Applicant Information Form 1a
Notified or Non-notified Process

Department of Conservation
Te Papa Atawbai
New Zealand Government

Is this the right application form for me?

This **Applicant Information Form 1a** – Notified or Non-notified Process must be completed for **the following longer term applications** (i.e. not one-off applications):

- Grazing
- Land use: Tenanting and/or using existing DOC facility/structure
- Land use: Use of public conservation land for private commercial facility/structure
- Guiding/Tourism/Recreation: Watercraft activities
- Filming
- Sports events
- Marine reserves application form 11a: Structure in a marine reserve

For other activities use the specific activity application forms that combine applicant and activity information or book a pre-application meeting.

How do I complete this applicant information form?

- Complete all sections of this **applicant information form**.
- In addition, you must complete the **activity application form/s** that you wish to undertake.
- DOC encourages electronic applications (e.g. typed Word document), rather than handwritten applications. Electronic applications are easier to read and less likely to be returned to you for clarification.
- If you need extra space, attach or include extra documents and label them according to the relevant section. Record all attachments in the table at the back of the application information form section **F Attachments**.

How do I submit my application?

Email the following to permissions@doc.govt.nz:

- **Completed applicant information form 1a**
- **Completed activity application form**
- Any other relevant attachments.

If I need help, where do I get more information?

- Check the DOC webpage for the activity you are applying[1] for.

[1] https://www.doc.govt.nz/get-involved/apply-for-permits/apply-for-a-permit/

- Arrange a pre-application meeting (either face to face or over the phone) by contacting the Department of Conservation Office[2] closest to where the activity is proposed. You can use DOC maps[3] to identify which District Office you should contact. Or arrange a meeting with any of our four offices that process concessions[4] – choose the one closest to where the activity is proposed.
- If your application covers multiple districts, contact the office nearest most of the locations you are applying for, or nearest to locations you have a specific question about.

What happens next?

Once your application forms are received, your application will be assessed by DOC. If your application is complete, DOC will begin processing.

If your application is incomplete it will be returned to you for more information.

Why does DOC ask for this information?

The questions in this application information form and the activity application form/s are designed to cover the requirements set out in conservation legislation. Your answers allow us to assess:

- Your most up-to-date details so that DOC can contact you about your application.
- Your qualifications, resources, skills and experience to adequately conduct the activity on public conservation land.
- Your creditworthiness will help determine whether DOC should extend credit to you and set up a DOC customer accounts receivable credit account for cost recovery. To make this assessment DOC will supply your information to a credit checking agency.

Note:

- Personal information will be managed by DOC confidentially. For further information check DOC's privacy and security statements[5].
- Information collected by DOC will be supplied to a debt collection agency in the event of non-payment of payable fees.

What fees will I pay?

You may be required to pay a **processing fee** for this application regardless of whether your application is granted or not. You may request an estimate of the processing fees for your application. If you request an estimate, DOC may require you to pay the reasonable costs of the estimate prior to it being prepared. DOC will not process your application until the estimate has been provided to you. In addition, if you are granted a guiding concession on public conservation land you may be required to pay annual **activity and management fees**. These fees are listed on the DOC webpage for the activity you are applying[6] for.

DOC will invoice your processing fees after your application has been considered. If your application is large or complex, DOC may undertake billing at intervals periodically during processing until a decision is made. If you withdraw your application DOC will invoice you for the costs incurred up to the point of your withdrawal.

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[2] www.doc.govt.nz/footer-links/contact-us/office-by-name/
[3] http://maps.doc.govt.nz/mapviewer/index.html?viewer=docmaps
[4] https://www.doc.govt.nz/get-involved/apply-for-permits/contacts
[5] https://www.doc.govt.nz/footer-links/privacy-and-security/
[6] https://www.doc.govt.nz/get-involved/apply-for-permits/apply-for-a-permit/

Your application will set up a credit account with DOC. See the checklist at the end of the form for the terms and conditions you need to accept for a DOC credit account.

Will my application be publicly notified?

Your application will be publicly notified if:

- It is a license with a term of more than 10 years.
- It is a lease.
- After having regard to the effects of the activity, DOC considers it appropriate to do so.

Public notification will increase the time and cost of processing of your application.

What does DOC require if my application is approved?

If your application is approved DOC requires:

- **Insurance** to indemnify the Minister of Conservation against any claims or liabilities arising from your actions. The level of insurance cover will depend on the activity.
- A copy of your **safety plan** audited by an external expert (e.g. Health and Safety in Employment (Adventure Activity) Regulations 2011 audit or a DOC listed organisation). See the Safety Plan[7] information on the DOC website for further information.

Note: DOC/Minister can vary the concession if the information on which the concession was granted contained material inaccuracies. DOC may also recover any costs incurred.

[7] https://www.doc.govt.nz/get-involved/apply-for-permits/managing-your-concession/safety-plans/

A. Applicant details

Legal status of applicant (tick)	☐ **Individual** (Go to ❶)	
	☐ **Registered company** (Go to ❷)	☒ **Trust** (Go to ❷)
	☐ **Incorporated society** (Go to ❷)	☐ **Other e.g. Educational institutes** (Go to ❷)

❶	**Applicant name (individual)**			
	Phone		**Mobile phone**	
	Email			
	Physical address		**Postcode**	
	Postal address (if different from above)		**Postcode**	

❷	**Applicant name (full name of registered company, trust, incorporated society or other)**	Te Araroa Trust		
	Trading name (if different from applicant name)			
	NZBN if applicable (to apply go to: https://www.nzbn.govt.nz)	9429042834939	**Company, trust or incorporated society registration number**	Charity Registration No: CC37358
	Registered office of company or incorporated society (if applicable)			
	Company phone	04 815 8519	**Company website**	https://www.teararoa.org.nz/
	Contact person and role	Sec 9(2)(a)		
	Phone	Sec 9(2)(a)	**Mobile phone**	Sec 9(2)(a)
	Email	Sec 9(2)(a)		
	Postal address	Te Araroa Trust, L12, 100 Wilis St Wellington	**Postcode**	

	Street address (if different from postal address)		**Postcode**	

B. Pre-application meeting

Have you had a pre-application meeting or spoken to someone in DOC?

No	☐
Yes	☒

- If yes record the:

Date of DOC pre-application meeting	May 24th, 2024 3pm
Name of DOC staff member	Darcy Liddell, Katy Newton
Name of person who had the pre-application meeting with DOC	Sec 9(2)(a), Te Araroa Trust Sec 9(2)(a), Southern Skies Planning

C. Activity applied for

Tick the **activity application form** applicable to the activity you wish to undertake on public conservation land. Complete the applicant information form and the activity application form and email them with any attachments to permissions@doc.govt.nz

ACTIVITY APPLICATION FORM*	FORM NO.	TICK
Grazing	2a	☐
Land use: Tenanting and/or using existing DOC facility/structure	3a	☐
Land use: Use of public conservation land for private/commercial facility/structure	3b	☒
Guiding/Tourism/Recreation: Watercraft activities	4b	☐
Filming	5a	☐
Sporting Events	6a	☐
Marine reserves application form: Structure in a marine reserve	11a	☐
Other activities (not covered in the above forms or in the new activity application forms that combine applicant and activity information)	7a	☐

Note: If the activity is not in this list check the activity on the DOC website to find the correct application form or book a pre-application meeting. Application forms that combine applicant and activity information on the DOC website include:

- Aircraft activities[8]
- Easements[9]

[8] https://www.doc.govt.nz/get-involved/apply-for-permits/business-or-activity/aircraft-activities/
[9] https://www.doc.govt.nz/get-involved/apply-for-permits/business-or-activity/access-easements/

- Land based guiding[10]

[10] https://www.doc.govt.nz/get-involved/apply-for-permits/business-or-activity/land-based-guided-activities/

D. Are you applying for anything else?

Are you submitting any other application forms in relation to this application?

No	☒
Yes	☐

- If yes, state which application forms:

E. Background experience of applicant

Provide relevant information relating to your ability to carry out the proposed activity (e.g. details of previous concessions, membership of professional organisations, and relevant qualifications).

Te Araroa Trust operates, maintains and manages the Te Araroa trail, a continuous walking link between Cape Reinga and Bluff. We are experienced in constructing and maintain assets across that are vital for the Trail.

Our Trustee Henry Marchant (PMP, BE (1st Class Hons) – Civil) is a professional Senior Project Manager for construction projects and will oversee and manage the construction project alongside our Engineering team from Frame Group.

F. Attachments

Attachments should *only* be used if there is:

- Not enough space on the form to finish your answer
- You have additional information that supports your answer
- You wish to make an additional request of DOC regarding the application.

Label each document clearly and complete the table below.

Section of the application form the attachment relates to	Document title	Document format (e.g. Word, PDF, Excel, jpg etc.)	Description of attachment
All	Whangaehu Swing Bridge Easement Concession AEE		Assessment of Environmental Effects by Southern Skies Planning
All	Appendix A – Design Drawings	PDF	Engineering Drawings by Frame Group
All	Appendix B – Technical Specification	PDF	Engineering Specification by Frame Group
All	Appendix C – Ecological Assessment	PDF	Assessment of the Ecological impact of walkers and the Bridge project by Sec 9(2)(a)
All	Appendix D – Archaeological Assessment	PDF	Hertiage/Archaeological Assessment by InSite Archaeology
All	Appendix E – Record of Title	PDF	Record of Titles for both sides of the Bridge location

G. Checklist

Application checklist	Tick
I have completed all sections of this applicant information form relevant to my application and understand that the form will be returned to me if it is incomplete.	☒
I certify that the information provided in this applicant information form, and any attached additional forms is, to the best of my knowledge, true and correct.	☒
I have completed the **activity application form**.	☒
I have appropriately labelled all attachments and completed section **F Attachments**.	☒

I will email **permissions@doc.govt.nz** my: • Completed applicant information form • Completed activity application form/s • Any other attachments.	☒

H. Terms and conditions for a credit account with the Department of Conservation

Have you held an account with the Department of Conservation before?	**Tick**
No	☒
Yes	☐
If 'yes' under what name	
Does your organisation require a purchase order number for invoicing purposes?	☐
If yes, please provide the number here:	
All invoices related to this Permission will be coded to this purchase order number unless otherwise advised. It is the applicant's responsibility to advise the Department if the purchase order needs to change through the lifetime of the Permission.	

In ticking this checklist and placing your name below you are acknowledging that you have read and agreed to the terms and conditions for an account with the Department of Conservation

Terms and conditions	**Tick**
I/We agree that the Department of Conservation can provide my/our details to the Department's Credit Checking Agency to enable it to conduct a full credit check.	☒
I/We agree that any change which affects the trading address, legal entity, structure of management or control of the applicant's company (as detailed in this application) will be notified in writing to the Department of Conservation within 7 days of that change becoming effective.	☒
I/We agree to notify the Department of Conservation of any disputed charges within 14 days of the date of the invoice.	☒
I/We agree to fully pay the Department of Conservation for any invoice received on or before the due date.	☒
I/We agree to pay all costs incurred (including interest, legal costs and debt recovery fees) to recover any money owing on this account.	☒
I/We agree that the credit account provided by the Department of Conservation may be withdrawn by the Department of Conservation, if any terms and conditions (as above) of the credit account are not met.	☒
I/We agree that the Department of Conservation can provide my details to the Department's Debt Collection Agency in the event of non-payment of payable fees.	☒

Typed applicant name/s	Sec 9(2)(a) , Te Araroa Trust	**Date**	25/10/2024

For Departmental use			
Credit check completed			
Comments:			
Signed		**Name**	
Approved (Tier 4 manager or above)		**Name**	

Concession Application
Form 3b – Private/commercial facility/structures

The Department recommends that you contact the Department of Conservation Office closest to where the activity is proposed to discuss the application prior to completing the application forms. Please provide all information requested in as much detail as possible. Applicants will be advised if further information is required before this application can be processed by the Department.

This form is to be used when the proposed activity is the building or use of any private or commercial facility or structure on public conservation land managed by the Department of Conservation. Examples may include lease of land to erect an information centre; authorisation to erect a weather station; or construct or lease a private/commercial campground or lodge. This form is to be completed in conjunction with either Applicant Information Form 1a (longer term concession) or Applicant Information Form 1b (one-off concession) as appropriate.

Please complete this application form, attach Form 1a or Form 1b, and any other applicable forms and information and send to permissions@doc.govt.nz. The Department will process the application and issue a concession if it is satisfied that the application meets all the requirements for granting a concession under the Conservation Act 1987.

If you require extra space for answering please attach and label according to the relevant section.

A. Description of Activity

Please describe the proposed activity in detail – where the site is located, please use NZTM GPS coordinates where possible, what you intend to use the building for, whether you intend to make any changes to the infrastructure.

Please include the name and status of the public conservation land, the size of the area for which you are applying and why this area has been chosen.

If necessary, attach further information including a map, a detailed site plan and drawings of proposal and label Attachment 3b:A.

Te Araroa Trust seeks a concession for the construction and use of a swing bridge across the Whangaehu River from the Whitiau Scientific Reserve (the reserve) and provide a river crossing link in the Te Araroa Trail. The Structure will be fully accessible on foot to members of the public.

Please refer to the attached Assessment of Effects and appended design drawings for details on exact location and size.

The bridge will be a 120m long x 0.75m wide swing footbridge suspended from towers adjacent to each river bank. The towers will comprise timber frames bolted to a concrete cap, and timber piles driven to a depth of 6m. The towers will be braced to outrigger timber piles and the main cables will be slung over and anchored with in-situ reinforced concrete anchored blocks. Catenary wind bracing cables will be fixed to the bridge deck and braced back to timber anchor piles. The main span will be accessed via 11.5m long x 0.75m wide timber staircases. Each staircase will have two landings incorporated and Type 'B' high barriers on either side.

B. Alternative sites considered

If your application is to **build, extend or add** to any permanent or temporary structures or facilities on public conservation land, please provide the following details:

- Could this structure or facility be reasonably located outside public conservation land? Provide details of other sites/areas considered.
- Could any potential adverse effects be significantly less (and/or different) in another conservation area or another part of the conservation area to which the application relates? Give details/reasons

This structure cannot be located outside of Public Conservation land as it would involve walkers either continuing to walk on dangerous roads or crossing private land. The area for the bridge in Whitiau Scientific Reserve has been chosen in discussion with the DOC Whanganui team to minimise adverse effects.

C. Larger area

Is the size of the area you are applying for **larger** than the structure/facility **NO**

If **yes**, please detail the size difference in the box below, and answer the following 3 questions, if **no** please go on to the next section:

Is this necessary for safety or security purposes? **N/A**

Is this necessary as an integral part of the activity? **N/A**

Is this essential to carrying on the activity? **N/A**

If the answer to any of the above is yes, please provide details and attach supporting evidence if necessary and label Attachment 3b:C.

D. Exclusive possession

Do you believe you need **exclusive possession** of the public conservation land on which your structure/building is located, ie no one else can use the land during your use of it? **NO**
(Exclusive occupation requires a lease which requires public notification of the application)

If **yes**, please answer the following 3 questions, if no please go to the next section:

Is exclusive possession necessary to protect public safety? **N/A**

Is exclusive possession necessary to protect physical security of the activity? **N/A**

Is exclusive possession necessary for the competent operation of the activity? **N/A**

If the answer to any of the above is yes, please provide details and attach supporting evidence if necessary and label Attachment 3b:D.

E. Technical Specifications **(for telecommunications sites only)**

Frequencies on which the equipment is to operate

Power to be used (transmitter output)

Polarisation of the signal

Type of antennae

The likely portion of a 24 hour period that transmitting will occur

Heaviest period of use

F. Term

Please detail the length of the term sought (i.e. number of years or months) and why.

Note: An application for a concession for a period over 10 years must be publicly notified, an application for a concession up to 10 years will not be publicly notified unless the adverse effects of the activity are such that it is required, or if an exclusive interest in the land is required.

50 years to match the design life of the bridge.

G. Bulk fuel storage

Under the Hazardous Substances and New Organisms Act 1996 (HSNO Act) 'Bulk fuel storage' is considered to be any single container, stationary or mobile, used or unused, that has a capacity in excess of 250 litres of Class 3 fuel types. This includes petrol, diesel, aviation gasoline, kerosene and Jet A1. For more information on Hazardous Substances, go to: http:/www.business.govt.nz/worksafe/information-guidance/legal-framework/hsno-act-1996

Do you intend to store fuel in bulk on the land as part of the activity? **NO**

If you have answered yes, then please provide full details of how and where you intend to store the fuel, and label any attachments including plans, maps and/or photographs as Attachment 3b:G. If your concession application is approved you will be required to provide a copy of your HSNO compliance certification to the Department before you begin the activity.

H. Environmental Impact Assessment

This section is one of the most important factors that will determine the Department's decision on the application. Please answer in detail.

In column 1 please list all the locations of your proposal, please use NZTM GPS coordinates where possible. In column 2 list any special features of the environment or the recreation values of that area. Then in column 3 list any effects (positive or adverse) that your activity may have on the values or features in column 2. In column 4 list the ways you intend to mitigate, remedy or avoid any adverse effects noted in column 3. Please add extra information or supporting evidence as necessary and label Attachment 3b:H.

Refer to Steps 1 and 2 in your Guide to Environmental Impact Assessment to help you fill in this section.

Location on public conservation land	Special feature or value	Potential effects of your activity on the feature or value (positive or adverse)	Methods to remedy, mitigate or avoid any adverse effects identified
Please see attached Assessment of Environmental Effects and associated appendices.			

I. Other

Is there any further information you wish to supply in support of your application? Please attach if necessary and label Attachment 3a:I.

Consultation on the project with Mana Whenua has been ongoing by Te Araroa Trust. This has included meetings, emails and phone calls with Sec 9(2)(a) , Te Rūnanga o Ngā Wairiki – Ngāti Apa and Sec 9(2)(a) , Māori Trust Rakautaua No 9.

Safety is a major driver for this project, We would appreciate as much speed as possible from DOC to review this Concession application because as the Bridge is finished we will significantly reduce the risk to walkers from road walking (especially on State Highway 3).

SOUTHERNSKIES ENVIRONMENTAL

APPLICATION FOR EASEMENT CONSESSION

ASSESSMENT OF EFFECTS

TE ARAROA TRAIL AND SWING BRIDGE WHANGAEHU RIVER

WHANGAEHU

October 2024

Prepared by: Sec 9(2)(a)
SouthernSkies Environmental

Reviewed by: Sec 9(2)(a)
Te Araroa Trust

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www.southernskies.co.nz
Date: 10/10/2024
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Status: Final

TABLE OF CONTENTS

1. INTRODUCTION

Te Araroa Trust (the applicant) seeks an easement concession for walking access across the Whitiau Scientific Reserve (the reserve) and the construction and use of a swing bridge across the Whangaehu River to provide a river crossing link in the Te Araroa Trail.

A separate resource consent application for the construction and use of the bridge has been lodged with Horizons Regional Council.

This report provides a description and assessment of effects of the activities for which the concession is sought.

2. LOCATION AND SITE DESCRIPTION

2.1 Address and Legal Description

Address:	NA
Approximate map reference:	NZTM 1780110, 5567050
Legal description:	North side parcels are covered by gazette notices. SEC 2 SO 421260 SEC A B SO 34170 SEC A SO 34171 SEC 547 SO 34291 SEC 516 SO 27717 BLKS IX X XIII IKITARA SD -TNA - SUBJ TO NATURAL GAS PIPELINE EASEMENT ON DP 61898 - SEC 516 WHITIAU SCENIC RES -SEC 547 WHITIAU SCIENTIFIC RES

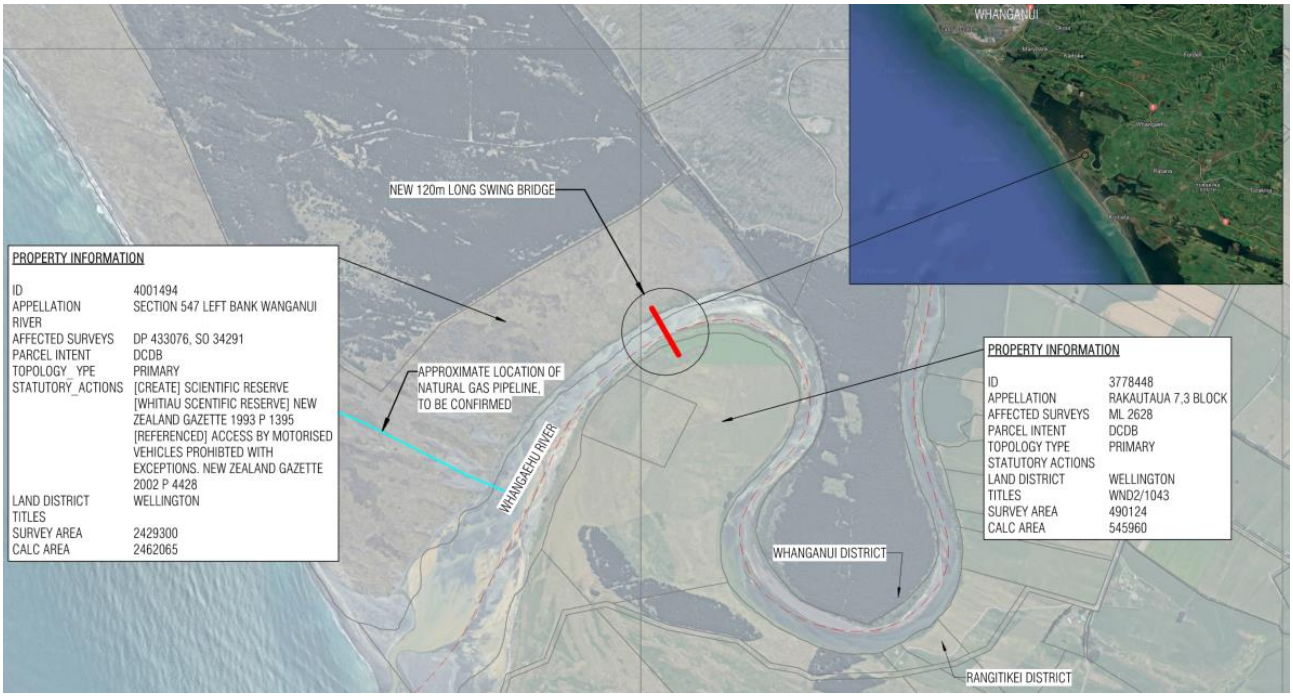

Figure 1: Land parcel information at the proposed new swing bridge location. Note: bridge spans between the Whanganui and Rangitikei Districts.

3. BACKGROUND

The Whangaehu River currently imposes a barrier to the Te Araroa Trail such that walkers must travel south from Whanganui via State Highway 3 (SH3) and the SH3 bridge at Whangaehu, approximately 12km south-east of Whanganui. To avoid the experiential effect and hazard of walking along the state highway, the Te Araroa Trust proposes to realign the trail along the beach from Landguard Road near Whanganui airport to the Whangaehu River mouth and then via existing 4WD/foot track up the northern side of the river to a new footbridge. Beyond the bridge the trail will link via farm land across and an unformed legal road to access the beach south of the river.

Walkers can continue south along the beach and ford the Turakina River. At a future date it is proposed to provide a similar footbridge over the Turakina River.

4. SITE DESCRIPTION

4.1 General Site Description

The proposed bridge location is approximately 1.6km upstream of the coastal outlet of the Whangaehu River and approximately 400m upstream of the river mouth, which is mapped at NZMS 260 S23: 896-283 (NZTM 1779571 5566595).

The north side (true-right) of the proposed bridge location is located within the Whitiau Scientific Reserve (the reserve), managed by the Department of Conservation (DoC) and protected in perpetuity under Section 21 of the Reserves Act 1977. Walking access to the bridge site will be via existing 4WD tracks form the beach. Construction access will be via existing 4WD track from the adjacent commercial pine forest and Pauri Road.

The characteristics and values if the Whitiau Scientific Reserve are described in the attached *Assessment of Environmental Effects for the Whangaehu River Bridge, Te Araroa Trail*; prepared by Singers Ecological (Ecological Assessment) provided in **Appendix A**.

This area has been identified as a scientific reserve for its intact sequence of vegetated dunes and damp dune hollows that extend approximately 1km inland from the shore. There are various species of native plants that have been identified within the reserve, including several threatened plant species and one critically endangered species. Fauna known to be present within the reserve includes North Island fern bird, New Zealand pipit, swamp harrier, katipō spider, and northern grass skink. Other lizards are noted as possibly present. The reserve has a statutory limitation of 'access by motorised vehicles prohibited'. Permission to override this for the construction period comprises part of the concession sought.

The north side area of proposed disturbance associated with installing the bridge support tower, tie back anchors and staircase adjacent to the true right bank is dominated (>80% cover) by two grasses, cock's foot and fescue (Lolium arundinaceum). Most other common species are also exotic, being herbaceous dicots and grasses. The proposed bridge abutment locations are not located within, or within a 10m setback from any natural wetlands. Two natural wetlands are present within 100m of the proposed bridge location. This includes a narrow strip of riverine marsh associated with the rise and fall of the Whangaehu River.

The south (true-left) side of the proposed bridge location comprises flat pasture as part of a working dairy grazing property. It is accessed across paddocks from the end of Whangaehu Beach Road. Works and access on that side are not addresses in this application.

The *Archaeological Assessment of Proposed Pedestrian Swing Bridge Across the Whangaehu River, Te Araroa Trail*; prepared by inSite Archaeology Limited, September 2024 (Archaeological Assessment)

provided in **Appendix B**, describes the archaeological environment of either side of the river. It is noted that there is a very high density of identified sites within the paddock on the south side, with only a few sites to the north side. The Archaeological Assessment does not identify any archaeological material within the footprint of the proposed bridge end structures where land disturbance will occur.

No works are proposed within the Whangaehu River or within a 10m setback from the river and therefore no native fish and other aquatic species will be impacted by the proposal.

4.2 Statutory Planning Environment

4.2.1 Conservation Estate

As noted above, the Whitiau Scientific Reserve is established and protected in perpetuity under Section 21 of the Reserves Act 1977.

It incorporates the Whangaehu River Marginal Strip conservation unit (No. 70624 Map Ref S22) and is managed under the Conservation Management Strategy: Wanganui Conservancy 1997-2007 (CMS). It falls within the Foxton Ecological District Boundary (Section 7 of the CMS) and the Manawatu Plains Ecological District Boundary (Section 8 of the CMS).

As stated in Section 1.2.1 of the Ecological Assessment, scientific reserves are classified to protect and preserve (an area) in perpetuity (Section 21). The relevant legislation is included below.

(1) …reserves classified as scientific reserves, purpose of protecting and preserving in perpetuity for scientific study, research, education, and the benefit of the country, ecological associations, plant or animal communities, types of soil, geomorphological phenomena, and like matters of special interest.

(2) Every scientific reserve shall be so administered and maintained under the appropriate provisions of this Act that—

(a) except where the Minister otherwise determines, the indigenous flora and fauna shall as far as possible be preserved.

(c) where scenic, historic, archaeological, biological, or natural features are present on the reserve, those features shall be managed and protected to the extent compatible with the principal or primary purpose of the reserve: provided that nothing in this paragraph shall authorise the doing of anything with respect to fauna that would contravene any provision of the Wildlife Act 1953.

Relevant sections of the CMS include:

Section 2.3 Coastal Environment

(b) Estuaries

Estuaries are a coastal feature from Patea southwards and from Waitara northwards. Both the Whanganui and Manawatu Estuaries are heavily used by a range of aquatic species and birds. The estuaries in the Conservancy were once an important source of kai for the Maori people but pollution has severely reduced estuarine food resources. Threats to the estuaries in the Conservancy include point source discharges both into the estuary itself and watercourses flowing into the estuary. Pollution in rivers from diffuse sources such as urban and farm runoff is also significant.

(c) Dunes and sea-cliffs

Dunes, estuarine edges and cliffs are the main habitats for terrestrial plants and animals of the coast. The Manawatu-Wanganui coast still has dunes which are dominated by the native sand-binders, spinifex and pingao, with hardy shrubs like sand coprosma. Damp dune hollows retain tall harakeke (New Zealand flax), toetoe, shrubs and ti kouka (cabbage trees), and further inland are dune swamps and lakes. Some dune hollows have temporary wetlands, (ephemeral) the habitat of some nationally rare plants. Small areas of dunes occur along the Taranaki coast as well, but cliffs predominate. Hardy plants, with fleshy, grey, or shiny leaves are typical of the cliffs, species such as native spurge, Hebe elliptica and, at their natural southern limits in North Taranaki, karo, pohutukawa and houpara. Although small in area, mats of tiny native plants on certain cliff-tops contain a range of unusual and rare native herbs. Fernbirds and gold-striped gecko are uncommon animals, and a number of insects are endemic, or are in few other places. Many of the Conservancy's threatened species are dependent upon such habitats, and have already been lost from areas where the habitat has changed. Except for steep sites, many of these areas have been subjected to heavy damage from livestock, recreational users, commercial uses, urban developments, roading, weeds and other modifiers. Before human intervention, forest grew close to the entire coast, apart from the young dunes. Only a few fragments of these forests remain.

Section 7 Foxton Ecological District

7.2 Vison

The active sand dune country and adjoining marine environment is valued by all users for its distinctive natural landforms (sand-derived drylands and wetlands), native plant and animal communities, landscapes, historic resources and remote-experience opportunities. Representative areas of land and marine environment are formally protected. Threats to remaining natural areas in the sand country have been removed or managed in such a way that natural character has increased. The area of natural dune lands has increased as some coastal lands are retired from farming and other land uses.

Section 8 Manawatu Plains Ecological District

8.2 Vison

The significance of the remaining small remnant indigenous forests and wetlands to the health and character of the landscape is accepted by residents and visitors. All significant remnants are formally protected and threats from weeds, possums and grazing are under control. Riparian areas are managed to retain or restore natural cover and help reduce pollution to rivers and streams. Areas of indigenous forest and wetland are created to replace some areas lost in the past.

4.2.2 National Policy Statements

National Policy Statement for Indigenous Biodiversity

The National Policy Statement for Indigenous Biodiversity (NPS:IB) came into effect in July 2023 and is engaged by this proposal. Whitiau Scientific Reserve qualifies as a significant natural area for its very high representativeness, diversity and pattern, rarity and distinctiveness and ecological context. For this reason, the NPS:IB is engaged.

Objective 1 states:

(1) The objective of this National Policy Statement is:

(a) to maintain indigenous biodiversity across Aotearoa New Zealand so that there is at least no overall loss in indigenous biodiversity after the commencement date; and

(b) to achieve this:

(i) through recognising the mana of tangata whenua as kaitiaki of indigenous biodiversity; and

(ii) by recognising people and communities, including landowners, as stewards of indigenous biodiversity; and

(i) by protecting and restoring indigenous biodiversity as necessary to achieve the overall maintenance of indigenous biodiversity; and

(ii) while providing for the social, economic, and cultural wellbeing of people and communities now and in the future.

The objective is reflected in 17 policies, of which (1), (2), (3), (7), (10), (13), (14), and (15) are of most relevance.

National Policy Statement for Freshwater 2020 (NPSFM) and National Environmental Standards for Freshwater 2020 (NES-F)

The NES-F provides a policy frameworks for the management of activities that can impact on freshwater. The proposal is not located within close proximity to any natural inland wetland. While it is downstream of the mapped extent of the coastal marine area (CMA) it is upstream of the mapped river mouth. Consequently, the NES-F does apply.

Objective 2.1(1) states:

(1) The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises:

(a) first, the health and well-being of water bodies and freshwater ecosystems

(b) second, the health needs of people (such as drinking water)

(c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The objective is reflected in 15 policies, of which (1), (2), (3), (5), (6) and (9) are of most relevance.

4.2.3 New Zealand Coastal Policy Statement 2010

As the site is within the coastal environment, the New Zealand Coastal Policy Statement (NZCPS) is engaged. The purpose of the NZCPS is to state policies in order to achieve the purpose of the Act in relation to the coastal environment of New Zealand.

Policy 1 recognises that the coastal environment extends beyond the CMA and incorporates a range of values associated with the broader environment. In this case, Policy 11 (indigenous biodiversity), Policy 13 (preservation of natural character), Policy 15 (natural features and natural landscapes), Policy 18 (public open space), and Policy 25 (subdivision, use, and development in areas of coastal hazard risk), are relevant; as is Policy 2 (the Treaty of Waitangi, tangata whenua and Māori heritage).

4.2.4 Regional Plan

As shown in Figure 2 below, the One Plan maps the mouth of the Whangaehu River approximately 1.2km upstream of the point that the river discharges to the coast and maps the CMA boundary a further approximately 400m further upstream. The proposed bridge location lies between these two points, such that the bridge will cross the CMA.

This reach of the river is also mapped in the One Plan as an Estuary Water Management sub-area.

As shown on Figure 2, the bridge location will cross the Whangaehu River Protection Zone, which reflects the following Schedule 9 values.

Rule CMA-STR-R7 – Structures for public access as a Restricted Discretionary Activity. Except as otherwise regulated by CMA-STRR8, the erection, reconstruction, placement, alteration or extension of any public walkway or foot accessway structure pursuant to s12(1) RMA, and, as an ancillary activity, any:

1. occupation of space in the CMA pursuant to s12(2) RMA.
2. disturbance of the foreshore or seabed pursuant to s12(1) RMA.
3. deposition of natural marine substances on the foreshore^ or seabed pursuant to s12(1) RMA.
4. discharge* of water* or contaminants* into the CMA pursuant to s15(1) RMA.
5. damming or diversion of water* in the CMA pursuant to s14(1) or s14(2) RMA.

The proposed swing bridge will occupy space above the CMA as the bridge is downstream of the Cross-river CMA boundary. No disturbance to the foreshore or seabed is proposed.

As an activity triggering a rule applying to the CMA, Objectives CE-CMA-O1 and CE-CMA-O2, and Policies CE-CMA-P4 (appropriate use and development) and CE-CMA-P5 (public access) are most relevant.

Figure 2: Location of river mouth and CMA (Source: Figure 31 of the One Plan)

Figure 3: Whangaehu River Protection Zone (Source: Figure 30 of the One Plan)

4.2.5 District Plans

The north side of the river (true right bank) is zoned Open Space in the Whanganui District Plan. It is also subject to a Flood Risk Area B overlay (100 year to 200 year flood extent).

The south side of the river (true left bank) is zoned as Rural under the Rangitikei District Plan and is not subject to overlays.

The proposal does not trigger any reason for consent under the district plans.

5. DESRIPTION OF PROPOSAL

Te Araroa Trust proposes to install a footbridge across the Whangaehu River, to facilitate walking access along the coast between Whanganui and areas south of the Whanau River mouth. This will require walkers to access the bridge via an existing 4WD track within Whitiau Scientific Reserve, and then via a paddock and walking track to the beach on the south side. Details are provided in the Ecological Assessment.

The bridge details are shown in the Design Drawings (**Appendix C**) and described in the Technical Specification (**Appendix D**). The bridge will be a 120m long x 0.75m wide swing footbridge suspended from towers adjacent to each river bank. The towers will comprise timber frames bolted to a concrete cap, and timber piles driven to a depth of 6m. The towers will be braced to outrigger timber piles and the main cables will be slung over and anchored with in-situ reinforced concrete anchored blocks. Catenary wind bracing cables will be fixed to the bridge deck and braced back to timber anchor piles. The main span will be accessed via 11.5m long x 0.75m wide timber staircases. Each staircase will have two landings incorporated and Type ‘B’ high barriers on either side.

The structure has been designed such that the lowest point of the bridge deck will have 1.2m minimum freeboard above the 200 year recurrence interval / 0.5% annual exceedance probability (AEP) flood level.

The installation will require approximately 64m^3 of earthworks over 40m^2 for each of the abutments (total 128m^3 of earthworks over 40m^2). Minor smoothing of the existing access track may also occur although this will be avoided if possible or otherwise kept to a minimum.

Excavated topsoil and material will be cut to waste and disposed of in an appropriate location that does not impact on the river or ecological values of the reserve.

No disturbance to the river banks or river bed is proposed or required.

The only vegetation removal required will be grasses at the bridge tower and backspan anchor block sites.

Best practice erosion and sediment control (ESC) measures will be implemented in accordance with Auckland Council Guideline Document 2016/005 *Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region* (GD05). Because the land disturbed will be very minor and comprise sandy silt soils, best practice will likely comprise temporary covering exposed excavation areas, progressive stabilisation as the structures are built, and mulching the disposal surplus soil using grass cleared from the works footprint. Silt socks can also be available if required although there will be a very low risk of any material adverse effect from sediment discharges from the works site.

The Te Araroa Trail that is proposed to use these bridges will also not require any additional land disturbance as the trail will utilise existing tracks for walkers.

Construction access from the north will utilise the existing formed vehicle tracks for trucks and a medium size excavator (circa 12T). Vehicles will include a concrete truck that will be driven into the site as far as possible without disturbing areas outside of the existing vehicle track alignment.

An existing aggregate parking area will be used as the site compound and laydown.

The excavator will be used to clear vegetation required within the immediate works area such as for the bridge staircase, foundations and anchor footings. All indigenous vegetation will be excavated, will be stockpiled on the alluvial terrace near the harakeke flax land. This will be later used for remediation of any areas of bare soil.

Pile holes for the stair cases, out riggers, and wind cable bracing towers will be drilled using an augur head on the excavator. To prevent soil slumping of potentially wet silty materials, the foundation pile holes will be encased in a steel or plastic cylinder to the required depth. Excess water will be pumped from these holes into a vegetated depression where it can drain to the sand soil horizons. The main tower timber pile foundations are will be driven using a digger-mounted drop hammer and will therefore require no excavations.

Works on the southern side will be similar but simpler, as access for the same vehicles and machinery will be across the paddock from the end of Whangaehu Beach Road and the works area will be within grazed pasture.

6. TERM OF CONCESSION

A 50 year term of concession is sought to justify the capital expenditure required to construct the bridge. This also aligns with the design life of the bridge.

7. CONSULTATION

7.1 Mana Whenua

The Te Araroa Trust has engaged with Sec 9(2)(a) of Ngāti Apa (Te Rūnanga o Ngā Wairiki – Ngāti Apa) and Sec 9(2)(a) of Māori Trust Rakautaua No 9, which is the owner of the coastal land to which the walkway connects, but not the land on which the bridge will be directly connected.

In accordance with section 62(3) of the Marine and Coastal Area (Takutai Moana) Act 2011, comment will be sought from groups seeking customary title. Any responses form that process will be provided to Council, noting that this process is separate to the direct engagement undertaken with Ngāti Apa and Māori Trust Rakautaua No 9 that is relevant to the RMA consent process.

Te Waiū o Te Ika, the Whangaehu River (Ngāti Rangi Claims Settlement Act 2019) is acknowledged as the legislation to enact the Ngāti Rangi settlement. The settlement contains a co-governance framework for Te Waiū o Te Ika, the Whangaehu River. The proposed bridge location is not within Te Rohe o Ngāti Rangi.

7.2 Department of Conservation

Consultation has been undertaken with DOC, as the manager of the land that the bridge will connect to on the north side. DOC is supportive in principle of the project.

7.3 Land owner (south side)

Sec 9(2)(a) and Sec 9(2)(a) own the farm on the eastern side of the river that the walkway would pass through to link back to the beach or to Whangaehu Beach Road. These owners are supportive of the project.

8. ASSESSMENT OF ENVIRONMENTAL EFFECTS

8.1 Ecological Effects

Please refer to Sections 4 and 5 of the Ecological Assessment for the consideration of potential effects o the proposal on the 4WD track within Whitiau Scientific Reserve.

8.2 Flooding Effects

The bridge and wind bracing cables will be suspended with a minimum 1.2m freeboard above the 0.5% flood plain. The support structures (e.g. stairs, wind cable bracing towers, out riggers, and main towers) will have a very small cross-section within the flood plain and will not impede flood flows in a material way. The bridge deck itself will be permeable and will also be suspended over the water surface of the river. Consequently, it does not constitute and additional area that could contribute to increase peak flow or volume.

8.3 Archaeological Effects

While the bridge site is assessed as being within the vicinity of many identified archaeological sites, no archaeological material has been identified at the specific tower sites where land disturbance will occur. The Archaeological Assessment states:

> *The proposed pedestrian swing bridge is situated in a landscape of high archaeological potential and significance to local iwi. However, there are no affected archaeological sites on the true right bank of the river and adverse effects to archaeological sites/values on the left bank are expected to be nil or*

negligible. Of the 29 NZAA recorded archaeological sites within the general landscape of the left bank (Figure 2), the pits and terraces of the nearest site (S23/27) are located more than 50 m beyond the extent earthworks and will not be affected. The 13 archaeological sites that will or may be crossed by the works crew to access the left bank construction site could be adversely affected to a minor or low extent by repeat movements of heavy and light vehicles, but this risk can be mitigated to a nil or negligible level by:

• limiting the number of vehicles that travel to the work site daily (i.e., carpooling);

• restricting vehicle movements to established formal (metalled) or informal (visible depressions in pasture) tracks; and,

• undertaking construction in the late summer when ground conditions are firm and the potential for ruts forming in the topsoil is limited.

Finally, although no trace of archaeological material was identified in the multiple auger samples collected on the left bank, it is possible that unknown archaeological remains could be discovered in this area between NZAA recorded site S23/27 and the river. However, given the limited extent of earthworks at this location (approximately 44 m2) any adverse effect is expected to be no more than minor. Any adverse effects on Māori garden / horticultural soils, given their likely substantial extent, is likely to be negligible: there is even a potential benefit to archaeological research values if the bridge construction provides an opportunity to collect analytical samples.

The applicant notes that an archaeological authority will be sought from Heritage New Zealand Pouhere Taonga to address the potential accidental discovery of archaeological material.

8.4 Impacts on CMA values

The bridge will not impede navigation up the river during navigable flow conditions.

The bridge will be clear of flows up to the 0.5% level. Increases in flood level due to climate change within the life of the bridge have been incorporated in to the 0.5% AEP level. In the event that flooding does occur to or above that level, it will comprise widespread flooding across the adjacent flood plain.

In the event that large woody debris passes down the alignment of the main channel during very high flows near or above the 0.5% AEP level, that could entangle with the lowest point of the bridge deck. To mitigate this risk, a 1.2m minimum freeboard above this flood level is provided to allow for the passage of large, floating debris as recommended in the New Zealand Bridge Manual. If debris does entangle with the bridge, this may result in damage to the bridge but will not cause any increase in flooding of adjacent land, due to the wide flood plain at that location. The risk of this occurring is assessed as low and the consequence of that occurring will be limited to damage to the bridge. In a high flood condition, pedestrian access to the bridge will be prevent by general flooding of the surrounding land.

The site is mapped as the Whangaehu River Protection Zone and the Estuary Water Management sub-area. The Ecological Assessment has taken account of the specific values of the zone, being the habitat for migratory birds, and recognising the values of the Whitiau Scientific Reserve. It is also noted that the zone recognises the presence of archaeological sites adjacent to the estuary.

The bridge will create a built structure within a modified natural environment. That will have a landscape and visual effect. The scale of that effect will be localised, as the bridge will be a relatively narrow, light-weight, and visually permeable structure. The extent that it will have visibility will be a benefit for track users, in the sense of wayfinding. The towers and staircases will be constructed from timber that will weather to a more natural appearance over time. The decking material will be a dull, natural grey or green

to blend with the natural hues of the site. It will have significant less bulk than a farm building that could be constructed on the southern side. It is also a significant distance from the beach and so does not directly impact on the immediate coastal landscape.

Overall, potential adverse effects on CMA and coastal environment values are assessed as minor.

8.5 Section 104(1)(b) Planning instrument provisions

(i) Conservation Management Strategy: Wanganui Conservancy 1997-2007

With the adoption of the recommendations of the Ecological Assessment and the proposed bridge construction methodology, the concession sought is assessed as compatible with the conservation outcomes ought by the CMS. It will provide safe continuity of Te Araroa Trail in a manner that does not compromise those outcomes, and the vision and values of the relevant ecological districts.

(ii) National Environmental Standards

No National Environmental Standards are relevant to this proposal.

(iii) Other regulations

No other regulations are relevant to this proposal.

(iv) National Policy Statements

National Policy Statement for Freshwater Management 2020[1]

For the reasons discussed in Section 7.1 above, the proposal is consistent with the policies of the NPS:FM. Minor vegetation clearance will be undertaken in a manner that will minimise the potential adverse effects on mobile species (birds and lizards) that may be present within the clearance area. Potential temporary adverse effects on existing vegetation will limited to grasses.

As stated in Section 1.2.3 of the Ecological Assessment:

> *The NPSFM defines wetland habitat and provides policy direction for wetlands, with the objective of no loss of extent. The NES provides regulations for managing effects to natural inland wetland habitat from activities. Activities are permitted if located 10 m away from a natural inland wetland, or 100 m away if there is a hydrological connection been the activity and the natural inland wetland.*
>
> *The Proposal is not located within a natural inland wetland habitat as defined by the NPSFM 2020. All components are greater than 10 m away from a natural inland wetland.*
>
> *Two wetland areas occur within 100 m of the proposal. These include a narrow strip of riverine marsh associated with the rise and fall of the Whangaehu River. This marsh is dominated by crack willow (Salix fragilis), rautahi (Carex geminata) and harakeke (Phormium tenax). Dense harakeke flaxland habitat, which conforms to schedule F 'Swamp and marsh' is approximately >80 m upstream of the bridge staircase foundations and northern deadman. Similarly,this area has an intermittent hydrology associated with periodic flooding of the river.*
>
> *Whilst these structures are within the 100 m zone which under the NES requires consideration if there is a hydrological connection with the proposed activity. It is my opinion that there is no connection*

[1] The assessment is provided for completeness, but noting that the Whangaehu River at this location is mapped as CMA.

between this activity and the hydrology of these wetlands which are entirely dependent on the natural rise and fall of the Whangaehu River. This activity, primarily being excavation of soil to construct foundations and a deadman anchor will have no effect on this hydrology.

For these reasons it is my opinion that the NPSFM and NES are not relevant to this proposal.

National Policy Statement for Indigenous Biodiversity 2023

Based on the findings of the Ecological Assessment, the proposal is consistent with the relevant provision of the NPS:IB. The approach to the project design, outcomes and engagement gives effect to the decision making principles and takes into account the principles of the Treaty of Waitangi. It takes a precautionary approach to avoidance and management of potential adverse effects on indigenous biodiversity by relying on existing access tracks and locating the proposed bridge where it will not necessitate direct impacts on high value vegetation or habitats. The safe access across the river and facilitating trail walkers away from SH3 will contribute to New Zealand's social, economic, cultural, and environmental wellbeing.

As noted in the Ecological Assessment:

"realigning the Te Araroa Trail through Whitiau Scientific Reserve has the potential to increase the risk of wildfire, which could have significant adverse effects on these values. Although the risk is very small and manageable, with climate change, increasing drought and fire risk is predicted. It is recommended that advocacy signage and information within digital platforms be used to inform users of the very high ecological value of the area and that overnight camping is prohibited. Monitoring should also be undertaken to ensure that over-night camping does not occur. Further, the Reserves Act (1977) provides provision to restrict access from time to time and this measure should be used when required, such as during periods of high to extreme fire risk periods, especially when adjoining plantation forest land has enforced these same requirements. These measures are consistent with policies 3 and 4 of the NPSIB 2023."

(v) A New Zealand Coastal Policy Statement 2010

Policy 1 recognises that the coastal environment extends beyond the CMA and incorporates a range of values associated with the broader environment. In this case, Policy 11 (indigenous biodiversity), Policy 13 (preservation of natural character), Policy 15 (natural features and natural landscapes), Policy 18 (public open space), and Policy 25 (subdivision, use, and development in areas of coastal hazard risk), are relevant; as is Policy 2 (the Treaty of Waitangi, tangata whenua and Māori heritage).

The project will avoid biodiversity effects as listed in Policy 11(a) and avoid significant effects as listed in Policy 11(b).

From a planning perspective, the bridge is assessed as resulting in a minor adverse on natural character. The site is not identified as an area of regionally outstanding natural features or landscapes and is not mapped as having outstanding natural character or high natural character. The bridge design is a back-country style of walking track structure. While it will be a structural element in the landscape, it is of a type that is not unexpected in a wilderness area. It is also noted that the surrounding landscape includes commercial pine forest, grazing farm land and associated buildings and farm races, and access from the south-east via Whangaehu Beach Road. For these reasons, the bridge is assessed as not inconsistent with Policy 13 in that its design and purpose does preserve the natural character of the coastal environment and does not constitute inappropriate development or use. This conclusion does recognise the subtle differences between natural character, natural features and landscapes. The proposal will not adversely impact the wider elements of natural character, including the biophysical, ecological and water quality elements.

The proposal will not impact outstanding natural features and outstanding natural landscapes, and will avoid significant adverse on other natural features and natural landscapes in the coastal environment. Any effect on the landscape will be minor and appropriate in the context of the location and the purpose of the bridge.

The proposal is strongly supportive of Policy 18 by enhancing access and appreciation of public open space (on the north side of the river) and also default public access and experience across land to the south (via the farm land), and between the coastal margin north and south of the Whangaehu River mouth.

The proposal is not inconsistent with Policy 25. The public walking access across this area is an appropriate use and does not increase the risk of environmental harm from coastal hazards.

Policy 2 is being given effect through the ongoing engagement undertaken with mana whenua.

Overall, the proposal will be generally consistent with the NZCPS policies and will not be inconsistent with those policies.

(vi) a regional policy statement or proposed regional policy statement:

The relevant regional policy statement provisions are addressed in the subservient regional plan provisions addressed below.

(vii)a plan or proposed plan

As an activity triggering a rule applying to the CMA, Objectives CE-CMA-O1 and CE-CMA-O2, and Policies CE-CMA-P4 (appropriate use and development) and CE-CMA-P5 (public access) are most relevant.

In accordance with Policy CE-CMA-P4. The bridge does have a functional need to be located over the CMA, being across the river. Its purpose is to provide pedestrian access across the river. It does not facilitate restoration or rehabilitation of natural features, but that requirement of CE-CMA-P4.2 is only required "where reasonably practicable". That is not a reasonably practicable outcome for a pedestrian bridge. The bridge and its use will avoid the adverse effects listed in CE-CMA-P4.3 to the extent reasonably practicable and such effects have been minimised through location, design and construction methodology so that they are mitigated in accordance with the final clause of that policy. The proposal is not inconsistent with CE-CMA-P4, based on the location, context, purpose and design of the bridge.

The proposal is strongly consistent with Policy CE-CMA-P5. The purpose of the bridge in to enhance public access.

9. CONDITIONS

It is anticipated that conditions will be imposed on the concession that reflect the management of the construction of the bridge and ongoing walking access through the reserve. It is requested that draft conditions be provided to the applicant for review in advance of a decision being made on the application.

10. NOTIFICATION

As a concession term greater than 10 years is ought, it is understood that the application must be publicly notified.

11. CONCLUSION

The purpose of the project is to improve the amenity and safety for walkers of the Te Araroa Trail by diverting the trail away from State Highway 3 between Whanganui and Whangaehu. It is part of a wider initiative to allow walking access along the coast to south of the Turakina River.

Potential adverse effects of the proposal will be appropriately managed and minimised. These effects will be compensated by the improved public access, safety and amenity afforded by the use of the track and bridge.

APPENDIX A: ECOLOGCIAL ASSESSMENT

APPENDIX B: ARCHAEOLOGICAL ASSESSMENT

APPENDIX C: DESIGN DRAWINGS

APPENDIX D: TECHNICAL SPECIFICATION

APPENDIX E: RECORD OF TITLE

Whangaehu River Swing Bridge

Prepared for NZ Transportation Agency Waka Kotahi & Te Araroa Trust

September 2024

Artist impression only, does not match structural drawing exactly.

FRAME GROUP

HELPING AOTEAROA NEW ZEALAND ACCESS, ENJOY AND PROTECT THE GREAT OUTDOORS

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Job Details

NZ Transportation Agency Waka Kotahi & Te Araroa Trust
Whangaehu River Swing Bridge
Frame Group Job Number: 23-097

INSPECTION REQUIREMENTS FOLLOWING A LARGE SEISMIC EVENT:

FOLLOWING A MODERATE TO STRONG EARTHQUAKE, I.E. WITH A FELT INTENSITY GREATER THAN MODIFIED MERCALLI INTENSITY (MMI) GREATER THAN "V" AS MEASURED AT THE NEARBY GEONET SENSOR, THE BRIDGE SHALL BE INSPECTED. IF THE INSPECTION IDENTIFIES SIGNIFICANT MOVEMENT, SAGGING, OR DAMAGE, THE BRIDGE SHALL BE CLOSED FOR IMMEDIATE INSPECTION BY STRUCTURAL AND GEOTECHNICAL ENGINEERS. REFER TO THE "WHANGAEHU RIVER SWING BRIDGE DESIGN REPORT" (FRAME GROUP, 2024) FOR MORE INFORMATION FOR KEY CONSIDERATIONS AND OPTIONS FOR RE-OPENING OF THE BRIDGE.

Drawing Index

Drawing Number	Drawing Title	Latest Revision
23-097-01	LOCATION PLAN 1	A
23-097-02	LOCATION PLAN 2	A
23-097-02a	LOCATION PLAN 3	
23-097-03	BRIDGE PLAN AND ELEVATION	A
23-097-04	BRIDGE TOWER DETAILS - SHEET 1	A
23-097-05	HANGER DETAILS	A
23-097-06	BRIDGE DETAILS AND SUPERSTRUCTURE PLAN	A
23-097-07	DECK PANEL DETAILS	A
23-097-07a	DECK STRINGER AND DECK BRACE DETAILS	
23-097-08	ADJUSTMENT BRACKET DETAILS	A
23-097-09	DEADMAN ANCHOR DETAILS	A
23-097-10	TOWER SADDLE ASSEMBLY	A
23-097-11	BRIDGE FOUNDATION DETAILS - SHEET 1	A
23-097-12	BRIDGE FOUNDATION DETAILS - SHEET 2	A
23-097-13	BRIDGE WIND CABLE AND ANCHORING DETAILS	A
23-097-14	SECONDARY WIND CABLE DETAILS	A
23-097-14a	INFILL BARRIER DETAILS	
23-097-14b	CABLE SUMMARY	
23-097-15	LOAD RESTRICTION SIGN DETAIL	A
23-097-16	STAIRCASE ELEVATION	A
23-097-17	STAIRCASE - TOWER SECTIONS AND DETAILS	A
23-097-18	STAIRCASE LANDING DETAILS	A
23-097-19	STAIRCASE DETAILS	

Drawing Version Control

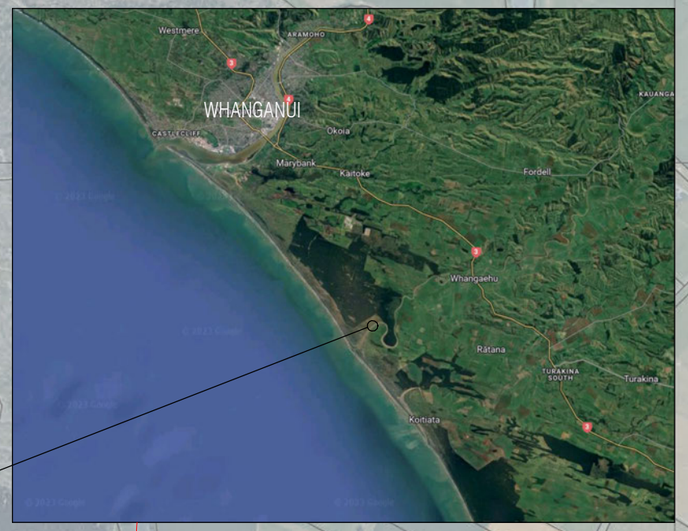
Drawing Package Version	Date	Revision Details / Status	Initials and Signature			
			Prepared by	Checked by	Reviewed by	Approved by
1. Draft / For Consultation	July 2024	Draft	Sec 9(2)(a)			
2. For Consent	September 2024	For Consent				
3. For Tender						
4. Consented /For Construction						
5. As Built						

Key

Initials	Name	Title
Sec 9(2)(a)		

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

0 1000



NEW 120m LONG SWING BRIDGE

APPROXIMATE LOCATION OF NATURAL GAS PIPELINE, TO BE CONFIRMED

WHANGAEHU RIVER

WHANGANUI DISTRICT

RANGITIKEI DISTRICT

PROPERTY INFORMATION

ID	4001494
APPELLATION	SECTION 547 LEFT BANK WANGANUI RIVER
AFFECTED SURVEYS	DP 433076, SO 34291
PARCEL INTENT	DCDB
TOPOLOGY_ YPE	PRIMARY
STATUTORY_ACTIONS	[CREATE] SCIENTIFIC RESERVE [WHITIAU SCENTIFIC RESERVE] NEW ZEALAND GAZETTE 1993 P 1395 [REFERENCED] ACCESS BY MOTORISED VEHICLES PROHIBTED WITH EXCEPTIONS. NEW ZEALAND GAZETTE 2002 P 4428
LAND DISTRICT	WELLINGTON
TITLES	
SURVEY AREA	2429300
CALC AREA	2462065

PROPERTY INFORMATION

ID	3778448
APPELLATION	RAKAUTAUA 7,3 BLOCK
AFFECTED SURVEYS	ML 2628
PARCEL INTENT	DCDB
TOPOLOGY TYPE	PRIMARY
STATUTORY ACTIONS	
LAND DISTRICT	WELLINGTON
TITLES	WND2/1043
SURVEY AREA	490124
CALC AREA	545960

THIS MAP SHOWS THE APPROXIMATE LOCATION OF BRIDGE. SETOUT TO BE CONFIRMED BY ENGINEER BEFORE CONSTRUCTION.

