CPS
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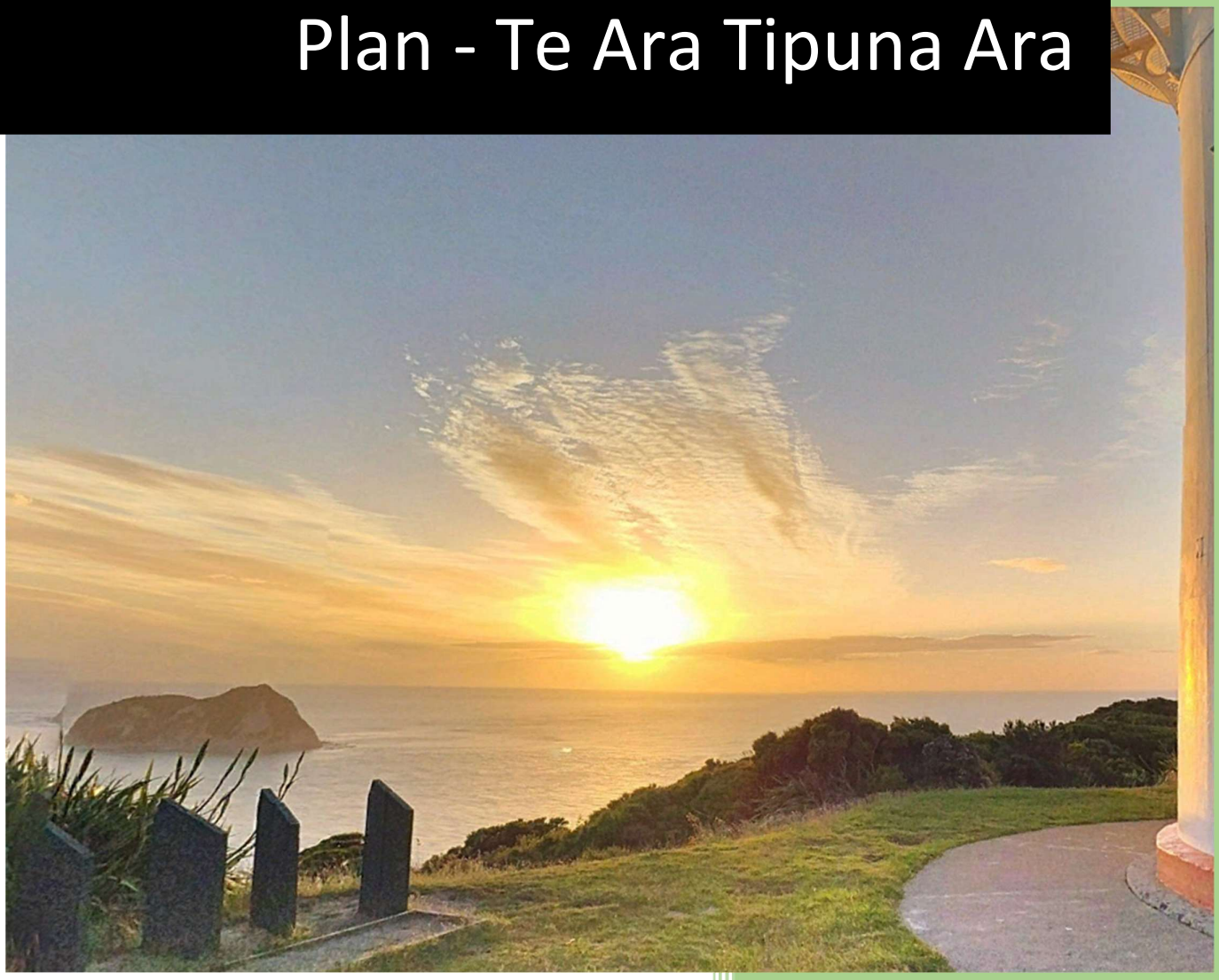
2025

(Draft) Construction Management Plan - Te Ara Tipuna Ara



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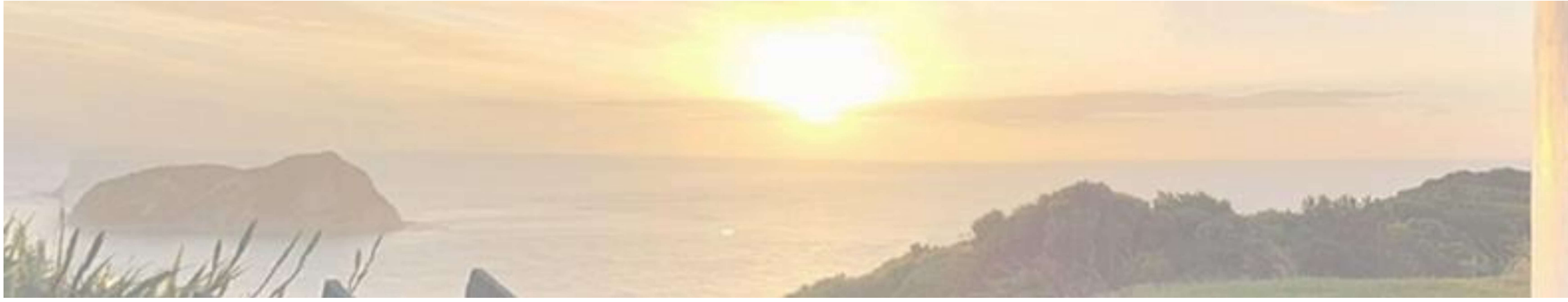

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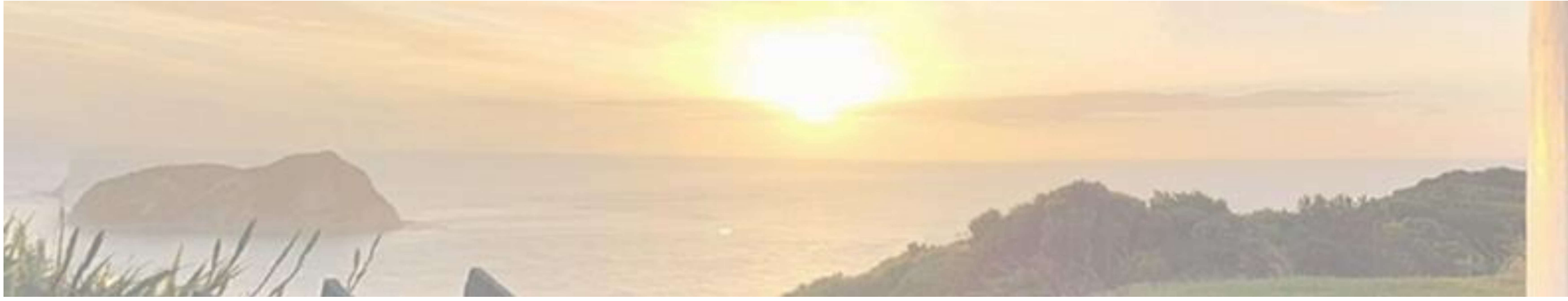


1 Introduction

[Note: This draft document has been prepared to be included as part of the documentation package submitted with the resource consent application for the Te Ara Tipuna Project. This document has been prepared in draft to support the resource consent application process and will be finalised by the Consent Holder and certified by Gisborne District Council prior to construction commencing. It provides the framework and parameters within which the construction activities associated with the Project can be managed in order to mitigate the actual and potential construction effects. Following the preparation of detailed construction drawings, confirmed staging, and the appointment of contractors, and prior to the commencement of works on-site, this draft CMP will be reviewed, updated and submitted to the Gisborne District Council for certification. Consequently, the final CMP will include more/alternative details regarding works methodologies, designs and safety protocols etc. developed by the Trust's appointed lead contractor for the Project.]

This [draft] Construction Management Plan (*CMP*) relates to the construction works associated with recreational walking pathway, known as "Te Ara Tipuna" (*'the Ara',* or *'the Project'*) authorised by resource consents ***[references to be inserted].***

Civil Project Solutions (CPS) has prepared this CMP to comply with condition[s] ***[references to be inserted].***

The purpose of this [***draft***] CMP is to describe the design and management methods that relate to construction of the Project and provide guidance on the construction activities and considerations involved in the delivery of the Project. As such it addresses:

- An indicative methodology for construction of the Ara, with reference to specific cross section treatments of the proposed ara types;
- Measures to manage the effects of construction activities; and
- Health & Safety management.

For clarity within this CMP, capitalised **"Ara"** refers to the entire trail as a whole. The term **"ara"** (lowercase) is used to describe tracks, parts of the whole Ara. This naming convention is used consistently throughout this and all Te Ara Tipuna documents to distinguish between the overall Ara and its component parts.

2 Objectives of the CMP

The objectives of this CMP are to:

- Outline the project design, cross section treatments and construction methodology for the project
- Identify any works during the course of the Project's construction that have the potential to have adverse effects on the environment
- Demonstrate the management measures that will be employed by the Consent Holder and its construction contractors to appropriately manage the potential effects of construction activities on the environment and give effect to the effects assessments included in the Consent application;
- Identify how heritage values and accidental archaeology discoveries are managed; and
- Establish how engagement with the public, landowners, the Gisborne District Council (GDC) and potentially affected parties will be managed during construction; and
- Ensure the safety of public at all times during the works.

3 Roles and Responsibilities

Construction of the Ara is under the overall control of the Project Manager who is responsible for ensuring that all consent conditions, technical requirements, health and safety plans and other requirements imposed by Gisborne District Council are implemented. Several different contractors may be working on the Ara at any one time - all are expected to cooperate and work with the Project Manager to coordinate the various activities.

Other positions and responsibilities associated with construction and design are as follows:

Table 1: Project Roles & Responsibilities		
Position	**Name and Contact Details**	**Responsibilities**
Project Manager	*TBC*	Site management, site coordination, complaints, daily monitoring and record keeping.
Project Engineer	*TBC*	Contract arrangements, overall project coordination, project meetings, detailed design, specifications and supervision of all services & as-built records.
Project Archaeologist	*TBC*	Compliance with Heritage New Zealand Pouhere Taonga Act 2014, obtaining and complying with Archaeological Authorities, engagement with mana whenua and authorities in case of accidental discoveries. The project archaeologist will be required to review the detailed design alignment prior to submission to the Local Authority.
Project Ecologist	*Angela Tinsel* *Angela.tinsel@viridis.co.nz*	Liaising with design team during detailed design to ensure ecological impacts are minimised, undertaking appropriate ecological surveys and preparing Ecological Management Plans for each design stage, in accordance with the Ecological Survey and Management Plan Protocol.
Project Landscape Architect	*Lisa Rimmer* *Lisa.rimmer@isthmus.co.nz*	That a suitably qualified landscape architect (NZILA registered) is to be engaged to provide design services relevant to the development of the comprehensive concept and detailed design documentation such that the LMP is addressed, and adverse effects of low moderate or less are confirmed and opportunities for landscape benefits are further investigated and integrated. This is to include (but is not limited to) a specific focus on opportunities to reduce adverse effects in the hot spot areas identified in the consent LVA with documentation to address a comprehensive spatial strategy for path types, structures, wayfinding, safety and interpretation signage, integration of mahi toi, plans, with cross sections-elevations,

		details and specifications for planting and hardscape elements. That a suitably qualified landscape architect (NZILA registered) is engaged to provide landscape and visual assessment services and a technical report (consistent with Te Tangi a te Manu- the NZILA assessment guidelines), as part of the comprehensive concept documentation and any council certification process to confirm the implementation of the LMP and that adverse effects are low moderate or less and opportunities for benefits have been investigated and integrated, in terms of all landscape matters - effects on ONFL, other landscapes, visual amenity (including privacy for individual properties) and natural character values. This assessment shall include a confirmatory detailed assessment of both construction and operational effects.
Project Landowner Liaison Officer	*TBC*	Leads easement negotiations and coordinates access arrangements with landowners. Responsible for managing relationships with landowners and other key stakeholders throughout construction, ensuring engagement is timely, culturally appropriate, and upholds tikanga. This role may also be held by the Project Cultural Lead, where appropriate.
Project Cultural Lead	*TBC*	Provides oversight of tikanga and cultural practice across construction activities. Acts as the first point of contact for cultural matters, including any discoveries made during works, and supports both the project team and contractors to apply appropriate protocols. This role may also be held by the Project Landowner Liaison Officer, where appropriate.
Traffic Engineer	*Steve James* *steve@urbanconnections.co.nz*	Liaison with the local authority and NZTA to ensure that the detailed design meets safety requirements and expectations. Independent safety audits and review of the Ara route wherever this may sit with or adjacent to the road corridor.
Geotechnical Engineer	*Andy Pomfret* *apomfret@initia.co.nz*	Desktop review of the detailed design relative to local geology and land movement history. Site investigations and soil verification to ensure the Ara

		meets the required bearing capacity and compaction requirements for the foundations of any structures.

4 [Proposed] Construction Activities

4.1 Scope of Construction Activities

The following section summarises the construction activities associated with the Project.

[Note: Given the draft nature of this CMP, the table below does not include the anticipated quantities for civil construction activities. However, indicative figures can be found in the km-by-km tracker spreadsheet (Tracker) prepared by CPS which forms part of the application.]

The table below outlines the various civil construction works components which will be involved in the Ara construction. The table also includes specific best practice requirements that will ensure works are completed in a safe manner with appropriate environmental controls.

Table 2: Proposed Construction Activities

Feature	Summary Design Information
Earthworks and land disturbance	Earthworks will be kept to a minimum and only conducted where there is a need for undertaking these activities (for example where a structure is required, where clearance is required to enable the Ara to continue or where the Ara surface is not wayfinding or existing). An important point to note when interpreting the tracker is that it has been established what the estimated area of vegetation clearance is and this correlates to the earthworks area. Vegetation clearance has been assumed to infer earthworks as a conservative approach. Earthworks may be required in the following situations: • Steep terrain. • Sections of gravel; • Steps; • Low benches; • Road crossings (leading up to the crossing); • Earthworks in the road corridor (e.g. traffic signage installation, minor vegetation clearance to allow for the ara to be traversed, pedestrian crossing tie ins, approaches to structures, foundations of structures such as swing or timber bridges & installation of safety barriers or elements as required by the Local Authority or NZTA.); • Establishment of waterbody crossings; • Approaches to and inclusion of structures, including bridges; and • Some minor vegetation and subsequently land may be disturbed during construction of the low impact bush ara and through plantation forestry. Removal of topsoil and some subgrade (if required) will be completed prior to backfilling and compacting with the selected clean engineered fill material.

	Large cuts (greater than 1.5m) in height and retaining structures will be avoided, where possible, by the Ara route following the natural contours of the land. A low bench cut will be the preferred construction methodology to cuts greater than 1.5m or retaining structures. Where low bench cuts are proposed, the Project's landscape architect, ecologist, and geotechnical engineer must be consulted to determine natural regeneration capability and Ara resilience suitability. Consultation with the project coastal hazard expert & archaeologist maybe required depending on the Ara's location and those areas identified in the Historic Heritage Management Plan. All earthworks will be managed to ensure that best practice dust and erosion and sediment control measures are followed, as outlined below. Excavated material will be kept onsite and utilised for landscaping or lost within the contours of the land where possible. Any material that needs to be taken offsite will be transported to an appropriate facility for disposal. Material will be assessed under the National Environmental Standard Contaminated Soil (NESCS) and necessary consents will be applied for, if required.
Stormwater management – including culverts	Approximately three quarters of the Ara will be wayfinding with no earthworks or land disturbance proposed. Wayfinding will not alter the natural contours of the land. It is proposed for the existing drainage and crossfall to be utilised. Accordingly, no stormwater management measures are proposed in these areas. Stormwater management measures will be required during detailed design if there are identified to be drainage improvements required. The remaining quarter of the Ara will be designed to maintain a level of cross fall that will allow stormwater to flow across the Ara and towards the nearest natural drainage channel. Due to the minor increase in impervious surface and due to no stormwater heading into any piped reticulation it is not anticipated that any attenuation will be required. Riprap or erosion protection may be installed at piped outlets if required. During construction, the natural drainage channels will be preserved with any introduced structures allowing flow paths for water to continue to flow close to pre-development levels noting no requirement for attenuation when not entering the reticulated network. Erosion and sediment controls will be used following best practice to ensure that earthworks are appropriately managed. No existing stormwater flows will be restricted. Culverts will be avoided where practicable, in intermittent and permanent streams In the first instance the preference will be to provide a natural waterbody crossing where users way find across the stream. If it is unsafe to provide a natural waterbody crossing, bridge structures will be used in the second instance. If required, the placement and use of any culverts on intermittent or permanent streams will provide for fish passage and will comply with the conditions outlined in Regulation

	70(2) of the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-FW) as well as the permitted activity standards in the Tairawhiti Resource Management Plan (TRMP) [to be inserted]. More details regarding culvert construction and fish passage are outlined below. In addition, where permanent culverts are installed, these will be designed for a 1:100-year AEP event based on the NIWA Hirds 2081-2100 RCP6.0 predicted rainfall probability data.
Toilet blocks and wastewater	Where available, existing toilets will be utilised. In the absence of suitable infrastructure, structures housing compostable toilets shall be installed. The supply and design of these toilets has not been finalised, but it is anticipated that their footprint will not exceed 9m2. The units will be housed and ventilated with a composting system included to avoid any solid or liquid discharge. These units will be raised off the ground, so they sit up and out of any wet conditions following heavy rain events. Hand sanitiser will be the washing facility provided with no potable water proposed. A service and maintenance agreement will need to be put in place with a local contractor to ensure these are maintained at regular intervals. The Project Landowner Liaison Officer, with support from the Project Cultural Lead, shall liaise with landowners during detailed design to ensure the location of any new compostable toilets will avoid culturally sensitive areas and observe required setbacks outlined in the GDC Guidelines for On-site Wastewater Management 2012 including a 20m setback from drainage channels and waterbodies. The location of toilet structures shall also take into consideration servicing requirements, with toilets located near to Ara Road access points (noting that vehicles will not be able to use the Ara itself). Where vehicle access is not possible, servicing of these facilities will be completed via small portable units (in accordance with the Operational Management Plan).
Roading & Concrete Work	Any work within the State Highway or Local Road corridor will be carried out as per the relevant guidelines (NZTA and Gisborne District Council (GDC) guidelines). These works will be confirmed during detailed design, and subject to a Safe Systems Audit (SSA) & RCA approval. Prior to the placement of any concrete the base course material will be tested against the required specification (if applicable) then the required concrete thickness and reinforcing will be installed. Frequency and type of use will determine the concrete strength and reinforcing requirements. This will be included in the detailed design for approval by the local authority prior to installation. Concrete works (Lime) near waterbodies, or areas where it can be entrained in stormwater that flows into waterbodies, can change the pH of water and create

	serious harm to instream fauna and flora. All works that need installation of concrete near waterbodies shall require site specific plans to ensure that the risk is avoided.
Waterbody Crossings: bridges	[Refer to appendix "F" for indicative swing bridge cross section provided by Abseil Access. Note that these are not site specific to the bridges along this ara but include several examples of abutment, crossing and foundation types. All swing bridges and structures related to waterbody crossings will be installed so that the height of the deck of the structure will not be overtopped by the 2% annual exceedance probability (50 year) flood event, with a minimum clearance height of 0.5 metres. If there is a discrepancy between this level and that advised by the building code or recent flood levels, the highest level will prevail. Due to these structures not yet going through detailed design there are only certain parameters which can be defined such as the following: - Bridge abutments may consist of both timber and steel. - Some abutments will require driven piles while other may require augured piles. - Earthworks clearance to form the abutments will be required but will be kept to a minimum. - No piles or abutments will sit within the waterbody. No minimum offset can be required at this point in time. - Stays will be installed to support the abutments and will vary in length depending on the overall deck length and width.
Steps	Refer to appendix "E" for cross section for typical steps.
Boardwalks	The intention is to use boardwalks where these are necessary to avoid or manage an effect (e.g. cultural site of significance). They will not be used in the road corridor. The design of these will be site and effect specific.
Road Crossings and Ara Alignment	Refer to appendix "A" for typical cross section for road crossings and aras within the road corridor.
Wayfinding markers	Refer to section 4.13. These will be co-designed with landowners and hapu.
Signage	Signage will be co-developed with landowners and hapu and will ensure where required the Local Authority & NZTA specifications are met.

5 Indicative Construction Methodology

5.1 Overview

The Ara has been developed to ensure it is in keeping with the natural environment to provide an immersive experience for users. Approximately three quarters of the Ara will require no or limited works, except wayfinding or use of existing farm Aras. The width of the ara has been set at a general width of 1.5m to align with the accepted footpath width in Gisborne. The minimum requirement is 1.2m. Where the track traverses through an ecologically sensitive area, a track width of 1m is required by the ecologist. Where this cannot be achieved, this has been noted on the tracker. Where assessed as an appropriate location (or requirement) for providing a higher level of service, additional work will be conducted to construct the following Ara types:

1. Low Impact Bush Ara – Any km where the ara will traverse across medium to heavily vegetated land,[1] and a low impact bush Ara is proposed. If a km is designated to be a low impact bush ara, the Ara will only be 1 to 1.5 m wide. Accordingly, it has been assumed that only the amount of vegetation clearance / earthworks required to facilitate a Ara of this width is proposed (informing calculations of vegetation clearance and earthworks). This lower impact ara type acknowledges the location's ecological value and expected restrictions on ability to use machinery in difficult to access terrain.
2. Steep terrain – Gravel, geotextile reinforcement where required. Gradients of >20% either ascending or descending.
3. Plantation forestry – Dense and possible indigenous vegetation identified. Low impact clearance as required.
4. Gravel – Only to be used where there is a need to reinforce the Ara to provide greater traction for users based on the gradient/nature of the ground. The exception is between Tokomaru and Ruatoria which has been identified as requiring an all-weather surface to allow for safe pedestrian access during civil defence emergencies. This section will require a higher level of service, requiring the application of gravel.
5. Steps – Structured steps provided where the gradient exceeds 25% and these are deemed practical. Further tracking and profiling to be provided at detailed design.
6. Road Crossing approach – As required for a crossing approach, in alignment with the safety assessment prepared by Urban Connection. Surface improvement may be required as requested by the roading authority leading up to the approach.
7. Road corridor – Some vegetation clearance may be required to allow the Ara to traverse the road corridor shoulder or berm. Wayfinding utilised where practical. Physical works within the road corridor will be limited to traffic signage installation, minor vegetation clearance to allow for the ara to be traversed, pedestrian crossing tie ins, approaches to structures, foundations of structures such as swing or timber bridges & installation of safety barriers or elements as required by the Local Authority or NZTA.
8. Bridge approach – Gravelled and shaped subgrade used to ensure safe entry/exit onto the bridge.
9. Toilets - Earthworks and clearance for placement of each structure. Foundations outlined at detailed design and may increase earthworks volumes.

Section 3.2 below provides a more detailed overview of the methodology for construction of each specified cross section (shown on Appendix 1). General construction considerations will also be discussed in section 4 outlining best practice methods for controlling and managing any effects which may arise during construction.

The following reports and management plans should be read and referenced in conjunction with this CMP:

- Ecological Impact Assessment (ECiA) (prepared by Viridis, dated xyz)
- Landscape Management Plan (prepared by…, dated…)
- Geotechnical Assessment/Report (prepared by Initia dated…)
- Traffic Impact Assessment (prepared by Urban Connections dated…)
- Coastal Hazard Assessment (prepared by 4DEnvironmental dated…)
- Heritage Assessment/Report (prepared by Insitu Heritage dated…)
- Cultural Impact Assessment (prepared by …, dated…)

[1] Areas of medium to heavily vegetated land have been identified based on aerial imagery, and where possible site walkovers/ driveovers and/or knowledge of the terrain. This has been discussed between CPS in collaboration with Vidiris.

6 Typical Ara Cross Sections

Appendix A to this draft CMP includes cross sections of the typical ara types that can be expected along the Ara. As this is a draft CMP, these cross-sections are currently indicative only and will be updated during detailed design of the Project in accordance with the conditions of consent and be included in the final CMP. The following sections below contain brief descriptions of each cross section.

6.1.1 Typical Ara Cross section (1a) Wayfinding Ara - Grassed

Most of the ara will be wayfinding across grassed areas, which will not require any works, apart from establishment of Wayfinder markers that will be provided at regular intervals. The Ara will follow the natural contours of the land in these sections. Wayfinding markers will either be installed as directional markers on trees or other nearby structures. If this is not possible a suitable wayfinding marker post will be installed by hammering this into the ground like a driven pile. Auguring will be avoided to minimise excavation and excess material being removed.

6.1.2 Typical Ara Cross section (1b) Pathway through Existing Vegetation

Where the Ara travels through existing vegetation, the ara route will weave through the trees, avoiding vegetation disturbance if possible and maintaining a maximum vegetation clearance width of 1.5m. Areas of steps, structure approaches, low benches or wider gravel paths will be avoided in these areas unless there is a need to provide these for safe use. Details of compliance with disturbance of >1m in sensitive areas is outlined in rows 63-65 in the Tracker. Removal will also be subject to the restrictions set out in the Ecological Survey and Management Plan.

All indigenous vegetation clearance within an identified ecologically sensitive area is to be undertaken by hand and felled vegetation is to be placed to the sides of the ara except for those areas within a road corridor, where felled vegetation will be removed from the road corridor or if appropriate, will be mulched in situ. To minimise the risk of floodwaters carrying away cleared vegetation, special care should be taken when working within flood plains, overland flow paths, or riparian areas. In such cases, it may be necessary to remove vegetation from the site entirely to prevent it from becoming debris during flooding events. Machine mulching of vegetation will only occur within the road corridor when there this is managed to meet construction noise and vibration management standards.

6.1.3 Typical Ara Cross section (1c) Sand Dune Crossing

Existing accessways that are perpendicular to the coastline will be used to cross over dune systems, avoiding any works within the sensitive area. There will be no intent to disturb any vegetation within these areas with existing natural access routes utilised.

Where there are no existing accessways that will avoid the Ara traversing dune systems, the measures set out below related to works in beach and dune systems shall apply.

6.1.4 Gravel sections

6.1.4.1 Typical Ara Cross section (2a) Gravel Ara

Sections of the Ara will be designed as a gravel ara only where there is a functional need to reinforce the Ara to provide greater traction for users (for example where the ara traverses a slope that is slippery under foot when wet and not suitable for installation of steps).

One area where there will be requirement for a gravel ara is along the Ara route from Tokomaru to Ruatoria km 97 to km 148 (note this will be subject to existing infrastructure and whether there is a need for improvement). This part of the Ara has been identified as requiring an all-weather surface to allow for safe pedestrian access during civil defence emergencies. As this section requires a higher level of service, it requires the application of gravel.

While the Tokomaru to Ruatoria section has been prioritised for an all-weather surface due to its heightened vulnerability during severe weather events, Te Ara Tipuna as a whole functions as a resilience network. The Ara provides a secondary pedestrian access corridor through areas that are otherwise solely reliant on State Highway 35, offering a level of network redundancy not currently available within the Ngati Porou rohe. In this way, the Ara supports emergency response, civil defence planning, and long-term community connectivity.

In these areas the Gravel Ara Construction Methods set out below at Appendix A shall apply.

6.1.4.2 Typical Ara Cross Section (2b) Ara- Gravel on Steep or unstable Ground

When the gradient is greater than 20% (or where there is deemed another need such as construction of steps or a structure), an aggregate based ara will be installed to provide Ara resilience and traction.

In these areas the Gravel Ara Construction Methods set out below in Appendix A shall apply.

6.1.4.3 Typical Ara Cross Section (2c) Wayfinding along Existing formed Aras within Private property

Where there are suitable existing Aras within the Ara envelope, these shall be used.
Wayfinder markers will be provided at regular intervals as required, in accordance with the methods set out below.

6.1.4.4 Steps

Where the gradient exceeds 25% and the Ara traverses a hill face parallel to the gradient, steps may be provided for Ara users. Formed boxed steps filled with gravel will be constructed as per the DOC guidelines. The Tracker has identified some areas where these may be required however, an onsite survey and detailed design will be required to confirm the final extents. It is acknowledged that not every instance where the ara exceeds a gradient of 25% have steps been provided with wayfinding being the preferred ara type.

6.1.5 Roading network

During the detailed design stage, the proposed design for all works within the NZTA and local road network, will be subject to a SSA and will require approval from NZTA and GDC.

For all works within the road corridor, an approved Construction Traffic Management Plan & Corridor Access Request (CAR) shall be implemented with any required service locations completed prior to commencement.

All signage shall be approved by the Road Controlling Authority (RCA) and a traffic safety engineer.

6.1.5.1 Typical Ara Cross Section (3a) Ara adjacent to Highway/Local Road

Where the Ara is parallel to any road, the Ara will be located at least 0.5m from the live lane, in line with NZTA's minimum setback requirement. Where practicable, a **4m distance from the live lane as recommended in the project's Safety Assessment is generally adopted.** There may be instances where the users will have to utilise the existing road for up to 50m. In all instances there will need to be input and final approval from the traffic engineer on the project. The ara form will be grassed, unless requiring areas of metal.

Where sections require metal, topsoil shall be removed to form an approximately 1- 1.5m wide Ara. The metal shall be well compacted.

Where possible, the existing drainage channel will be avoided. If the space does not permit a 1 -1.5 m wide Ara, a revetment or permanent traffic barrier maybe required if longer than 50m. The final decision will be at the discretion of the traffic engineer.

The design will ensure that Ara users shall avoid drainage channels, which may include use of bridging structures.

The ara will be marked out with installed flexible visibility markers (these are site specific, with specifications to be confirmed during detailed design in consultation with NZTA).

Raised structures will be avoided within the road corridor.

6.1.5.2 Typical Ara Cross Section (3b) Ara along Road shoulder -Highway and Local Road

The Ara will be at least 0.5m from the live lane and will utilise and compact existing metalled edge.

If the existing metal edge is not suitable, a compacted gravel ara which is then appropriately sealed will be formed approximately 1-1.5m wide. Removal of topsoil may be required in certain areas to extend to achieve the 1-1.5m width.

Where possible, the existing drainage channel will be avoided. If the space does not permit 1-1.5 m lane, a revetment or permanent traffic barrier maybe required if longer than 50m.

The design will ensure that Ara users shall avoid drainage channels, which may include use of bridging structures. Final approval of setback distances and location will be provided by the traffic engineer.

The ara will be marked out with installed flexible visibility markers (these are site specific, with specifications to be confirmed during detailed design in consultation with NZTA).

6.1.5.3 Typical Ara Cross Section (3c) Ara alongside Low Volume Road

The Ara will be chosen on the most widest and safest side of the road.

The existing drainage patterns and flow paths will be identified and ara location/construction will avoid these areas or, if unable to be avoided, managed to maintain the existing stormwater channels.

The establishment of the Ara will require removed of vegetation and grass layer to form a 1.2m wide walkway, which will be shaped and compacted.

6.1.5.4 Typical Ara Cross Section (3d) Low volume using Existing Road Carriageway

This Ara type is suitable for roads with very low traffic volume and the roadside berm lacks space for a 1-1.5m ara.

Following road shoulder selection, vegetation and grass cover should be removed, stockpiled, and then disposed as required (as per best practice and following the procedures outlined in sections above). The subgrade should be shaped to provide cross fall towards the drainage channel. A width of 1.2-1.5m should aim to be achieved.

Pedestrian signage will be installed to alert drivers.

Provision shall be made for 'turn off areas' where pedestrians can move off the road where possible.

6.1.5.5 Typical Ara Cross Section (3e) Existing local road fit for purpose

This Ara type is suitable for roads with very low traffic volume and a grassed berm that enables adequate space for the Ara and appropriate separate from the live lane.

The Ara will be located on the most widest and safest side of the road and there shall be no vegetation removal or ground alteration required.

6.1.5.6 Typical Ara Cross section (4) Pathways adjacent Highway Residential Settlement

This Ara type is for areas where an existing pathway that is suitable exists within the residential areas. No additional works are required

6.1.6 Typical Pedestrian Crossing

There will be numerous locations where road crossings are required along the route.

Safety and signage will be two of the most important aspects of this work with clear communication of expectations required between the project team and NZTA or GDC as the Road Controlling Authority.

As the Ara approaches the road corridor, signage will be put in place warning walkers of the upcoming road crossing. Way finding markers will be installed to direct walkers towards the point of crossing which shall be selected in consultation with the Project's traffic safety adviser. Relevant line marking shall be installed following detailed design and approval.

6.1.7 Concrete Landing

Where required there may be scope to install a concrete landing or strip in select areas. These areas may be appropriate as follows:

1. Transition from swing bridge to a compacted AP20 Surface.
2. Transition from a road crossing to a way finding or aggregate Ara.
3. Along the road shoulder where the Ara is steep or narrow.

Construction will first require stripping of topsoil (and subgrade) and replacement with a minimum of 100mm AP40 as the basecourse. The concrete footpath should then be boxed and poured to a minimum depth of 75mm. Reinforcing/fibre content can be confirmed at detailed design. Adequate cross fall and channel drainage should be provided to ensure water does not pool on the path. Due to this scope being site specific, no cross section has been provided.

7 Construction Management Measures

7.1 Erosion & Sediment Control Measures

Erosion and sediment control measures are to be established prior to any excavation works commencing.

These measures must be established in accordance with the Erosion and Sediment Control Plan (ESCP) which Is required to be prepared in accordance with the conditions of the Consent. The ESCP must be prepared in accordance with the *Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region – June 2016.*

The objective for sediment control measures is to keep clean water from entering areas of open ground and control and manage sediment laden water prior to it exiting any construction area.

The sediment control measures shall include the following which will be installed, operated and maintained in accordance with the ESCP:

- silt fences;
- contour drains/drainage channels;
- diversion bunds; and
- Grass clearways for stormwater filtration.

The objective for erosion control measures is to the prevent erosion and minimise soil instability. Erosion control measures will include the following as required, which will be installed, operated and maintained in accordance with the ESCP:

- riprap protection;
- installation of flumes to avoid scouring where culverts are installed;
- Retaining structures to be installed only as required;
- Covering exposed areas with topsoil and grass seed as soon as possible following final contouring.

Monitoring of the effectiveness of sediment and erosion controls will be undertaken in accordance with the requirements of the ESCP. A site specific ESCP will be prepared for each site prior commencement of any construction activities for approval by the Local Authority.

7.2 Structures

Structures used as a part of the Ara may require specifically engineered designs depending on the type of structure and the section of the ara they are located on.

