Tunnel. Construction of the tunnel commenced in 1935 and spanned a 19-year period.

A photo taken in 1937 of the eastern entrance (Figure 3-1) shows the extent of the earthworks and infrastructure related works that had occurred during the early stages of construction.

Evidence of previous earthworks is clearly evident today in and around the site of the proposed plant room (Appendix 2, Photo 1).

Figure 3-1: Homer Tunnel Construction Work Site,1937.
Source: Downer.

3.2. Land Environments

Land Environments of New Zealand (LENZ) classification is commonly used in ecological assessments to detail a project's ecological setting. LENZ groups together land environments throughout the country with similar environmental characteristics such as climate, landform, geology and soils as these influence the distribution of indigenous vegetation and habitat types. The LENZ classification is hierarchical in scale, from the high Level 1 classification to the most detailed Level IV classification.

The project site is located in Level 1 Land Environment R which extends along the main divide and includes the Fiordland Mountains and the Level IV land environment R2.2a. Land environment R2.2a is described in Table 3-1.

The first column describes its landform, geology, soil and climatic characteristics while the other columns titled Threat Category, % indigenous vegetation cover and % formally protected are derived from the Threatened Environment Classification 2012, which combines data from three national databases; LENZ, the Land Cover Database (LCDBv4.0, based on 2012 satellite imagery), and a 2012 update of the national protected areas network.

The Threatened Environment Classification was developed by Landcare Research (Walker et al., 2007) to help identify places in New Zealand in which the terrestrial indigenous ecosystems, vegetation types and habitats are much reduced and poorly protected nationally.

Table 3-1: Land Environment (Level IV) Details.

LENZ	Description	Threat Category	% Indigenous veg. cover remaining	% protected
R2.2a	Steep mountains; imperfectly drained soils of very low fertility from granite. Cool temperatures, low solar radiation. Very high monthly water balance ratio and no annual water deficits.	6	99.97	99.96

The threat category of 6 assigned to Land Environment R2.2a indicates that this land environment remains almost completely under indigenous vegetation cover which is virtually all formally protected.

4. Vegetation Communities

4.1. Overview

The indigenous vegetation community encountered within the construction footprint is classified as mixed tussock grassland-scrub. Mixed tussock grassland-scrub is the dominant plant community in the sub-alpine and low alpine zones in the headwaters of the Hollyford River.

The mixed tussock grassland-scrub exists within extensive boulderfields, especially to the north of the tunnel colonising rocky ground amongst numerous boulders and large rocks dislodged from the surrounding mountain faces and bluffs during avalanches and rock falls. These feature on the cover page and on Figure 4-1.

4.2. Mixed Tussock Grassland-Scrub

The mixed tussock grassland-scrub community in and surrounding the construction footprint comprises of patches of the snow tussock *Chionochloa pallens* subsp. *cadens,* blue tussock *(Poa colensoi)* and *Rytidosperma gracile* that occurs in association with scattered shrubs of *Veronica odora,* Coprosma ciliata., *Coprosma pseudocuneata*, *Olearia ilicifolia, Olearia nummularifolia, Coprosma serrulata and* inaka *(Dracophyllum longifolium).* In places there is the distinctive large leaved mountain daisy (*Celmisia semicordata* Subsp. *semicordata*). Extensive patches of prickly shield fern (*Polystichum vesticum*) occur in the vicinity of the avalanche shelter along with several discrete stands of mountain lacebark (*Hoheria glabrata)*.

A mosaic of plants of a low stature occurs in this community featuring creepers such as *Coprosma depressa, Anaphalioides bellidioides, Muehlenbeckia axillaris*, *Gaultheria depressa* var. *novae-zealandiae, Gaultheria crassa* and *Lycopodium scariosum*, herbs such as *Celmisia densiflora*, *Anisotome aromatica* Var. *aromatica* and *Lagenifera cuneata* and the ferns Blechnum *montanum and Blechnum penna-marina.* In places the rocky ground is covered in light green carpets of the moss *Racomitrium* spp. Many of the boulders and rocks in the site are extensively covered with foliose and crustose lichens.

4.3. Threatened and At-Risk Flora

During the site survey no flora classified as threatened or At-Risk were observed in the project site or immediate surrounds.

Figure 4-1: Satellite Imagery of Eastern Homer Tunnel Area (Imagery date: 23-1-2012).

5. Fauna

5.1. Avifauna

During the walk over survey kea were observed in the general area around the tunnel. Kea (Nationally Endangered) is a regular visitor here owing to its inquisitive nature. Suitable breeding and foraging habitat exist in and around the project area in the form of beech forest, subalpine scrub, tussock grassland and herbfields[1]. Kea breed from July to January nesting often in holes, under logs and in cavities amongst boulders overgrown with scrub and trees. Keas are omnivorous, taking a wide range of plant and animal matter. They forage in trees and scrub for shoots, fruits, leaves, nectar and seeds, dig in the soil for insect larvae and plant tubers (Heather, et al, 2005).

The subalpine tussock-scrub is also favoured habitat for the threatened rock wren (Nationally Endangered). It is locally common in the Homer Tunnel area and found from 900 m to 2500 m in altitude where the habitat may vary from dense sub-alpine scrub, through talus where stable rock falls are interspersed with low shrubbery to bare rock in very exposed situations. Rock wrens breed in spring and summer with a thickly lined and fully enclosed nest constructed at ground level within a natural cavity with only one brood reared in a season[2]. The diet is mainly invertebrates especially beetles, spiders, centipedes, caddisflies but *Copromsa* and *Gaultheria* fruit and grass seed are also eaten (Heather et al, 2005). Shrubs of *Coprosma* and *Gaultheria* are common within the affected area of subalpine scrub.

[1] http://www.nzbirdsonline.org.nz/species/kea
[2] http://www.nzbirdsonline.org.nz/species/rock-wren

Interrogation of the Atlas of Bird Distribution in New Zealand, 1999-2004 indicates that a number of other native birds are resident in the upper Hollyford valley. These are: New Zealand bush falcon (At-risk-Recovering), New Zealand pipit (At-risk-Declining), South Island rifleman, bellbird, grey warbler, New Zealand fantail and silvereye.

5.2. Herpetofauna

Two lizards species are recorded in the Homer Tunnel area. These are: Cascade gecko (Mokopirirakau "Cascades"; At-Risk, Declining) and Awakopaka skink (*Oligosoma awakopaka*; Data Deficient). Both species are reported as being present above 1,000 metres towards the Homer Saddle but neither is considered likely to be resident close to the highway[3]. Both species occupy rocky subalpine and low alpine scrub and alpine grasses/tussocks, including scree and boulderfield edges.

5.3. Invertebrates

The upper montane and low alpine zones of northern Fiordland where mega herbfields and diverse shrublands occur support diverse invertebrate fauna assemblages, including array of diurnal and nocturnal moth species, butterflies, giant weevils, grasshoppers, cicadas, giant slugs, flies and stoneflies. The fauna contains many widespread species, together with a sizeable collection of local endemics (Peat and Patrick 2005).

6. Summary of Ecological Values

The ecological values inherent to the subalpine beech forest and sub-alpine scrub communities and associated habitats within and adjacent to the project area are:

- Provides suitable breeding and feeding habitat for nationally threatened kea and rock wren;
- Posseses high floristic diversity; and
- Supports high invertebrate diversity.

7. Assessment of Ecological Values and Ecological Significance

The ecological value and significance of the affected indigenous vegetation types and habitats of indigenous fauna encountered on site has been assessed using the combination of the attributes/criteria set out in Table 4 of the Environment Institute of Australia and New Zealand (EIANZ 2018) Guidelines and in Appendix 3 of the Southland Regional Policy Statement.

The assessment matters and attributes used to assign values to the affected indigenous vegetation communities and habitats are sourced from Tables 4 and 6 of the EIANZ Guidelines and transposed in Tables 7-1 and 7-2 below.

[3] email correspondence: Carey Knox, Wildland Consultants.

Table 7-1: Attributes to be considered when assigning ecological value and determining ecological significance of a vegetation community and habitat.