These structural drawings are to be read with the Technical Specifications titled

WHANGAEHU RIVER
SWING BRIDGE

Reference: FGL 23-097 Rev A - September 2024
prepared for: NZTA WAKA KOTAHI AND TE ARAROA TRUST FOR CONSENT,
by: Frame Group Limited

FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI; Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: LOCATION PLAN 1

SCALE: 1 : 15000 @ A3	DATE: SEPTEMBER 2024	
DRAWN: Sec 9(2)(a) / DESIGNED / APPROVED	FGL JOB: 23-097	
DRAWING PACKAGE VERSION: 2.FOR CONSENT	DRAWING No.: 23-097 -01	REV: A

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

CONSTRUCTION ACCESS AND SET-OUT

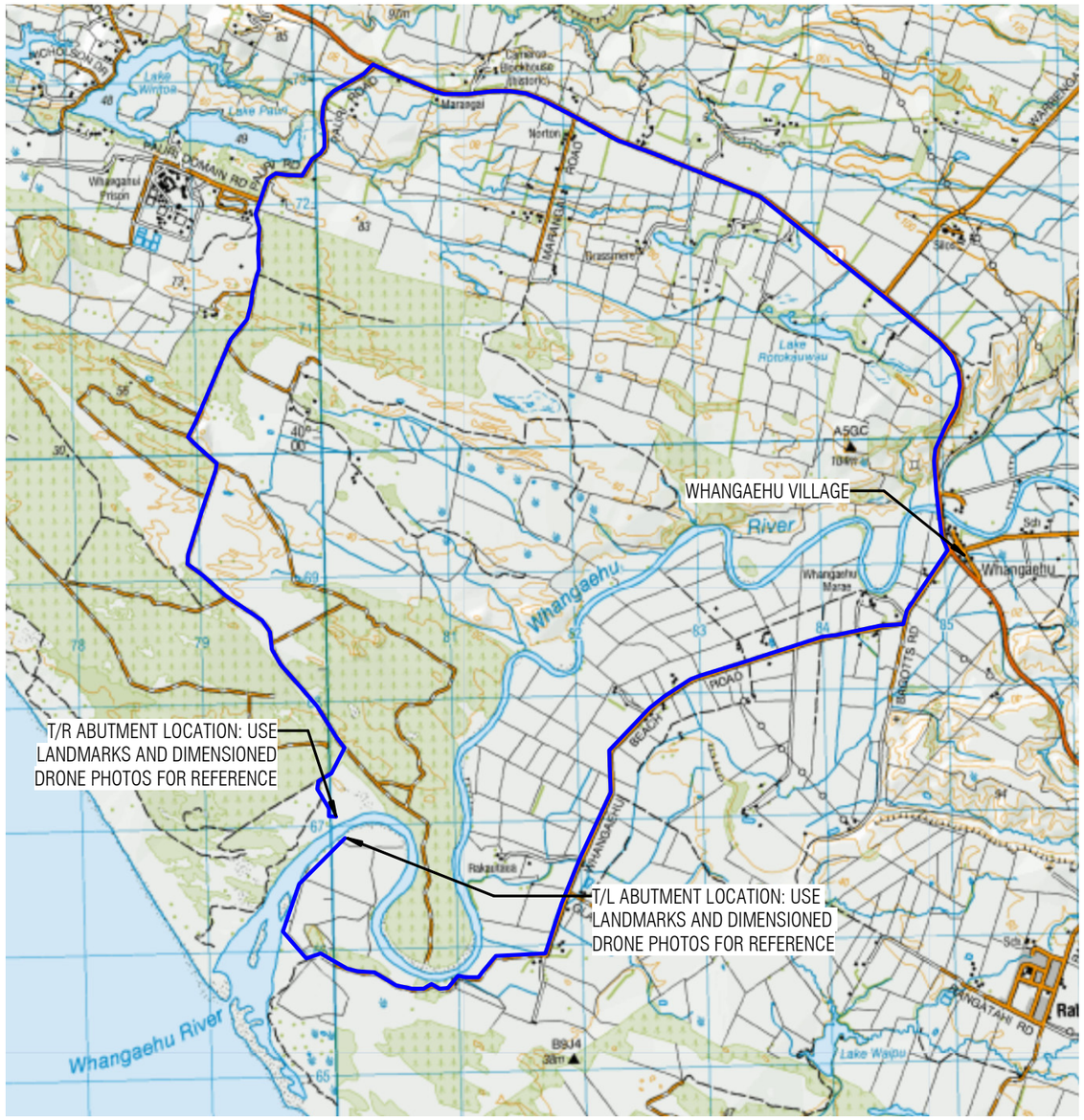
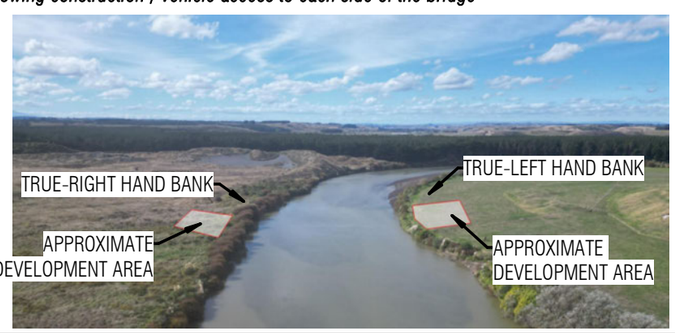


Figure 1: Map showing construction / vehicle access to each side of the bridge



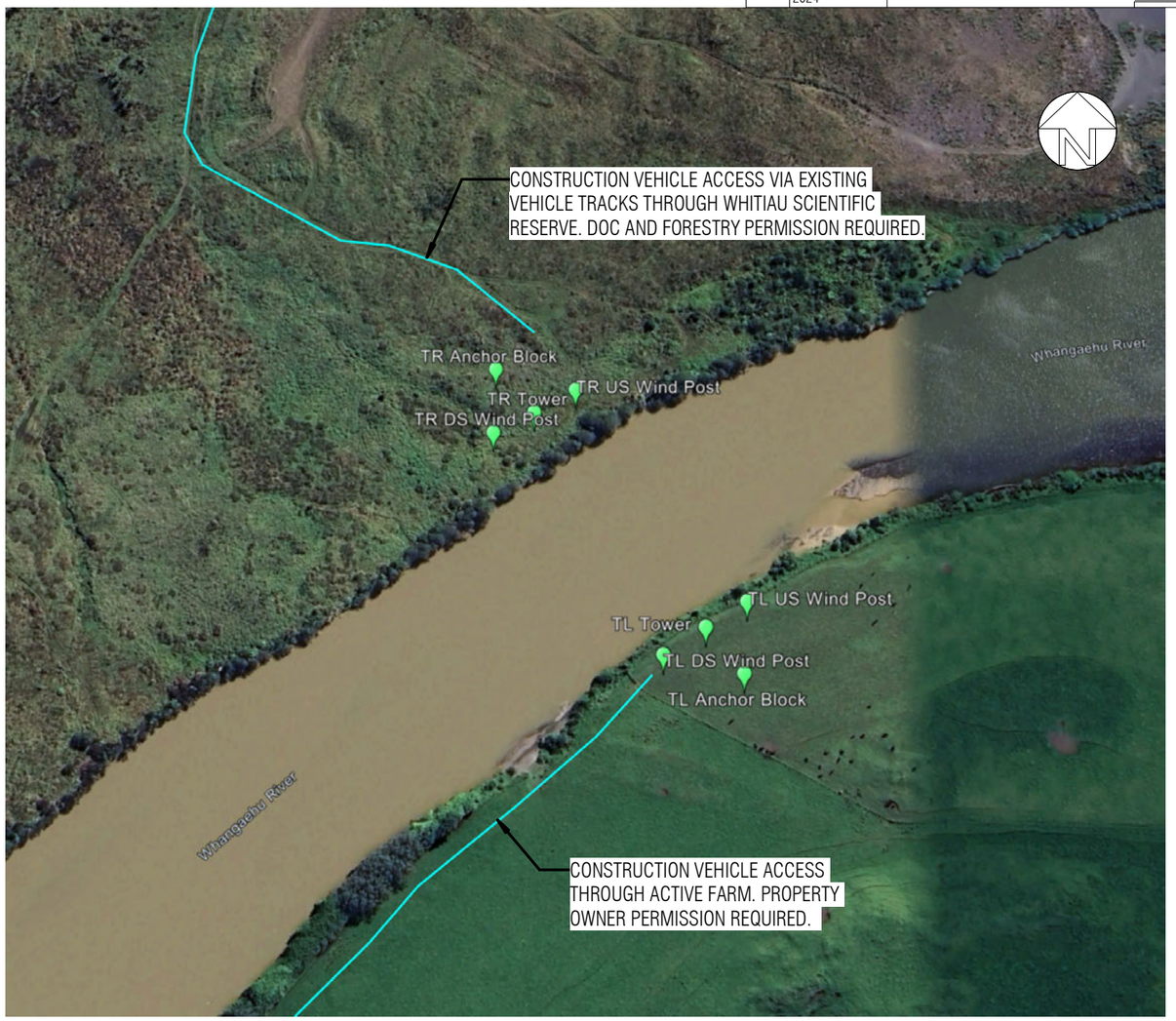


Figure 2: Approximate layout of bridge foundations. Final locations to be set-out by Contractor and approved by Engineer before construction.

Construction Access and Set-Out Notes:

1. Vehicle access is available to each side of the bridge as follows:
   True-Left = (T/L) Public road and private land (active farm).
   True-Right = (T/R) Public road, commercial forest, and DOC Reserve.
2. Te Araroa Trust is to obtain access permission from all affected land owners on behalf of the Contractor. The Contractor is to abide by all access and construction damage mitigation measures agreed with these landowners, and any conditions in relevant Resource Consents.
3. The Contractor is to provide a detailed access and construction methodology for approval before starting construction. The methodology is to detail how vegetation and site damage will be minimised and remediated.
4. The Contractor is to set-out a maximum construction and access footprint and all work and vehicle operations are to be carried out within this footprint.
5. Other set-out requirements in the Technical Specifications apply.

FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ Transport Agency; Te Araroa

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: LOCATION PLAN 2

SCALE: @ A3			DATE: SEPTEMBER 2024
DRAWN: Sec 9(2)(a)	DESIGNED	APPROVED	FGL JOB: 23-097
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FIGURE 3: APPROXIMATE LOCATION OF BRIDGE ALIGNMENT. FINAL LOCATIONS TO BE SET-OUT BY CONTRACTOR AND APPROVED BY ENGINEER BEFORE CONSTRUCTION.

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Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR
NZ TRANSPORT AGENCY WAKA KOTAHI
Te ARAROA NEW ZEALAND TRAIL

PROJECT
WHANGAEHU RIVER SWING BRIDGE

TITLE
LOCATION PLAN 3

SCALE 1 : 3000 @ A3	DATE SEPTEMBER 2024	
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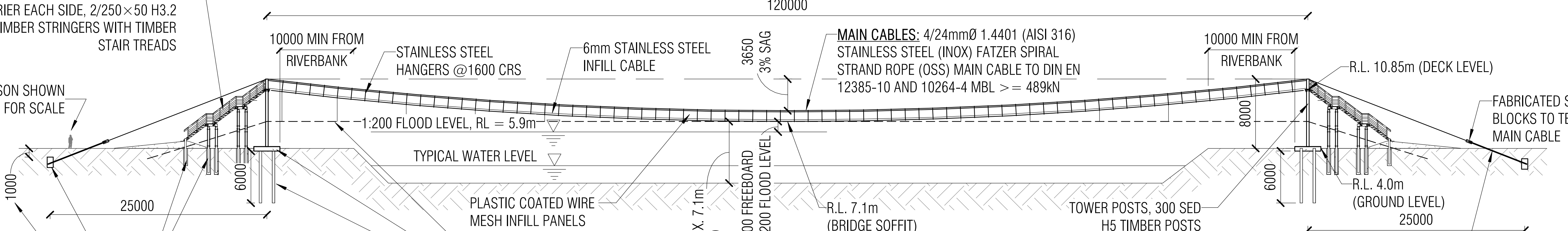
Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

1 BRIDGE ELEVATION

1 : 500



THIS STRUCTURE IS DESIGNED IN ACCORDANCE WITH SNZ HB 8630:2004 "TRACKS AND OUTDOOR VISITOR STRUCTURES"

DESIGN DETAILS	
SITE USER GROUP	DAY VISITOR (DV)
BARRIER DESIGN LOAD	0.36 kN/m
BARRIER TYPE	B
LOAD RESTRICTION	5 PEOPLE
EFFECTIVE FALL HEIGHT	>3.0m
FALL SURFACE	UNFAVOURABLE
IMPORTANCE LEVEL (IL)	2
DESIGN LIFE	50 YEARS

NOTES:

ALL EXPOSED STEEL, INCLUDING FIXINGS TO BE TYPE 316 STAINLESS STEEL UNLESS NOTED OTHERWISE ON THE DRAWINGS.

ALL TIMBER TO BE TREATMENT GRADE H5 EXCEPT FOR STAIRCASE STRINGERS AND BARRIERS AND TOWER CROSS BRACINGS WHICH ARE GRADE H3.2

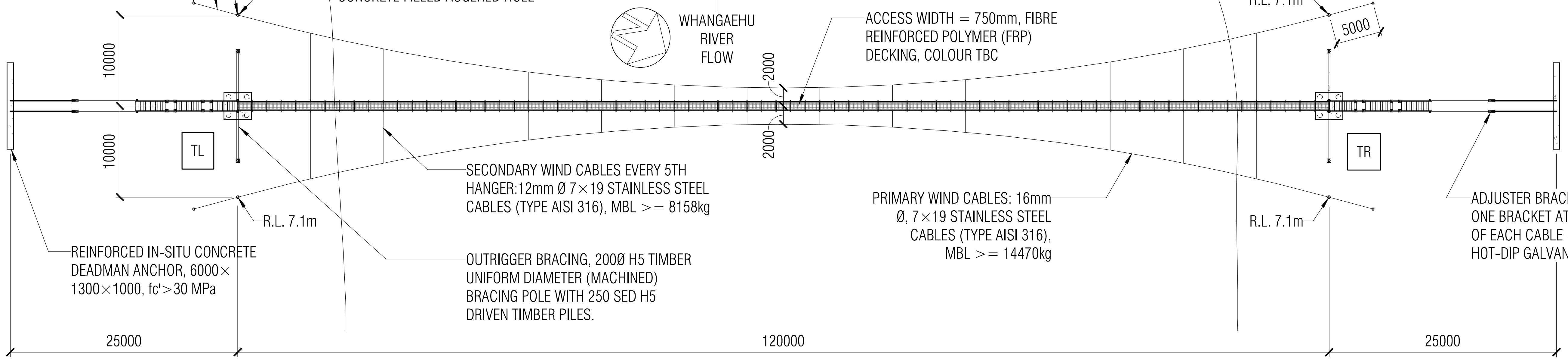
SET-OUT:

ALL WORKS ARE TO BE MIN 10000 FROM THE RIVERBANKS. SET-OUT IS TO BE MARKED ON SITE BY THE CONTRACTOR AND CONFIRMED BY THE ENGINEER BEFORE COMMENCING CONSTRUCTION.

REDUCED LEVELS (R.L'S) ARE SET TO THE NEW ZEALAND VERTICAL DATUM 2016 (NZVD2016)

2 BRIDGE PLAN

1 : 500



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PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI / Te ARAROA NEW ZEALAND'S TRAIL

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: BRIDGE PLAN AND ELEVATION

SCALE	DATE
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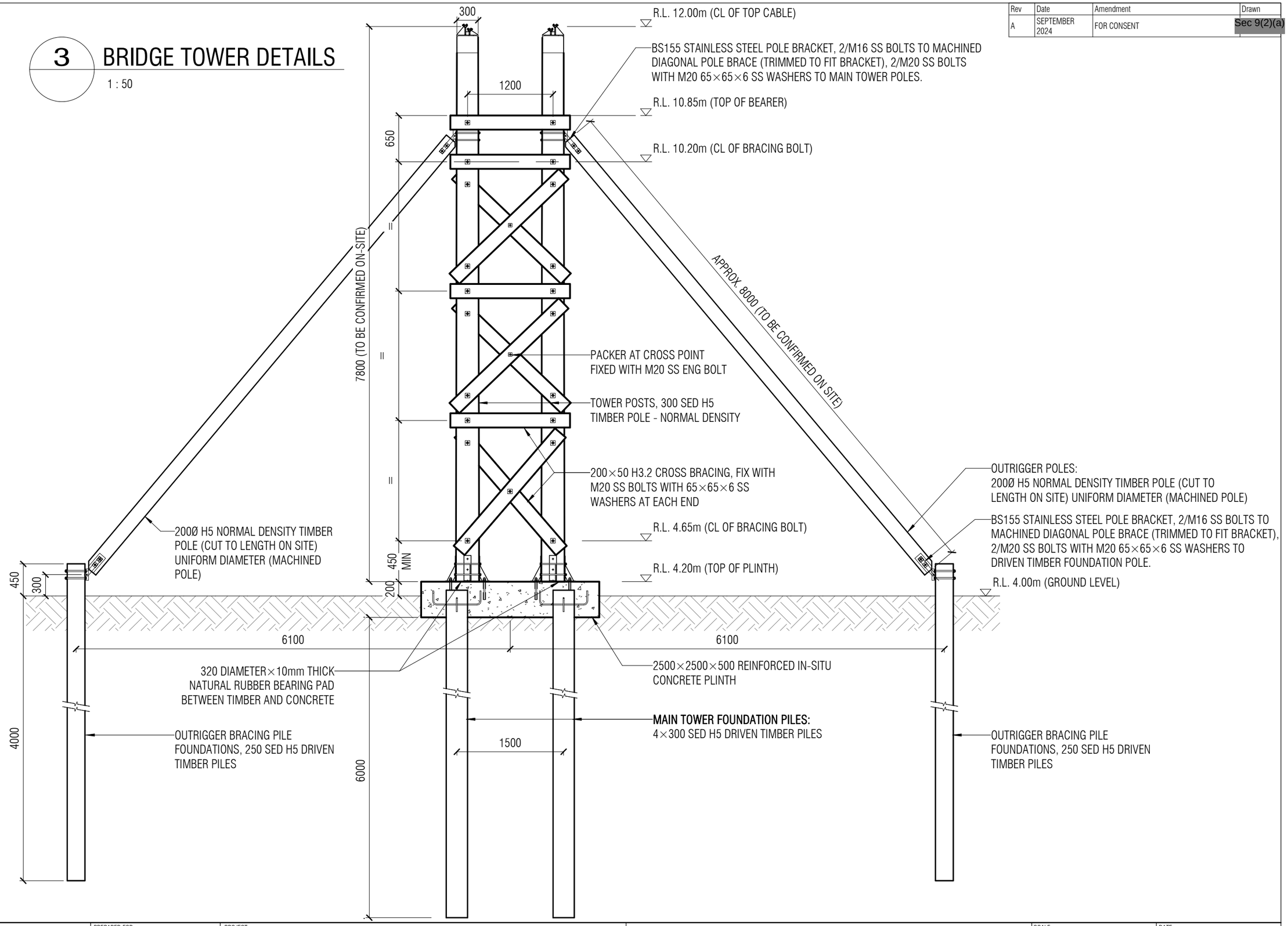
Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

3 BRIDGE TOWER DETAILS

1 : 50



FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI; Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: BRIDGE TOWER DETAILS - SHEET 1

SCALE: 1 : 50 @ A3	DATE: SEPTEMBER 2024
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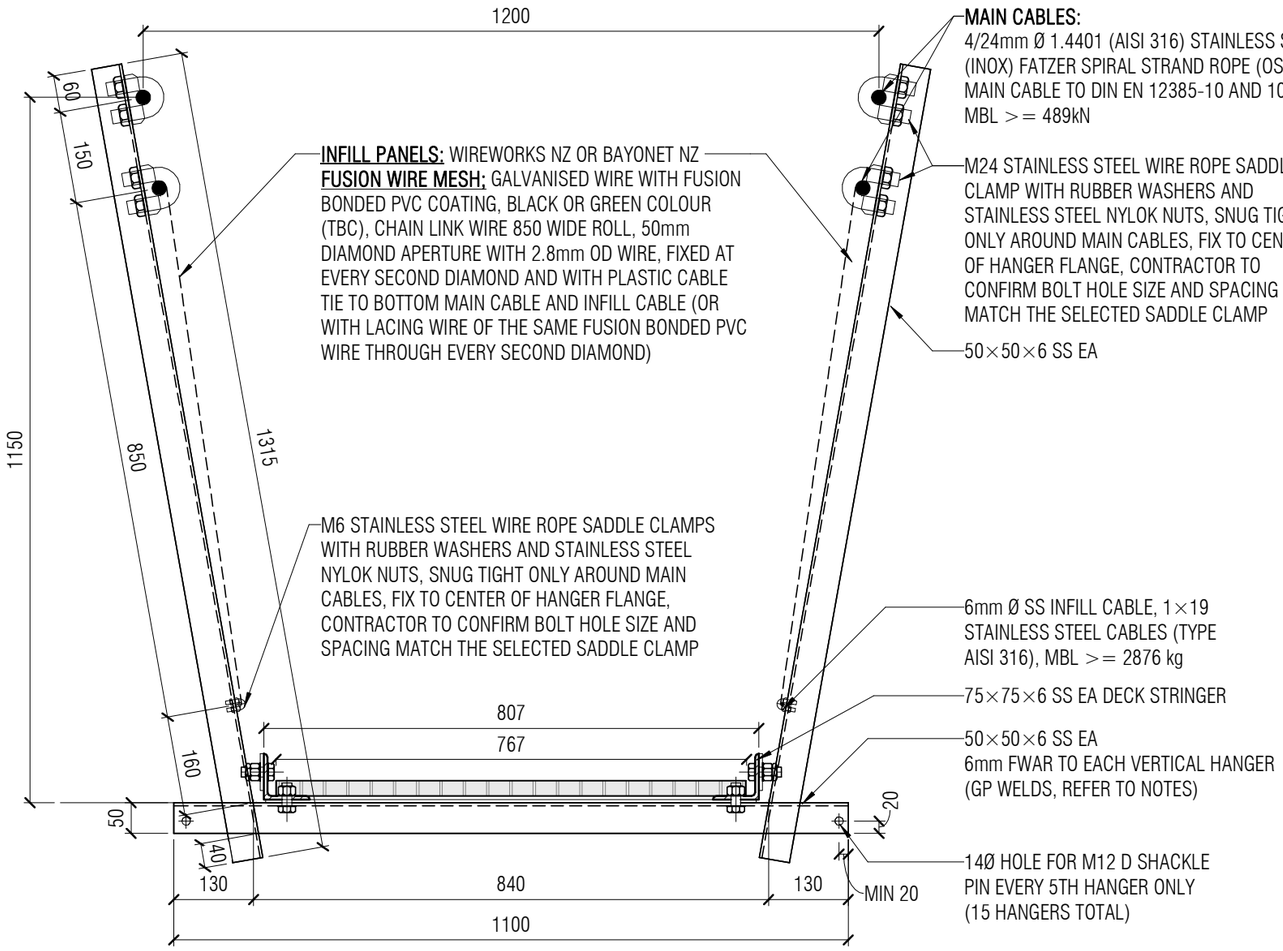
	REV: A

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

4 STEEL HANGER DETAIL

1 : 10 HANGER SPACING = 1600mm



STEEL HANGER NOTES:

GENERAL

1. ALL STEEL SECTIONS TO BE TYPE 316 STAINLESS STEEL(SS), HOT-ROLLED ANNEALED AND PICKLED (HRAP) AND IN ACCORDANCE WITH AS/NZS 3679.1:2016 AND A276/A276M-17.
2. ALL STEEL FABRICATION WORK SHALL BE IN ACCORDANCE WITH AS/NZS 5131:2016 AND NZS 3404:1997.
3. THE EDGES OF ALL STEEL PLATES SHALL PLATES SHALL BE ROUNDED OFF TO A MINIMUM RADIUS OF 2mm.
4. MATERIAL CERTIFICATES TO BE PROVIDED FOR ALL MATERIALS INCLUDING HARDWARE, STEEL PLATES AND STRUCTURAL SECTIONS.

WELDING

5. ALL WELDING CONSUMABLES, PROCEDURES, QUALITY CONTROL AND QUALIFICATIONS OF PERSONNEL SHALL COMPLY WITH AS/NZS 1554.1:2014.
6. ALL WELDS SHALL BE CLASS GP IN ACCORDANCE WITH AS/NZS 1554.1:2014.
7. WELDING SHALL NOT COMMENCE UNTIL THE ENGINEER HAS ACCEPTED THE WELDING PROCEDURE QUALIFICATION RECORD (WPQR).
8. NO ON-SITE WELDING IS PERMITTED.

WELDING INSPECTION

9. INSPECTION AND TESTING FREQUENCY:
   ALL WELDS SHALL BE INSPECTED AND TESTED AN INDEPENDENT WELDING INSPECTOR WITH QUALIFICATIONS MEETING THE REQUIREMENTS OF AS/NZS 1554.1:2014 CLAUSE 7.2 IN ACCORDANCE WITH THE FREQUENCIES NOTED IN THE FOLLOWING TABLE:

EXTENT ON NON DESTRUCTIVE EXAMINATION (NDE) IN ACCORDANCE WITH AS/NZS1554.1:2014 (%)			
WELD CATEGORY	VISUAL SCANNING (SEE CLAUSE 7.3)	VISUAL EXAMINATION IN ACCORDANCE WITH TABLE 6.2.2	ULTRASONICS OR MAGNETIC PARTICLE TESTING TO TABLE 6.2.1
GP	100%	10%	0%
SP	100%	100%	100%

9. BEFORE ANY WELDED COMPONENT IS INSTALLED ON-SITE, THE CONTRACTOR SHALL SUBMIT A WELD INSPECTION RECORD DETAILING THE QUALIFIED WELDING PROCEDURES, WELDER AND SUPERVISOR QUALIFICATIONS, INSPECTION, REWORK, AND ANY OTHER WELDING QUALITY MATTERS.

10. ALL WELDING SHALL BE UNDERTAKEN UNDER SUPERVISION OF A WELDING SUPERVISOR WHO SHALL PREPARE AND ISSUE A WELD INSPECTION CERTIFICATE ON COMPLETION OF ALL WELDING.

11. ALL WELDS SHALL BE FULLY SEALED ALL AROUND.

FRAME GROUP
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PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI; Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: HANGER DETAILS

SCALE	1 : 10 @ A3
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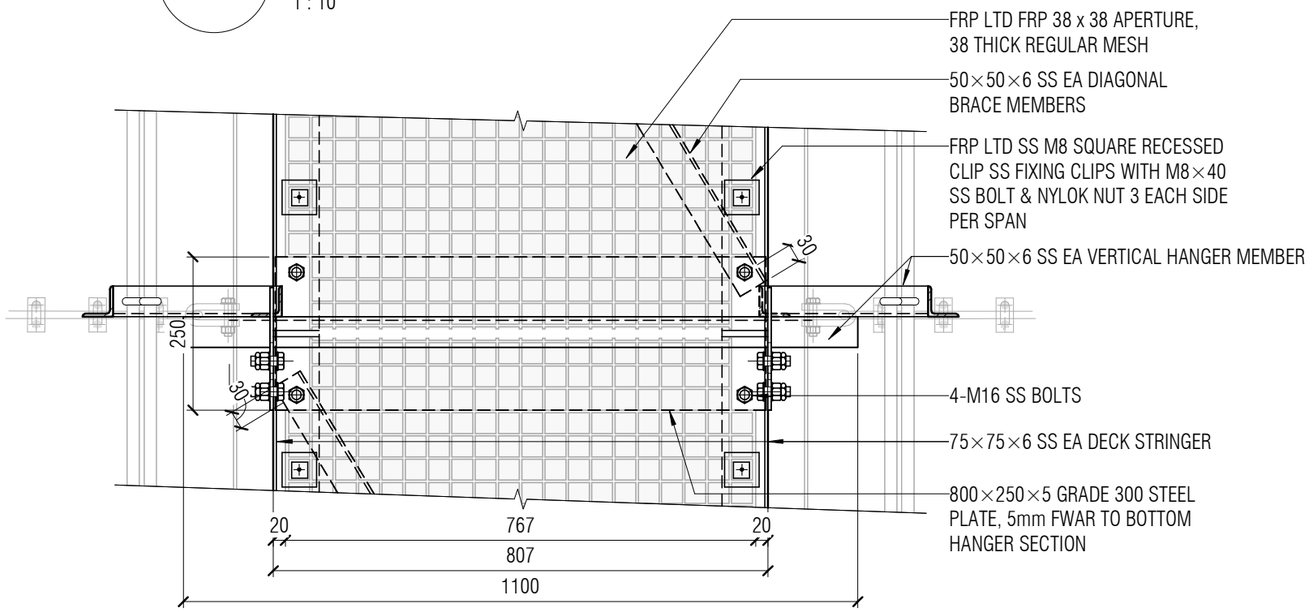
REV	A

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

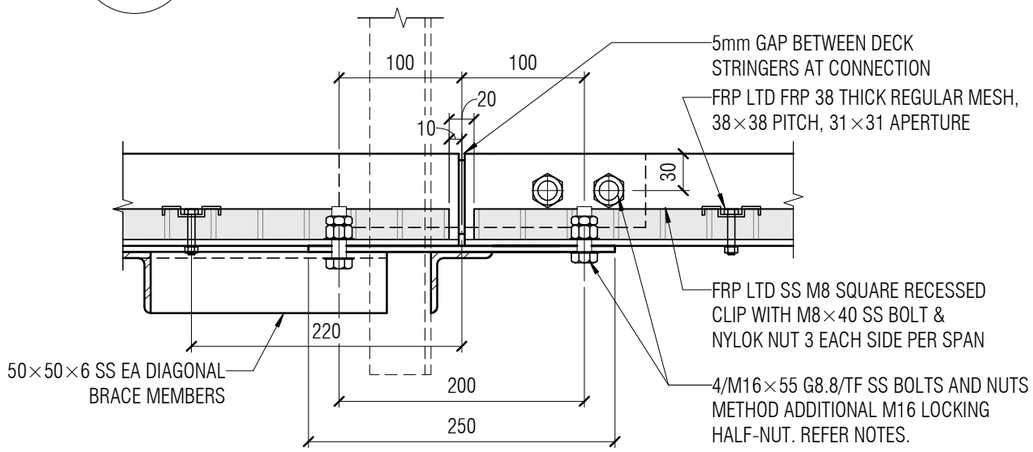
5 PLAN AT HANGER

1 : 10



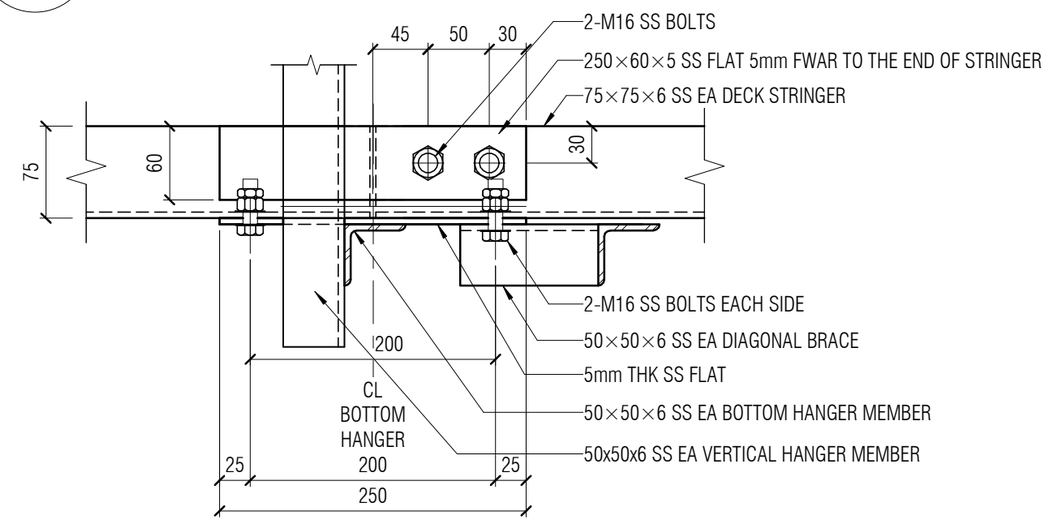
6 GRATING FIXING DETAIL

1 : 5



7 HANGER AND STRINGER FIXING DETAIL

1 : 5

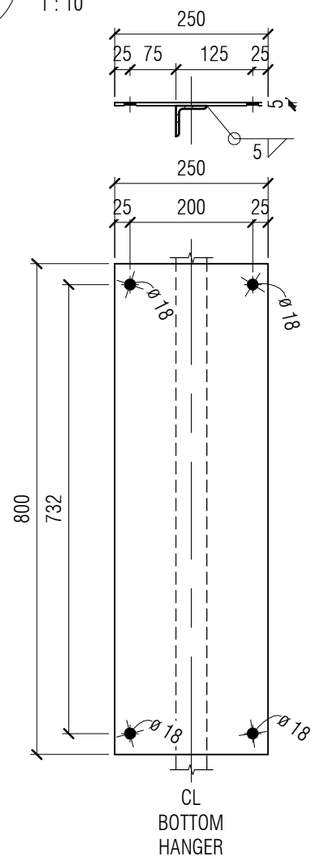


NOTES:

1. ALL BOLTS TO BE GRADE 8.8/S UNLESS OTHERWISE SPECIFIED.
2. REFER TO THE FRP INSTALLATION GUIDANCE ESTABLISHED BY THE MANUFACTURER ATTACHED TO THE TECHINCAL SPECIFICATION FOR MORE DETAILS.
3. ALL BOLT NUTS TO ORIENTATED SO THAT THE NUT IS LOCATED ON THE MOST EASILY ACCESSIBLE SIDE OF THE CONNECTION TO IMPROVE INSTALLATION, INSPECTION, MAINTENANCE, AND DECOMMISSIONING.
4. ALL BOLTS TO BE TIGHTENED WITH AN IMPACT DRIVER AND CHECKED FOR CORRECT TORQUE. ENGINEER TO CONFIRM CORRECT MINIMUM TORQUE VALUES FOR EACH BOLTED CONNECTION.
5. ALL BOLTS ON THIS SHEET TO HAVE A FULL NUT AND A HALF LOCK NUT INSTEAD OF A SINGLE NYLOK FULL NUT UNLESS EXPLICITLY STATED OTHERWISE. ALL NUTS AND BOLTS TO BE STAINLESS STEEL.
6. ALL STEEL SECTIONS TO BE TYPE 316 STAINLESS STEEL(SS)

8 BOTTOM PLATE DETAIL

1 : 10



FRAME GROUP
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PREPARED FOR: NZ TRANSPORT AGENCY, Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: BRIDGE DETAILS AND SUPERSTRUCTURE PLAN

SCALE: As indicated @ A3			DATE: SEPTEMBER 2024
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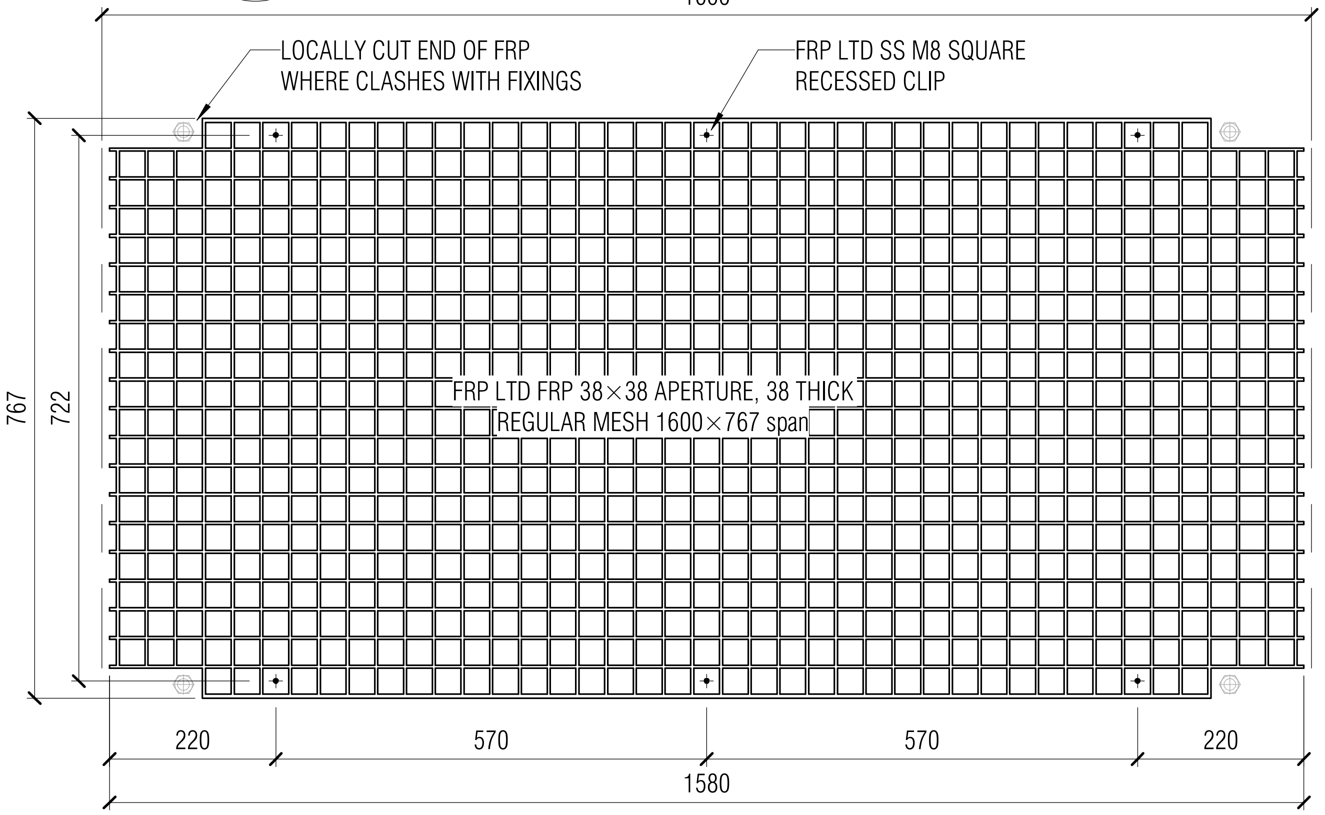
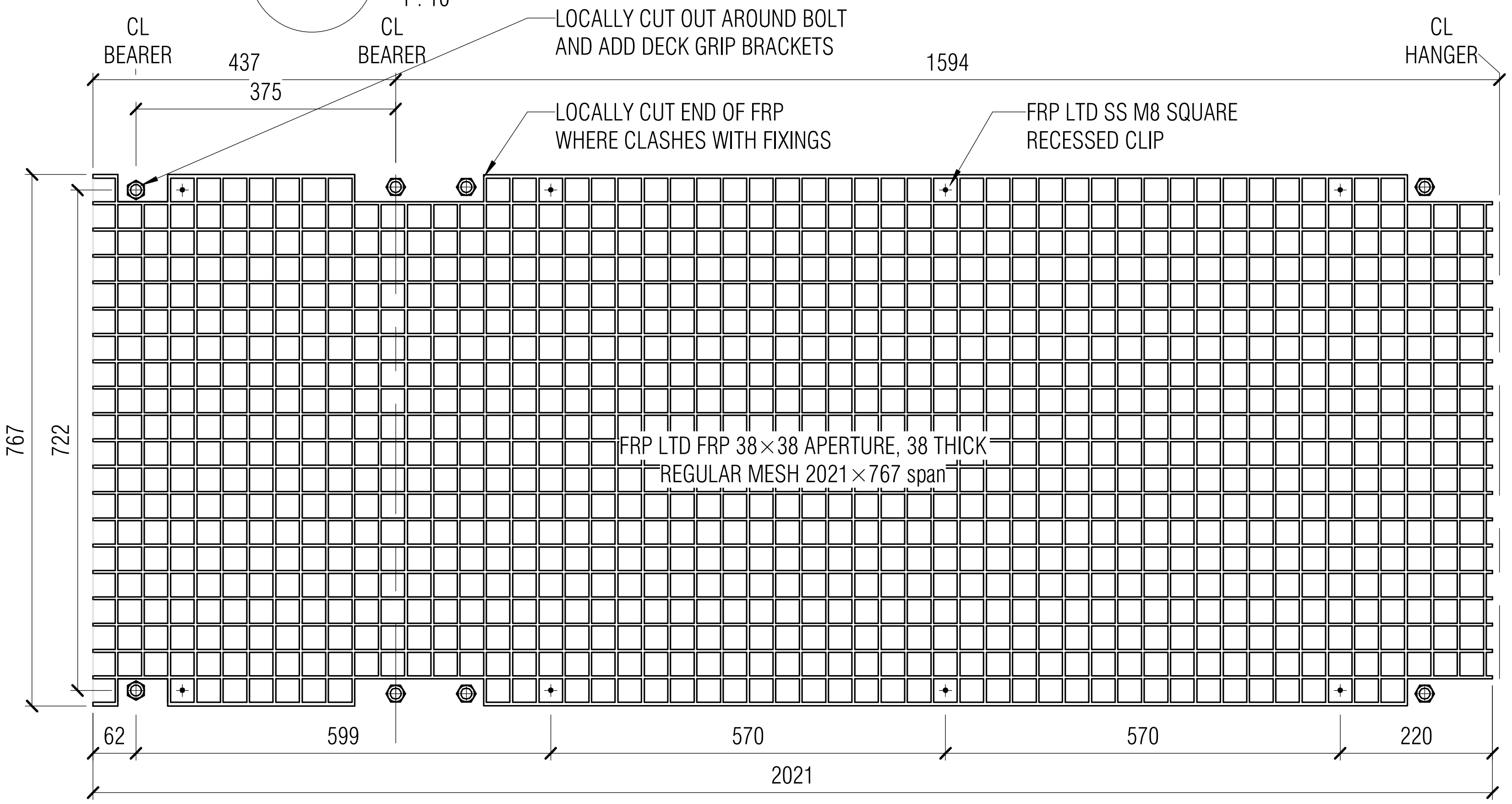
10 FRP DECKING SEGMENT - TYPICAL

1 : 10



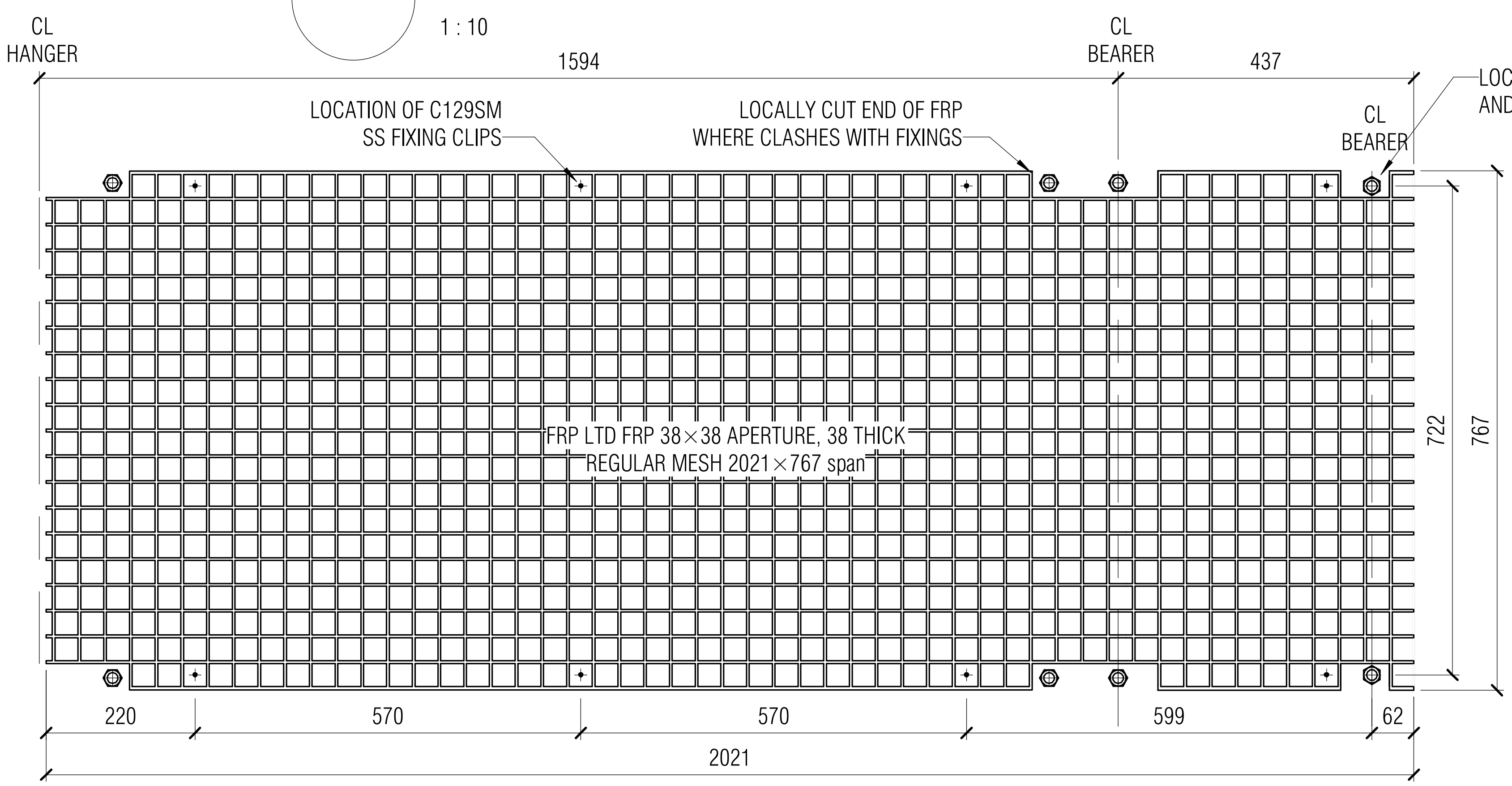
8 FRP DECKING SEGMENT - TL

1 : 10



9 FRP DECKING SEGMENT - TR

1 : 10



DECK PANEL COLUR TO BE CHOSEN BY OTHERS

NOTES:

1. **BRIDGE SPAN TOLERANCE:** STRINGERS AND DIAGONAL BRACING FOR 1×CENTRAL DECK BAY TO BE CUT AND DRILLED ON-SITE TO ACCOUNT FOR BRIDGE SPAN TOLERANCE (I.E. 1×HANGER BAY NOT SPACED AT 1600 C/C), ALL OTHER HANGERS TO BE SPACED AT 1600 CRS.

FRAME GROUP
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PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI / Te ARAROA NEW ZEALAND'S TRAIL

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: DECK PANEL DETAILS

SCALE	DATE
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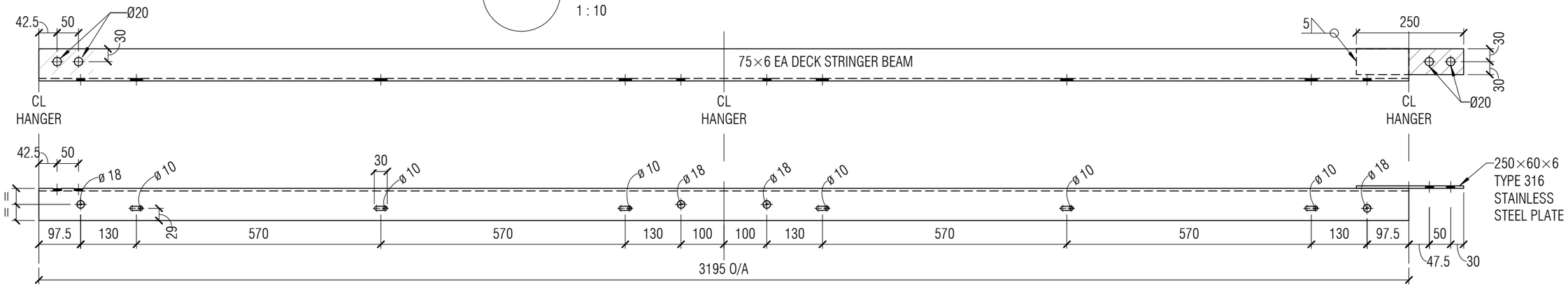
Rev	Date	Amendment	Drawn

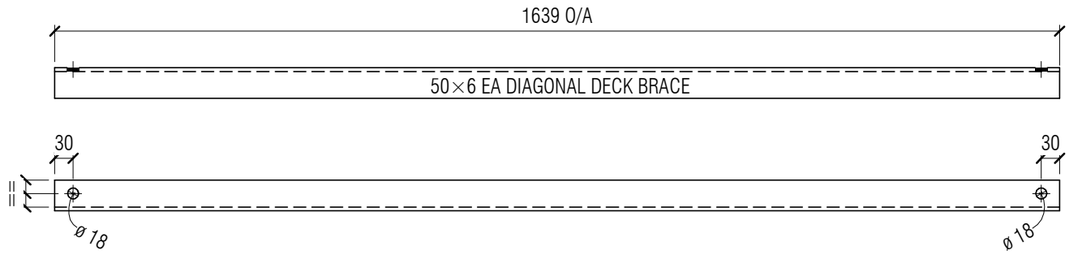
11 DECK STRINGER - TYPICAL DOWNSTREAM

1 : 10



12 DECK BRACE - TYPICAL

1 : 10 (75 REQUIRED)



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Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR
NZ TRANSPORT AGENCY WAKA KOTAHI
Te ARAROA NEW ZEALAND TRAIL

PROJECT
WHANGAEHU RIVER SWING BRIDGE

TITLE
DECK STRINGER AND DECK BRACE DETAILS

SCALE	DATE
1 : 10 @ A3	SEPTEMBER 2024
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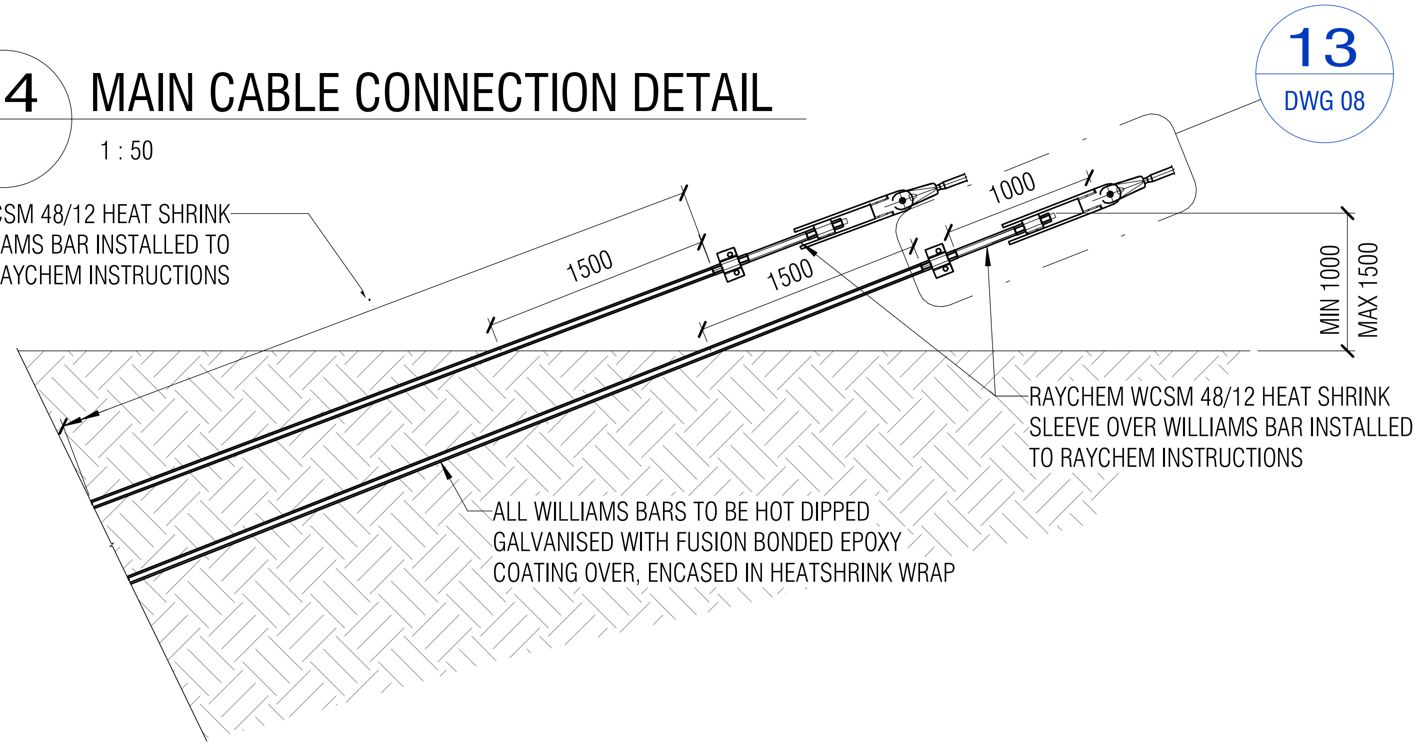
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

14 MAIN CABLE CONNECTION DETAIL

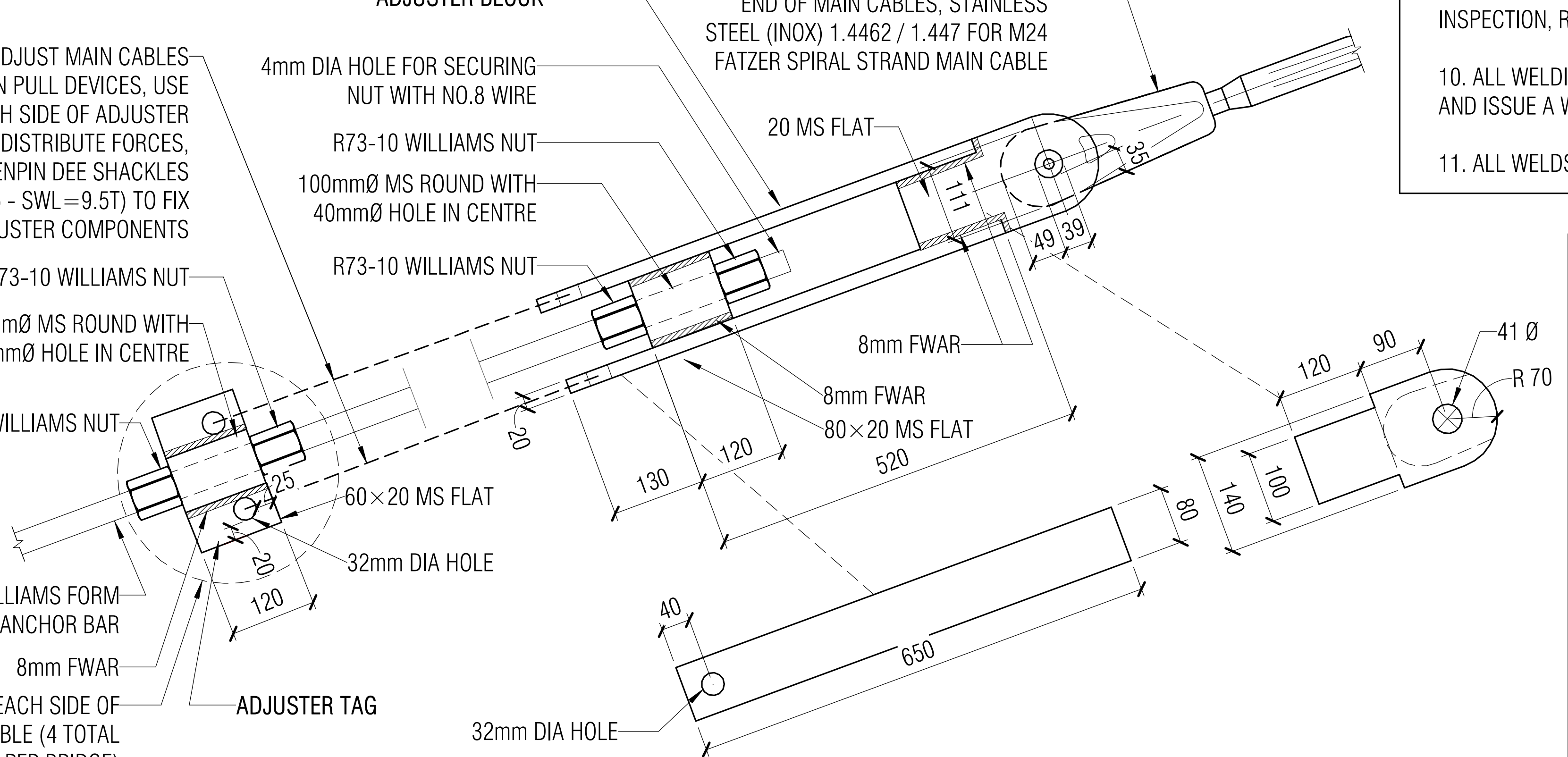
1 : 50



13 ADJUSTER BLOCK DETAIL

DWG 08

1 : 10



STEEL ADJUSTER BLOCK NOTES:

GENERAL

1. ALL ADJUSTER BLOCK STEEL SECTIONS TO BE GRADE 300 STEEL AND IN ACCORDANCE WITH AS/NZS 3679.1:2016 AND A276/A276M-17.
2. ALL STEEL FABRICATION WORK SHALL BE IN ACCORDANCE WITH AS/NZS 5131:2016 AND NZS 3404:1997.
3. THE EDGES OF ALL STEEL PLATES SHALL PLATES SHALL BE ROUNDED OFF TO A MINIMUM RADIUS OF 2mm.
4. MATERIAL CERTIFICATES TO BE PROVIDED FOR ALL MATERIALS INCLUDING HARDWARE, STEEL PLATES AND STRUCTURAL SECTIONS.