Structures to be installed as part of the Project include steps, swing bridges, timber single span bridges, retaining walls, and toilet blocks. Concept designs/images for each of these structures are appended to this draft CMP. Final designs which shall be developed based on the concept designs will be included in the final CMP for certification. Indicative numbers of each type of structures (excluding steps and retaining walls) associated with the Project and their kilometre reference numbers are as follows:

Table 3: Structure Identification		
Structure type	Indicative number	Indicative km location
Toilet blocks	12	Km30 Km60 Km82 Km116 Km128 Port Awanui Km3 Hikurangi Loop Km13 Hikurangi Loop Km45 SH to Waipiro Connect Km7 Km183 Km199 Km234
Swing Bridges (Crossing option 4)	8	Km13 (Pouawa River) Km20 (Waimoko River) Km109 (Waikawa Stream) Km128 (Wharekaha Stream) Km212 (Karakatuwhero River) Km234 (Wharekahika River) Km238 (Oweka Stream) SH to Waipiro Connect Km6 (Makatote Stream)
Timber single span bridges (Crossing option 5)	7	Km48 (Kaitawa Stream) SH to Waipiro Connect Km6 (3x footbridges), Km4 (2x footbridges), Km2 (1x footbridge) (Makatote Stream (Tributaries) and other small streams)
Retaining Walls	Not yet identified	To be identified and detailed as required at detailed design. These will be avoided where practical.
Steps	Identified in 22km's	Refer to tracker
Culverts	Not yet identified	To be identified and detailed as required at detailed design. These will be avoided where practical.

7.2 Waterbody & Road Crossings

With the Ara traversing both public and private land whilst tracking closely to the East Coast, there are numerous locations where it crosses both the State Highway or local roads along with various waterbodies. A series of crossing options for each have been identified as being appropriate as approved by Urban Connections. Below are the 6 crossing options (2 for road crossings and 4 for waterbody crossings):

7.1.1 Crossing Option 1 – Warning Signage

Crossing option 1 has been provided for where the bridge crossing meets one or more of the following criteria and has been deemed appropriate by Urban Connections.

1. The bridge is 30m or less in length.
2. There is good visibility both ways with enough time for pedestrians to cross safely without holding up traffic.
3. This has been deemed appropriate by the Traffic Engineer based on the site driveover & roadrunner video footage.

Warning signage is to be installed at an appropriate distance identified at detailed design to warn motorists that this bridge may be share with pedestrians.

7.1.2 Crossing Option 2 – Push Button

Crossing option 2 is an illuminated warning system which is to be used where crossing option 1 is not deemed appropriate. This is to be used where a higher level of warning is required for users to cross safely and for road users to be warned when a pedestrian is crossing the bridge. The following criteria have formed the basis of the decision provided by Urben Connections:

1. The bridge is 30-100m in length with good visibility either side.
2. The bridge is less than 30m in length with poor visibility either side.

Refer to Appendix B for further detail on the plan view of this arrangement.

7.1.3 Crossing Option 3 – Traffic Light

Crossing option 3 is a traffic light system where pedestrians press a push button which triggers a traffic light to then allow safe crossing of the bridge with traffic held at both ends. This option is provided for where option 1 or 2 criteria are not met. The following have formed the basis for Urban Connections recommendations on the location of these crossings:

1. The bridge length is greater than 100m and the time of which traffic is held up is deemed appropriate for the traffic volume on that road.
2. The bridge is between 30-100m in length with poor visibility at either end.

Three of these crossings have been provided in total across the route. Refer to Appendix B for further detail.

7.1.4 Crossing Option 4 – Swing Bridge

Crossing option 4 is a swing bridge provided as a separate structure to the existing bridge. Swing bridges have been provided for where options 1-3 have not been deemed appropriate by the Traffic Engineer. There are a total of 8 swing bridges across the Ara with 7 on the main ara and 1 on the Hikurangi loop. The main criteria for these are as follows:

1. Where crossing options 1-3 have not been deemed appropriate by the traffic engineer.
2. Where the crossing is not adjacent to the road corridor and the length does not permit a natural waterbody crossing or timber single span bridge

- Below is a table provided by Abseil Access for the various option 4 crossings and possible solutions along with some approximate parameters. Timber towers are a similar cost to equivalent steel option but timber looks nicer and never needs to be painted lowering maintenance costs.
- Deadman anchors can be made from H5 tanalised timber. Concrete deadmen are better but more expensive, especially if the concrete is flown in.
- Rigid hanger frames produce a nice stable deck (resist torsion forces). The rigid frames can also have the cable attached lower than the handrail. This reduces the tower height (cost saving) resulting in shorter cable and anchor positions. It also allows users to have a more open central area.

- Driven timber piles under the tower pads are a cost-effective way to overcome ground lower than 300kPa bearing capacity.
- Fibre reinforced plastic (FRP) is less maintenance than timber at no extra cost. Material costs are higher but install time is quicker.
- Fusion bonded PVC galvanized chain-link mesh is the Asbeil Access choice for the side barrier. 900mm high with a small gap at the base (80mm) for inspection access to the hanger frame bolts. Steel tube handrail.
- Tower height is generally 1/8th -1/10th of the span. Lower towers require the cable to be tighter which increases quantities of other items.
- Anchor position is generally 3 x the tower height. Optimum cable angle here is around 25 degrees. It can be steeper (30 degrees or more) but then the anchor block needs to be bigger.
- The handrail height is 1.2m. 1.4m comes from the NZTA bridge manual and this is believed to be too high, it detracts from the user experience and costs more. All Abseil Access bridges are 1.2m.

Bridge Reference	Length, width and deck depth	Maximum height and diameter of suspension uprights	Maximum length of back stay	Likely materials used for deck, safety railing (assumed 1.4m high)	Similar completed example provided by Abseil Access
Km13 Pouawa River	36m length, 1.5mdeck depth	4.5m timber	14m	FRP deck Fusion bonded pvc coated galvanised chainlink side mesh, timber deadman	Waitekohe bridge or Totara bridge (stainless steel)
Km20 Waimoko River	40-50m length	5.5m timber	17m	FRP deck Fusion bonded pvc coated galvanised chainlink side mesh, timber deadman	Bucklerburn (refer website)
Km48 Kaitawa Stream	15m length, 1.5m deck, timber bridge				Martins Creek
Km109 Waikawa Stream	80m length	9m steel	25m	FRP deck Fusion bonded pvc coated galvanised chainlink side mesh, concrete deadman	Bucklerburn (refer website)
Km128 Wharepong a Stream	40m length	5m timber	14m	FRP deck Fusion bonded pvc coated galvanised chainlink side mesh, timber deadman	Bucklerburn (refer website)
Km212 Karakatuwh ero River	100m length	12m steel	33m	FRP deck Fusion bonded pvc coated galvanised chainlink side mesh, concrete deadman. Note that extra flood	Bucklerburn (refer website)

				clearance required here for the under deck stability.	
Km234 Wharekahika River	40m length	5m timber	14m	FRP deck Fusion bonded pvc coated galvanised chainlink side mesh, timber deadman.	Bucklerburn (refer website)
Makatote Stream G15B (SH to Waipiro Connect) km 6	**30m length**	**4m timber**	**10m**	**FRP deck Fusion bonded pvc coated galvanised chainlink side mesh, timber deadman**	**Waitekohe bridge (Galvanised steel)**
Km238 Oweka Stream	50m length	5.5m timber	17m	FRP deck Fusion bonded pvc coated galvanised chainlink side mesh, timber deadman	Bucklerburn (refer website)

7.1.5 Crossing Option 5 – Timber Bridge

Crossing option 5 is a timber single span bridge which can reach up to 20m in length (maximum). The range within this application is 10-15m with a high-level concept provided by Abseil Access in Appendix G. These crossing options have been provided where the following criteria are met:

1. The crossing is in a remote location or one which is not adjacent to an existing bridge.
2. The span is <20m and is able to be spanned without any part of the structure in the waterbody.

It is important to note that no part of the structure will sit in the waterbody. The concept shown identifies piles on the embankment which will help start the span but will not sit within the waterbody itself. These crossing options are generally more cost effective than swing bridges for shorter crossing lengths.

7.1.6 Pedestrian Road Crossing Option 1

Where there is a requirement for a road crossing two indicative crossing options have been provided. It should be noted that these are to be reviewed and approved by the Roading Authority prior to any implementation. The detail of each will be covered in the detailed design.

Crossing option 1 is provided for where the traffic volume is <250 vehicles per day. Wayfinding markers and optional improvements to the surface leading to the carriageway are provided. Warning signage is provided for traffic to indicate a pedestrian crossing is approaching.

Refer to Appendix B for further detail.

7.1.7 Pedestrian Road Crossing Option 2

Crossing option 2 is similar to 1 but is provided for where the traffic volume >250 vehicles per day. Additional warning signage for pedestrians is provided to ensure safe movement towards the edge of the carriageway. At detailed design this will be refined to meet the expectations of the Roading Authority.

Refer to Appendix B for further detail.

8 Earthworks/ land disturbance

The proposed Project route has been located to minimise the amount of land disturbance by following the natural contours of the land. The identification of the final ara route within the proposed 50m / 100m corridor will further enable micro-siting of the ara to minimise the amount of topsoil required to be removed.

Should topsoil removal be necessary, it shall be stockpiled temporarily on site, away from overland flow paths, water courses and the road corridor. Laydown areas will be provided for and identified where this may occur. Topsoiling and regressing shall be completed within 6 weeks after completion of a section of any earthworks. Where there is capacity, the topsoil will be reused on site for landscaping or to recontour and re-grass. All exposed earthworks areas which were grassed prior to works occurring are to be grassed (or covered in an appropriate geotextile cloth) to achieve an 80-90% grass cover.

Topsoil removal, replacement and re-grassing shall be completed in stages, where practicable, so as to minimise the potential for sediment discharge and dust emission.

In the event construction activities identify any contaminated or potentially contaminated material, works will cease and the site will be assessed under the National Environmental Standard Contaminated Soil (NESCS) and further assessments and consents obtained, if required.

8.1 Dust Controls

All soil disturbance activities shall be completed in stages, where practicable, so as to minimise the potential for dust emission. Areas of earthworks exposure will be minimised in accordance with the Topsoil Removal & General Soil Disturbance measures outlined above to minimise potential dust effects.

Any potential dust hazards presented by open excavations or stockpiles will be visually monitored by construction staff. Dust control measures will include the following as required, which will be installed, operated and maintained in accordance with the site specific ESCP:

- Covering of loads
- Compaction of stockpiles
- Use of bunds to protect exposed areas from high winds
- Use of water carts to keep the exposed soil damp
- Regrassing & revegetation as soon as practicable.
- Controlling work periods around poor weather particularly high winds
- Environmental monitoring and reporting to identify and mitigate risks

8.2 Heritage and Archaeology

The proposed Project route has been located taking into account a high-level assessment of known archaeological sites to avoid and minimise effects on sites with known heritage values.

Notwithstanding this approach to avoid and minimise effects, the ara still traverses areas where there are potential or likely heritage values that require particular care. The Historic Heritage Assessment which accompanied the application (InSitu, 2025) identified such areas as yellow or red. All contractors working on the site are to be advised of the location of yellow and red areas and the potential heritage values of such sites prior to any work within those areas. Before any construction works occur in yellow or red areas the Project Archaeologist shall attend the site and confirm whether an Archaeological Authority is required to undertake the

works. Where an Archaeological Authority is required, no works shall occur until it has been issued and all contractors have been provided with a copy of the Archaeological Authority and its conditions. All works shall be conducted in accordance with the Archaeological Authority and the Historic Heritage Management Plan (*HHMP*), which shall prescribe construction methods, including in relation to land disturbance.

All construction works, including works within any 'Green' areas identified in the Historic Heritage Assessment (InSitu, 2025), must comply with the Archaeological Accidental Site Discovery Protocol (*ASDP*) provided in the HHMP. By way of summary, should any land disturbance accidentally uncover any unidentified archaeological sites:

- all works shall cease
- the Accidental Discovery Protocols will be followed and
- the Project Manager will be immediately contacted;
- the Project Manager will contact and work with the Project Archaeologist to ensure that all protocols under the Heritage New Zealand Pouhere Taonga Act 2014 are adhered to and mana whenua are contacted.

8.3 Landscape Mitigation

[to be inserted]

8.4 Vegetation Removal

Where the Ara travels through existing vegetation, the Ara route will, wherever possible, be designed to weave through the trees and avoid vegetation removal or disturbance. Where vegetation clearance is required, the restrictions set out in the Ecological Survey and Management Plan shall apply, including the following:

- Generally, the width of vegetation clearance will not exceed 1.5m. The only exceptions from this maximum width limitation are road crossings, bridge approaches, bridge installation, sections of gravel, steps, low benches & toilets.
- In specified ecologically sensitive areas identified in the EcIA, vegetation removal widths are reduced to 1m. There are several areas where this is not possible which include the following kms: km4, km48, km108-109, Hikurangi Loop km10, Hikurangi Loop km36-37, SH to Waipiro Connect km5-6, Hikurangi loop km164, km215-217, km218.4, km233-234.
- No indigenous trees > 30 cm d.b.h will be removed.
- Removal of indigenous trees > 15cm d.b.h will only be undertaken where there is no viable alternative Ara route within the consented envelope that would avoid removal.
- Where vegetation removal is necessary within an identified ecologically sensitive area (*ESA*) (as outlined in Appendix B of the ECiA), the width of vegetation clearance shall be no greater than 1m unless this cannot be achieved due to the construction activity and track type required.
- All indigenous vegetation clearance within an identified ecologically sensitive area is to be undertaken by hand and felled vegetation is to be placed to the sides of the Ara, except within a road corridor, a flood plain, or adjacent to a stream or river where it will be removed off site or if appropriate, mulched.
- No machine mulching of vegetation will occur outside of the road corridor.
- Where indigenous vegetation is removed to form the ara and is unable to be reinstated following construction, planting of an area equivalent to 2:1 (replanting area : vegetation removal area) with eco-sourced species suitable for the environment and ecological district will be provided as close as possible to the area of vegetation removed. Further details of this planting is outlined in the ECiA.
- [Add protocols for vegetation removal in the road reserve, including SH35 corridor]

Refer to the EcIA and ESMP for a full description of controls and protocols around vegetation removal.

Where vegetation clearance is in close proximity to dwellings, the Project Manager shall engage the services of an arborist to avoid clearance posing any risk to residents or their assets.
Close approach permits are to be applied for as necessary when working beneath any overhead lines or when excavating near live underground services.

8.4 Gravel Ara Construction Methods

In areas where the Ara is required to be a gravel ara design, vegetation clearance and topsoil removal will be carried out, prior to placement of the AP20mm aggregate.

The subgrade will be compacted and inspected for soft spots. Upon placing the aggregate, the aggregate will be spread and compacted to a minimum depth of 75mm. 3-4% cross fall should be achieved. If the subgrade is soft, geogrid or bidim cloth can be used to help reinforce the area and avoid the metal punching through. In areas where stability is required, StrataWeb or equivalent can be used to lock in the aggregate.

The finished level of the Ara shall not be significantly lower than the surrounding ground to avoid pooling on the Ara. Drainage channels shall be maintained or provided for where the catchment above the Ara is significant.

Compaction recommendations and stability analysis shall be in accordance with recommendation by the geotechnical engineer to ensure Ara stability and minimise effects on the surrounding environment.

8.5 Works in beach and dune systems

Work within the dune or beach systems will be avoided where practical. Existing beach access via formed walking tracks, existing vehicle access, existing steps or other natural entry points will be utilised when crossing the dunes onto the beach. It is intended that wayfinding posts will be the only form of physical work being placed appropriately to show where access points are to be utilised. The project ecologist will be consulted with and will be required to review the detailed design drawings for construction prior to submission. Limitations will be set around the timing of any wayfinding marker installation to avoid nesting times of bird species. If areas of bird habitat are identified, then the alignment may need to be adjusted to suit.

8.6 Construction Adjacent to Streambeds, Rivers & Coastal Environments

Construction near streambeds, rivers, wetlands and coastal environments will be minimised as much as possible, with the strong preference to use natural stream crossings on foot, where possible. Earthworks and vegetation removal within, or within a 10m setback from, natural inland wetlands will be avoided. Erosion and sediment control measures will be tightly managed and addressed through site specific sediment and control plans.

If natural stream crossings on foot are not possible, low impact design crossings such as small single span foot bridges, or for larger water courses, swing bridges, will be provided.

No work will occur within intermittent and permanently flowing streams. However, there may be some works required for installation of bridge piles on the upper embankment. Culverts are also unlikely to be installed directly into watercourses.

Construction methodology and works will follow best practice guidelines for working within these areas. These guidelines include establishing appropriate erosion and sediment controls prior to construction. Site specific erosion and sediment control plans will be required to be submitted and approved prior to starting work. Regular

monitoring of the measures to ensure they remain effective, particularly after heavy rain events will also be important. Rehabilitation of these sites to prevent erosion and sediment generation will also be required once construction has been completed.

Works that will be required within the riparian zone will include minor vegetation removal and land disturbance for bridge approaches.

All works within the riparian zone as well as works within waterbodies will meet those permitted activity standards included in the TRMP., including 6.3.2.1 General Standards:

a) Native fish passage shall not be impeded by physical barriers or other means;

b) Activities shall not reduce the flood carrying capacity or the ability of the stream or river to carry floating debris;

c) Activities shall not cause any increase in induced bank erosion or permanent destabilisation of the bed or river;

d) All practicable steps shall be taken to avoid the release of sediment from the activity, and no clearly discernible change in visual clarity of the water shall occur after reasonable mixing downstream of the activity site more than 48 hours after construction work commences in the lake, river or stream;

e) No works shall be carried out in the wet part of the bed in the tidal reaches of rivers and streams between 1 March and 30 June;

f) No works shall be undertaken in the bed of a waterbody listed in Schedule G15(E) (trout) between 1 May and 30 September;

g) No works shall be undertaken in the bed of a waterbody listed in Schedules G15(A) or G15(B) (Aquatic habitat) between 1 May and 30 August;

h) No works shall be undertaken in the bed of a waterbody listed in Schedule G15(C) (Habitats of Threatened Indigenous Flora and Fauna) where NZ or Banded Dotterel or other river bed nesting and/or roosting birds are found between 31 August to 31 December;

i) The activity shall alter the natural course of the stream or river;

j) No contaminants (including, but not limited to, oil, hydraulic fluids, petrol, diesel, other fuels, paint, solvents, or anti-fouling paints), excluding sediment, shall be released to water from the activity;

k) No machinery refuelling or fuel storage shall occur at a location where fuel can enter any waterbody; and

l) The activity shall not compromise the structural integrity or use of any other authorised structure or activity in the bed of the stream, river or lake, including flood control works in Council Administered Drainage Areas (defined in Schedule H19).

8.7 Commonly used Plant & Machinery

The types of plant and machinery anticipated to be used in the construction of the Ara will be as follows:

- Small Excavators
- Piling rigs
- Cranes
- Transportation vehicles for mobilising plant and equipment
- Bobcats
- Trucks – Including concrete trucks, tip trucks and general cartage vehicles.
- Loaders
- Smaller compaction equipment (plate compactors etc).
- Chainsaws, axes and other handheld tools
- Small generators
- Geotechnical testing/investigation equipment
- Woodchippers & other miscellaneous arborist equipment

Prestart checks on all mechanical equipment are to be completed every morning prior to starting work. A Site-Specific Safety Plan (SSSP) will be required to be kept onsite and approved prior to establishment of any new worksites. All members on that site will require an induction and will be required to be wearing the appropriate PPE.

Prior to working within 20m of a water body, all machinery should be checked for any leaks. Any refuelling required should be carried out on a hard sealed surface (where practical) and must be further than 20m from a watercourse.

8.8 Noise & Vibration

Construction noise and vibration are both key elements which need to be managed for two key purposes:

1. To avoid noise and vibration levels which have an adverse effect on human health.
2. To ensure the acoustic environment is consistent with the character of the zone/area.

The location and nature of the work involved in constructing the ara means that the risk posed by noise and vibration generation will be considerably lower than other construction activities.

A large portion of the Ara is located remotely, away from residential properties and environments occupied by humans. Additionally, the construction of 72% of the Ara is wayfinding, following natural contours with very limited to no land disturbance or vegetation disturbance. This will mean a significant reduction in the use of machinery. Noise and vibration levels are expected to be reduced as a result.

Vibrations will generally be generated from cartage of material to site, tracking of machinery across the landscape, plate compaction and vegetation removal (which can involve uprooting of deeply embedded plants).

Noise and vibrations generated adjacent to residential zones and within zones with natural character or ecological sensitives shall be managed via the following procedures:

- Works shall be undertaken in accordance with the construction noise (and the general noise limits for permitted activities when no construction noise limits apply) and vibration limits set out in C11.2.15 and C11.2.16 (refer to Appendix 8.2.

- Prior to any work being undertaken, it is recommended that background readings are taken as a reference for what levels are practically achievable based on background noise at the specific location of proposed work.
- Noise associated with emergency warning devices should be exempt from any decibel limits when working adjacent to residential and coastal environment zones.
- Cartage vehicles shall use the most appropriate route for access to the site maintaining a safe speed limit to avoid significant dust, noise and excessive vibration generation.
- Any noise or vibration complaints from residents or by passers shall be managed via the complaints register process and shall be promptly communicated to the Project Manager in the first instance.
- General complaints should be recorded on the complaints register and be available for the local authority on request.
- When not in operation for an extended period, machinery should be switched off rather than left to idle.
- Daily pre-start checks, and end of week checks should be completed on all machinery to ensure they are running efficiently – this will help avoid any unnecessary noise and vibration.
- Notification of works to sensitive receivers in close proximity to high noise works. Potentially affected noise sensitive receivers within 100 m of piling works (if any) should be notified that works will be in the local area as appropriate. This should include:
    - A brief overview of the works
    - The consented working hours and expected duration of the project
    - Contact details (name, phone number, email) for any complaints or queries

Should any issues arise during construction, refer to these to the project manager.

8.9 Design and Installation of wayfinding markers

Purpose and Placement

Wayfinding markers will be installed along the Ara to support safe and intuitive navigation, mark road crossings, and guide users at key intersections.

Design and Identity

Markers will be co-designed with landowners and hapu to reflect local context and hapu identity. A consistent Te Ara Tipuna theme will be maintained through shared colours or forms, while allowing expression of local narratives.

Standards and Suitability

Markers will be clearly visible, low impact, and built to suit remote, coastal conditions. All will meet safety and visibility standards, and consider accessibility in height and legibility.

Approvals and Sensitivities

Markers within road corridors will require NZTA or Road Controlling Authority approval. Temporary or removable options may be used in sensitive areas.

Final Specifications and Installation

Final details will be confirmed during detailed design, reviewed by the Trust and Cultural Lead, and incorporated into the Landscape Management Plan (LMP).

Initially, there are two kinds of markers intended with their respective methods of installation:

1. Wayfinding marker 1 will be a directional marker of suitable shape and size which can be placed on a tree or similar nearby structure to direct users as required along the ara. Their size and location frequency will vary as deemed appropriate for users to comfortably find their way along the ara. Wayfinding markers will be placed at eye level on existing trees if this is no conflict with the ecological or landscape and visual assessments.
2. Wayfinding marker 2 will be a marker post which will be installed where there is no suitable nearby structure to install marker 1. These markers will be co-designed by the landowners and the hapu with installation being via driven pole. Their frequency will vary with their use being predominantly through open land.

8.10 Culverts

Culverts will be installed and designed to comply with the regulations of NES Freshwater. However, it should be clarified that the extent of culvert construction will be isolated to convey overland flow paths rather than flow through waterbodies. In the first instance all waterbodies will be bridged by a structure (with no part of that structure in the waterbody) or users will traverse through on foot.

The requirement for culverts is anticipated to be required predominantly to convey overland flow where there may have been minor cuts or areas that could create scour or erosion on the track. Existing flow paths will be maintained where possible.

8.11 Construction laydown areas

Temporary laydown areas will be established at practical locations along the Ara to support construction activity. These sites have been identified based on existing use by civil contractors on the East Coast, proximity to the Ara, and suitability for short-term operational needs such as material storage, vehicle turnaround, and equipment staging.

Many of the proposed areas are already used as work depots or are open paddocks, reducing the need for earthworks or modification. Use of any site will be subject to landowner agreement and final confirmation during detailed design.

8.12 Construction access

Construction will occur across both very accessible and very remote areas. The remote nature of some locations will limit the construction methodologies to ensure that costs are carefully managed. Where there is a need to reach remote areas with machinery and the methodology cannot be achieved without this, helicoptering in items may be required. This will be avoided in the first instance, or the track type reassessed. Landowner approvals will likely be a determining factor in access points and methodology adjustment requirements.

8.13 Complaints

The Project Manager is responsible for maintaining a system for recording complaints and a complaints register. A notice board shall be erected at any construction site and will include the Project Manager's contact details, so that complaints can be made.

For any complaints, the following information will be recorded in the complaints register:

- Date and time of complaint;
- Method by which complaint was made;
- Personal details of the complainant as provided by the complaint;
- Nature of the complaint;
- Actions taken in relation to the complaint, including any follow up contact with the complaint;
- If no action was undertaken, the reason why no action was taken.

The Project Manager is responsible for ensuring that all complaints are appropriately investigated, actioned and that information is fed back to the complainant.

8.14 Health & Safety Management

Health and safety risks will be assessed via weekly toolbox meetings. Discussions will include any concerns from the previous week and consider any new risks associated with the changing work environment or ara construction methodology. Assessed risks will be communicated to all workers involved on the worksite. Each individual will require an induction following establishment on site, they will be required to be familiar with the Site-Specific Safety Plan. Each morning all workers onsite (and visitors) will sign onto the pre-start sheet with work for the day outlined in the toolbox meeting. Relevant documents required prior to establishment of works include:

- Certified Construction Traffic Management Plan (Local Authority approved);
- Certified ESMP
- Certified LMP
- Site Specific Safety Plan
- Corridor Access Request
- Close approach permits (if applicable)

For all work adjacent to the road corridor, the local authority and/or NZTA should be informed, and approval granted prior to work commencing.

9 Disclaimer

This document is to be read and understood by all contractors prior to starting work. The SSSP provided by each contractor should be formulated in conjunction with the requirements as set out in this document.

This version of the CMP is a draft for the purpose of submission with the resource consent application. It has been based on the .kml file dated 9th July and the expected construction methodologies. The BOP GIS version of the map should be used to reference this document from this point forward. At the time of detailed design this plan will be updated to reflect the true construction methodologies proposed.

If there is an inconsistency between the CMP and the resource consent conditions, the conditions within the consent shall prevail.

Completed By: Civil Project Solutions

Signature:

Name: Zac Borrie

Position: Senior Project Manager

Completed By: Tonkin & Taylor

Signature:

Name:

Position:

Appendix A - Typical Ara Cross Sections

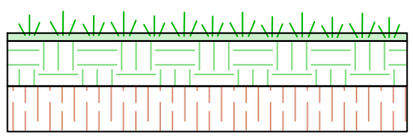
WHEN APPLYING THIS DOCUMENT

The extent of this project are too large to develop consistent cross-sections throughout, Typical cross-sections have been prepared as a guideline only to be applied and adapted as appropriate to the constraints of the particular site.The cross-sections provided may not be appropriate in some cases where extreme ground instability or hazardous areas are present. Note that stabilisation works should only be undertaken where absolutely necessary.

Implimentation of the cross-sections on the State Highway, Local Roads, Paper Roads, Private Land or any other areas shall take into account but not limited to;

- Terrain Hazards (Slips / cliffs / narrow lanes)
- Vehicular Traffic (Existing and Future)
- Existing Ground Stability and Composition
- Trail Drainage and Existing Drainage Systems
- Construction Costs & Feasibility
- Sight Lines
- Maintenance
- Road Safety
- Pedestrian Safety
- Wayfinding
- Walkway Amenity
- Private Landowner Requirements
  Preserving the Natural Character of the environment
- Heritage Values and Archaeological Sites
- Avoiding Disturbance of Earth in Vicinity of Significant Water Bodies
- Utilising Existing Surfaces and Formed Pathways
- Trail slopes and cross-falls
- The appropriate provision of road signage, traffic calming and other implication to vehicle traffic
- See construction management plan for step details

For the purposes of this document, grass layer refers to the top layer of the ground which contains the majority of the organic material, top soil refers to all soil between the bottom of the grass layer and the top of the subgrade.



Disclaimer:
This set of plans is subject to peer review, input and plans from other professionals.
All information contained herein is subject to change.

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GENERAL NOTES
1. Coordinates in terms of : .
2. Elevations in terms of : .
3. Contour interval is : .

NO	DATE	REVISION	BY	CHK	APP
B	06/03/2025	Cross-sections Updated	.	.	.
C	03/04/2025	Cross-sections Updated	.	.	.
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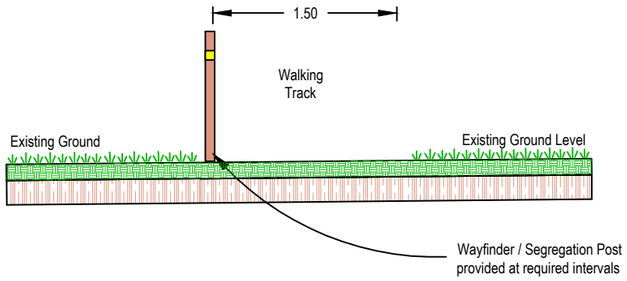
DRAWN	P PIERARD	30/05/2023
CHECKED	.	.
APPROVED		.

TITLE
TE ARA TIPUNA TRACKS
CONCEPTUAL DOCUMENT
COVER PAGE

SCALE	ORIGINAL SIZE	DRAWING No	REVISION
. @A3	A3	J2004-200-01	C

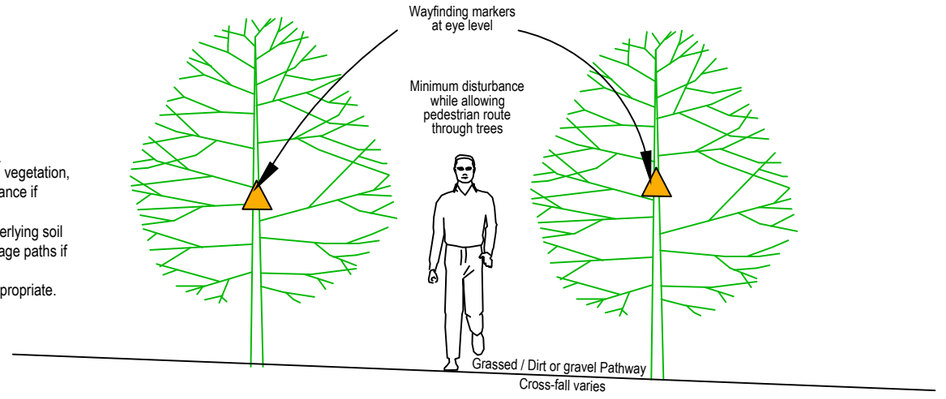
Typical Trail Cross-section 1a
Wayfinding Trail - Grassed



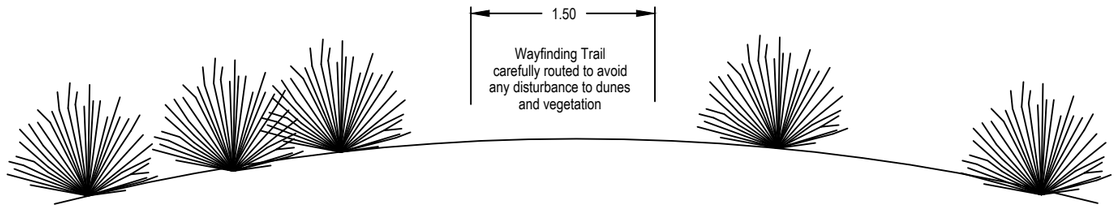
CONSTRUCTION NOTES:
1) Install wayfinders as appropriate (wayfinder specificaition and information TBC).
2) Suitable in areas with less than 15% grade and where a grassed track is preffered and appropriate (e.g. through undulating rural hillside and existing grassed tracks)

Typical Cross-section 1b
Wayfinding Pathway Through Existing Vegetation

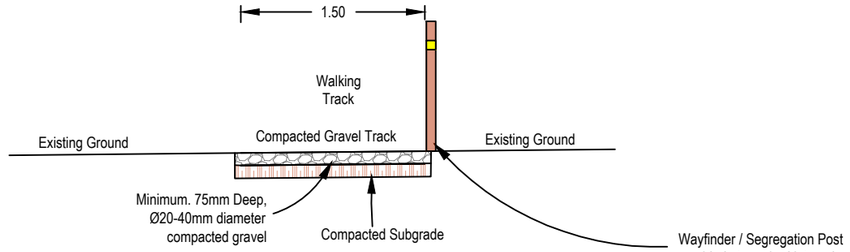
CONSTRUCTION NOTES:
1) Weave the route through vegetation, avoiding vegetation disturbance if possible.
2) Shape and compact underlying soil and maintain existing drainage paths if required.
3) Ensure wayfinding as appropriate.



Typical Cross-section 1c
Sand Dune Crossing

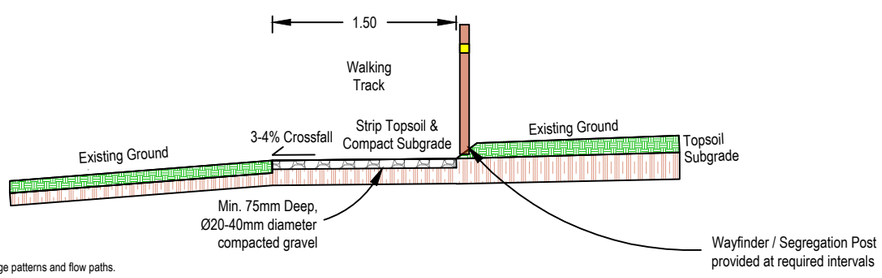


Typical Cross-section 2a
Wayfinding Trail - Gravel



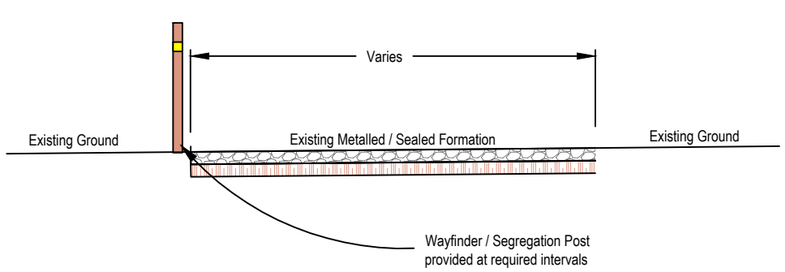
CONSTRUCTION NOTES:
1) Clear vegetation, strip topsoil.
2) Shape and compact subgrade, match existing drainage patterns and flow paths.
3) Install wooden edgings.
4) Supply, place, compact and lime stabalise the track.