Assessment Matters	Attributes
Representativeness	Criteria for representative vegetation and aquatic habitats: • Typical structure and composition • Indigenous species dominate • Expected species and tiers are present • Thresholds may need to be lowered where all examples of a type are strongly modified Criteria for representative species and species assemblages: • Species assemblages that are typical of the habitat • Indigenous species that occur in most of the guilds expected for the habitat type.
Rarity/ distinctiveness	Criteria for rare/distinctive vegetation and habitats: • Naturally uncommon, or induced scarcity • Amount of habitat or vegetation remaining • Distinctive ecological features • National priority for protection Criteria for rare/distinctive species or species assemblages: • Habitat supporting Nationally Threatened or At Risk species, or locally uncommon species • Regional or national distribution limits of species or communities • Unusual species or assemblages • Endemism
Diversity and Pattern	• Level of natural diversity, abundance and distribution • Biodiversity reflecting underlying diversity • Biogeographical considerations – pattern, complexity • Temporal considerations, considerations of lifecycles, daily or seasonal cycles of habitat availability and utilisation
Ecological Context	• Site history, and local environmental conditions which have influenced the development of habitats and communities • The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience (from "intrinsic value" as defined in RMA) • Size, shape • Buffering function • Condition and sensitivity to change • Contribution of the site to ecological networks, linkages, pathways and the protection and exchange of genetic material • Species role in ecosystem functioning – high level, key species identification, habitat as proxy • Is important for indigenous fauna during some part of their life cycle.

Table 7-2: Criteria for assigning ecological value to vegetation communities and habitats.

Value	Description
Very high	Area rates High for 3 or all the four assessment matters. Likely to be nationally important and recognised as such
High	Area rates High for 2 of the assessment matters. Moderate and Low for the remainder, or Area rates High for 1 of the assessment matters. Moderate for the remainder. Likely to be regionally important and recognised as such.
Moderate	Area rates High for one assessment matter. Moderate and Low for the remainder, or Area rates Moderate for 2 or more assessment matters. Low to Very Low for the remainder. Likely to be important at the level of the Ecological District.
Low	Area rates Low or Very Low for majority of assessment matters and Moderate for one. Limited ecological value other than as local habitat for tolerant native species.
Negligible	Area rates Very Low for 3 matters and Moderate. Low or Very Low for remainder.

Table 7-3: Summary of ecological values assigned to the affected indigenous vegetation communities and habitats.

Assessment Matters	Ecological Value	Ecologically Significant
Representativeness: The affected subalpine tussock grassland-scrub community supports a range of indigenous plant, avifauna and invertebrate species that are representative of the plant and animal communities that occur in the subalpine and low alpine zones in the Darren Ecological District.	**High**	**Yes**
Rarity/Distinctiveness The subalpine tussock grassland-scrub community is a distinctive ecological feature within the Hollyford River headwaters.The community provides suitable breeding and feeding habitat for the threatened rock wren and kea and at-risk New Zealand pipit and New Zealand falcon.	**High**	**Yes**
Diversity and Pattern: The tussock grassland-scrub community features a diverse range of plants including a number of species of small leaved shrubs and sub-shrubs and herbaceous plants. The scrub provides habitat for a diverse assemblage of indigenous invertebrates.	**High**	**Yes**
Ecological Context The affected vegetation and associated habitats provide important habitat for specialist indigenous plant species, avifauna and indigenous invertebrate species during all or part of their lifecycles.	**High**	**Yes**
Overall ecological value	**Very High**	

8. Assessment of Ecological Effects

The level of effect of construction of the plant room and ancillary facilities on the sub-alpine tussock grassland-scrub community (Table 8-2) is determined in accordance with the EIANZ criteria by considering magnitude of the effects (Table 8-1) in association with assigned ecological values (Table 7-3). The magnitude of effect is influenced by the extent of clearance or modification of this plant community required for the project and the timing of the works (Section 2.4).

Table 8-1: Criteria for scoring magnitude of effect (EIANZ, 2018).

Magnitude	**Description**
Very High	Total loss of, or very major alteration to, key elements/features/ of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether; AND/OR Loss of a very high proportion of the known population or range of the element/feature
High	Major loss or major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature
Moderate	Loss or alteration to one or more key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known population or range of the element/feature
Low	Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances or patterns; AND/OR Having a minor effect on the known population or range of the element/feature
Negligible	Very slight change from the existing baseline condition. Change barely distinguishable, approximating to the 'no change' situation; AND/OR Having negligible effect on the known population or range of the element/feature

Table 8-2: Criteria for scoring level of effect (EIANZ, 2018).

Ecological value → **Magnitude ↓**	**Very high**	**High**	**Moderate**	**Low**	**Negligible**
Very High	Very high	Very high	High	Moderate	Low
High	Very high	Very high	Moderate	Low	Very low
Moderate	High	High	Moderate	Low	Very low
Low	Moderate	Low	Low	Very low	Very low
Negligible	Low	Very low	Very low	Very low	Very low

Positive	Net gain	Net gain	Net gain	Net gain	Net gain

The magnitude of ecological effect on the affected sub-alpine tussock grassland-scrub community is assessed as low as the proposed works will affect a small area of vegetation encompassing approximately 600 m^2.

This scoring correlates with the EIANZ criteria set out in Table 8-1, i.e., "*the clearance of the vegetation will result in a minor shift away from the existing baseline conditions. Change arising from the loss/alteration will be discernible but the underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances or patterns and will have a minor effect on the known population or range of the element/feature*."

The ecological function and integrity of the tussock grassland-scrub community beyond the construction footprint will be maintained.

The level of ecological effect of permanent removal of an area of this plant community is assessed to be moderate based on a low magnitude of effect on a community of very high ecological value.

9. Proposed Avoidance and Mitigation Measures

9.1. Timing of Works

- The works shall avoid the breeding season of kea and rock wren which extends from July to January.

9.2. Vegetation Clearance and Reinstatement

- During vegetation clearance, tussocks and turfs shall be carefully uplifted and stored at a nearby designated site and watered regularly;
- Organic material that occurs across the site shall be put aside to be used as a planting medium during reinstatement of the uplifted tussocks and turfs.

9.3. Work Site Control Measures

- The construction site shall be clearly defined on the ground by a supervising engineer in collaboration with an ecologist and the appointed contractor in advance of construction;
- Prior to works, the contractor shall ensure that a briefing occurs with its staff to ensure the works are to be conducted as sensitively as possible in recognition of the national park setting;
- Construction works must avoid disturbing areas outside the defined construction sites to avoid damage to surrounding vegetation;
- Works must be conducted to ensure no contaminants are discharged onto the land or into watercourses (directly or indirectly).
- All vehicles, machinery, equipment and aggregate material must be cleaned of weeds, seeds and soils before entering the works area. Refuelling must be undertaken away from watercourses and surrounding vegetation.

9.4. Weed Control

- The construction site shall be monitored over the duration of the works and also over the duration of the subsequent maintenance period (2 years) to detect whether any problem weed species have been accidentally introduced to the area. All necessary steps will be undertaken to eradicate these weeds.

10. Conclusions

The proposed plant room works will result in the permanent removal of a small area of sub-alpine tussock grassland-scrub vegetation next to the Homer Tunnel avalanche shelter.

The ecological value of the affected subalpine tussock grassland-scrub is very high in accordance with the criteria set out in the EIANZ Guidelines. Additionally, this community is ecologically significant in terms of the assessment criteria set out in Appendix 3 of the Southland Regional Policy Statement.

The magnitude of ecological effect of the works has been assessed as low. This score reflects a minor shift away from the existing baseline conditions due to the limited area of vegetation that will be permanently cleared during the works.

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Appendix 1 – Plant Species List

The following is a list of native and naturalised plants observed across the site during the course of the site visit. This list is by no means exhaustive and identifies the more common plants encountered on the site. Nomenclature for indigenous plants follows Mark (2012), Poole and Adams (2011), Wilson(1993), Johnson & Brooke (1998) and for exotic plants (indicated by *) follows treatments in Popay, Champion & James (2010).