WELDING

5. ALL WELDING CONSUMABLES, PROCEDURES, QUALITY CONTROL AND QUALIFICATIONS OF PERSONNEL SHALL COMPLY WITH AS/NZS 1554.1:2014.
6. ALL WELDS SHALL BE CLASS SP IN ACCORDANCE WITH AS/NZS 1554.1:2014.
7. WELDING SHALL NOT COMMENCE UNTIL THE ENGINEER HAS ACCEPTED THE WELDING PROCEDURE QUALIFICATION RECORD (WPQR).
8. NO ON-SITE WELDING IS PERMITTED.

WELDING INSPECTION

9. INSPECTION AND TESTING FREQUENCY:
   ALL WELDS SHALL BE INSPECTED AND TESTED AN INDEPENDENT WELDING INSPECTOR WITH QUALIFICATIONS MEETING THE REQUIREMENTS OF AS/NZS 1554.1:2014 CLAUSE 7.2 IN ACCORDANCE WITH THE FREQUENCIES NOTED IN THE FOLLOWING TABLE:

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WELD CATEGORY	VISUAL SCANNING (SEE CLAUSE 7.3)	VISUAL EXAMINATION IN ACCORDANCE WITH TABLE 6.2.2	ULTRASONICS OR MAGNETIC PARTICLE TESTING TO TABLE 6.2.1
GP	100%	10%	0%
SP	100%	100%	100%

9. BEFORE ANY WELDED COMPONENT IS INSTALLED ON-SITE, THE CONTRACTOR SHALL SUBMIT A WELD INSPECTION RECORD DETAILING THE QUALIFIED WELDING PROCEDURES, WELDER AND SUPERVISOR QUALIFICATIONS, INSPECTION, REWORK, AND ANY OTHER WELDING QUALITY MATTERS.

10. ALL WELDING SHALL BE UNDERTAKEN UNDER SUPERVISION OF A WELDING SUPERVISOR WHO SHALL PREPARE AND ISSUE A WELD INSPECTION CERTIFICATE ON COMPLETION OF ALL WELDING.

11. ALL WELDS SHALL BE FULLY SEALED ALL AROUND.

DURABILITY NOTES:

1. ALL WILLIAMS BARS AND WILLIAMS BAR COMPONENTS TO BE HOT DIPPED GALVANIZED.
2. ALL ADJUSTMENT BLOCK COMPONENTS TO BE HOT DIPPED GALVANIZED.
3. FABRICATE ALL STEEL COMPONENTS FULLY (DRILL, CUT, WELD, AND BEND) BEFORE HOT-DIPPED GALVANIZING
4. ALL WILLIAMS BARS AND NUTS TO BE HOT-DIPPED GALVANISED (HDG) WITH FUSION BONDED EPOXY COATING.
5. GALVANISED ADJUSTER BLOCK COMPONENTS TO TO DENSO WRAPPED AS PER THE TECHNICAL SPECIFICATIONS AFTER THE BRIDGE HAS BEEN CONSTRUCTED.

ADJUSTMENT BLOCK NOTE:

ADJUSTMENT BLOCK TO BE MIN 1000 AND MAX 1500 ABOVE GROUND LEVEL.

FRAME GROUP

Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI; Te ARAROA NEW ZEALAND'S TRAIL

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: ADJUSTMENT BRACKET DETAILS

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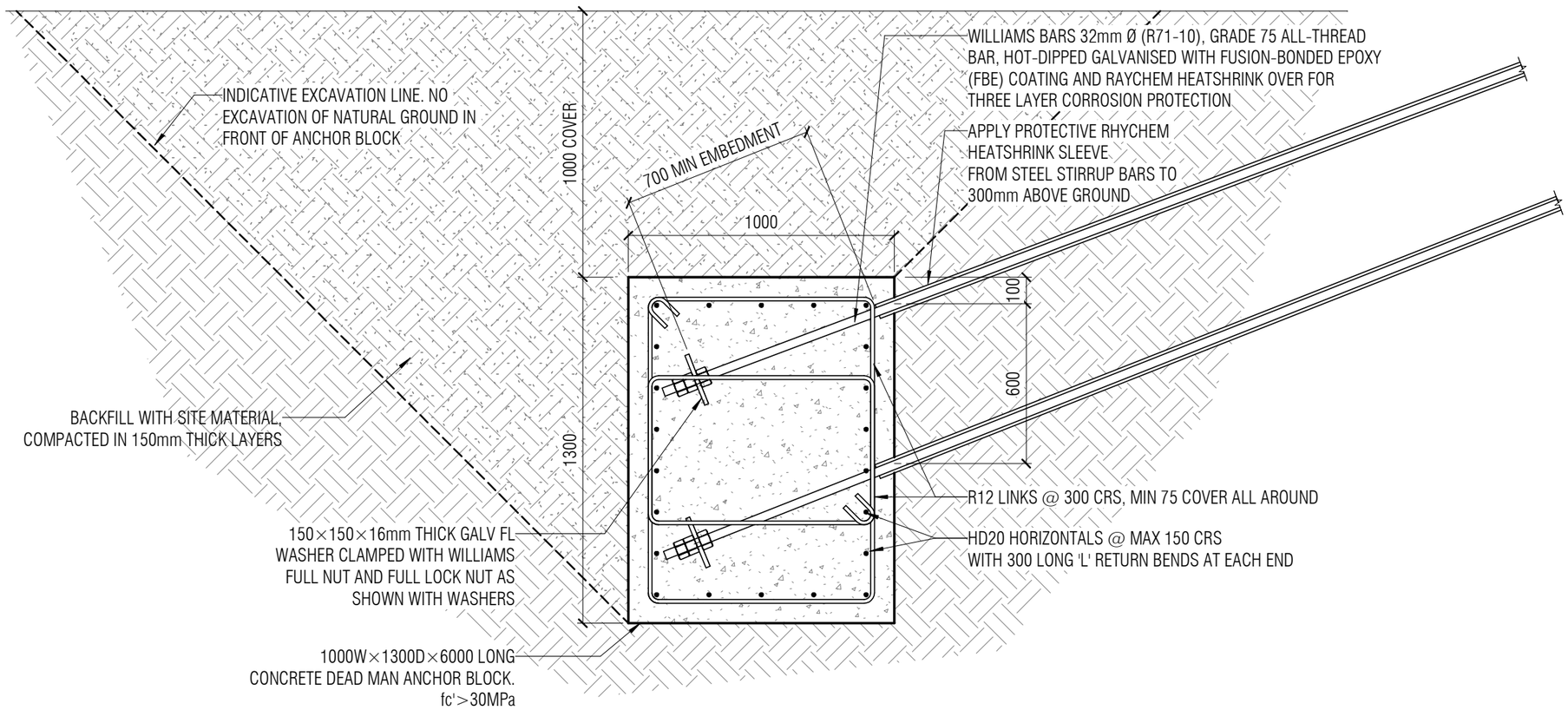


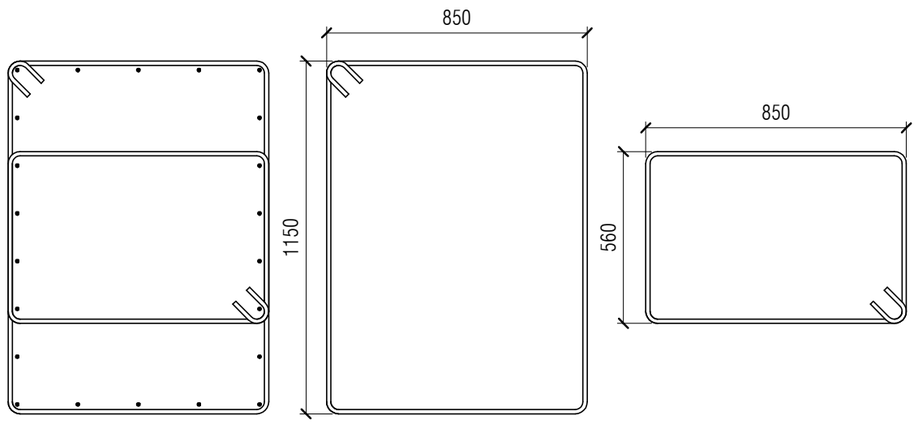
NOTES:

1. EXCAVATION FOR REINFORCED CONCRETE DEADMAN PREDOMINANTLY THROUGH APPROXIMATELY 2-3m OF SOFT TO FIRM SILT AND WET SAND.
2. STOCKPILE AND REUSE EXISTING MATERIAL FOR BACKFILL.
3. CONTRACTOR IS TO ALLOW FOR DEWATERING EXCAVATION AS REQUIRED.
4. EXCAVATE FOR DEADMAN IN THE FOLLOWING STAGES:
   - A. EXCAVATE FOR DEADMAN, INCLUDING LOWER SECTION OF TRENCH FOR ANCHOR ROD ONLY.
   - B. CONSTRUCT REINFORCED CONCRETE DEADMAN WITH STEEL PLATES (PLATES A) CAST INTO DEADMAN.
   - C. REINSTATE EXCAVATED MATERIAL AROUND REINFORCED CONCRETE DEADMAN UP TO TOP OF DEADMAN ONLY.
   - D. EXCAVATE TRENCH FOR ANCHOR ROD AND INSTALL ANCHOR RODS.
   - E. REINSTATE EXCAVATED MATERIAL IN TRENCHES FOR ANCHOR ROD AND BACKFILL REMAINDER OF DEADMAN EXCAVATION UP TO FINISHED GROUND LEVEL.

ALL EXCAVATION WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH WORKSAFE NEW ZEALAND'S GOOD PRACTICE GUIDELINE "EXCAVATION SAFETY".

WILLIAMS BAR NOTES:

1. ANCHOR BARS SHALL BE 32MM WILLIAMS GRADE 75 ALL-THREAD REBAR TO ASTM A615M-09.
2. WILLIAMS BARS AND ALL ASSOCIATED COMPONENTRY (INCLUDING WILLIAMS NUTS, WILLIAMS ALL-THREAD ANCHOR BAR AND STEEL WASHER PLATES) TO BE HOT DIP GALVANISED.
3. WILLIAMS BARS AND ALL ASSOCIATED COMPONENTRY (INCLUDING ALL WILLIAMS NUTS AND WILLIAMS ALL-THREAD ANCHOR BAR TO BE COATED WITH FUSION BONDED EPOXY COATING OVER THE HOT DIP GALVANISED COATING. THE CONTRACTOR IS TO PROPOSE A PRODUCT AND AN APPLICATOR FOR APPROVAL BY THE ENGINEER BEFORE COATING. COATING CERTIFICATES FROM THE SUPPLIER ARE TO BE SUPPLIED BY THE CONTRACTOR TO THE ENGINEER.
4. EACH ANCHOR BAR SHALL BE SUPPLIED AND INSTALLED AS A SINGLE LENGTHS WITH NO COUPLERS OR JOINERS BETWEEN THE DEADMAN ANCHOR AND THE MAIN CABLE CONNECTION FITTING.
5. WILLIAMS R73 HEX NUTS AND FULL LOCK NUT SHALL BE USED WITH THE WASHER AT THE ENDS OF THE WILLIAMS ALL-THREAD ANCHOR BAR AS INDICATED ON THE DRAWINGS.



STIRRUP SETS
38 REQUIRED

R12 STIRRUP FABRICATION DETAILS

FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY, Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: DEADMAN ANCHOR DETAILS

SCALE: 1 : 20 @ A3			DATE: SEPTEMBER 2024
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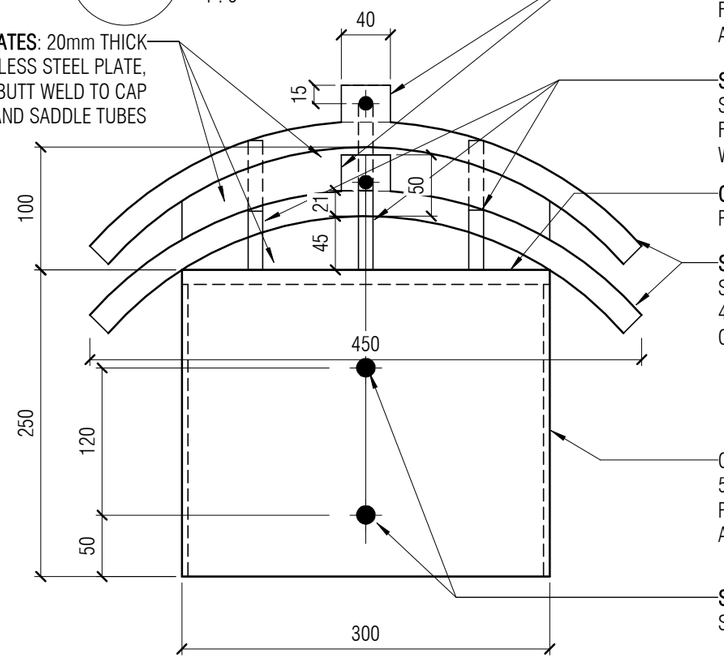
Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

16 SADDLE ELEVATION

1 : 5



SADDLE WEB PLATES: 20mm THICK TYPE 316 STAINLESS STEEL PLATE, FULL PENETRATION BUTT WELD TO CAP BARREL AND SADDLE TUBES

SADDLE PIN TAG: FULL STRENGTH BUTT WELD TAG MADE OF SADDLE TUBE MATERIAL OR RETAIN 40MM WIDE SECTION OF FULL PIPE CIRCUMFERENCE AT HIGH-POINT OF SADDLE, CUT AND UNFOLD TO FORM TAGS FOR HOLDING PIN BOLTS

SADDLE STIFFENER PLATES: 12mm THICK TYPE 316L STAINLESS STEEL PLATE, 6mm FILLET WELD ALL ROUND OR FULL PENETRATION BUTT WELD TO CAP BARREL, SADDLE WEB, AND SADDLE TUBE

CAP TOP PLATE: 12mm TYPE 316L STAINLESS STEEL PLATE, FULL PENETRATION BUTT WELD TO CAP BARREL

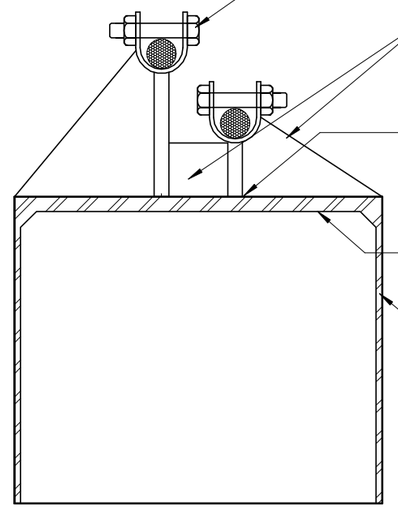
SADDLE TUBES: 32mm NOMINAL BORE (NB), STAINLESS STEEL SCHEDULE 40 PIPE, TYPE 316L SS TO ASTM A312, 42.4 OD, 3.56 WALL THICKNESS
CURVED TO 300mm RADIUS

CAP BARREL ROLLED TO 300 OD WITH 5mm TYPE 316L STAINLESS STEEL PLATE, FULL PENETRATION BUTT WELD AT JOINT

SADDLE BOLTS: 2/M16 STAINLESS STEEL BOLTS WITH NYLOK NUTS

17 SADDLE CROSS SECTION

1 : 5



HOLDING PIN BOLTS M8 STAINLESS STEEL ENG BOLT WITH NYLOK NUT THROUGH 10mm HOLE

SADDLE STIFFENER PLATES, 12mm THICK TYPE 316L STAINLESS STEEL PLATE, 6mm FILLET WELD ALL ROUND OR FULL PENETRATION BUTT WELD TO CAP BARREL, SADDLE WEB, AND SADDLE TUBE

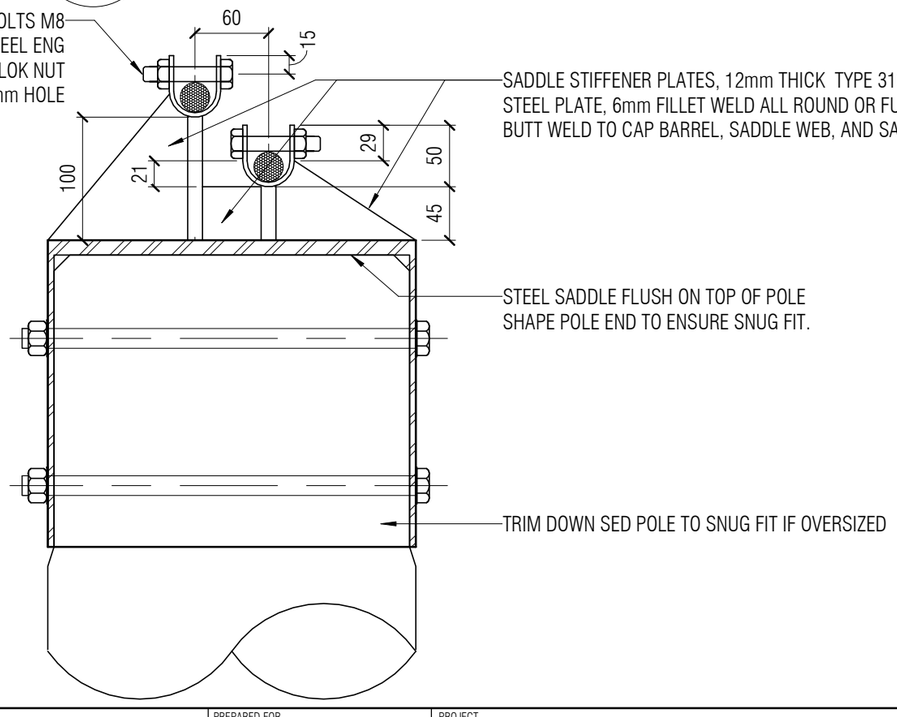
8 BOTH SIDES

STEEL SADDLE FLUSH ON TOP OF POLE SHAPE POLE END TO ENSURE SNUG FIT.

CAP BARREL ROLLED TO 300 OD WITH 5mm TYPE 316L STAINLESS STEEL PLATE, FULL PENETRATION BUTT WELD AT JOINT

18 SADDLE ASSEMBLY

1 : 5



HOLDING PIN BOLTS M8 STAINLESS STEEL ENG BOLT WITH NYLOK NUT THROUGH 10mm HOLE

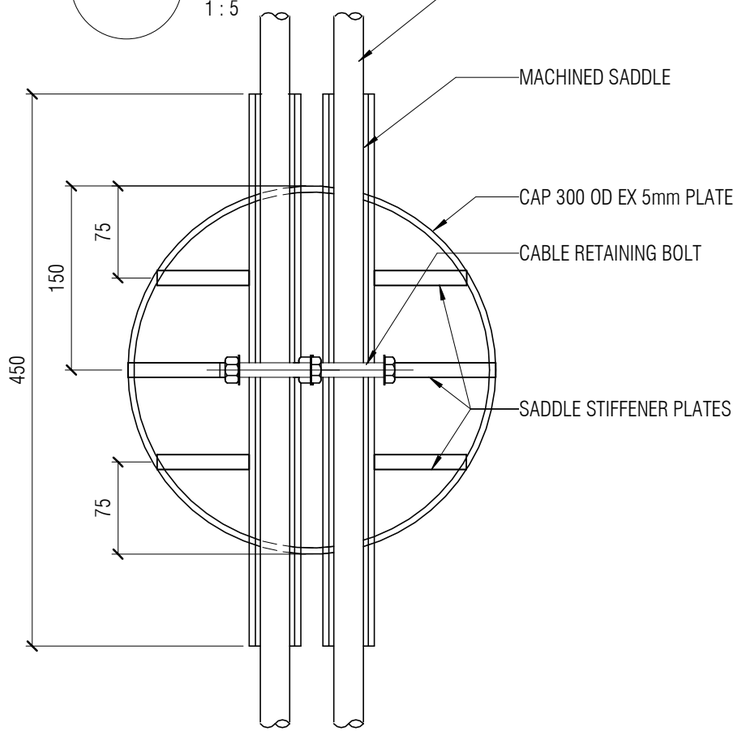
SADDLE STIFFENER PLATES, 12mm THICK TYPE 316L STAINLESS STEEL PLATE, 6mm FILLET WELD ALL ROUND OR FULL PENETRATION BUTT WELD TO CAP BARREL, SADDLE WEB, AND SADDLE TUBE

STEEL SADDLE FLUSH ON TOP OF POLE SHAPE POLE END TO ENSURE SNUG FIT.

TRIM DOWN SED POLE TO SNUG FIT IF OVERSIZED

19 SADDLE PLAN

1 : 5



24mm MAIIN CABLE

MACHINED SADDLE

CAP 300 OD EX 5mm PLATE

CABLE RETAINING BOLT

SADDLE STIFFENER PLATES

NOTES:

1. ALL STEEL FABRICATION WORK SHALL BE IN ACCORDANCE WITH AS/NZS5131 AND NZS3404.
2. THE EDGES OF ALL STEEL PLATES SHALL BE ROUNDED OFF TO A MINIMUM OF 2mm.
3. STEEL PLATE SHALL BE MINIMUM GRADE 316 STAINLESS STEEL UNLESS SPECIFIED OTHERWISE.
4. ALL SADDLE WELDS TO BE GENERAL PURPOSE (GP), REFER SHEET 05 FOR NOTES ON GP WELDS.

FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI; Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: TOWER SADDLE ASSEMBLY

SCALE	1 : 5 @ A3
DATE	SEPTEMBER 2024
DRAWN	Sec 9(2)(a)
FGL JOB	23-097
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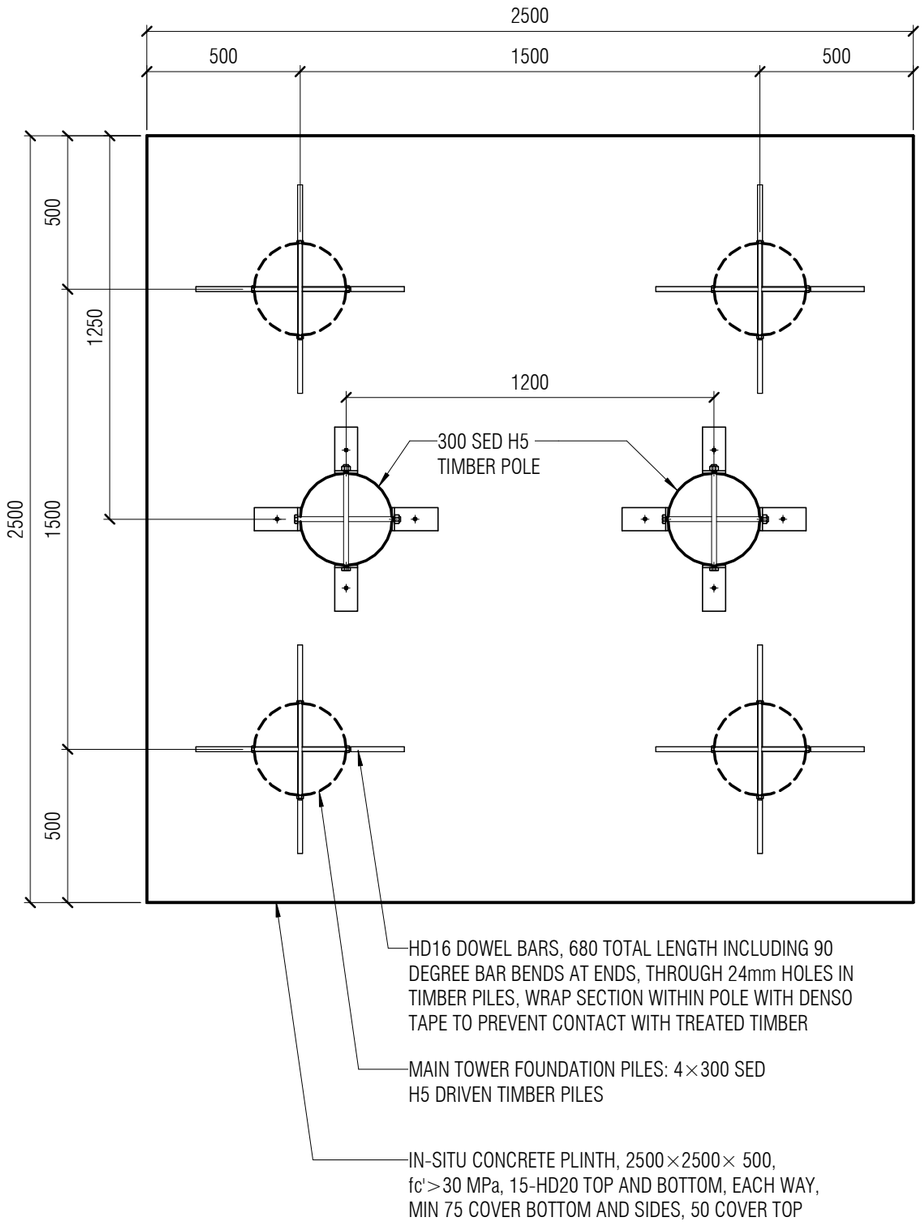
DRAWING No.	23-097 -10
REV	A

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

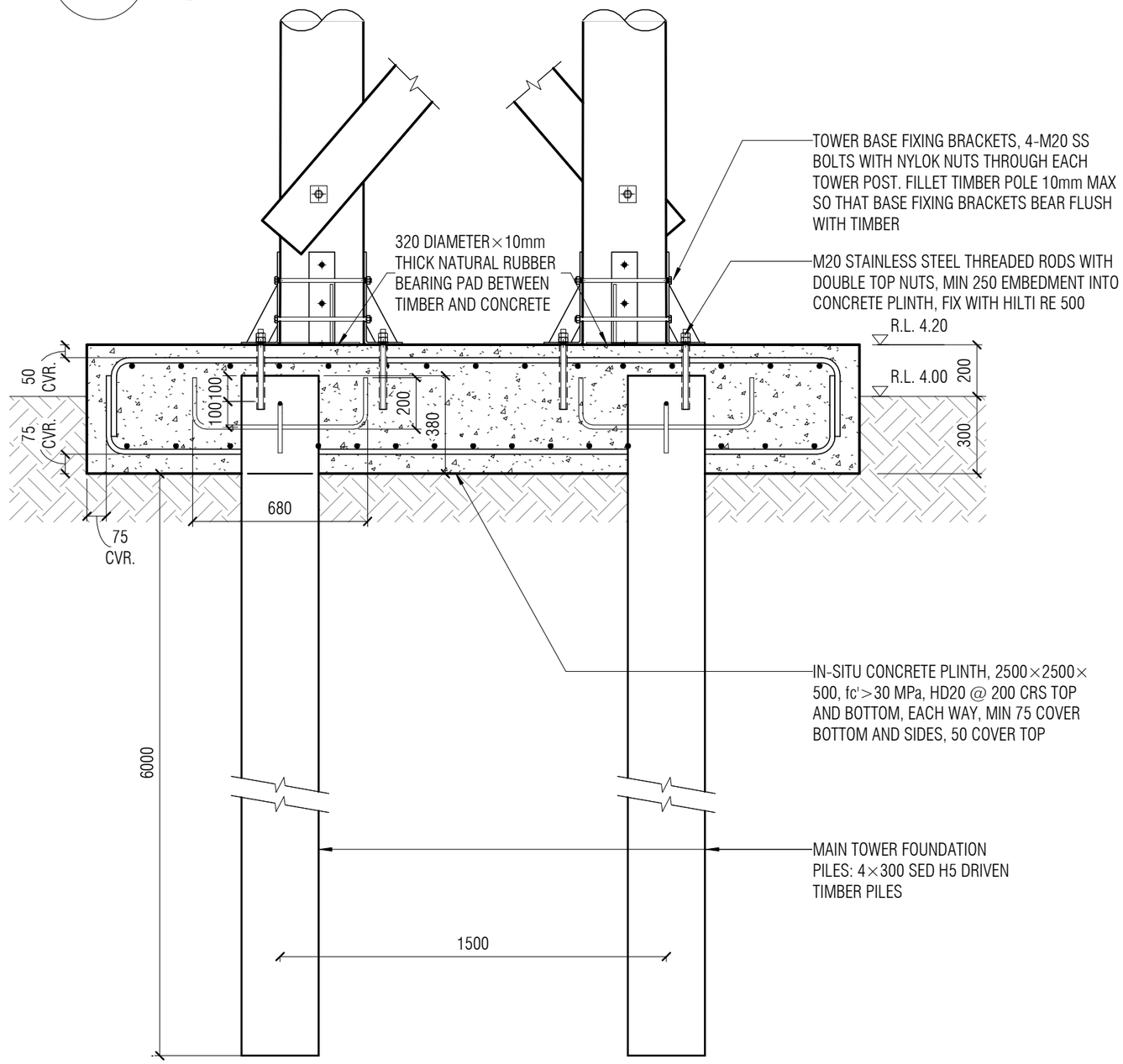
20 BRIDGE TOWER FOUNDATION PLAN

1 : 20



21 BRIDGE TOWER FOUNDATION SECTION

1 : 20



FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR
NZ TRANSPORT AGENCY
Te ARAROA

PROJECT
WHANGAEHU RIVER SWING BRIDGE

TITLE
BRIDGE FOUNDATION DETAILS - SHEET 1

SCALE	DATE
1 : 20 @ A3	SEPTEMBER 2024
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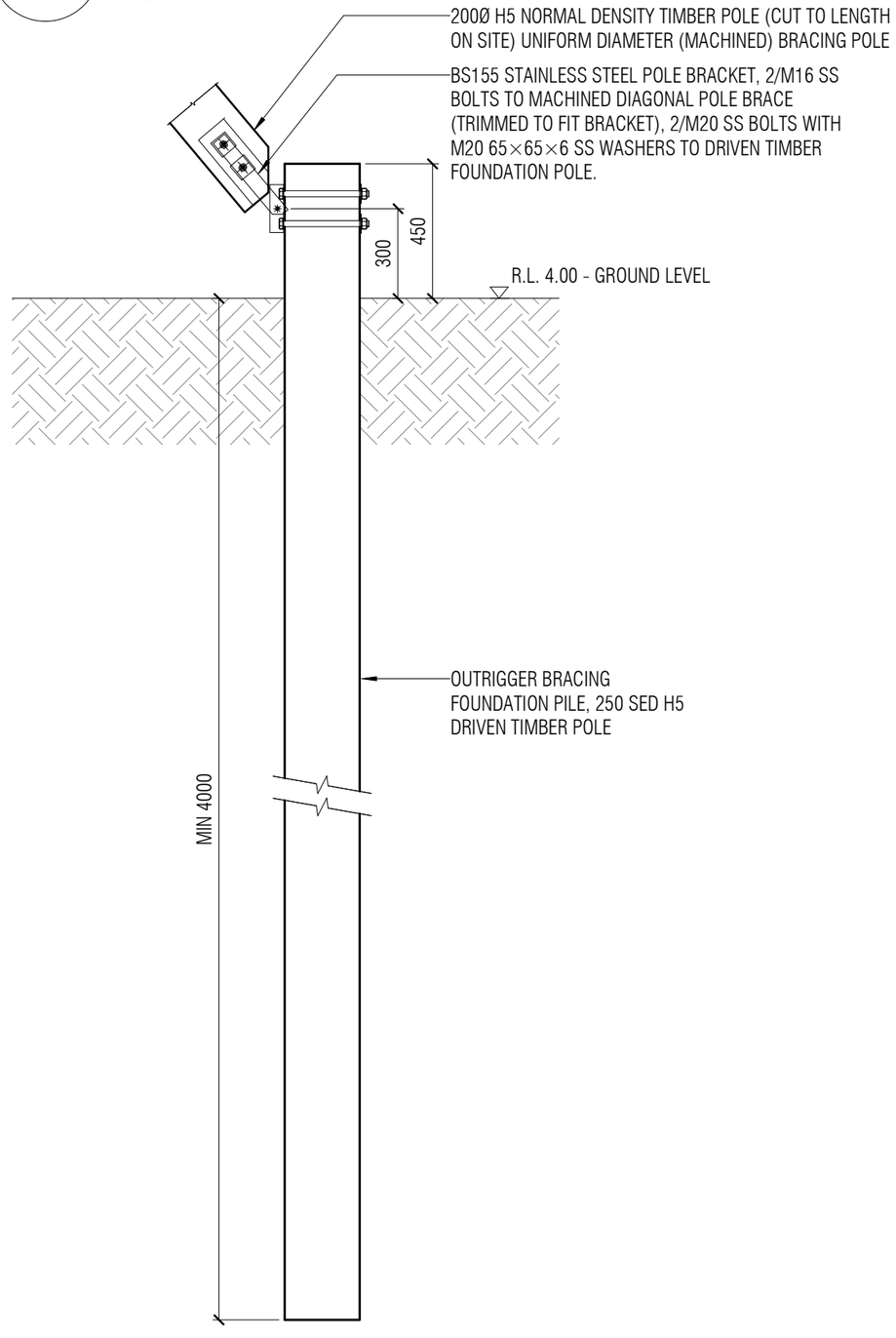
Sec 9(2)(a)	23-097
DRAWING PACKAGE VERSION	DRAWING No. / REV
2.FOR CONSENT	23-097 -11 / A

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

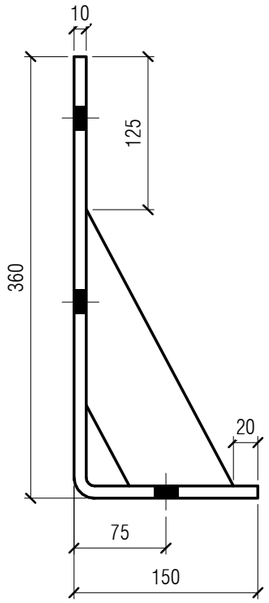
22 PILE FOUNDATION DETAIL FOR TOWER BRACES

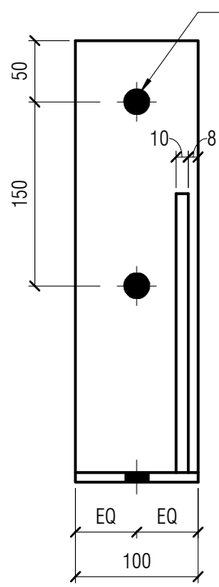
1 : 20



23 BASE FIXING BRACKET (ACROSS)

1 : 5 (8 TOTAL REQUIRED)



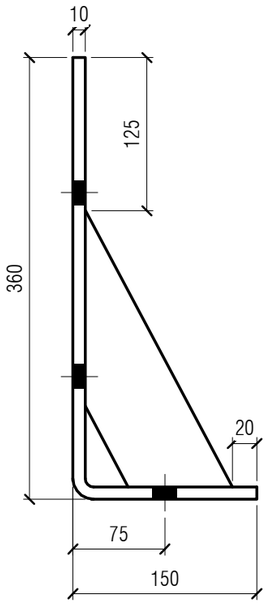


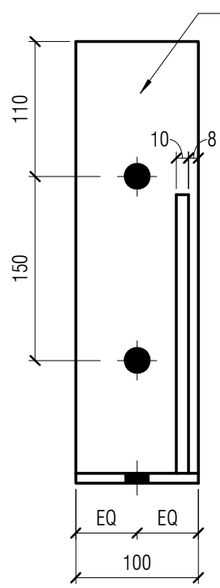
FABRICATED FROM 10mm PLATE /100×10 FLAT.

ALL WELDS 6mm FILLET ALL-AROUND.

24 BASE FIXING BRACKET (ALONG)

1 : 5 (8 TOTAL REQUIRED)





FABRICATED FROM 10mm PLATE /100×10 FLAT.

ALL WELDS 6mm FILLET ALL-AROUND.

BASE FIXING BRACKET NOTES:

1. ALL STEEL FABRICATION WORK SHALL BE IN ACCORDANCE WITH AS/NZS5131 AND NZS3404.
2. THE EDGES OF ALL STEEL PLATES SHALL BE ROUNDED OFF TO A MINIMUM OF 2mm.
3. STEEL PLATE SHALL BE MINIMUM GRADE 316 STAINLESS STEEL UNLESS SPECIFIED OTHERWISE.
4. ALL BASE FIXING BRACKET WELDS TO BE GENERAL PURPOSE (GP), REFER SHEET 05 FOR NOTES ON GP WELDS.
5. ALL STEEL PLATE TO BE 10mm THICK.
6. ALL BRACKET WELDS TO BE FULL LENGTH FULL PENETRATION BUTT WELDS OR 6mm FILLET WELD ALL ROUND.

FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI / Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: BRIDGE FOUNDATION DETAILS - SHEET 2

SCALE: As indicated @ A3			DATE: SEPTEMBER 2024
DRAWN: Sec 9(2)(a)	DESIGNED	APPROVED	FGL JOB: 23-097
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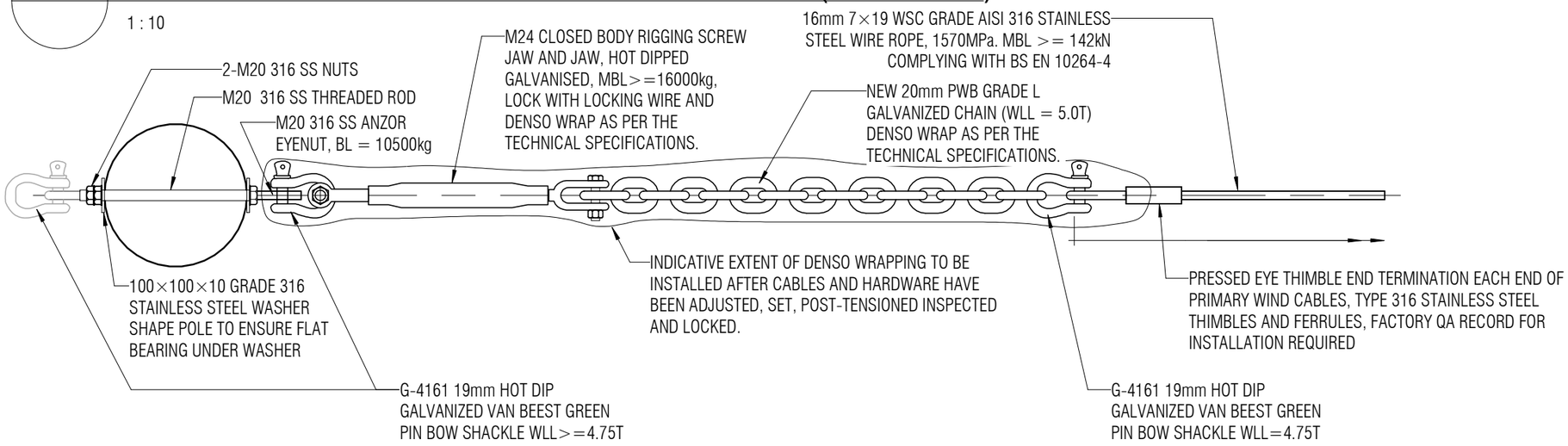
Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

25 PRIMARY WIND CABLE END CONNECTION DETAIL (PLAN VIEW)

1 : 10

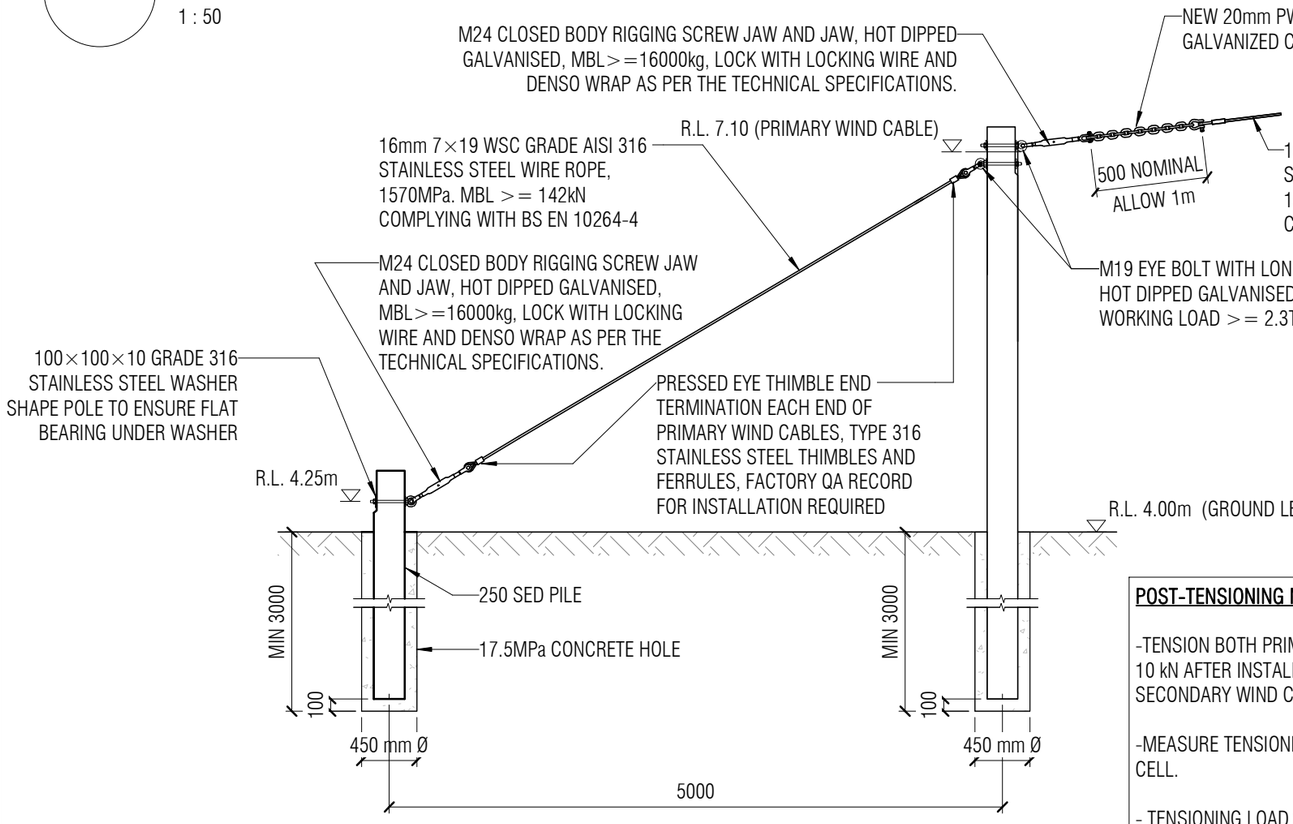


NOTES:

ALL RIGGING HARDWARE (INCL. RIGGING SCREWS, SHACKLES, & EYEBOLTS) ARE TO BE LOCK WIRED WITH MIN. 2.0mm GRADE 316 STAINLESS STEEL WIRE TO PREVENT UNWINDING **IMMEDIATELY AFTER INSTALLATION**. REFER TO THE TECHNICAL SPECIFICATIONS FOR RIGGING SCREW LOCK WIRE INSTALLATION.

26 PRIMARY WIND BACK-SPAN DETAIL

1 : 50



POST-TENSIONING NOTE:

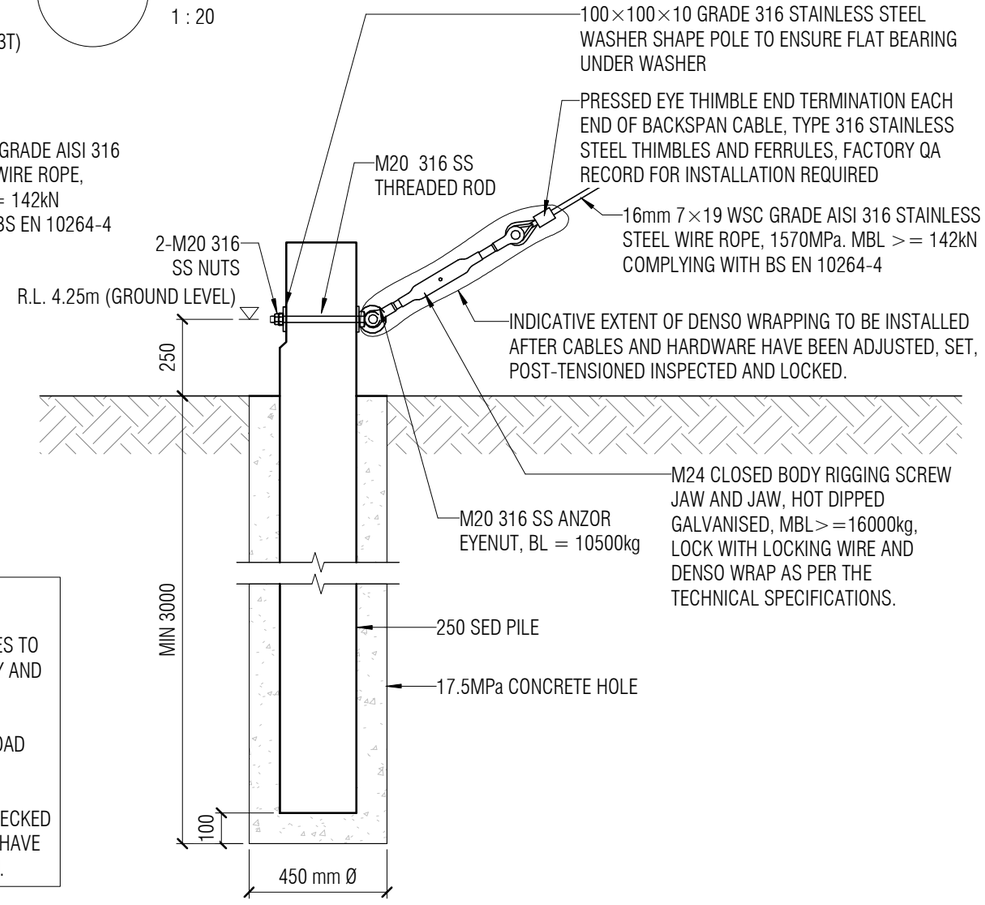
-TENSION BOTH PRIMARY WIND CABLES TO 10 kN AFTER INSTALLING ALL PRIMARY AND SECONDARY WIND CABLES.

-MEASURE TENSIONING LOAD WITH LOAD CELL.

- TENSIONING LOAD SHOULD BE RECHECKED AFTER 20 MINUTES AS IT WILL LIKELY HAVE REDUCED DUE TO CABLE ELONGATION.

27 PRIMARY WIND BACK-SPAN FOUNDATION DETAIL

1 : 20



FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI; Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

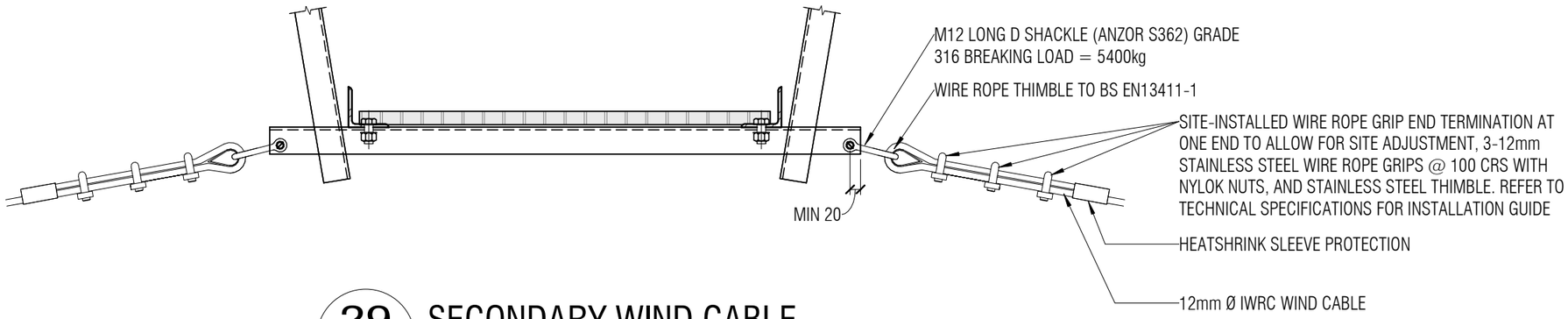
TITLE: BRIDGE WIND CABLE AND ANCHORING DETAILS

SCALE: As indicated @ A3	DATE: SEPTEMBER 2024
DRAWN / DESIGNED / APPROVED: Sec 9(2)(a)	FGL JOB: 23-097
DRAWING PACKAGE VERSION: 2.FOR CONSENT	DRAWING No.: 23-097 -13
	REV: A

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

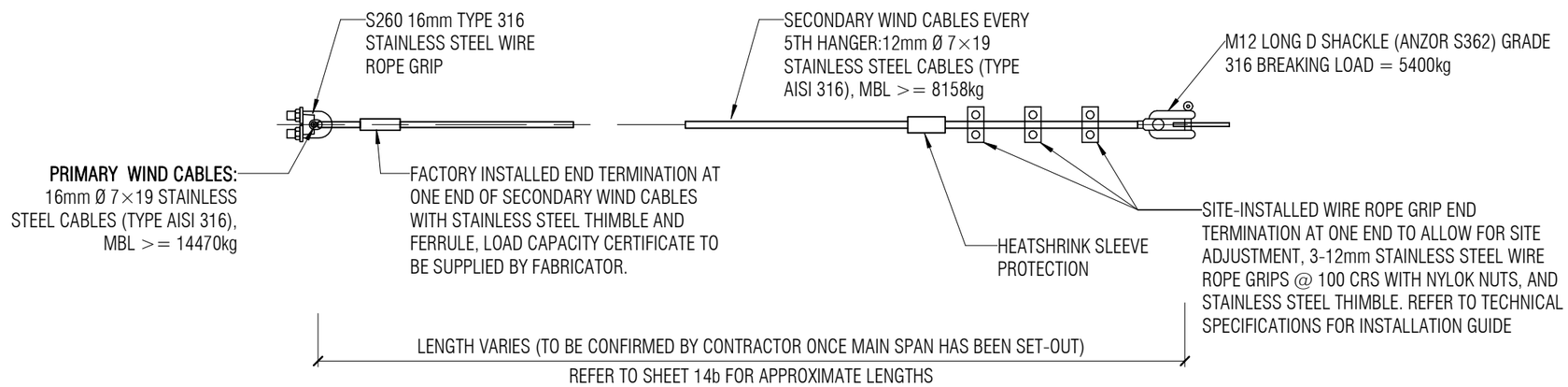
28 SECONDARY WIND CABLE END CONNECTION DETAIL

1 : 10



29 SECONDARY WIND CABLE

1 : 10



FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI; Te ARAROA TE WHANGANUI-A-TARA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: SECONDARY WIND CABLE DETAILS

SCALE	DATE
1 : 10 @ A3	SEPTEMBER 2024
DRAWN: Sec 9(2)(a) / DESIGNED / APPROVED	FGL JOB: 23-097
DRAWING PACKAGE VERSION: 2.FOR CONSENT	DRAWING No.: 23-097 -14 / REV: A

Rev	Date	Amendment	Drawn

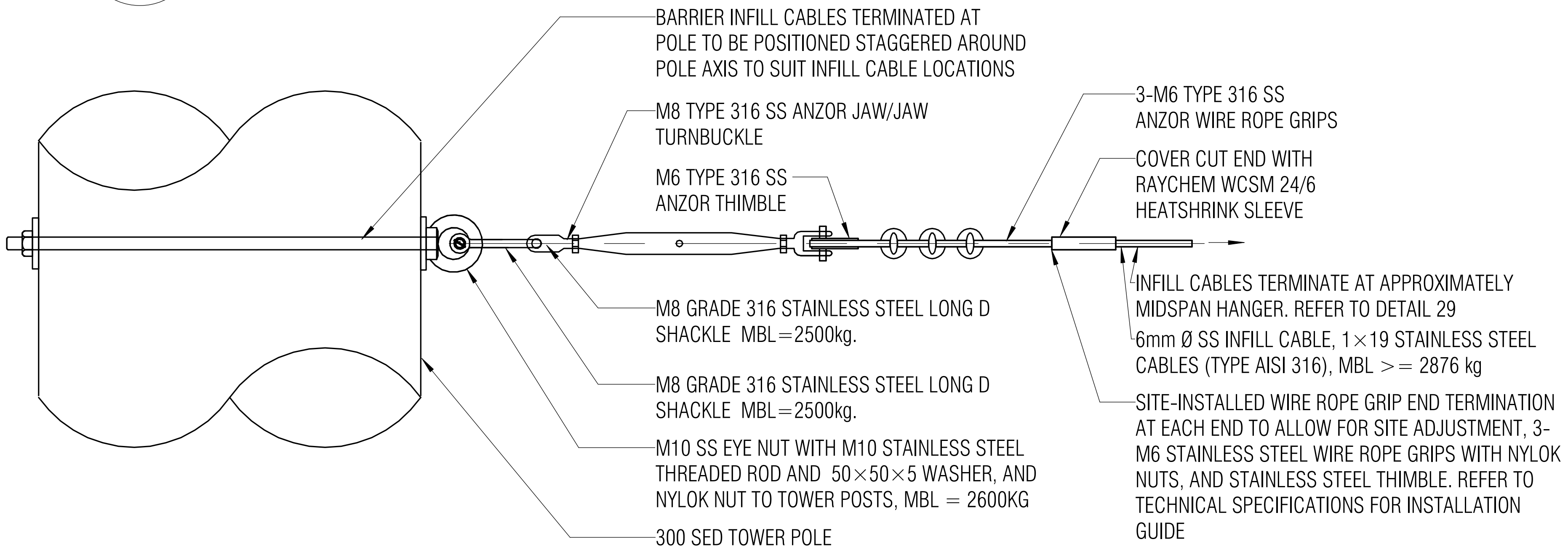
INFILL BARRIER NOTES:

1. INFILL BARRIER COMPONENT DETAILS:
- TURNBUCKLES: M8 GRADE 316 STAINLESS STEEL JAW-JAW PIPE TURNBUCKLE MBL = 2200kg. (ANZOR S312P).
- WIRE ROPE: 6MMØ 7X19 GRADE 316 STAINLESS STEEL WIRE ROPE, MBL=2086kg. (ANZOR).
- THIMBLE: M6 GRADE 316 STAINLESS STEEL WIRE ROPE THIMBLE. (ANZOR S234).
- WIRE ROPE GRIPS: M6 GRADE 316 STAINLESS STEEL WIRE ROPE GRIPS. (ANZOR S260).
- SHACKLES: M8 GRADE 316 STAINLESS STEEL D SHACKLE MBL=2800kg. (ANZOR S360) OR M8 GRADE 316 STAINLESS STEEL LONG D SHACKLE MBL = 2500kg (ANZOR S362)

2. ALL RIGGING HARDWARE (INCL. RIGGING SCREWS, SHACKLES, & EYEBOLTS) ARE TO BE LOCK WIRED WITH MIN. 2.0mm GRADE 316 STAINLESS STEEL WIRE TO PREVENT UNWINDING IMMEDIATELY AFTER INSTALLATION. REFER TO THE TECHNICAL SPECIFICATIONS FOR RIGGING SCREW LOCK WIRE INSTALLATION.