Non-typical Cross-section 2b
Wayfinding Trail - Gravel on Steep or Unstable Ground



CONSTRUCTION NOTES:
1) Clear vegetation, strip topsoil.
2) Shape and compact subgrade, match existing drainage patterns and flow paths.
3) Supply, place, compact gravel track formation.
4) Can be used for short sections typically less than 50m exceeding 15% in grade where walking may otherwise be hazardous.
5) Subject ot level of instability may require site specific pavement CBR rating or further investigation from geotechnical engineer.

Typical Cross-section 2c
Wayfinding along Existing Formation within Private Property or Paper Roadway



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2. Elevations in terms of : .
3. Contour interval is : .

NO	DATE	REVISION	BY	CHK	APP
B	06/03/2025	Cross-sections Updated	.	.	.
C	03/04/2025	Cross-sections Updated	.	.	.

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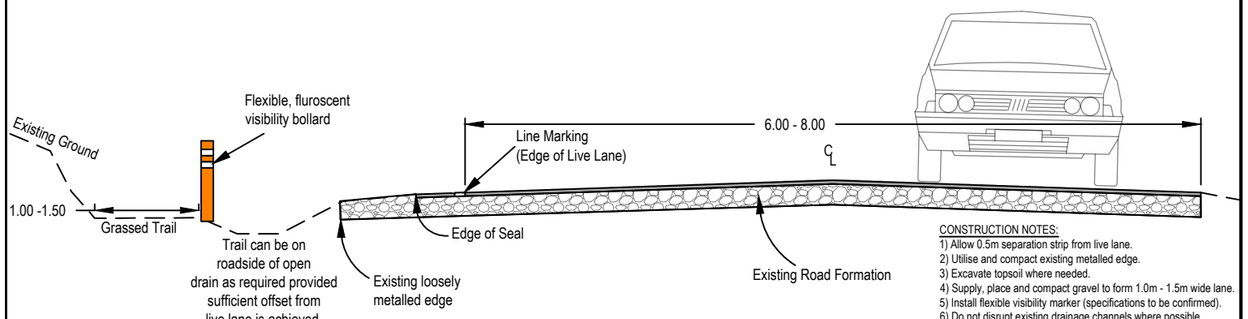
DRAWN	P.PIERARD	30/05/2023	
CHECKED		.	
APPROVED	.	.	

TITLE
TE ARA TIPUNA TRACKS
CONCEPTUAL DOCUMENT
TYPICAL CROSS-SECTIONS

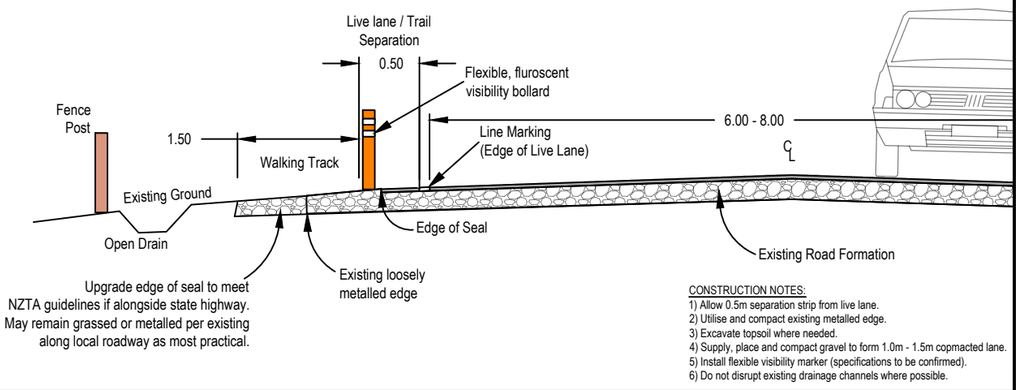
SCALE	ORIGINAL SIZE	DRAWING No	REVISION
1:50 @A3	A3	J2004-200-02	C

Typical Cross-section 3a
Trail Adjacent Highway or Local Road



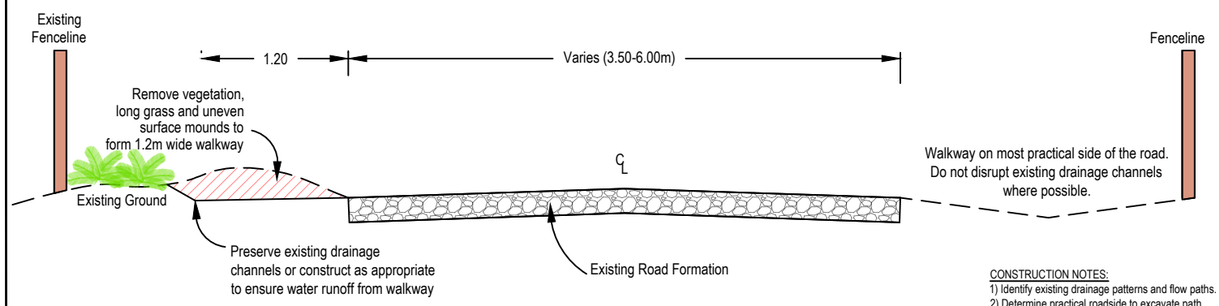
CONSTRUCTION NOTES:
1) Allow 0.5m separation strip from live lane.
2) Utilise and compact existing metalled edge.
3) Excavate topsoil where needed.
4) Supply, place and compact gravel to form 1.0m - 1.5m wide lane.
5) Install flexible visibility marker (specifications to be confirmed).
6) Do not disrupt existing drainage channels where possible.
7) Where space does not permit 1.0-1.5m lane, culvert or revetment may need to be considered.

Typical Cross-section 3b
Trail Along Highway or Local Road Shoulder



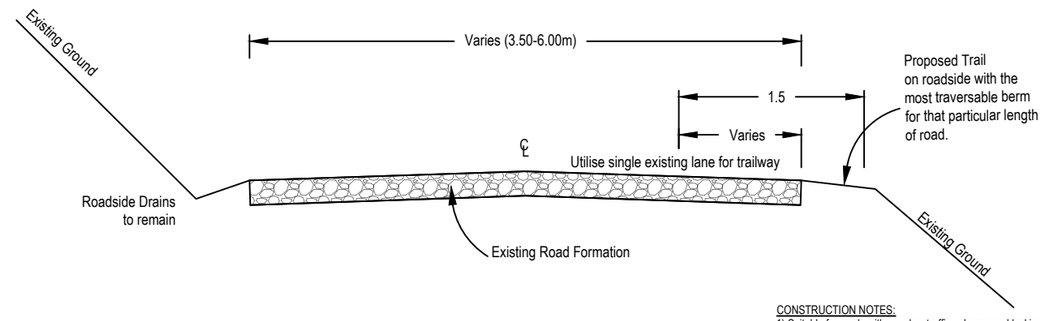
CONSTRUCTION NOTES:
1) Allow 0.5m separation strip from live lane.
2) Utilise and compact existing metalled edge.
3) Excavate topsoil where needed.
4) Supply, place and compact gravel to form 1.0m - 1.5m copmacted lane.
5) Install flexible visibility marker (specifications to be confirmed).
6) Do not disrupt existing drainage channels where possible.

Typical Cross-section 3c
Trail Alongside Low-Volume Road
Earthworks or Vegetation Removal Required



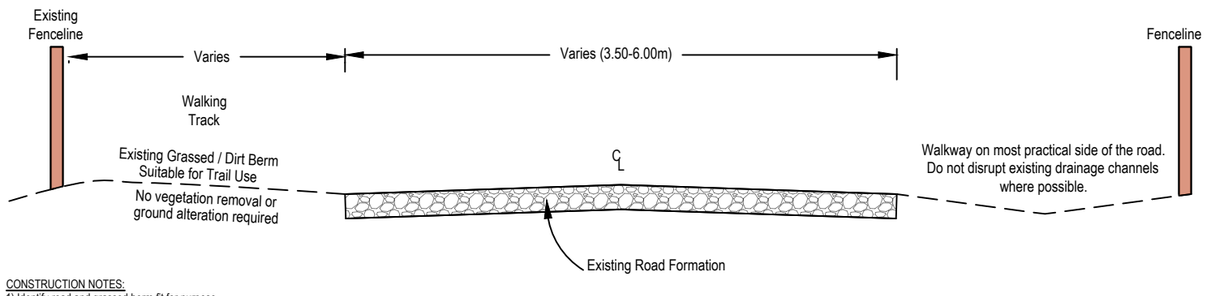
CONSTRUCTION NOTES:
1) Identify existing drainage patterns and flow paths.
2) Determine practical roadside to excavate path.
3) Remove vegetation and grass layer.
4) Shape and compact ground layer to form pathway.
5) Ensure stormwater runoff away from trail.

Typical Cross-section 3d
Low-volume Road Utilising Existing Road Carriageway



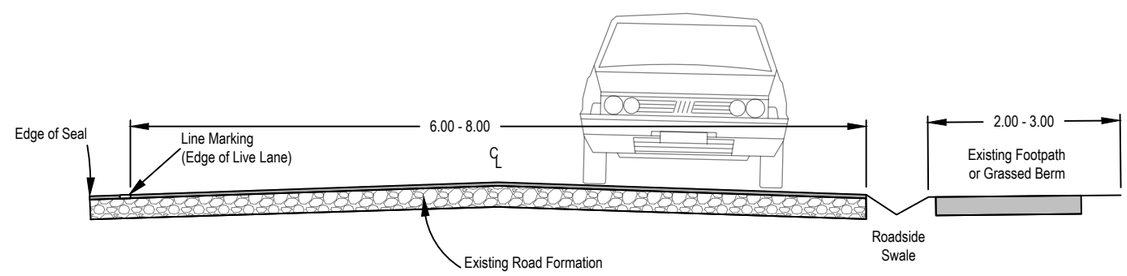
CONSTRUCTION NOTES:
1) Suitable for roads with very low traffic volumes and lacking space on roadside berm.
2) Pedestrian signage should be installed as required by local authorities.
3) Consideration must be given to pedestrian safety when approaching blind corners.
4) Provide "turn-off" areas where pedestrians can move off the road where possible.

Typical Cross-section 3e
Existing Local Road Berm Fit for Purpose



CONSTRUCTION NOTES:
1) Identify road and grassed berm fit for purpose.
2) Add road signage as required by local authority.

Cross-section 4
Pathways Adjacent Highway in Residential Settlement



CONSTRUCTION NOTES:

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NO	DATE	REVISION	BY	CHK	APP
B	06/03/2025	Cross-sections Updated	.	.	.
C	03/04/2025	Cross-sections Updated	.	.	.

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TITLE
TE ARA TIPUNA TRACKS
CONCEPTUAL DOCUMENT
TYPICAL CROSS-SECTIONS

SCALE	ORIGINAL SIZE	DRAWING No	REVISION
1:50 @A3	A3	J2004-200-03	C

Typical Pedestrian Crossing

Plan View Scale 1:250

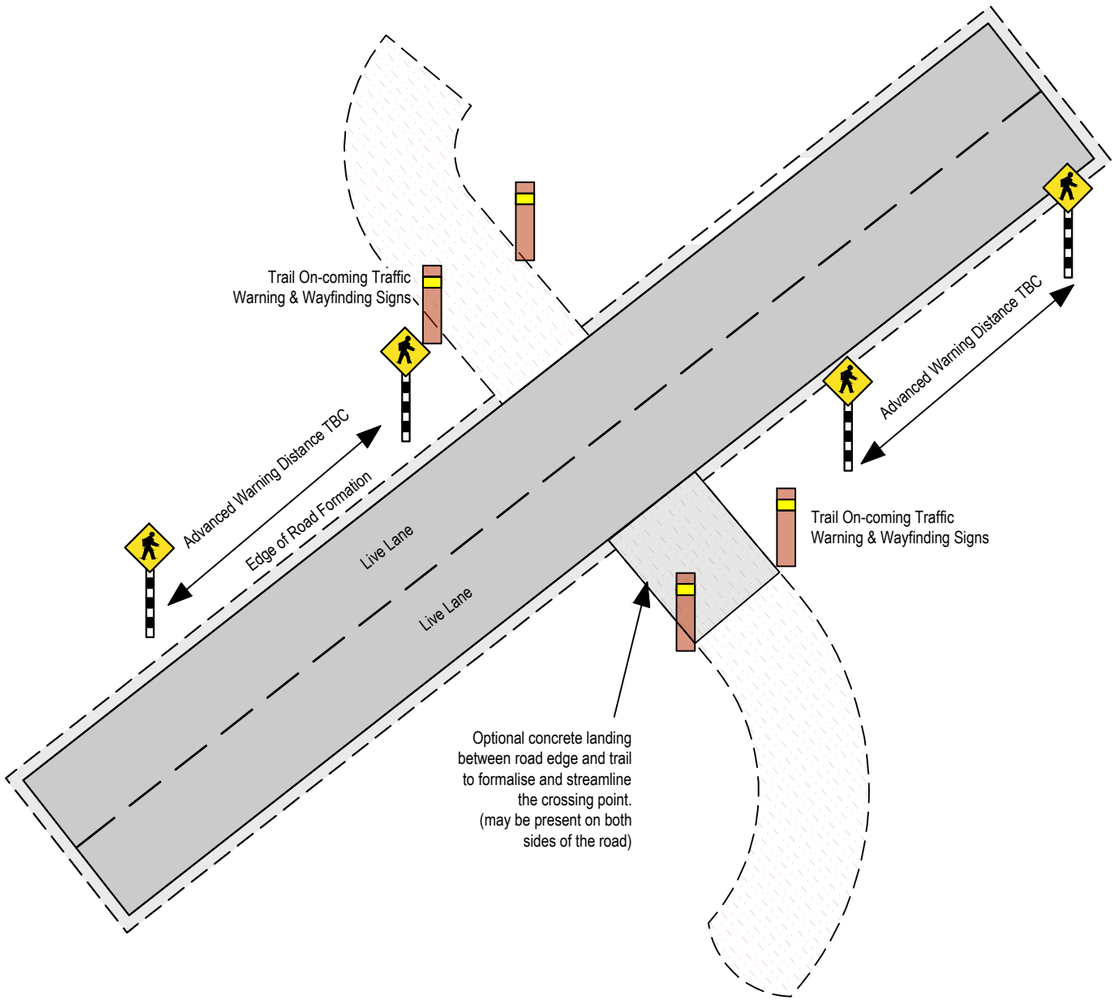


Diagram 1
Stream Crossing

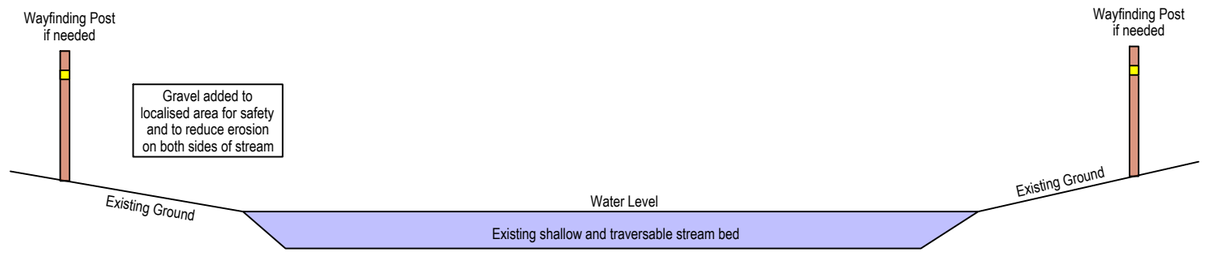
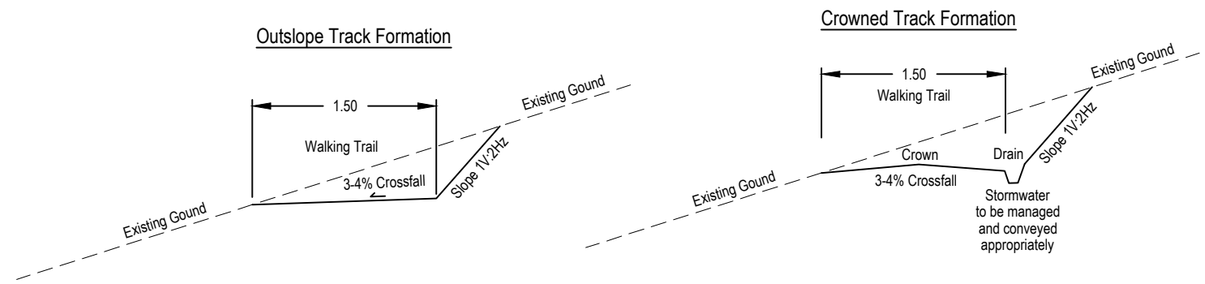


Diagram 2
Low Benched Track Examples



CONSTRUCTION NOTES:
1) Cut to fill may be utilised where existing soils are suitable for fill material.
2) Crowned track may be used where there are steep track gradients and significant water run-off.
3) Low benches may be utilised as needed, refer to km by km tracker.
4) Use of low benches and stormwater management to be designed prior to construction.

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TITLE
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CONCEPTUAL DOCUMENT
TYPICAL CROSS-SECTIONS & PEDESTRIAN CROSSINGS

DRAWING No J2004-200-04

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Typical Foot Bridge (under 15m)

Typical Swing Bridge

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TE ARA TIPUNA TRACKS
CONCEPTUAL DOCUMENT
TYPICAL EXAMPLES

SCALE	ORIGINAL SIZE	DRAWING No	REVISION
1:50 @A3	A3	J2004-200-05	C

Typical Shelter

Typical Steps

Typical Toilet

Typical Hut

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B	06/03/2025	Cross-sections Updated	.	.	.
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SCALE 1:50 @A3
ORIGINAL SIZE A3

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TYPICAL EXAMPLES

DRAWING No J2004-200-06
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3. Contour interval is : .

NO	DATE	REVISION	BY	CHK	APP
B	06/03/2025	Cross-sections Updated	.	.	.
C	03/04/2025	Cross-sections Updated	.	.	.

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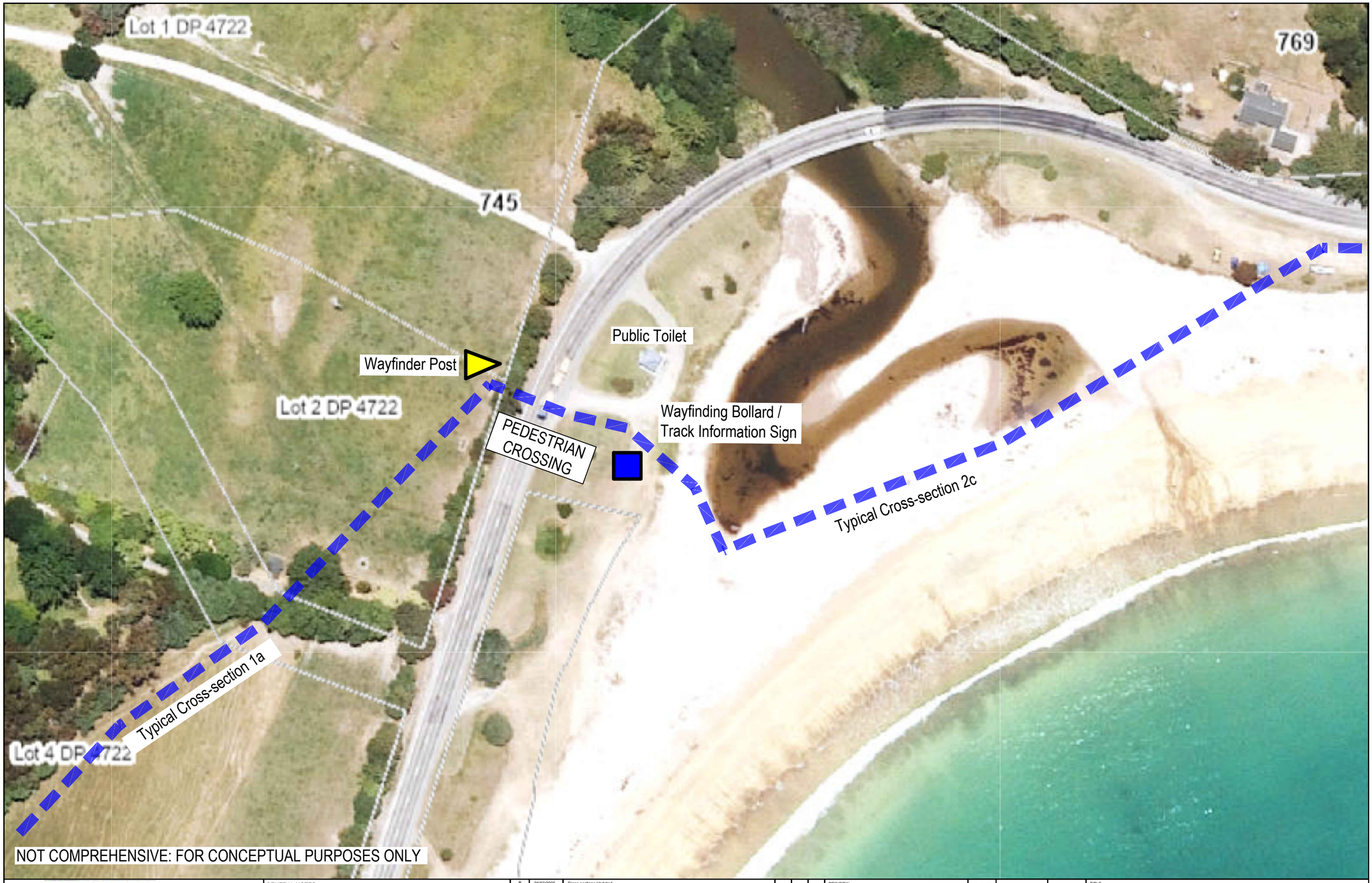
SCALE: NTS @A3
ORIGINAL SIZE: A3

TITLE
TE ARA TIPUNA TRACKS
CONCEPTUAL DOCUMENT
EXAMPLE SECTION OF TRAIL 2

DRAWING No: J2004-200-08
REVISION: C



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B	06/03/2025	Cross-sections Updated	.	.	.
C	03/04/2025	Cross-sections Updated	.	.	.
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TITLE
TE ARA TIPUNA TRACKS
CONCEPTUAL DOCUMENT
EXAMPLE SECTION OF TRAIL 3

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3. Contour interval is : .

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B	06/03/2025	Cross-sections Updated	.	.	.
C	03/04/2025	Cross-sections Updated	.	.	.

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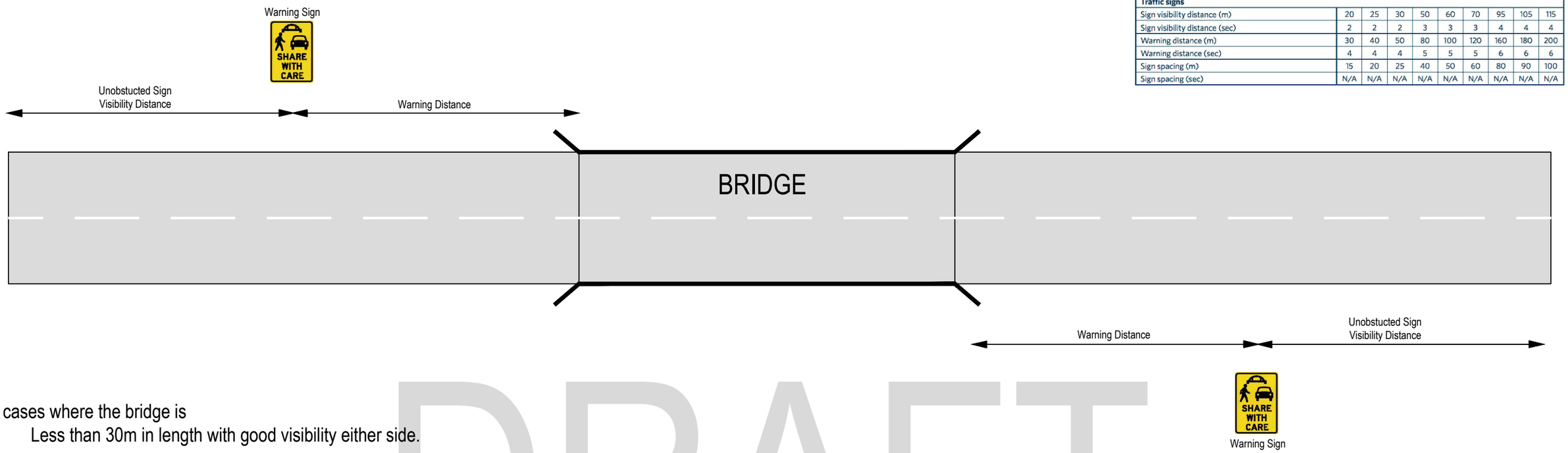
CONCEPTUAL DOCUMENT
EXAMPLE SECTION OF TRAIL 4

SCALE	ORIGINAL SIZE	DRAWING No	REVISION
NTS @A3	A3	J2004-200-10	C

Appendix B – Crossing Options

BRIDGE CROSSING SAFETY OPTION 1

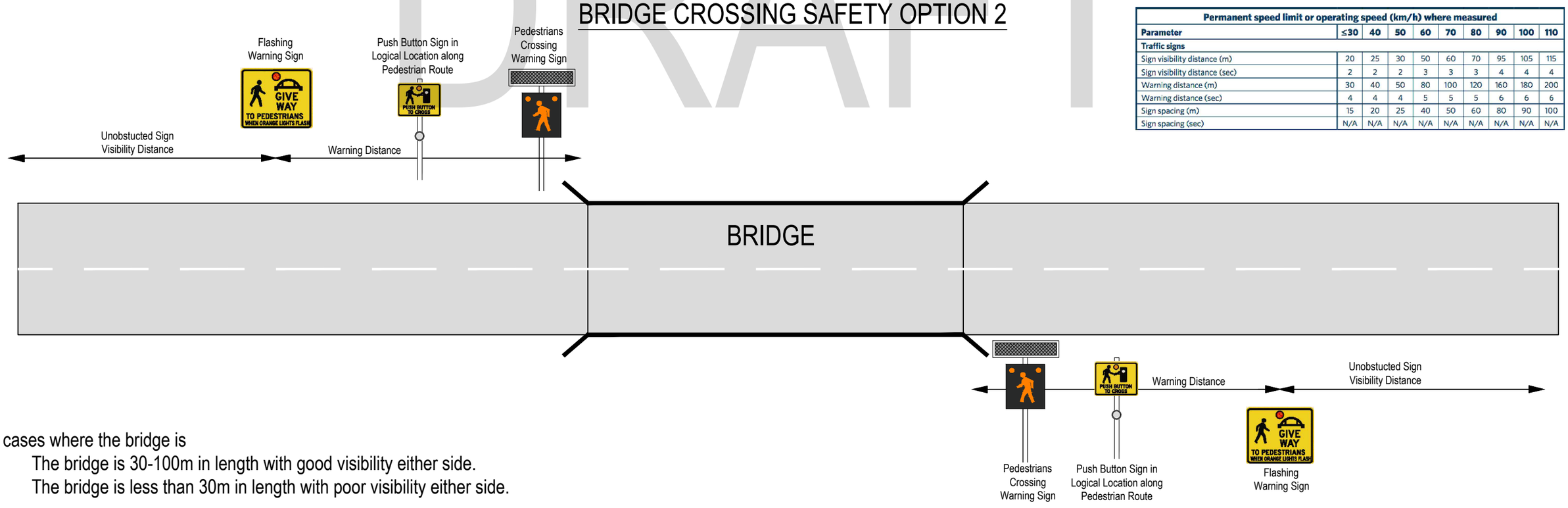
Permanent speed limit or operating speed (km/h) where measured									
Parameter	**≤30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**
Traffic signs									
Sign visibility distance (m)	20	25	30	50	60	70	95	105	115
Sign visibility distance (sec)	2	2	2	3	3	3	4	4	4
Warning distance (m)	30	40	50	80	100	120	160	180	200
Warning distance (sec)	4	4	4	5	5	5	6	6	6
Sign spacing (m)	15	20	25	40	50	60	80	90	100
Sign spacing (sec)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



For cases where the bridge is
- Less than 30m in length with good visibility either side.

BRIDGE CROSSING SAFETY OPTION 2

Permanent speed limit or operating speed (km/h) where measured									
Parameter	**≤30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**
Traffic signs									
Sign visibility distance (m)	20	25	30	50	60	70	95	105	115
Sign visibility distance (sec)	2	2	2	3	3	3	4	4	4
Warning distance (m)	30	40	50	80	100	120	160	180	200
Warning distance (sec)	4	4	4	5	5	5	6	6	6
Sign spacing (m)	15	20	25	40	50	60	80	90	100
Sign spacing (sec)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



For cases where the bridge is
- The bridge is 30-100m in length with good visibility either side.
- The bridge is less than 30m in length with poor visibility either side.

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2. Elevations in terms of : .
3. Contour interval is : .

NO	DATE	REVISION	BY	CHK	APP

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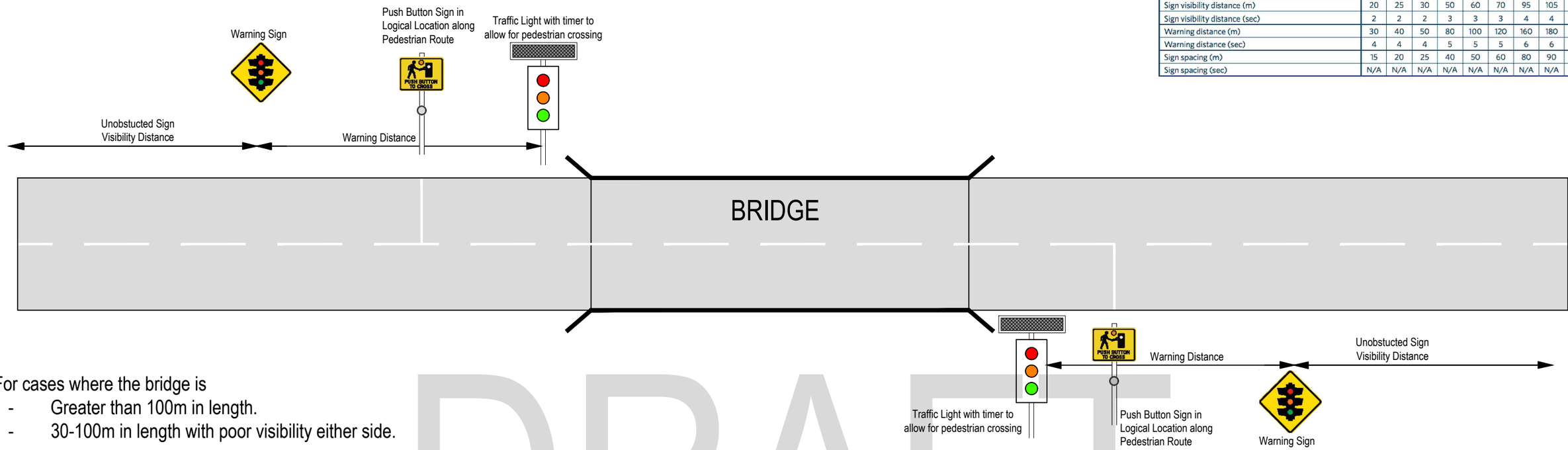
TITLE
TE ARA TIPUNA TRACKS
BRIDGE CROSSING SAFETY OPTIONS
OPTIONS 1 & 2

SCALE	ORIGINAL SIZE	DRAWING No	REVISION
NTS @A3	A3	J2004-220-01	A

BRIDGE CROSSING OPTION 3

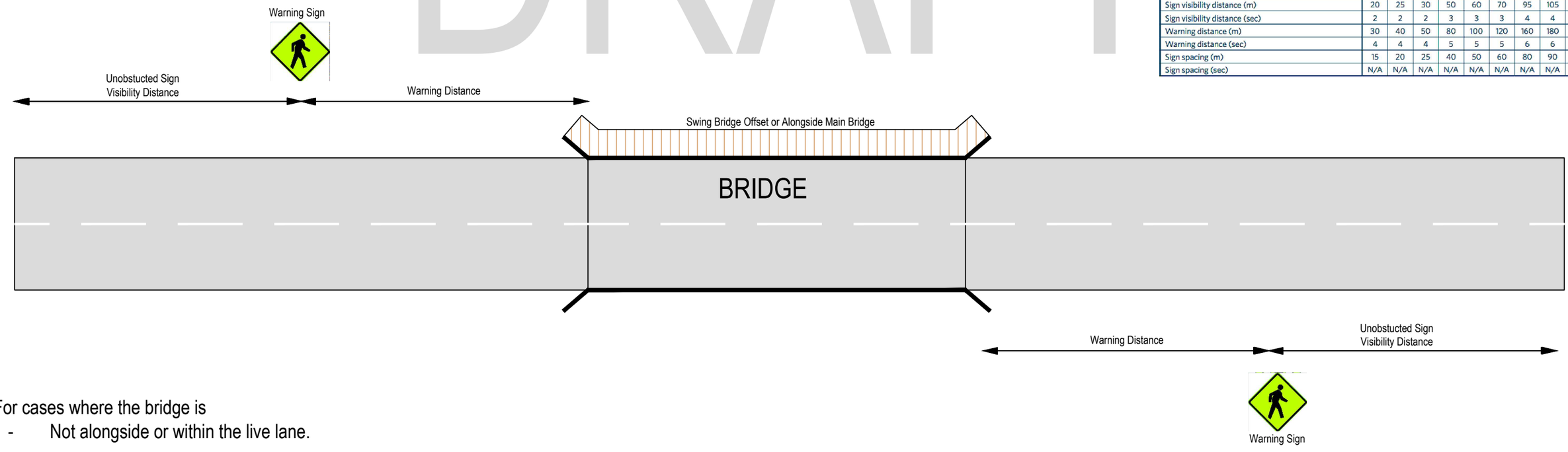
Permanent speed limit or operating speed (km/h) where measured									
Parameter	**≤30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**
Traffic signs									
Sign visibility distance (m)	20	25	30	50	60	70	95	105	115
Sign visibility distance (sec)	2	2	2	3	3	3	4	4	4
Warning distance (m)	30	40	50	80	100	120	160	180	200
Warning distance (sec)	4	4	4	5	5	5	6	6	6
Sign spacing (m)	15	20	25	40	50	60	80	90	100
Sign spacing (sec)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



For cases where the bridge is
- Greater than 100m in length.
- 30-100m in length with poor visibility either side.