Trees and Shrubs	
Mountain lacebark	*Hoheria glabrata*
Snow totara	*Podocarpus nivalis*
	Coprosma pseudocuneata
	Coprosma ciliata
	Coprosma serrulata
Mountain tauhinu	*Ozothamnus vauvilliersii*
	Hebe odora
	Veronica treadwellii
	Olearia nummularifolia
Mountain holly	*Olearia ilicifolia*
Inaka	*Dracophyllum longifolium*
	Gaultheria depressa var. *novae-zealandiae*
	Gaultheria crassa
Sub Shrubs	
	Coprosma depressa
Creeping pohuehue	*Muehlenbeckia axillaris*
	Hebe ciliolata
Herbaceous Plants	
Dicotyledonous Plants	
Large mountain daisy	*Celmisia semicordata* subsp. *semicordata*
	Celmisia densiflora
	Celmisia petiolata
	Epilobium glabellum
Everlasting daisy	*Anaphalioides bellidioides*
	Stellaria gracilenta
	Lagenifera cuneata
Common pennywort	*Hydrocotyle novae-zelandiae* var. *montana*
Sheep's sorrell*	*Rumex acetosella*
Bidibid	*Aceana* sp. *'alpine'*
Catsear*	*Hypochoeris radicata*
Mountain violet	*Viola cunninghamii*
Hairy buttercup	*Ranunculus hirtus*
Mountain violet	*Viola cunninghamii*

Grasses, Sedges and Rushes	
Midribbed Snow Tussock	*Chionochloa pallens* subsp. *cadens*
Mountain astelia	*Astelia nervosa*
Blue tussock	*Poa colensoi*
	Poa subvestita
Meadow grass*	*Poa pratensis*

Browntop*	*Agrostis tenius* *Rytidosperma pumilum* *Carex goyenii* *Uncinia clavata*
Club Mosses	
Creeping clubmoss	*Lycopodium scariosum*
Ferns	
Alpine hard fern Mountain kiokio Prickly shield fern	*Blechnum penna-marina* *Blechnum montanum* *Polystichum vesticum* *Hypolepis millefolium*
Mosses	*Rhacomitrum sp.*

Appendix 2 – Site Photographs

Photo 1: View of an area where the proposed plant room will be sited adjacent to the avalanche shelter and where much of the earthworks and vegetation clearance will occur.

Photo 2: Shrubs of *Hebe odora* are prevalent within the proposed work site. The leafy *Celmisia semicordata* subsp. *semicordata* cover part of the grassy slope near the stone wall defining the end of the tunnel.

Photo 3: Ground cover within the work site typically includes young plants of *Coprosma serrulata*, scattered alpine hard fern (*Blechnum penna-marina*), the feathery *Anisotome haastii* and the creeping everlasting daisy (*Anaphalioides bellidioides*) growing out an extensive carpet of moss.

Photo 4: Extensive carpets of the moss *Racomitrium* sp. occurs across the rockier terrain near the edge of the work site. Sub-shrubs of *Gaultheria depressa* var. *novae-zealandiae* are locally common.

Appendix F

Heritage Assessment

Waka Kotahi New Zealand Transport Agency
c/o Chris Collins and Gemma Kean
Senior Project Manager (Complex)
Level 1, BNZ Centre
120 Hereford Street
Christchurch

24 November 2021

Homer Tunnel Resilience Improvements – Phase 1 – Heritage Comments

Origin Consultants Ltd (Origin Consultants) has been engaged by Waka Kotahi New Zealand Transport Agency (Waka Kotahi), to provide heritage advice in relation to the proposed resilience improvement works at the eastern portal of the Homer Tunnel.

The proposed works will be carried out in two stages. These heritage comments relate to the first phase (Phase 1) of the works, which include:

- Cable trenching through a part of the avalanche shelter remains alongside SH94;
- New equipment building excavations and placement beneath replaced rubble alongside the Homer Tunnel; and
- Rock pinning the eastern tunnel entrance stacked rock wall (façade).

In preparing this advice, we have reviewed:

- WSP, Waka Kotahi (NZ Transport Agency) Homer Tunnel – SH94 RP 240/0.00 Resilience Improvements – Phase 1, titled
    - 'Site Plan,' C01, Revision A (2 September 2021)
    - 'Site Plan Proposed Extent of Ground Investigations,' C02, Revision A (18 November 2021)
    - 'Proposed Plant Room and Accessway Plan,' C01, Revision A (3 November 2021)
    - 'Proposed Plant Room and Accessway Sections,' C02, Revision A (3 November 2021)
    - 'Existing Portal Masonry Headwall Strengthening,' C05, Revision A (undated)
- WSP, 'SH94: Homer Tunnel Proposed Plant Room – Landscape Advice Note' (3 November 2021)

- WSP, 'Homer Tunnel Improvements Works 2021/22 | New Plant and Equipment Facilities Landscape and Visual Assessment – Appendices (Draft for Comment)' (October 2021)

This advice should be read in conjunction with the Waka Kotahi, Resource Consent Application: Waka Kotahi NZ Transport Agency Soil & Vegetation Disturbance, Trenching and Cables for Replacement Equipment Building Structure East Homer Tunnel, SH94 and Fiordland National Park, and Concession Application: Waka Kotahi NZ Transport Agency Soil & Vegetation Disturbance, Trenching and Cables for Replacement Equipment Building Structure East Homer Tunnel, SH94 and Fiordland National Park, November 2021 (referred to as Waka Kotahi Resource Consent and Concession Applications).

Site Description

The Homer Tunnel is a significant landmark on the road to the Milford Sound/Piopiotahi. It forms a crucial link on the Milford Road, providing the only road access to the Milford Sound.

The eastern portal tunnel entrance is composed of a semi-circular concrete arch, with a construction date of 1936/1937. It has a bonded course stone façade with a parapet to the external face. The eastern portal (on the Te Anau side) avalanche shelter is constructed in reinforced concrete and is semi-octagonal in section. It was constructed from 1938 to 1941 and truncated following avalanches in 1945 and 1997. There is a small concrete building attached to the northern side of the eastern portal. This was originally built as a shed for drill sharpening and replaced an earlier timber building destroyed in an avalanche in 1945. It is now used as a plant room for the Homer Tunnel. This building is located within an area of high rockfall and known avalanche paths.

Figure 1. Eastern portal and avalanche shelter, with the concrete plant room visible to the right of the tunnel entrance.

The Homer Tunnel is not listed in the Southland District Council District Plan or included in the Heritage New Zealand List Rārangi Kōrero. However, it is located within UNESCO World Heritage Site, Te Wāhipounamu, and has also been recognised as meeting Heritage New Zealand Pouhere Taonga Act 2014 and District Plan criteria for listing. As such, Waka Kotahi treat the tunnel as built heritage.

The Tunnel was constructed during a time of severe economic depression and was undertaken in recognition of the growing importance of tourism to New Zealand. It was a project of large magnitude, which was subsequently eclipsed by the impressiveness of the surrounding landscape. It was a significant feat for a young country with a small population and revealed that the pioneering phase of the country was shifting towards one of settlement, leisure, and tourism.

A brief history of the construction of the Homer Tunnel and eastern portal is attached as Appendix 1.

Assessment of Significance

While there are many aspects to the concept of 'heritage significance,' the following significance assessment has been based on the criteria outlined in NZTA, "Historic heritage impact assessment guide for state highway projects," (March 2015) which adopts the best practice guidance issued by Heritage New Zealand Pouhere Taonga.[1]

Origin Consultants regard the Homer Tunnel to have:

- **High technology, engineering, and scientific value** – The significance of the Homer Tunnel lies in the organisational challenge of surveying the remote valleys, blocked by a mountain range, and then bringing in men and supplies to build a road and tunnel across the valleys and through the mountain. The subsequent challenge of cutting through solid rock in an inhospitable climate was duly met by engineers. When completed, the tunnel was the longest road tunnel in New Zealand, and one of the highest in the world. The construction of a reinforced concrete avalanche protection for each portal is likely the only example of such a feature being built in New Zealand. While a large portion of the protection did not survive beyond 1945, it was still a notable form of construction to protect the tunnel entrances. The destruction of a substantial portion is reflective of the immense power of the avalanches that struck, rather than a failure in technological or constructional expertise.
- **High contextual and group value** – The Homer Tunnel forms the core of a cluster of sites associated with the construction of the Milford Road. These additional sites include the workers' camps, hydroelectric generation along the river, and the road itself. The Tunnel has a dramatic setting, as a small structure that is dwarfed by the Homer Saddle and surrounding valleys and ranges. This setting contributes to its high contextual value.
- **High historic value** – The Tunnel was constructed during a time of severe economic depression and was undertaken in recognition of the growing importance of tourism to New Zealand. It was a project of large magnitude, which was subsequently eclipsed by the impressiveness of the surrounding landscape. It was a significant feat for a young country with a small population and revealed that the pioneering phase of the country was shifting towards one of settlement and leisure. The construction of the Tunnel was associated with many notable surveyors, engineers, politicians, and site workers.
- **Moderate architectural value** – The architectural values of the Tunnel are limited, as the tunnel itself is rudimentary in form. Being cut through hard rock, linings and architectural designs were limited. The few architectural elements that can be found relate to the stone façade to the eastern portal.
- **Moderate rarity and representative value** – When constructed, the Tunnel was the longest and highest tunnel in New Zealand at that time. It was built with the full-face and drift method, whereas other roading tunnels were cut through softer rock and used the heading and bench method. In comparison to other roading tunnels constructed at a similar time, the Homer Tunnel was built purely for tourism purposes, rather than to link infrastructure.
- **Moderate integrity value** – The Tunnel has had little modification, with minor additions and services and altering the road surface. It retains significant features from its time of construction, including the eastern portal stone façade.