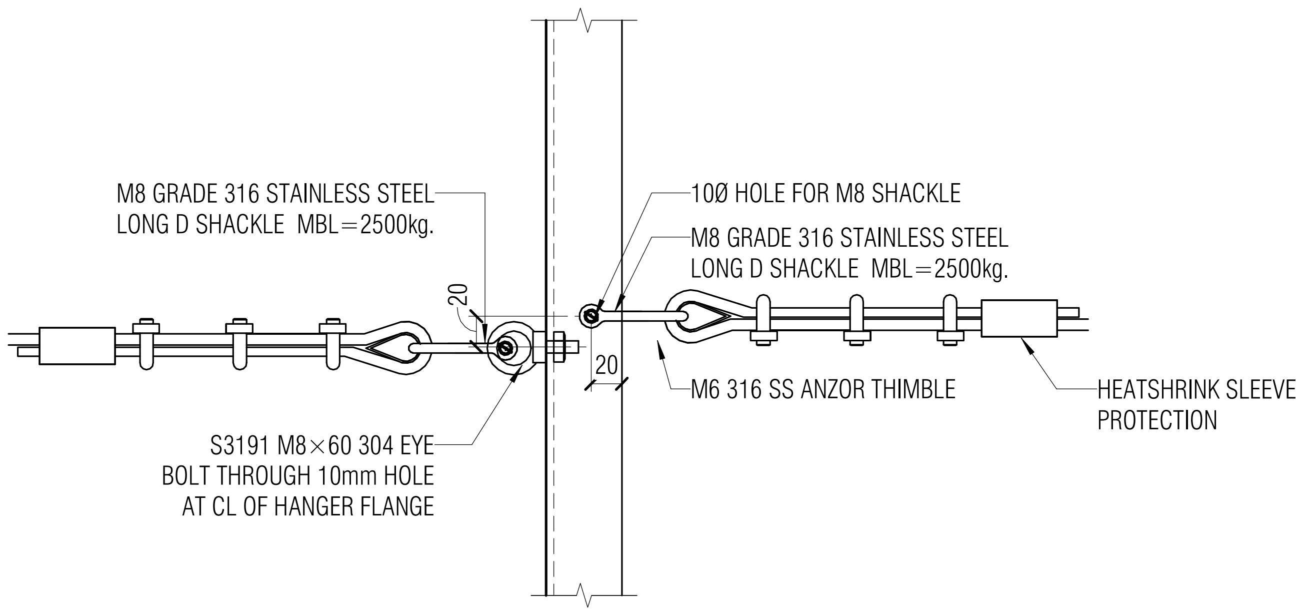
30 INFILL CABLE CONNECTION DETAIL AT TOWERS

1 : 5



31 INFILL CABLE CONNECTION DETAIL AT MID SPAN

1 : 5 (HANGER 36 ONLY)



FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI; Te ARAROA NEW ZEALAND'S TRAIL

PROJECT: WHANGAEHU RIVER SWING BRIDGE

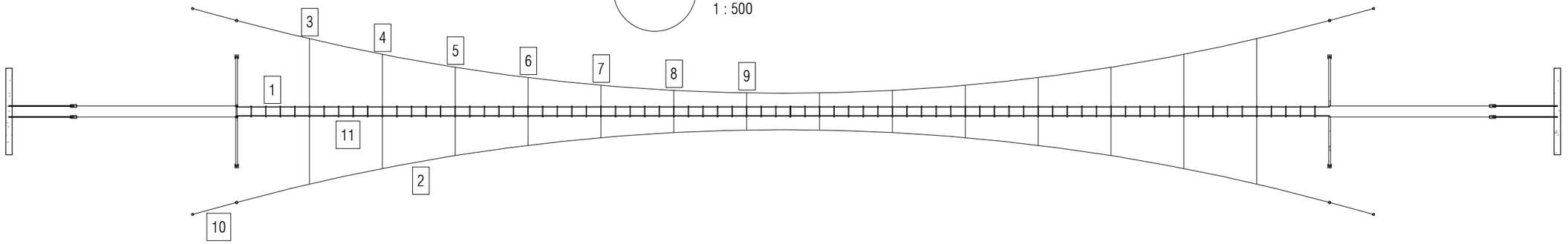
TITLE: INFILL BARRIER DETAILS

SCALE	DATE
1 : 5 @ A3	SEPTEMBER 2024
DRAWN: Sec 9(2)(a)	FGL JOB: 23-097
DRAWING PACKAGE VERSION: 2.FOR CONSENT	DRAWING No.: 23-097 -14a
	REV:

Rev	Date	Amendment	Drawn

32 CABLE PLAN

1 : 500



Cable Name	Cable Type	End Termination	Reference No#	No# Required	Approximate Length (m)
Main Cables (including back span)	24mm Ø 1.4401 (AISI 316) STAINLESS STEEL (INOX) FATZER SPIRAL STRAND ROPE (OSS) MAIN CABLE TO DIN EN 12385-10 AND 10264-4, MBL >= 489kN	HYEND FATZER OPEN SOCKET EACH END OF MAIN CABLES, STAINLESS STEEL (INOX) for M24 MAIN CABLE, FACTORY QA RECORD FOR INSTALLATION REQUIRED	1	4	160
Primary Wind Cables	16mm 7×19 WSC GRADE AISI 316 STAINLESS STEEL WIRE ROPE, 1570MPa. MBL >= 142kN COMPLYING WITH BS EN 10264-4	PRESSED EYE THIMBLE END TERMINATION EACH END, TYPE 316 STAINLESS STEEL THIMBLES AND FERRULES, FACTORY QA RECORD FOR INSTALLATION REQUIRED	2	2	122
Secondary Wind Cables	SECONDARY WIND CABLES EVERY 5TH HANGER:12mm Ø 7×19 STAINLESS STEEL CABLES (TYPE AISI 316), MBL >= 8158 kg	FACTORY INSTALLED END TERMINATION AT ONE END WITH STAINLESS STEEL THIMBLE AND FERRULE, LOAD CAPACITY CERTIFICATE TO BE SUPPLIED BY FABRICATOR. OTHER END IS SITE-INSTALLED WIRE ROPE GRIP END TERMINATION AT ONE END TO ALLOW FOR SITE ADJUSTMENT, 3-12mm STAINLESS STEEL WIRE ROPE GRIPS @ 100 CRS WITH NYLOK NUTS, AND STAINLESS STEEL THIMBLE.	3	4	8.6
			4	4	6.6
			5	4	4.9
			6	4	3.6
			7	4	2.6
			8	4	2
			9	4	1.7
Wind Cables Back Span	16mm 7×19 WSC GRADE AISI 316 STAINLESS STEEL WIRE ROPE, 1570MPa. MBL >= 142kN COMPLYING WITH BS EN 10264-4	PRESSED EYE THIMBLE END TERMINATION EACH END, TYPE 316 STAINLESS STEEL THIMBLES AND FERRULES, FACTORY QA RECORD FOR INSTALLATION REQUIRED	10	4	4.7
Barrier Infill Cables	6mm Ø SS INFILL CABLE, 1×19 STAINLESS STEEL CABLES (TYPE AISI 316), MBL >= 2876 kg	SITE-INSTALLED WIRE ROPE GRIP END TERMINATION AT EACH END TO ALLOW FOR SITE ADJUSTMENT, 3-M6 STAINLESS STEEL WIRE ROPE GRIPS WITH NYLOK NUTS, AND STAINLESS STEEL THIMBLE. REFER TO THE TECHNICAL SPECIFICATIONS FOR THE INSTALLATION GUIDE	11	4	60

NOTES:

CABLE LENGTHS FOR PRICING ONLY - CABLE LENGTHS SHALL BE CONFIRMED BY THE CONTRACTOR FOLLOWING INSTALLATION OF ANCHORS & ERECTION OF TOWERS. CABLES SHALL NOT BE FABRICATED UNTIL ANCHORS HAVE BEEN INSTALLED AND THESE LENGTHS HAVE BEEN CONFIRMED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.

END TERMINATIONS TO BE WRAPPED TO PREVENT DAMAGE TO COATING DURING TRANSPORTATION.

ALL CABLES TO BE MEASURED AND CUT ON THE SAME DAY AT THE SAME TEMPERATURE TO ENSURE THAT THEY ARE ALL THE SAME LENGTH.

FACTORY QA RECORDS FOR END TERMINATION INSTALLATION SHALL BE SUBMITTED TO THE ENGINEER BEFORE DELIVERY TO SITE.

FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR NZ TRANSPORT AGENCY WAKA KOTAHI / Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: CABLE SUMMARY

SCALE: As indicated @ A3

DATE: SEPTEMBER 2024

DRAWN | DESIGNED | APPROVED: Sec 9(2)(a)

FGL JOB: 23-097

DRAWING PACKAGE VERSION: 2.FOR CONSENT

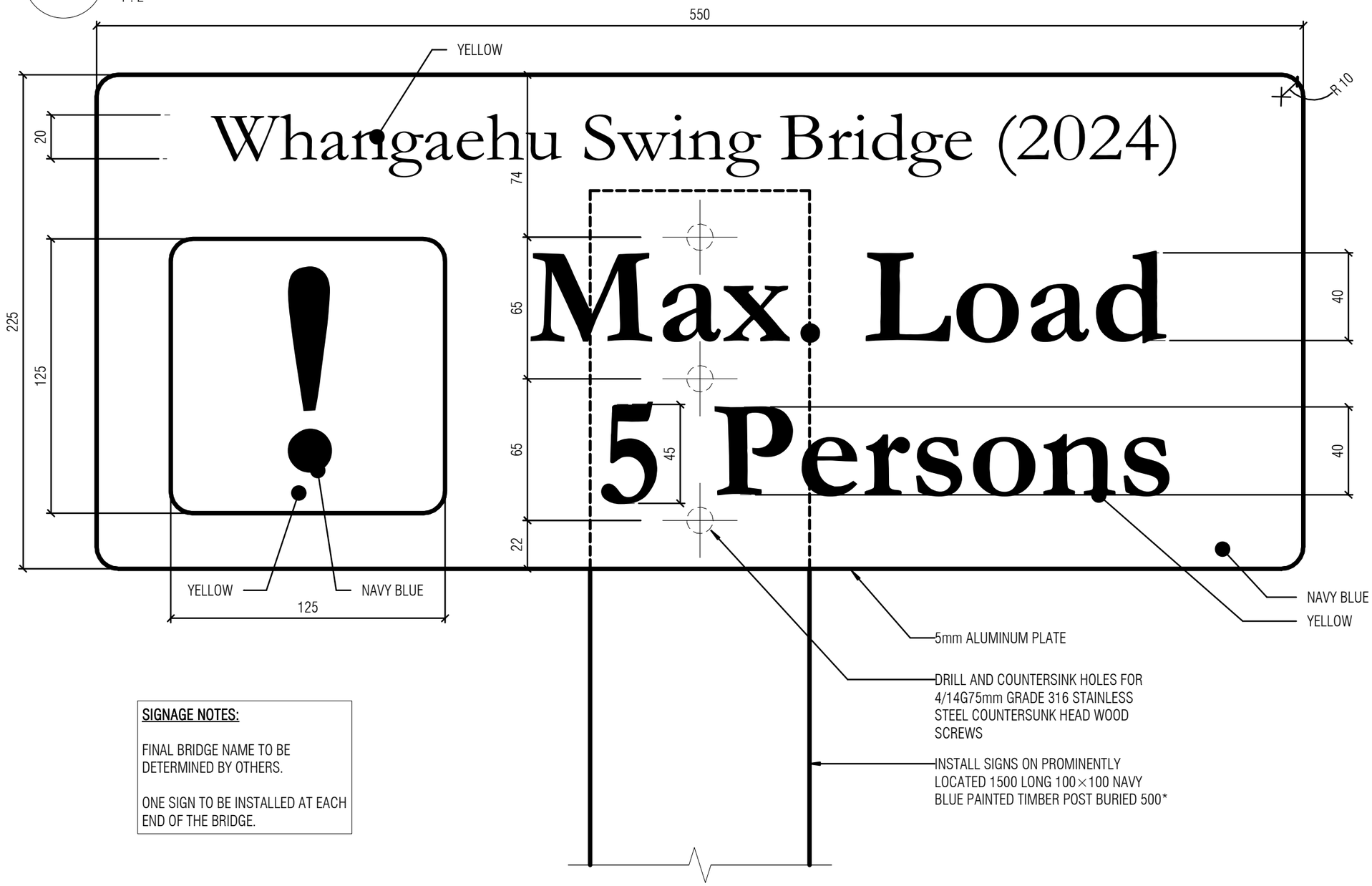
DRAWING No.: 23-097 -14b

REV

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

33 LOAD RESTRICTION SIGN (2 REQUIRED)

1 : 2



SIGNAGE NOTES:

FINAL BRIDGE NAME TO BE DETERMINED BY OTHERS.

ONE SIGN TO BE INSTALLED AT EACH END OF THE BRIDGE.

FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI; Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: LOAD RESTRICTION SIGN DETAIL

SCALE	1 : 2 @ A3
DATE	SEPTEMBER 2024
DRAWN / DESIGNED / APPROVED	Sec 9(2)(a)
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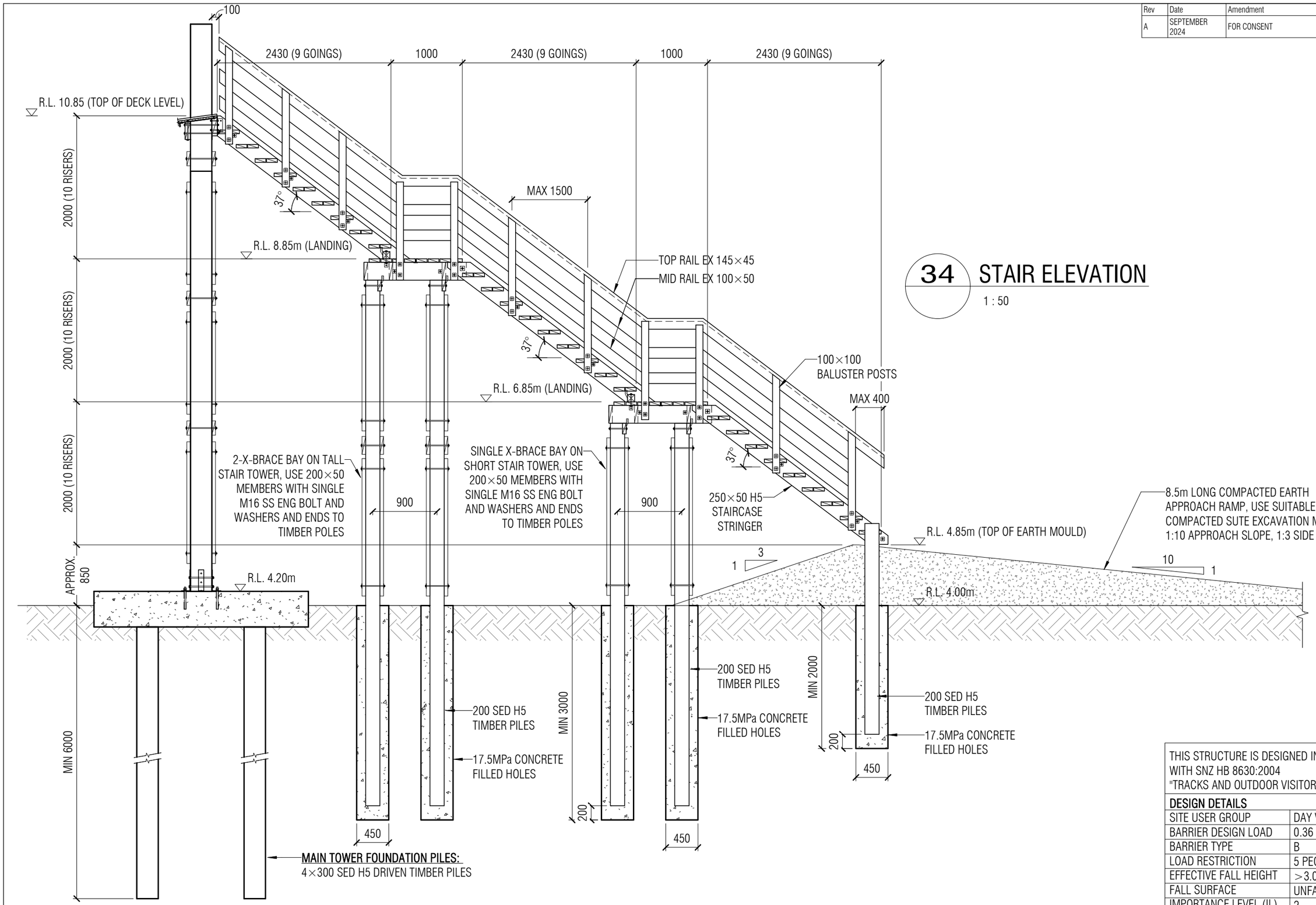
DRAWING No.	23-097 -15
REV	A

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)



34 STAIR ELEVATION

1 : 50

THIS STRUCTURE IS DESIGNED IN ACCORDANCE WITH SNZ HB 8630:2004 "TRACKS AND OUTDOOR VISITOR STRUCTURES"

DESIGN DETAILS	
SITE USER GROUP	DAY VISITOR (DV)
BARRIER DESIGN LOAD	0.36 kN/m
BARRIER TYPE	B
LOAD RESTRICTION	5 PEOPLE
EFFECTIVE FALL HEIGHT	>3.0m
FALL SURFACE	UNFAVOURABLE
IMPORTANCE LEVEL (IL)	2
DESIGN LIFE	50 YEARS

FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY WAKA KOTAHI; TE ARAROA NEW ZEALAND TRAIL

PROJECT: WHANGAEHU RIVER SWING BRIDGE

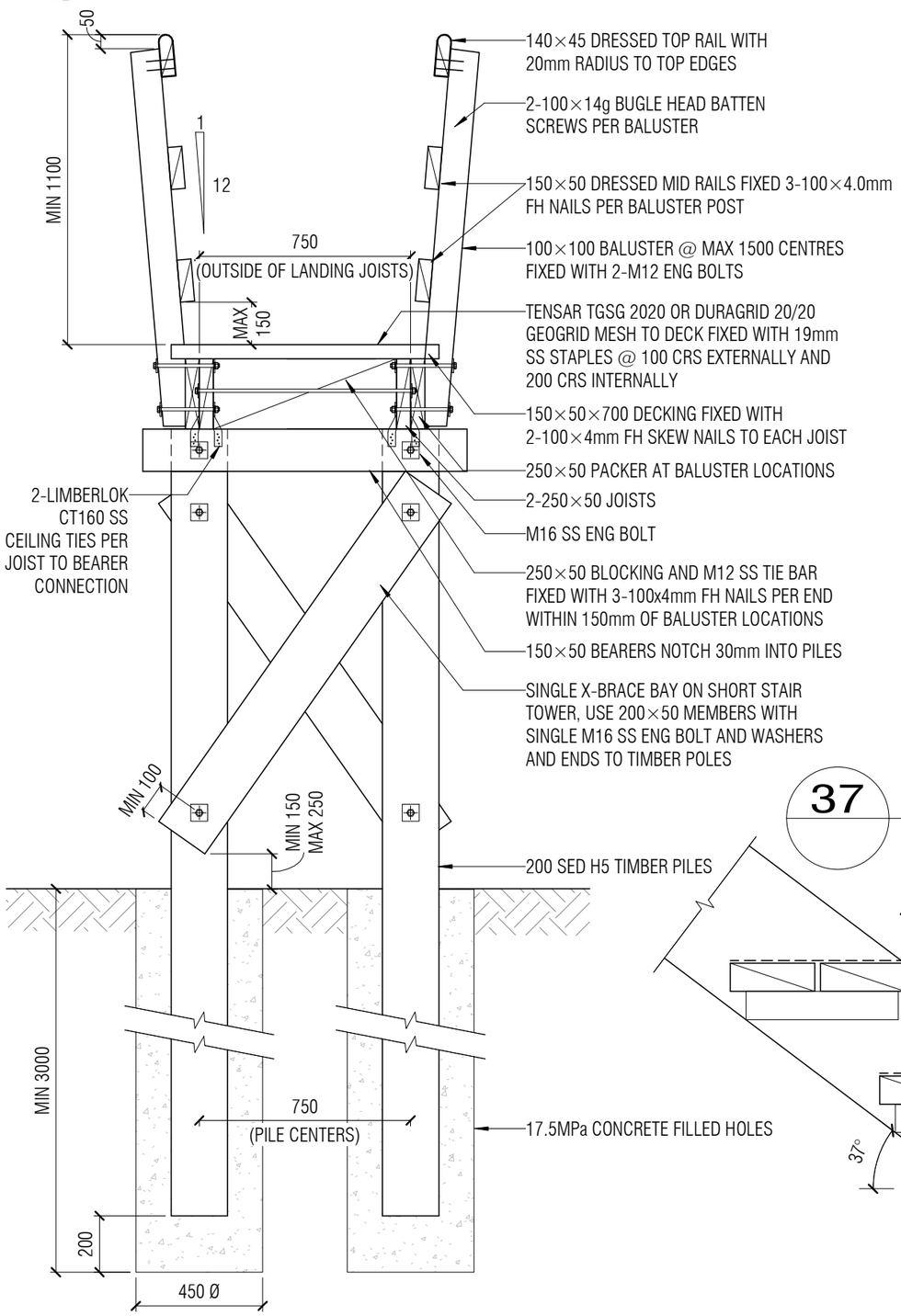
TITLE: STAIRCASE ELEVATION

SCALE	DATE
1 : 50 @ A3	SEPTEMBER 2024
DRAWN: Sec 9(2)(a)	FGL JOB: 23-097
DRAWING PACKAGE VERSION: 2.FOR CONSENT	DRAWING No.: 23-097 -16 / REV: A

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

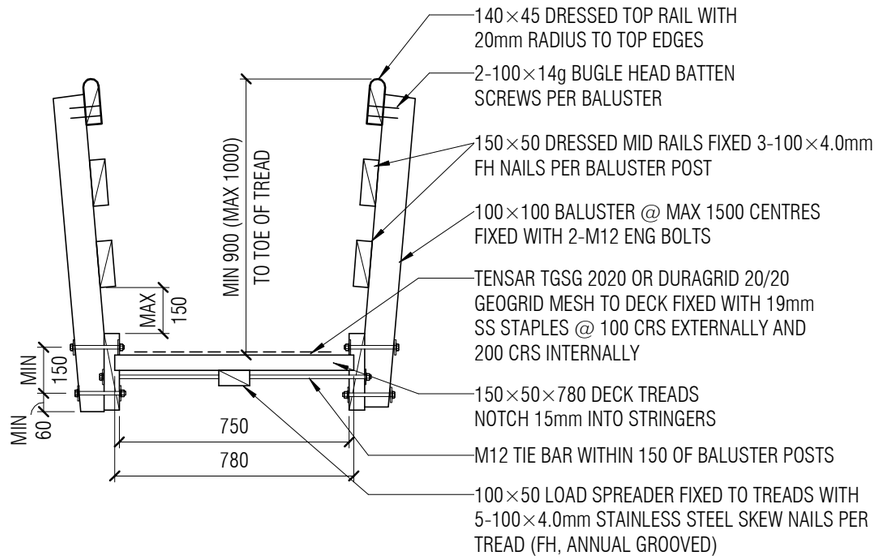
35 LOWER STAIRCASE LANDING SECTION

1 : 20



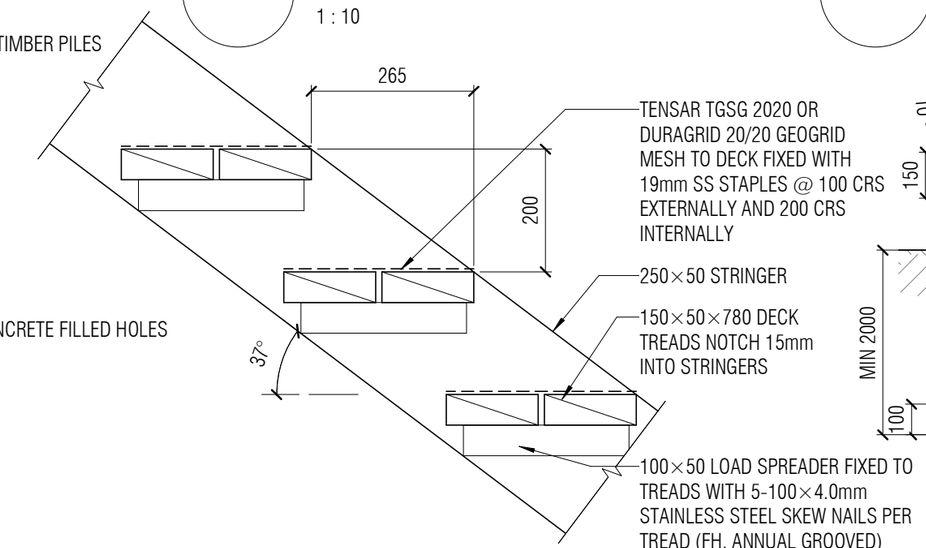
36 TYPICAL STAIRCASE SECTION

1 : 20



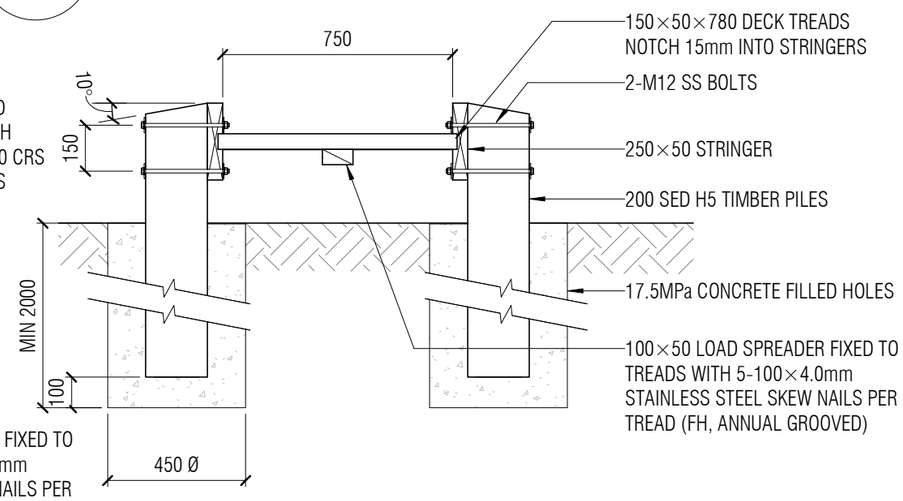
37 STAIRCASE TREAD DETAIL

1 : 10



38 STAIRCASE BOTTOM FOUNDATION SECTION

1 : 20



FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR: NZ TRANSPORT AGENCY; Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

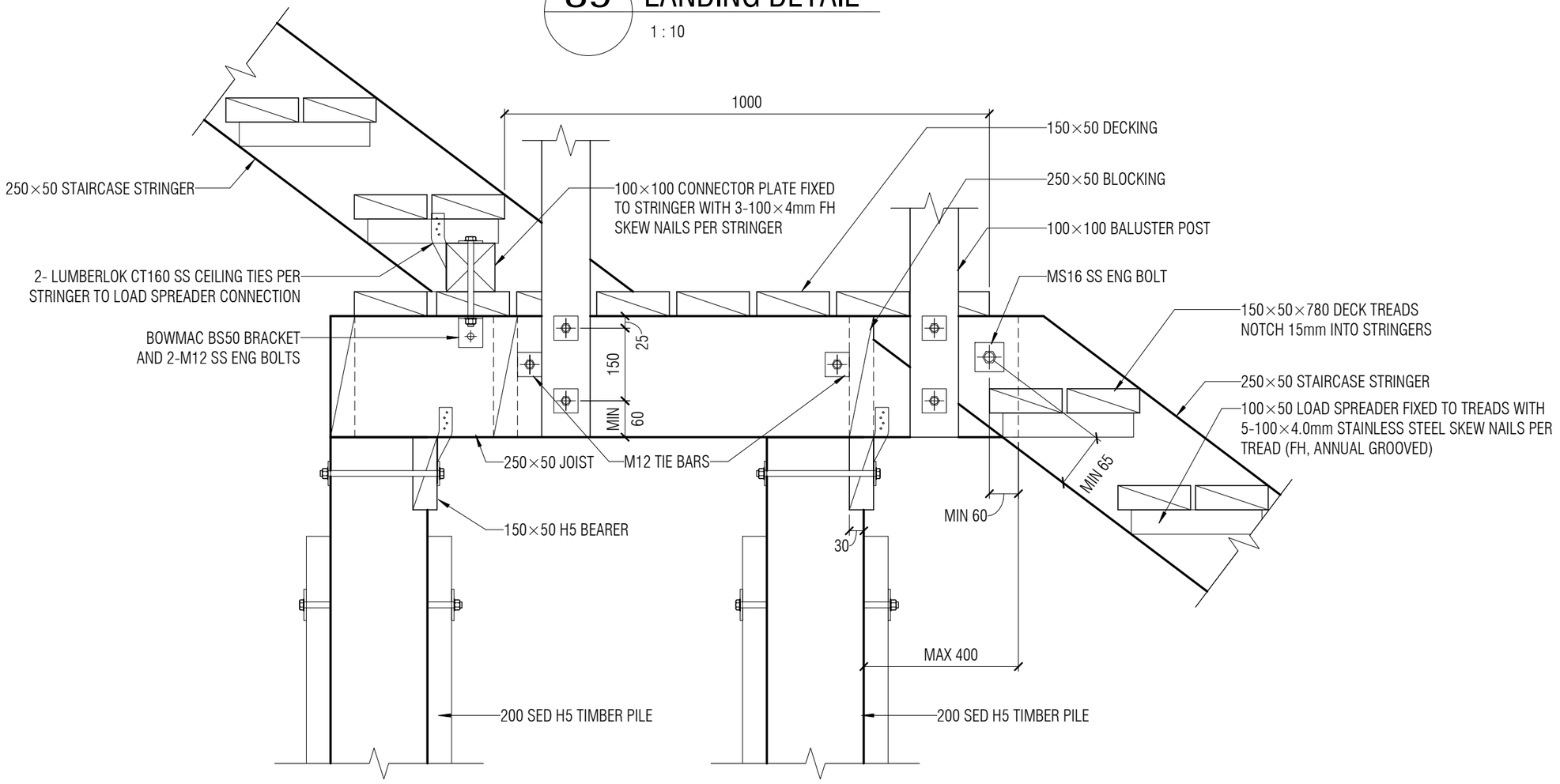
TITLE: STAIRCASE - TOWER SECTIONS AND DETAILS

SCALE	As indicated @ A3
DATE	SEPTEMBER 2024
DRAWN	Sec 9(2)(a)
FGL JOB	23-097
DRAWING PACKAGE VERSION	2.FOR CONSENT
DRAWING No.	23-097 -17
REV	A

Rev	Date	Amendment	Drawn
A	SEPTEMBER 2024	FOR CONSENT	Sec 9(2)(a)

39 LANDING DETAIL

1 : 10



FRAME GROUP
Ph: (09) 638-7221 www.frame.co.nz

PREPARED FOR
NZ TRANSPORT AGENCY WAKA KOTAHI
Te ARAROA NEW ZEALAND TRAIL

PROJECT
WHANGAEHU RIVER SWING BRIDGE

TITLE
STAIRCASE LANDING DETAILS

SCALE 1 : 10 @ A3	DATE SEPTEMBER 2024
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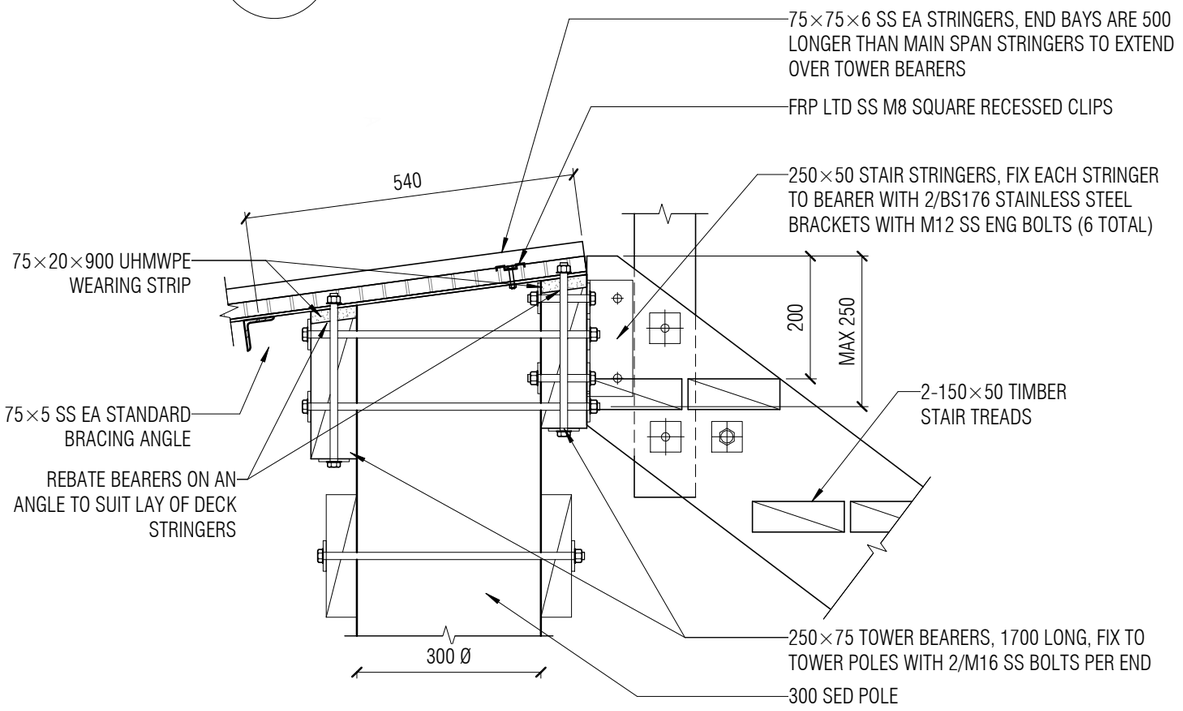
DRAWING PACKAGE VERSION 2.FOR CONSENT	DRAWING No. 23-097 -18 / REV A

Rev	Date	Amendment	Drawn

40 STAIRCASE - BRIDGE TOWER CONNECTION DETAIL

1 : 10



41 BRIDGE TOWER CONNECTION

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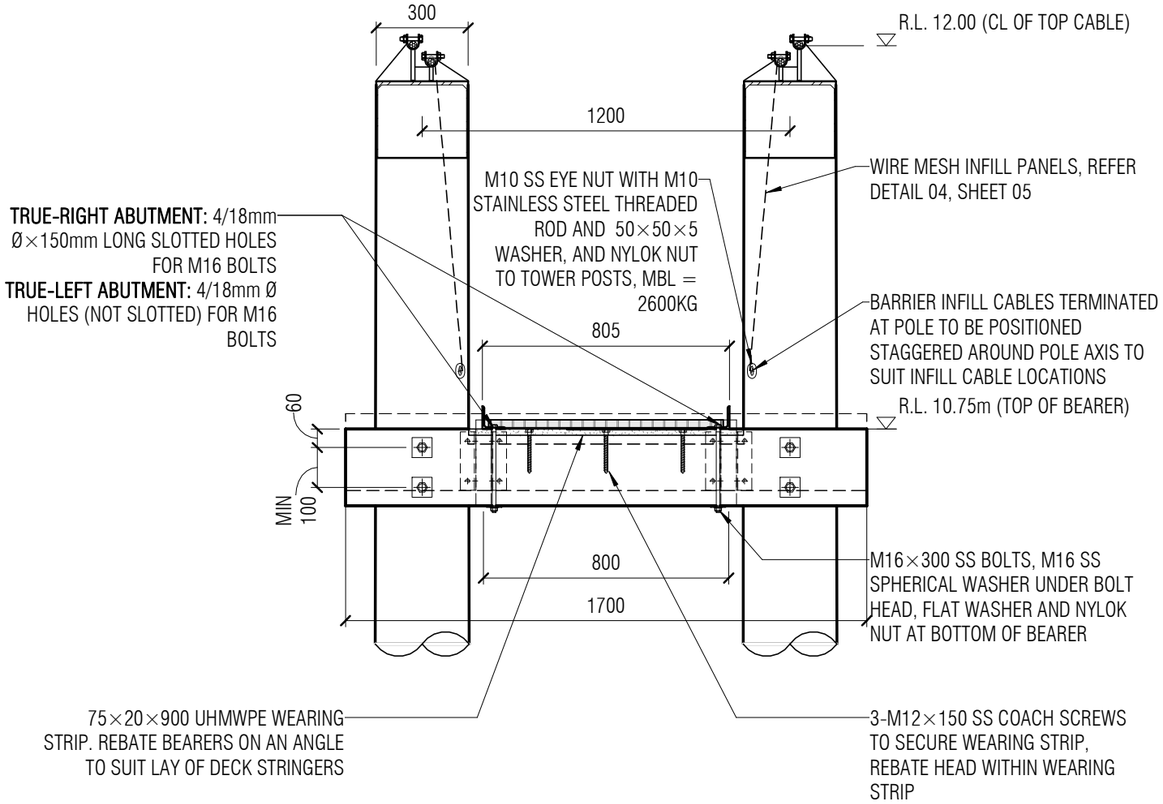

42 TOP RAIL SPLICE ELEVATION

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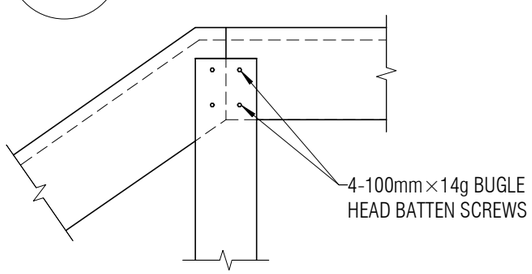

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PREPARED FOR: NZ TRANSPORT AGENCY, Te ARAROA

PROJECT: WHANGAEHU RIVER SWING BRIDGE

TITLE: STAIRCASE DETAILS

SCALE: As indicated @ A3	DATE: SEPTEMBER 2024
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Whangaehu Swing Bridge
Technical Specifications

Prepared for NZTA Waka Kotahi
& Te Araroa Trust
For Consent
September 2024

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Job Details

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Project Name: Whangaehu Swing Bridge
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Key

Initials	Name	Title
	Sec 9(2)(a)	

**A hard-copy of these Technical Specifications is to be kept on-site at all times.*

TABLE OF CONTENTS

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TECHNICAL SPECIFICATION

1.0 SCOPE OF WORK

1.1. Required Works

1.1.1. This specification is for the construction of the Whangaehu Swing Bridge located across the Whangaehu River. The bridge spans between the Whanganui and Rangitikei Districts, with the Whangaehu River being the natural District boundary line. The swing bridge and the approach staircases have been designed in accordance with the requirements defined in SNZ HB 8630:2004 for the Day Visitor (DV) user group and with a load restriction for five persons.

1.1.2. The construction works generally consists of the following:

- **Whangaehu Swing Bridge:** The construction of a 120m long × 0.75m wide swing bridge, including stainless steel main cables and wind brace cables; cross braced timber towers with timber outriggers; concrete plinth pile cap main tower foundations with driven timber piles; timber pile wind cable anchors in piles in augured, concrete filled holes; stainless steel welded main tower saddle caps; FRP decking with stainless steel frame supports; wire mesh barrier infill panels; stainless steel hangers; and hot-dip galvanised adjustment main cable adjustment blocks.
- **Approach Staircases:** The construction of an approximately 11.0m long x 0.75 m wide timber staircase on each end of the swing bridge with two landings incorporated and 0.9m – 1.1m high 'Type B' barriers on both sides. Stair foundation posts are timber piles in piles in augured, concrete filled holes.
- **Deadman Anchor:** The construction of 6000mm long x 1300mm deep x 1000mm wide, buried, reinforced concrete deadman anchor blocks at each side of the bridge to anchor the main cables via hot-dip galvanised and fusion-bonded epoxy coated steel anchor bars.
- Any necessary temporary works and signage. The design of all temporary staging, scaffolding etc. shall be the responsibility of the Contractor and shall comply with the provisions of section F5 of the NZBC.
- All other works indicated, described, or implied in the structural drawings or in this technical specification.

1.1.3. The above works include all associated site establishment and de-establishment, site clearance, remedial works, excavation works, vegetation removals, and other works required to construct the **Whangaehu Swing Bridge.**

1.1.4. The Contractor is to refer to the following documents for more details of this project:

- **Structural Drawings -** prepared by: Frame Group, titled: 'Whangaehu Swing Bridge – Structural Drawings', dated: September 2024, revision: A, Version 2: for Consent, Sheets 01-19.

- **Archaeological Assessment** – prepared by: inSite Archaeology Ltd, titled: 'Archaeological Assessment of Proposed Pedestrian Swing Bridge Across the Whangaehu River, Te Araroa Trail', dated: September 2024, Revision: Final (2 September).
- An **Archaeological Authority** with minor effects from Heritage New Zealand Pouhere Taonga (HNZPT) – related to the Archaeological Assessment findings, to be obtained by the Client.
- **Geotechnical Report -** prepared by: Riley Consultants Ltd, titled: 'Geotechnical Assessment – Whangaehu Swing Bridge', dated 20 August 2024, referenced: 240042-C, issue: Final.
- **Building Consent Documents** – All Conditions are required to be adhered to by the Contractor.
- **Resource Consent Documents** - All Conditions are required to be adhered to by the Contractor.
- **Hydrological Report -** prepared by: Riley Consultants Ltd, titled: Flood Assessment – Whangaehu Swing Bridge, dated 20 August 2024, referenced: 240042-B, issue: Final.

1.1.5. It is the Contractor's responsibility to obtain an adequate understanding of the documents listed above and this Technical Specification for construction purposes and shall always maintain at least one printed copy for each stated document on-site.

1.2. Location

1.2.1. The work is located at the boundaries between the Whanganui and Rangitikei District and across the Whangaehu River, in North Island, New Zealand.

1.2.2. Location plans are included in the structural drawings to illustrate the proposed location of the Whangaehu Swing Bridge. The set out of the proposed swing bridge is to be confirmed on-site by the Engineer before construction begins.

1.3. Access to Site

1.3.1. Access to the site can be gained via public roads, private land that operates as commercial forest, and existing vehicle tracks through the Whitiau Scientific Reserve (True-Right) and public roads and private land that operates as an active farm (True-Left). Refer to the location plans of the structural drawings for more details.

1.3.2. Vehicle access is available to each side of the bridge as follows:

True-Left = Public road and private land (active farm)

True-Right = Public road, commercial forest, and DOC Reserve.

1.3.3. The Contractor is to provide a detailed access and construction methodology for approval before starting construction. The methodology is to detail how vegetation and site damage will be minimised and remediated.

1.3.4. Te Araroa Trust to obtain access permission from all affected land owners on behalf of the Contractor. The Contractor is to abide by all access and construction damage mitigation measures agreed with these landowners, and any Conditions in relevant Resource Consents and Archaeological Authorities from HNZPT.

1.3.5. The Contractor is responsible for checking and confirming that they can deliver required materials and equipment (including machinery and plant) to site along these access routes in their current condition.

1.3.6. Alternative access direct to the site from private properties may be arranged with adjacent landowners, but it remains the Contractors' responsibility to arrange such access and to cover any associated costs.

1.3.7. The Contractor will be deemed to have visited the site and assessed the access conditions prior to submitting the tender.

1.3.8. The Contractor will not be permitted to operate equipment on any section of the tracks within the specified development area in the structural drawings where the frame or equipment wheelbase width is wider than the existing track formation width unless prior approval is provided by the engineer.

2.0 GENERAL REQUIREMENTS

2.1. Preliminary

2.1.1. All sections of the specification shall be read in conjunction with all other sections.

2.1.2. Refer to the Special Conditions of Contract for this Contract which shall be equally binding on all trades.

2.2. Materials and Labour

2.2.1. The Contractor shall supply the whole of the materials, plant and labour necessary for the Contract. Work shall be carried out according to best trade practice by skilled and experienced personnel to the standards hereinafter specified.

2.2.2. The Contractor is to arrange his own access for plant and materials and all necessary transportation of plant and materials to the site.

2.3. Design Variations

2.3.1. The Contractor shall obtain written authorisation for each and every variation before it is made.

2.3.2. Variations to the design made without the written approval of the Engineer to Contract, may have detrimental effects on the site ecology, or may have the effect of invalidating any Producer Statement and preventing the issue of a Code Compliance Certificate.

2.3.3. The Principal may require any variation to the design made without prior approval of the Engineer to the Contract to be rectified at the Contractor's expense.

2.4. Standards

2.4.1. Each section of the Specification shall be read in conjunction with the principal standards listed therein and related documents. In the event of this Specification being at variance with the standard, the requirements of this Specification will take precedence.

2.4.2. Reference to any standard shall include any amendments to or substitution for that standard.

2.5. Work Area

2.5.1. The works shall be confined to the immediate site only, allowing the room necessary to carry out the works.

2.5.2. The Contractor is to set-out a maximum construction and access footprint before Construction which is to be approved by the Principle's Representative and all work and vehicle operations are to be carried out within this footprint. This is to minimise and contain construction damage to a specific area.

2.5.3. The Contractor shall be responsible for the security of the site and shall make provision for the erection and maintenance of temporary barriers to prevent unauthorised access to the site.

2.5.4. The Contractor shall be responsible for locating and avoiding services such as power cables, communication lines and water lines and wastewater pipes at the site and on access routes. Services damaged during construction shall be reinstated at the Contractor's expense.

2.6. Site Establishment

2.6.1. The Contractor shall make allowance in his price for the provision of all site facilities that may be required. The position of these facilities shall be approved by the Engineer and shall comply with Government and Local Authority requirements for health and safety.

2.6.2. The Contractor shall make allowance in his price for the establishment of any stockpiles or dumpsites required

2.6.3. The Contractor shall make allowance in his price for the provision of all site services that may be required (e.g. communications, gas, sanitation, water, electricity etc).

2.6.4. The Contractor shall determine and avoid the location of the major gas pipeline near the construction location that runs underground below the Whangaehu River.

2.7. Site Meetings and Inspections

2.7.1. The Contractor or the Contractor's representative shall attend site meetings called by the Engineer.

2.7.2. The Contractor shall provide the Engineer with at least 48 hours' notice of any inspection required.

2.7.3. If the Contractor requests an inspection and, on arrival for inspection, the Engineer or their Representative finds that the work is not yet ready for inspection, the Engineer reserves the right to deduct the cost of time for that inspection from the contract price.

2.8. Programme

2.8.1. The Contractor shall be responsible for programming the whole of the works. Within five working days of acceptance of the contract, the Contractor shall produce and forward to the Engineer a construction programme showing when the work is to be undertaken. Due allowance is to be made for inclement weather.

2.9. Requirements from Other Parties

2.9.1. Any requirements that involve changes to the design communicated to the Contractor by other parties, including (but not restricted to) Department of Conservation (DOC) staff, arborists, archaeologists, council inspectors, and Heritage

NZ personnel, shall not be taken by the Contractor as an instruction under the contract.

2.9.2. If such a communication is received, then prior to the work being undertaken, such requirements shall be forwarded by the Contractor to the Engineer for review and subsequent issue of contract instruction if appropriate.

2.9.3. Any such work carried out by the Contractor without the written approval of the Engineer is undertaken at the Contractor's risk.

2.9.4. Where other parties enforcing Acts of Parliament and Regulations (e.g. OSH, Heritage NZ, RMA) instruct the Contractor to stop work immediately, the Contractor shall comply with the instruction and advise the Engineer immediately.

2.10. Health and Safety

2.10.1. The Contractor shall at all times comply with the provisions of the Health and Safety at Work Act 2015. The Contractor shall take all necessary steps to ensure that the obligations placed on the "Principal", "Engineer" and the "Person carrying out business or undertaking" under the provisions of the Act are complied with at all times and shall immediately advise the Principal or the Principal's Representative of any obligations not being fulfilled.

2.10.2. The Contractor shall be responsible for the health and safety of all employees, subcontractors and visitors to the Site and other places of work under the Contract. The Contractor shall always provide a safe working environment.

2.10.3. For the period between being given access to the Site and the issue of the Final Completion Certificate, the Contractor shall diligently fulfil its obligations as a PCBU under the Act in respect of the Contract Works. If more than one PCBU has a duty in relation to the same matter imposed by or under the Act, the Contractor shall, so far as is reasonably practicable, consult, co-operate with, and co-ordinate activities with all other PCBUs who have a duty in relation to the same matter.

2.10.4. In addition to its obligations under the Act, the Contractor shall comply with the reasonable requests and Site requirements of the Supervisor with respect to safety. The Contractor shall advise and shall immediately notify the Supervisor if there is any matter in connection with the Works which it considers requires action by the Supervisor to fulfil the Supervisors obligations under the Act.

2.11. Safety Plan

2.11.1. The Contractor shall prepare a 'Site-Specific Safety Plan (SSSP)', which shall identify all site-specific hazards (actual or potential) to all personnel on-site. The plan shall include safety procedures, requirements for protective clothing and equipment, safety equipment, mitigation procedures, emergency procedures and any other requirements deemed necessary. The Contractor shall communicate the contents of the Plan to all employees, make copies of the Plan accessible for reference and shall maintain the Plan up to date. The Safety Plan shall identify as a minimum:

- Hazard identification and mitigation processes;
- Protective clothing and equipment (PPE);
- Job Safety Analysis (JSA's);
- Emergency Plans;
- Procedures for management and protection of members of the public;
- Contractors inductions procedures;
- Contractor Safe Operating Procedures (SOPs);
- Working at Heights shall align with current legislative requirements and industry best practices (Best Practice Guidelines for Working at Heights in New Zealand). Training records are to be available on request;
- any other conditions deemed necessary.

2.11.2. The Safety Plan shall include a written assessment of hazards of the Contract Works and the specific measures which the Contractor will take to eliminate, isolate, or minimise these risks. The Plan shall highlight any hazards which the Contractor expects other PCBUs to control.

2.11.3. The Contractor shall establish and maintain a Site Hazards Register as part of the safety plan. Within the Hazards Register the Contractor shall record any identified hazards to health and safety and progress on the minimisation, isolation, or elimination of these hazards. The Register shall be made available to the Supervisor for inspection when requested.

2.11.4. Five working days before works commence on site, the Contractor shall submit the plan to the Engineer for review. At commencement, the Contractor shall confirm that the Safety Plan has been implemented and is operating on the site.

2.11.5. If at any stage during the course of the works, the Engineer or the delegated representative(s) observe activities or procedures which do not comply with the Safety Plan, a Stop Work notice may be issued to the Contractor.

2.11.6. Extensions of time arising out of Stop Work notices issued to the Contractor due to non-compliance with the approved Safety Plan will not be considered.

2.11.7. The Contractor shall ensure that during the execution of the Contract, there is no risk to the health and safety of other Contractors or the Principal's employees or to members of the public that may be in the vicinity of the site.

2.11.8. The Contractors Safety Plan shall include particular procedures with respect to maintaining the safety of users of the structures and/or tracks during construction including use of appropriate signage, barriers and other protection deemed necessary.

2.11.9. The Contractor shall arrange with the Principal's Representative for temporary closure of any existing structures and/or tracks where the nature of the work places public users of the structures and/or tracks at risk.

2.12. Health and Safety Reporting

2.12.1. Before any work commences on Site, the Contractor shall notify the Supervisor, in writing, of the name, qualifications and contact details of the Contractor's Site Safety Supervisor.

2.12.2. The Contractor shall provide a brief report on Health and Safety as part of the inputs to monthly reporting to the Supervisor. This report shall include at least details of the following:

- Health and Safety inspections,
- Induction and training activities,
- New hazard identification and measures to manage these hazards,
- Health and Safety Plan reviews,
- Breaches of the Health and Safety requirements and corrective action,
- Accident and injury record and responses for the period reported,
- Details of consultation, co-operation, and coordination with other PCBUs relating to the safety of the works,
- Other matters to include as the Contractor considers appropriate.

2.12.3. The Contractor shall also establish and maintain a register of incidents which shall be always available for inspection by the Engineer. This register shall include details of actions taken following any incident. The Contractor shall report all incidents and serious harm accidents in writing to the Engineer within 24 hours. The Contractor shall provide the Supervisor a copy of any report which the Contractor is required to make to a public authority on any accident associated with carrying out the Contract Works.

2.13. Health and Safety Procedures

2.13.1. The Contractor shall implement and carry out an inspection and audit regime to ensure compliance by all persons on the Site with the Contractor's Health and Safety Plan.

2.13.2. The Contractor shall appoint a Site Safety Supervisor with defined responsibilities for the implementation of the Contractor's Health and Safety Plan and for monitoring Site safety.

2.13.3. The Contractor shall ensure that a sufficient suitably qualified employees are available to administer first aid.

2.13.4. The Contractor shall provide any necessary protective equipment and clothing for the use of employees during their work. The Contractor shall ensure employees are properly trained in the use of Plant, Materials, and equipment and that the Plant and equipment are in safe working order.

2.13.5. The Contractor shall provide a safety briefing to all personnel who participate in carrying out of the Contract Works and shall have arrangements for the briefing of all new personnel.

2.13.6. The Contractor shall ensure that the health and safety procedures of its Subcontractors are consistent with the provisions of the Health and Safety at Work

Act and with the Contractor's health and safety procedures for the Contract Works. The Contractor shall ensure that all Subcontractors understand and follow the health and safety requirements for the Contract Works.

2.14. Potential and Known Hazards

2.14.1. Throughout the Contract period, the Contractor shall encourage a philosophy of hazard identification and elimination among all employees attending the Site, including Subcontractors and suppliers.

2.14.2. The SSSP shall include a written assessment of hazards of the Contract Works and the specific measures which the Contractor will take to eliminate, isolate, or minimise these risks. The Plan shall highlight any hazards which the Contractor expects other PCBUs to control.

2.14.3. The Contractor shall establish and maintain a Site Hazards Register as part of the SSSP. Within the Hazards Register the Contractor shall record any identified hazards to health and safety and progress on the minimisation, isolation, or elimination of these hazards. The Register shall be made available to the Supervisor for inspection when requested.

2.14.4. As the PCBU responsible for care of the Contract Works and Site, the Contractor will carry the main responsibility for the identification, assessment, and control of hazards on Site. The Supervisor has identified the following significant hazards as likely to be applicable to the works (this list is not intended to be exclusive):

Environmental Hazards:

- Extremes of weather including cold wind, rain, sun.
- Unstable ground and steep side slopes.
- Tight, dense, sharp vegetation.
- Working near and over water.
- Flash flooding of local waterways.

Other Hazards:

- Members of the public/track users.
- Helicopter travel and underslung loads.
- Helicopter supply of gear.
- Machinery operation including diggers and chainsaws.
- Working at heights/rope access.
- River crossings.
- Road travel.
- Walking – slips, trips, falls.
- Fatigue – working long hours, and on continuous days.

2.15. Reporting

2.15.1. Before any work commences on Site, the Contractor shall notify the Supervisor, in writing, of the name, qualifications and contact details of the Contractor's Site Safety Supervisor.