BRIDGE CROSSING OPTION 4

Permanent speed limit or operating speed (km/h) where measured									
Parameter	**≤30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**
Traffic signs									
Sign visibility distance (m)	20	25	30	50	60	70	95	105	115
Sign visibility distance (sec)	2	2	2	3	3	3	4	4	4
Warning distance (m)	30	40	50	80	100	120	160	180	200
Warning distance (sec)	4	4	4	5	5	5	6	6	6
Sign spacing (m)	15	20	25	40	50	60	80	90	100
Sign spacing (sec)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



For cases where the bridge is
- Not alongside or within the live lane.

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3. Contour interval is : .

NO	DATE	REVISION	BY	CHK	APP
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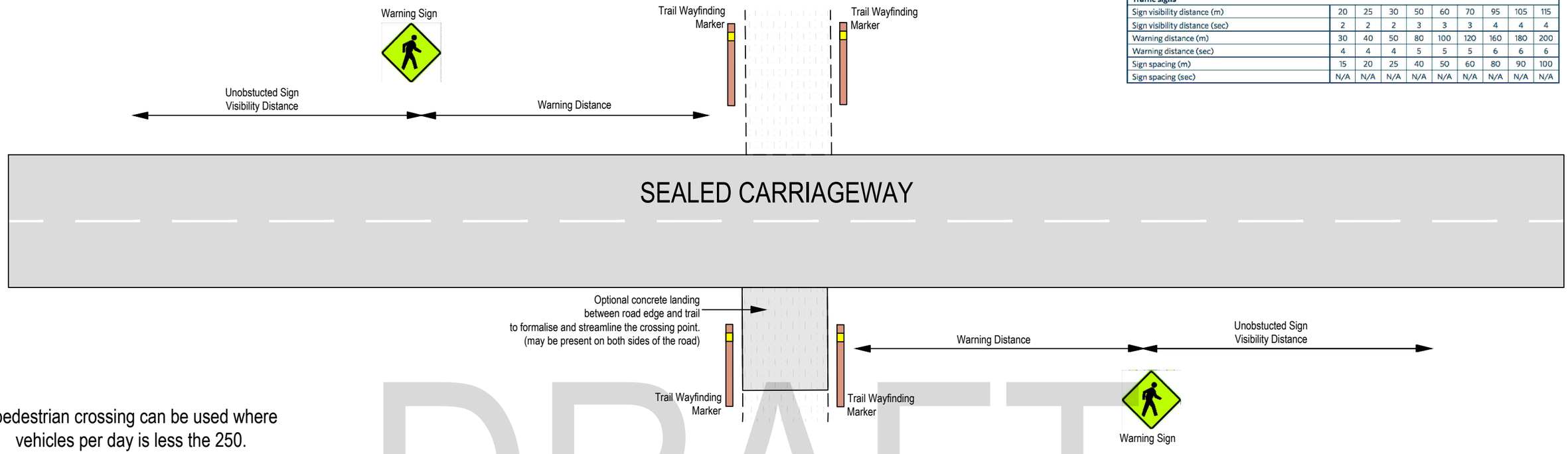
TITLE
TE ARA TIPUNA TRACKS
BRIDGE CROSSING SAFETY OPTIONS
OPTIONS 3 & 4

SCALE	ORIGINAL SIZE	DRAWING No	REVISION
NTS @A3	A3	J2004-220-02	A

PEDESTRIAN CROSSING OPTION 1

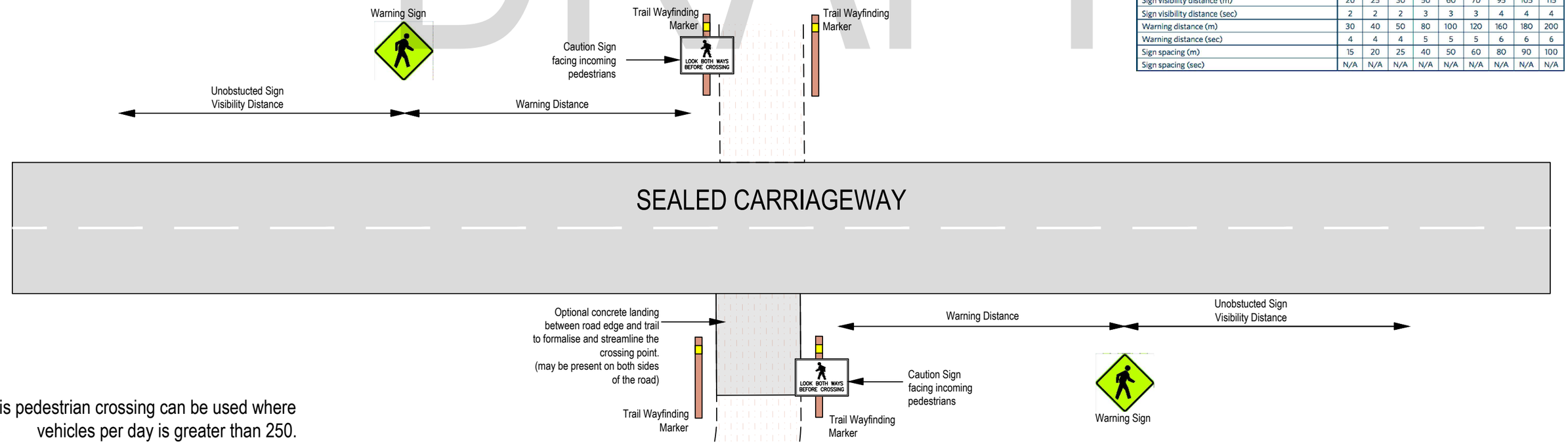
Permanent speed limit or operating speed (km/h) where measured									
Parameter	**≤30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**
Traffic signs									
Sign visibility distance (m)	20	25	30	50	60	70	95	105	115
Sign visibility distance (sec)	2	2	2	3	3	3	4	4	4
Warning distance (m)	30	40	50	80	100	120	160	180	200
Warning distance (sec)	4	4	4	5	5	5	6	6	6
Sign spacing (m)	15	20	25	40	50	60	80	90	100
Sign spacing (sec)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



This pedestrian crossing can be used where
- vehicles per day is less the 250.

PEDESTRIAN CROSSING OPTION 2

Permanent speed limit or operating speed (km/h) where measured									
Parameter	**≤30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**
Traffic signs									
Sign visibility distance (m)	20	25	30	50	60	70	95	105	115
Sign visibility distance (sec)	2	2	2	3	3	3	4	4	4
Warning distance (m)	30	40	50	80	100	120	160	180	200
Warning distance (sec)	4	4	4	5	5	5	6	6	6
Sign spacing (m)	15	20	25	40	50	60	80	90	100
Sign spacing (sec)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



This pedestrian crossing can be used where
- vehicles per day is greater than 250.

CPS®
Civil Project Solutions
1 Te Maanga Drive
PO Box 460
Gisborne, NZL
Project Management Specialists
0800 PROJECT
www.civilprojects.co.nz

GENERAL NOTES
1. Coordinates in terms of : .
2. Elevations in terms of : .
3. Contour interval is : .

NO	DATE	REVISION	BY	CHK	APP
.	.	.	.	.	.

PRINCIPAL

SURVEYED		
DRAWN	P.PIERARD	10/06/2025
CHECKED		
APPROVED		

TITLE
TE ARA TIPUNA TRACKS
PEDESTRIAN CROSSING SAFETY OPTIONS
OPTIONS 1 AND 2

SCALE	ORIGINAL SIZE	DRAWING No	REVISION
NTS @A3	A3	J2004-220-03	A

Appendix C – RMA, National Environmental Standards for Freshwater & TRMP References

Appendix D – Typical Toilet Block

Appendix E – Typical Steps

Appendix F – Example Swing Bridge Crossings

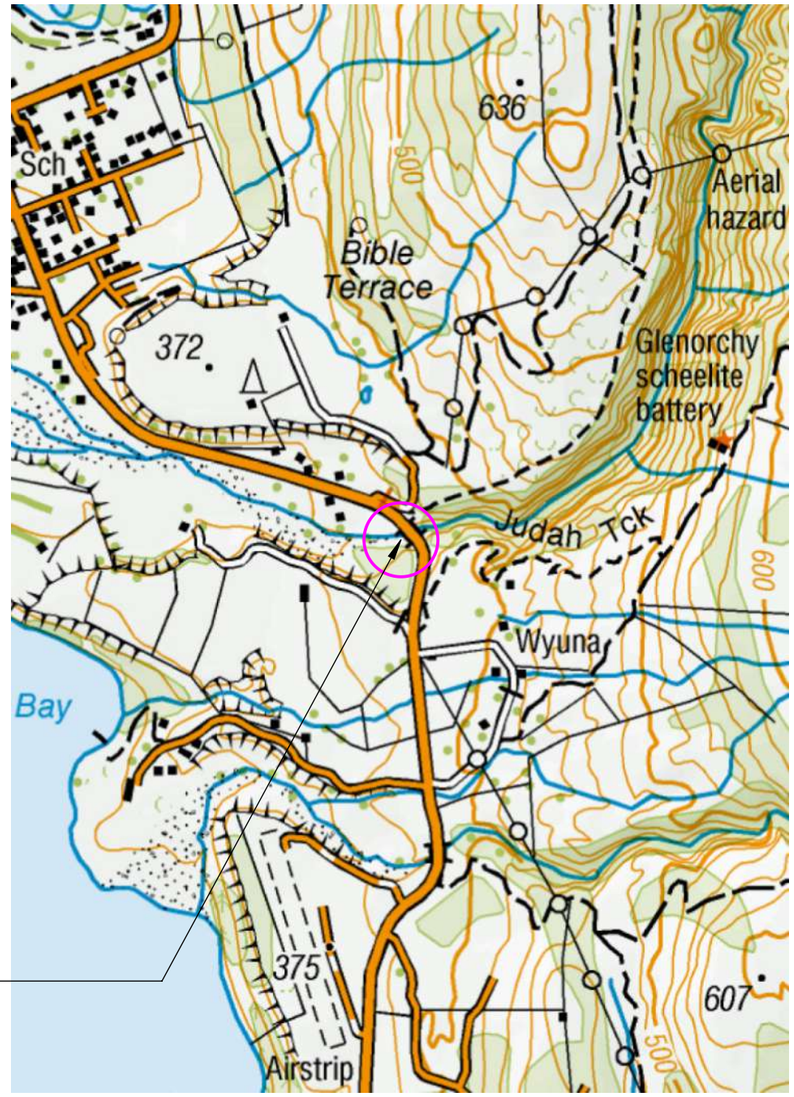
Hugo Glenorchy Bridge

48m Suspension Bridge

DESIGN PARAMETERS	
Standard	SNZ HB 8630:2004
User Group	3. Day Visitor
Deck Length	48m
Deck Design Load	10 Person
Fall Surface	Unfavourable
Effective Fall Height	>3m
Barrier Type	A
Load Test	1.5Q + ~~0.2G~~ = 1.8t (1.8 cubic meters of water)

Bridge Location

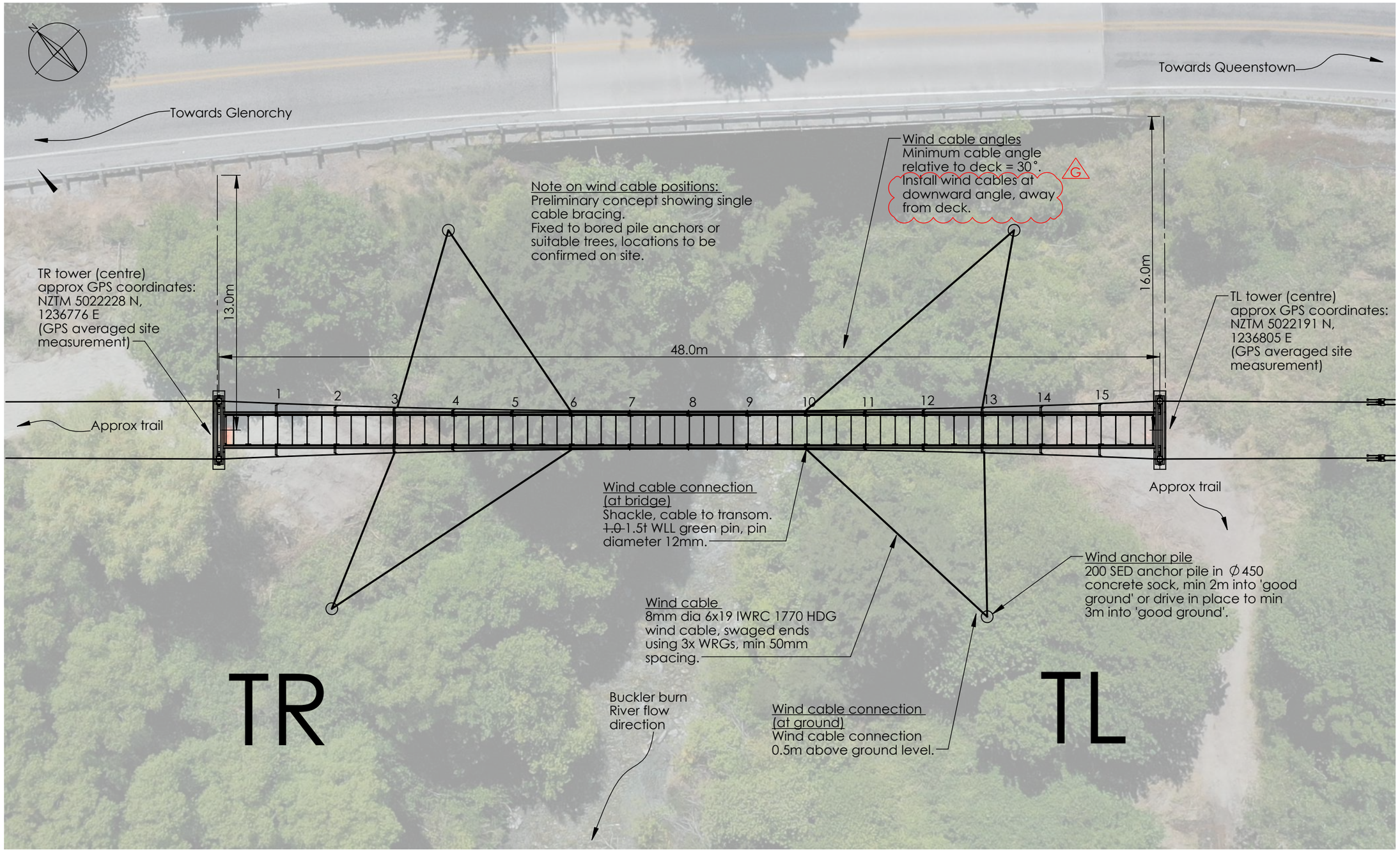
44°51'39.5" S, 168°24'10" E



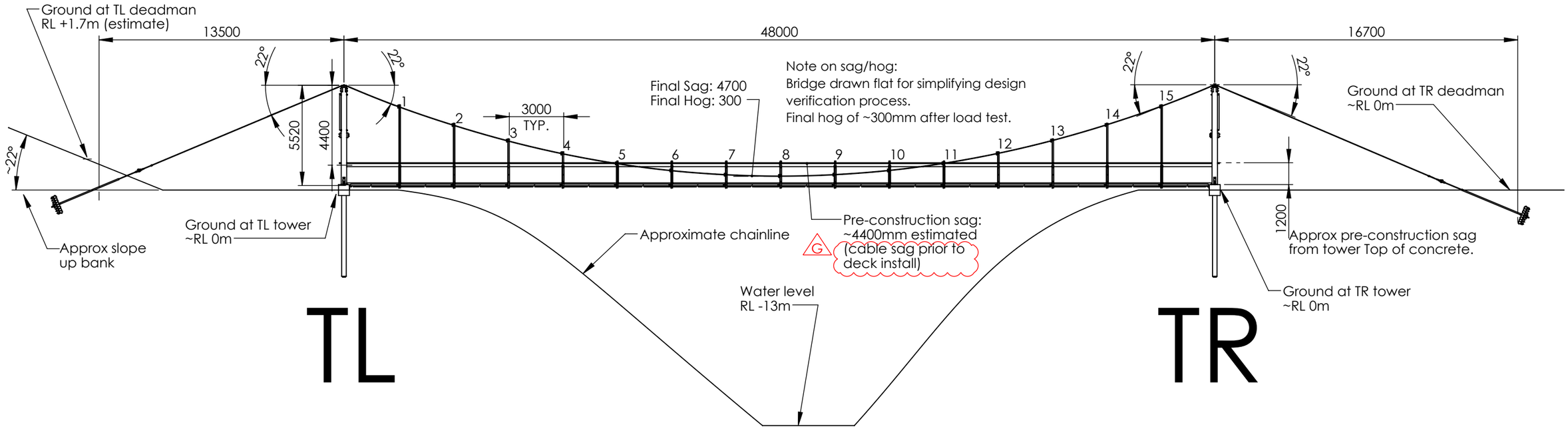
REVISION TABLE		
REV.	DESCRIPTION	DATE
A	Design review	03/02/2025
B	For review, shop drawings added	07/02/2025
C	Revisions following design review	18/02/2025
D	Revisions following peer review	5/03/2025
E	Additional minor revisions	10/03/2025
F	Additional minor revisions	12/03/2025
G	Additional minor revisions	17/03/2025

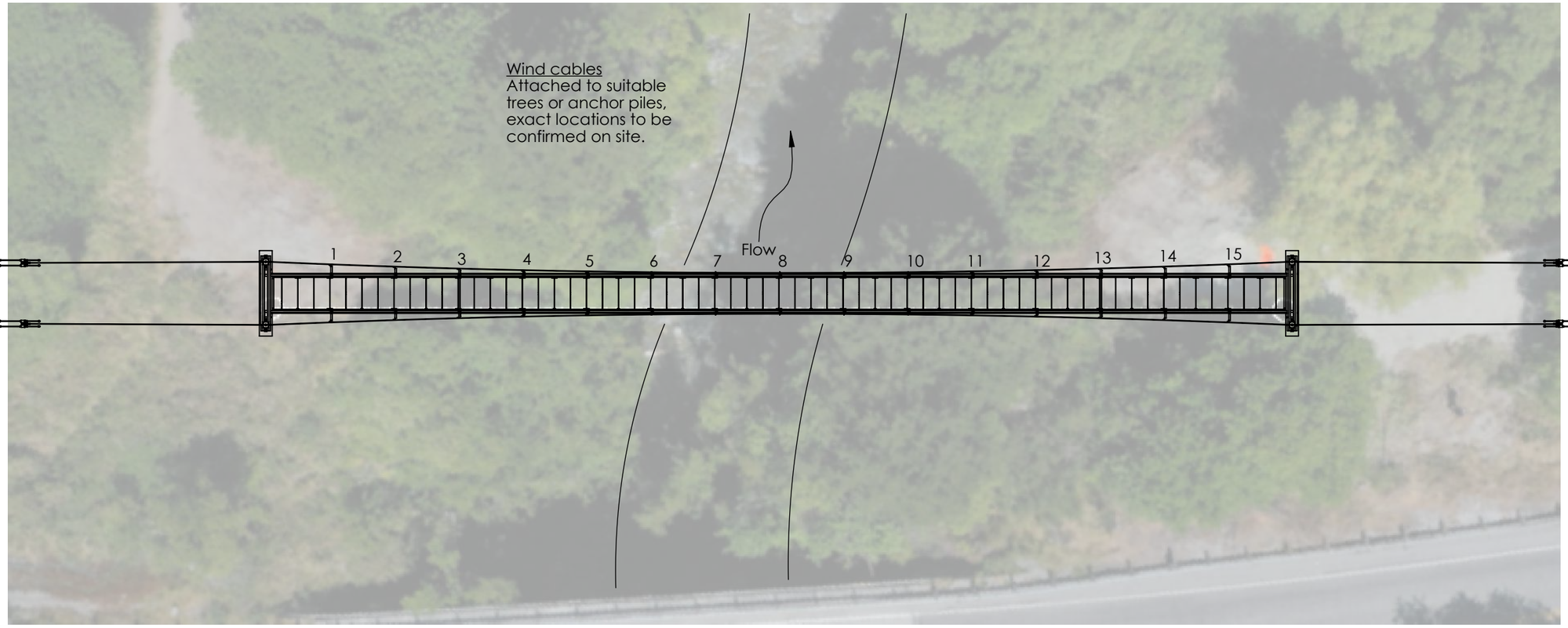
INDEX	
Design Drawings	AA-1829-DWG-01
Shop Drawings	AA-1829-DWG-02

ABSEIL ACCESS
CIVIL · INFRASTRUCTURE · ENVIRONMENTAL

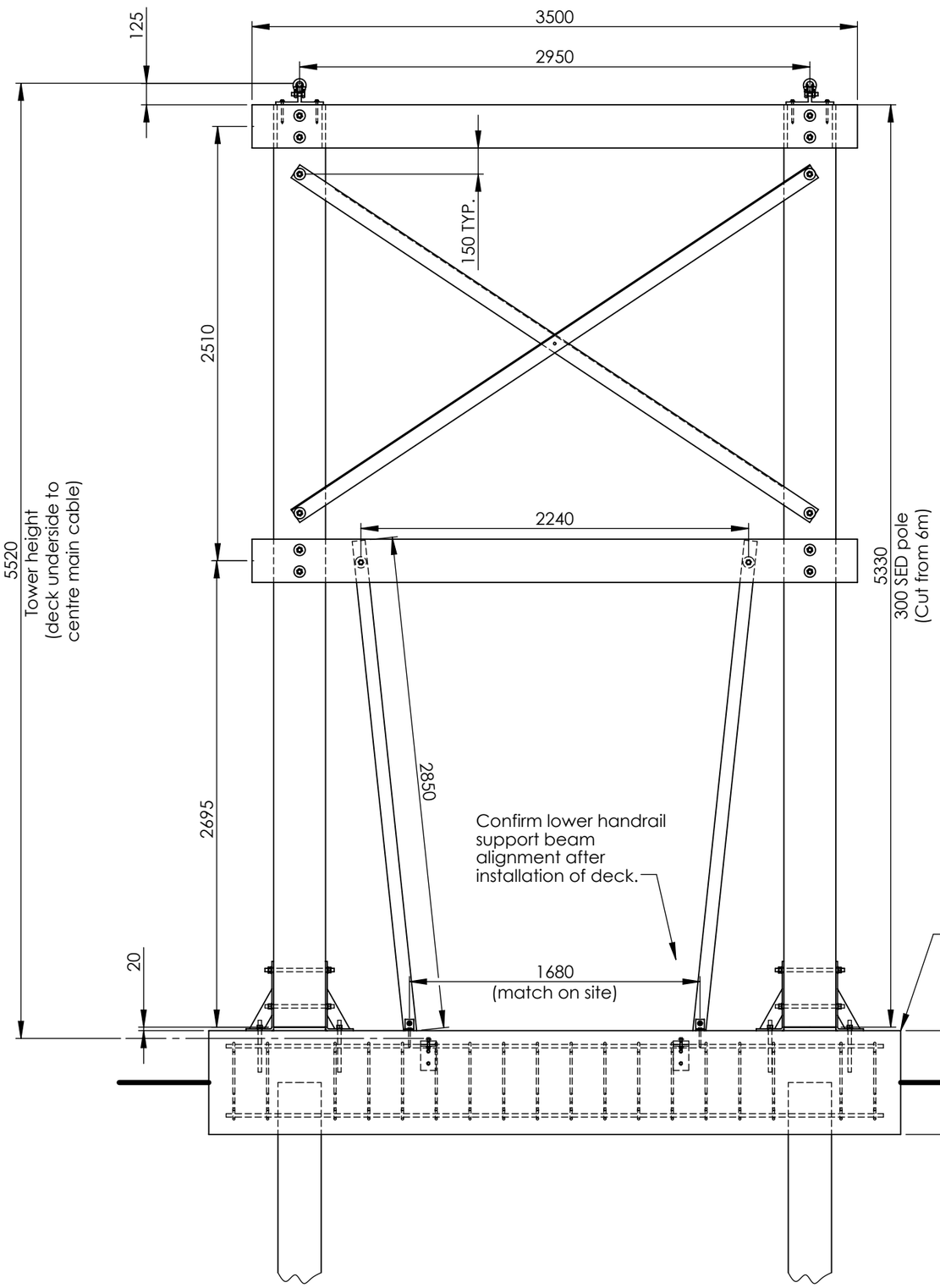


Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Plan view (looking upstream)	Drawing Number: AA-1829-DWG-01-2		Checked	Date: 17/03/2025
				Approved	Scale: 1:200 on A3
				Status: Constr.	Revision: G

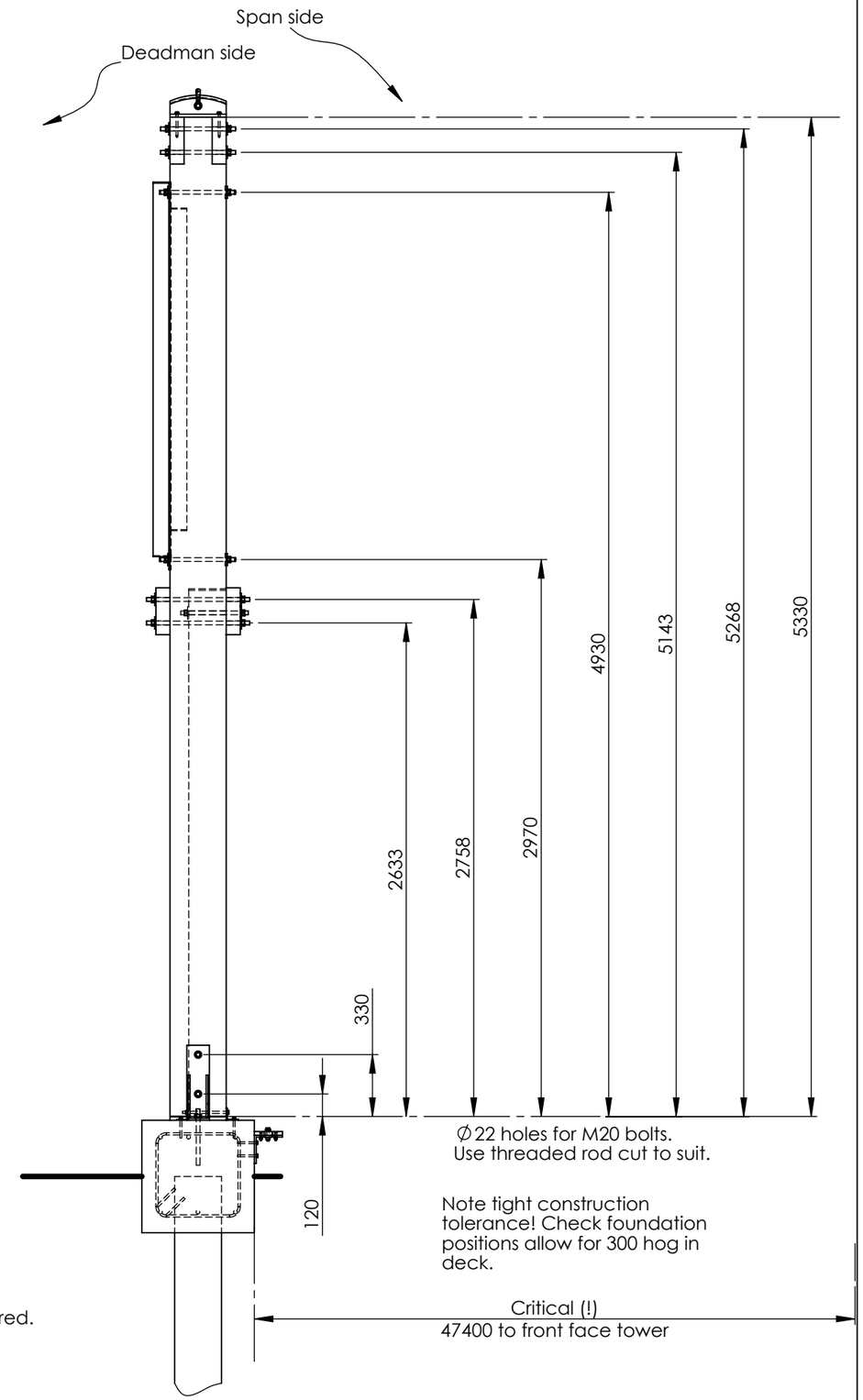




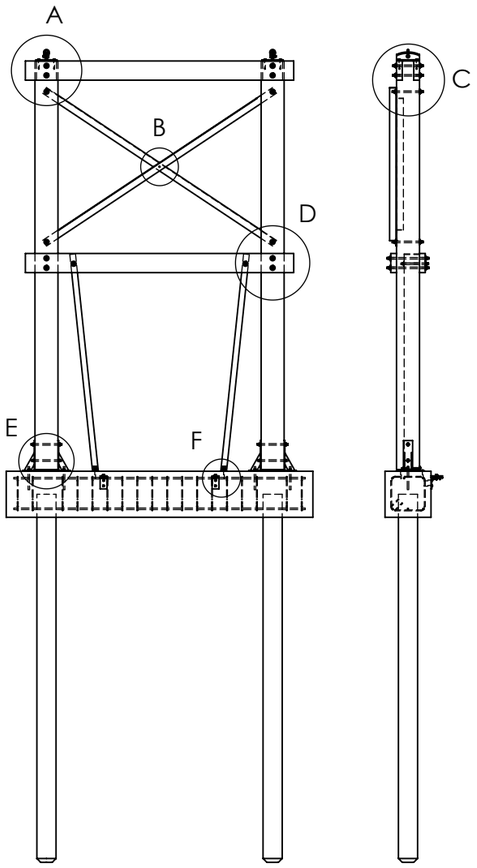
Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Plan & elevation views	Drawing Number: AA-1829-DWG-01-3		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G



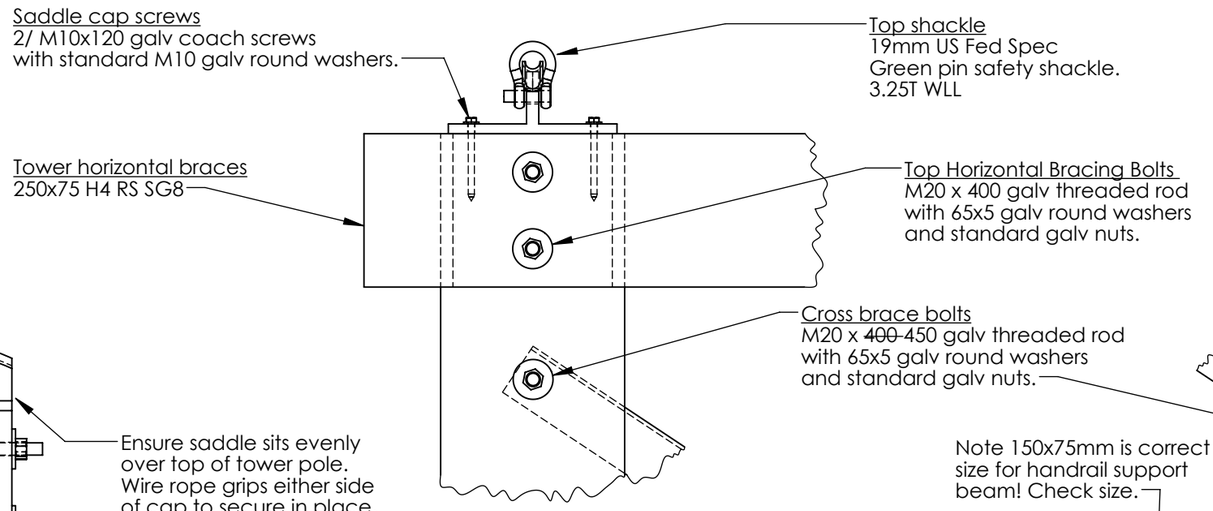
Note on tower timber:
Stained dark for aesthetics.



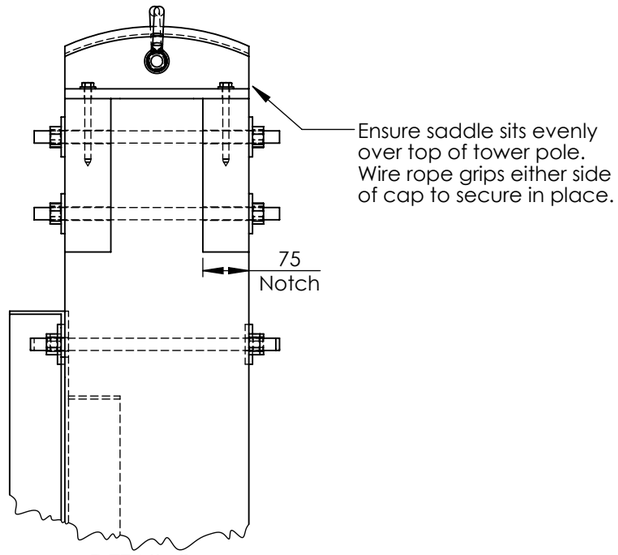
Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Tower overview	Drawing Number: AA-1829-DWG-01-4		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G



Recheck lengths are suitable prior to cutting /ordering threaded rod!