[1] Accessed at: https://www.nzta.govt.nz/assets/resources/guide-to-assessing-cultural-heritage-effects/docs/historic-heritage-impact-assessment-guide-2015.pdf

- **Moderate vulnerability value** – Large portions of the original avalanche protection at the eastern portal have been destroyed, indicating its vulnerability in its alpine environment. Improvements are now necessary to improve the safety of the Tunnel and its avalanche/rock fall protection.
- **Moderate cultural value** – The Tunnel was held in in high public esteem, catching the imagination of the wider nation during a time New Zealand developed its own, unique identity, separate from that of the British Empire. The Milford Sound was heralded as one of the most scenic places on earth for the tourist. For a government department to undertake a large roading and tunnel project (costing more than $60 million in today's currency) with relatively little discord indicates how the scenic value of this part of the country was appreciated by New Zealanders.

The Homer Tunnel was constructed post-1900 and, as such, does not meet the definition of an archaeological site under the Heritage New Zealand Pouhere Taonga Act 2014.

Assessment of the Proposed Phase 1 Works

Trenching and Cabling

Trenching and cabling is required to connect services in the new equipment building to the new power supply located at the Green Shed operations and emergency management site in the Alpine Tunnel Operation Centre (ATOC) concession area located 500m east of the Tunnel portal along SH94.

The required trenching and cabling are described in the Waka Kotahi Resource Consent and Concession Applications as follows:

> *The length of trenching for replacement cable placement is 100m from SH94 through the modified carpark to the new equipment building and into the Tunnel. Trenching will be up to 1.2m deep and 1.8m wide. The trenching will reconnect the power source for the Tunnel (generators) that are to be relocated to the Green Shed operations and emergency management 500m east of the Tunnel along SH94.*

In addition, isolated investigations will be carried out to the north of SH94. Six pits, up to 2m deep, will be dug adjacent to SH94, within the carparking area. The purpose of these investigations is to inform the next stage of the works to the tunnel (Phase 2) with regard to:

a) The nature of the ground in the vicinity of the shelter for engineering purposes; and
b) The likelihood of encountering archaeological material and the likely provenance of that material.

While the site is not considered an archaeological site under the Heritage New Zealand Pouhere Taonga Act 2014, the Homer Tunnel is recorded as archaeological site D40/11 on the New Zealand Archaeological Associations recording website, ArchSite. A substantial amount of debris from the September 1945 avalanche, where 115m of the original eastern portal avalanche protection was destroyed, forms part of the road alignment. This debris is visible on either side of the road alignment; however, the carparking area to the north of the Tunnel entrance is relatively clear of debris. This area has been heavily modified during the construction of the tunnel and after the avalanche. While it is unlikely there is any surviving archaeology that relates to the 19th century, there is the potential for it to contain some materials and artefacts that relate to the 20th century use of the site. While this material would not fall under the HNZPT Act 2014, it does fall under the Conservation Act 1987 meaning that archaeological monitoring and recording is required.

The archaeological monitoring and recording, and any resultant insights into the site could tie into any interpretation for the second phase of the works.

The proposed excavations for trenching/cabling and the test pits have been discussed with Dr. Matt Schmidt of the Department of Conservation by video call on 16 November 2021.

Assessment Summary: Origin Consultants' recommendations for archaeological monitoring are outlined in Appendix 2.

New Equipment Building

The proposed new equipment building is described in the Waka Kotahi Resource Consent and Concession Applications as follows:

> *A new equipment building is proposed on the north side of the Homer Tunnel eastern entry/exit and existing Plant Room attached to the Tunnel.*
>
> *The new building is proposed to be 9.15m long, by 3.7m wide, and up to 3.2m high. It will be constructed of connecting pre-cast concrete units.*
>
> *The new building will be connected to the Homer Tunnel by a pre-cast concrete corridor of 11.5m in length, 2.22m wide, and up to 3.2m high. A temporary further 5m long by 2m wide corridor is proposed to connect the existing and new equipment buildings to the Tunnel until such time as all necessary systems and services are shifted to the new equipment building.*
>
> *Three wing-wall protection structures will be placed at the north and west sides of the new building, to form retaining walls against the talus slope. The 14.5m-long north-facing wing-wall with a sloped outer (east) edge up to 4.5m in height will extend up to 5m west past the equipment building and will be up to 7.5m in length across the face of the new equipment building and up to 3.5m in height. The wing walls will be pre-cast exposed coloured concrete panels, made to appear similar to the surrounding material and slope colours.*
>
> *The new equipment building and connected corridors will be largely covered back over with removed, stored and replaced talus material, with retained vegetated talus used to re-naturalise the slope and provide additional avalanche and rock fall protection for the new structures.*

The eastern portal entrance is dwarfed by the Homer Saddle, and this view from the approach acts as a reminder of the technological and engineering feat of carving this Tunnel through isolated and rugged terrain. The viewshaft from the east of the tunnel is also aesthetically important and adds to the setting of the Tunnel.

The proposed design aligns with clause 9 of the ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value 2010, which states that the setting of the Tunnel should be conserved alongside the Tunnel itself. The setting of the Tunnel is maintained by the proposed design of the new equipment shed, built into the slope to the north of the tunnel entrance. The external entrances to the new equipment building are secluded and are not highly visible from the eastern approach. The design of the wing walls incorporates recessive colours, which are in keeping with the natural elements of the surrounding landscape. The building, and connecting corridors, will be largely covered back over with removed, stored, and replaced talus material and vegetation. This design will assist in maintaining the small-scale appearance of the tunnel entrance.

During a transitional period, a temporary corridor will be constructed to connect the existing and new equipment buildings. This corridor is located to the rear of the existing equipment building, so will also be secluded from view when approaching the Tunnel. Any adverse effects associated with this corridor will be temporary.

Assessment summary: From a heritage perspective, it is considered that the burial of the new building and the design of the exposed wing walls will result in less than minor adverse effects on the heritage values of the tunnel. The archaeological impacts will be adequately mitigated by the monitoring proposals outlined in Appendix 2.

Stone Facade Wall Reinforcement

The proposed rock wall reinforcement is described in the Waka Kotahi Resource Consent and Concession Applications as follows:

> *To ensure that earthworks for the new equipment building do not cause damage to the original eastern portal rock wall, and to protect it from further deterioration, Waka Kotahi proposes to reinforce the stacked rock wall by pinning it back into the slope during the excavation activities.*

Pinning the rock face will involve small steel plates affixed to the front east facing wall, with a capped pin inserted through the plate and rock wall and anchored into the slope behind the wall.

The stone wall façade at the eastern portal entrance is one of the only architectural elements of the Homer Tunnel. As the Tunnel is rudimentary in form, the architectural design of the Tunnel is limited. As such, the stone façade is considered to have high heritage significance.

Pattress plates are a traditional method of restraining/securing unreinforced masonry of heritage buildings and structures; typically, they are used in infrastructure retaining walls and abutments, as well as in agricultural and commercial buildings. Their installation will have the beneficial effect of providing added stability to the façade during the proposed works and for the future. The even spacing of the plates and dark coloured washers will reduce their visual effects and ensure they blend in with the surrounding masonry.