2.15.2. The Contractor shall provide a brief report on Health and Safety as part of the inputs to monthly reporting to the Supervisor. This report shall include at least details of the following:

- Health and Safety inspections,
- Induction and training activities,
- New hazard identification and measures to manage these hazards,
- Health and Safety Plan reviews,
- Breaches of the Health and Safety requirements and corrective action,
- Accident and injury record and responses for the period reported,
- Details of consultation, co-operation, and coordination with other PCBUs relating to the safety of the works,
- Other matters to include as the Contractor considers appropriate.

2.15.3. The Contractor shall also establish and maintain a register of incidents which shall be always available for inspection by the Supervisor. This register shall include details of actions taken following any incident. The Contractor shall report all incidents and serious harm accidents in writing to the Supervisor within 24 hours. The Contractor shall provide the Supervisor a copy of any report which the Contractor is required to make to a public authority on any accident associated with carrying out the Contract Works

2.16. Work at Heights and Industrial Rope Access

2.16.1. Under the Health and Safety at Work Act 2015 if there is any potential for a person to fall from any height, reasonable and practicable steps must be taken to prevent harm resulting. The Contractor's attention is brought to the following clarification of types of fall protection and required qualifications.

2.16.2. **Fall Restraint:** some device or materials (such as a barrier) are used to prevent a worker getting to the edge. NZQA Unit 23229 Use of safety harness for personal fall protection when working at height is a minimum qualification to employ this system.

2.16.3. **Fall Arrest:** this system uses a proprietary device to stop a fall. The workers weight prior to the fall is fully supported by the structure they are working on, and the rope and device is considered a backup. NZQA Unit 15757 Employ Fall Arrest Systems is a minimum qualification to employ this system. NAQA unit standard 23229 is a prerequisite for this standard.

2.16.4. **Work Positioning:** this is where rope is used to position a worker through climbing, belaying or abseiling. There must be a backup system in place, i.e., a complete secondary system. This situation requires the use of Industrial Rope Access techniques.

2.16.5. WorkSafe New Zealand guidelines for the Prevention of Falls, to meet the requirements of the Health and Safety at Work Act 2015 states: "A minimum of two trained operatives shall be always present on site while industrial rope access methods are being used. The second person needs to be present to provide backup and emergency assistance as detailed in the emergency plan".

2.16.6. If Industrial Rope Access techniques are to be used on site, then the Contractor shall ensure the following:

- Work is compliant with the Industrial Rope Access in New Zealand: Best Practice Guidelines, May 2012 (IRAANZ).
- At least two staff on site are qualified to a minimum National Certificate in Industrial Rope Access (Elementary Rope Skills) (Level 3).
- If there is any complexity to the anchors or rescue system, then the Contractor shall ensure that at least one of the staff on site is qualified to a minimum of National Certificate in Industrial Rope Access (Working on Ropes) (Level 4) and is preferably also IRAANZ Level 2 certified. In this situation, there must also be at least one other staff member qualified to a minimum National Certificate in Industrial Rope Access (Elementary Rope Skills) (Level 3).

2.16.7. In addition to the above the Contractor shall always ensure that staff on site will have the skills and equipment on site to raise or lower an injured worker to a safe location where the injured person is not suspended on a rope any longer. This must be able to be achieved within 10 minutes.

2.17. Public Access

2.17.1. The Contractor shall close the track to public access to isolate the work site for safety reasons during the construction period.

2.17.2. The Contractor shall supply and install temporary rigid barriers during construction **(minimum 1.8-metre height with solid top and bottom rails and with durable infill)** to prevent members of the public from entering the work site.

2.17.3. The contractor shall install signs at all points for pedestrian access to the closed sections of the track. The signs shall be formed from suitable, durable materials and include the following text:

- **"*Bridge under construction. Please keep out. No unauthorised entry*."**

2.18. Producer Statements

2.18.1. The Contractor shall, on completion of the works, provide the Engineer with a Producer Statement-Construction (PS3). The issuing of a Certificate of Practical Completion is subject to the receipt of the PS3.

2.19. Quality Assurance Requirements

2.19.1. The Engineer will carry out construction monitoring during the construction of this bridge to ensure that the Contractor is complying with the quality assurance requirements of this specification.

2.19.2. The contractor shall allow access to all documentation and records relating to the contract if required by the Engineer for purposes of confirming quality or compliance with the contract and this specification.

2.19.3. The contractor shall also provide the following documentation to the Engineer for the purpose of quality assurance:

Item	Quality Assurance Information to be Provided
Structural Steelwork	• Mill test certificates for all steel sections and plate. • Compliance certificates for welding consumables. • Identification marks or tags used on all steelwork.
Welding	• Copy of current qualifications for all welders. • Copy of current qualifications for welding supervisor. • Copy of all welding procedures. • Fabricators QA inspection and test report on completion of all welding. **Note different requirements for GP and SP welds detailed on the structural drawings.*
FRP Decking	• Suppliers certificates and guarantees covering FRP panels and stainless steel fixings.
Williams Bars	• Certificates of conformance including suppliers certification of bars and nuts including strength grade.
Structural Steel Coatings	• Galvanising records from applicator for Williams bars, adjustment blocks, etc including galvanising Reference Grade (to AS/NZS 4680:2006) and minimum coating thickness achieved. • Fusion Bonded Epoxy Coating record from the applicator.
Bolts and threaded rods	• Manufacturer's certificates for all bolts, threaded rods, nuts and washers.
Timber	• Evidence of timber grading and treatment.
Cables and Cable Hardware	• Mill and load test certificates for all wire rope. • Test certificates for all chain.

	• Declaration of conformity in accordance with EN 10204-2.1 and material certificate in accordance with EN 10204-3.1 for all spelter sockets. • Factory QA records for all spelter socket installation. • Test certificates for spelter socket installation. • Factory QA records for all swaged and other mechanical end splice cable terminations. • Inspection and manufactures test certificates for all shackles. • Manufacturers test certificates for all rigging screws.
Piling Records	• Piling As-built drawings showing location and depth of all piles. • Pile set cards for all driven piles. • PS3 Producer Statement – Construction.
Nails and screws	• Evidence of material grade (i.e. photographs of nail box showing grade of nails)
Wire Mesh	• Suppliers certificates confirming wire diameter, and coating to include both galvanising and fusion bonded PVC casing.
Reinforced Concrete	• Concrete delivery dockets. • Concrete test results. • Mill test certificates for all reinforcing steel.
Bridge Construction	• PS3 Producer Statement – Construction.

Refer also to the individual sections of this specification for further information on QA information required.

2.20. Building Consents

2.20.1. The Contractor shall comply with all conditions of Building Consent relating to the bridge.

2.20.2. If inspections are required by the Council building inspectors, it shall be the Contractor's responsibility to ensure that the Council is kept informed and given sufficient notice as to when inspections are needed.

2.20.3. Work requiring Council inspections shall not be covered over until the inspections have taken place.

2.21. Resource Consents

2.21.1. The Contractor shall comply with all conditions of the Resource Consent relating to the bridge.

2.21.2. If inspections are required by the Council building inspectors, it shall be the Contractor's responsibility to ensure that the Council is kept informed and given sufficient notice as to when inspections are needed.

2.21.3. Work requiring Council inspections shall not be covered over until the inspections have taken place.

3.0 ENVIRONMENTAL AND HERITAGE ISSUES

3.1. General

3.1.1. While undertaking any works the Contractor shall at all times comply with the obligations, provisions and requirements of the Resource Management Act and the Historic Places Act.

3.1.2. An **Exclusion Zone** shall be established extending 10 metres from both riverbanks. This zone must be clearly marked on-site throughout the construction period. No ground-level activities, including excavations or machinery movements, are permitted within this Exclusion Zone. This measure ensures compliance with the National Policy Statement for Freshwater Management 2020.

3.1.3. The Contractor shall comply with all conditions of the Resource Consents relating to the work.

3.2. Protection and Reinstatement of Area

3.2.1. All Machinery and Plant shall be water blasted prior to transporting to Site (including between abutment , to remove loose dirt, oil, or grease which may hold seeds and other undesirable materials. To avoid the transportation of Didymo and invasive weeds, all Plant and Machinery shall be thoroughly dried after water blasting for at least 48 hours, before transporting to Site. All Plant and Machinery shall be in good condition and shall have a high standard of maintenance and servicing. There shall be no evidence of oil or fluid leaks.

3.2.2. Particular care shall be taken to protect the Whitiau Scientific Reserve. A representative for the Department of Conservation will be made available for the Contractor to liaise with for confirming environmental protection measures and procedures within the reserve.

3.2.3. The Contractor's activity shall be confined to the construction and access zone (to be confirmed by the Engineer before starting construction). Damage to the vegetation or ground beyond the track zone shall be rectified at the Contractor's expense.

3.2.4. The Contractor shall not disturb, modify or remove any items or materials at the site other than that necessary to carry out the work.

3.2.5. The Contractor is to take particular care not to damage any native vegetation, natural features or other structures at the site other than those that are approved by the Engineer for modification or removal. Any damage as a result of the Contractor's work shall be rectified at the Contractor's expense.

3.2.6. The Contractor shall reinstate all land areas affected by the works, including the re-establishment of working areas, to a condition at least equal to that at the commencement of the works.

3.2.7. Reinstatement shall be finished within one week of the completion of works and all excess materials shall be removed from the site.

3.3. Sediment and Erosion Control Measures

3.3.1. Silt traps and silt fencing approved by the Engineer are to be constructed wherever soil or silt is likely to be washed off a work site into stream channels in the event of heavy rainfall.

3.3.2. Particular care shall be taken to ensure that sediment is not lost off the site into streams or around the base of trees near the site or into neighbouring properties.

3.3.3. Sediment and erosion control measures shall be inspected and maintained once a week and after each significant rainfall. Maintenance shall consist of removing silt in over-laden areas and fixing or replacing control measures in damaged areas.

3.3.4. The control measures must be maintained until the site has been adequately stabilised against erosion and sediment run-off.

3.4. Materials Brought on Site

3.4.1. All materials brought onto the site are to be of an approved type and from an approved weed-free source.

3.4.2. Materials are to be contained in a stockpile to prevent spillage onto the site and to facilitate complete removal of surplus after completion of the works.

3.5. Removal of Waste Material

3.5.1. Waste is defined as all foreign material on the site. This includes, but is not limited to aggregate, nails, wood, plastic, FRP off0cuts, and metal off-cuts.

3.5.2. All waste is to be removed from the site at the completion of the work.

3.5.3. Waste or rubbish being held at the site prior to removal is to be stored in such a fashion that it cannot be blown about by the wind. No fires are permitted.

3.6. Excess Material from Excavations

3.6.1. All surplus material generated from excavation work associated with the work is to be contained and used for site restoration purposes as approved by the Engineer or is to be removed from the site at the Contractor's expense.

3.7. Vegetation

3.7.1. The Principal's Representative shall identify on-site all trees to be removed.

3.7.2. The Contractor shall obtain approval from the Principal's Representative before any removal or cutting of major tree roots. Tree roots less than 35mm in diameter are to be cut cleanly according to best arboriculturally practice. If indigenous tree roots greater than 35mm in diameter are encountered, the Principal's Representative shall be advised and all instructions from the Principal's Representative shall be followed. If the instructions require work other than cutting the root, the Contractor will be entitled to a variation.

3.7.3. All root severance is to be conducted in accordance with accepted modern arboriculture practice. In particular where roots are being severed, the cut end is to be left cleanly cut with an un-shattered face, and with the bark undamaged.

3.7.4. Trimming of native vegetation shall only be permitted where there is no other reasonable alternative.

3.8. Refuelling and Fuel Storage

3.8.1. The Contractor shall exercise due care and responsibility to minimise the potential for leakage or spillage of fuels, lubricants and/or any substance that could be spilled. Spillages shall be cleaned up immediately and contaminated material taken from the site. All spillages shall be reported to the Engineer.

3.8.2. Bulk fuels and oils are not to be stored on site.

3.8.3. Oil changes are not permitted on vehicles or machinery on site.

3.8.4. Major repairs are not permitted on site without approval of the Engineer.

3.8.5. No machine shall be allowed to work on-site with an oil leak.

3.9. Dangerous Goods

3.9.1. The Contractor shall minimise the use of the Site for the storage of fuels, explosives and other dangerous goods as may be required for the construction of the works and shall not use the Site, or allow access to others, for any purpose not connected to the Contract.

3.9.2. All storage shall be subject to statutory requirements and the requirements of the local authority.

3.9.3. The Contractor shall ensure spill and clean up kits are available on site in any event.

3.10. Archaeological Discovery Protocol

3.10.1. Construction work is to be carried out with regard to the **Archaeological Assessment** – prepared by: inSite Archaeology Ltd, titled: 'Archaeological Assessment of Proposed Pedestrian Swing Bridge Across the Whangaehu River, Te Araroa Trail', dated: September 2024, Revision: Final (2 September). The assessment has the following findings:

- An Archaeological Authority with minor implications is required for these works. HNZPT will likely grant the application for an archaeological authority with minor effects without need for a research strategy or management plan;
- The Contractor shall follow the requirements of the HNZPT Archaeological Authority at all times.
- An independent Archaeologist (to be engaged by the Client) will likely observe parts of construction including excavation material and the Contractor shall allow these observations to occur.

- That construction is undertaken in the late summer when ground conditions are firmer and archaeological sites along access tracks are less likely to be affected by vehicle movements; and,
- That vehicle numbers are managed to limit the number of daily vehicle movements across archaeological sites and movement is limited to established tracks.

3.10.2. If any Archaeological evidence, including shell midden, hangi, or oven stones, pit depressions, defensive ditches, mining relics, artefact material and/or human remains are exposed during construction then the following procedure shall apply:

- Immediately as it becomes apparent that archaeological evidence has been exposed, the Contractor shall cease all work in that particular area and notify the Engineer.
- The Contractor shall secure the area in a way that ensures that any archaeological material, artefacts or remains are untouched.
- The Engineer will notify an appointed archaeologist, the heritage team at the council, Heritage NZ and in the case of human remains, Tangata Whenua and the Police, that an archaeological or traditional site has been exposed so that appropriate action can be taken.

3.10.3. Work in the vicinity where archaeological evidence is uncovered shall not re-commence until the Engineer gives approval (after the Engineer has received approval from Heritage NZ).

3.10.4. Damage to archaeological sites caused by the Contractor may be subject to prosecution under the Resource Management Act and/or Heritage New Zealand Pouhere Taonga Act 2014.

4.0 EXCAVATIONS AND FOUNDATIONS

4.1. Scope

4.1.1. The Contractor shall refer to the following Geotechnical Report for a detailed description of the geotechnical site conditions:

- **Geotechnical Report** - prepared by: Riley Consultants Ltd, titled: 'Geotechnical Assessment – Whangaehu Swing Bridge', dated 20 August 2024, referenced: 240042-C, issue: Final.

4.1.2. This section of the work includes:

- Excavations for concrete-filled auger holes for:
  - **timber stair foundation piles** of 450 mm diameter, 2000-3000 mm depth, (x10);
  - **Wind anchor poles** for catenary wind bracing cables of 450 mm diameter and 3000 mm depth (x4);
  - **Main Tower Concrete Plinth Foundation** of 2500 x 2500 x 500 mm (length, width, depth) set 300 mm below ground surface;
- Excavations for the concrete block deadman anchors and anchor bars of 6000 x 1000 x 1300 mm (length, width, depth) to be buried under 1000 mm ground cover (note that extensive benching and over-excavation beyond these dimensions are required for these deadman anchors).

4.2. Nature of Ground

4.2.1. The existing ground is expected to consist of interbedded layers of sandy SILT/silty SAND and silty CLAY.

4.2.2. The ground water table is likely to be approximately:

- 2.5m below ground level (bgl) on the True-Left, and
- 1.0m below ground level (bgl) on the True-right, and

4.2.3. Rock is not expected to be encountered in the excavations.

4.3. Pre-inspection by the Contractor

4.3.1. Prior to submitting a tender, all prospective tenderers shall carry out a site visit to confirm access and ground conditions on the site and satisfy themselves that they can achieve the requirements of the drawings and specification with respect to machinery and plant access, and drilling, shoring, and installing the foundations as detailed.

4.4. Set Out

4.4.1. The Contractor is responsible for setting out the work from the information provided on the drawings.

4.4.2. An **Exclusion Zone** shall be established extending 10 metres from both riverbanks. This zone must be clearly marked on-site throughout the construction period. No ground-level activities, including excavations or machinery movements, are permitted within this Exclusion Zone. This measure ensures compliance with the National Policy Statement for Freshwater Management 2020.

4.4.3. The final location and set-out of swing bridge including tower foundations, cable spans and lengths, deadman anchor reinforced concrete blocks, wind cable anchors, reduced levels, staircases, and all other structural components specified in the structural drawings shall be set-out by the Contractor and then confirmed on-site with the Principal's Representative and the Engineer prior to the commencement of excavation work.

4.5. Excavation and backfilling Deadman Anchor Rods

4.5.1. Ground on the river side of ground anchors shall be disturbed as little as possible during excavation works to ensure that the deadman anchors bear against undisturbed ground.

4.5.2. Trenches shall be cut in undisturbed soil for anchor rods.

4.5.3. Ground anchor backfill shall be well compacted in layers no greater than 200mm using a vibrating plate compactor. Care shall be taken to fill all voids around the ground anchor.

4.6. Dewatering

4.6.1. The Contractor shall allow for all dewatering required to complete the excavation, construction and backfilling works required for the construction of the bridge.

4.7. Excavations Generally

4.7.1. Excavations for foundations are to be built to the dimensions and details shown on the drawings, allowing for working room as necessary.

4.7.2. Each individual foundation shall be proved to the satisfaction of the Engineer or their Representative.

4.7.3. The contractor's methodology shall be submitted to the Engineer to Contract for approval, and strict adherence to such should be followed during construction and be subject to inspection.

4.8. Excavations Methodology

4.8.1. The Contractor shall submit an excavation and backfill methodology for all excavation and trenching work across the site for review and approval by the Engineer before commencing any excavations.

4.8.2. The methodology shall include but may not necessarily be limited to the following items:

- Excavation methodology for piles, deadman anchors, and foundations including excavation shoring, propping, sleeving, dewatering etc..
- Excavation methodology for the deadman anchors addressing excavation stability and safety, stockpiling of materials, dewatering etc.
- Notification of WorkSafe New Zealand for all notifiable works.
- Details of proposed plant and machinery.
- Reinstatement and compaction of material following construction/ installation of the Deadman anchor reinforced concrete blocks.
- Site reinstatement.

4.9. Excavation Stability

4.9.1. Care shall be taken to ensure worker safety in potentially unstable deep excavations. This may be achieved by battering and benching cut faces where this is compatible with the design or installing shuttering to the Contractors design.

4.9.2. All excavation and trenching work shall be carried out in accordance with the WorkSafe New Zealand Excavation Safety Good Practice Guideline (https://worksafe.govt.nz/topic-and-industry/excavation/excavation-safety-gpg/).

4.10. Obstructions

4.10.1. Excavate and remove any obstruction that is encountered which may interfere with the specified shape and size of the foundations as detailed.

4.11. Poor Ground Conditions

4.11.1. Poor ground conditions encountered during excavation shall be notified to the Supervisor before any over excavation or other remedial action is taken by the Contractor.

4.12. Inspection

4.12.1. The Contractor shall give the Engineer reasonable notice to enable inspection of the foundations to be carried out before placing concrete and back fill. Approval shall be obtained from the Engineer before any back-filling, hard-filling or concreting is undertaken.

4.13. Over-Excavations

4.13.1. Any excavation caused solely by encountering poor ground conditions or other natural weakness shall be treated as an extra provided such extra work has been authorised by the Principal's Representative.

4.14. Maintenance of Excavations

4.14.1. The Contractor's tender price shall include provision to provide and erect all temporary casing, underpinning, needling, shoring, strutting, sheet piling, timbering and any other form of support or stabilisation that may be necessary to prevent collapse, subsidence or displacement of any excavation.

4.14.2. Should any excavation become filled with water during construction, the Contractor shall pump this water out before pouring concrete. The costs of pumping will be deemed to be included the Contractor's tender price.

4.14.3. The Contractor shall be responsible for the safety of operations, the structural sufficiency, and standards of construction of all temporary work.

4.14.4. Temporary works to stabilise excavations shall be designed in such a way as to allow removal without damage to the structure or adjacent buildings.

4.15. Fill

4.15.1. All fill material shall be site material (i.e. no imported fill) from the side of the river that the excavation occurs. The Engineer shall review and approve site material suitable for use as fill before use (noting that some site material will not be suitable fill material (e.g. silts and clay).

4.15.2. There shall be no leaf litter or vegetation other than live tree roots in any fill formation.

4.15.3. Fill material shall be placed in level layers not exceeding 200mm loose depth and shall be compacted using suitable compaction equipment such as a plate compactor or oscillating foot compactor to achieve the equivalent of good ground after compaction.

4.15.4. Fill slopes shall be left in a tidy condition. It shall remain the Contractor's responsibility to make good any fill or cut batter slumping or minor subsidence which occurs during the period of this Contract up until the end of the Defects Liability Period.

4.15.5. Where available, vegetation and organic soil shall be spread over fill slopes to reduce the potential for damage or loss of sediment during heavy rainfall and runoff.

5.0 PILE DRIVING

5.1. Scope

5.1.1. This section of the Specification sets out the requirements for the following:

- Supply, and installation of driven timber piles for:
    - Outrigger Foundation Poles, and
    - Driven piles under tower foundation.
- All quality assurance associated with the above items.
- The extent of work is shown on the construction drawings.

5.2. Standards

5.2.1. Principal standards relevant to this section are:

- SESOC / NZGS CONSTRUCTION SPECIFICATION BORED AND DRIVEN PILES (Rev I, June 2022).
- NZS3605 Timber Piles and Poles for use in Buildings.
- NZS3640 Chemical Preservation for Round and Sawn Timber

5.3. Pile Installation Parameters

5.3.1. The following minimum construction parameters are required to be met, as per the Structural Drawings:

Description	Performance Requirement
Main Tower Piles	
Minimum Depth of Embedment	6.0m
Minimum Driving Resistance	60kN
Pile Set	To be confirmed by Engineer (dependant on driving rig)
Other Piles (Outrigger Foundation Piles)	
Minimum Depth of Embedment	4.0m
Minimum Driving Resistance	40kN
Pile Set	To be confirmed by Engineer (dependant on driving rig)

5.4. Pile Tolerances

5.4.1. The Contractor shall make all necessary provisions to the pile construction procedure, initial spotting and inclination of piles, in order to achieve installation of piles to the specified tolerances. Unless specified otherwise in the Project Specific Requirements, all piles shall be installed so as to achieve the following tolerances:

- Plan position of the pile top at its commencement level: Within 75 mm of the plan location shown on the drawings.

- Vertical elevation of the pile top at its commencement level: Plus 40 mm or minus 75 mm from the vertical elevation shown on the drawings
- Verticality of the as-built pile shaft: 1H : 75V or straighter

5.5. Pile Driving / Penetration and Bearing:

5.5.1. The Contractor shall submit a detailed programme for the execution of the piling work prior to piling work commencing on site. Final set must be achieved using a drop hammer to confirm pile load bearing capacity using a set/blow method described below.

5.5.2. The Contractor shall carry the sole responsibility for providing all necessary equipment for the pitching, positioning and driving of piles. The driving procedure shall avoid damage to the piles.

5.5.3. The pile driving equipment shall be approved by the Engineer.

5.5.4. Any pile damaged during driving shall be repaired to the satisfaction of the Engineer, or withdrawn and replaced, or if the Engineer directs, an additional pile shall be driven.

5.5.5. The piles shall be driven full depth (or to such greater depths as may be necessary) to give the required ultimate bearing value equal to that indicated on the drawings and shall also be to the correct level and line for seating the abutment caps.

5.5.6. The Contractor shall be satisfied that the supplied pile can be driven to the required depth and shall undertake driving to avoid damage.

5.5.7. The sets and rebound shall be measured and recorded for each pile at the completion of driving. The Engineer shall provide minimum set/blow requirements to confirm the required strength. When a set or resistance is being measured, the following requirements shall be met;

- The pile shall be in good condition, without damage or distortion.
- The hammer blow shall be in line with the axis of the pile, and the impact surfaces shall be flat and perpendicular to the hammer axis.
- The hammer shall be in good condition, delivering the required energy per blow.
- The rebound shall be measured and recorded.

5.5.8. The set shall be recorded either as the penetration in millimetres per ten blows, or the number of blows required to produce a penetration of 25 millimetres.

5.5.9. The contractor shall confirm with the engineer the driving set for the first pile driven before continuing the pile driving operation. At this stage the engineer will confirm any requirement to install any extra piles should the required ultimate bearing value not be achieved.

5.5.10. A re-drive test shall be carried out on the first two piles driven unless the Engineer directs that a re-drive test is not required.

5.5.11. The re-drive test shall be undertaken after the pile has stood for a minimum of 2 hours following the completion of driving to gain the required bearing value. The Engineer will instruct on the specific re-driving requirements which will consist of additional hammer drops to confirm bearing. Acceptance of the pile shall be that the bearing value has not decreased to below the minimum bearing requirements.

5.5.12. Where a drop hammer is used, no drop shall exceed 2500 mm for a bottom driven pile or 2000 mm for a top driven pile unless agreed prior by the Engineer.

5.5.13. Piles to be driven shall be clearly marked with paint prior to installation with the pile number, overall length and at regular intervals, the cumulative length measured from the pile tip.

5.5.14. When timber piles are installed by driving, the heads shall be cut off square to expose sound timber and to within ± 20 mm of the levels specified on the drawings. The cut surfaces shall be well dried and brush treated with a suitable preservative, in accordance with NZS3605.

5.5.15. The Contractor shall locate and protect all existing services prior to commencing the pile installation in any particular area.

5.6. Driven Pile Construction Record Card

5.6.1. The Contractor shall complete a Pile Construction Record Card for every pile constructed on the Site. An example Record Card is shown in Figure 1. A copy of the proposed Pile Construction Record Card shall be submitted to the Engineer one week prior to commencing pile construction. The Pile Construction Record Card shall contain the following information as a minimum;

- Contract and structure name
- Pile number, location, type, steel grade, pile dimensions, preformed length, end plate details, locations of splices and cross referencing to NDE.
- Date and time of driving, redriving, jetting or preboring, including stoppages and delays, from start to finish.
- Type, weight, drop and mechanical condition of the hammer, and equivalent information for other equipment.
- The height of the working platform on which the piling machine operates.
- Final drop height, etc., and the set and rebound, recorded either as the penetration in millimetres per ten blows, or the number of blows required to produce a penetration of 25 millimetres, including a legible copy of the set card and the calculated ultimate driving resistance.
- Any information regarding obstructions, delays and other interruptions to the sequence of work.
- The expected and actual constructed founding levels.
- Weather conditions (including tide and wave height if applicable).

- The design and actual constructed elevation of the top of the pile, including compliance with tolerances.
- Cross referencing to proving bores (if applicable).
- Cross referencing to pile load test results (if applicable).
- Updated set cards for piles that been re-driven.
- The Contractors signature verifying that all work has been completed satisfactorily.
- Pile construction records shall be submitted to the Engineer within 24 hours of the completion of each pile

5.7. Observation

5.7.1. The Engineer shall observe the first pile driven on each side of the river to confirm they are performing and to confirm adequate set, bearing pressure, and depth is being achieved.

5.7.2. The Engineer shall be given 24 hours notice of the commencement of pile driving. The Contractor shall give the Engineer adequate notice and provide all necessary facilities to enable the Engineer to check driving resistances, sets, and rebounds. The driving of each pile shall be continuous until the depth and/or resistance or set, as required by the design, has been achieved. In the event of an unavoidable interruption to driving, a pile may be re-driven provided it can be driven to the specified depth and/or resistance or set without damage.

A hard-copy of these Technical Specifications is to be kept on-site at all times.

B2 EXAMPLE DRIVEN PILE RECORD

DRIVEN PILE RECORD

CONTRACT:		CEP NO:	
PILE NO:		AREA:	

Piling Details	Date	Time
Start Driving:		
Start Splicing:		
Finish Splicing:		
Finish Driving:		
Crane Type:		
Hammer Type:		
Welder:		

Depth	Notes	Date Time

Location & Offset Sketch			
Platform Level:		RL	
Offsets		Initial	
		Final	
	Vert:	mm/m	
Offsets		Initial	
		Final	
	Vert:	mm/m	

Pile Details		
Section Type:		
Dimensions:		mm
Thickness:		mm
Steel Grade:		MPa
Pile Length:		m
Pile Weight:		kg
Check Safe to Lift by:		
Temp or Perm:		
Check by:	Date:	

Level Details		
Design Top Level:		RL
Actual Top Level:		RL
Design Toe Level:		RL
Actual Toe Level:		RL
Design Rock Level:		RL
Actual Rock Level:		RL
Check by:	Date:	

Driving Details		
Hammer Weight:		t
Helmet Weight:		t
Target Load (Ru):		kN
Target Drop:		mm
Target Set (S):		mm
Target Compression (C):		mm
Actual Load (Ru):		kN
Actual Drop:		mm
Actual Set (S):		mm
Actual Compression (C):		mm
Check by:	Date:	

Special Notes

Approval			
Design Representative:		Date:	
Contractors Representative:		Date:	

Figure 1 Example Driven Pile Construction Record Card from Appendix B of SESOC / NZGS CONSTRUCTION SPECIFICATION BORED AND DRIVEN PILES (Rev I, June 2022).

6.0 TIMBER CONSTRUCTION

6.1. Standards

6.1.1. The principal standards relevant to this section are as the following:

Standard	Name
NZS 3602:2003	Timber and wood-based products for use in building
NZS 3605:2001	Timber piles and poles for use in building
NZS 3622:2004	Verification of timber properties
NZS 3631:1998	New Zealand timber grading rules
NZS 3640:2003	Chemical preservation of round and sawn timber
NZS 3640:2003 A1-5	Chemical preservation of round and sawn timber Amendments 1 - 5
NZS AS 1720.1:2022	Timber Structures – Part 1: Design
AS/NZS 4680:2006	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles

6.2. Scope

6.2.1. This section of the Specifications covers all timberwork shown on the drawings or specified herein. This includes supply, fabrication and installation of all timber elements including:

- Supply and construction of timber approach staircases, including landings (T/L and T/R).
- Supply and installation of the timber barriers (0.9 m – 1.1 m high ‘Type B’) for the staircases.
- Supply and installation of the timber poles for outriggers, foundations, and anchor posts.
- Including all associated fixings and details.

6.3. Timber

6.3.1. All timber shall be sound Pinus Radiata (unless noted otherwise on the drawings) of the grades and treatment indicated on the drawings and indicated below.

6.3.2. The species, grade, sizes, finish, treatment and moisture content of timber and wood based products shall comply with the requirements of this specification and relevant standards, at the time of enclosure or installation.

6.3.3. Copies of the timber grade certificates including date, sizes, package number and grade for the timber used for this contract shall be supplied to the Principal's Representative and Engineer when requested.

6.3.4. The timber shall be sound, well-seasoned and maintain figured dimensions.

6.3.5. The Contractor shall not use any portions of timber containing pith on the surface.

6.3.6. All timber shall be rough sawn to the sizes shown on the drawings unless specified otherwise.

6.3.7. Grade tags shall be left in place on all timbers installed as part of the work, and shall be removed by the Contractor following Engineer's inspection.

6.3.8. Timber used in constructing the swing bridge shall comply with the following, according to use and environment:

Location	Species	Grade	Treatment
Sawn timber not in contact with the ground/concrete (including staircase stringers, staircase timber barriers, staircase treads, tower cross bracings, bearers etc.)	Pinus Radiata	SG8	H3.2
Sawn timber in contact with or within 150mm to the ground/concrete (including staircase pier cross bracings, some staircase stringers etc.)	Pinus Radiata	SG8	H5
Round poles (for bored piles and above-ground) (including staircase pier poles, wind cable anchor poles, main tower poles, and tower outrigger diagonal bracing poles)	Pinus Radiata	Normal Density	H5
Round poles (for pile driving) (main tower foundation poles, and outrigger foundation poles)	Pinus Radiata	High Density	H5

Timber Element	Timber Finish
Stair stringers, joists, decking, blocking, and all other timber not listed below	Rough Sawn
Tower Poles – main tower vertical poles, wind cable anchor foundation poles, and main tower foundation poles (below ground)	Shaved (small end diameter poles)
Timber poles – main tower diagonal outriggers	Machined (uniform diameter)
Barrier rails	Dressed

6.4. Treatment

6.4.1. Treatment shall comply with the current requirements of the Timber Preservation Council. All treated timber shall be branded with the appropriate wood mark. It is preferred that timbers be treated at least 2 months prior to installation.

6.4.2. All timber shall be cut to the required length before preservation treatment, unless this is not possible due to the need to make allowance for site variation.

6.4.3. Cut faces of timber sections greater than 50mm thick shall be treated with Metalex or similar field applied preservative treatment if cutting is carried out after preservative treatment. Sawn timber in contact with ground shall have sawn edges coated with a liberal coating of Holdfast Metalex Green timber preservative.

6.5. Nails, Staples, and Screws

6.5.1. All nails and staples shall be Type 316 Stainless Steel and comply with the following, unless specified otherwise on the drawings:

Use	Size	Type
General structural use	100 × 4.0mm	Type 316 Stainless steel annular grooved flat head nails

6.5.2. All screws shall be stainless steel Grade A4-70 (316), manufactured in accordance with BS EN ISO 3506:2009.

6.6. Bolts, Washers and Miscellaneous Brackets and Fittings

6.6.1. Bolts, washers, rods, miscellaneous brackets and fittings shall be Type 316 Stainless Steel unless otherwise specified on the drawings.

6.6.2. Bolts and washers shall be Type 316 Stainless Steel, snug tight, engineers bolts of the diameters and sizes shown on the drawings and fitted with square washers of the same material unless otherwise specified on the drawings.

6.6.3. All stainless steel bolts, nuts and washers shall be Grade A4-70 (316), manufactured in accordance with BS EN ISO 3506:2009 and ASTM F593-17 and ASTM F594-09.

6.6.4. Washers shall comply with the following minimum standards unless otherwise specified in the drawings:

Bolt Size	Washer
M12	50 x 50 x 5.0
M16	60 x 60 x 6.0
M20	65 x 65 x 6.0

6.6.5. Thread protrusion past the nut shall be a minimum of two thread pitch after tightening.

6.6.6. Bolts may consist of appropriate Type 316 Stainless Steel threaded rod cut to length on site.

6.6.7. All cut ends shall have zinc-rich coating applied for corrosion protection.

6.7. Proprietary Fixings

6.7.1. All proprietary “Bowmac” brackets shall be Type 304 or 316 Stainless Steel and of the specified type and thickness shown on the drawings. All fixings shall be made using the specified fastener dimensions and be installed fully in accordance with the manufacturer’s instructions and recommendations. Approved alternatives may be used but these must be approved by the Engineer prior to installation.

6.8. Workmanship

6.8.1. Work generally shall be in accordance with the best trade practice, and this shall be deemed to include those methods, practices and processes contained in current syllabuses for the NZQA courses in carpentry.

6.8.2. Details not shown on the drawings shall be formed according to the principles of NZS 3604:2011.

6.8.3. Accurately set out all work. Attend on other trades to provide cutouts penetrations, blocks, fillets etc. required by them.

6.8.4. Fix all members true to line.

6.9. Temporary Works

6.9.1. All temporary staging, scaffolding etc shall comply with the provisions of section F5 of the NZBC.

6.10. Treated Timber Handling

6.10.1. Treated timber contains chemicals classified as toxic and hazardous under certain conditions. Strict adherence to handling procedures is crucial to mitigate risks. Ensure compliance with guidelines from authoritative bodies such as the NZ Timber Preservation Council, Environmental Protection Authority New Zealand **(EPA NZ)** and Environmental Risk Management Authority **(ERMA NZ)** including, but not limited to the following risk mitigation strategies:

- **Personal Protective Equipment (PPE)**
  - Wear gloves, safety glasses, and a filter mask when handling or working with treated timber to minimise exposure to chemicals and dust.
  - Use goggles during power-sawing or machining to protect eyes from flying particles.

- **Work Practices**
  - Avoid indoor sawing of CCA-treated timber to reduce inhalation risks.
  - Allow treatment-damp timber to dry in a well-ventilated area before use.
  - Clean up sawdust, shavings, and scraps promptly and dispose of them according to EPA NZ, ERMA NZ, and local regulations.

- **Clothing and Hygiene**
  - Wash hands, face, and any exposed skin thoroughly after handling treated timber, especially before eating, drinking, or smoking.
  - Launder clothing separately if contaminated with sawdust or residue before reuse.

- **Disposal**
  - Do not burn CCA-treated offcuts or sawdust, nor use them in barbecues, to prevent inhalation or ingestion of toxic chemicals.
  - Dispose of treated timber waste in designated landfills according to environmental regulations to prevent soil and water contamination.

6.10.2. It is strongly recommended to adopt the above stated treated timber handling procedures for adherence to the HSWA 2015 (Health and Safety Work Act 2015). Other adherence demonstration methods include, but are not limited to maintain records of training sessions, inspections, and incidents and other document compliance efforts.

6.10.3. The Contractor shall adopt best practice to minimise the risk exposure to all construction workers handling treated timber. The Contractor has the responsibility to ensure that all construction workers are provided with their rights associated with Health and Safety in accordance with the HSWA 2015.

6.10.4. It is recommended for the Contractor to refer to the treated timber handling guidelines of the following authorities for the minimisation and mitigation of the associated Health and Safety risks with treated timber:

- EPA NZ
- ERMA NZ
- New Zealand Timber Preservation Council
- WorkSafe NZ
- Building Performance NZ
- BRANZ (Building Research Associated of New Zealand)

7.0 WIRE MESH BARRIER INFILL PANELS

7.1. Scope

7.1.1. This section of the works shall consist of:

- The installation of the swing bridge barrier infill panels on both sides.

7.2. Wire Mesh Barrier

7.2.1. Refer to the manufacturer's guidance for detailed installation instructions.

7.2.2. The swing bridge barrier infill installed shall comply with the following unless otherwise specified on the drawings.

Use	Type	Fixing
Swing Bridge Barrier Infill Panels	50mm aperture Wireworks NZ Chain Link Fusion Galvanised Wire Mesh (black colour) with **Fusion Bonded PVC Coating** – 50mm diamond x 2.8mm OD wire Or 50mm aperture Bayonet NZ Chain Link Fusion Galvanised Wire Mesh (black colour) with **Fusion Bonded PVC Coating** – 50mm diamond x 2.8mm OD wire (product code: CL502530PB), knuckled fence top and bottom edge	Fixed at every second diamond and with plastic cable tie to bottom main cable and infill cable Or With galvanised Wire lacing (black colour) with **Fusion Bonded PVC Coating** 2.8mm OD wire.

8.0 CONCRETE

8.1. Scope

8.1.1. This section of the work shall consist of all concrete work shown on the drawings or specified herein. This includes supply and placing of formwork and concrete for:

- Main Tower plinth foundations,
- concrete-filled augured timber pile foundations,
- Outrigger pile caps,
- Concrete deadman anchor blocks, and
- Other concrete structural components as specified in the structural drawings.

8.2. Standards

8.2.1. The principal standards relevant to this section are:

Standard	Name
NZS 3101:2006	Concrete structures standard
NZS 3104:2021	Specification for concrete production
NZS 3109:1997	Concrete construction
NZS 3114:1987	Specification for concrete surface finishes
NZS 3121:2015	Water and aggregate for concrete
NZS 3124:1987	Specification for concrete construction for minor works

8.2.2. A thorough knowledge of NZS 3124:1987 and NZS 3109:1997 is expected of the Contractor's supervising personnel.

8.3. Concrete (Ready mixed)

8.3.1. All concrete to be supplied by a ready-mixed supplier shall be a "Normal" Class mix in accordance with NZS 3104:2021. The plant shall have a current Certificate of Audit.

8.3.2. Site batched concrete for reinforced concrete elements shall not be used without prior approval from the Engineer. However, site batched concrete may be used around all timber piles embedded in concrete.

8.3.3.

8.3.4. Delivery records shall be kept for each concrete batch including concrete mix properties, 28 day strength, slump etc. These records shall be retained by the Contractor and provided to the Engineer.

8.3.5. The concrete shall have a slump of 100mm.

8.3.6. The Contractor shall be responsible for the placement of the concrete and shall advise the concrete supplier if the mix is to be pumped.

8.3.7. Aggregates for concrete shall be selected from a single source, which shall be used for all concrete that will form part of the permanent works.

8.3.8. Concrete is to be suitably vibrated to ensure full compaction of the pour and the expulsion of any entrapped air.

8.4. Concrete (Site mixed)

8.4.1. Site batched concrete for reinforced concrete elements shall not be used without prior approval from the Engineer. However, site batched concrete may be used around all timber piles embedded in concrete.

8.4.2. Site-mixed concrete shall comply with NZS 3109:1997. The material specifications, methods and techniques set out there in shall be observed in all respects.

8.5. Concrete Strength

8.5.1. The following are the required aggregate sizes and minimum compressive strengths at 28 days:

Location	Max. Aggregate Size	Minimum 28-Day Compressive Strength	Minimum Curing Period
Reinforced concrete Deadman anchor block and tower foundation plinth	19mm	30MPa	7 days
Concrete holes for all augured timber piles	19mm	17.5MPa	3 days

8.6. Cement

8.6.1. For normal circumstances the cement used shall be ordinary Portland cement (type GP) except that with the approval of the Engineer, rapid hardening Portland Cement (type RH) may be used.

8.6.2. Additives may only be used with the approval of the Engineer. Where the Contractor proposes to use alternative cement types and blends, full details of this proposal shall be submitted to the Engineer for approval. The Contractor shall certify that his proposal will satisfy the durability requirements of the New Zealand Building Code and NZS 3101 for an intended life of 50 years and the specified exposure classification.

8.7. Aggregate and Water

8.7.1. The aggregate and water used for the concrete mix shall comply with NZS 3121:2015.

8.7.2. Water used for site concrete shall be clean imported tap water. The use of water from a site watercourse is not permitted unless approval has been given by the Engineer. Particularly, the Whangaehu River is highly acidic and will be extremely detrimental to any concrete mix.

8.7.3. Aggregate used for site concrete shall be clean imported aggregate. The use of aggregate from a watercourse, beach etc, is strictly prohibited.

8.8. Concrete Placing, Compacting, Finishing and Curing

8.8.1. The Contractor shall provide the Engineer with at least 48 hours' notice prior to any concrete pour. Prior to the pour, the Engineer shall inspect the formwork and reinforcement to ensure compliance with the drawings and this Specification. Any aspects found not to be in accordance with the drawings or Specification shall be rectified by the Contractor prior to placing of concrete.

8.8.2. No concrete shall be poured without approval from the Engineer.

8.8.3. All concrete shall be conveyed from the mixer or truck mixer to the place of final deposit as rapidly as possible by methods which shall prevent segregation. The addition of water or any other material to ready mixed concrete at the site is strictly prohibited.

8.8.4. Concrete is to be suitably vibrated to ensure full compaction of the pour and the expulsion of any entrapped air. The method of vibration must be in accordance with NZS 3109. Over vibration of the concrete must be avoided.

8.8.5. Immediately after placement, concrete shall be protected from premature drying, excessively hot and cold temperatures, and mechanical injury, and shall be cured to prevent moisture loss for the period necessary for the hydration of the cement and hardening of the concrete. Suitable methods of curing include:

- Ponding or continuous sprinkling
- Application of suitable membrane (e.g. polythene sheets)
- Application of appropriate sprayed curing compound

8.8.6. The Contractor must satisfy themselves that whatever method they choose will not adversely affect the permanent works and/or the quality of finishing required.

8.8.7. The Contractor shall ensure that all concrete can be conveyed to site with the current available access and within the confirmed construction and access area footprints. Concrete must be able to be delivered directly to pour locations without having to use manual handling e.g. wheelbarrows. Where it is necessary for concrete to be placed under water, the method adopted must comply with NZS 3109 and must ensure that no segregation of the mix and/or no intermixing of the concrete and water occurs. This can only be avoided if the concrete is discharged at a point below the level of the previously placed concrete. The use of a tremie pipe is recommended

although any other suitable approved method will be considered. It is not acceptable to place concrete by simply depositing it from above the water surface, a tremie pipe or similar approved must be used.

8.8.8. Finish the top of all foundations to a good steel trowel finish with sufficient fall to drain surface water.

8.9. Concrete Curing

8.9.1. Immediately after placement, concrete shall be protected from premature drying, excessively hot and cold temperatures and mechanical injury, and shall be cured to prevent moisture loss for the period necessary for the hydration of the cement and hardening of the concrete. Suitable methods of curing include:

- Ponding or continuous sprinkling
- Application of suitable membrane (e.g. polythene sheets)
- Application of appropriate sprayed curing compound

8.9.2. The Contractor must be satisfied that the method chosen will not adversely affect the permanent works and/or the quality of finishing required.

8.9.3. When mean ambient temperatures exceed 10° C, curing shall be continued for at least seven days. At lower temperatures, the curing shall be continued for a period to be advised by the Engineer.

8.10. Surface Finishes

8.10.1. The surface finishes of formed concrete shall comply with NZS 3114:1987.

8.10.2. The finishes required for this project are:

Location	Type of Finish
Unformed surfaces	U3 (Trowelled)
Formed surfaces	F3

8.10.3. All exposed edges shall have a 20x20mm chamfer.

8.11. Formwork

8.11.1. Formwork shall comply with NZS 3109:1997. Formwork shall be used wherever necessary to support and confine the concrete and shape it to the required dimensions. Joints and linings shall be sufficiently tight to prevent water loss from the concrete. Formwork shall be securely fixed and braced and have sufficient strength and rigidity to support in safety all loads arising during construction and to maintain the specified dimensional tolerances.

8.11.2. Formwork shall be removed without shock or vibration, and shall permit the concrete to take the imposed loads gradually. Formwork shall not be removed until the minimum period set down in NZS 3109:1997 has elapsed, unless otherwise approved by the Engineer.

8.12. Proprietary Grout Products

8.12.1. Where specified on the drawings Hilti HIT-RE 500 epoxy grout shall be used in accordance with the manufacturers specification.

8.12.2. Clean anchor holes shall be filled with epoxy from the bottom up, prior to anchor rod installation, in a manner that leaves all voids filled.

9.0 REINFORCING STEEL

9.1. Scope

9.1.1. This section of the work shall consist of all concrete work shown on the drawings or specified herein. This includes supply and placing of formwork and concrete for:

- Main Tower plinth foundations,
- concrete-filled augured timber pile foundations,
- Outrigger pile caps,
- Concrete deadman anchor blocks, and
- Other concrete structural components as specified in the structural drawings.

9.2. Standards

9.2.1. The principal standards relevant to this section are:

Standard	Name
AS/NZS 4680:2006	Hot-dip Galvanised (Zinc) Coatings on Fabricated Ferrous Articles
AS/NZS 5131:2016	Structural Steelwork – Fabrication and Erection
AS/NZS 4671:2019	Steel Reinforcing Materials
NZS 3404.1 & .2:1997	Steel Structures Standard
NZS 3101:2006	Concrete structures standard
NZS 3109:1997	Concrete construction

9.2.2. All reinforcement designated with the symbol D shall be deformed steel as per AS/NZS 4671:2019.

9.2.3. All reinforcement designated with the symbol H shall be deformed high-yield steel as per AS/NZS 4671:2019, Grade 500.

9.2.4. All reinforcement designated with the symbol R shall be plain mild steel as per AS/NZS 4671:2019, Grade 300.

9.2.5. All steel reinforcement shall be Micro-alloyed (MA) Grade 300E and 500E (as specified in the drawings) in accordance with AS/NZS 4671 and shall comply with the relevant clauses of NZS 3109 except as modified below.

9.2.6. Steel reinforcement bars have been designated as:

- **D**XX (Grade 300E MA Deformed bars).
- **YD**XX (Grade 500E MA Deformed bars).
- **R**XX (Grade 300E MA Plain round bars).
- **Y**RXX (Grade 500E MA Plain round bars)

9.2.7. Reinforcing steel shall be of New Zealand Origin, or

9.2.8. Reinforcing steel manufactured outside of New Zealand shall have third party quality assurance carried out by an Australasian Certification Authority for Reinforcing and Structural Steels (ACRS) registered authority.

9.2.9. The following certification shall be provided to the Engineer for approval:

- Mill test certificates for all reinforcing steel from an ILAC accredited laboratory.

9.3. Bending, Cutting, welding and Fixing

9.3.1. Reinforcing shall be rust free and clean from laitance, mud, oil or any other coatings which will adversely affect its bonding capacity.

9.3.2. All reinforcing shall be bent to the allowable radii specified in NZS 3101:2006 and NZS 3109:1997. Where possible all reinforcing shall be delivered to site pre bent. On-site bending of reinforcement shall be kept to an absolute minimum and shall only be done using appropriate tools.

9.3.3. Reinforcement shall be accurately placed, adequately supported and secured against displacement. Soft black wire not less than 1.2mm thick shall be used to tie intersections. Reinforcement shall be adequately supported using proprietary chairs to ensure correct cover is achieved to all sides. The use of broken brick, concrete, rock etc to support reinforcement is strictly prohibited.

9.3.4. The practice of re-bending reinforcement on site is not permitted unless expressly permitted by the Principal's Representative. In any case only Grade 300 bars may be re-bent and bars may only be re-bent once. The re-bending of Grade 500 reinforcement is strictly prohibited.

9.3.5. Steel reinforcement shall not be welded, except where approved by the Engineer. If approved, welding of reinforcement shall comply with AS/NZS 1554.3.

9.4. Lapping

9.4.1. The lapping of reinforcement shall only take place where indicated on the drawings or approved by the Engineer. Lapping bars shall be securely tied together with wire ties in accordance with NZS3109. The minimum lap length shall be as given below for the particular bar diameter:

Bar Diameter	Grade 300E deformed	Grade 500E deformed
10mm	400mm	650mm
12mm	500mm	750mm
16mm	650mm	1000mm
20mm	800mm	1250mm
25mm	1000mm	1600mm
32mm	1200mm	2000mm

9.5. Cover

9.5.1. The minimum concrete cover (measured from the concrete surface to the nearest reinforcing steel) shall be as follows unless indicated otherwise on the drawings. The tolerances on cover shall comply with NZS 3109 Clause 3.9. In no case shall the cover be less than the cover specified below or on the drawings.

Cast-in-place concrete Minimum Cover	
Exposed to the weather	50mm
Cast directly against and permanently in contact with the ground	75mm

10.0 STRUCTURAL STEEL

10.1. Scope

10.1.1. This section of the work consists of the supply, fabrication, surface treatment, delivery and erection of all structural steelwork and associated items necessary for the works as shown on the contract drawings.

10.1.2. This includes :

- Hangers,
- Main tower saddle caps for main cables,
- Cable connection and adjustment block assemblies,
- Deck diagonal bracing and stringer beams,
- Main tower base plate brackets,
- Miscellaneous plates,
- And all associated connections, fixings and details.
- All quality assurance associated with the above items.

10.2. Standards

10.2.1. The principal standards relevant to this section are:

NZ Standards	Name
AS/NZS 3678:2016	Structural Steel – Hot-rolled plates, floorplates and slabs
AS/NZS 3679:2016	Structural Steel – Hot-rolled bars and sections
AS/NZS 1554.1:2016	Structural Steel Welding Part 1: Welding of Steel Structures
AS/NZS 1554.6:2012	Structural Steel Welding Part 6: Welding Stainless Steel for Structural Purposes
AS/NZS 2312.1:2014	Paint Coatings
AS/NZS 4680:2006	Hot-dip Galvanised (Zinc) Coatings on Fabricated Ferrous Articles
AS/NZS 5131:2016	Structural steelwork - Fabrication and erection
AS/NZS 2980:2018	Qualification of welders for fusion welding of steels - Additional requirements for Australia and New Zealand
American Standards - American Society for Testing and Materials (ASTM) standards:	
ASTM A240/A240M-22a	Standard Specification for Chromium and Chromium-Nickel Stainless Steel

	Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM A276-13a	Standard Specification for Stainless Steel Bars and Shapes
ASTM A312/A312M-01	Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipes
ASTM F594-09	Standard Specification for Stainless Steel Nuts
ASTM F593-17	Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

10.2.2. Structural Steel subcontractors shall be familiar with the content of these documents.

10.2.3. Contractual arrangements specified in this specification shall take precedence over those in section 8 of the HERA specification.

10.3. Steel

10.3.1. The Contractor shall price his steel on available stocks, and on prices ruling at the time of tender.

10.3.2. Substitute sizes will be permitted only with the approval of the Engineer.

10.3.3. Any tender based on substitute sizes shall be accompanied by a statement listing the substitutes.

10.3.4. The edges of all steel plates shall be rounded off to a minimum radius of 2mm.

10.4. Materials

10.4.1. All materials and workmanship shall comply with NZS 3404:1997 Steel Structures Standard, unless shown otherwise on the drawings. The grade of all steel components shall comply with the table below unless otherwise specified on the drawings:

Item	**Specification**
Tower saddle brackets	Stainless Steel Plate HRAP, Type 316L to ASTM A240; and , Stainless Steel Schedule 40 Pipe, Type 316L to ASTM A312
Equal Angle (EA) sections for hangers, diagonal deck bracing, and deck stringer beams.	Stainless Steel Angles, HRAP, Type 316, to ASTM A276
Adjuster Blocks	Steel Flats and Rounds, Grade 300 to AS/NZS 3679:2016

Miscellaneous plates, cleats, etc.	Stainless Steel Flat Bar, HRAP, Type 316, to ASTM A276

10.5. Materials Compliance Certificates

10.5.1. All steel supplied shall have third party quality assurance carried out by an Australasian Certification Authority for Reinforcing and Structural Steels (ACRS) registered authority.

10.5.2. Certification shall be provided to the Engineer for steels in accordance with NZS 5131 (Basic Traceability, clause 4.7.1) and for fasteners and welding consumables in accordance with NZS 3404 Section 3.2.3. The following information shall be submitted to the Engineer for approval:

- Mill test certificates for all steel sections and plate from an ILAC accredited laboratory.
- Manufacturers certificates for bolts, nuts and washers from an ILAC accredited laboratory.
- Compliance certificates for welding consumables.
- Identification marks or tags used on all steelwork.

10.6. Bolts

10.6.1. All bolts, nuts and washers used for structural steelwork shall comply with NZS 3404:1997 and shall be fitted with round washers matching bolt dimensions under heads and nuts.

10.6.2. Refer to “Structural Timber” section for details of all bolts, nuts and washers used for timberwork.

10.6.3. All bolts, nuts and washers shall be Type 316 Stainless Steel and all threaded bars shall be Type 316 Stainless Steel unless otherwise specified in the drawings.

10.7. Fabrication

10.7.1. All steel fabrication work shall be in accordance with NZS 5131.

10.7.2. The Contractor shall confirm, by site measurement, all dimensions that affect fabrication or set out of the members.

10.7.3. Steel components shall be fully fabricated off site. Site welding shall not be permitted.

10.8. Welding

10.8.1. All connections shall be as shown on the drawings. Welding shall be done by qualified operators and strictly in accordance with AS/NZS 1554.1:2016. Welders shall be certified in accordance with AS/NZS 2980:2018. All welding shall be structural purpose (SP) class welding in accordance with AS/NZS 1554.1:2016. All welding shall be carried out in a fabrication shop.

10.8.2. Welding consumables used shall be of a type compatible with the steel being welded. Welding consumable selection shall be in accordance with AS/NZS1554.

10.8.3. Only welders qualified to AS/NZS1554 or who have attained a similar standard shall be employed on the Works. Proof of welders proficiency and qualification shall be made available to the Engineer on request.

10.9. Inspection of Welds

10.9.1. All welds shall be inspected and tested by an independent, third-party welding inspector with qualifications meeting the requirements of AS/NZS 1554.1:2016 clause 7.2 in accordance with the frequencies noted in the following table:

EXTENT ON NON-DESTRUCTIVE EXAMINATION (NZD) IN ACCORDANCE WITH AS/NZS 1554.1:2016 (%)			
WELD CATEGORY	VISUAL SCANNING (SEE CLAUSE 7.3)	VISUAL EXAMINATION IN ACCORDANCE WITH TABLE 6.2.2	ULTRASONICS TO TABLE 6.2.1 or **Magnetic Particle or Liquid Penetrant**
GP	100%	10%	0%
SP	100%	100%	100%

10.9.2. Non-compliant welds shall be repaired and re-tested to the satisfaction of the weld inspector.

10.9.3. Before any welded component is installed on site, the Contractor shall submit to the Principal's Representative the Weld Inspection Record for that component.