DETAIL A
SCALE 1 : 10



DETAIL C
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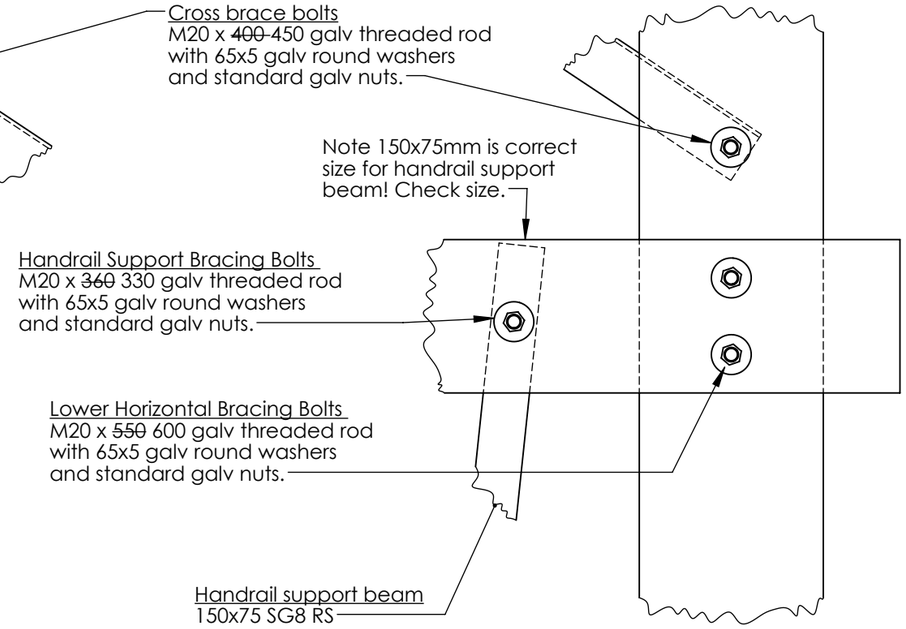

DETAIL D
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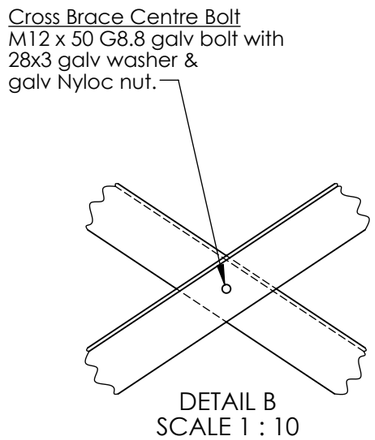

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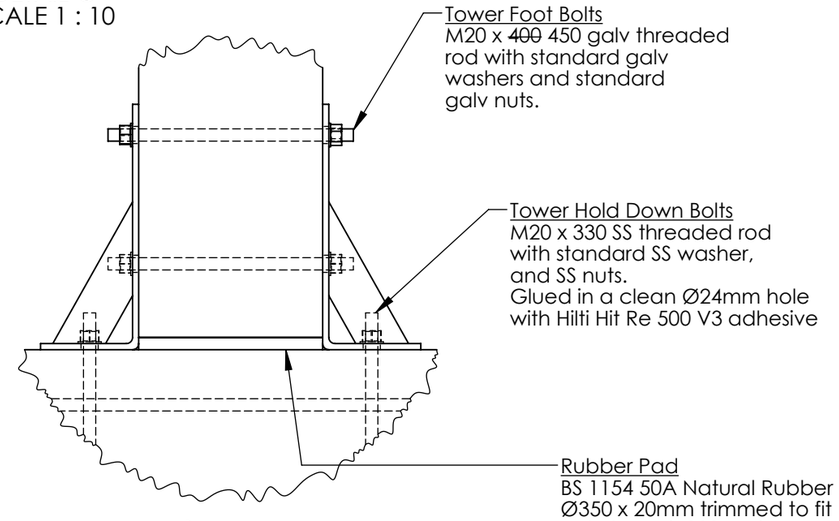

DETAIL E
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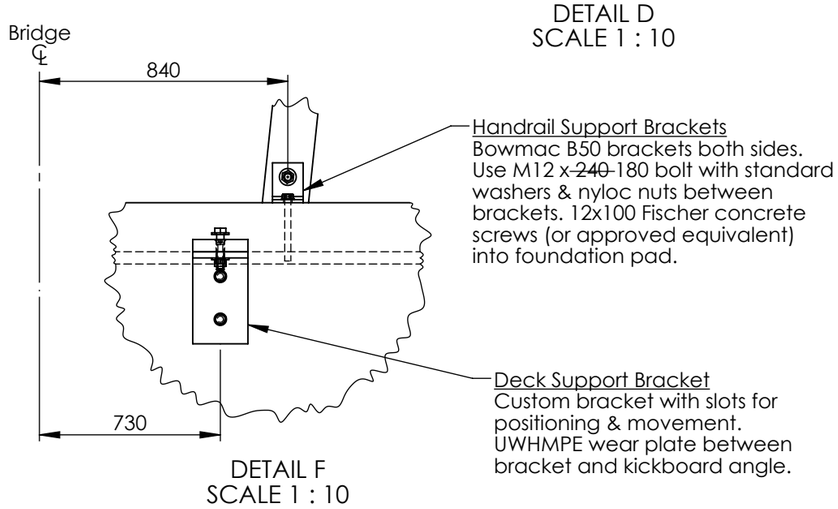
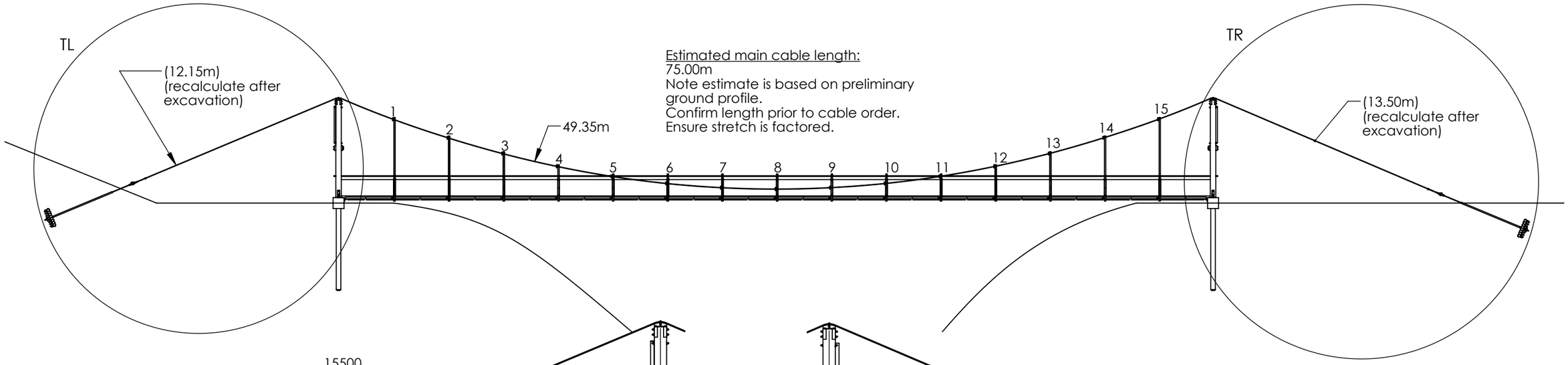
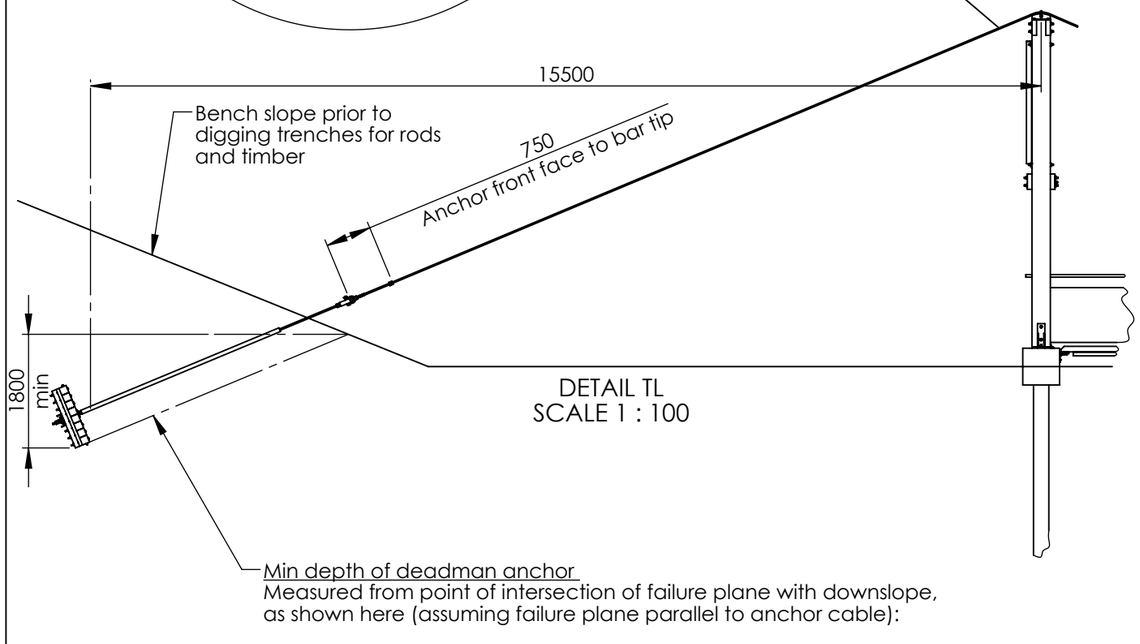


DETAIL F
SCALE 1 : 10

Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Tower additional details	Drawing Number: AA-1829-DWG-01-5		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

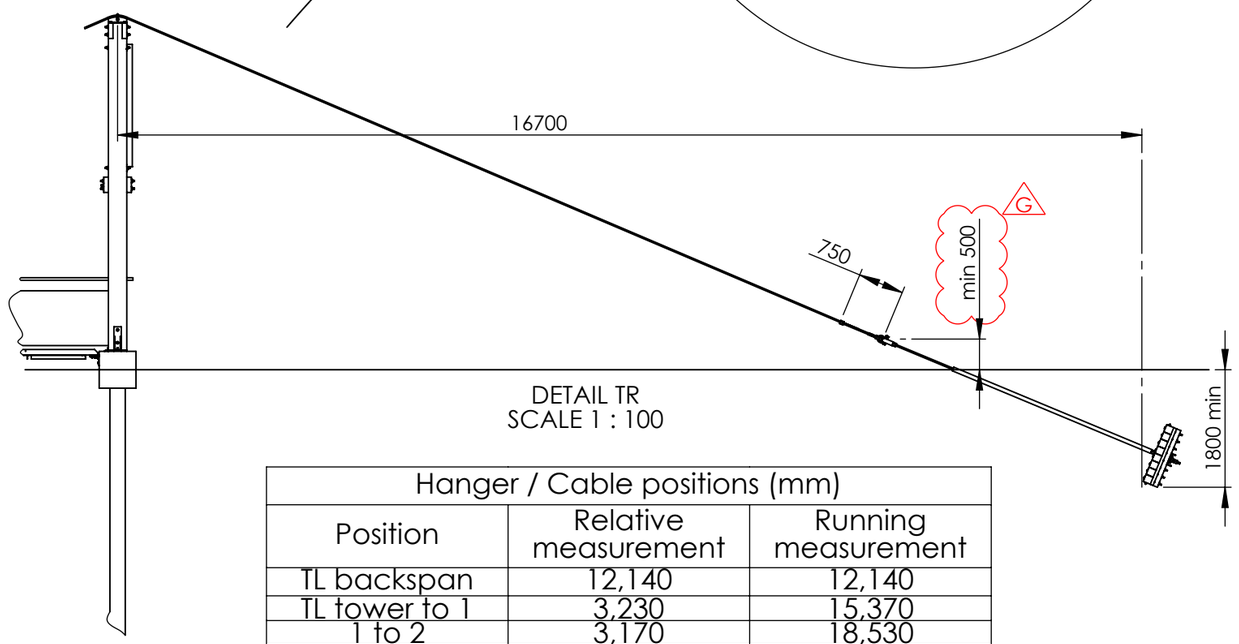


Estimated main cable length:
75.00m
Note estimate is based on preliminary ground profile.
Confirm length prior to cable order.
Ensure stretch is factored.

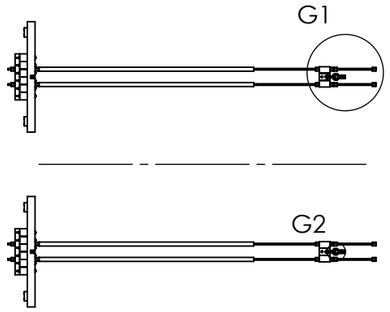


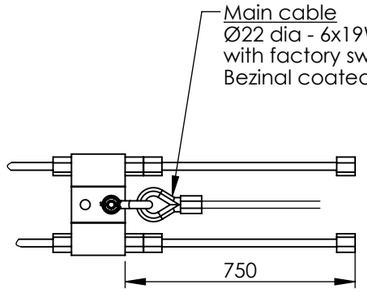
DETAIL TL
SCALE 1 : 100

Min depth of deadman anchor
Measured from point of intersection of failure plane with downslope, as shown here (assuming failure plane parallel to anchor cable):

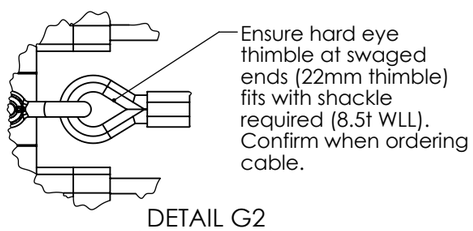


DETAIL TR
SCALE 1 : 100





DETAIL G1
SCALE 1 : 20

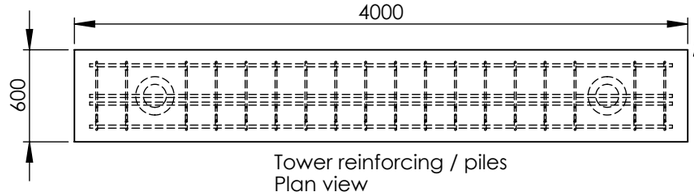


DETAIL G2
SCALE 1 : 10

Hanger / Cable positions (mm)		
Position	Relative measurement	Running measurement
TL backspan	12,140	12,140
TL tower to 1	3,230	15,370
1 to 2	3,170	18,530
2 to 3	3,120	21,660
3 to 4	3,080	24,740
4 to 5	3,050	27,790
5 to 6	3,030	30,820
6 to 7	3,010	33,830
7 to 8	3,000	36,830
8 to 9	3,000	39,830
9 to 10	3,010	42,840
10 to 11	3,030	45,860
11 to 12	3,050	48,910
12 to 13	3,080	51,990
13 to 14	3,120	55,120
14 to 15	3,170	58,280
15 to TR Tower	3,220	61,510
TR backspan	13,490	75,000

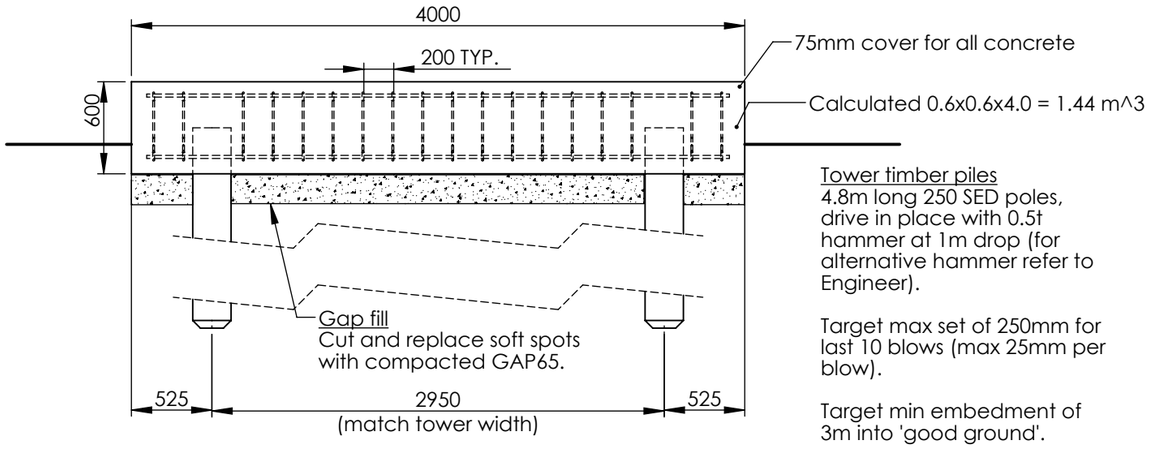
Update this table after excavation!

Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Main cable details	Drawing Number: AA-1829-DWG-01-6		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G



Tower reinforcing / piles
Plan view

Arrange reinforcing to ensure no clash with other parts.



Tower reinforcing / piles
Elevation view

Tower timber piles
4.8m long 250 SED poles, drive in place with 0.5t hammer at 1m drop (for alternative hammer refer to Engineer).

Target max set of 250mm for last 10 blows (max 25mm per blow).

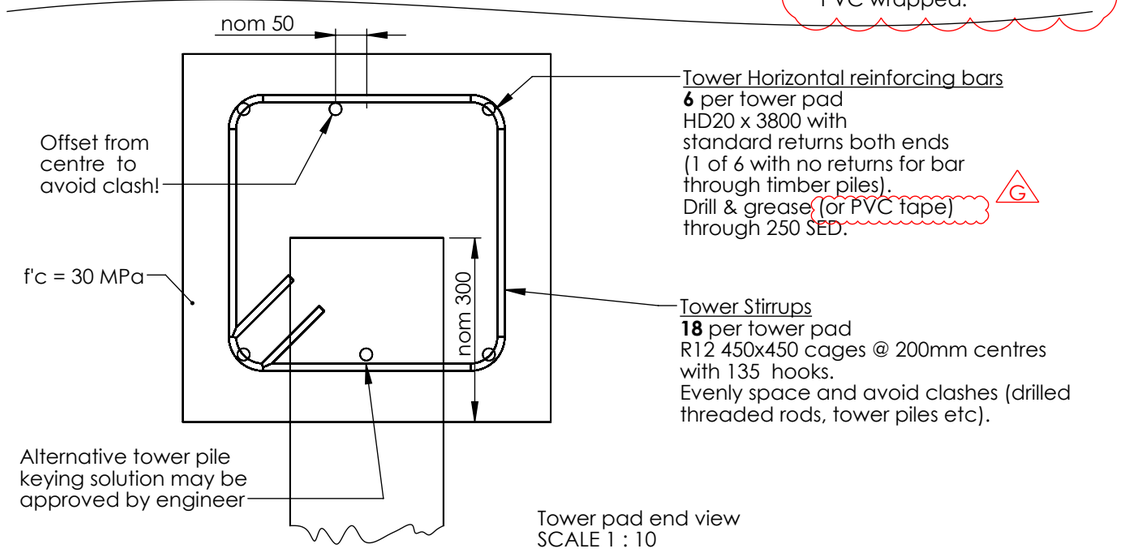
Target min embedment of 3m into 'good ground'.

Cut any excess pole length and treat with metalex.

Bind end of timber pole with PVC tape to provide cover where steel touches timber.

G Min 30mm cover to steel reinforcement adjacent to timber pole unless steel is PVC wrapped.

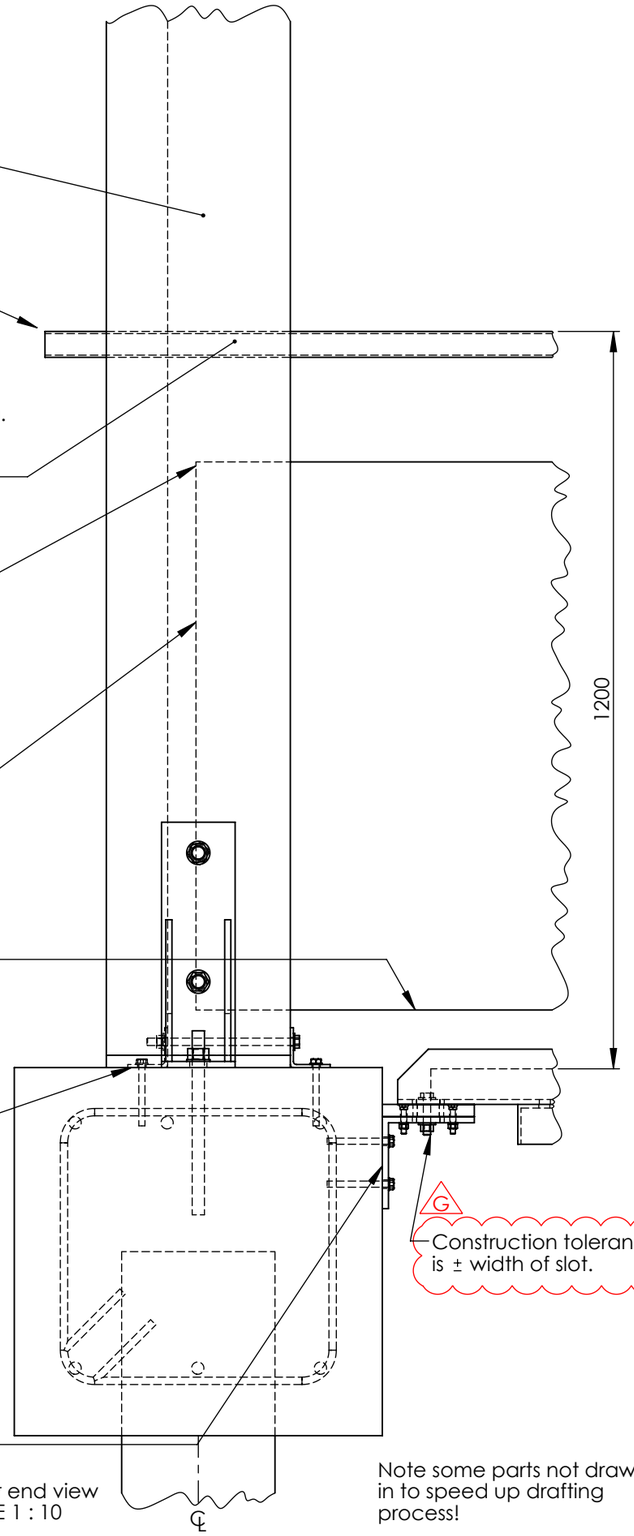
Tower pad views
SCALE 1 : 40



Tower Horizontal reinforcing bars
6 per tower pad
HD20 x 3800 with standard returns both ends
(1 of 6 with no returns for bar through timber piles).
Drill & grease (or PVC tape) through 250 SED. G

Tower Stirrups
18 per tower pad
R12 450x450 cages @ 200mm centres with 135 hooks.
Evenly space and avoid clashes (drilled threaded rods, tower piles etc).

Tower pad end view
SCALE 1 : 10



Handrail support beam
~~200x75~~ 150x75 H4 RS SG8

Handrail
32NB medium galv pipe
with end caps (push & threaded)

32NB Saddle Clamp
Masterklamp double collar plate 4.21.48
with 2/ M10 x90mm hex bolts,
M10 Nyloc nuts, & M10 galv round washers
(standard/20mm against steel, 35mm against timber).
Plastic insert sized to fit for desired tolerance / movement. SelectFit C200G32 may used as a substitute part.

Infill Rigging
M10 316SS rigging screw on one end only
1.5T D shackle on other end.
Fixed to handrail support beam with
M12 x 180 bolt, M12 eyebolt & 50x3 washer

Infill Mesh
PVC coated 50mm galv black mesh
900 wide, hog ring to mesh support cables
with 22mm 316SS hog rings.
Stapled to handrail support beam with
316SS staples.
Infill mesh part number: CL502328PB

Infill Cables
5mm 316SS cable with swaged end
or 3x wire rope grips

Handrail Support Brackets
Bowmac B50 brackets both sides. Use
M12 x 240 bolt with standard washers &
nyloc nuts between brackets. ~~10~~ 12 x100
Fischer concrete screws (or approved equivalent) into foundation pad. G

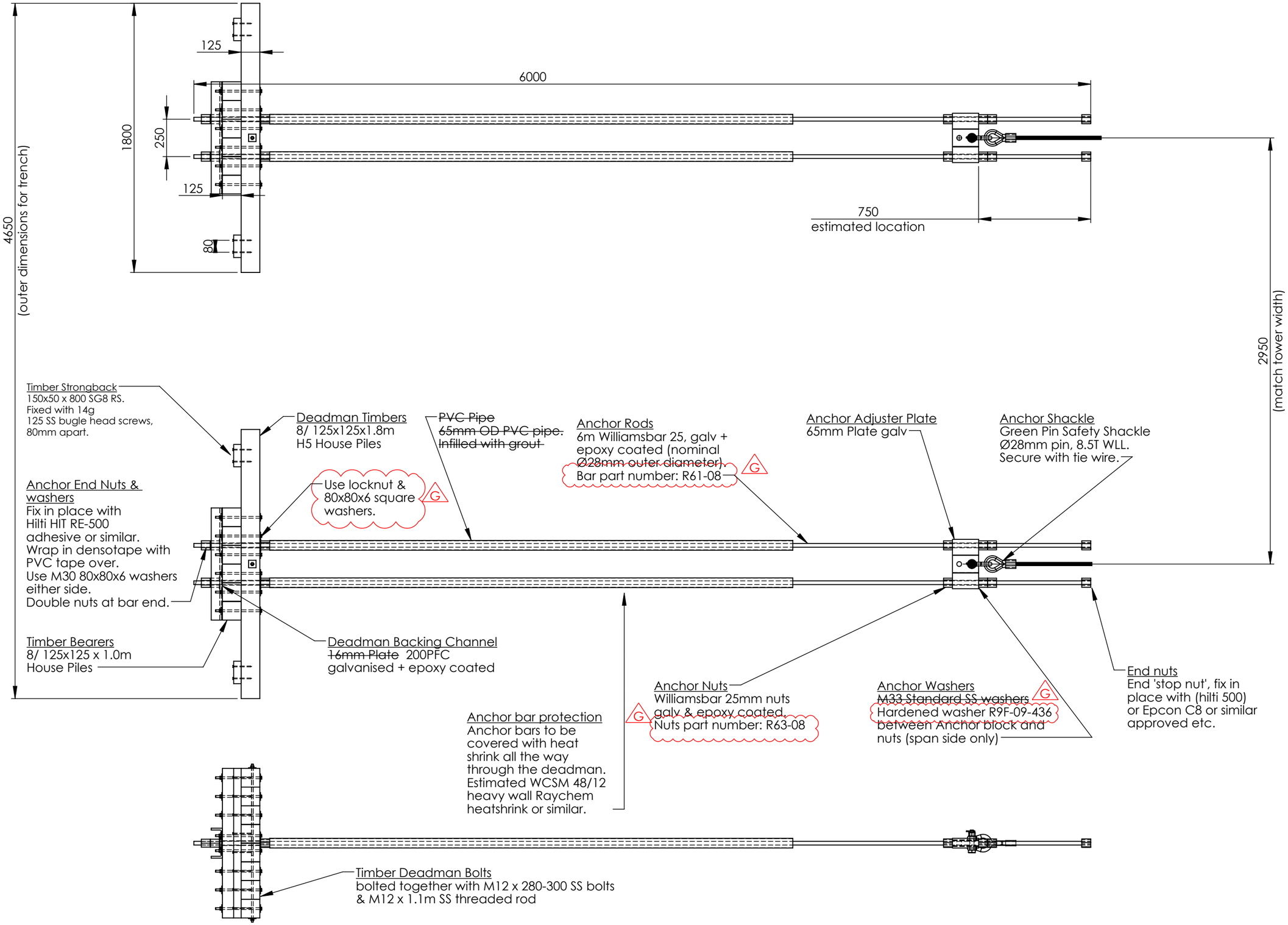
Deck support bracket
150x150x10 EA bracket
with slotted hole to top for
connection to deck
stringer, hand tight with
locknut. 2/14dia holes to
side for 2/ 12x140 FBSII
Fischer concrete screws
installed as per
manufacturer into
concrete block.

Tower end view
SCALE 1 : 10

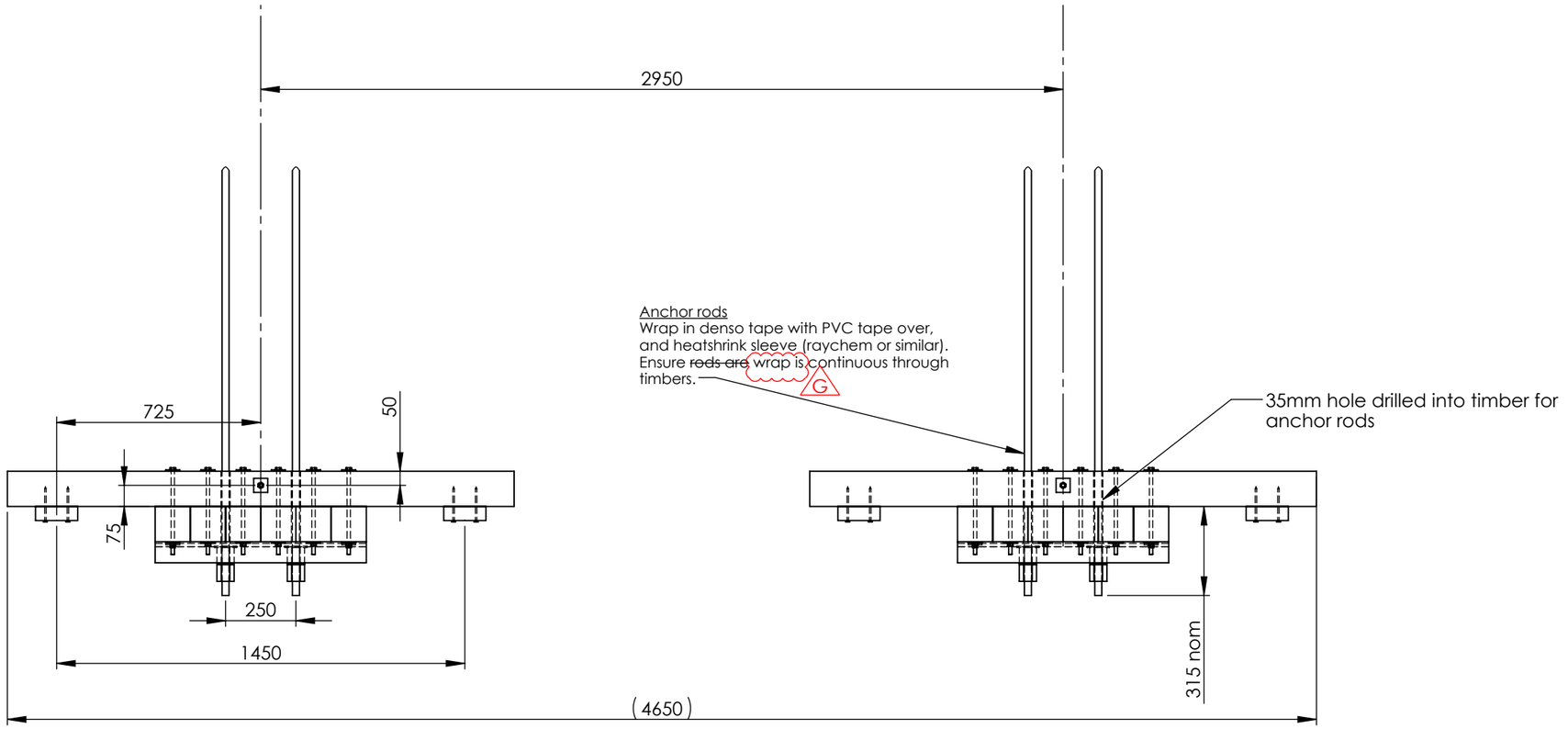
Note some parts not drawn in to speed up drafting process!