During the proposed excavation and pattress plate installation works, the stone façade will be vulnerable to damage, including:

- Mechanical damage during excavations close-by;
- Vibration during excavations and core drilling;
- Disintegration of the stonework during core drilling;
- Undermining of the foundations during excavations, particularly during the 500mm excavation to the ground level as the base of the wall.

The method of the original construction of the stone façade is also unknown and whether, for example, there are voids or other variable ground conditions behind the wall. Removal of the soil and vegetation around the wall and its exposure for pattress plate installation may also reveal the need for repair or maintenance to the stonework and its pointing. Documentation to address these possibilities and the use of machinery close to the stone façade should be included in a Construction Management Plan.

Assessment summary: Provided that the contractor is briefed about these vulnerabilities/risks through a Construction Management Plan and heritage advice is sought from Origin Consultants on any issues found, any adverse effects on the heritage values of the stone façade will be less than minor.

Conclusion

The proposed works include measures to protect the longevity of key aspects of the Homer Tunnel and avoid identified areas of significance. The effects of the proposed works on the cultural heritage values of the Homer Tunnel are summarised as follows:

- The proposed design of the new equipment building is sensitive to the environment and setting of the Tunnel and maintains the existing viewshaft of the eastern approach.
- The proposed pattress plates to reinforce the rock wall/eastern stone façade are considered to have a beneficial effect on the façade by improving the resilience of the façade. Their visual effect is reduced due to their even spacing and recessive colouring.

Any adverse effects on the heritage values of the Homer Tunnel have been mitigated through the proposed design of the new equipment building, and potential adverse effects on the stone façade wall of the eastern portal entrance due to the required earthworks are mitigated by the proposed reinforcement.

The proposed works also recognise the potential to encounter archaeology associated with the construction of the Homer Tunnel and avalanche shelter and allow for monitoring and recording.

Robin Miller
Director
Chartered & Registered Building Surveyor
RICS Certified Historic Building Professional
LBP Design Level 2 BP 133157

Lucy Travis
Heritage Consultant/Historian

For and on behalf of Origin Consultants Ltd

Phone Pirvacy
Office 9 Arrow Lane, Arrowtown
Post PO Box 213, Queenstown 9348
Web www.originteam.co.nz

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Appendix 1 – Brief History

The Māori history of Fiordland extends back to the earliest settlers of Te Wai Pounamu, the Waitaha. Legend describes the physical formation and shaping of the South Island centred around the sinking of Te Waka Aoraki. Aoraki and his brothers were thrown from the waka and turned into stone, becoming the highest peaks of the Southern Alps. The fiords of the region represent the raised sides of the wrecked waka, which were hacked away in an effort to make it habitable by humans.[2] According to legend Te Kōhaka-o-Te-Ruru (Homer Saddle) was formed by Ruru, who took over from Tu-te-Raikiwhananoa, and cut the South Island coastline with his huge axe. In his inexperience, he tackled the base first, and created a square rock face.[3]

Kākāpō and koko-takiwai attracted Ngāti Mamoe and Ngāi Tahu to Fiordland. Koko-takiwai was an easily shaped, softer pounamu and was sought after for making hei-tiki. In addition to kākāpō, the area also offered many other mahinga kai. As such, there were two principal trails to the Milford Sound. The inland route is now followed by the Milford Track, over Omanui (McKinnon Pass), down the Waitawai (Clinton River) to the head of Lake Te Anau. From there, pounamu and resources would be transported by raft to the head of the Waiau River. The other trail was from Martins Bay, up the Hollyford Valley, and over into the Routeburn Valley to a pounamu source at the head of Lake Wakatipu. The sea was also utilised to travel to Fiordland, and there were numerous tauranga waka along the coast.[4]

From early European settlement, the Fiordland continued to be a significant source of resources into the twentieth century. Initially the area was used by whalers and sealers, and later was recognised for its tourism potential. By 1878, several attempts had been made to locate a track from Queenstown through to the Milford Sound, including by WH Homer and George Barber, who scouted a route from Te Anau and over the Darren Ranges into the Cleddau Valley in 1888.[5] In 1890, the Government became interested in an overland connection to the Milford Sound and prison labourers were sent to begin constructing a road towards Lake Te Anau, via Homer Saddle. However, this programme only lasted until 1892.[6]

Following the failure of the Government's prisoner programme, little further action was taken to find a viable route until 1908. An expedition was launched by the Tourism Department to locate an overland track. The party left from the Milford side, and explored each branch of the Cleddau Valley. They suggested a tunnel of 4,000 yards on a descending grade to the Cleddau Valley and a road cut into a ledge zig-zagging down the face of Homer's Saddle.[7] The tunnel concept was presented to the Minister for Tourism (Hon T Mackenzie) in 1912.[8]

Following the outbreak of the First World War, any further consideration of the route was put on hold. In 1922, as part of a project to create jobs during the Depression, the Government decided to extend the highway beyond the Te Anau Hotel and up the Eglinton Valley. These works began in 1929/1930.[9] By 1933, New Zealand was still deeply in economic depression, and the Public Works Department doubled the number of men working on the road through Eglinton Valley. In late 1933, a Public Works Department survey party explored the valley to find the most practical route for the proposed tunnel and to estimate the probable costs.[10] These investigations found that the best route would be through the Homer Saddle. By June 1934, the

[2] Department of Conservation, "Fiordland National Park Management Plan," June 2007.
[3] Te Rūnanga o Ngā Tahu, "Kawarau and Te Wai-o-Koroiko," Retrieved 24 May 2019, from http://www.kahurumanu.co.nz/atlas.
[4] Department of Conservation, "Fiordland National Park Management Plan," June 2007.
[5] *Southland Times*, "From Milford to Wakatip," 12 February 1889.
[6] *Lyttelton Times*, "Westland," 18 December 1890.
[7] *Otago Witness*, "The Wakatipu Milford Connection: To the Editor," 15 January 1908.
[8] *Lake Wakatip Mail*, "A Big Undertaking," 16 April 1912.
[9] *Evening Post*, "By Motor to Milford," 10 April 1931; Jack Ede, *Mountain Men of Milford* (Christchurch: The Caxton Press, 1988).
[10] AF Downer, Tunnelling in New Zealand (1861-1978). Transactions of the New Zealand Institution of Engineers Incorporated: Civil Engineering Section. Vol 7, Issue 1 (March 1980).

engineers selected where the tunnel would be pierced, providing the shortest route to cut through the range.[11]

Construction of the Tunnel

Work began in July 1935 on the eastern side of the Homer Saddle. This initially involved cutting through loose scree on the saddle by hand. This loose rock was removed by September, and drilling began at the start of 1936.[12] By March, a fully equipped workshop was built, compressors were erected, a blacksmith's shop, explosives magazine, and appurtenant buildings, including accommodation, water supply, and telephone lines were all constructed.[13] The eastern portal arch was completed in the same year.[14]

An avalanche struck the eastern entrance in July 1936, killing Percy Leigh Overton, injuring seven others, and destroying multiple buildings.[15] Construction continued to be slowed by heavy snowfall and avalanches through winter.[16] By May 1937, 470ft of the tunnel had been excavated. Another avalanche struck, killing two and injuring three.[17] Work was suspended until Downer & Company won the contract to take over and complete the works.[18]

By April 1938, around 180ft of avalanche protection had been constructed on the eastern approach.[19] The full 480ft was completed on the eastern side in May 1940.[20] A concrete drill shed was erected north of the eastern portal by March 1939.[21] The heading tunnel was cut through to the western side of Homer's Saddle in early February 1940 and enlarged by ring boring.[22] Progress towards the completion of the tunnel was then impacted by the outbreak of the Second World War with works completely ceasing in April 1942.[23]

In September 1945, 300ft (115m) of the original eastern portal avalanche protection was destroyed by an avalanche (Figure 4).[24] A substantial amount of the debris has subsequently formed part of road alignments and widening. This debris remains within the legal road corridor and other parts have been incorporated into the road surface itself. A small section of the avalanche protection was placed above ground, immediately adjacent to the eastern tunnel entrance. Works recommenced in January 1951, but stopped over winter due to the risk of avalanche.[25] The tunnel was completed at the end of 1953, and opened to the public in the summer of 1954.[26] In 1997, a further 10m (approx.) of avalanche protection was destroyed.