10.10. Qualification of Welding Procedures

10.10.1. The welding procedure (i.e. weld preparation, consumables and the welding parameters) shall be qualified in accordance with AS/NZS1554.1 before commencement of any welding. The Contractor shall establish a welding procedure and list the applicable welding parameters in the welding procedure qualification record (PQR or WPQR).

10.10.2. Welding procedures shall be supplied to the Engineer for review and approval prior to commencing fabrication.

10.10.3. Welding shall not commence until the engineer has accepted the welding procedure qualification record (WPQR).

10.11. Schedule of SP Welds

10.11.1. The following welds are SP category welds and require inspection and testing in accordance with Clause 10.8:

ITEM	WELD
Adjusters Brackets (x8)	All welds
Adjuster Bracket Tags (x8)	All welds

10.12. Bolts

10.12.1. Bolts used shall be tightened to a snug-tight condition as per NZS 3404 .1 Section 15.2 unless noted otherwise in the drawings.

10.12.2. All bolts shall be installed with washers and nuts of the equivalent grade.

10.12.3. All bolts shall have a minimum of two thread pitches protruding beyond the outside face of the nut following installation.

10.12.4. Nuts for structural steelwork steel to steel connections (i.e. not associate with timber members) are to be Nylok full nuts or full nuts with half-nut lock nuts. This is due to the tendency of stainless steel nuts to come loose under cyclic loading.

10.13. Corrosion Protection – Hot Dip Galvanising and Fusion Bonded Epoxy Coating

10.13.1. The following components are to be hot dip galvanised in accordance with AS/NZS 2312.2:2014, and AS/NZS 4680:2006:

Item	Number required	Hot dip galvanising reference standard	Average Coating Thickness (µm)	Fusion Bonded Epoxy Coating after galvanising? (Yes/N0)
Adjusters Brackets	8	HDG600	85	No
Adjuster Bracket Tags	8	HDG600	85	No
Williams Bar Anchor Bars	8	Factory supplied coating	?	Yes
Williams Bar Nuts and Washers	As per drawings	Factory supplied coating	?	Yes

10.13.2. All corrosion protection coatings are to be applied after components are fully-fabricated i.e. cut, welded, drilled etc.

10.13.3. All galvanising damaged during construction generally or by drilling of holes on site etc shall be coated with a zinc rich coating (Rexene Armour Zinc 110 Zinc Epoxy Primer or similar which is approved by the Engineer shall be used).

10.13.4. All coatings damaged during shall be touched up with an appropriate compatible coating of the same colour. All coating repairs shall be carried out using a Contractor prepared repair specification preapproved by the Engineer.

10.13.5. The Contractor shall supply the following supplier records to the Engineer for Quality Assurance.

- Galvanising records from applicator for Williams bars, adjustment blocks, etc including galvanising Reference Grade (to AS/NZS 4680:2006) and minimum coating thickness achieved.
- Fusion Bonded Epoxy Coating record from the applicator.

11.0 CABLES AND CABLE HARDWARE

11.1. Scope

11.1.1. This section of the work consists of the supply, installation, fitting, adjustment and protection of structural cables and associated hardware for:

- Main cables x4
- Primary Wind Cables x2
- Secondary Wind Cables x 28 (variable lengths)

11.2. Standards

11.2.1. The principal Standards relevant to this section are:

Standard	Name
BS EN 13411-8:2011	Terminations for steel wire ropes. Safety, Swage terminals, and swaging
DIN EN 12385-10	Steel wire ropes. Safety, Spiral ropes for general structural applications
ETA-15/0917	European Technical Assessment - Prefabricated steel and stainless steel wire ropes with end connectors
DIN EN 10264-4	Steel wire and wire products - Steel wire for ropes - Part 4: Stainless steel wire
BS EN 13411-3:2004+A1:2008	Terminations for steel wire ropes. Safety, Ferrules, and ferrule-securing
BS EN 13411-5:2003+A1:2008	Terminations for steel wire ropes. Safety, U-bolt wire ripe grips
AS 2319:2001	Rigging screws and turnbuckles
BS EN 12385-4:2002+A1:2008	Steel wire ropes. Safety, Stranded ropes for general lifting applications
AS 3569:2010 AMDT 1	Steel wire ropes - Product specification
US Federal Specification FF-C-450	Wire Rope Grips
AS/NZS 4671:2019	Steel for the reinforcement of concrete
ASTM A615M-09	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

11.3. Cable Specifications

11.3.1. All cable components shall comply with the specifications stated in the drawings and the table below:

Cable	Nominal Diameter	Details	Minimum Breaking Load
Main Cables	24mm	1x37 Fatzer Stainless Steel (Inox) Spiral Strand Cable (OSS) High-strength wire made of stainless steel (Inox) 1.4401 (AISI 316) Compliance with DIN EN 10264-4 and 12385-10	489kN
Main cable terminations	24mm	Fatzer HYEND open socket Stainless steel (Inox) 1.4462 / 1.4470 Swaging in accordance with ETA-15/0917	>489kN
Primary Wind Cables	16mm	IWRC, 7 x 19 Stainless Steel Cables Stainless Steel (AISI 316)	14470kg
Secondary Wind Cables	12mm	1 x 19 Stainless Steel Cables Stainless Steel (AISI 316)	10401kg

11.4. Stainless Steel Spiral Strand Main Cables

11.4.1. Spiral strand cables shall be Fatzer brand spiral strand cables manufactured from high strength stainless steel (Inox) 1.4401 (AISI 316) to DIN EN 10264-4. A mill test certificate from an ILAC accredited laboratory shall be provided confirming cable materials comply with DIN EN 10264-4**.**

11.4.2. Cables shall meet the Minimum Breaking Loads (MBL) specified in the drawings and table above and be accompanied by a load test certificate from an ILAC approved test laboratory.

11.4.3. Cables shall have a modulus of elasticity of 130 kN/mm^2 +/- 10 kN/mm^2 as per the manufacturer's performance specifications.

11.4.4. Cables shall be delivered to the site on drums and handled and installed without inducing sharp kinks that could damage the cable.

11.4.5. Where specified on the drawings, primary and secondary wind cables shall be provided with copper or AISI 316 stainless steel splice ends to BS EN 13411-3:2004, and fitted with hard eye thimbles to BS EN 13411-3:1004 as specified in the structural drawings.

11.5. Main Cable End Terminations

11.5.1. Main cable HYEND open Socket end terminations are to be installed to the main cables following site set-out and confirmation of required cable lengths in NZ by a certified NZ fabricator who is qualified to complete this work and provide a load capacity certification for these terminations. .

11.5.2. The installer is to be confirmed by the Engineer before completing this work. Fatzer HYEND Adjustable Spelter Sockets shall be swaged to ETS-15/0917 to develop the full breaking strength of the cable.

11.5.3. Factory QA records for spelter socket installation shall be submitted to the Engineer before delivery to site.

11.5.4. Spelter sockets shall be protected from damage prior to cable installation on the bridge.

11.6. Stainless Steel Wire Rope

11.6.1. All stainless steel wire rope shall be 1x19 or 7x19 AISI 316 grade stainless steel as specified in the table above and in the drawings.

11.6.2. All stainless steel wire ropes shall comply with DIN EN 10264-4 and DIN EN 12385-10.

11.6.3. Cables shall meet the Minimum Breaking Loads (MBL) specified in the drawings and table above and be accompanied by a load test certificate from an ILAC approved test laboratory.

11.7. Cable Lengths

11.7.1. All cable lengths shall be determined by the Contractor based on actual site set-out dimensions before cutting cables to length and applying end terminations. Cable lengths measured by the Contractor are to confirmed by the Engineer prior to fabricating the final cable lengths.

11.8. Hardware Generally

11.8.1. Hardware shall be as specified unless specific authorisation is obtained from the designing engineer.

11.8.2. All hardware shall be stamped with identifying marks including the manufacturer's safe working load where appropriate. No "commercial" grade hardware may be used.

11.8.3. All hardware items shall be hot dip galvanised or Type 316 Stainless Steel as specified on the structural drawings. Zinc plating is not acceptable.

11.8.4. Prior to delivery, the Contractor shall provide for the Supervisor's review copies of load test certificates obtained from the supplier(s) of cable hardware items. The Supervisor has the right to reject items where satisfactory certification is not provided.

11.9. Pressed Trimble Eye Terminations

11.9.1. Pressed Trimble Eye Terminations are required for:

- Both ends of primary wind cables, and
- One end of secondary wind cables.

11.9.2. Pressed ends shall be full strength factory applied talurit swages in accordance with BS-EN13411-3 to develop the full strength of the cable. Ferrules on stainless steel cables either stainless steel or copper.

11.9.3. All thimbles shall be heavy-duty thimbles in accordance with AS1138. Where stainless steel cables have been used they shall be stainless steel.

11.9.4. Factory QA records for swaging cables shall be submitted to the Engineer before delivery to site.

11.10. Wire Rope Grip End Terminations

11.10.1. Wire rope grip terminations are required:

- at one end of the secondary wind cables, and
- at both ends of barrier infill cables.

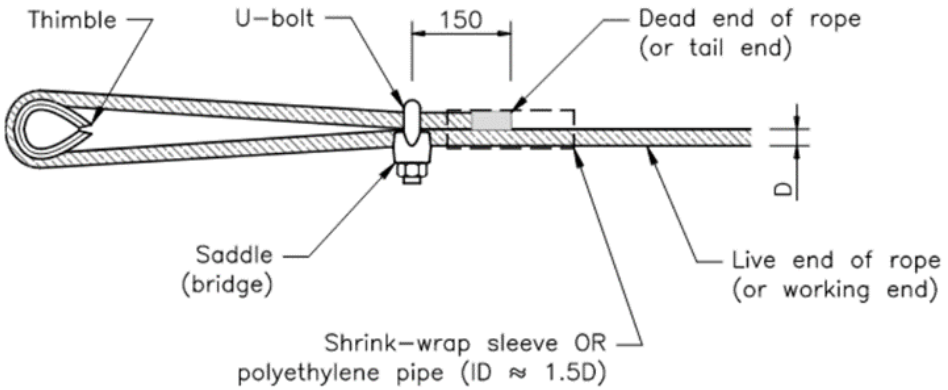
These terminations shall be installed as per the following guide (all wire rope grips and thimbles are to be Type 316 stainless steel):

Specification

- Nuts must be tightened using a torque wrench.

Step 1 - First Grip

1. Prior to installing any grips, place heat–shrink sleeve or polyethylene pipe over the cable.
2. Determine the required tail length based on the required number of grips and spacing (See Table).
3. Place the first grip and tighten to 80% of required torque at this stage. The first grip should be placed 150mm from the dead end of the rope.

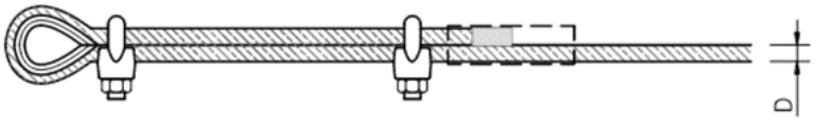


Note:

- The saddle of the grip should always be fitted on the live end of the rope and the U–bolt on the dead end of the rope.
  (Tip: Do not saddle a dead horse).
- Do not alternate the orientation of the grips.
- Orientate the diagonal lugs inside each grip's saddle with the lay of the cable strands.

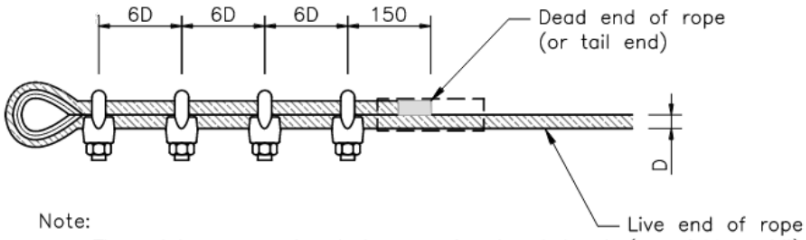
Step 2 - Second Grip

4. Place the second grip immediately against the thimble, but not so close to damage the thimble or cable during the tightening process.
5. Tighten the nuts to 80% of the required torque at this stage.



Step 3 - Remaining Grip(s)

6. Place all other grips, at equal spacing, between the two end grips. The recommended spacing is six times the rope diameter (6D) (See Table).



Note:

- The minimum spacing between grips is at least (or working end) away from each other.

Step 4 - Tighten to specified torque

7. Apply a light tension to the live end of the rope and tighten all nuts to the specified torque shown in the Table.

Step 5 - On-going torque checks

8. Check cable grip torque according to the following schedule:

For bridges within 1hr of the road–end:

- As a final operation prior to leaving bridge site, then after;
- 24 hrs
- 7 days
- 3 months
- 12 months

For all other bridges

- As a final operation prior to leaving bridge site, then after;
- 3 months
- 12 months.

Nom. Wire Rope Dia. (D)	MIN number of grips	MAX Grip Spacing (6D)	Required Torque
(mm)	(No.)	(mm)	(N.m.)
8	4	48	9
10	4	60	12
13	4	78	33
16	4	96	49
19	5	114	68
22	5	132	107
26	6	156	147
30	7	180	212
34	8	204	296

Note:

Any existing wire rope grips installed on cables should not be removed or altered.

AMIS notifications shall be entered against the structure for each torque checking operation where wire rope grips are used on main cables.

11.11. Trial Assembly

11.11.1. Before delivery, all components shall be assembled to check fit. Components have been selected on dimensional compatibility, but in some instances, nominal tolerances are minimal and may be less than manufacturing tolerance. Individual selection may be necessary in this instance. The Principal's Representative shall be notified if the specified components do not fit. Changes or modification to components shall not be made without the approval of the Principal's Representative or the Engineer.

11.12. Williams Bar Components – Main Cable Anchor Bars

11.12.1. Anchor bars shall be 32mm Williams Grade 75 All-Thread Rebar to ASTM A615M-09.

11.12.2. Williams bars and all associated componentry (including all welded steel brackets, Williams nuts, Williams All-Thread anchor bar and washers) to be hot dip galvanised.

11.12.3. Williams bars and all associated componentry (including all welded steel brackets, Williams nuts, Williams All-Thread anchor bar and washers) to be coated with Fusion Bonded Epoxy coating over the hot dip galvanised coating. The Contractor is to propose a product and an applicator for approval by the Engineer before coating. Coating certificates from the supplier are to be supplied by the Contractor to the Engineer.

11.12.4. Each anchor bars shall be supplied and installed as a single lengths with no couplers or joiners between the Deadman anchor and the main cable connection fitting.

11.12.5. Williams R73 Hex Nuts and full lock nut shall be used with the washer at the ends of the Williams All-Thread anchor bar or where indicated on the drawings.

11.13. Corrosion Protection

11.13.1. Where shown on the drawings items shall be coated in the full Denso system consisting of:

- Denso MP Primer (Paste)
- Denso Petrolatum Tape (grease impregnated cloth tape) and
- Polyethylene Tape.

11.13.2. All Denso tape shall be applied with 50% overlap to achieve a continuous double thickness. Refer to Section 12 for full Denso wrap installation requirements.

11.13.3. Exposed hot dip galvanised shackles, and chain shall be coated with CRC Softseal following final adjustment of cable tension.

11.13.4. Galvanised rigging Screws shall be filled with general-purpose grease before assembly, regardless of the corrosion environment.

11.13.5. The threads of all galvanised rigging screws shall be protected with Denso Multi-Purpose Primer and Denso Mastic up until an inspection and adjustment three months after installation. Following the adjustment, the threads shall be wrapped with the remaining components of the Denso system. (Refer to manufacturer's specifications).

11.13.6. The buried nuts, exposed portions of threaded bar and attachments and bearing plates of the Williams All Thread Re-Bar anchors that are not Raychem Heat shrink wrapped, shall be protected with the Denso System, taking care to fully seal up to the heat shrink wrapping.

11.14. Chain

11.14.1. Chain is required at the end terminations of the primary wind cables.

11.14.2. All chain shall be PWB Grade L – ArmourGalv (galvanised) chain in accordance with AS2312.

11.14.3. Test certificates shall be supplied with all chain used on this project.

11.15. Hot dip Galvanised Rigging Screws

11.15.1. Where hot dip galvanised rigging screws have been specified, these rigging screws shall be hot dip galvanised and manufactured using heat certified Australian Steel in accordance with AS1442 and AS1443.

11.15.2. Where the grade of these rigging screw has not been specified, Grade L rigging screws shall be provided.

11.15.3. These Rigging screws shall be tested and certified in accordance with AS2319 and certificates shall be provided for all rigging screws supplied.

11.15.4. All galvanised rigging screws shall be pulled apart, packed with Denso primer paste and reassembled before installation. Wire up with 2.5mm galvanised lacing wire, (or alternatively 2.0mm grade 316 stainless steel lacing wire) to prevent unwinding **immediately following installation.**

11.16. Stainless Steel Rigging Screws

11.16.1. Where stainless steel rigging screws have been specified, rigging screws shall be manufactured from AISI316 / DIN1.4401 stainless steel with minimum breaking loads specified in the drawings.

11.16.2. Stainless rigging screws shall have locking nuts both ends and be wired up with 2.0mm stainless steel locking wire to prevent unwinding **immediately following installation** The locking wire of the rigging screws shall be installed as per the following guide.

Cables impart an anti-clockwise torque on rigging screws. Locking wire is installed to prevent this torque unwinding the end fittings from the barrel of rigging screws.

- Locking wire shall be installed from the moment a rigging screw is installed.
- Locking wire shall be **3.15mm diameter soft galvanised wire** (not high tensile). Start with approx. 1.5 - 2.0m length of wire depending on size of rigging screw.
- Locking wire installation shall be carried out, or supervised, by personnel experienced in cable structure construction.
- Many in-service rigging screws will be wired differently to this specification. As long as the wire is at least 2.0mm diameter, is intact and passes through the barrel and both end-fittings it can be considered adequate.
- **Ensure the length of end fitting thread inside the barrel is at least 1.5 x the length of the swaged portion of the barrel** before installing locking wire. The threaded length of end fittings is approximately half the barrel length.

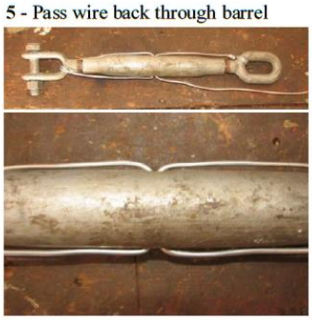
1 - One complete wrap of end-fitting

2 - Four tight winds of tail

3 - Trim back end of tail

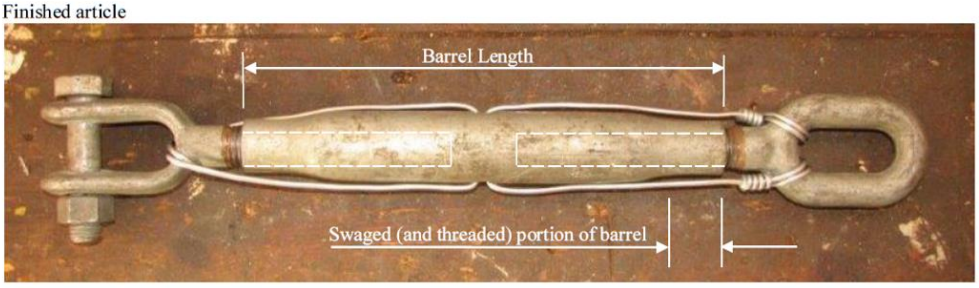
4 - Pass wire through barrel then one complete wrap of other end fitting

5 - Pass wire back through barrel



6 - Terminate wire at end-fitting as shown steps 1 - 3

Finished article



11.16.3. The Williams All-Thread anchor bar shall be applied with the protective Denso System as per section 11 in this specification and illustrated in the drawings over its entire length until 75mm into the Deadman anchor's concrete cover to avoid corrosion at the concrete's interface. The application of the Denso System shall be as per the manufacturer's recommendations.

12.0 DENSO SYSTEM

12.1. Scope

12.1.1. This section applies to Denso Tape wrapping the components specified on the structural drawings for additional corrosion protection including supply and appropriate application of Denso Tape.

12.2. Cleaning

12.2.1. Wire brush dirt, loose rust etc. from substrate. Minimum service conditions: damp, but no free droplets or water; free of loose rust, scale, mud, paint etc.

12.3. Denso Mastic

12.3.1. Where necessary contour all sharp and irregular profiles with Denso Mastic to ensure tape will not bridge or become perforated during wrapping or in service. Maximum service temperature 55 degrees Celsius.

12.4. Denso Petrolatum Tape

12.4.1. Spirally apply tape without stretching, heavy compound side to work. Apply with 55% overlap to achieve consistent full double thickness of tape. Select a tape width roughly equal to the component diameter. Smooth tape by hand as wrapping proceeds to exclude voids, ensure intimate contact and seal tape overlaps.

12.5. Denso MP/HD Tape

12.5.1. Spirally apply tape without stretching. Apply with a 55% overlap to achieve consistent full double thickness. Select a tape width roughly equal to the component diameter.

12.6. Installation

12.6.1. The Denso system shall be installed as per the following guide.

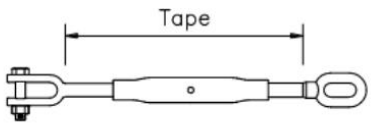
Densotape Installation

Step 1: Denso MP Primer (Paste)

a. Clean metal surfaces with a wire brush. Firmly adherent rust and scale need not be removed.
b. Apply film of paste over component filling any small imperfections, voids, etc.

Step 2: Denso Tape (grease impregnated cloth tape)

a. Wrap tape without overstretching. Apply heavily coated side of the tape to metal surface.
b. Smooth down and mould by hand especially all overlapped edges.
c. A 55% overlap of tape should be applied to achieve a continuous double layer of tape.
d. Apply tape over barrel and threads ensuring tape does not extend into clevis or eyes.



13.0 BRIDGE FRP DECKING

13.1. Scope

13.1.1. This section of work consists of the installation of the FRP (Fibre Reinforced Polymer) decking of the swing bridge.

13.2. General

13.2.1. The Contractor shall purchase the FRP decking products and the associated fixings as specified in the structural drawings. Alternatives shall not be used unless otherwise approved by the Engineer.

13.2.2. The Contractor shall provide the Engineer with all the associated documentation, performance specification, and invoices as soon as possible upon completion of the purchase. Installation is strictly forbidden without the Engineer's approval of the procured FRP products and its associated fixings for design compliance.

13.2.3. All fixings used for any FRP products shall be Type 316 Stainless Steel only.

13.3. Cutting and Installation

13.3.1. The installation of the FRP products specified in the structural drawings shall be in accordance with the manufacturer's guidelines and carried out by a suitably qualified construction personnel.

13.3.2. The contractor shall ensure that the supporting structure of the FRP components and its associated fixings are in adequate condition, debris free, and has a dry surface prior to installation.

13.3.3. Dust generation shall be minimised during cutting with dust collection and vacuum systems at a minimum. Refer to the manufacturer's guidelines for the detailed cutting procedures.

13.3.4. Appropriate installation and cutting tools specified by in the manufacturer's guidelines shall be used unless otherwise agreed by the Engineer.

13.3.5. Any identified severely damaged, deflected, faded, and worn FRP components post installation shall be replaced unless otherwise approved by the Engineer.

13.3.6. Waste FRP material shall be disposed of responsibly in accordance with local council regulations.

13.4. Health and Safety

13.4.1. All works during the installation and cutting of the FRP products shall adhere with the regulations stated in the Health and Safety Work Act 2015.

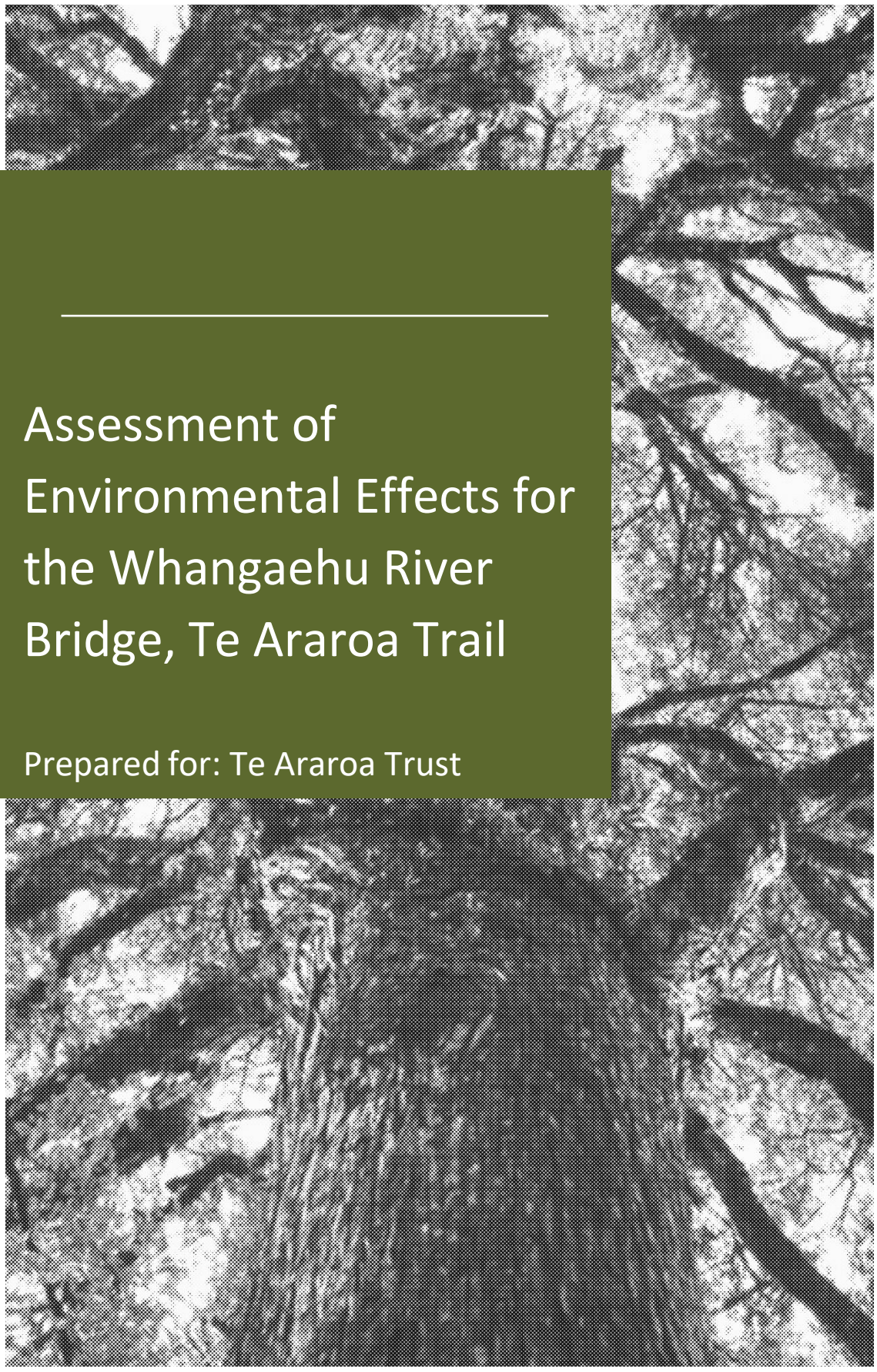
13.4.2. Appropriate health and safety guidelines and personal protective equipment (PPE) shall be followed and worn, respectively, during the installation and cutting of the FRP products.

13.4.3. All health and safety requirements stated in section 2 of this technical specification are applicable to all FRP cutting and installation works.

END OF TECHNICAL SPECIFICATION

FRAME GROUP

HELPING AOTEAROA NEW ZEALAND ACCESS,
ENJOY AND PROTECT THE GREAT OUTDOORS



Assessment of Environmental Effects for the Whangaehu River Bridge, Te Araroa Trail

Prepared for: Te Araroa Trust

NSES Ltd report 22:2024/25

SINGERS
ECOLOGICAL

Author(s): Sec 9(2)(a) for Singers Ecological
Date: June 2024

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CONTENTS

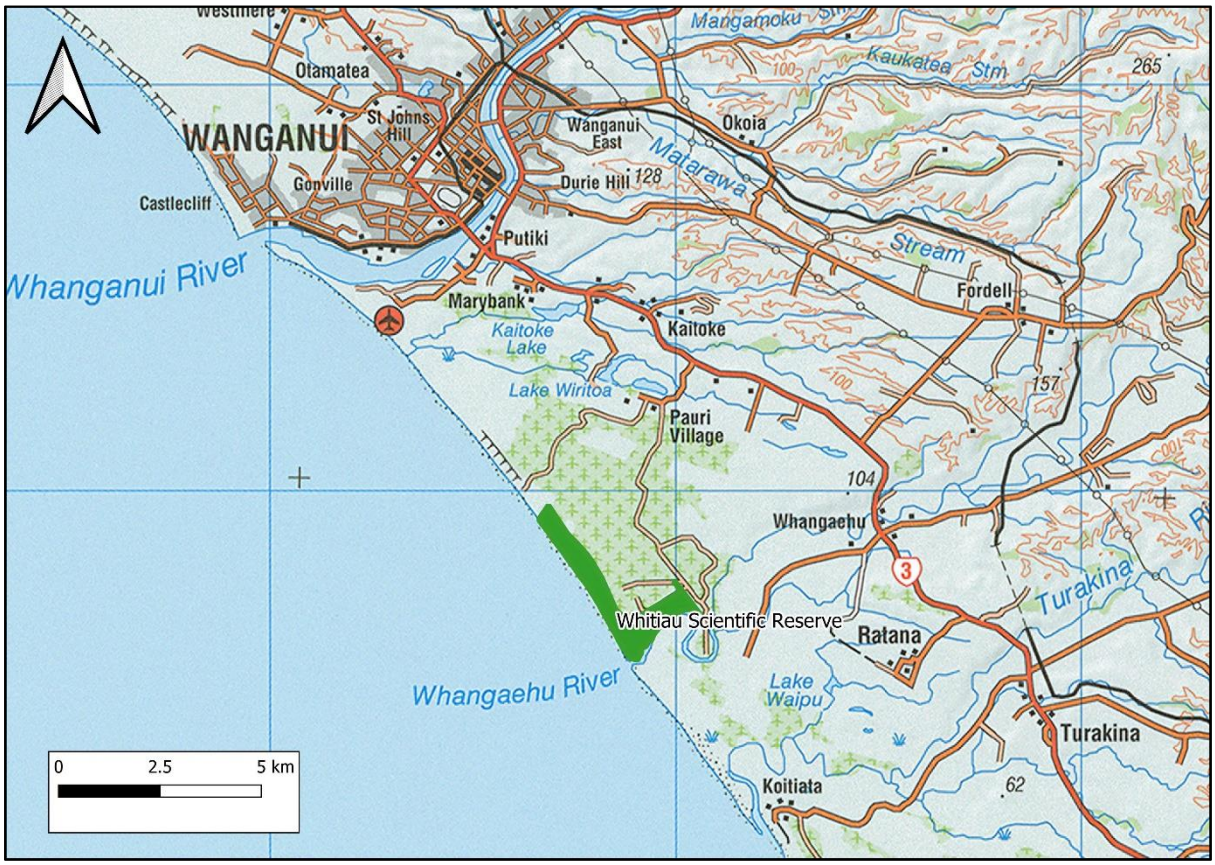
1. Introduction

The Te Araroa Trail is a continuous 3,000 km walking track from Cape Reinga to Bluff. From Whanganui the trail currently follows State Highway 3 to Turakina township requiring walkers to hike alongside a main highway.

This assessment of environmental effects (AEE) is part of a project to realign the trail along the west coast from near the Whanganui airport to Koitiata township, at the mouth of the Turakina River. This will require development of a bridge across the Whangaehu River and access through the Whitiau Scientific Reserve, located on the true right side of the river.

Whitiau Scientific Reserve is located on the north side of the Whangaehu River, approximately 12 km southeast of Whanganui and is managed by the Department of Conservation. The reserve is a nationally significant area of Holocene age coastal dunes and associated dune plains and wetlands.

Figure 1.1: Location of Whanganui and the Whitiau Scientific Reserve



1.1 The Proposal

The proposed trail route will enter the Whitiau Scientific Reserve from the beach at the mouth of the Whangaehu River and head inland for approximately 1.6 km along an existing 4WD track to the site of the proposed swing bridge. This track is already well developed and is used for management purposes and whitebait fishers.

The proposed Whangaehu River swing bridge is located approximately 5.3 km southwest of the current SH3 Whangaehu River Bridge. The proposal is to construct a 120 m long x 0.75 m wide cable suspended pedestrian swing bridge across the Whangaehu River.

Figure 1.2: Representation of the proposed swing bridge design

The bridge will be constructed for a 50 year timeframe using a combination of timber, stainless steel, concrete and reinforced polymer (FRP).

The treated wooden components include the bridge staircase and foundation piles, with the piles encased in concrete and a steel casing. The bridge staircases will be 6.5m–8m in height. The swing bridge platform will also be supported by wooden out riggers. All wooden structures will be cut to length offsite, though some minor trimming will be required on site. These towers and staircase will be supported by stainless steel wires located behind and perpendicular to the staircase and towers, which will be held with concrete deadman anchors. The bridge platform will be held by stainless steel wire cables and treated timber bracing. The bridge deck will be a fibre reinforced polymer decking. The bridge load capacity is for five people.

On the true right bank of the river the bridge is located within the Whitiau Scientific Reserve, whilst the true left bank of the river consists of private farmland. There are no ecological values on the farmland of significance. This AEE pertains only to the requirement for a resource consent for construction of the bridge and effects within Whitiau Scientific Reserve.

Effects associated with the walking track will be addressed through the Department of Conservation's concession process. This assessment has however considered the purpose of a scientific reserve and obligations of the manager.

Figure 1.3: Proposed works footprint within the Project Area

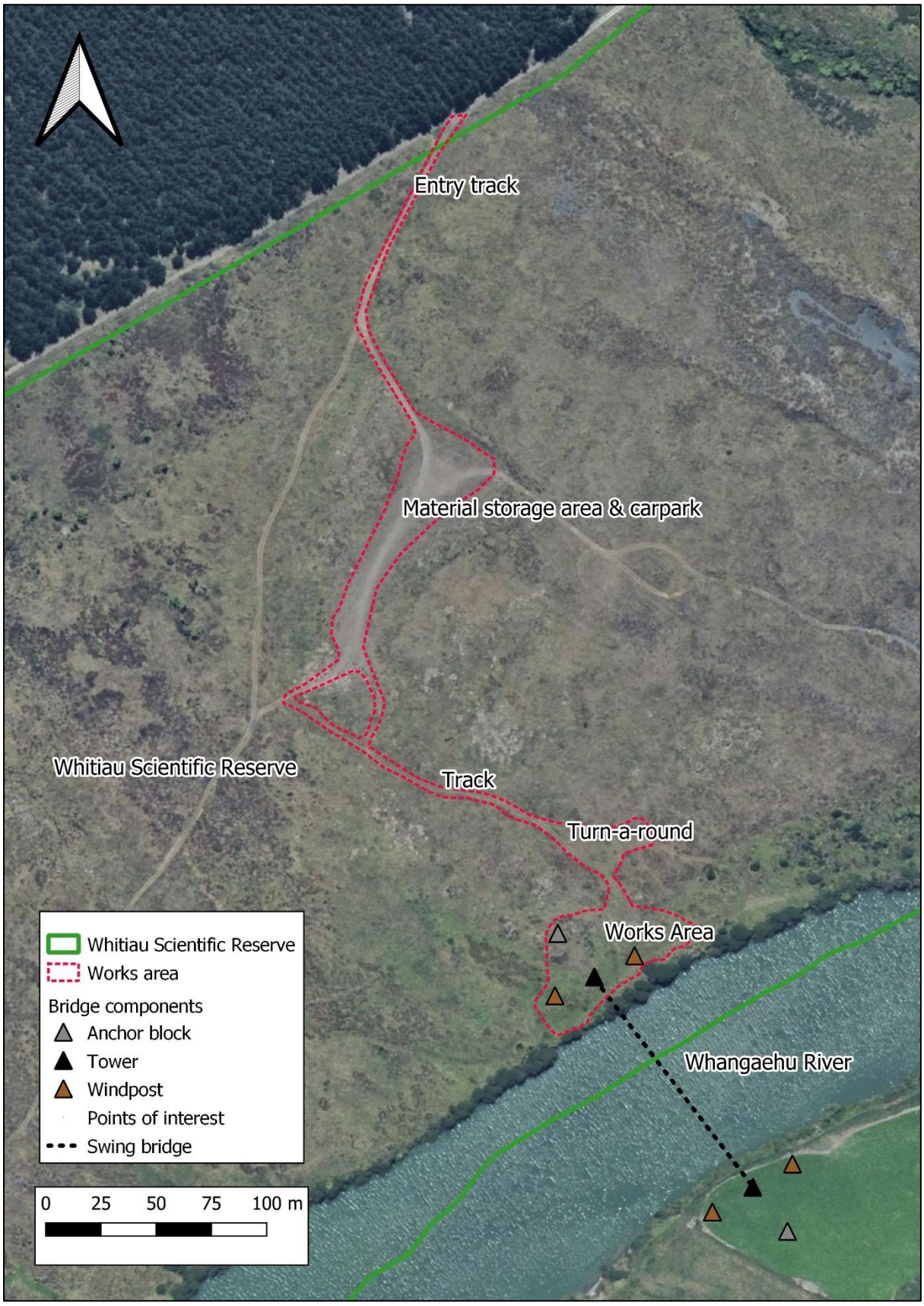


Figure 1.3 sets out the proposed works footprint. The proposal will involve small scale earthworks using a digger including preparation of tracks to bridge components and excavation of soil for foundations. The works footprint includes:

- Utilising existing formed tracks for vehicle access for trucks and a digger. It is proposed that concrete truck access is as close to the bridge foundations as possible.
- The area recommended for material storage and a carpark has a hardened gravel surface and is unvegetated. It will be used for offloading materials from trucks, carpark and all refuelling of the digger.
- From the material storage area, all bridge materials will be transported to where needed.
- The digger will be used to create a more uniform track surface to enable improved access, such as for a concrete truck. This will require using onsite soil material such as any raw sand from excavation of foundations.
- A digger will be used to clear vegetation required within the immediate works area such as for the bridge staircase, foundations and anchor footings. All indigenous vegetation will be excavated, will be stockpiled on the alluvial terrace near the harakeke flaxland. This will be later used for remediation of any areas of bare soil.
- The digger with an auger attachment will excavate 6 m holes for foundation piles and anchor blocks. To prevent soil slumping of the wet river silt, the foundation pile holes will be encased in a steel cylinder to the required depth. Excess water will be pumped from these holes into a temporary sediment retention pond, such as a small, excavated depression within the alluvial terrace.
- Excavated silt and soil from the foundations will be stockpiled and then later used for remediating disturbed ground following completion. This will be used to remediate areas where soil disturbance has occurred.

1.2 Statutory Framework

1.2.1 Reserves Act 1977

Scientific reserves are classified to protect and preserve (an area) in perpetuity (Section 21). The relevant legislation is included below.

(1) …reserves classified as scientific reserves, purpose of protecting and preserving in perpetuity for scientific study, research, education, and the benefit of the country, ecological associations, plant or animal communities, types of soil, geomorphological phenomena, and like matters of special interest.

(2) Every scientific reserve shall be so administered and maintained under the appropriate provisions of this Act that—

(a) …except where the Minister otherwise determines, the indigenous flora and fauna shall as far as possible be preserved.

(c) where scenic, historic, archaeological, biological, or natural features are present on the reserve, those features shall be managed and protected to the extent compatible with the principal or primary purpose of the reserve: provided that nothing in this paragraph shall authorise the doing of anything with respect to fauna that would contravene any provision of the Wildlife Act 1953

The concept of preservation in perpetuity is therefore fundamental to this AEE. Consequently, activities proposed within a scientific reserve need to be undertaken in such a way to preserve all features of significance, so this proposal is consistent with the Act.

Whilst this AEE is for a resource consent under the Resource Management Act 1991, this AEE has been undertaken, cognisant of the purpose of this reserve under the Reserves Act 1977.

1.2.2 Resource Management Act 1991, and associated subordinate plans

The Resource Management Act aims to sustainably manage resources and plan for the future of our environment. The Horizons Regional Council's One Plan provides direction for this. Of specific relevance to this Proposal is Schedule F — Rare and threatened habitats.

1.2.2.1 Schedule F: Indigenous Biological Diversity

Schedule F classifies habitat that is rare, threatened or at risk. A resource consent is required if a proposal occurs within an area which is rare, threatened or at risk habitat and meets criteria.

This proposal occurs within 'Stable duneland' which is a rare habitat. Whitiau Scientific Reserve additionally contains additional rare, threatened or at risk habitats including 'Active dunes' and 'Swamp and marsh wetland'. The 'Stable duneland' (within Whitiau Scientific Reserve) meets criteria because the area in question exceeds 0.05 hectares.

These designations and also because the area is legally protected, also classify the Whitiau Scientific Reserve as a Significant Natural Area under the Whanganui District Plan.

1.2.2.2 National Policy Statement for Indigenous Biodiversity

Whitiau Scientific Reserve qualifies as a significant natural area for its very high representativeness, diversity and pattern, rarity and distinctiveness and ecological context.

For this reason, relevant NPSIB policies include:

> Policy 1: Indigenous biodiversity is managed in a way that gives effect to the decision making principles and takes into account the principles of the Treaty of Waitangi.
>
> Policy 3: A precautionary approach is adopted when considering adverse effects on indigenous biodiversity.
>
> Policy 4: Indigenous biodiversity is managed to promote resilience to the effects of climate change.
>
> Policy 7: SNAs are protected by avoiding or managing adverse effects from new subdivision, use and development.
>
> Policy 10: Activities that contribute to New Zealand's social, economic, cultural, and environmental wellbeing are recognised and provided for as set out in this National Policy Statement.
>
> Policy 13: Restoration of indigenous biodiversity is promoted and provided for.

1.2.3 National Policy Statement for Freshwater 2020 (NPSFM) and National Environmental Standards for Freshwater 2020 (NES)

The NPSFM defines wetland habitat and provides policy direction for wetlands, with the objective of no loss of extent. The NES provides regulations for managing effects to natural inland wetland habitat from activities. Activities are permitted if located 10 m away from a natural inland wetland, or 100 m away if there is a hydrological connection been the activity and the natural inland wetland.

The Proposal is not located within a natural inland wetland habitat as defined by the NPSFM 2020. All components are greater than 10 m away from a natural inland wetland.

Two wetland areas occur within 100 m of the proposal. These include a narrow strip of riverine marsh associated with the rise and fall of the Whangaehu River. This marsh is dominated by crack willow (*Salix fragilis*), rautahi (*Carex geminata*) and harakeke (*Phormium tenax*). Dense harakeke flaxland habitat, which conforms to schedule F 'Swamp and marsh' is approximately >80 m upstream of the bridge staircase foundations and northern deadman. Similarly, this area has an intermittent hydrology associated with periodic flooding of the river

Whilst these structures are within the 100 m zone which under the NES requires consideration if there is a hydrological connection with the proposed activity. It is my opinion that there is no connection between this activity and the hydrology of these wetlands which are entirely dependent on the natural rise and fall of the Whangaehu River. This activity, primarily being excavation of soil to construct foundations and a deadman anchor will have no effect on this hydrology.

For these reasons it is my opinion that the NPSFM and NES are not relevant to this proposal.

2. The environmental impact assessment framework and methodology

2.1 EIANZ methodology

The ecological impact assessment follows the Environment Institute of Australia and New Zealand guidelines assessment of effects (EIANZ 2018). This method involves determining the study areas biological components, including reviewing existing information, assigning value or importance, assessing effects and magnitude from the activity, and measures for managing impacts. The magnitude of effect has used the area of stable duneland within Whitiau Scientific Reserve for the comparison of habitat loss.

A component of assigning value is identifying whether the Project Area is designated as a significant natural area under the Whanganui District Plan and the reasons or criteria which justify this designation.

When assigning value, significance criteria within National Policy Statement of Indigenous Biodiversity (NPSIB) significance criteria (representativeness, diversity and pattern, rarity and distinctiveness, ecological context) have been undertaken. These are identical to the EIANZ methodology.

2.2 Desktop and site assessment

The present assessment initially undertook a desktop assessment using QGIS. This involved the creation of a high resolution vegetation map using a combination of shapefiles created from the above work and what was discernible on more recent aerial imagery (Manawatu Whanganui 0.3m Rural Aerial Photos (2021-22). The 2021-22 imagery was taken in summer and shows a vegetation browning between dunes and alluvial soils. The location of the bridge structures were provided and imported into QGIS. Using this spatial information several maps showing the location of the bridge structures were made to inform fieldwork, which were exported as a georeferenced pdf to Avenzamap app.

A site visit was undertaken on the 17th of April 2024 with Jim Campbell (DOC Ranger), who has had over 35 years' experience managing the reserve.

During this visit, an Avenza map showing the location of bridge structures was used to navigate to the site. The area was assessed as to whether any wetland vegetation was present using Clarkson (2013), which determined that wetland is present adjacent to and associated with the margin of the Whangaehu River and approximately >80 m upstream. At the location of the bridge tower, data was collected of plant species presence and cover using the unbounded Recce method of Hurst and Allen (2022). Observations of fauna were recorded.

During the field visit drone images were taken at 120 m height and 80% overlap, using a DJI MavicPro with a 4K RGB camera. These images were then processed into an orthomosaic using WebOMB software. Using this layer, field notes and site photos a high resolution vegetation map was made using QGIS software.

On site ecological values of importance and potential effects associated with construction, including measures to avoid and minimise effects were discussed with Jim Campbell.

A plant species list for the Whangaehu—Turakina mouth dunes (Ogle & Campbell 1990) was reviewed. iNaturalistNZ and New Zealand Bird Atlas records were checked to assess what of other species of significance occur at the site.

3. Ecological Values

3.1 Whitiau Scientific Reserve

Whitiau Scientific Reserve is a nationally significant coastal reserve which protects ecosystems, habitats and species associated with Holocene dunes of the West Coast of the North Island. Despite its modified condition it is one of the most important dune reserves within the Foxton Ecological District, the largest dune system in New Zealand. Conservation, particularly of invasive weeds has maintained and improved native dominance within the reserve and allowed dune ecosystems to naturally develop.

The reserve includes active foredunes with populations of native sand binders, spinifex (*Spinifex serceus*) and pingao (*Ficinia spiralis*) (At Risk — declining species), characteristic dune shrubs including tauhinu (*Ozothamnus leptophyllus*), sand coprosma (*Coprosma acerosa*) and sand daphne (*Pimelea villosa*) (At Risk — declining species).

Behind the foredunes low lying dune slacks of bare moving sand occur with sand sedge (*Carex pumila*) which grades into dune plains of oioi (*Apadasmia similis*). Older dune plains are in a process of vegetation succession and are dominated by indigenous wetland plants such as harakeke (*Phormium tenax*), mingimingi (*Coprosma propinqua*) and other *Coprosma* hybrids, mānuka (*Leptospermum scoparium*) and cabbage trees (*Cordyline australis*). An area of harakeke flaxland with mānuka and tree ferns occurs on a flood prone river terrace approximately 80 m upstream of the bridge.

The furtherest inland part of the reserve is an area of stable dunes. These stable dunes are dominated by knobby clubrush (*Ficinia nodosa*) and coastal pohuehue (*Muehlenbeckia complexa*) amongst exotic grasses, of which cocks' foot (*Dactylis glomerata*) is most common. These areas are in a process of vegetation succession with larger plants establishing, including cliff flax (*Phormium cookianum*) and shrubs including coastal daisy (*Olearia solandri*).

These native dominant ecosystems are of very high representativeness, diversity and pattern, rarity and distinctiveness, ecological context so are of very high ecological value.

Fauna known to be present within the reserve include:

- North Island fern bird or mātātā (*Poodytes punctatus*) — At risk, Declining. This species is most common within areas of dense vegetation such as flaxland, shrubland areas.
- New Zealand pipit or pīhoihoi (*Anthus novaeseelandiae*) — At risk, Nationally uncommon. Present in open grassland and dune areas.
- Swamp harrier or kāhu (*Circus approximans*). Known to breed in the reserve.
- Katipō spider (*Latrodectus katipo*) — Nationally endangered. This species occurs in foredune areas and is often associated with pingao and driftwood lying above the mean high water spring tides mark.

- Northern grass skink *(Oligosoma polychroma*) — Not threatened. Likely present in dune areas.
- Other lizards which possibly could be present include
    - Kupe skink (*O. infrapunctatum*) — Threatened, Nationally critical.
    - barking green gecko (*Naultinus punctatus*) — At Risk, Declining and
    - ngahere gecko (*Mokopirirakau* 'southern North Island' — At Risk, Declining.

These lizards are most likely to occur within refugia such as dense areas of coastal pohuehue and flaxland, which are not present within the works area.

Outside of Whitiau Scientific Reserve, the Whangaehu estuary provides habitat for a wide range of wetland and wader birds including migratory species (Jim Campbell *pers.com.*). Species recorded on iNaturalistNZ and eBird bird lists between the Turakina and Whangaehu estuaries include:

- Pied shag or kāruhiruhi (*Phalacrocorax varius*) — Recovering.
- Black shag or māpunga (*Phalacrocorax carbo*) — Relict.
- Variable oyster catcher or tōrea pango (*Haematopus unicolor*) — Recovering.
- Royal spoon bill or kōtuku ngutupapa (*Platalea regia*) — Naturally uncommon.
- Black backed gull or karoro (*Larus dominicanus*). Large numbers regularly seen.
- Red billed gull or tarāpunga (*Chroicocephalus novaehollandiae*) — At risk, Declining.
- Caspian Tern or taranui (*Hydroprogne caspia*) — Threatened, National Vulnerable.
- Banded dotterel or pohowera (*Anarhynchus bicinctus*) — At risk, Declining.

During my site visit on 17th of June a small flock of dotterels (20–30 birds) were seen which were likely this species.

These birds potentially could breed in suitable open sandy sites within the reserve, though are more likely to breed near the river mouth:

- Black fronted dotterel (*Charadrius melanops*) — Naturally uncommon.
- Wrybill or ngutu pare (*Anarhynchus frontalis*) — Recovering. Migrant.
- Pectoral sandpiper (*Calidris melanotos*). Migrant
- Spur-winged plover (*Vanellus miles*). Likely breed at this site.
- Black swan or kakīānau (*Cygnus atratus*).
- Pied stilt (*Himantopus leucocephalus*).

3.2 Vegetation and ecological values within the proposed works area

The proposed works immediately including the tracks, etc. and around the bridge components are either non-vegetated or dominated by exotic plan species. Where the bridge staircase, foundations and anchor blocks are located, the vegetation is dominated (>80% cover) by two grasses, cock's foot (*Dactylis glomerata*) on stable dunes, and fescue (*Lolium arundinaceum*) on the alluvial flood prone terrace (Figure 3.1 and 3.2). Most other common species are also exotic, being herbaceous dicots and grasses.

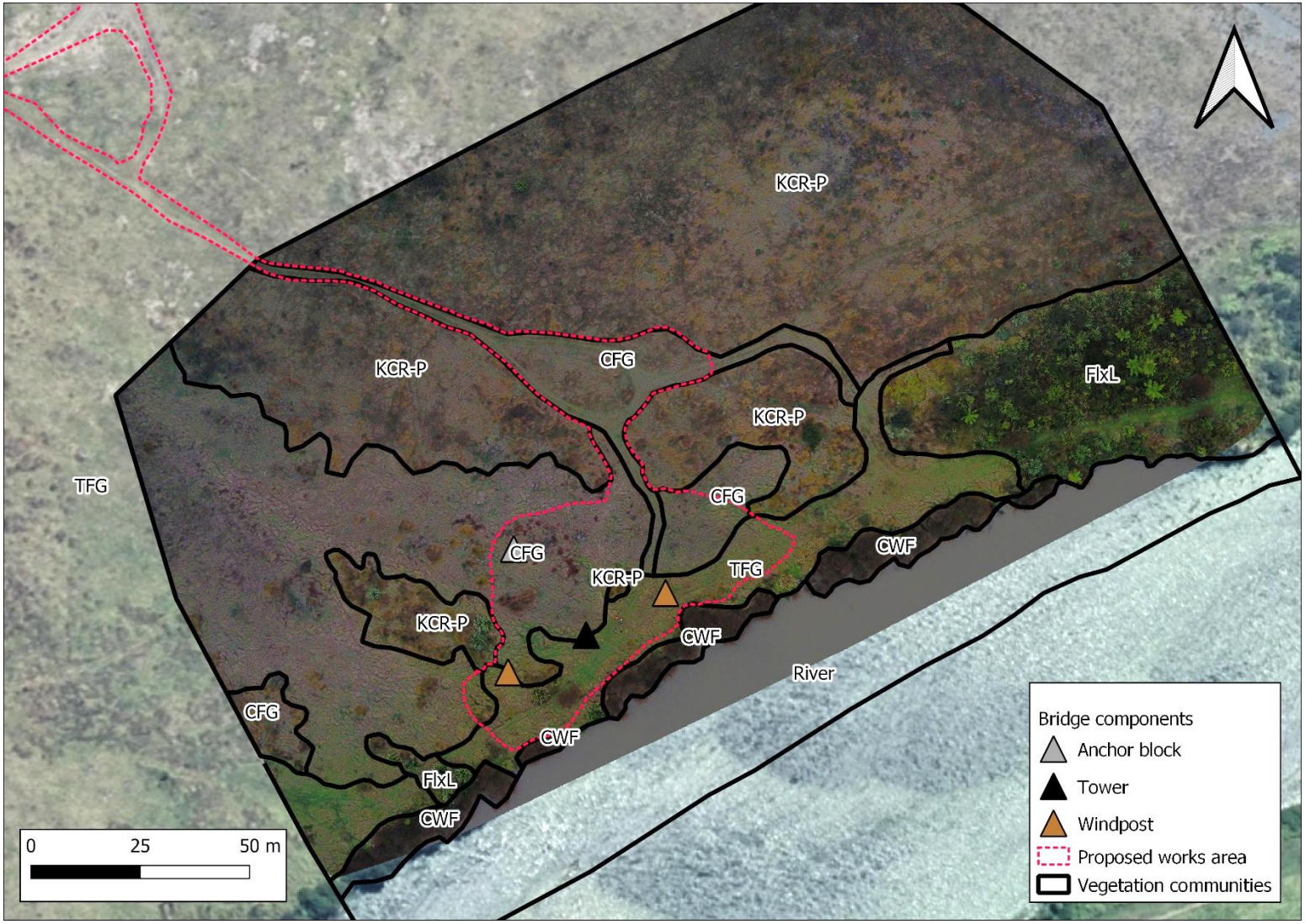
Figure 3.1: Dense exotic dominant grassland of cock's foot on dune toe slope (left) and tall fecuse on alluvial terrace (right). Jim Campbell (DoC Ranger) is standing at the approximate location of the bridge staircase. The line of crack willows (right) is the location of the Whangaehu River.

Less common native species within the works footprint include giant umbrella sedge (*Cyperus ustulatus*) and rautahi (*Carex geminata*) on the alluvial terrace. On the stable dune landform, knobby clubrush and coastal pōhuehue, and cliff flax are present.

Other areas included within the works area (as shown in Figure 3.1) are human modified tracks. These areas are all of comparatively low ecological value.

The location of the bridge on the south side of the river is entirely within improved pasture which has negligible ecological values.

Figure 3.2: Vegetation communities within and surrounding the proposed works area mapped using the June 2024 drone orthomosaic. Vegetation codes are: CFG= Cock's foot grassland, CWF= Crack willow forest, KCR—P= Knobby clubrush, coastal pohuehue rushland, vineland, FlxL= Harakake flaxand, TFG= Tall fescue grassland,



Vegetation communities immediately adjacent to the works area, including the knobby clubrush, coastal pohuehue rushland, vineland and harakeke flaxland shown in Figure 3.1, are of very high ecological value.