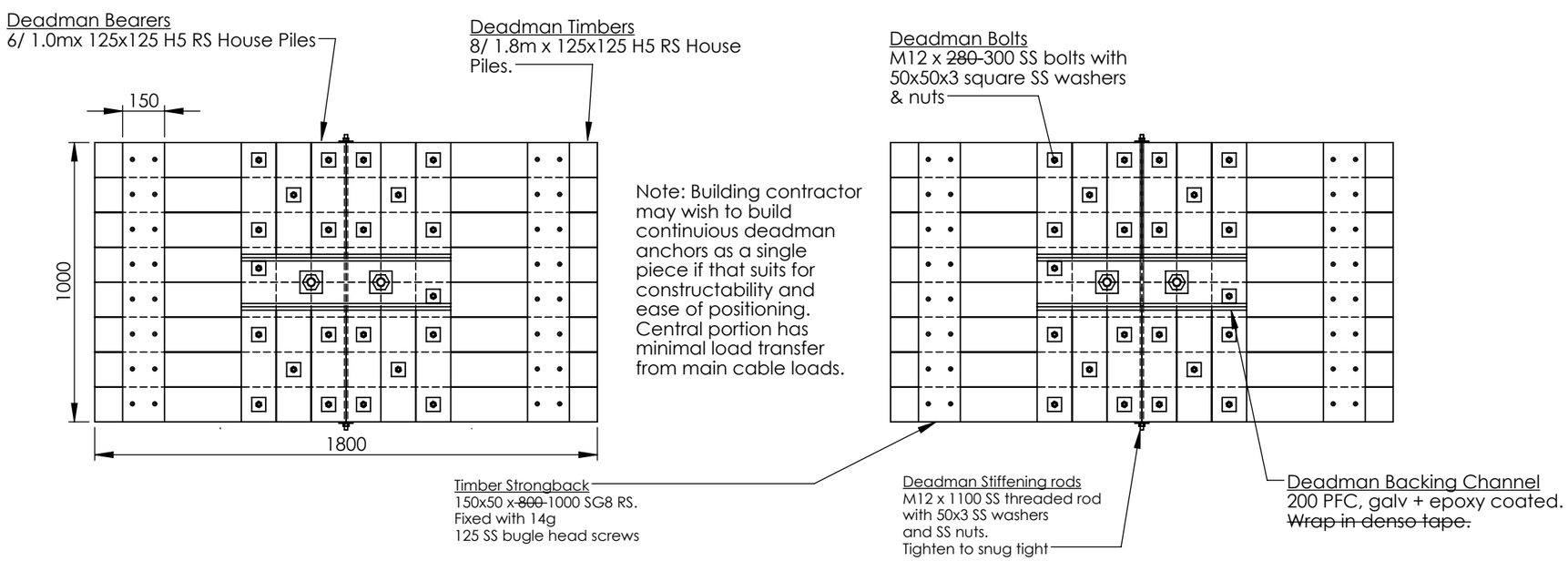
Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS
Project: Hugo Glenorchy Bridge	Foundations & end termination	Drawing Number: AA-1829-DWG-01-7	

Design		Drawn	DC
Checked		Date	17/03/2025
Approved		Scale	Various
Status	Constr.	Revision	G

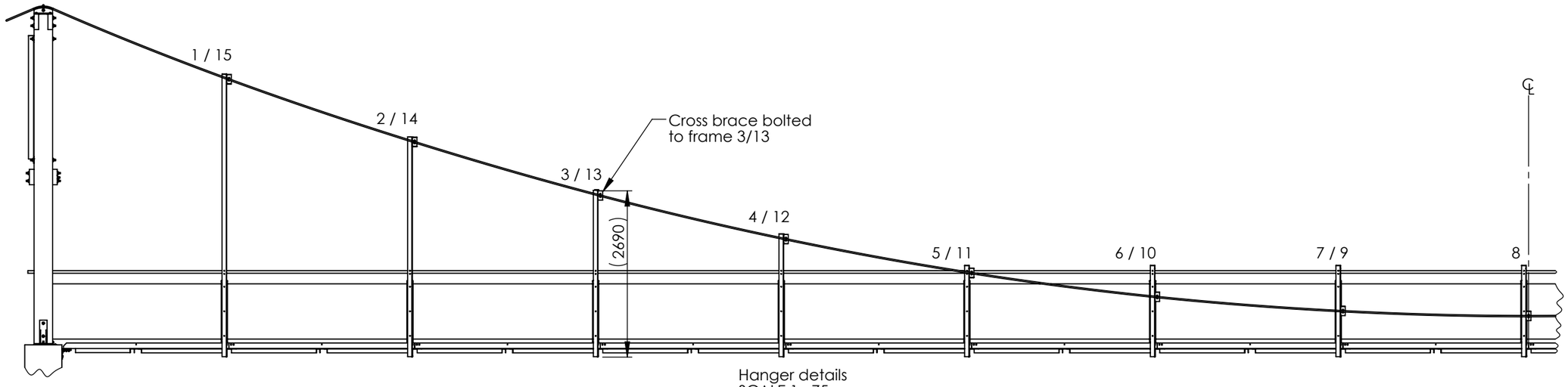


Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Deadman anchor assembly 1	Drawing Number: AA-1829-DWG-01-8		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

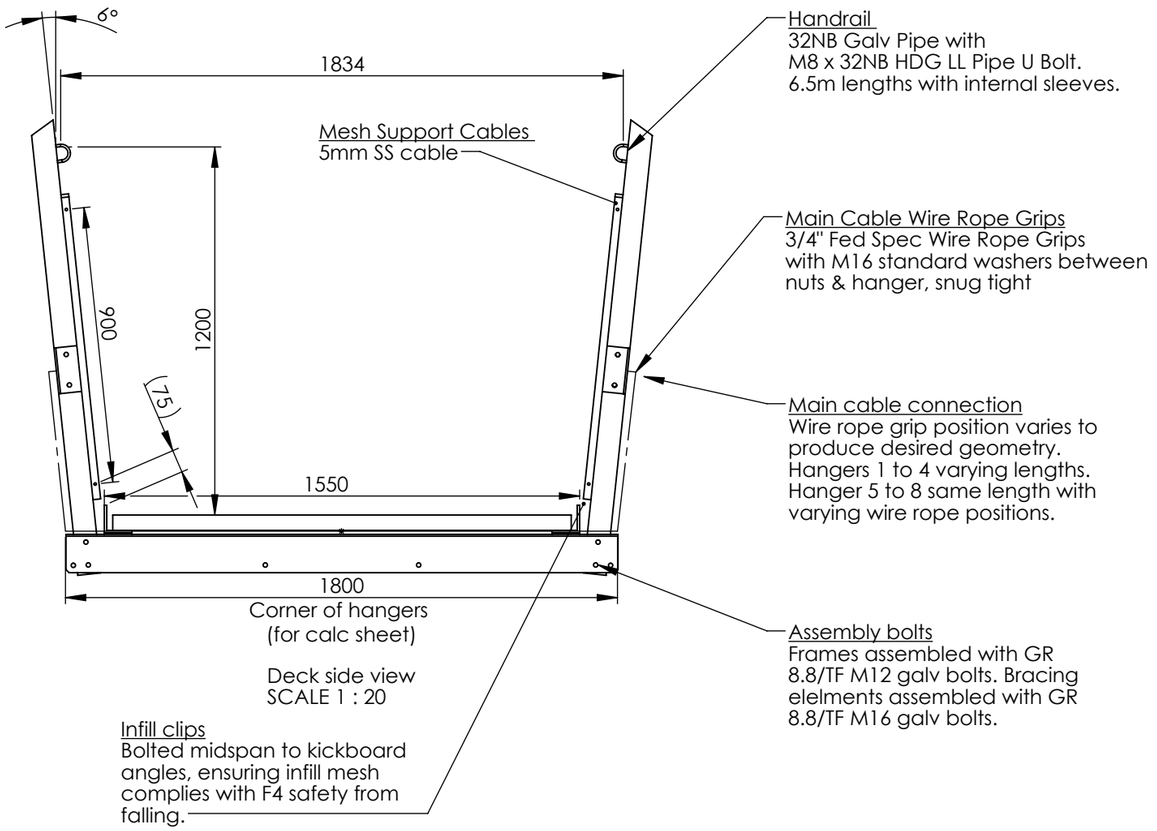




Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Deadman anchor assembly 2	Drawing Number: AA-1829-DWG-01-9		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

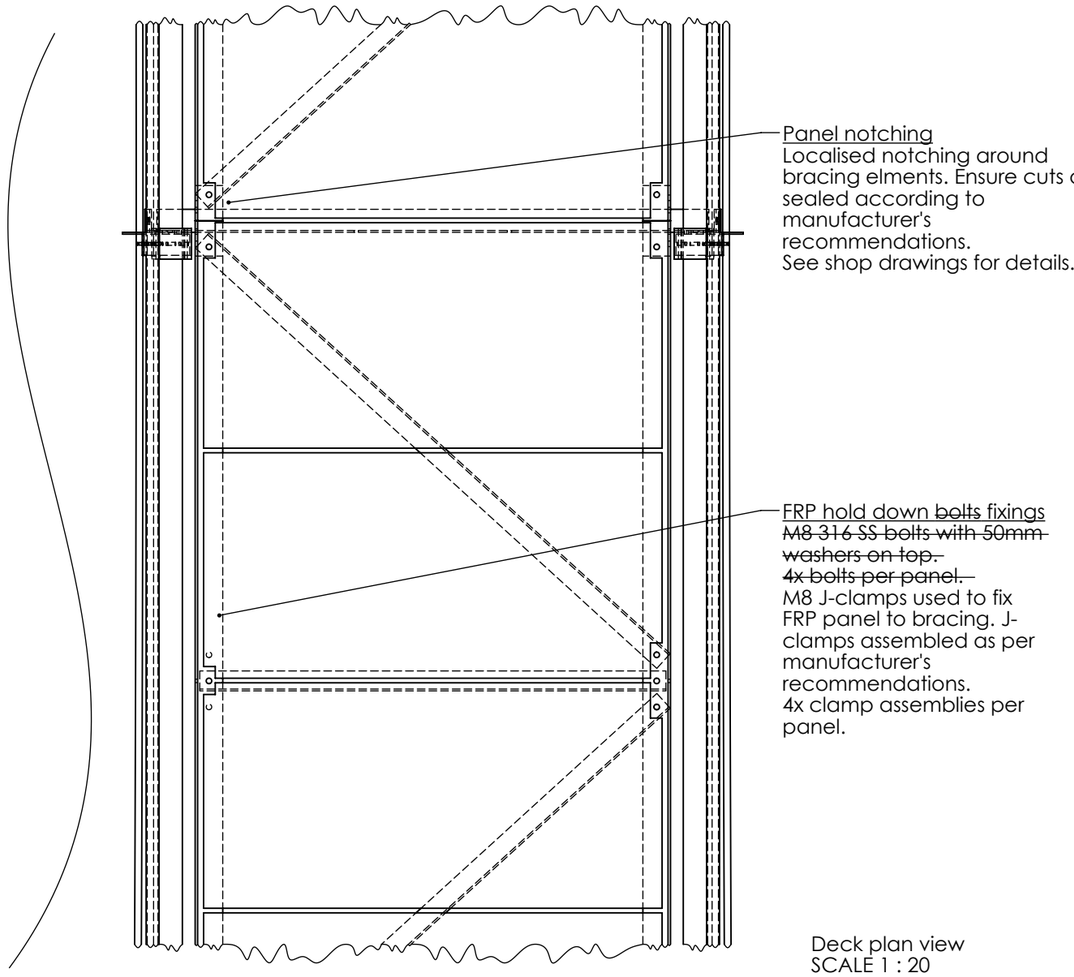


Hanger details
SCALE 1 : 75



Corner of hangers
(for calc sheet)

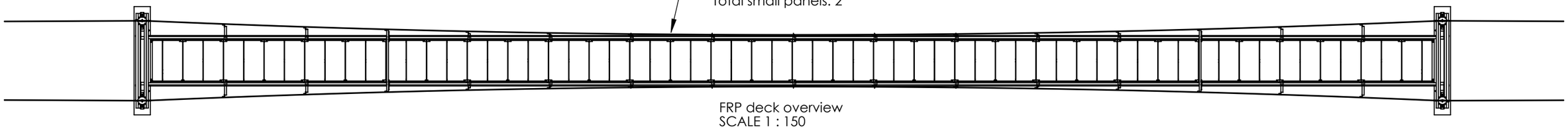
Deck side view
SCALE 1 : 20



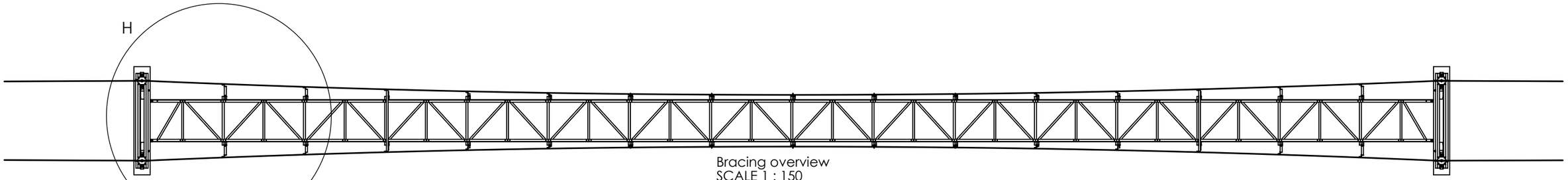
Deck plan view
SCALE 1 : 20

Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Deck assembly	Drawing Number: AA-1829-DWG-01-10		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

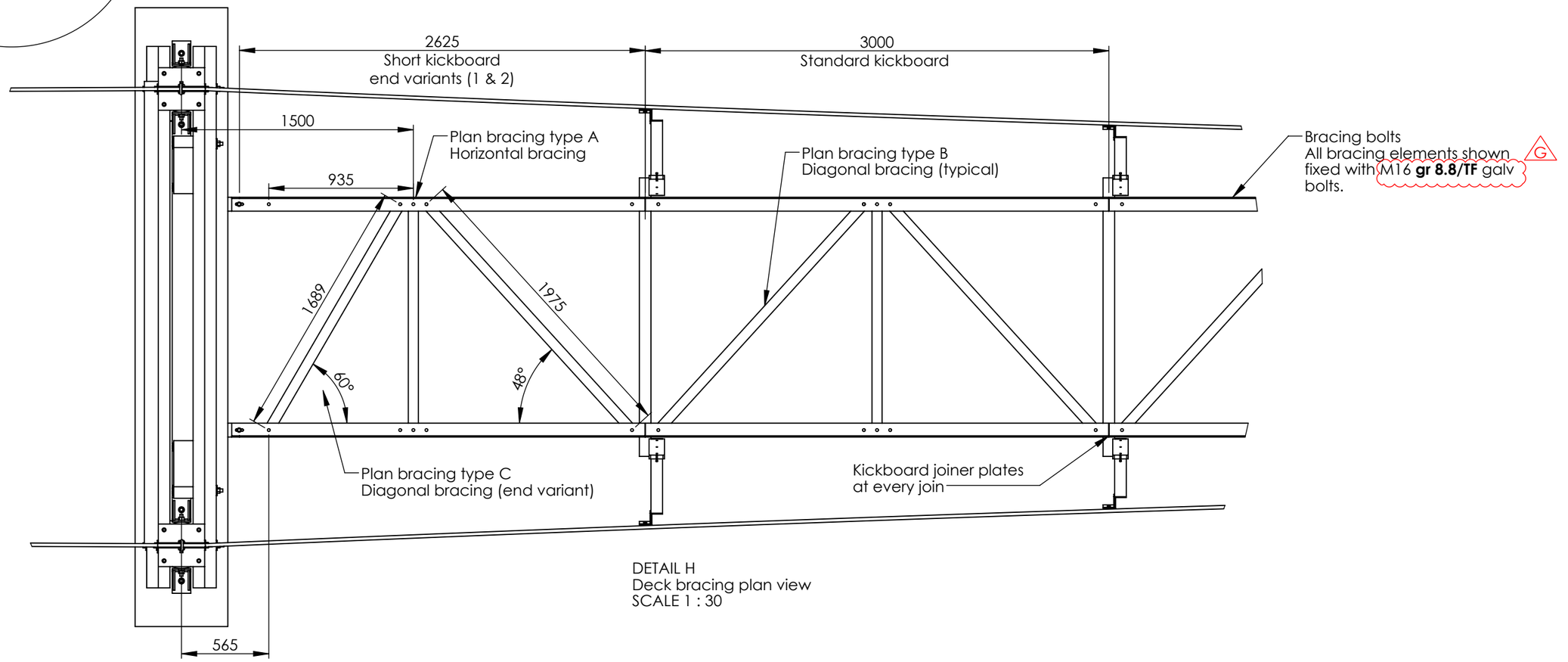
FRP Heavy duty mesh
1495 x 735
4x panels per 3.0m bay.
16 bays total.
Small panel variant at towers
Total standard panels: 62
Total small panels: 2



FRP deck overview
SCALE 1 : 150



Bracing overview
SCALE 1 : 150



DETAIL H
Deck bracing plan view
SCALE 1 : 30

Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Deck & bracing details	Drawing Number: AA-1829-DWG-01-11		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

General

1. These standard notes apply to this project unless specifically noted otherwise on the project drawings. In the event of discrepancy, the project drawings take precedence.
2. Check and verify dimensions and levels on-site before commencing construction or off-site fabrication.

Cable & Rigging

1. Measure length and order main cables following tower and ground anchor installation.
2. Provide certification for factory swaged cable ends confirming capacity and details of any testing.
3. Fill rigging screw barrels and coat threads with Denso Paste.
4. Rigging hardware shall be:
    1. Wire Rope Grips - Type B to EN 13411-5 or equivalent.
    2. Thimbles - Heavy pattern, hot dip galvanised.
    3. Shackles - Green pin with Safety bolt, G-4163.
    4. Rigging screws - Green pin standard with Safety bolt, G-6323 or approved equivalent.

Timber

1. All material and workmanship shall be in accordance with NZS 3604, NZS 3602 & NZS 3603. G
2. Cut faces of timber shall be treated with Metalex or similar field approved treatment if cutting is carried out after preservation treatment.
3. All timber shall be Pinus Radiata with grades shown below.
    - Rough sawn timber not in contact with ground/concrete or lagging: SG8, H4
    - Rough sawn timber in contact with ground/concrete or within 150mm: SG8, H5
    - Round or sawn posts/piles in contact with ground/fresh water: NZS 3605, H5
    - Gauged timber: SG8, H3.2

Concrete

1. All materials and workmanship shall be in accordance with NZS 3109 & 3124.
2. Concrete compressive strength to be 30MPa, at 28 days.
3. All concrete cover to be 50mm, except when cast against ground the cover is to be 75mm
4. All reinforcing bar shall be grade 500E unless noted otherwise.
    - HD20 denotes Grade 500E 20mm deformed bar.
    - R12 denotes Grade 300E 12mm plain bar.
5. Temperature of the curing concrete must not drop below 5˚C during the first 24 hours.

Steelwork

1. All steel plates to be grade 250 minimum to AS/NZS 3678.
2. Hot rolled sections to be minimum grade 300 to AS/NZS 3679.
3. All bolts to comply with AS/NZS 1252 and to be galvanised in accordance with AS/NZS 1214 unless noted otherwise.
4. All bolts to be grade 4.6 minimum (for timber connections or timber to steel). Grade 8.8 minimum for steel connections.
5. All welding shall be in accordance with AS/NZS 1554.1.
6. All welding electrodes shall have a minimum ultimate strength of 480 MPa and shall comply with AS/NZS 4854. All welds shall be category SP to AS/NZS 1554.1.
7. Deburr / break sharp edges.
8. All steelwork shall be hot dip galvanised in accordance with AS/NZS 4680 after fabrication and removal of welding slag and burrs.
9. All bolts, nuts and washers, including holding down bolts shall be hot dip galvanised.

Construction Monitoring

1. CM2 Level of construction monitoring provided by a CPEng structural engineer is required, in accordance with engineering NZ guidance.

Inspection and Maintenance

1. Structural inspections shall be completed by a suitably qualified person every 2 years minimum, as per SNZ HB 8630.
2. Any defects noted shall be actioned within 6 months.

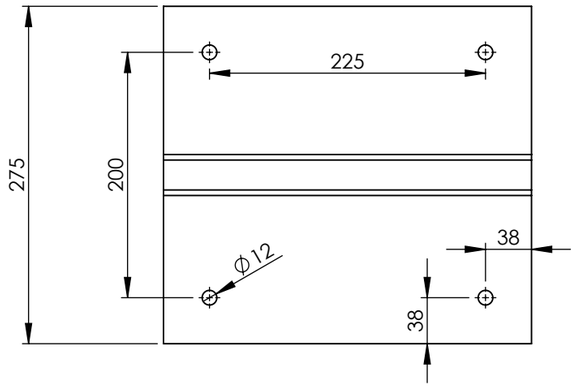
Fixings

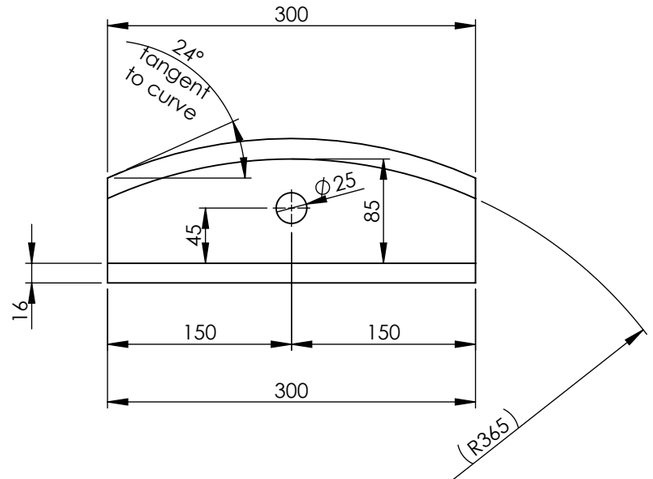
1. Grade 8.8/TB or TF denote friciton grip bolts that need to be intalled in accordance with NZS 3404. Load washers are recommended or the part turn method to tension these bolts.
2. Bolts shall be pre coated with grease before installation through any treated timber.
3. For snug tight connections nyloc nuts should be used, unless noted otherwise.
4. All chemical anchor bolts to be installed as per manufacturers recommendations.
5. All bolts shall be installed with minimum 2 threads protuding past the nut.

Client: Glenorchy Trails Trust	Sheet Title: Design Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Notes	Drawing Number: AA-1829-DWG-01-12		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

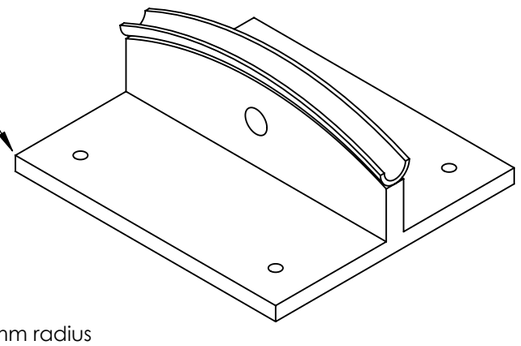
Part name	Quantity	Drawing number	Material
Tower saddle	4	AA-1829-DWG-02-2	Galvanised steel
Tower cross brace type 1	2	AA-1829-DWG-02-3	Galvanised steel
Tower cross brace type 2	2	AA-1829-DWG-02-3	Galvanised steel
Tower foot bracket	8	AA-1829-DWG-02-3	Galvanised steel
Tower end termination bracket	4	AA-1829-DWG-02-4	Galvanised steel
Tower wear strip	4	AA-1829-DWG-02-4	UHMWPE
Anchor adjuster block	4	AA-1829-DWG-02-5	Galvanised steel
Anchor backing channel	4	AA-1829-DWG-02-5	Galvanised steel, epoxy or PVC coated
Transom	15	AA-1829-DWG-02-6	Galvanised steel
Hanger uprights (types 1-4)	16 (8x Left, 8x Right)	AA-1829-DWG-02-7	Galvanised steel
Hanger uprights (types 5-8)	14 (7x Left, 7x Right)	AA-1829-DWG-02-8	Galvanised steel
Kickboard joiner plate	30	AA-1829-DWG-02-9	Galvanised steel
Hanger main cable bracket	30	AA-1829-DWG-02-9	Galvanised steel
Kickboard angles (typical)	28	AA-1829-DWG-02-10	Galvanised steel
Kickboard angles (ends)	4 (2x type 1, 2x type 2)	AA-1829-DWG-02-11	Galvanised steel
Plan bracing type A	16	AA-1829-DWG-02-12	Galvanised steel
Plan bracing type B	30	AA-1829-DWG-02-12	Galvanised steel
Plan bracing type C	2	AA-1829-DWG-02-12	Galvanised steel
Hanger cross brace	2	AA-1829-DWG-02-12	Galvanised steel
Mesh infill panels	30	AA-1829-DWG-02-13	Dressed pine
Infill clips	32	AA-1829-DWG-02-13	Galvanised steel
FRP panels	64	AA-1829-DWG-02-14	FRP heavy duty mesh

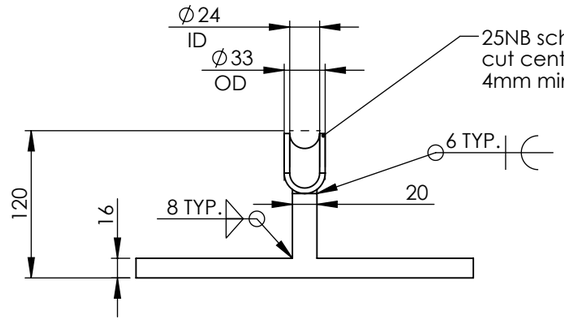
Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Summary / index	Drawing Number: AA-1829-DWG-02-1		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G



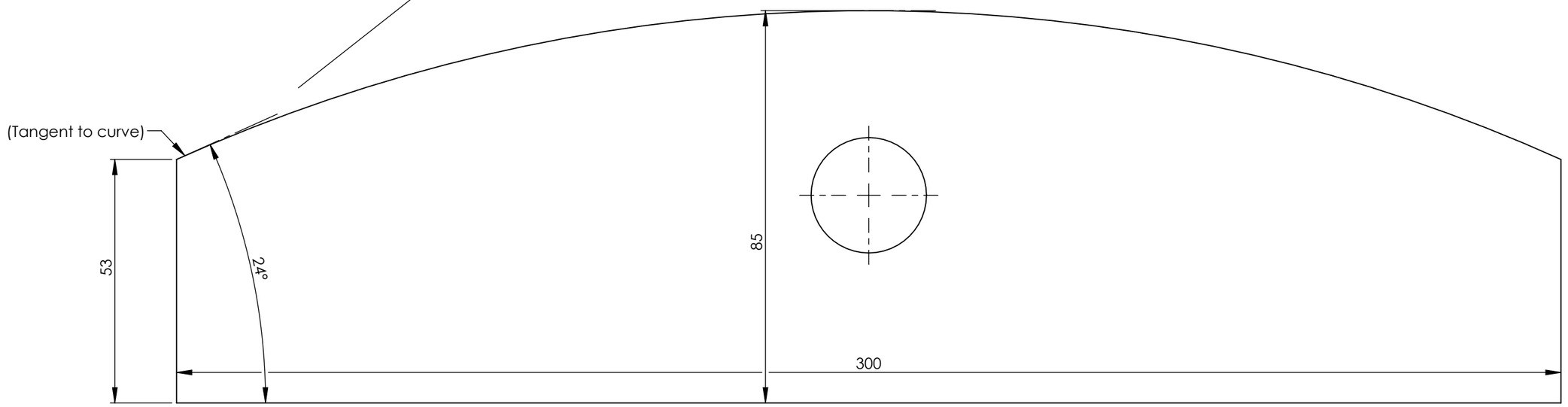


Tower Saddle
Quantity: 4
16mm & 20mm plate with
cut in half 25NB bent welded pipe.
Galvanised after fabrication.



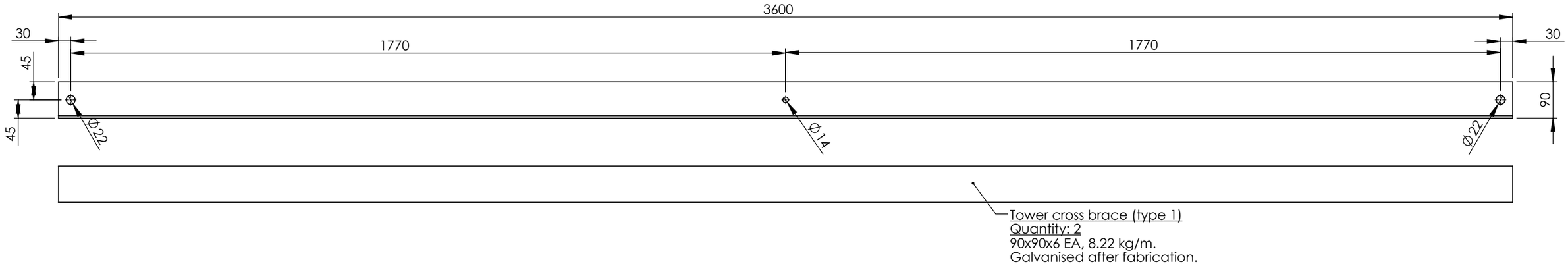


Tower Saddle
SCALE 1 : 5

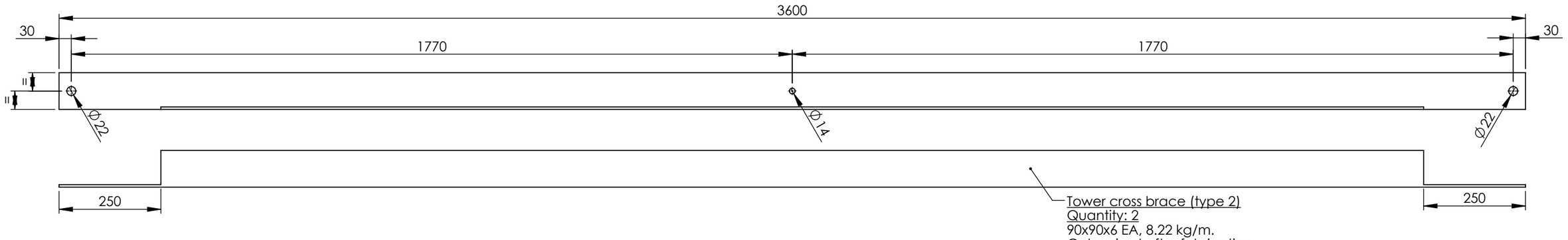


Central steel detail
SCALE 1 : 1

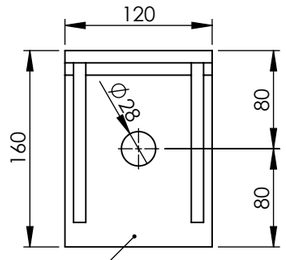
Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Tower saddle	Drawing Number: AA-1829-DWG-02-2		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G



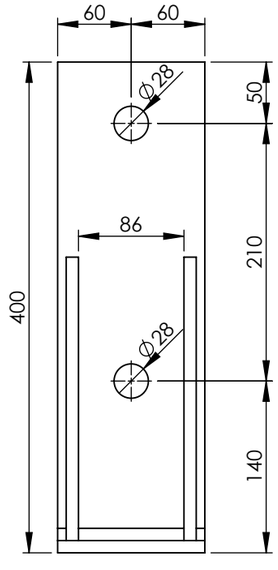
Tower cross brace (type 1)
Quantity: 2
90x90x6 EA, 8.22 kg/m.
Galvanised after fabrication.

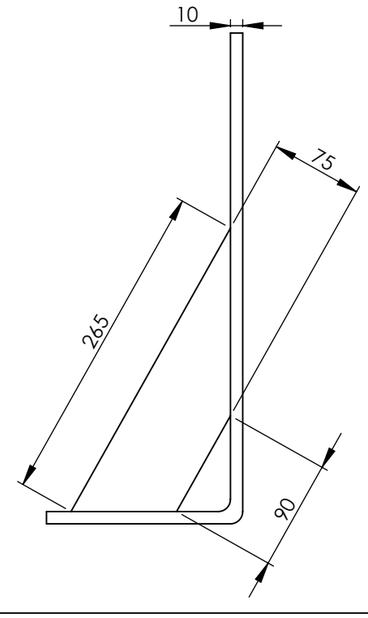


Tower cross brace (type 2)
Quantity: 2
90x90x6 EA, 8.22 kg/m.
Galvanised after fabrication.



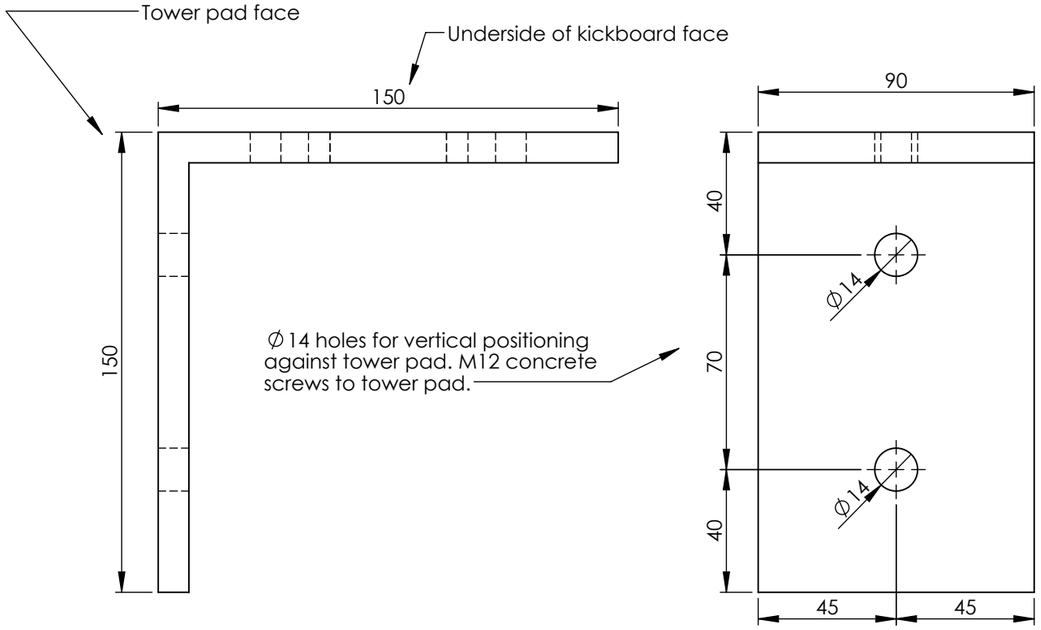
Tower foot bracket
Quantity: 8
10mm plate.
Galvanised after fabrication.