[11] *New Zealand Herald*, "Forming Tourist Road," 2 June 1934.
[12] *New Zealand Herald*, "Milford Road Tunnel," 3 August 1935 and 14 September 1935; *Stratford Evening Post*, "Big Traffic Tunnel," 15 January 1936.
[13] Public Works Statement (By Hon R Semple, Minister of Public Works), *Appendix to the Journals of the House of Representatives*, 1936 Session I, D-01.
[14] *Otago Daily Times*, "The Homer Tunnel," 7 April 1938.
[15] *Stratford Evening Post*, "Avalanche Brings Death Crashing Down Mountain," 7 July 1936; "Frantic Dash," 8 July 1936.
[16] *Evening Post*, "Eglinton Valley," 2 January 1937.
[17] *New Zealand Herlad*, "Snow Tragedy," 5 May 1937.
[18] *Otago Daily Times*, "Mr Semple and the Homer Tunnel," 26 November 1937.
[19] *Otago Daily Times*, "The Homer Tunnel," 7 April 1938.
[20] *Otago Daily Times*, "News of the Day," 16 April 1941; Public Works Statement (By Hon HT Armstrong, Minister of Public Works), *Appendix to the Journals of the House of Representatives*, 1941 Session I, D-01.
[21] Archives New Zealand.
[22] *Press*, "Work on Homer Tunnel," 27 September 1940.
[23] *Otago Daily Times*, "Slowing Down," 11 April 1940; "Homer Tunnel," 22 September 1945.
[24] DU White, *The Homer Tunnel*, 10 May 1947.
[25] *Otago Daily Times*, "The Homer Tunnel," 16 October 1950; "Completion Decided," 4 September 1950.
[26] Ede, *Mountain Men of Milford*.

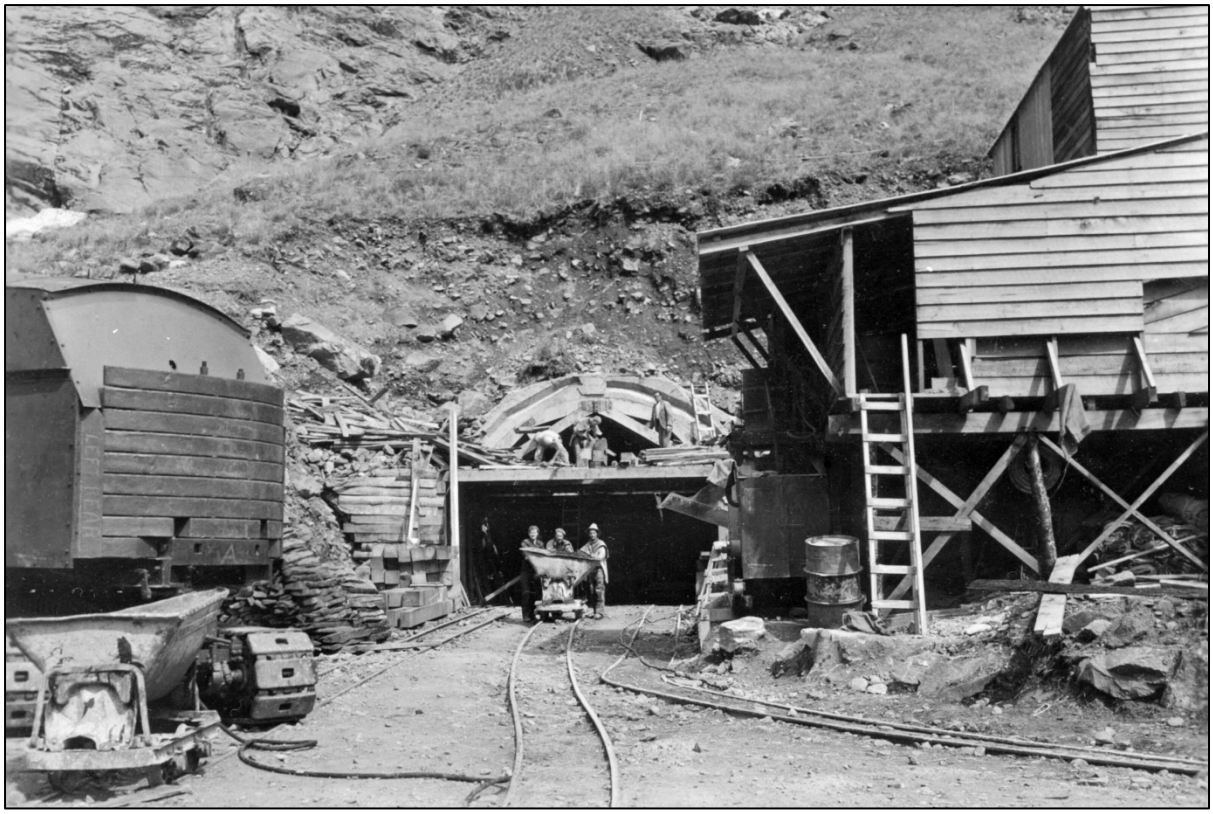

Figure 2. Constructing the eastern tunnel portal in 1936.[27] The original timber drill shed is on the right.

Figure 3. View of collapsed eastern portal avalanche protection, 14 January 1946.[28]

[27] Alexander Turnbull Library.
[28] Archives New Zealand.

Appendix 2 – Proposed Mitigation Methodology for Recording of Heritage Features

Proposal

This proposal is for monitoring and mitigation of the potential historic values impacted by proposed works in the vicinity of Homer Tunnel. The methodology outlined below for mitigation purposes is based on the historic understanding of the site as documented in the draft conservation plan from May 2019 prepared by Origin Consultants Ltd and summarised in this document.

Historic research suggests that the areas highlighted in Figure 4 and Figure 5 have the highest potential for historic material to be discovered. Areas of potential interest using archaeological monitoring techniques have been highlighted on the figures in blue and are believed to be optimised locations to monitor to determine the site stratigraphy and encounter remnant material associated with the construction of the tunnel.

According to the Heritage New Zealand Pouhere Taonga Act 2014, archaeological significance is assigned to features and materials that pre-date 1900. It is unlikely that anything around the Homer Tunnel from that period has survived due to the heavy modification of the site and surrounding area following its construction from 1935. No archaeological investigations have previously been undertaken at the site.

The Conservation Act 1987 under section 6(a) tasks the Department of Conservation (DOC) to manage for conservation purposes historic resource. DOC is committed to the preservation and protection of natural and historic resources. The recording and analysis of this project will be undertaken using modern archaeological techniques and methodologies and any information uncovered will be shared with the DOC. This will involve archaeological monitoring and recording specific parts of the trench for services and operating under an Accidental Discovery Protocol.

Based on the proposed works, Origin Consultants make the following recommendations for mitigation of the provision of new services:

- As a first principle, every practical effort should be made to avoid damage to any archaeological or heritage feature or site encountered during works.
- The areas highlighted in blue for the trenching works should be monitored by an archaeologist to determine if any material related to the construction of the Homer Tunnel has survived.
- Additional works should be undertaken using a standard Accidental Discovery Protocol when the archaeologist is not on site (Waka Kotahi Minimum Standard P45, or equivalent).
- If any archaeological features are uncovered during excavations, these should be recorded using appropriate archaeological standards by an archaeologist.
- The proposed output of the monitoring is an archaeological report (to be lodged with Waka Kotahi and DOC), which will include stratigraphical information from the trenches and test pits which could be used for future interpretation of the site.