3.2.1 Summary of Vegetation values within or potentially within the Project Area

Table 3.1: Summary of vegetation values within the Project Area

Vegetation community	Area (ha) in works area	Significance criteria			
		Representativeness	Diversity and pattern	Rarity and distinctiveness	Ecological context
Cock'sfoot grassland	0.239	Negligible	Negligible	Negligible	Negligible
Knobby clubrush–coastal pohuehue vineland	0.001	High	Low	High	Very high
Tall fescue grassland	0.355	Negligible	Negligible	Negligible	Negligible

3.3 Fauna values

Most of the fauna values are associated with the Whangaehu estuary including coastal wetlands and active dunes. Native species known to be present within the reserve of value include fernbird, pipit, and kāhu. Banded dotterel may also use the reserve, though nesting is most likely to occur near the estuary.

There is currently insufficient information to accurately determine the lizard values within the Project Area. Exotic grasslands are typically poor habitats for native lizards and often have high numbers of lizard predators such as mice and hedgehogs. Thus, lizard abundance is expected to be very low or lizards may be potentially absent. There is a very small chance that a threatened lizard species is present within the works footprint. For this reason, it is recommended that further survey work is undertaken to determine lizard presence (see 4.3 Avoidance).

4. Assessment of Environmental Effects

The effects of this proposal can be split into temporary effects associated with construction activities, and permanent effects associated with the bridge and increased human use.

4.1 Temporary Construction effects

Temporary construction effects will occur for the construction team to access the site, excavate foundations and construct the bridge. This will include disturbance of soil and loss of vegetation. Whilst the area is dominated mostly by cock's foot and tall fescue, it does include a small component of native species.

Whilst unlikely to occur, construction could also have negative effects to any lizards present within the construction actually footprint. Lizards are absolutely protected wildlife under the Wildlife Act 1953. These effects are proposed to be addressed in section 4.3.

4.2 Permanent effects associated with the bridge

Construction of a bridge results in a small loss of habitat. Most bridges also require a small clear area around components to reduce ongoing effects. Whilst this habitat is exotic dominant habitat it has the potential to regenerate into native dominant vegetation. This permanent footprint expected to be less than 500m^2, when including the staircase, anchors, clear land around the bridge and development of a permanent track foot track to the bridge. Whitiau Scientific Reserve is 246.177 hectares, so this represents a loss of 0.002% of the reserve.

The bridge is constructed of corrosion resistant materials including stainless steel, treated wood and fibre reinforced polymer decking. These materials are expected to have a long life and require minimal maintenance. The anticipated life expectancy is for 50 years. The bridge is however located in an area where natural hazards may occur including, flooding, tsunami and liquefaction during a large earthquake. These stochastic factors may mean that ongoing maintenance or replacement is required. This could result in ongoing cumulative effects to the reserve.

4.2 Permanent human effects

The current access into the Whitiau Scientific Reserve is restricted, requiring users to traverse 11 km along the beach from an access near the Whanganui Airport. This distance limits visitors mostly to people on vehicles or occasional horse riders. Despite being prohibited, most recreational users access the reserve via the beach on motor bikes or other all-terrain vehicles.

Realignment of the Te Araroa Trail will dramatically increase hiking usage through the reserve. Given the scarcity of natural areas within the Whanganui—Marton area, it is likely that this walk will also become popular by day visitors especially during warmer months of the year. In general traversing through the area, recreational users will have negligible effect on the ecological values of the reserve or the estuary. Positive and negative effects are also possible.

Positive effects

Greater human use could potentially result in increased knowledge of species present through citizen science app platforms, which are increasingly used by the public. I note that there is not an eBird list for the Whangaehu estuary and very limited iNaturalistNZ records, most due to two observers. Citizen scientists regularly discover rare and uncommon species.

With greater access to the reserve and appreciation of the area, the community may become more willing to participate in association with DoC to better manage the reserve, such as pulling pink ragwort and tree lupin. Community pest control projects are also rapidly increasing across New Zealand and the community may establish and manage predators, such as to protect nesting banded dotterels, with improved access.

Negative effects

Greater human use could potentially result in several negative effects, from trail users such as clearance of vegetation for temporary camping sites, sewerage and rubbish. Whilst Koitiata has a suitable campsite, it is highly likely that some users will overnight camp within the reserve.

Whilst very unlikely, the greatest potential effect is the increased risk of fire, for example if trail users camp in the area and light fires. Stable dune vegetation dominated by grass and low woody species is highly flammable, especially in hot, dry and windy conditions.

Greater human disturbance could also result in disturbance and nest abandonment of nesting shore birds, such as banded dotterel, a declining species. This is more likely to occur as a result of day visitors with dogs.

4.2.1 Magnitude of effects

Table 4.1 summarises the magnitude of effects, applying Table 10 of the EIANZ methodology.

Table 4.1: Magnitude of effects

Effect	Value (Extent)	Magnitude of Effect	Overall Effect
Construction effects	Negligible value of exotic grassland within area impacted.	Negligible	Very low
Loss of habitat	Loss of up to 500 m^2 of exotic dominant grassland vegetation with potential to regenerate into native habitat	Negligible. Less than 0.002% of the reserve	Very low
Human use	Very high value dune ecosystems.	Negligible (daily use) to Very high (human caused wildfire).	Negligible to Very High (if fire occurred)
Human disturbance of wildlife	Moderate, fernbird, pipit and kāhu are unlikely to be affected by human disturbance. Effects on banded dotterel and other ground nesting birds are unknown.	Negligible to Low. Potential low effect on a small number of ground nesting birds.	Low

The overall effect of this proposal is generally very low to low. There is however potential to result in very high effects if wildfires resulted from recreational users occur. These effects are manageable (see section 4.3 Avoidance).

4.3 Effects management hierarchy

The effects management hierarchy has been applied when considering this proposal. The EIANZ Guidelines state that moderate level effects, or greater, typically require measures to avoid, remedy or mitigate effects, while low to very low effects levels are not normally of concern, although care may be required to minimise effects through design, construction, and operation of a project.

4.3.1 Avoidance

The following measures have been undertaken or a proposed to avoid effects:

- The bridge site has good vehicle access and is dominated by exotic vegetation. This location has avoided other locations of much higher ecological value.
- This assessment provides a construction footprint (Figure 1.3) which specifically limits all activities to within this boundary. Adhering to this will ensure that high value native dominant stable duneland is avoided. It is proposed that the works boundary be included within the Department's works approval and concession applications. Additionally, the project manager must be made aware to ensure all vehicles and activities occur within this area.
- All vehicles and equipment must be thoroughly cleaned before entering the reserve. Vehicles and equipment pose a threat of introducing unwanted organisms of threat to the reserve's values — such as weeds, pathogens, Argentine ants, plague skinks. Piles of pre-cut timber should be stored indoors to reduce the chance of introducing Argentine ants and plague skinks.
- Native lizards are absolutely protected species under the Wildlife Act 1953 and efforts must be made to avoid effects harming them. It is recommended that at least 30 artificial covers be placed 6 months before construction starts to detect whether lizards are present. These should be place within a 1 hectare area, within the works area and in adjacent native dominant. If lizards are found, suitable measures, for example undertaking visual searched before earthworks or pitfall trapping. Any lizards found should be relocated to a suitable habitat within the reserve.
- On occasion there will be a need to avoid the risk of wildfire, caused by recreation users. Section 21 (2) (b) of the Reserves Act 1997, enables the manager to prohibit entry of the public into a Scientific Reserve from time to time. It would be prudent to plan to undertake this action in extreme circumstances, for example in high to extreme fire risk conditions and when the neighbouring plantation forest had also enacted this measure. This would require trail users to avoid this route during this period.

Minimise

A number of measures are proposed to minimise construction effects including:

- Undertaking construction in dry weather conditions to minimise physical damage to soils when using a digger to excavate foundations.
- Pouring concrete in during a period of fine weather and when the river is at normal flow and not expected to flood. All concrete should be covered for a period of 72 hours if rain is expected to minimise high pH leachate entering the surrounding soil and river.
- Treated timber will be stored for at least two months to be fully cured, to minimise any CCA leachate (copper, chromium, and arsenic) entering the environment. All timber should be pre-cut at a suitable building facility to minimise treated timber saw dust entering the

environment. Any cutting on site should use a tarpaulin to catch saw dust and offcuts, to be disposed to landfill.

Remediation

The activity will result in disturbance of vegetation and soil. Site remediation should include:

- All indigenous plants impacted should be dug out using a digger and used as propagules for remediation, through cultivation within a local nursery, such as the Whanganui Prison Nursery. Suitable species for propagation include knobby clubrush, giant umbrella sedge, rautahi, harakeke and coastal pohuehue.
- On completion of the works, all stockpiled soil excavated from the foundations etc should be spread across disturbed areas.
- It is recommended that all areas of disturbed bare soil be planted to remediate vegetation cover. Only indigenous plants collected from the reserve should be used for this purpose. Other suitable species include sand coprosma, coastal tree daisy, manuka, harakeke and whararikі.

5. Conclusion and recommendations

Scientific Reserves are designated to preserve in perpetuity the values they contain. Whitiau contains dune ecosystems that are of very high ecological value and are regarded as rare habitats within schedule F (Horizons Regional Council). These ecosystems nationally and regionally have been greatly reduced in extent and are highly vulnerable to human activities. Many dune ecosystems are becoming increasingly degraded by these activities. Consequently, despite some local damage from vehicles, overall, the Whitiau Scientific Reserve is of high ecological condition. Having only visited the reserve twice, first in 1994 and again in 2024, 30 years apart, I was taken by the significant change that has occurred, with natural succession and improvement of both the dune plain and stable dune ecosystems.

This proposal will generally have negligible effects on indigenous vegetation values and wildlife values of the Whitiau Scientific Reserve, primarily because the location chosen is in an area of exotic vegetation with good vehicle access. There is a very low chance that lizards occur within the works footprint and measures are recommended to address this risk.

The proposal will result in additional management for the Department to ensure that the values of the reserve are preserved in perpetuity. Increased use by hikers especially those with dogs could result in greater disturbance of ground nesting birds. The effect of this is currently unknown as no information exists of what species nest here and how common they are. This effect is likely to be low and considerably less than other current users on recreational vehicles. Ensuring hikers do not camp within the reserve will also be another challenge for the department to manage.

Realignment of the Te Araroa Track through Whitiau Scientific Reserve has the potential to increase the risk of wildfire, which could have significant adverse effects on these values. Although the risk is very small and manageable, with climate change, increasing drought and fire risk is predicted. It is recommended that advocacy signage and information within digital platforms be used to inform users of the very high ecological value of the area and that overnight camping is prohibited. Monitoring should also be undertaken to ensure that over-night camping does not occur. Further, the Reserves

Act (1977) provides provision to restrict access from time to time and this measure should be used when required, such as during periods of high to extreme fire risk periods, especially when adjoining plantation forest land has enforced these same requirements. These measures are consistent with policies 3 and 4 of the NPSIB 2023.

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Te Araroa New Zealand's Trail. Te Araroa - New Zealand's Trail — Manawatū-Whanganui

Archaeological Assessment of Proposed Pedestrian Swing Bridge Across the Whangaehu River, Te Araroa Trail

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QUALITY INFORMATION

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Cover image: Whangaehu., 17 December 1868, Whangaehu, by Nicholas Chevalier. Gift of Mrs Caroline Chevalier, the artist's widow, England, 1912. Te Papa (1912-0044-232)

INTRODUCTION

The New Zealand Transport Agency Waka Kotahi (**"NZTA"**) and Te Araroa Trust wish to construct a 120 m long, pedestrian swing bridge (**"the bridge"**) across the Whangaehu River, approximately 1.5 km from the river mouth, to allow the Te Araroa trail to be re-routed away from State Highway 3 south of Whanganui (Figure 1). The bridge will be situated in the coastal dune environment, an area of intensive historic Māori occupation by the Ngāti Apa and Whanganui iwi as well as a more limited occupation by early Pākehā. A multitude of archaeological sites are recorded in the general vicinity and wider landscape of the bridge, predominantly on the left-bank of the river, but these are not expected to be affected due to the minor nature of the earthworks that are required (Figure 2).

Figure 1: Location of the proposed pedestrian swing bridge across the Whangaehu River.

On the right-bank of the river the bridge will be constructed on Department of Conservation land, part of the Whitiau Scenic Reserve. On the left-bank of the river the bridge will be constructed on the Rakautaua 7,3 Block owned by Sec 9(2)(a) . Construction of the bridge will require earthworks to install structures. Each side of the bridge requires the following:

- concrete-filled auger holes for:
  - tower foundation piles of 550 mm diameter and 6000 mm depth (x4);
  - outrigger foundation piles of 450 mm diameter and 3000 mm depth (x2);
  - timber stair foundation piles of 450 mm diameter, 2000-3000 mm depth, (x10);
  - anchors for catenary bracing / cables of 450 mm diameter and 3000 mm depth (x4);
- a concrete tower plinth of 2500 x 2500 x 500 mm (length, width, depth)

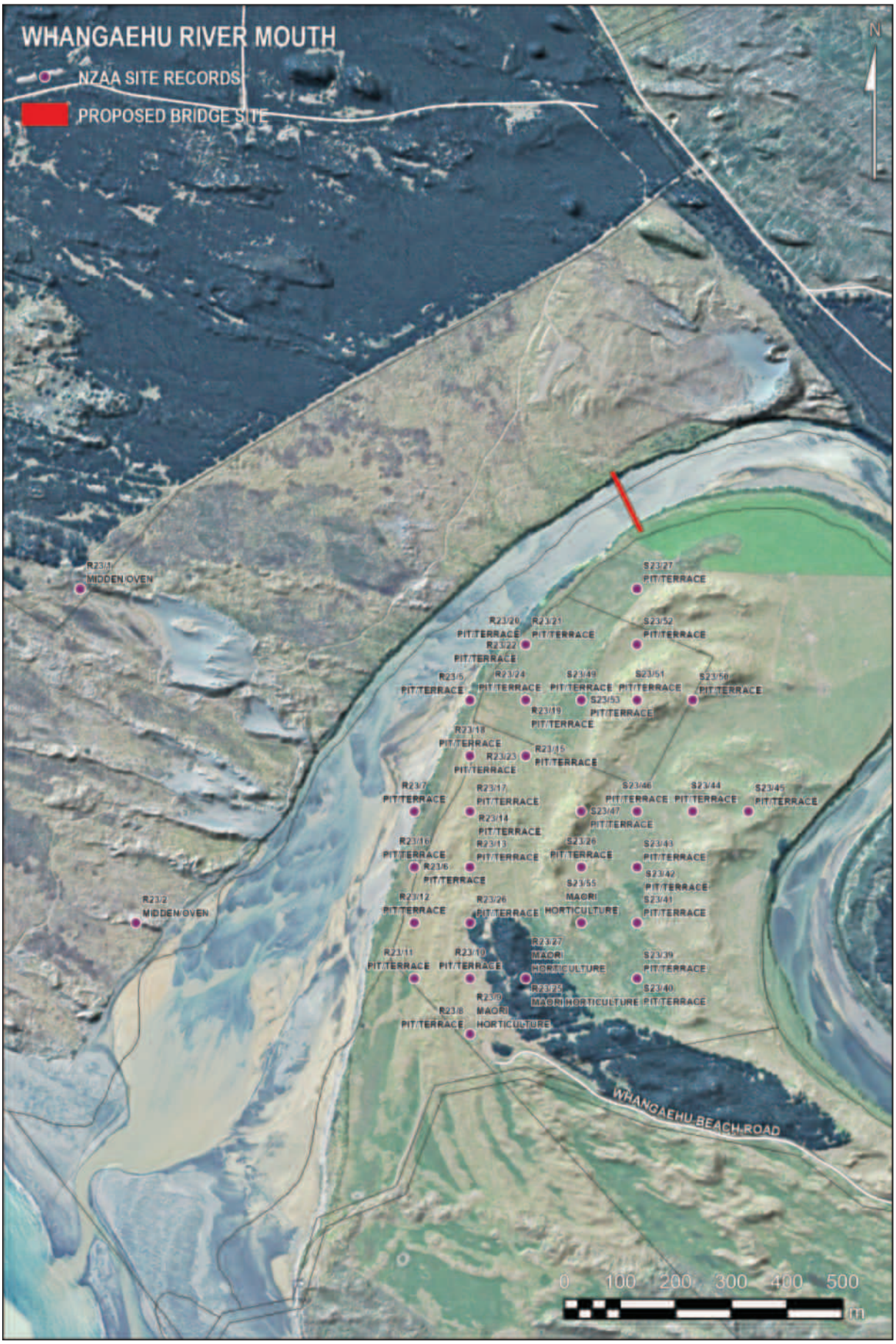


Figure 2: Location and orientation of the proposed pedestrian swing bridge across the Whangaehu River, also showing the location of NZAA recorded archaeological sites. Archaeological sites on the true right bank are scheduled in the Whanganui operative district plan.

set 300 mm below ground surface;
- concrete plinth caps of 500 x 500 x 400 mm (length, width, depth) set 200 mm below ground surface over tower outrigger piles; and,
- concrete block deadman anchor of 6000 x 1000 x 1300 mm (length, width, depth) to be buried under 1000 mm ground cover.

Trenching to install the concrete block deadman anchor will need to be of a greater area to facilitate best practice in accordance with health and safety requirements for excavations in sand and silt. Minor additional trenching will also be required to install anchor rods. In total earthworks are expected to affect less than 44 m^2 of land on either bank of the river (88 m^2 total for the whole bridge).

STATUTORY AND PLANNING REQUIREMENTS

There are two main pieces of legislation in New Zealand that control work affecting archaeological sites. These are the Resource Management Act 1991 (**"RMA"**) and the Heritage New Zealand Pouhere Taonga Act 2014 (**"HNZPTA"**), both of which promote the identification, protection, preservation, and conservation of historical and cultural heritage. The HNZPTA also provides a legislative mechanism, via an authority process administered by Heritage New Zealand Pouhere Taonga (**"HNZPT"**), for the management of works that require the modification or destruction of archaeological sites. The authority process applies to archaeological sites on land of all tenure including Māori title, public, private, and designated land regardless of whether:

- the site is recorded in the New Zealand Archaeological Association (**"NZAA"**) Site Recording Scheme or included in the New Zealand Heritage List/Rārangi Kōrero;
- the site only becomes known about as a result of ground disturbance; and / or,
- the activity is permitted under a district or regional plan, or a resource or building consent has been granted.

The HNZPTA includes provisions for criminal penalties in the event of the unauthorised damage or destruction of archaeological sites.

District Plans
The bridge will not affect scheduled historic heritage, archaeological sites or wāhi tapu sites in either the Whanganui or Rangitikei operative district plans.

ARCHAEOLOGICAL ASSESSMENT

As previously mentioned, although the coastal dunes were intensively occupied by Māori in historic times, and to a lesser degree by Pākehā in the nineteenth century, archaeological sites are not expected to be affected on the right bank of the river. The banks on either side of the river are comprised of Holocene dune deposits, but those on the right are active dunes of loose sand in an unvegetated or sparsely vegetated state with areas of deflation, while those on the left are stable and vegetated.[1] The different dune stabilities are apparent in Figure 3, where a range of archaeological sites associated with Māori horticulture are clearly visible as surface features on the left bank (cf. Figure 2).

Thirty-one NZAA recorded archaeological sites are situated within the general landscape of the bridge (Figure 2). The two NZAA recorded midden/oven sites on the right bank of the river are included in the Whanganui District Council (**"WDC"**) schedule of archaeological and wahi tupuna sites (see WDC operative district plan, Appendix K), but neither of these sites will be affected.[2] Of the remaining 29 NZAA recorded sites, only the pit/terrace site S23/27 is situated in any proximity to the bridge works on the left bank. However, lidar derived topographic data (Figure 3) and the site record description indicate that the site, as described, will not be affected:

1 GNS Science. (2018). New Zealand Geology Web Map. http://data.gns.cri.nz/geology/.Landcare Research New Zealand (LRNZ). (2022). S-Map Online. https://smap.landcareresearch.co.nz/maps-and-tools/app/.

2 Both sites – R23/1 and R23/2 – are situated more than 500 m from the proposed bridge location on the right bank.

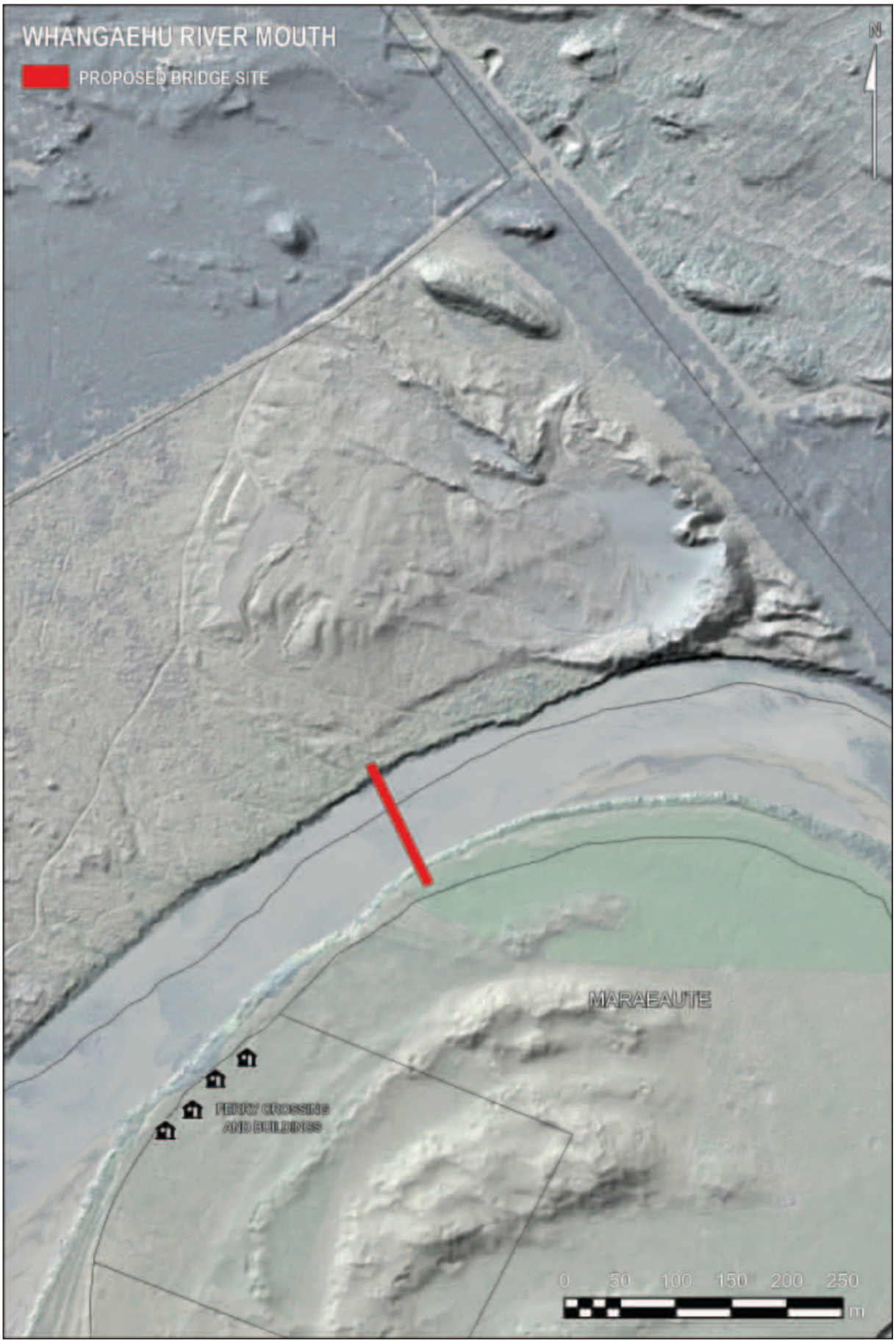


Figure 3: Detail of proposed pedestrian swing bridge location, showing differences in the stable (true left bank) and unconsolidated (true right bank) dune topography, historic place names and structures.

Low rise about 120 m long. N. E. end is all bumps and hollows with no pattern that I could make out. At SW end there are a few well defined pits and [a] lot thats [sic] unclear as the other end. One possible terrace and possible borrow pits also present. (NZAA site record S23/27)

The low rise described in the site record form is situated more 80 m from the river bank and is more than 50 m distant from the nearest earthworks for the bridge, this being the deadman anchor. In order to access the bridge site, a further 13 archaeological sites must be crossed by vehicle across open farmland (Figure 2, Table 1 and Appendix 1). Archaeological sites on the left bank are not included as scheduled archaeological, wāhi tapu or heritage sites in the Rangitikei operative district plan.

Table 1: NZAA recorded archaeological sites on the true left bank of the Whangaehu River that will need to be crossed by vehicles accessing the bridge construction site.

NZAA ID	SITE TYPE	THREAT	THREAT LEVEL
R23/5	Pit / Terrace	Vehicle movements	Nil / Negligible
R23/6	Pit / Terrace		
R23/7	Pit / Terrace		
R23/8	Pit / Terrace		
R23/9	Māori horticulture		
R23/10	Pit / Terrace		
R23/11	Pit / Terrace		
R23/12	Pit / Terrace		
R23/16	Pit / Terrace		
R23/18	Pit / Terrace		
R23/20	Pit / Terrace		
R23/21	Pit / Terrace		
R23/22	Pit / Terrace		
S23/27	Pit / Terrace	Bridge works	Nil

The historic survey plan ML 3148 indicates the NZAA recorded archaeological sites on the left bank are associated with the historic name, Maraeaute (Figure 3). The 'aute' of Maraeaute is a likely reference to paper mulberry, Broussonetia papyrifera, a cultivated tree of which the bark was used to make cloth: an historic import from island Polynesia but which is no longer found in New Zealand. Witnesses stated to the Māori Land Court, during the partition hearing for the Rakautaua Block, that Maraeaute was a "kumara, potato and taro cultivation, the soil for these cultivations being brought from the river" (Whanganui Minute Book 14: 72). The survey plan also shows a small collection of buildings situated on the left bank at a ferry crossing site, but these are situated 200 m down river of the bridge and will not be affected (Figure 3).

On the 30th of April this year as site visit was undertaken to the bridge tower locations on both the left and right banks. Eight auger samples were taken at both locations within the potentially affected areas to study the respective soil profiles for evidence, or traces of evidence, of archaeological activity. No archaeological material (shell, charcoal, etc) or traces of archaeological material were identified in any of the auger samples from either bank (Figure 4). Archaeological sites are unlikely to be present younger, unconsolidated sands of the right bank, but the possibility that undetected archaeological remains are present within the stable dune deposits of the left bank cannot be entirely excluded. If archaeological remains are discovered the most likely scenario is that this would be in the form of Māori gardening / horticultural soils, as per the Māori Land Court testimony quoted above.

ASSESSMENT OF EFFECTS

The proposed pedestrian swing bridge is situated in a landscape of high archaeological potential and significance to local iwi. However, there are no affected archaeological sites on the true

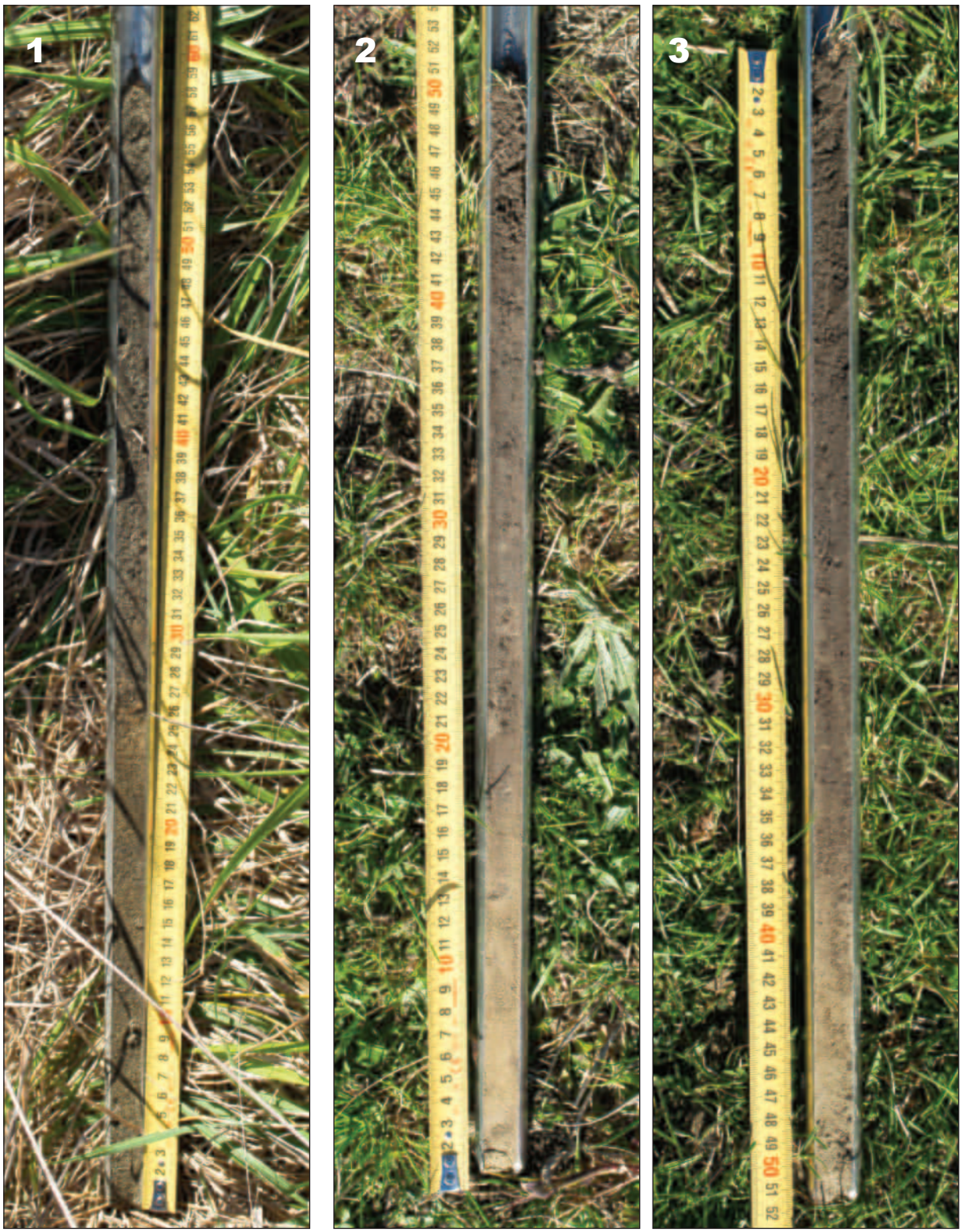


Figure 4: A selection of auger samples taken from the true left (1) and right (2 and 3) banks of the Whangaehu River at the bridge construction sites. No trace of charcoal or other anthropogenic disturbance was observed in any of the samples collected.

right bank of the river and adverse effects to archaeological sites/values on the left bank are expected to be nil or negligible.

Of the 29 NZAA recorded archaeological sites within the general landscape of the left bank (Figure 2), the pits and terraces of the nearest site (S23/27) are located more than 50 m beyond the extent earthworks and will not be affected. The 13 archaeological sites that will or may be crossed by the works crew to access the left bank construction site could be adversely affected to a minor or low extent by repeat movements of heavy and light vehicles, but this risk can be

mitigated to a nil or negligible level by:

- limiting the number of vehicles that travel to the work site daily (i.e., car-pooling);
- restricting vehicle movements to established formal (metalled) or informal (visible depressions in pasture) tracks; and,
- undertaking construction in the late summer when ground conditions are firm and the potential for ruts forming in the topsoil is limited.

Finally, although no trace of archaeological material was identified in the multiple auger samples collected on the left bank, it is possible that unknown archaeological remains could be discovered in this area between NZAA recorded site S23/27 and the river. However, given the limited extent of earthworks at this location (approximately 44 m2) any adverse effect is expected to be no more than minor. Any adverse effects on Māori garden / horticultural soils, given their likely substantial extent, is likely to be negligible: there is even a potential benefit to archaeological research values if the bridge construction provides an opportunity to collect analytical samples.

CONCLUSION

Although there is no indication that archaeological sites will be affected by the construction of a pedestrian swing bridge across the lower Whangaehu River, there is the potential for known and unknown archaeological sites to be affected to a negligible or minor extent, respectively. Therefore, it is recommended that the NZTA and Te Araroa Trust apply to HNZPT for an archaeological authority with minor implications at least three months before wishing to undertake this work. Given the limited extent of the earthworks on the left bank of the Whangaehu River a management plan should not be required for this work: it will be sufficient for the bridge earthworks to be monitored in person by the section 45 archaeologist. Nor is a research strategy required. Appropriate documentation should be taken of any archaeological finds or representative soil profiles that may be observed and given the apparent association of the Maraeaute location with early Māori horticulture, as stated by witnesses recorded in the minutes of the Māori Land Court, soil samples for pollen and/or microfossil analysis should be collected from a suitable stratigraphic profile (if present).

Overall, despite its location in a landscape of high archaeological potential the construction of the bridge is unlikely to result in adverse effects to archaeological sites and appropriate measures have been taken to avoid the risk of adverse effects. The application for an archaeological authority with minor effects should be approved.

Recommendations

- that NZTA and Te Araroa Trust apply to HNZPT for an archaeological authority with minor implications at least three months before the intended date of construction;
- that HNZPT grant the application for an archaeological authority with minor effects without need for a research strategy or management plan;
- that construction is undertaken in the late summer when ground conditions are firmer and archaeological sites along access tracks are less likely to be affected by vehicle movements; and,
- that vehicle numbers are managed to limit the number of daily vehicle movements across archaeological sites and movement is limited to established tracks.

APPENDIX 1:

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORDS

Archaeological site record reports downloaded from ArchSite, 2 September 2024, for the 14 archaeological sites that will or may be crossed by vehicles accessing the bridge construction site on the true left bank of the Whangaehu River. These site could be adversely affected to a minor or low extent by repeat movements of heavy and light vehicles, but this risk can be mitigated to a nil or negligible level by:

- limiting the number of vehicles that travel to the work site daily (i.e., car-pooling);
- restricting vehicle movements to established formal (metalled) or informal (visible depressions in pasture) tracks; and,
- undertaking construction in the late summer when ground conditions are firm and the potential for ruts forming in the topsoil is limited.

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: R23/5

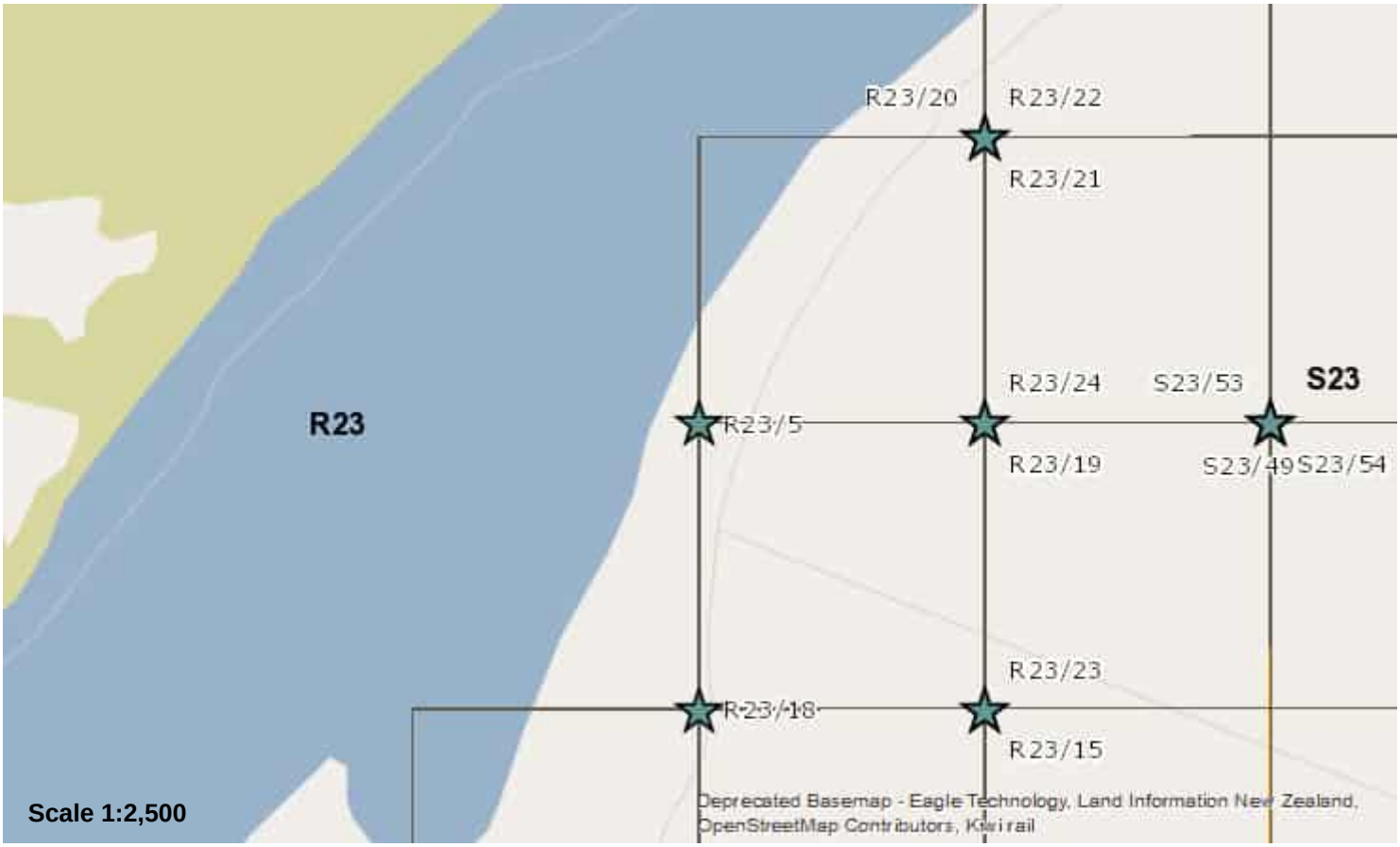
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779772 **Northing:** 5566595 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/86 **METRIC SITE NUMBER:** R23/5



Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a)

02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/5

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

SITE RECORD INVENTORY	NZAA SITE NUMBER: R23/5

Supporting documentation held in ArchSite

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name MARTON
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER ~~R23~~ N143/86
DATE VISITED 30.3.81
SITE TYPE PITS
SITE NAME: MAORI
OTHER

Grid Reference FN39 Easting 2633,0 Northing 3745,0

1. Aids to relocation of site *(attach a sketch map)*

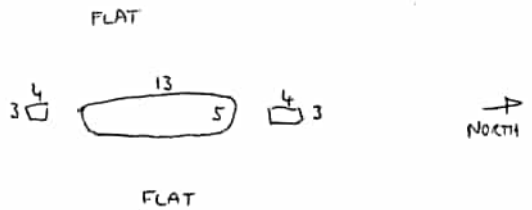
Situated on river flats in Rakautaua 8. CT D2/1043.
Locality map with N143/49.
Air photo co ordinates 386/4 -60, +38mm.

2. State of site and possible future damage

Good. Light damage by stock a possibility.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Three pits in a line end to end. Central pit is large and elongated.



4. Owner Address: B. Craig, Whangaehu Beach Road
Tenant/Manager Address:

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* 386/4 clearly

6. Reported by Address: A. Walton, NZHPT, 3.2.82
Filekeeper Date: 3/3/82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

C D	Type of site
A F	Local environment today
A C	
A B	Present condition and future danger of destruction
A A	Security code
G E	

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: R23/6

SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779672 **Northing:** 5566295 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/91 **METRIC SITE NUMBER:** R23/6

Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a) 02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/6

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

SITE RECORD INVENTORY	NZAA SITE NUMBER: R23/6

Supporting documentation held in ArchSite

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name MARTON
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER N143/91
DATE VISITED 28.3.81
SITE TYPE PITS
SITE NAME: MAORI / OTHER

Grid Reference FN12 Easting 2632000 Northing 3742000

1. Aids to relocation of site *(attach a sketch map)*

Rakautaua 7No3. CT D2/1043.
Locality map with N143/90.
Air photo co-ordinates: 386/4 -63, +20mm.

2. State of site and possible future damage

Fair - poor. In grass.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Two or three pits on top of low sand ridge. Further pit (roughly 3x3) to north along ridge a very short distance and with another pit (c 3x2.5) immediately adjacent at foot of ridge.

4. Owner Sec 9(2)(a)
Address Whangaehu Beach Road
Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)* 386/3 badly

6. Reported by Sec 9(2)(a)
Address NZHPT
7/4/82
Filekeeper Sec 9(2)(a)
Date

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

AM	Type of site
AA	Local environment today
AC	Land
BB	Present condition and future danger of destruction
AA	Security code
GE	

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: R23/7

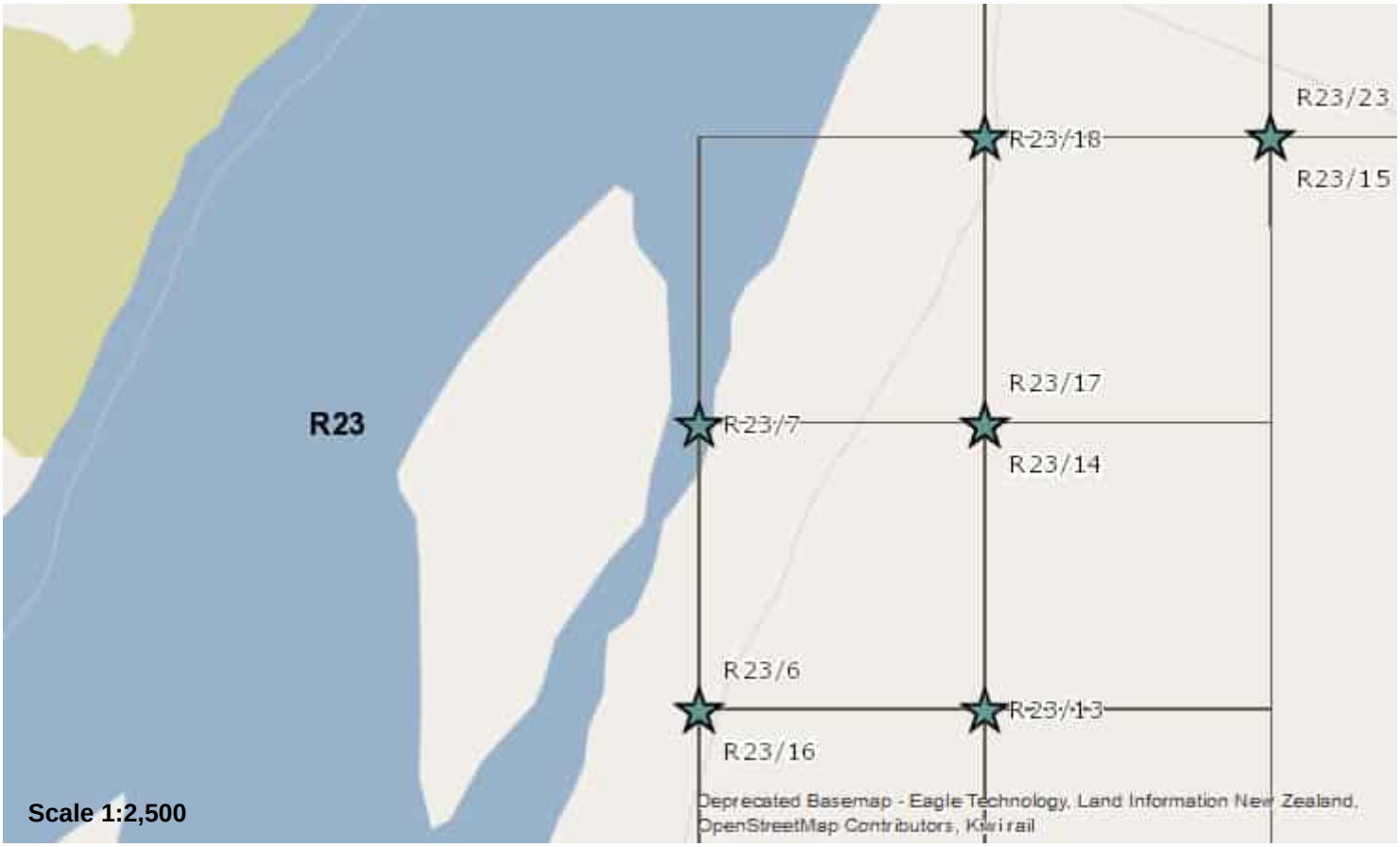
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779672 **Northing:** 5566395 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/92 **METRIC SITE NUMBER:** R23/7



Finding aids to the location of the site

Brief description

TERRACES/PITS

Recorded features

Other sites associated with this site

Printed by: Sec 9(2)(a)

02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/7

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name
NZMS 1 map edition Marton 4th 1971

NZAA NZMS 1 SITE NUMBER N143/92
DATE VISITED 28.3.81
SITE TYPE Terraces/pits
SITE NAME: MAORI
OTHER

Grid Reference FN13 Easting 2632000 Northing 2743000

1. Aids to relocation of site *(attach a sketch map)*

Rakautaua 7No3. CT D2/1043.
Locality map with N143/90.
Air photo co ordinates 386/4 -63, +24mm.

2. State of site and possible future damage

Good.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

A curious set of features consisting of three terraces cut into the base of a low scarp and with pits on ridge above and on flat ground in front.

See attached sketch plan.

4. Owner Address Sec 9(2)(a) Whangaehu Beach Road

Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* 386/4 clearly

6. Reported by Address Sec 9(2)(a) NZHPT 24.2.82

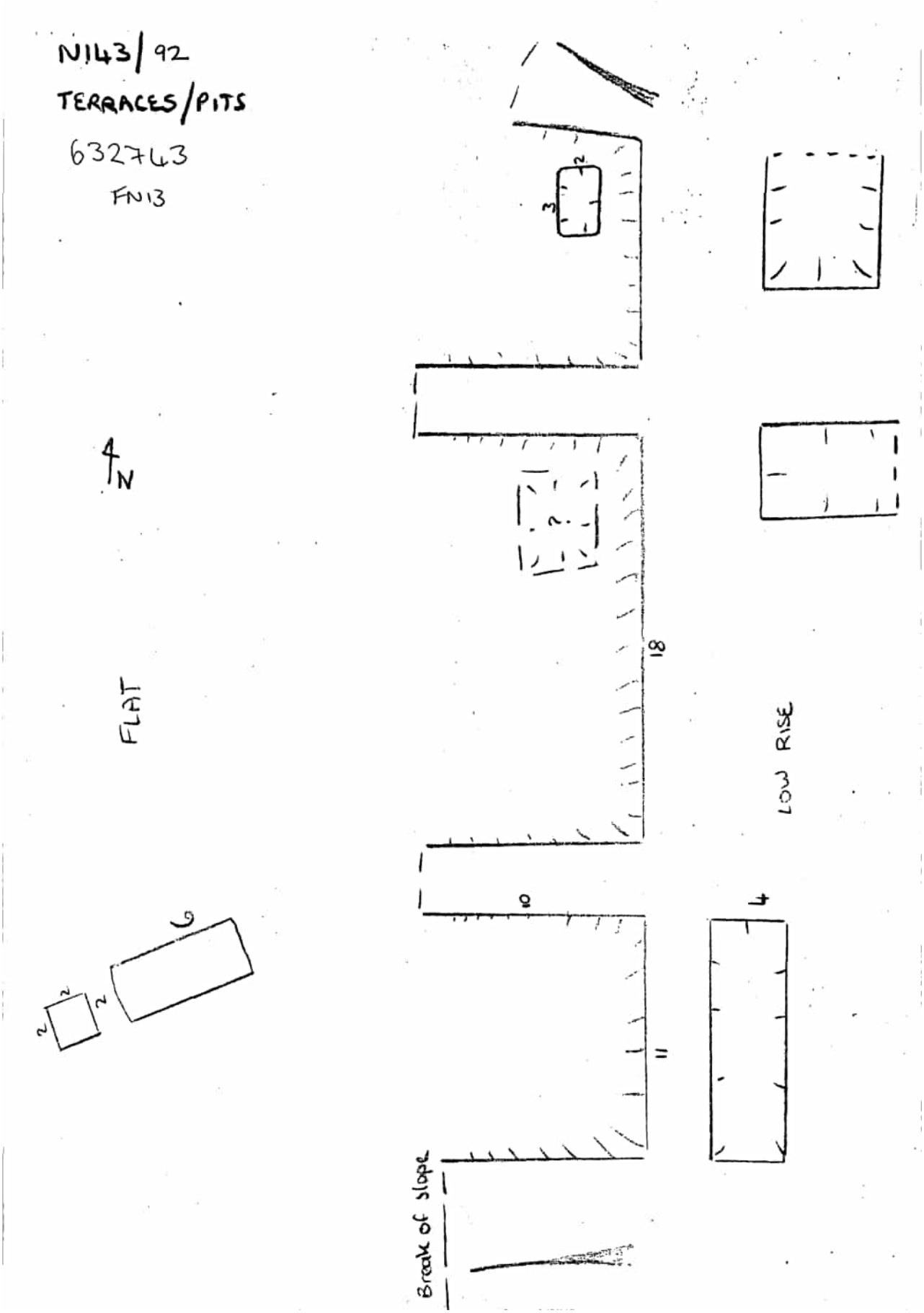
Filekeeper Date Sec 9(2)(a) 5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

A O Type of site
A S Local environment today
A C Land c

A A Present condition and future danger of destruction
A A Security code
G E


N143/92
TERRACES/PITS
632763
FN13
N
FLAT
LOW RISE
Break of slope
18
10
11
4
6
2
2
2
3
2
?

Site Record Form

NZAA SITE NUMBER: R23/8

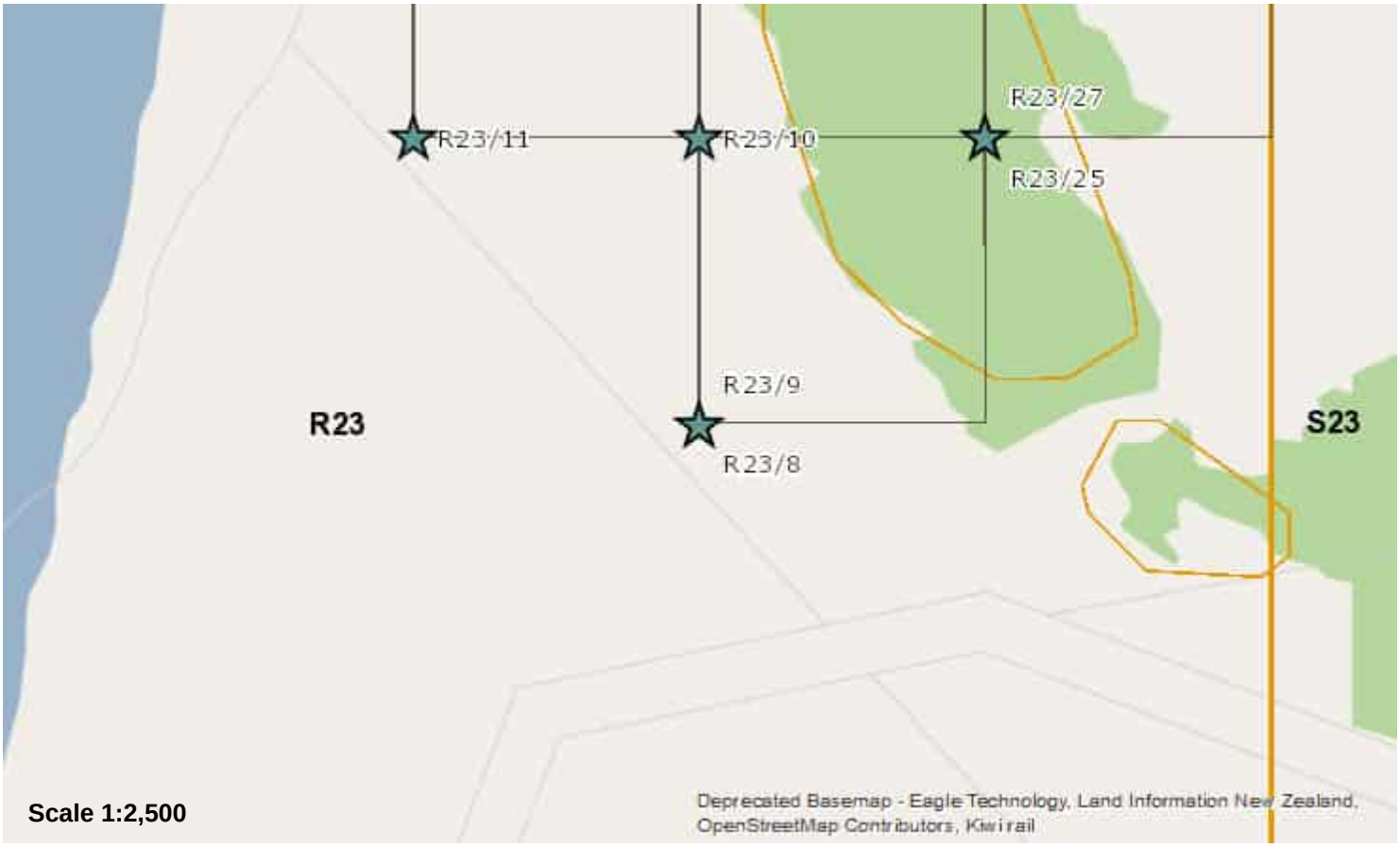
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779772 **Northing:** 5565995 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/93 **METRIC SITE NUMBER:** R23/8



Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a)

02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/8

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name MARTON
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER N143/93
DATE VISITED 30.3.81
SITE TYPE PITS
SITE NAME: MAORI
OTHER

Grid Reference FN22 Easting 2634 00 Northing 2738 00

1. Aids to relocation of site *(attach a sketch map)*

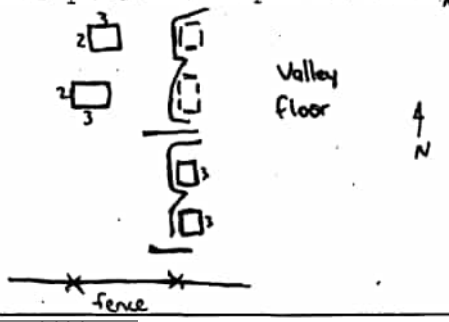
Rakautaua 7No3. CT D2/1043.
Locality map with N143/90.
Air photo co-ordinates 386/4 -55, -1mm.

2. State of site and possible future damage

Good.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Four clear pits and couple of other possible pits at base of ridge.