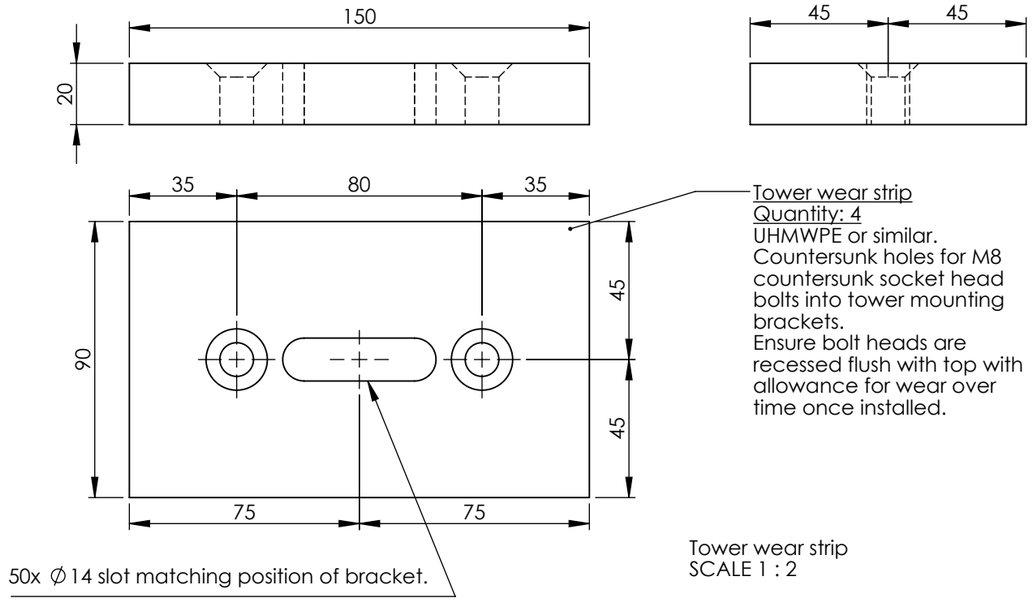




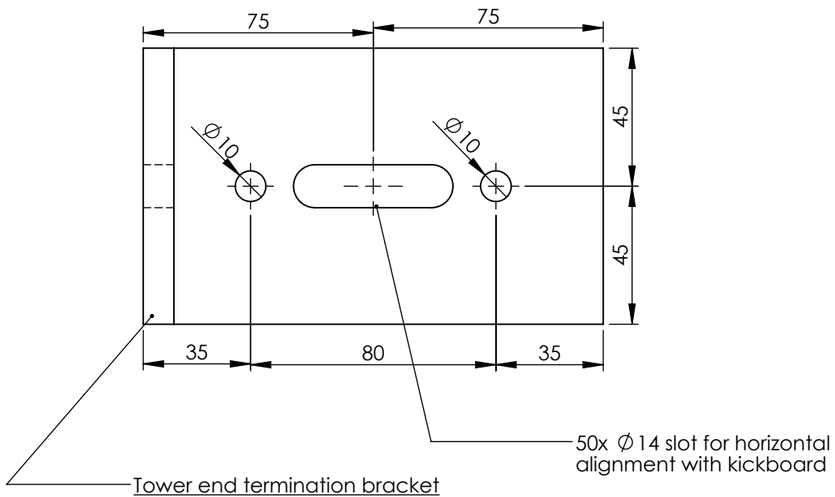
Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	Design / Drawn: DC
Project: Hugo Glenorchy Bridge	Misc tower parts 1	Drawing Number: AA-1829-DWG-02-3	Checked / Date: 17/03/2025
			Approved / Scale: Various
			Status: Constr. / Revision: G

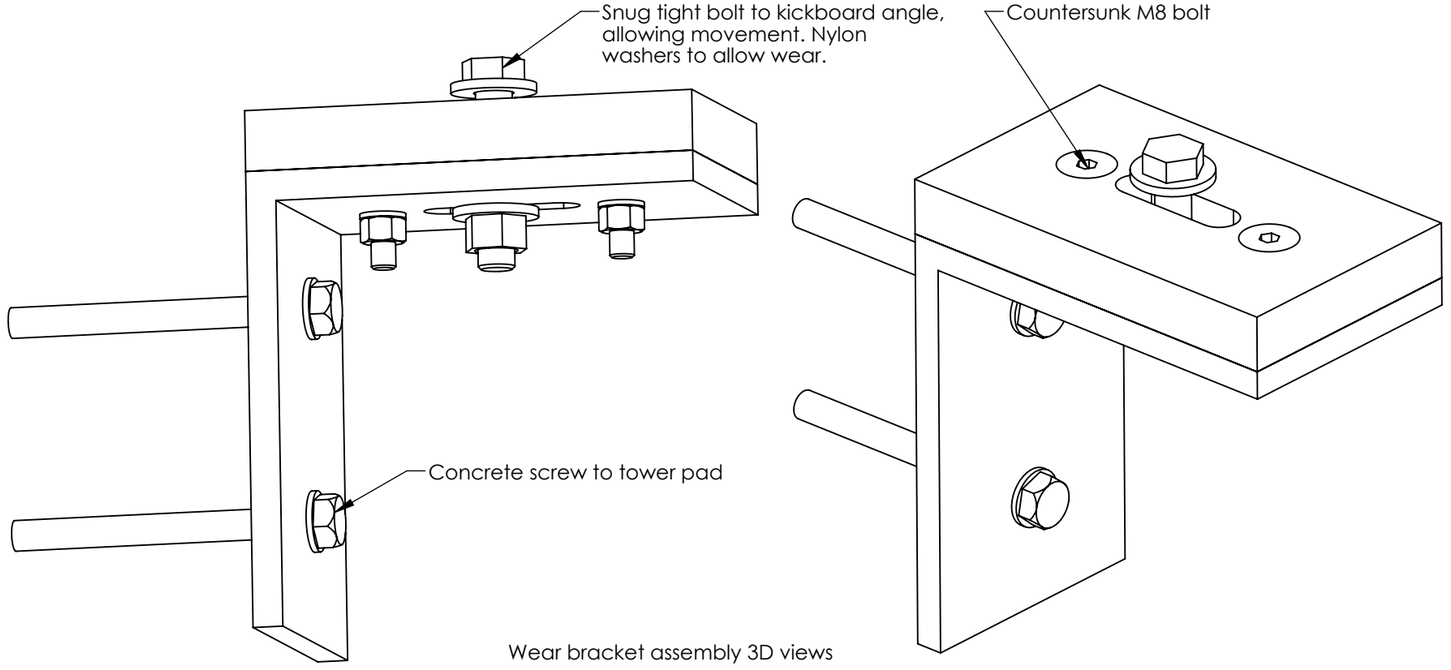
Tower end termination bracket
SCALE 1 : 2





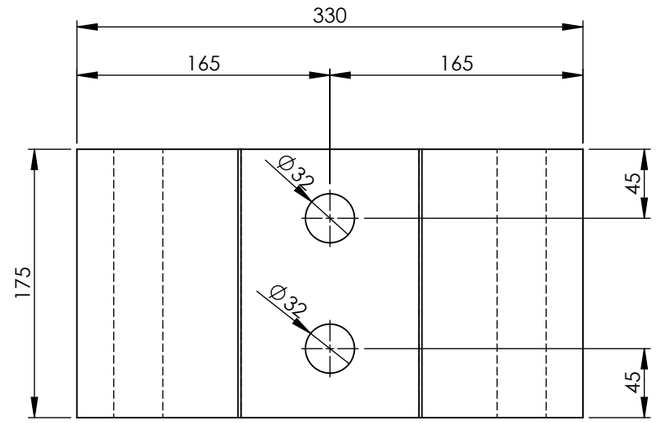
Tower wear strip
SCALE 1 : 2



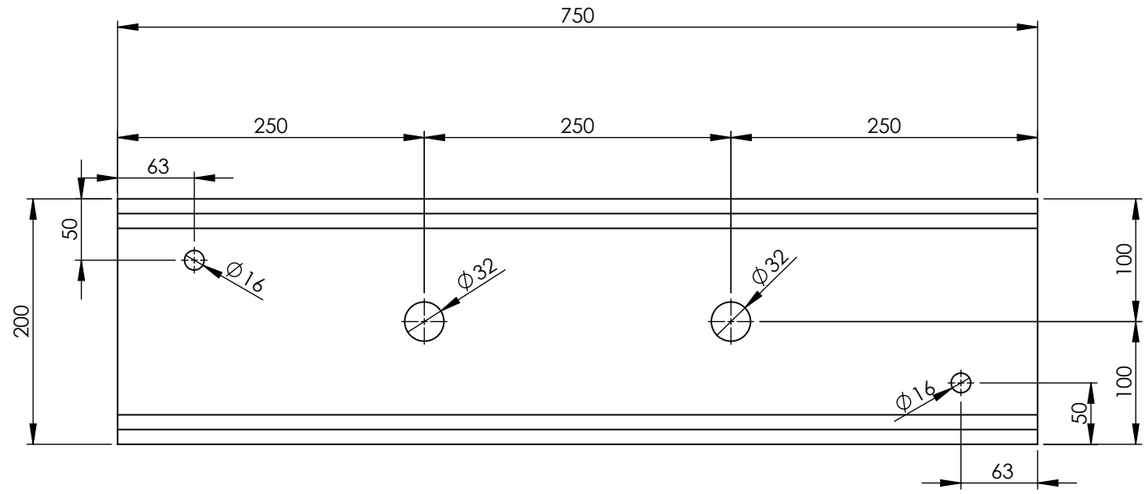


Wear bracket assembly 3D views

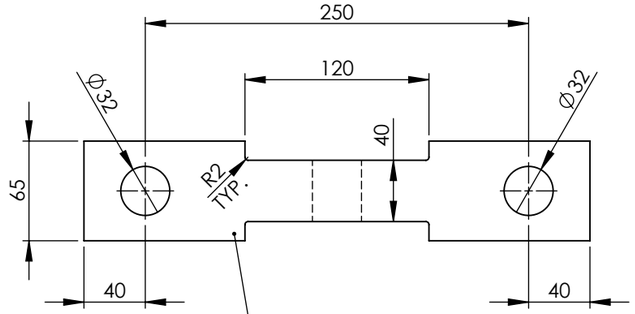
Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Misc tower parts 2	Drawing Number: AA-1829-DWG-02-4		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G



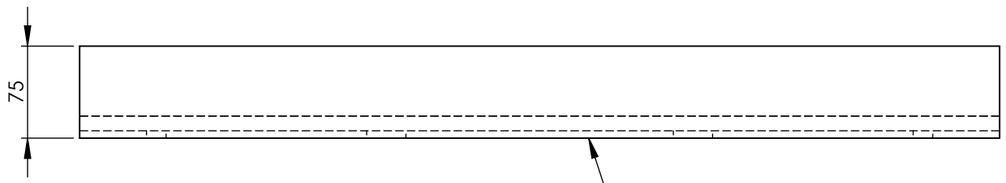
Anchor adjuster block
SCALE 1 : 4



Anchor backing channel
SCALE 1 : 5



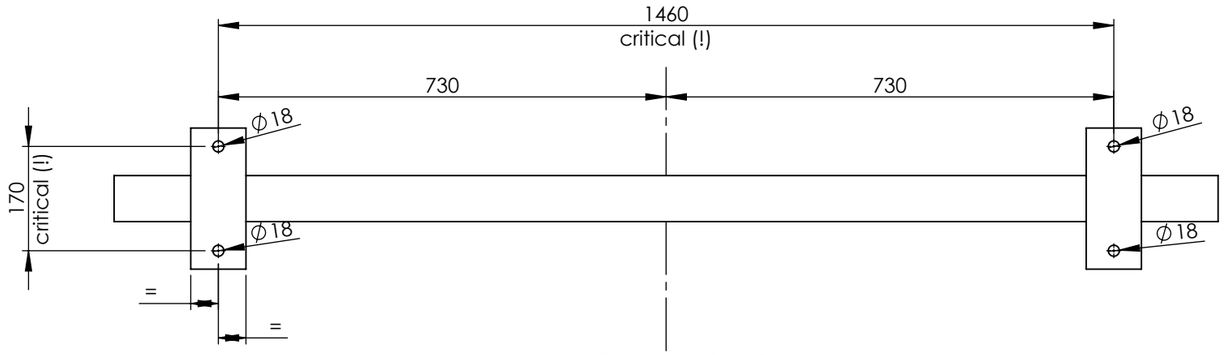
Anchor adjuster block
Quantity: 4
65mm machined plate.
Galvanised after fabrication.



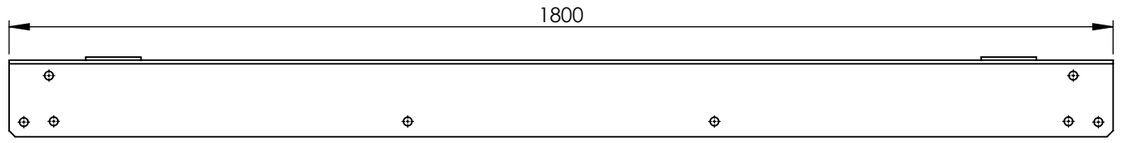
Anchor backing channel
Quantity: 4
200 PFC, 22.9 kg/m.
Galvanised after fabrication.
Epoxy or PVC coated for
additional corrosion protection.

Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Misc anchor parts	Drawing Number: AA-1829-DWG-02-5		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

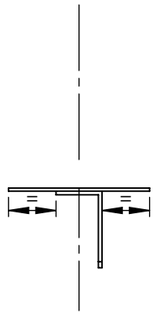
Critical (!) dimensions for assembly noted. Trial assembly with matching parts where possible.



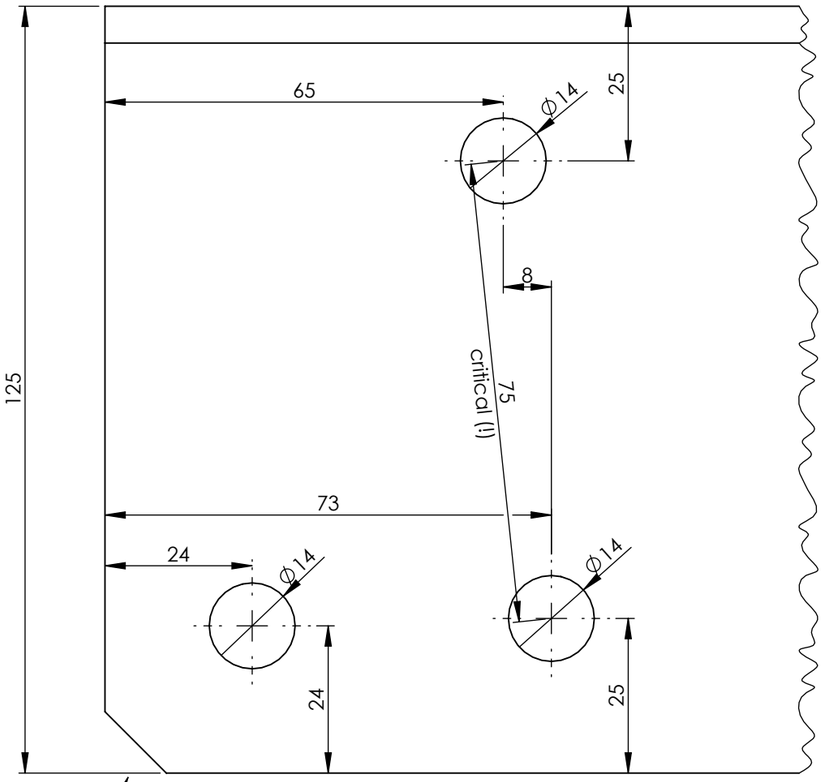
Transom - plan view
SCALE 1 : 10



Transom - elevation view
SCALE 1 : 10



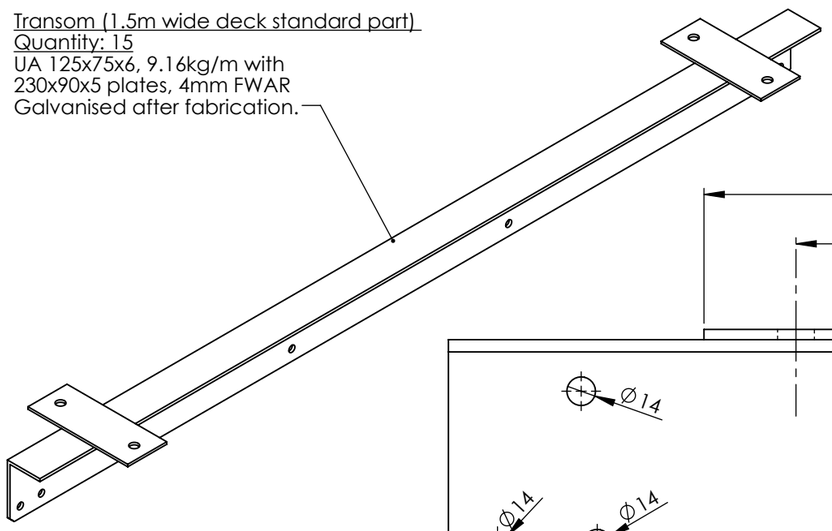
Transom - side view
SCALE 1 : 10

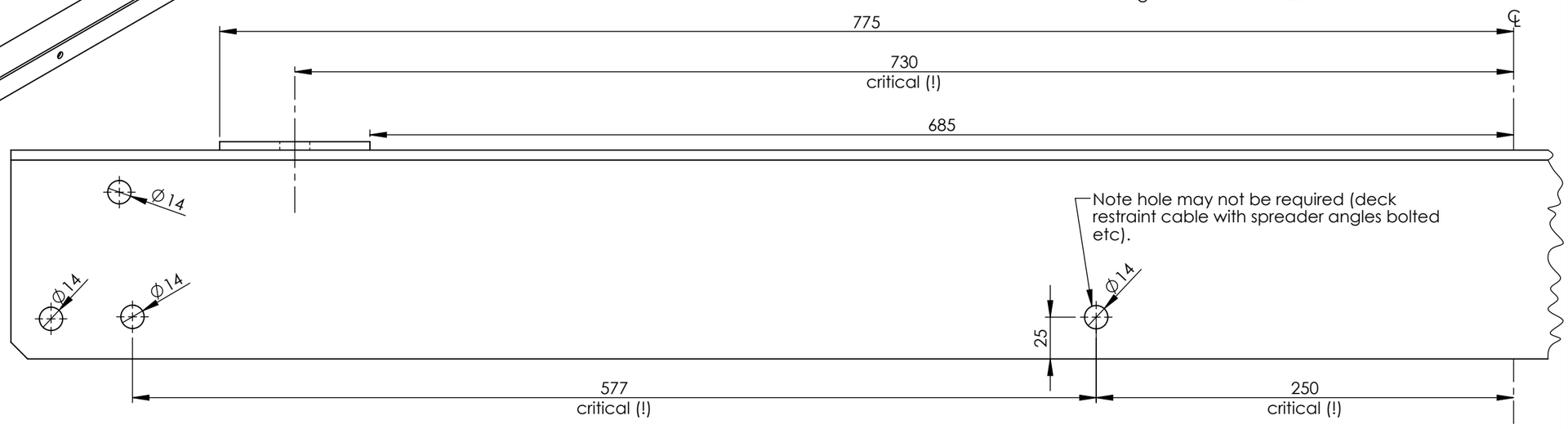


10mm chamfered edge

Transom - hole / end view
SCALE 1 : 1

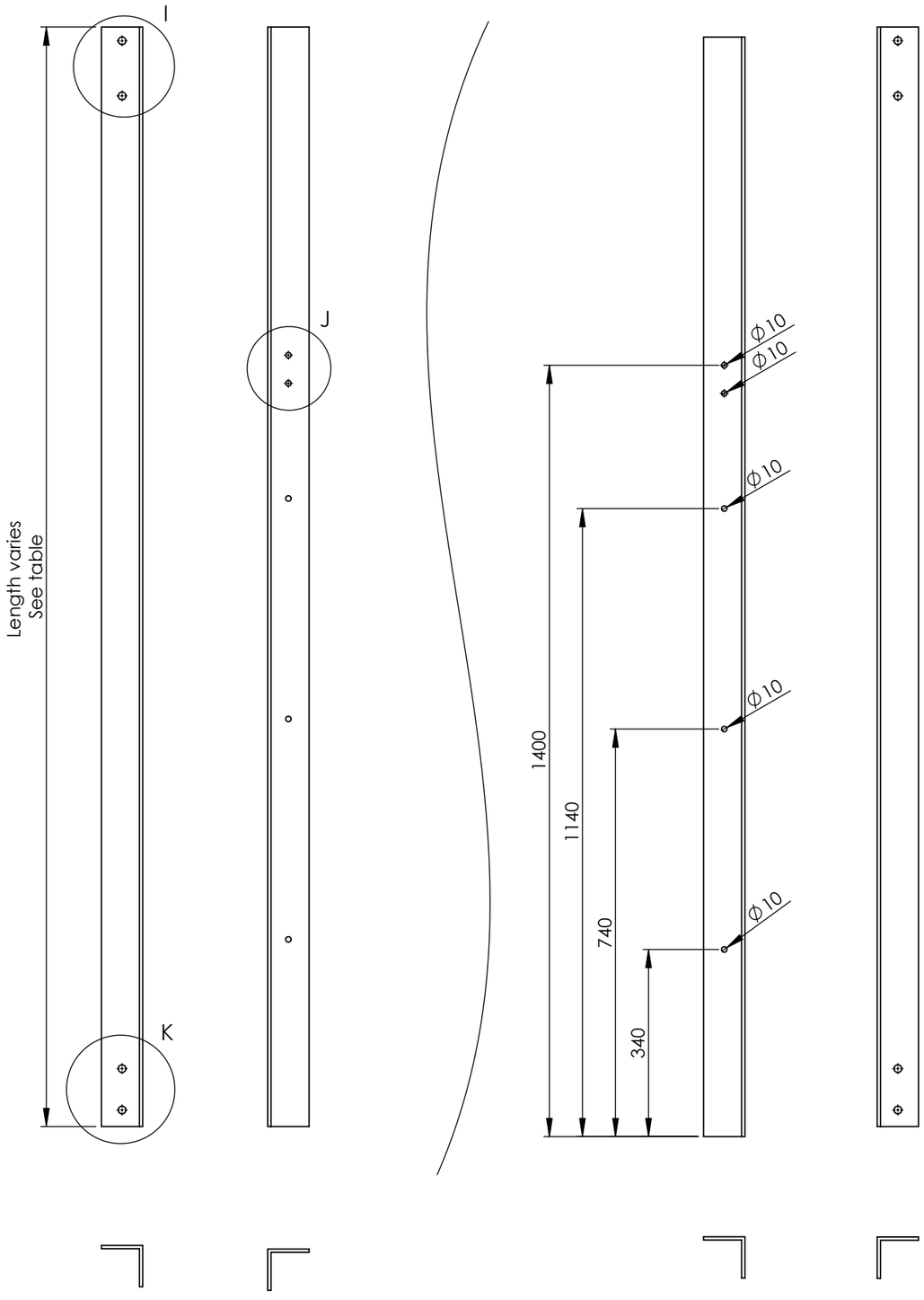
Transom (1.5m wide deck standard part)
Quantity: 15
UA 125x75x6, 9.16kg/m with
230x90x5 plates, 4mm FWAR
Galvanised after fabrication.

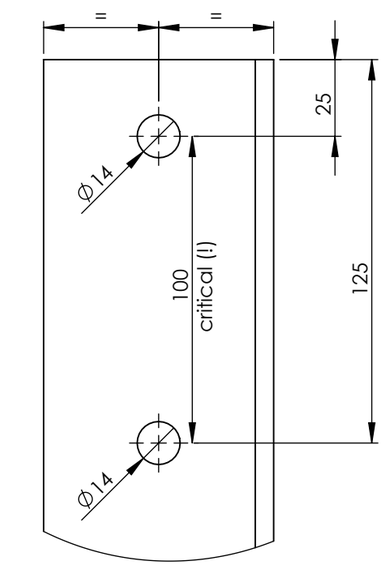




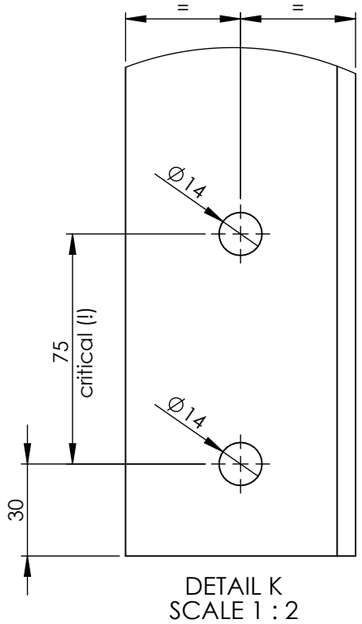
Transom - side view
SCALE 1 : 3

Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Standard transom (1.5m size)	Drawing Number: AA-1829-DWG-02-6		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

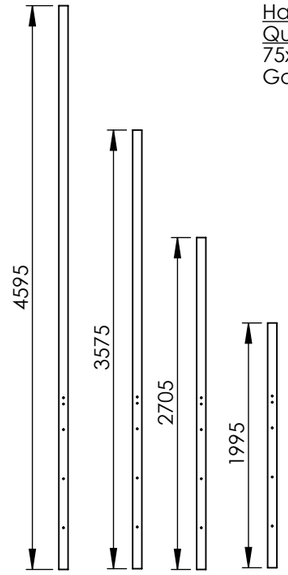


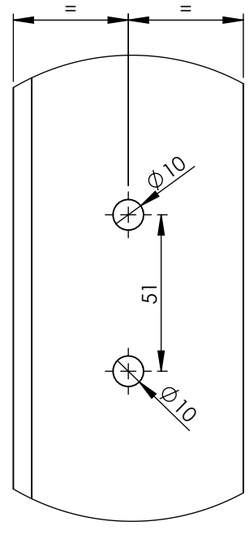


DETAIL I
SCALE 1 : 2
Main cable bracket holes



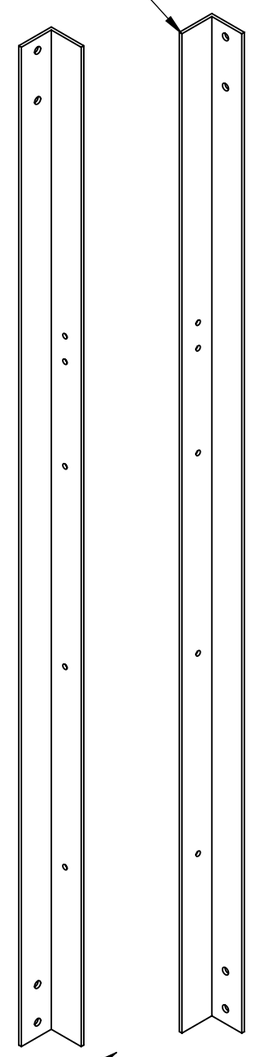
DETAIL K
SCALE 1 : 2
Base transom bolt holes





DETAIL J
SCALE 1 : 2
Handrail bracket holes

Hanger uprights (Types 1-4)
Quantity 16 (8xLeft, 8x Right)
75x75x6 EA, 6.81 kg/m
Galvanised after fabrication.

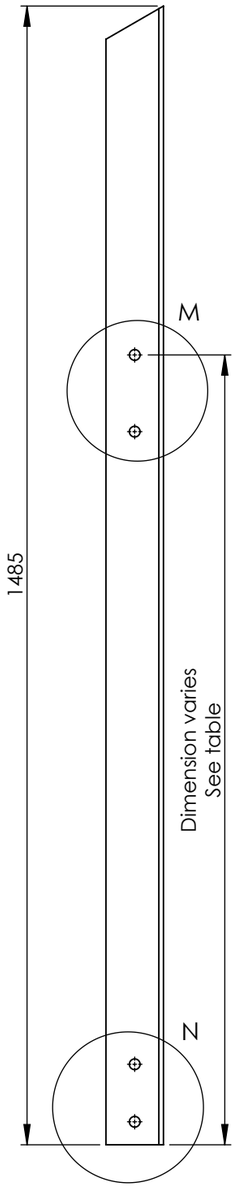


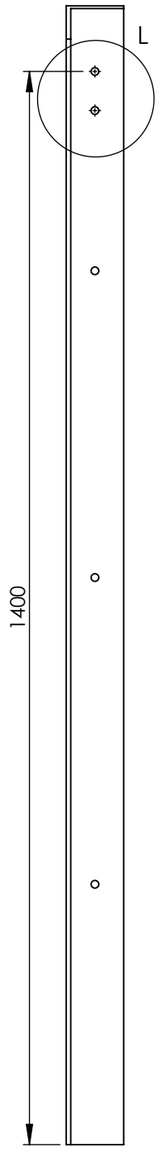
Mirrored along ℄ of bridge
L & R variants

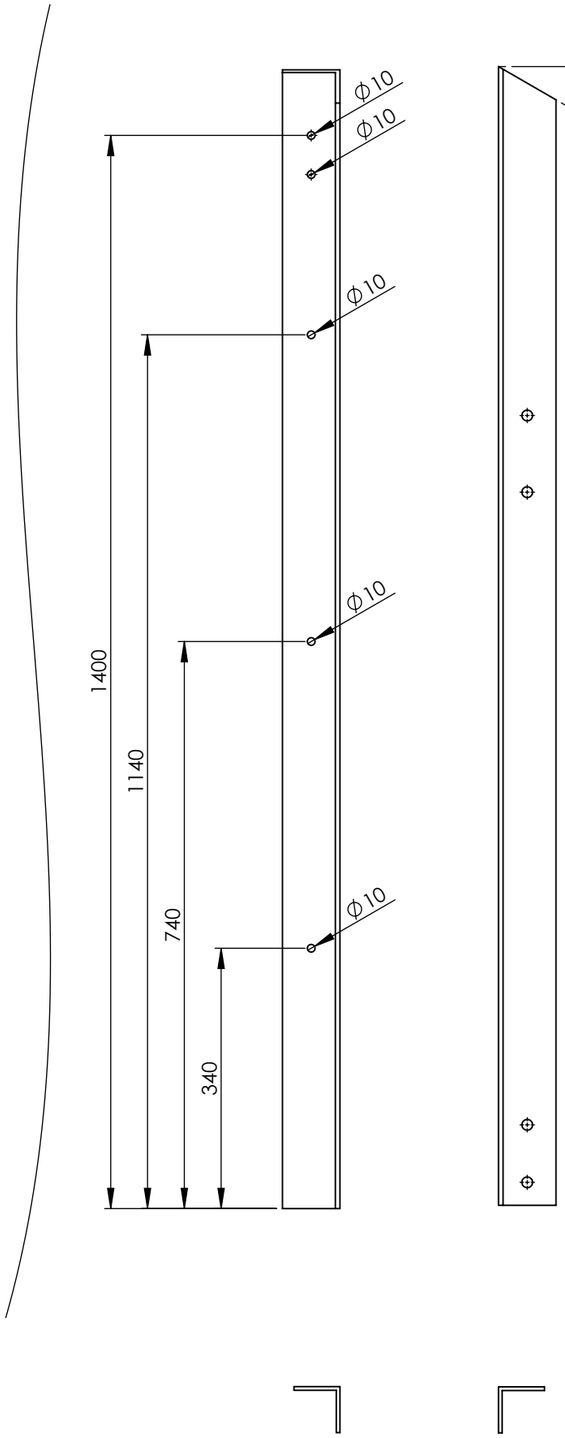
Upright angle type	Variable length	Quantities
Hanger 1	4595	2x Left, 2x Right
Hanger 2	3575	2x Left, 2x Right
Hanger 3	2705	2x Left, 2x Right
Hanger 4	1995	2x Left, 2x Right

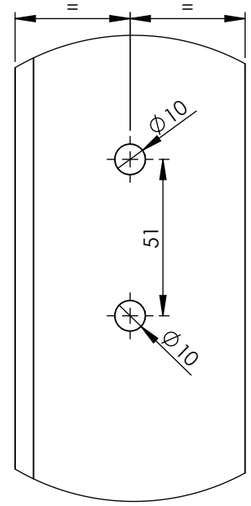
Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS
Project: Hugo Glenorchy Bridge	Hanger uprights (Types 1-4)	Drawing Number: AA-1829-DWG-02-7	

Design		Drawn	DC
Checked		Date	17/03/2025
Approved		Scale	Various
Status	Constr.	Revision	G

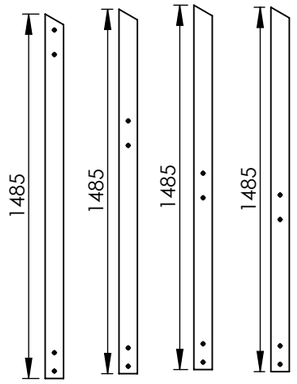




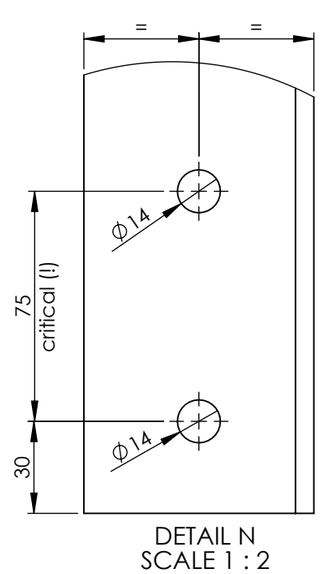




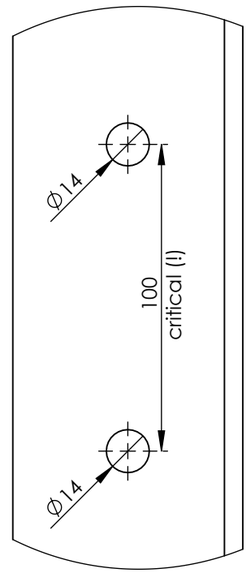
DETAIL L
SCALE 1 : 2
Handrail bracket holes



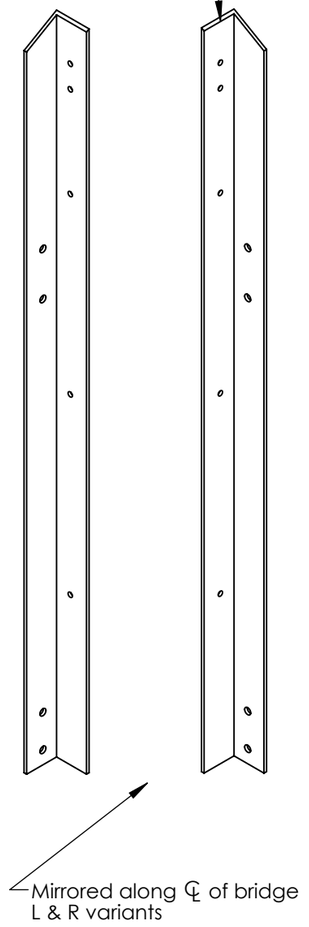
Hanger uprights (Types 5-8)
Quantity 14 (7xLeft, 7x Right)
75x75x6 EA, 6.81 kg/m
Galvanised after fabrication.