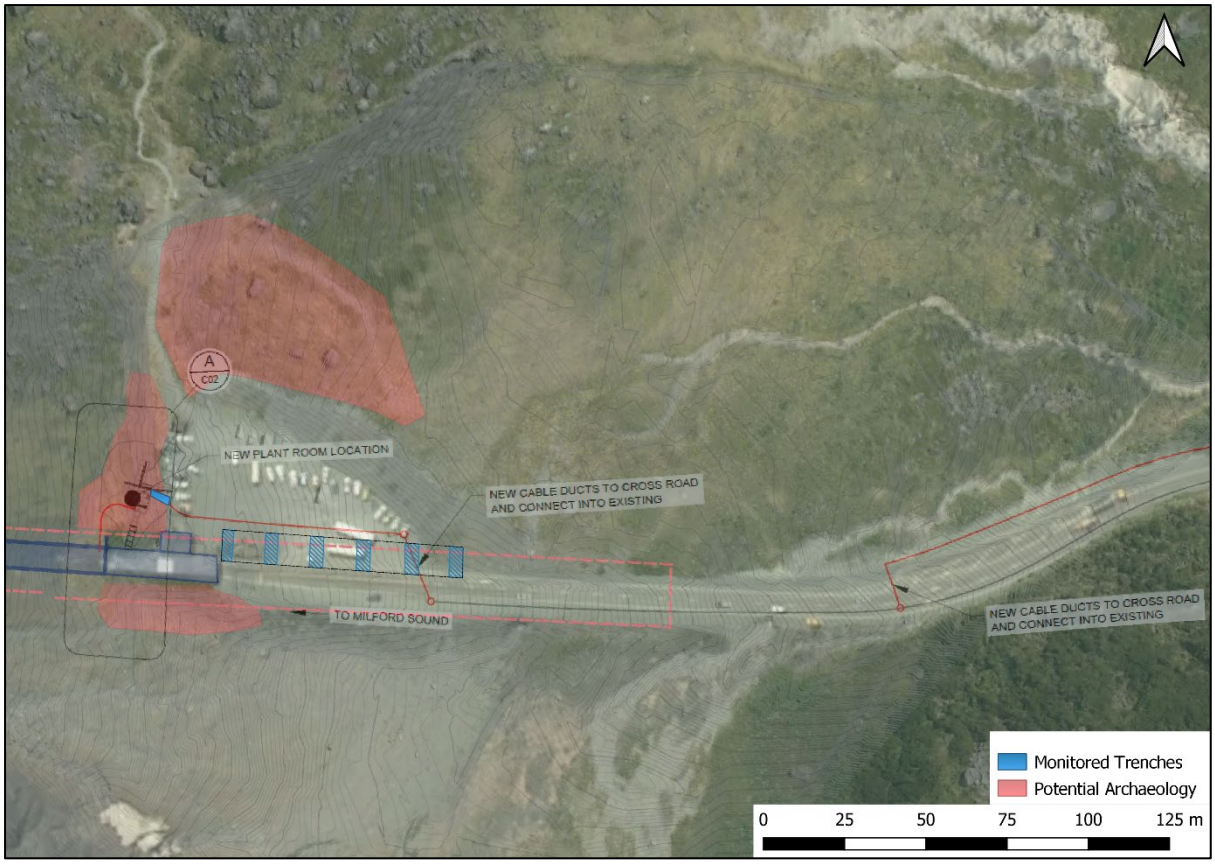

Figure 4. The area with the highest potential of archaeology and the proposed monitored trenches.

Figure 5. The area with the highest potential of archaeology and the proposed monitored trenches.

Appendix G

Accidental Discovery Protocols

Minimum Standard P45 – Accidental Archaeological Discovery Specification

1 Purpose

This specification sets out the standard procedure that the Transport Agency representative and Contractors will follow in the event that an archaeological site, kōiwi/human remains or taonga (Māori artefacts) are accidentally discovered during investigation, construction and/or maintenance of the State Highway network and associated works.

This minimum standard P45 does not apply when an archaeological authority has been issued by Heritage New Zealand Pouhere Taonga (HNZPT). Refer instead to the authority, which will set out the archaeological requirements specific to that area of the project.

P45 replaces the earlier standard Z/22. P45 reflects the minimum requirements of the Transport Agency in accordance with statutory obligations under the Heritage New Zealand Pouhere Taonga Act 2014 and the Protected Objects Act 1975.

The procedures contained in P45 are also designed to recognise and provide for the protection of cultural and historic heritage and the special relationship of Māori in regard to their land, water, sites, wahi tapu and other taonga.

Drivers for the revision include the Heritage New Zealand Pouhere Taonga Act 2014, (which replaced the Historic Places Act 1993) and revised guidelines released by HNZPT for the handling of kōiwi/human remains.

An assessment of effects on archaeological values should be completed during the earliest stages of Transport Agency project planning. Transport Agency has guidelines for such an assessment (*Assessing historic heritage impacts guide for state highway projects*).

The decision to either proceed with an accidental archaeological discovery using specification P45 for earthworks on any project or to apply for an archaeological authority must be informed by a project archaeologist in conjunction with HNZPT.

The specification can be referenced in Resource Management Act approvals as a condition of designation or consent.

To reflect an existing agreement with Te Runanga o Ngai Tahu, where Māori archaeological sites, artifacts or kōiwi are found within the **Canterbury and West Coast** regions, the *Accidental Discovery Protocol (2003)* (Attachment 1) agreed between Te Runanga o Ngai Tahu and Heritage New Zealand applies. P45 will apply to other (non- Māori) sites.

In the **Auckland** region, works must also comply with the Accidental Discovery Rule E12.6 in the Auckland Unitary Plan. This rule has some additional triggers and requirements not included in P45. In particular attention is drawn to the parts of the rule that apply to Protected New Zealand Objects as defined in the Protected Objects Act 1975 (including any fossil or sub-fossil), evidence of contaminated land and lava caves.

2 General procedures following the accidental discovery of possible archaeological sites, kōiwi/human remains or taonga

1. **Immediately** following the discovery of material that could be an archaeological site, kōiwi/human remains and/or taonga, the Contractor will cease all work within a minimum of 20m of any part of the discovery and immediately advise the Transport Agency representative of the discovery.

2. If it is unclear whether the find is an archaeological site, kōiwi/human remains and/or taonga, the Transport Agency representative should consult a qualified archaeologist to confirm its origin.

3. The Transport Agency representative shall notify the following people of the discovery:

   - The New Zealand Police, if any kōiwi/human remains are uncovered
     To be satisfied that the remains are not a missing person or part of a crime scene. This is also a requirement of the Coroners Act 1988.

   - Project Archaeologist
   - If a project archaeologist is not nominated in the contract documents, a qualified archaeologist will be appointed by the Transport Agency representative to ensure all archaeological sites, kōiwi/human remains and taonga are dealt with appropriately and to support liaison with key parties, including clarifying with HNZPT whether an authority is required;

   - The Regional Archaeologist at HNZPT

   - Appropriate iwi group(s) or kaitiaki representative(s)
     In most situations these relationships will have been established during project planning. However, note that statutory acknowledgement areas establish obligations on the Crown to work with iwi under specific Accords. Advice on the appropriate iwi group(s) is available through the relevant Transport Agency statutory planner responsible for consents and approvals.

   - Auckland Council, if the discovery is made in the Auckland region
     This is to ensure compliance with the accidental discovery rule in the Unitary Plan.

4. The Transport Agency representative shall require the Contractor to secure the discovery area, ensuring the area (and any object(s) contained within) remains undisturbed and meets health and safety requirements.

   Note: It is an offence under S87 of the Heritage New Zealand Pouhere Taonga Act 2014 to modify or destroy an archaeological site without an authority from HNZPT irrespective of whether the works are permitted or a consent has been issued under the Resource Management Act 1991.

5. The Transport Agency representative shall ensure that either themselves or the Contractor, as appropriate, are available to meet and guide the Project Archaeologist, New Zealand Police, HNZPT Regional Archaeologist, the appropriate iwi group(s), and (in the Auckland region) the Council to the discovery area. The Contractor and Transport Agency representative will assist with any reasonable requests any of these people may make.
6. The Transport Agency representative shall ensure that no information is released to the media except as authorised by the Transport Agency, in consultation with HNZPT, Police and the appropriate iwi group(s).
7. Further assessment of the site by the Project Archaeologist may be required. If the discovery area contains an archaeological site which cannot be avoided, an application for an archaeological authority must be made to HNZPT in accordance with the Heritage New Zealand Pouhere Taonga Act 2014. All requirements in relation to an archaeological authority will be instructed by the Transport Agency representative as a variation to the contract.
8. The Project Archaeologist and Transport Agency representative shall ensure that any possible archaeological sites, kōiwi/human remains or taonga are protected until as much information as practicable is obtained and a decision is made regarding their appropriate management.
9. When the archaeological authority has been granted, the Transport Agency representative will inform the Contractor when HNZPT have authorised that work in the discovery area can recommence. The Contractor must not recommence work until all statutory and cultural requirements have been met, including the mandatory stand-down period associated with an authority.
10. The Transport Agency representative shall ensure the Contractor undertakes all subsequent works in accordance with the conditions of this authority.
11. In the Auckland region, where it has been determined that no authority is required (for example in the case of kōiwi, or post-1900 archaeological remains), the Transport Agency representative will seek confirmation from the Council that there are no additional statutory requirements under the Unitary Plan.