4. Owner Address Sec 9(2)(a)
Whangaehu Beach Road

Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* brief visit

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* 386/4 badly

6. Reported by Address Sec 9(2)(a)
NZHPT
7/4/82

Filekeeper Date Sec 9(2)(a)
5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

A	M	Type of site
A	S	Local environment today
A	C	Land

A	A	Present condition and future danger of destruction
A	A	Security code
G	E	

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: R23/9

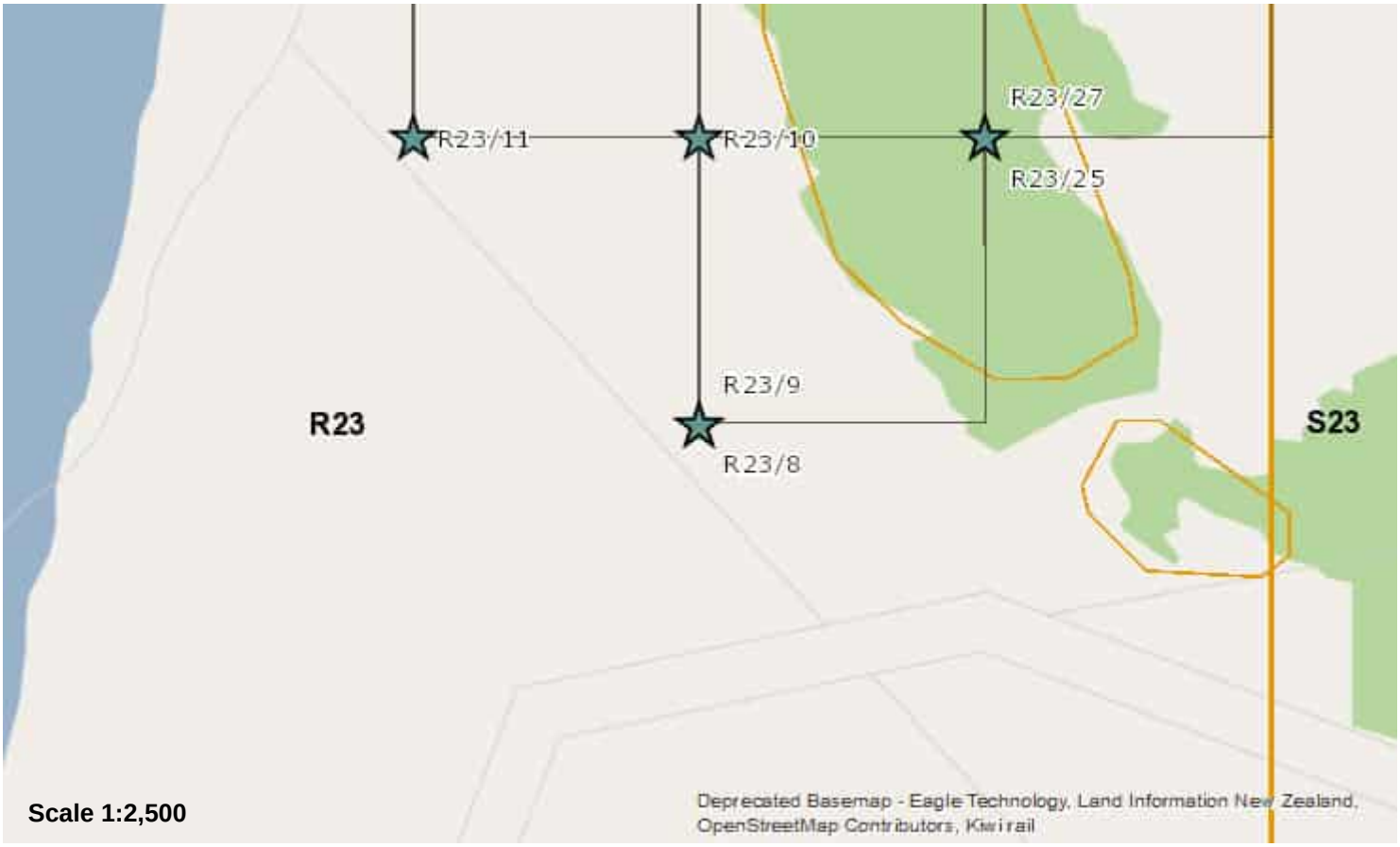
SITE TYPE: Maori horticulture

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779772 **Northing:** 5565995 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/94 **METRIC SITE NUMBER:** R23/9



Finding aids to the location of the site

Brief description

BORROW PITS

Recorded features

Borrow pit

Other sites associated with this site

Printed by: Sec 9(2)(a) 02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/9

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name MARTON
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER N143/94
DATE VISITED 30.3.81
SITE TYPE ?Borrow pits
SITE NAME: MAORI
OTHER

Grid Reference FN23 Easting 2 6 3 4 0 0 Northing 2 7 3 8 0 0

1. Aids to relocation of site *(attach a sketch map)*
Rakautaua 7N03. CT D2/1043.
Locality map with N143/90.
Air photo co-ordinates: 386/4 -60, +5.

2. State of site and possible future damage
good.

3. Description of site *(Supply full details,history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*
Four or more large irregular pits at base of ridge, west side. Measured 8x3, 14x4, 8x4, 16x4: maximun dimensions. Possibly borrow pits.

4. Owner Address Sec 9(2)(a) Whangaenu Beach Road
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)* 386/4 clearly

6. Reported by Sec 9(2)(a)
Address NZHPT 7/4/82
Filekeeper Sec 9(2)(a)
Date 5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

C Z	Type of site
A S	Local environment today
A C	

A A	Present condition and future danger of destruction
A A	Security code
G E	

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: R23/10

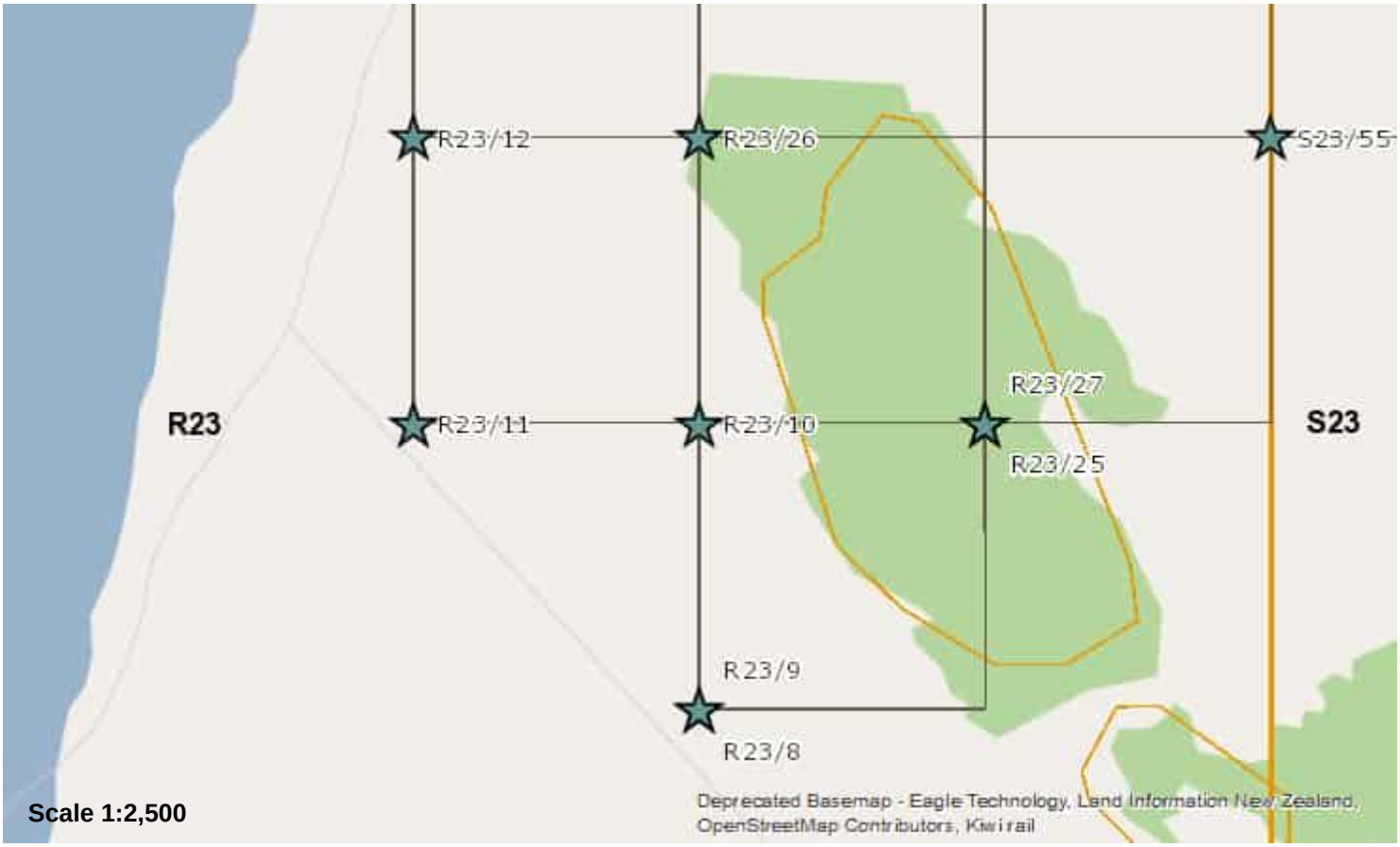
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779772 **Northing:** 5566095 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/95 **METRIC SITE NUMBER:** R23/10



Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a) 13/08/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/10

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name Marton
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER N143/95
DATE VISITED 30/3/81
SITE TYPE PITS
SITE NAME: MAORI
OTHER

Grid Reference FN24 Easting 2634 00 Northing 2739 00

1. Aids to relocation of site *(attach a sketch map)*

Rakautaua 7No3. CT D2/1043.
Locality map with N143/90.
Air photo co-ordinates: 386/4 -56,+3.

2. State of site and possible future damage

Good - fair condition.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Rather difficult to read in places but some 8+ pits on top of ridge.

See attached SDF.

4. Owner Sec 9(2)(a)
Address Whangaehu Beach Road.
Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)* 386/4 Badly

6. Reported by Sec 9(2)(a)
Address NZHPT
26/4/82
Filekeeper Sec 9(2)(a)
Date 5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

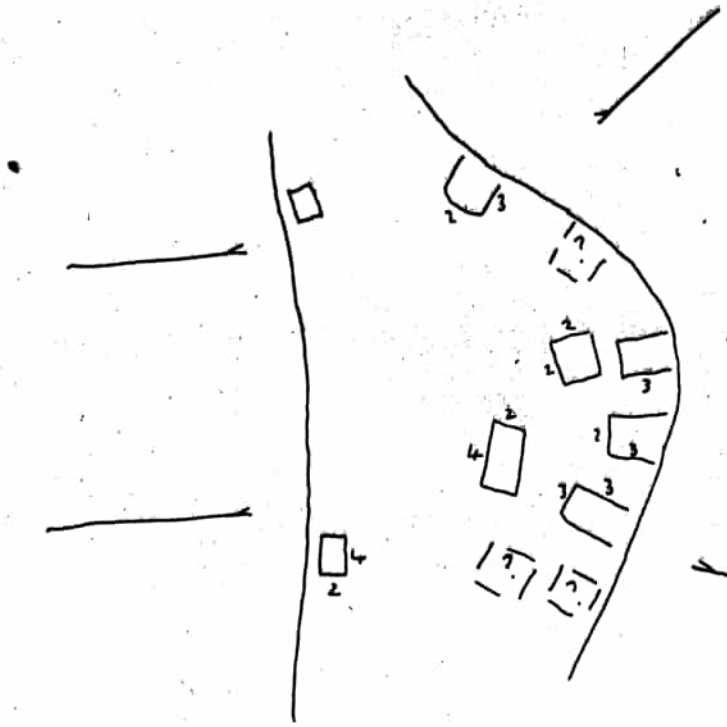
AM	Type of site
AW	Local environment today
AC	Land ...

AA	Present condition and future danger of destruction
AA	Security code
GE	...

N143
Marton
634739

N143/ 95
PITS

SKETCH PLAN FN24



ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: R23/11

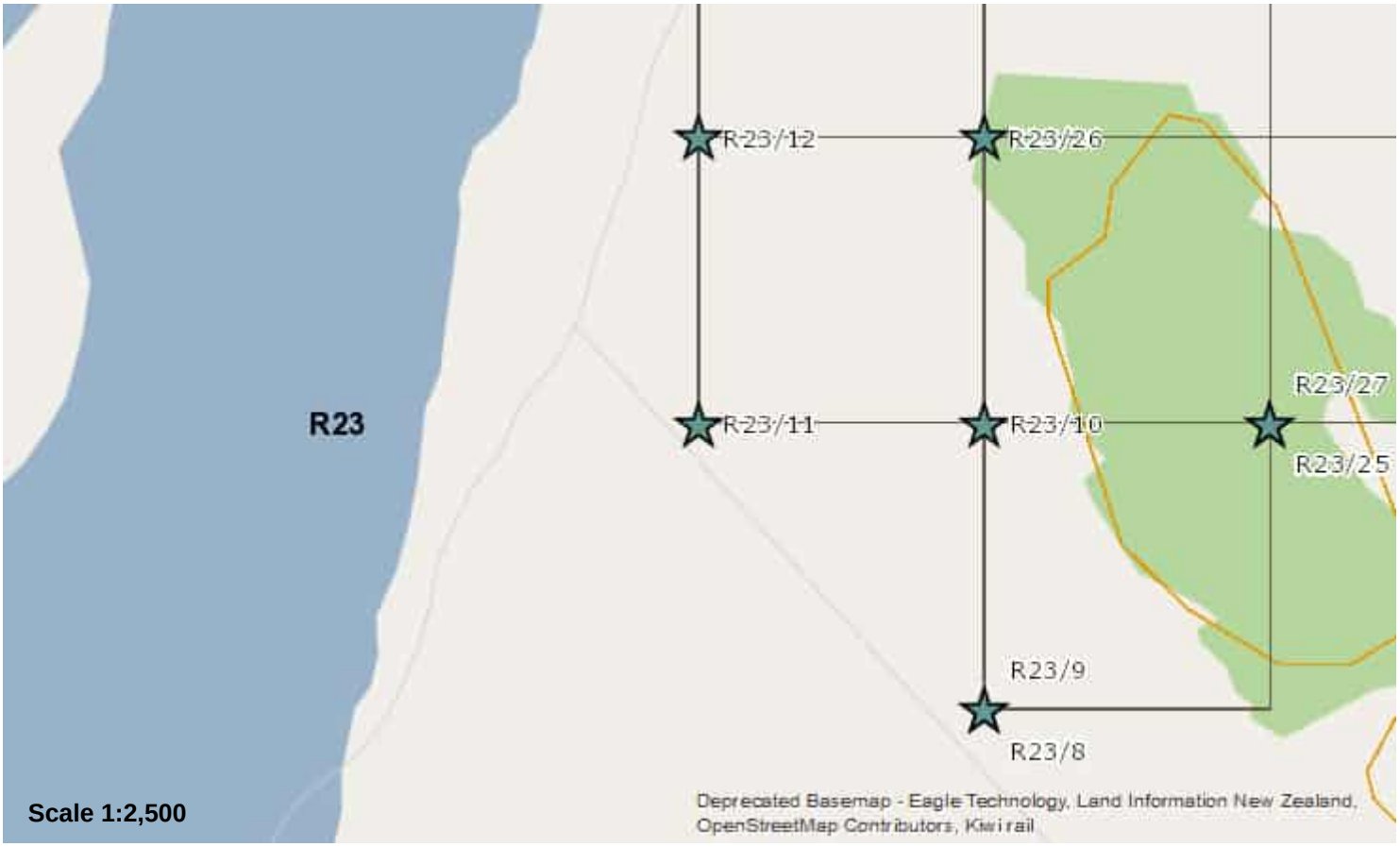
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779672 **Northing:** 5566095 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/96 **METRIC SITE NUMBER:** R23/11



Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a) 02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/11

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

SITE RECORD INVENTORY	NZAA SITE NUMBER: R23/11

Supporting documentation held in ArchSite

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name MARTON
NZMS 1 map edition 4th 1975

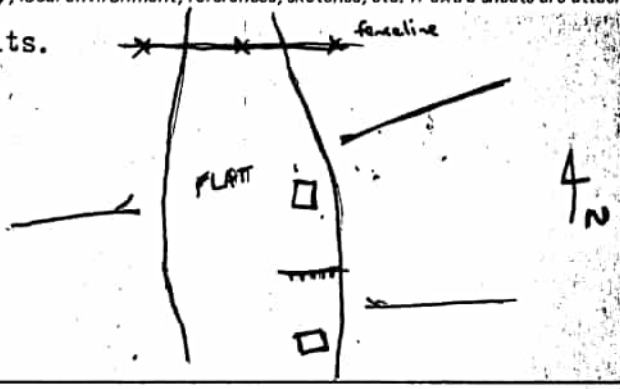
NZAA NZMS 1 SITE NUMBER N143/96
DATE VISITED 30/3/81
SITE TYPE PITS
SITE NAME: MAORI OTHER

Grid Reference FN25 Easting 2633 00 Northing 2739 00

1. Aids to relocation of site *(attach a sketch map)*
Rakautaua 7No3. CT D2/1043.
Locality map with N143/90.
Air photo co-ordinates: 386/4 -60,+7mm.

2. State of site and possible future damage
Fair - poor.

3. Description of site *(Supply full details,history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*
On rise on ridge. Two pits.



4. Owner Sec 9(2)(a)
Address Whangaehu Beach Road.
Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)* 386/4 Badly or not at all

6. Reported by Sec 9(2)(a)
Address NZHPT 26/4/82
Filekeeper Sec 9(2)(a)
Date 5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

AM	Type of site
AW	Local environment today
AC	Land cl
BB	Present condition and future danger of destruction
AA	Security code
GE	

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: R23/12

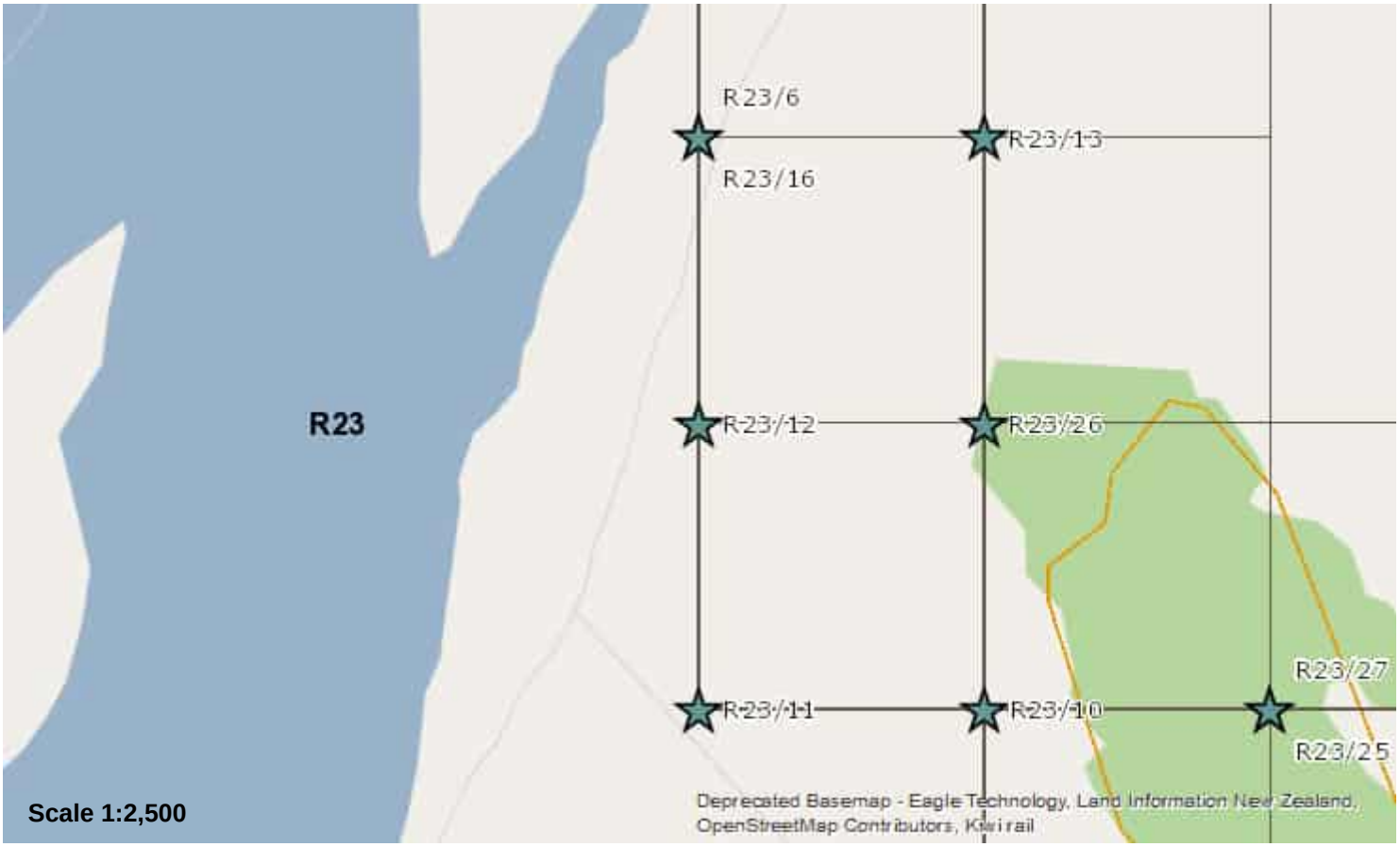
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779672 **Northing:** 5566195 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/97 **METRIC SITE NUMBER:** R23/12



Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a)

02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/12

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name Marton
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER N143/97
DATE VISITED 30/3/81
SITE TYPE Pits
SITE NAME: MAORI
OTHER

Grid Reference Fn26 Easting 2633,0 Northing 2740,0

1. Aids to relocation of site *(attach a sketch map)*

Rakautaua 7No3. CT D2/1043.
Locality map with N143/90.
Air photo co-ordinates: 386/4 -60, +10mm.

2. State of site and possible future damage

Fair to poor

3. Description of site *(Supply full details,history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Looks like two or more pits on ridge. Immediately beyond fence there are more possibly four plus in a group. These show better on the old air photos than they do on the ground at present.

4. Owner Address Sec 9(2)(a) Whangaehu Beach Road
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)* 386/4 Not too badly.

6. Reported by Sec 9(2)(a)
Address NZHPT 26/4/82.
Filekeeper Sec 9(2)(a)
Date 5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

AM	Type of site
AW	Local environment today
AC	Land cl...
BB	Present condition and future danger of destruction
HA	Security code
GE	Lan...

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: R23/16

SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779672 **Northing:** 5566295 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/101 **METRIC SITE NUMBER:** R23/16

Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a) 02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/16

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

SITE RECORD INVENTORY	NZAA SITE NUMBER: R23/16

Supporting documentation held in ArchSite

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name MARTON
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER N143/101
DATE VISITED 30/3/81
SITE TYPE pits
SITE NAME: MAORI / OTHER

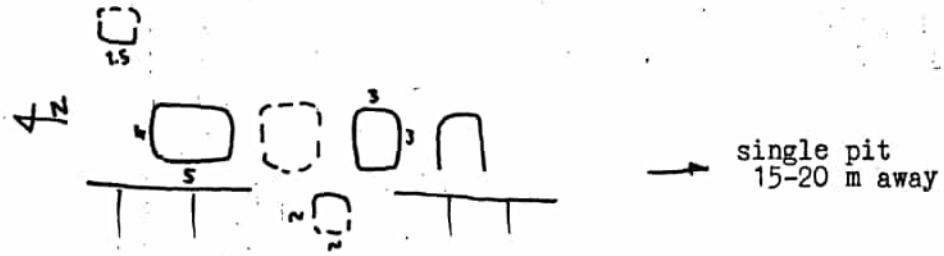
Grid Reference fn34-5 Easting 2632000 Northing 2742000

1. Aids to relocation of site *(attach a sketch map)*
Rakautaua /No3.
Locality map with N143/90.
Air photo co-ordinates: 386/4 -61,+21mm.

2. State of site and possible future damage
Good.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Group of 4-6 pits. One other pit (3x3) some distance from others at 386/4 -61,+17mm.



4. Owner Address Sec 9(2)(a) Whangaehu Beach Road
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)* 386/4 fairly clear

6. Reported by Sec 9(2)(a)
Address NZHPT 27/4/82
Filekeeper Sec 9(2)(a)
Date 5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

AM	Type of site
--	Local environment today
A	

AA	Present condition and future danger of destruction
AA	Security code
GE	

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: R23/18

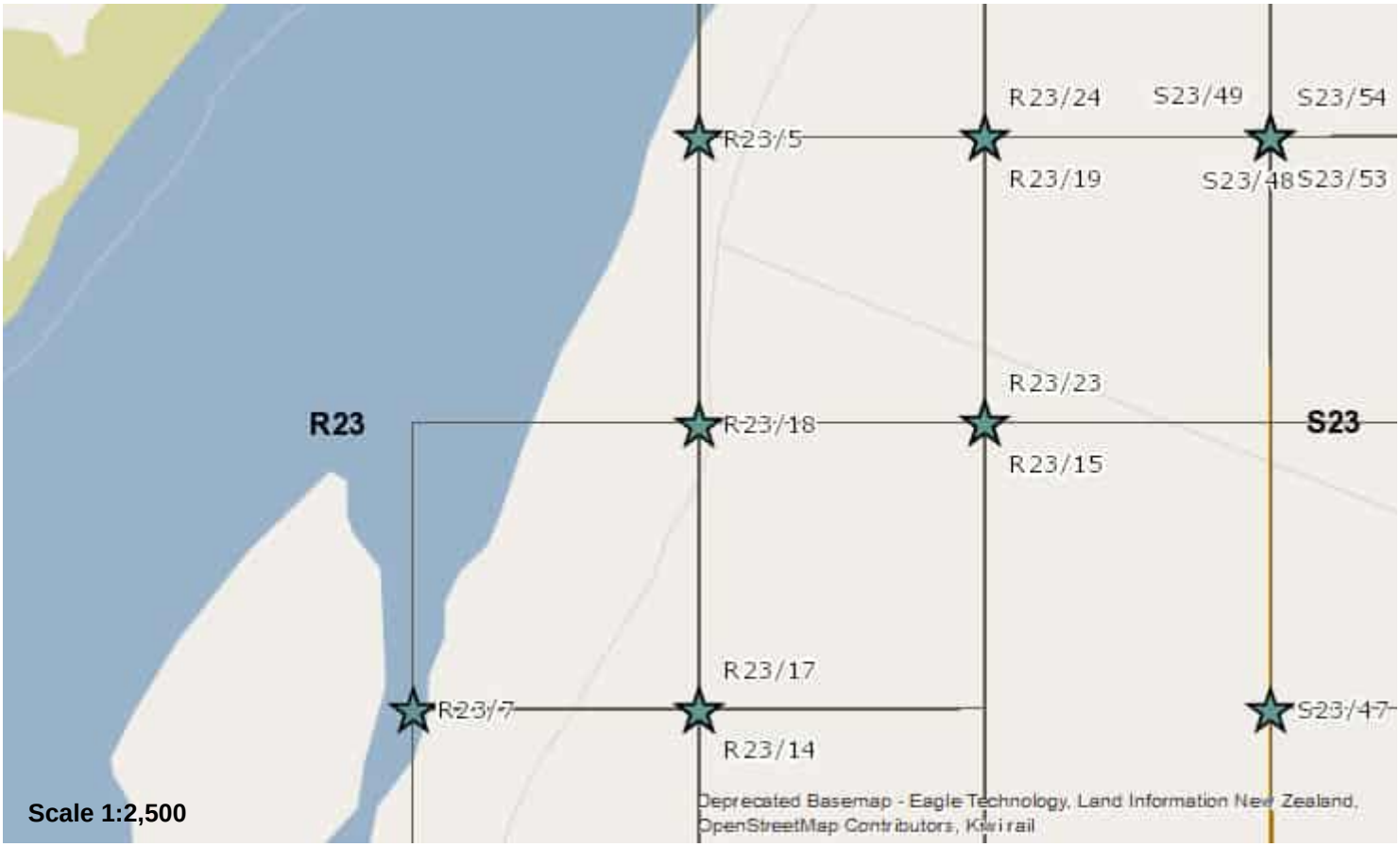
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779772 **Northing:** 5566495 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/103 **METRIC SITE NUMBER:** R23/18



Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a)

02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/18

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

SITE RECORD INVENTORY	NZAA SITE NUMBER: R23/18

Supporting documentation held in ArchSite

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZAA NZMS 1 SITE NUMBER N143/103
DATE VISITED 30/3/81
SITE TYPE pits
SITE NAME: MAORI
OTHER

NZMS 1 map number N143
NZMS 1 map name Marton
NZMS 1 map edition 4th 1975

Grid Reference fn37 Easting 2 6 3 3 0 0 Northing 2 7 4 4 0 0

1. Aids to relocation of site *(attach a sketch map)*

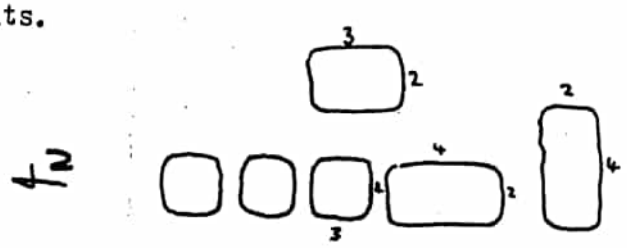
Rakautaua 8.
Locality map with N143/90.
Air photo co-ordinates: 386/4 -59,+32.

2. State of site and possible future damage

Good.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Six pits.



4. Owner Address [redacted] Whangaehu Beach Road
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* 386/4 clearly

6. Reported by [redacted] Address NZHPT 27/4/82
Filekeeper [redacted] Date 5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

A M	Type of site
- -	Local environment today
A C	

A A	Present condition and future danger of destruction
A A	Security code
G E	

Site Record Form

NZAA SITE NUMBER: R23/20

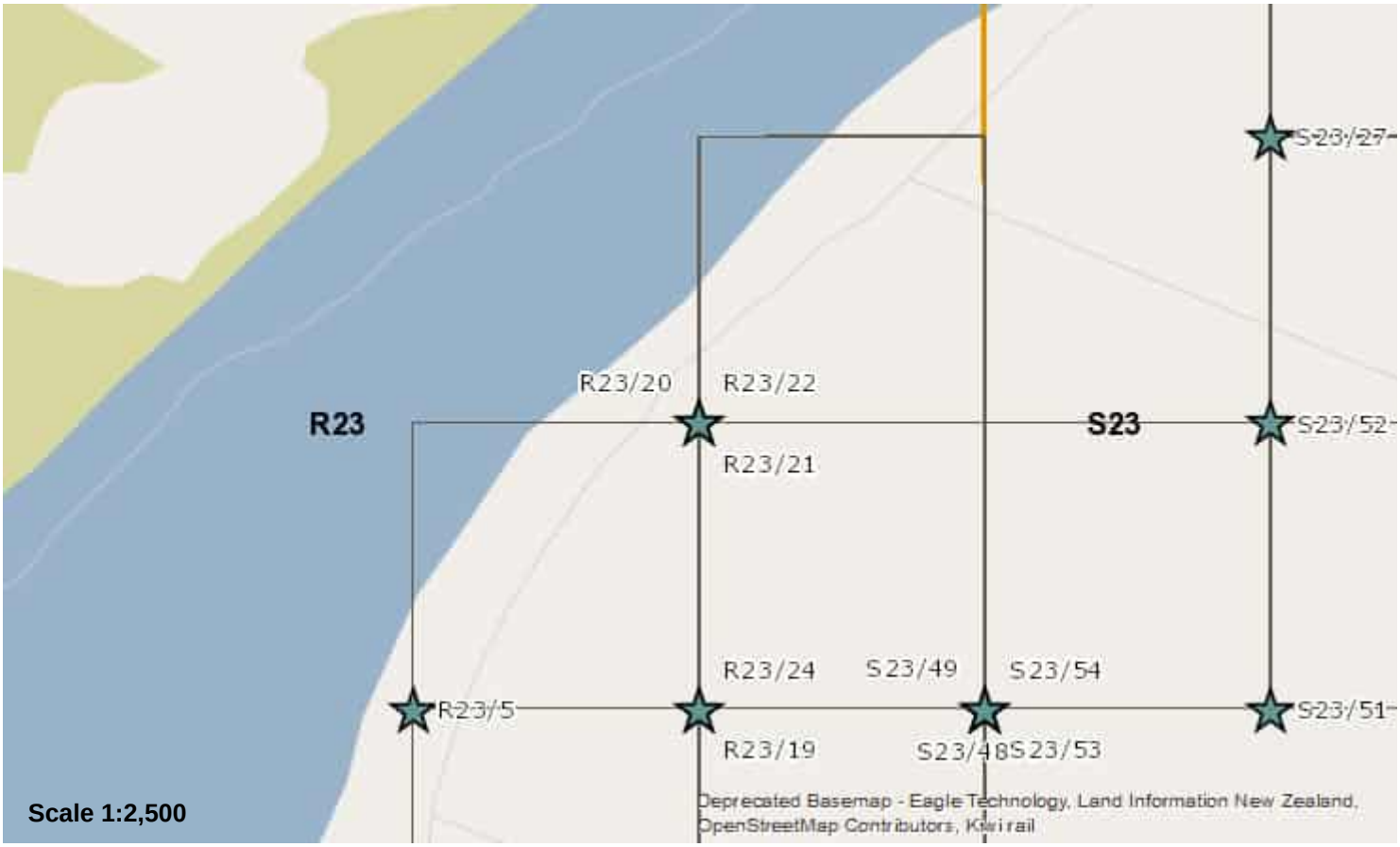
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779872 **Northing:** 5566695 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/105 **METRIC SITE NUMBER:** R23/20



Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a)

02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/20

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

SITE RECORD INVENTORY	NZAA SITE NUMBER: R23/20

Supporting documentation held in ArchSite

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name Marton
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER N143/105
DATE VISITED 30/3/81
SITE TYPE Pits
SITE NAME: MAORI
OTHER

Grid Reference Fn40 Easting 2634000 Northing 2746000

1. Aids to relocation of site *(attach a sketch map)*

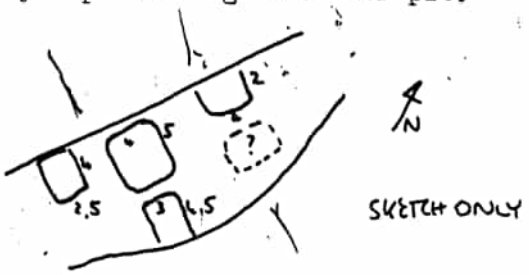
Could be Rakautaua 7No3 or Rakautaua 8 or bit in each.
Locality map with N143/90.
Air photo co-ordinates: 386/4 -50, +40mm.

2. State of site and possible future damage

Fair .

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

A very deep pit measuring 5 x 4, three ather well defined features and one shallow hollow probably representing a further pit.



4. Owner Address Sec 9(2)(a) Whangaenu Beach Road
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)* 386/4 clearly

6. Reported by Sec 9(2)(a)
Address NZHPT 27/4/82
Filekeeper Sec 9(2)(a)
Date 5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

A M	Type of site
- -	Local environment today
A C	Land cl...
B B	Present condition and future danger of destruction
A A	Security code
G E	...

Site Record Form

NZAA SITE NUMBER: R23/21

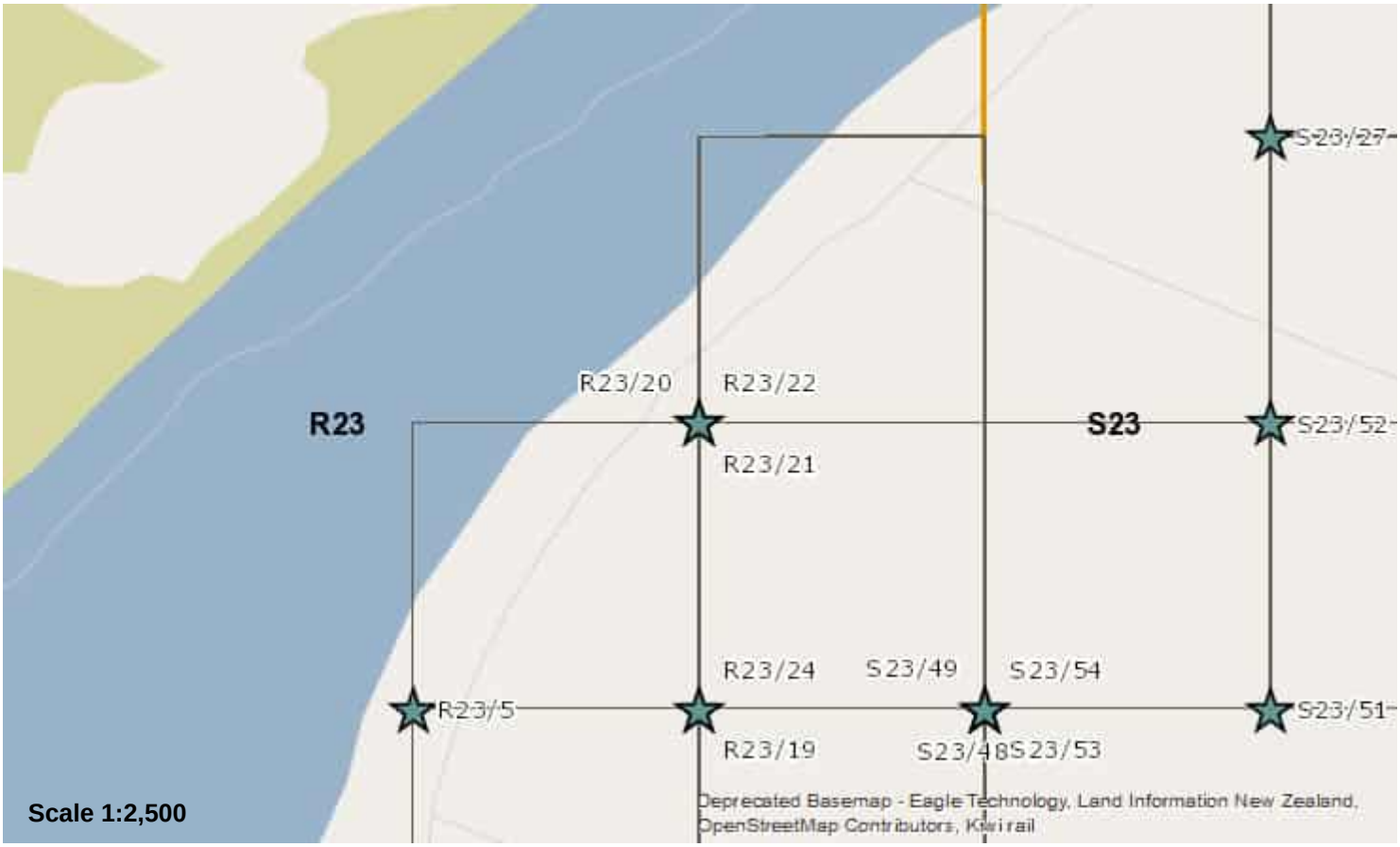
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779872 **Northing:** 5566695 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/106 **METRIC SITE NUMBER:** R23/21



Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a)

02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/21

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

Supporting documentation held in ArchSite

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name MARTON
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER N143/106
DATE VISITED 30/3/81
SITE TYPE Pits
SITE NAME: MAORI
OTHER

Grid Reference fn41 Easting 2635000 Northing 2746000

1. Aids to relocation of site *(attach a sketch map)*

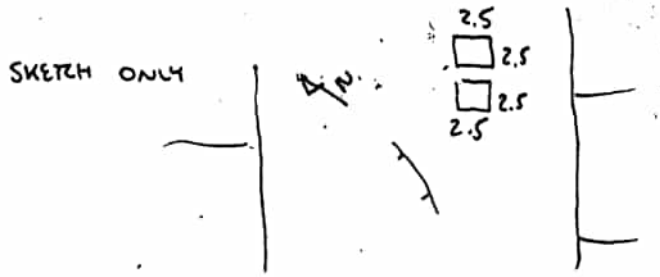
Rakautaua 7No3.
Locality map with N143/90.
Air photo co-ordinates: 386/4 -47, +42.

2. State of site and possible future damage

Good to fair.

3. Description of site *(Supply full details,history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Two pits and some other odd features on ridge.



4. Owner Address Sec 9(2)(a) Whangaehu Beach Road.
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)* 386/4 very badly if at all

6. Reported by Sec 9(2)(a)
Address NZHPT 27/4/82
Filekeeper Sec 9(2)(a)
Date 5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

AM	Type of site
AW	Local environment today
AC	
BA	Present condition and future danger of destruction
AA	Security code
GE	

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: R23/22

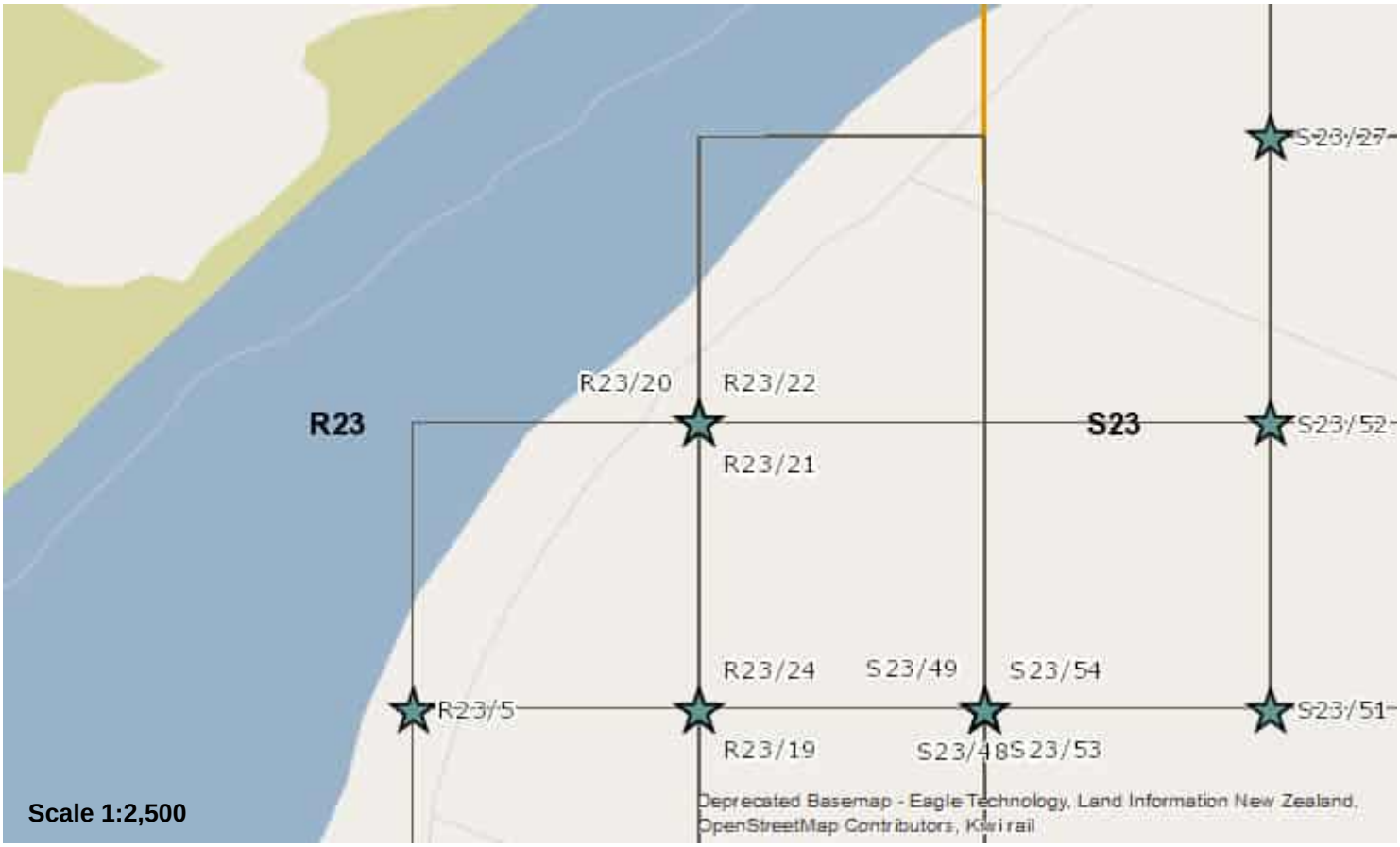
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1779872 **Northing:** 5566695 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/107 **METRIC SITE NUMBER:** R23/22



Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a)

02/09/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: R23/22

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N143
NZMS 1 map name MARTON
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER N143/107
DATE VISITED 30/3/81
SITE TYPE PITS
SITE NAME: MAORI / OTHER

Grid Reference Fn42 Easting 2635 00 Northing 2746 00

1. Aids to relocation of site *(attach a sketch map)*
   See Locality map with N143/90.
   Air photo co-ordinates: 386/4 -43, +43mm.

2. State of site and possible future damage
   Fair to good.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*
   Series of pits, and possible pits, on ridgetop.
   See SDF.

4. Owner Address Sec 9(2)(a) Whangaehu Beach Road. Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit
   Photographs *(reference numbers, and where they are held)*
   Aerial photographs *(reference numbers, and clarity of site)* 386/4 clearly

6. Reported by Address Sec 9(2)(a) NZHPT 26/4/82 Filekeeper Date Sec 9(2)(a) 5.10.82

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
   NZHPT Site Field Code

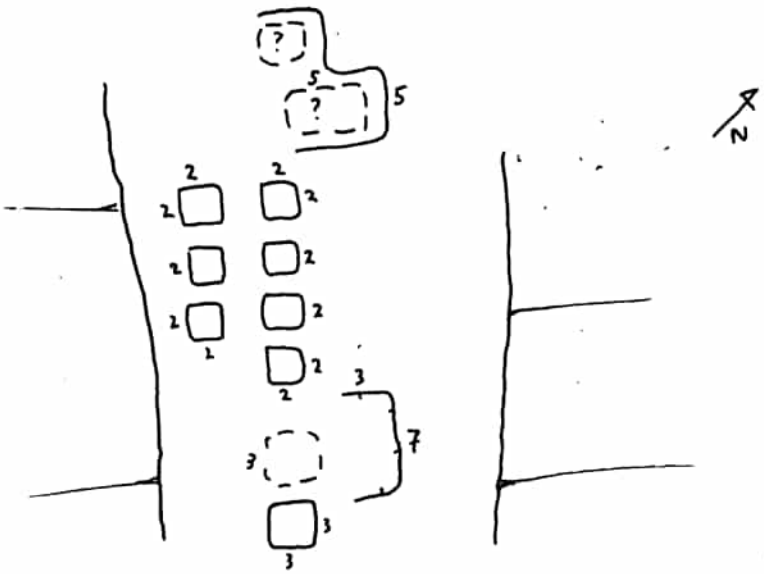
AM Type of site
AW Local environment today
AC

BA Present condition and future danger of destruction
AA Security code
GE

N143
MARTON
635746

N143/107
PITS

SKETCH PLAN (FN42)



ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: S23/27

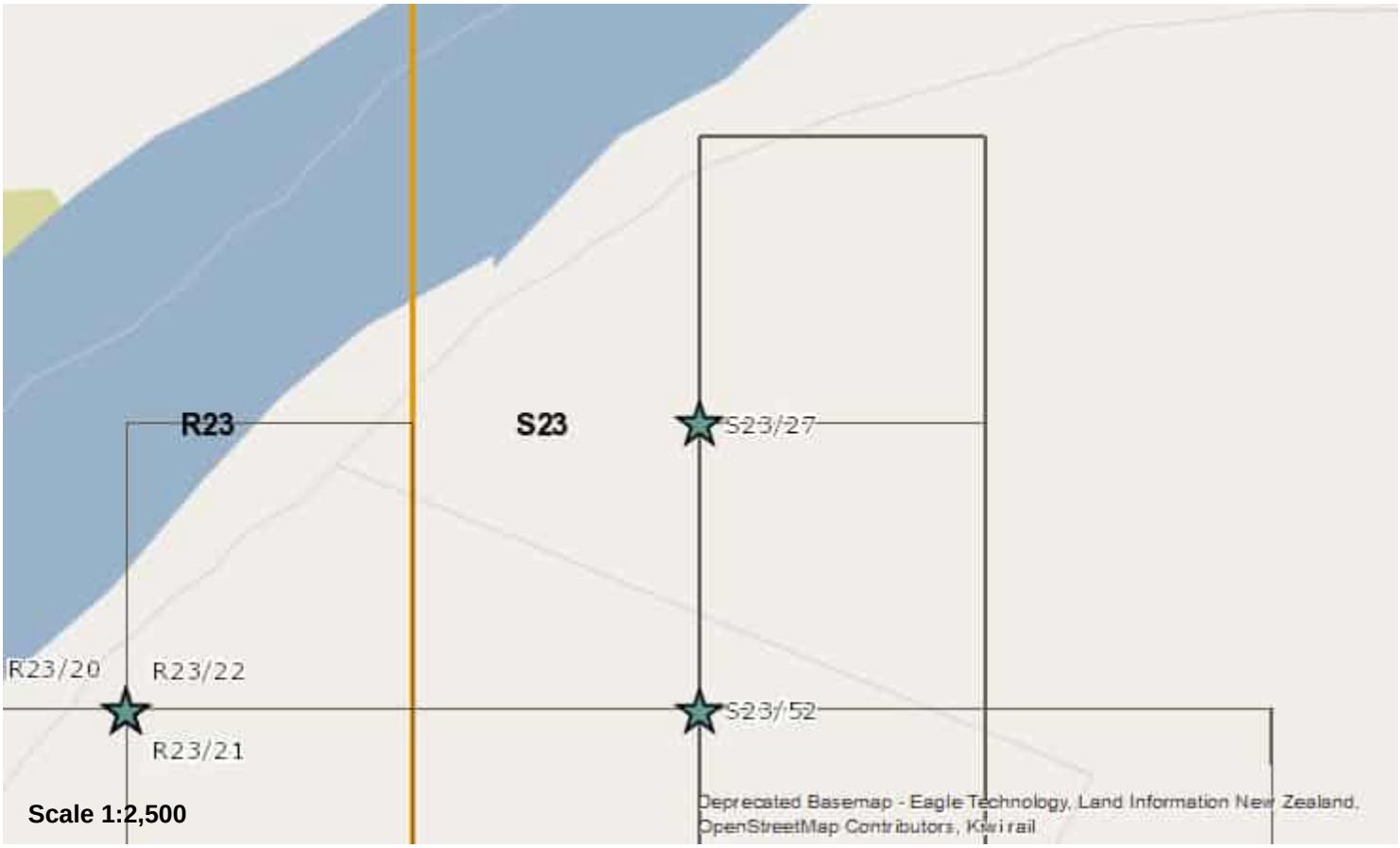
SITE TYPE: Pit/Terrace

SITE NAME(s):

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1780072 **Northing:** 5566795 **Source:** CINZAS

IMPERIAL SITE NUMBER: N143/50 **METRIC SITE NUMBER:** S23/27



Finding aids to the location of the site

Brief description

PITS

Recorded features

Pit

Other sites associated with this site

Printed by: Sec 9(2)(a)

13/08/2024

SITE RECORD HISTORY	NZAA SITE NUMBER: S23/27

Site description

Condition of the site

Statement of condition

Current land use:

Threats:

FN 44

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number N 143
NZMS 1 map name Marton
NZMS 1 map edition 4th 1975

NZAA NZMS 1 SITE NUMBER N143/50
DATE VISITED 30 / 3 /1981
SITE TYPE Pits
SITE NAME: MAORI / OTHER

Grid Reference FN 44 Easting 2637 00 Northing 2747 00

1. Aids to relocation of site *(attach a sketch map)*
On low rise amidst river flats.
Air photo co-ordinates: 386/4 -43, +47mm.
7 No.3 Rakauroua Block, Ikitara S.D. CT D2/1043.

2. State of site and possible future damage
Poor. No real pattern evident but obviously not natural.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*
Low rise about 120m long. N.E. end is all bumps and hollows with no pattern that I could make out. At SW end there are a few well defined pits and lot thats as unclear as the other end. One possible terrace and possible borrow pits also present.

4. Owner Address Sec 9(2)(a) Beach Road, Whangaehu.
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Brief visit
Photographs *(reference numbers, and where they are held)* -
Aerial photographs *(reference numbers, and clarity of site)* 386/3 Clearly.

6. Reported by Address Sec 9(2)(a) NZHPT
Filekeeper Sec 9(2)(a)
Date 19/10/81

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

A M	Type of site	B B Present condition and future danger of destruction
B D	Local environment today	A A Security code
A C		G E

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**WND2/1043**
Land Registration District	**Wellington**
Date Issued	27 May 1965

Prior References
WN295/237

Estate	Fee Simple
Area	134.7173 hectares more or less
Legal Description	Rakautaua 8 Block, Rakautaua 7 2 Block and Rakautaua 7 3 Block

Registered Owners
Sec 9(2)(a)

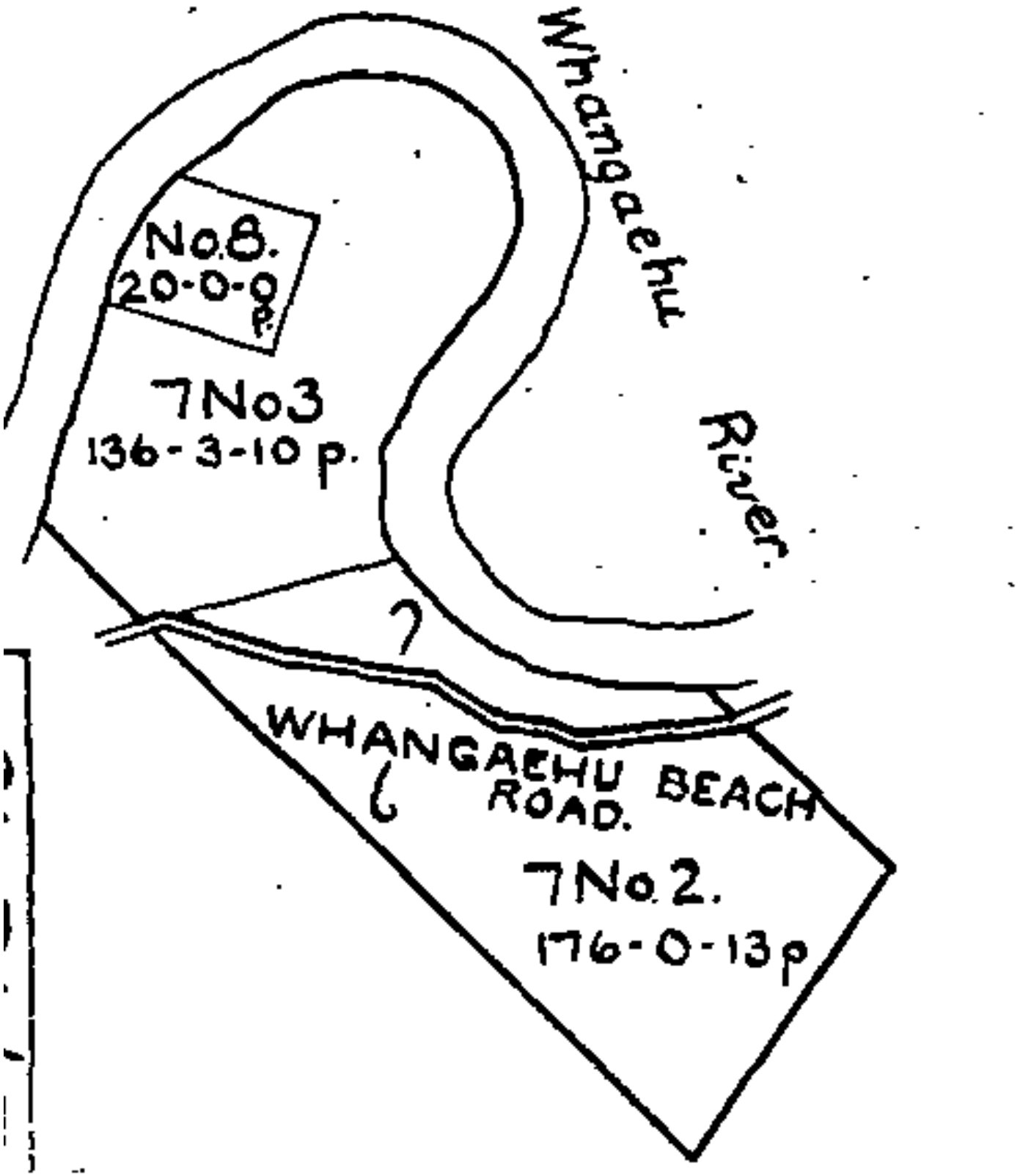
Interests

753588 Pipeline Certificate pursuant to Section 70 of the Petroleum Act 1937 - 6.8.1968 at 10.05 am

8638374.24 Notice pursuant to Section 195(2) Climate Change Response Act 2002 - - 17.11.2010 at 7:00 am (Affects Rakautaua 7 2 Block)

8722010.16 Notice pursuant to Section 195(2) Climate Change Response Act 2002 - - 22.3.2011 at 7:00 am

9108421.3 Mortgage to Bank of New Zealand - 31.8.2012 at 10:58 am


Whangaehu River
No.8.
20-0-0 P.
7No3
136-3-10 p.
7
WHANGAEHU BEACH ROAD.
6
7No.2.
176-0-13p

View Statutory Action

Parcel Section 547 Left Bank Wanganui River **Parcel ID** 4001494
Current Purpose Access by motorised vehicles prohibted with exceptions. **Parcel Status** Current

Statutory Action	Type	Recorded	Action	Status
New Zealand Gazette 1993 p 1395	Gazette Notice	17/06/2001	Create	Current

Statute
Purpose Scientific Reserve
Name Whitiau Scientific Reserve
Comments

Statutory Action	Type	Recorded	Action	Status
New Zealand Gazette 2002 p 4428	Gazette Notice	16/12/2002	Referenced	Current

Statute the, Reserves Act 1977
Purpose Access by motorised vehicles prohibted with exceptions.
Name
Comments

***** End of Report *****