3 Further procedures in the event that kōiwi/human remains are discovered

1. The discovery of kōiwi/human remains, whether of Māori or non-Māori origin, needs to be handled with respect and sensitivity. Decisions on the next steps should not be unduly rushed.

2. The New Zealand Police are involved in all cases of kōiwi/human remains discovery. Their primary role is to undertake a formal identification of the remains and to determine if they relate to a missing person or if a crime has been committed.

3. HNZPT Regional Archaeologists will (if necessary and where possible) visit a site following the notification of the discovery of kōiwi/human remains. HNZPT staff can assist in formal identification of the remains as human if required, and whether they are associated with an archaeological site and therefore require an archaeological authority before works can proceed. They will also work with the Transport Agency representative, iwi and Police to identify appropriate processes.

4. Iwi, hapu and whānau also play an important role as kaitiaki in the care and management of kōiwi following discovery.

5. As soon as practicable after the Transport Agency representative has given notice to the New Zealand Police through the local police station, the Project Archaeologist, HNZPT regional archaeologist, appropriate iwi group(s), and (in the Auckland region) the Council that kōiwi/human remains have been discovered, the Transport Agency representative shall invite these parties to meet to discuss the next steps.

6. If the remains are of Māori derivation there are a number of sensitive issues to work through including: any cultural ceremonies; the possibility for the remains to stay where they are; if a disinterment license is required from the local Public Health Unit; what protocols will be followed for the removal of the remains if in situ preservation is not possible; the final location of the remains; the level of recording and extent of any further scientific analysis; and who will remove the remains.

7. The Transport Agency representative, in consultation with iwi representatives, shall make the necessary arrangements for any cultural ceremonies as soon as practicable.

8. Once these ceremonies are completed, the Transport Agency representative shall arrange for the Project Archaeologist, in consultation with the New Zealand Police, HNZPT Regional Archaeologist, and the appropriate iwi group(s), to proceed as agreed with potential recording, further analysis, in situ retention or exhumation in a manner to meet professional standards and the New Zealand Archaeological Association code of ethics.

9. If the remains are of non-Māori derivation it will need to be established: whether any descendants can be traced; whether a disinterment license is required from the local Public Health Unit; where remains will be reburied; and what level of recording and scientific analysis should be undertaken.

10. The Project Archaeologist will record details of the kōiwi/human remains, the site of discovery, and any other relevant facts, and these records will be made available to the New Zealand Police, HNZPT, and the appropriate iwi group(s) or other descendants.

11. An archaeological authority may be required from HNZPT before work affecting the site can recommence, particularly if the remains are identified as human and within an archaeological context.

4 Custody of taonga (excluding kōiwi/human remains) or material found at an archaeological site

1. The Project Archaeologist will have initial control of, and responsibility for, all material contained in the discovery area.
2. The Transport Agency representative shall ensure no objects are removed from the site until it has been determined, in consultation between the Project Archaeologist and the appropriate iwi group(s), whether it is associated with an archaeological site and/or the object is taonga (be it taonga tūturu as defined in the Protected Objects Act 1975 or otherwise).
3. If the object is of Māori origin the Project Archaeologist will record the object and its context, and, if it is a taonga tūturu, will also notify the Ministry for Culture and Heritage of the finding as required under the Protected Objects Act 1975.
4. Where statutory acknowledgement areas exist, following Treaty Settlement, the Accords between the Crown and iwi may oblige the Transport Agency to directly notify those iwi of taonga tūturu finds and to transfer these finds for temporary custodianship to these iwi, until ownership is determined. If this situation arises, the Māori Land Court makes the final determination on ownership of all taonga tūturu.
5. If the object is a taonga and less than 50 years old (i.e. not taonga tūturu), the Transport Agency representative shall invite the appropriate iwi group(s) to remove the taonga from the site.
6. If the object is European in origin the Project Archaeologist shall deliver any such object to the Transport Agency representative.

5 Recommencement of Works

1. The Project Archaeologist will have initial control of, and responsibility for, all material contained in the discovery area.

Situation	Recommencement Procedure
Item is identified as taonga tūturu.	Ministry for Culture and Heritage approval required.
An archaeological authority is required.	Works may recommence once the archaeological authority is granted, the 15 working day appeal period has expired and any other pre-start conditions are met. Adherence to site specific protocols with relevant iwi groups. A site blessing should be considered.
Human remains, no archaeological authority required.	Police approval required prior to recommencement. Adherence to site specific protocols with relevant iwi groups. A site blessing should be considered.
No archaeological authority required.	Confirmation from either Heritage New Zealand or project archaeologist and where relevant, local authority that no further consents or approvals are required. Adherence to site specific protocols with relevant iwi groups. A site blessing should be considered.

Appendix A
Protocol in the event of a discovery, or suspected discovery, of a site of cultural importance (Waahi Taonga/Tapu)

1. *Kōiwi tangata accidental discovery*

If Kōiwi tangata (human skeletal remains) are discovered, then work shall stop immediately and the New Zealand Police, Heritage New Zealand (contact details below) and Te Ao Marama Inc (Ngai Tahu (Murihiku) Resource Management Consultants) shall be advised. Contact details for Te Ao Marama Inc are as follows:

Te Ao Marama Inc
Murihiku Marae, 408 Tramway Road, Invercargill
P O Box 7078, South Invercargill 9844
Phone: (03) 931 1242

Te Ao Marama Inc will arrange a site inspection by the appropriate Tangata Whenua and their advisers, including statutory agencies, who will determine how the situation will be appropriately managed in accordance with tikanga māori.

2. *Archaeological Sites*

Archaeological sites are protected under the Heritage New Zealand Pouhere Taonga Act (2014), and approval is required from Heritage New Zealand before archaeological sites can be modified, damaged or destroyed.

Not all archaeological sites are known or recorded precisely. Where an archaeological site is inadvertently disturbed or discovered, further disturbance must cease until approval to continue is obtained from Heritage New Zealand. As stated above, the New Zealand Police also need to be advised if the discovery includes kōiwi tangata /human remains.

Heritage New Zealand Regional archaeologist contact details:
Dr Matthew Schmidt
Regional Archaeologist Otago/Southland
Heritage New Zealand
PO Box 5467
Dunedin
Ph. +64 3 470 2364, mobile 027 240 8715
Fax. +64 3 4773893
mschmidt@heritage.org.nz

3. *Taonga or artefact accidental discovery*

If taonga or artefact material (e.g. pounamu/greenstone artefacts) other than kōiwi tangata is discovered, disturbance of the site shall cease immediately and Southland Museum and Te Ao Marama Inc. shall be notified of the discovery by the finder or site archaeologist in accordance with the Protected Objects Act 1975. All taonga tuturu are important for their cultural, historical and technical value and are the property of the Crown until ownership is resolved.

4. *In-situ (natural state) pounamu/greenstone accidental discovery*

Pursuant to the Ngai Tahu (Pounamu Vesting) Act 1997, all natural state pounamu/greenstone in the Ngai Tahu tribal area is owned by Te Runanga o Ngai Tahu. Ngai Tahu Pounamu Management Plans provide for the following measures:

- any *in-situ* (natural state) pounamu/greenstone accidentally discovered should be reported to Te Runanga o Ngai Tahu staff as soon as is reasonably practicable. Te Runanga o Ngai Tahu staff will in turn contact the appropriate Kaitiaki Papatipu Runanga;

- in the event that the finder considers the pounamu is at immediate risk of loss such as erosion, animal damage to the site or theft, the pounamu/greenstone should be carefully covered over and/or relocated to the nearest safe ground.

The find should then be notified immediately to the Programme Leader – Ohanga, at Te Rūnanga o Ngāi Tahu. The contact details are as follows:

Programme Leader - Ohanga
Te Rūnanga o Ngāi Tahu
Te Whare o Te Wai Pounamu
15 Show Place
P O Box 13-046,
Otautahi/Christchurch 8021
Phone: (03) 366 4344: Fax: (03) 341 6792
Web: www.ngaitahu.iwi.nz