DETAIL N
SCALE 1 : 2
Base transom bolt holes

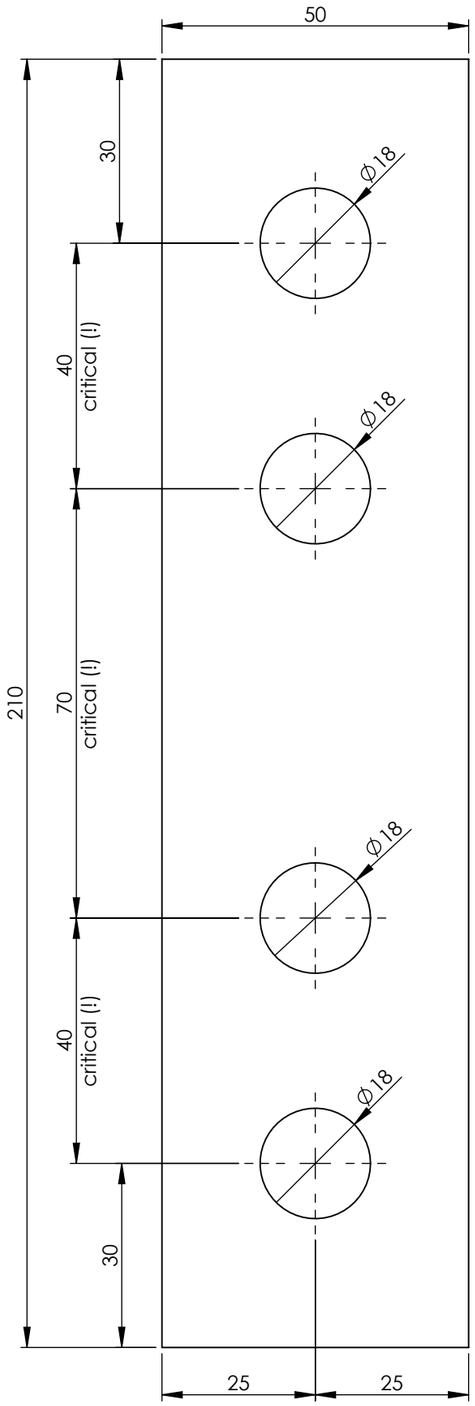


DETAIL M
SCALE 1 : 2
Main cable bracket holes



Upright angle type	Variable dimension	Quantities
Hanger 5	1420	2x Left, 2x Right
Hanger 6	1030	2x Left, 2x Right
Hanger 7	800	2x Left, 2x Right
Hanger 8	720	1x Left, 1x Right

Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Hanger uprights (Types 5-8)	Drawing Number: AA-1829-DWG-02-8		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G



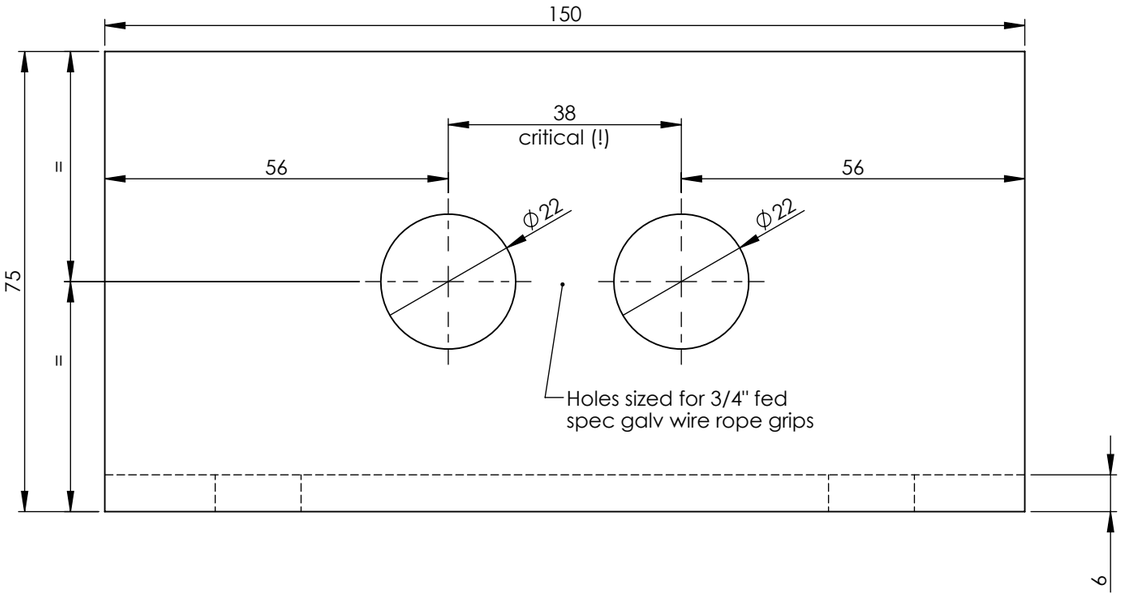
Kickboard joiner plate
SCALE 1 : 1

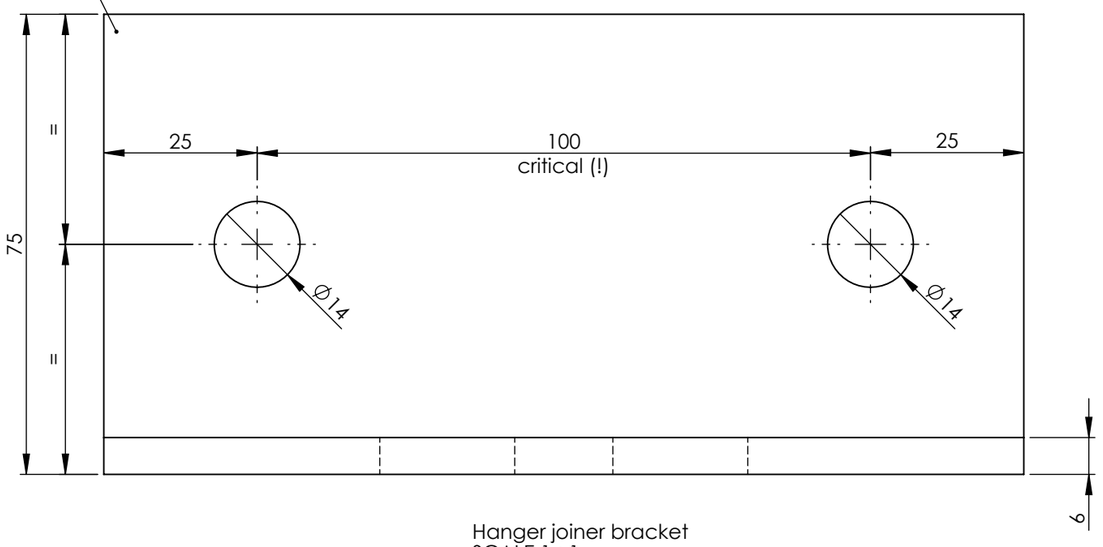
Kickboard joiner plates
Quantity: 30
8mm plate.
Galvanised after fabrication.

Hanger main cable bracket
Quantity: 30
75x75x6 EA, 6.81 kg/m.
Galvanised after fabrication.

Note brackets may be welded to uprights instead of M12 G8.8 bolts, TBC.

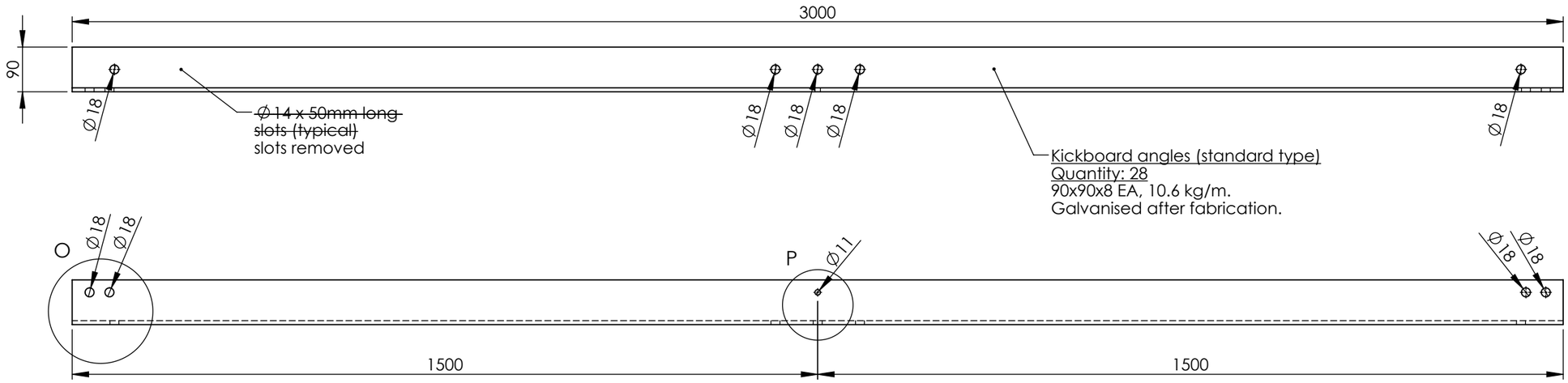
Ensure holes align correctly with kickboard angles

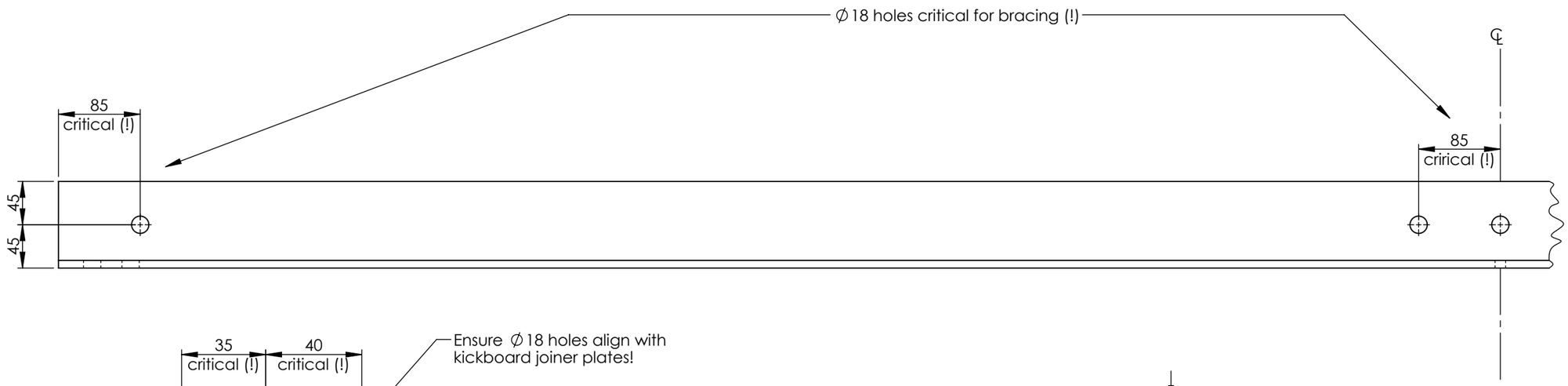


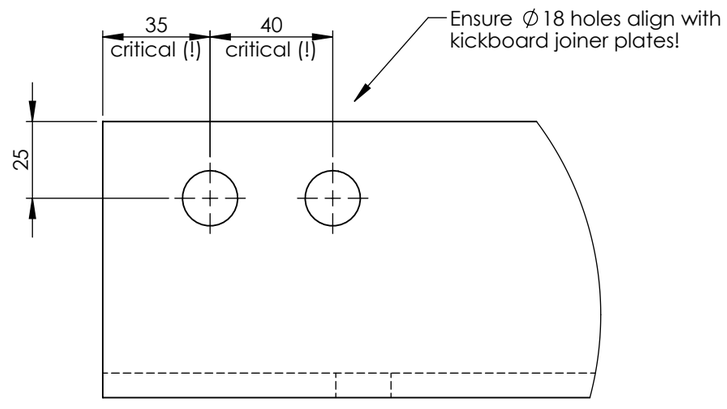


Hanger joiner bracket
SCALE 1 : 1

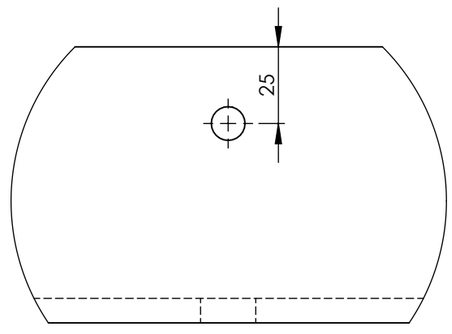
Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Joiner plates / brackets	Drawing Number: AA-1829-DWG-02-9		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G





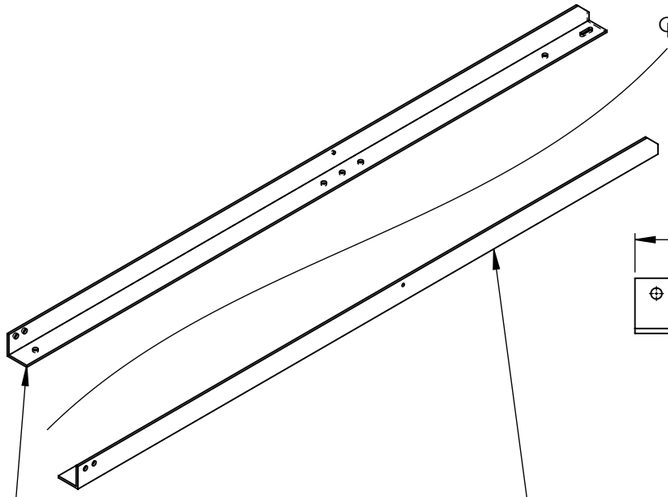


DETAIL O
SCALE 1 : 2



DETAIL P
SCALE 1 : 2

Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Kickboard angles (typical)	Drawing Number: AA-1829-DWG-02-10		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

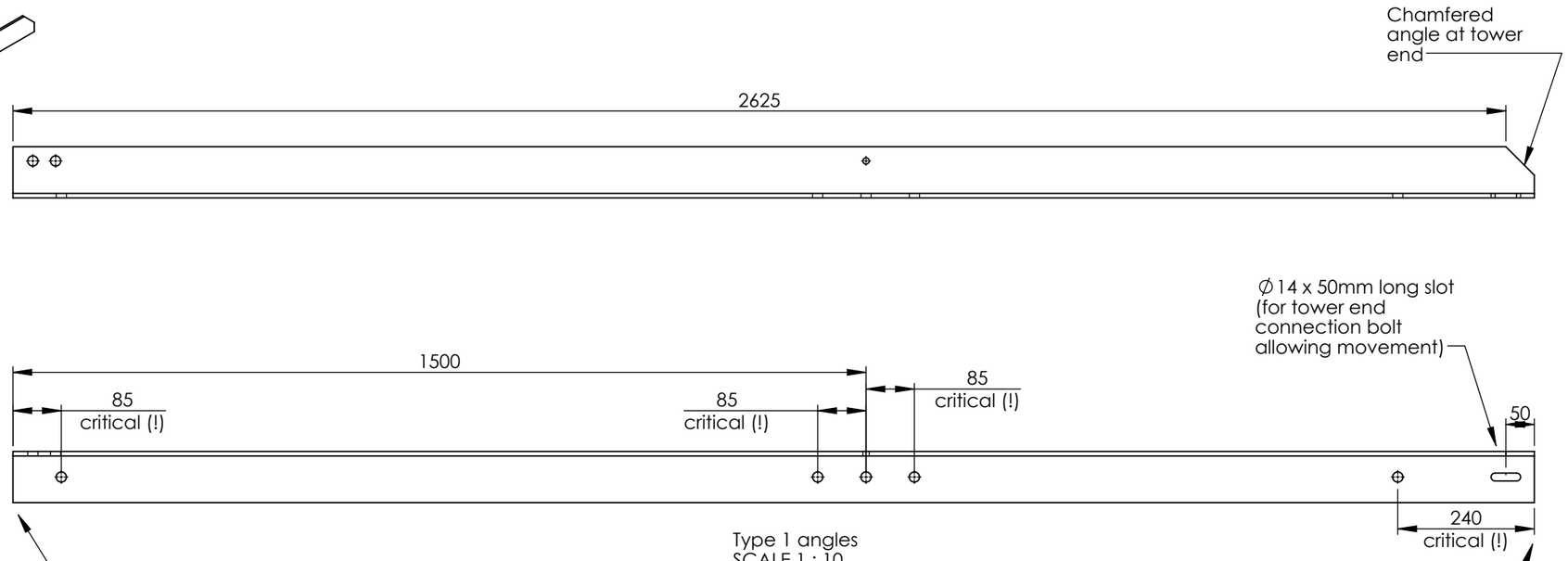


℄ bridge

Kickboard angles (end type 1)
Quantity: 2
90x90x8 EA, 10.6 kg/m.
Galvanised after fabrication.

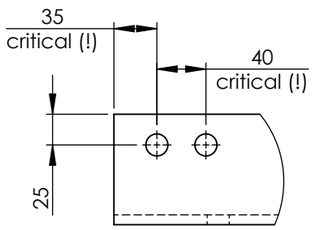
Kickboard angles (end type 2)
Quantity: 2
90x90x8 EA, 10.6 kg/m.
Galvanised after fabrication.

∅18 holes are critical for bracing.

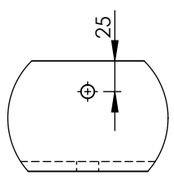


Type 1 angles
SCALE 1 : 10

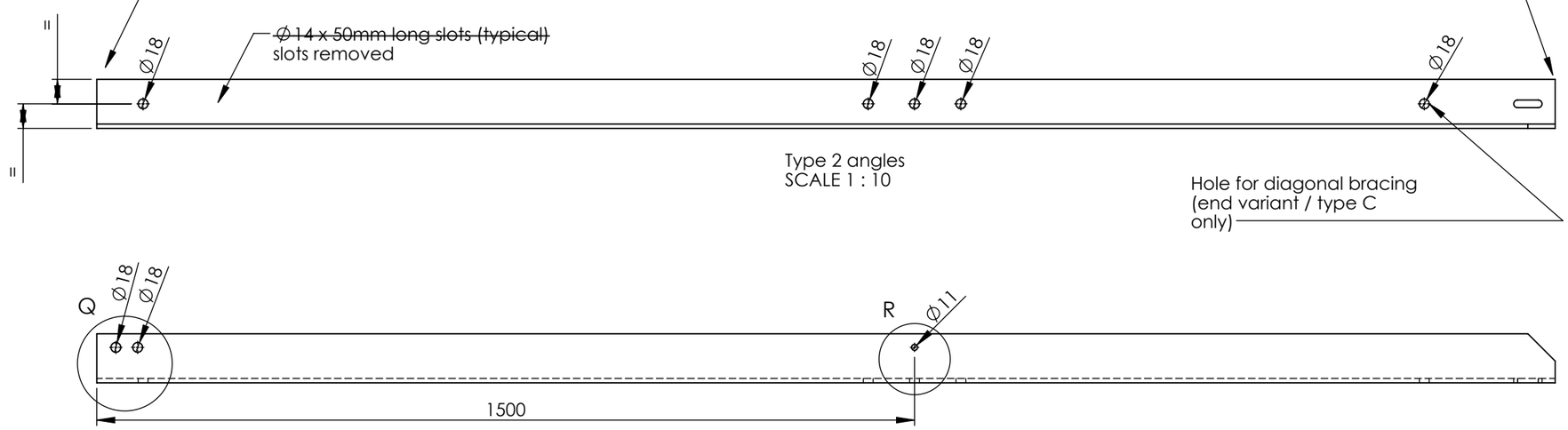
Types 1 & 2 angles mirrored along ℄ of bridge



DETAIL Q
SCALE 1 : 5

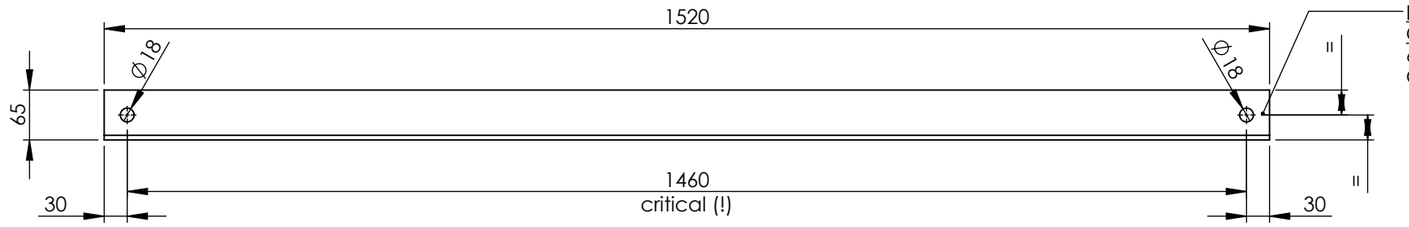


DETAIL R
SCALE 1 : 5

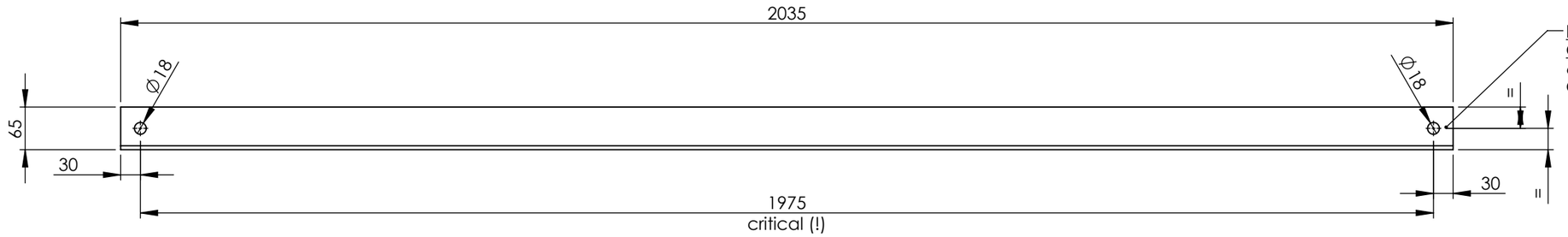


Type 2 angles
SCALE 1 : 10

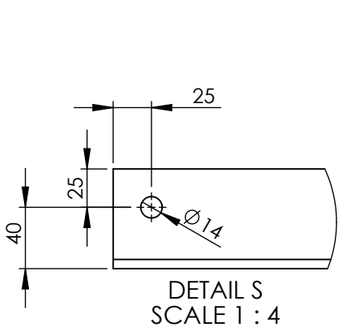
Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Kickboard angles (ends)	Drawing Number: AA-1829-DWG-02-11		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G



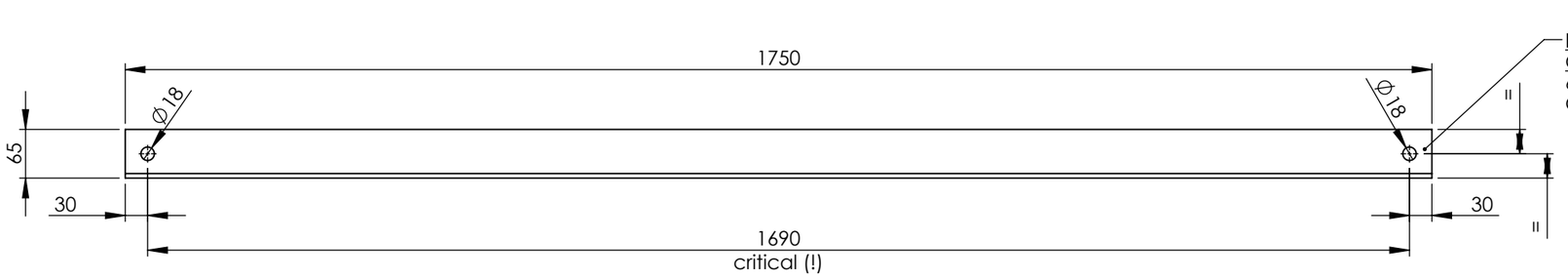
Plan bracing horizontals (Type A)
Quantity: 16
65x65x6 EA, 5.87 kg/m.
Galvanised after fabrication.



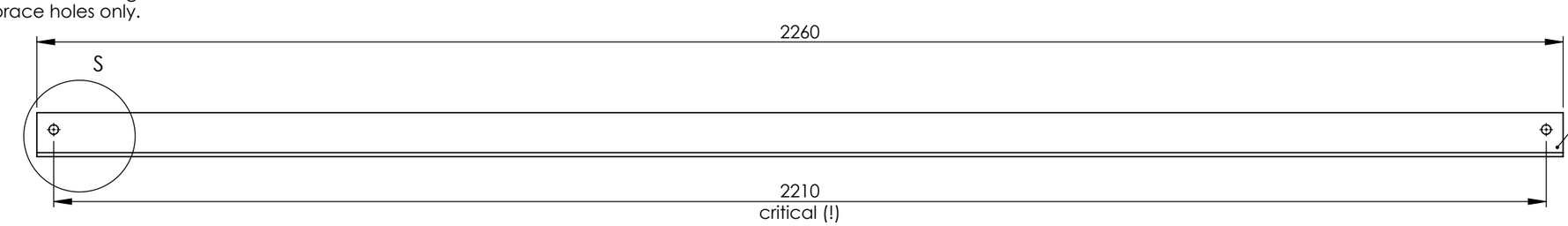
Plan bracing diagonals (Type B)
Quantity: 30
65x65x6 EA, 5.87 kg/m.
Galvanised after fabrication.



DETAIL S
SCALE 1 : 4
Note unequal hole position for hanger cross brace holes only.

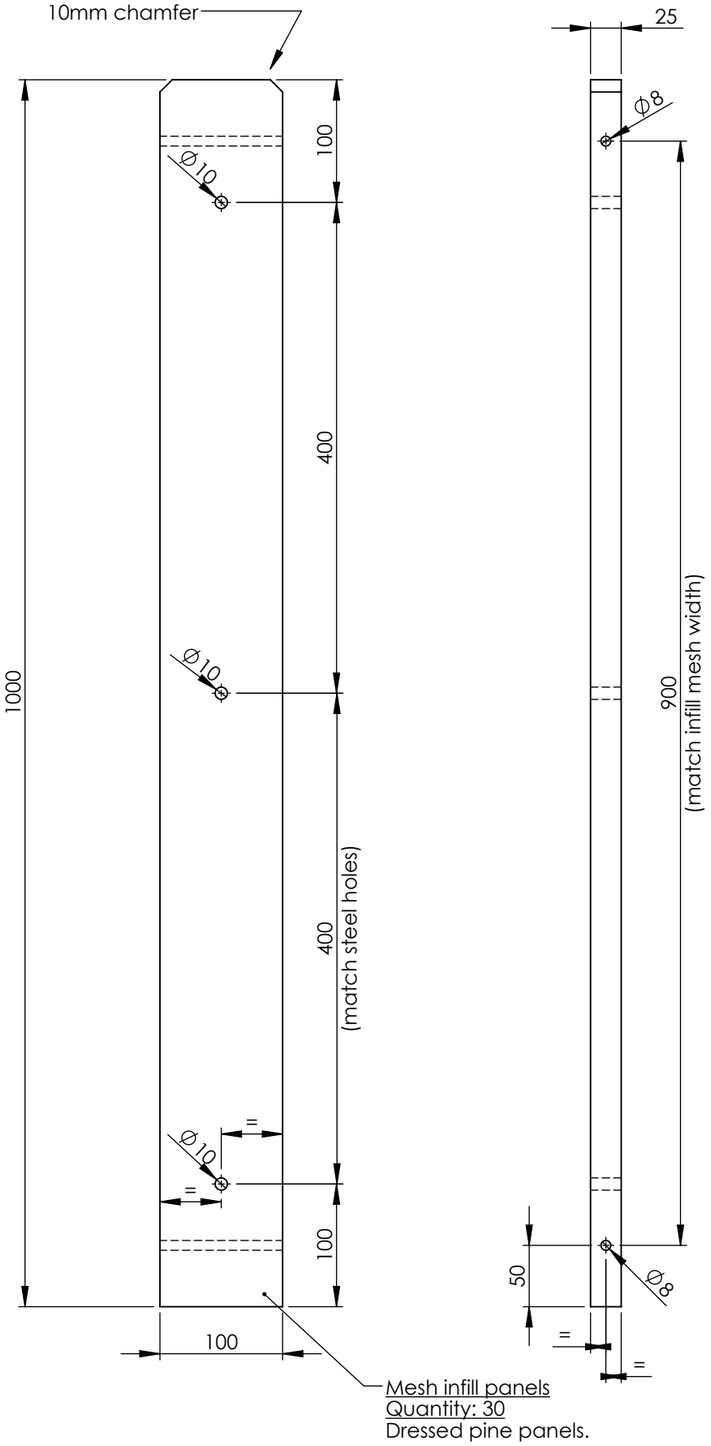


Plan bracing diagonals (Type C)
Quantity: 2
65x65x6 EA, 5.87 kg/m.
Galvanised after fabrication.



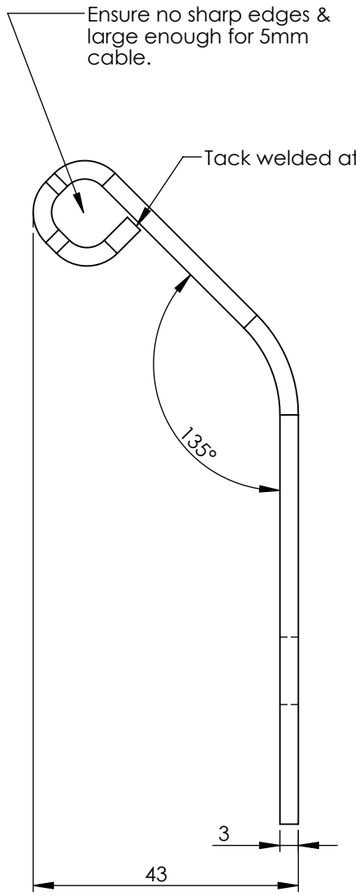
Hanger cross brace
Quantity: 2
65x65x6 EA, 5.87 kg/m.
Galvanised after fabrication.

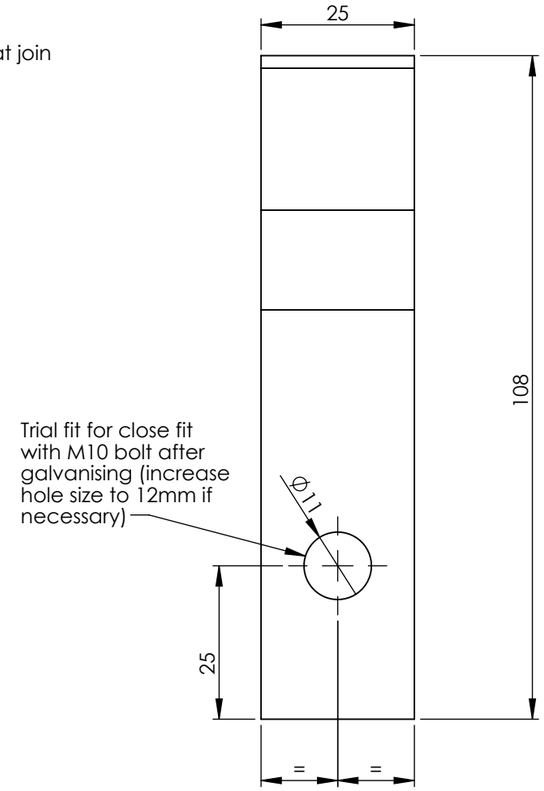
Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	Design / Drawn: DC
Project: Hugo Glenorchy Bridge	Bracing and hanger cross brace	Drawing Number: AA-1829-DWG-02-12	Checked / Date: 17/03/2025
		ABSEIL ACCESS	Approved / Scale: Various
			Status: Constr. / Revision: G



Mesh infill panels
Quantity: 30
Dressed pine panels.

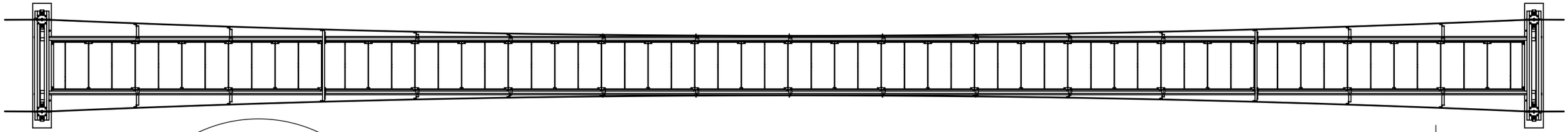
Trial fit with infill mesh & frames on site to achieve optimum gap between lower infill rail and edge of kickboard.
Ensure lower rail complies with F4AS1 safety from falling:
"Openings anywhere over the full height of the barrier shall be such a size that a 100 mm diameter sphere cannot pass through them"
Lower rail must have large enough gap to allow hand to pass through (if maintenance is required at transoms etc).

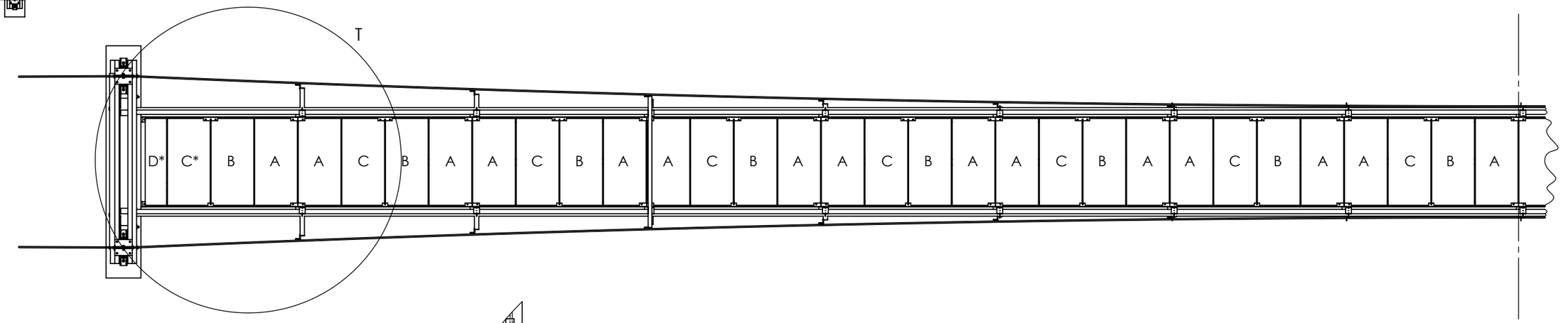


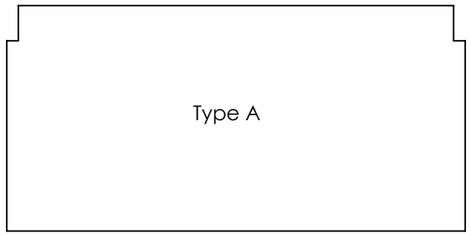


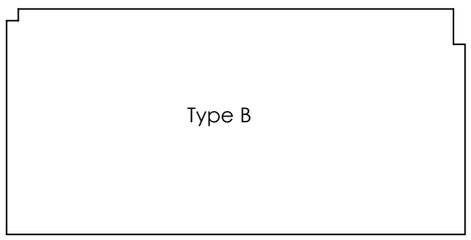
Infill clips
Quantity: 32
Galvanised after fabrication.

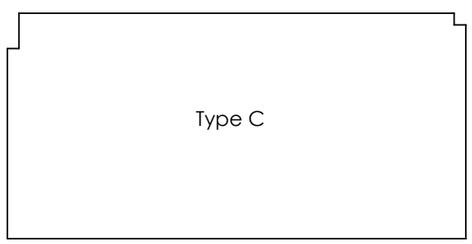
Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Infill mesh parts	Drawing Number: AA-1829-DWG-02-13		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

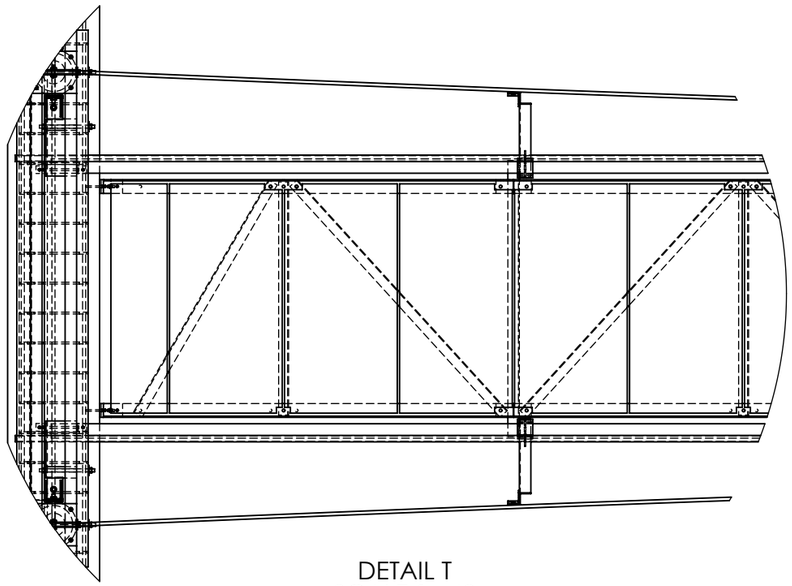




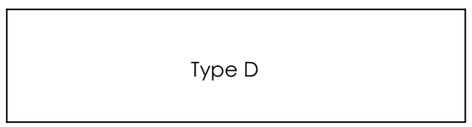








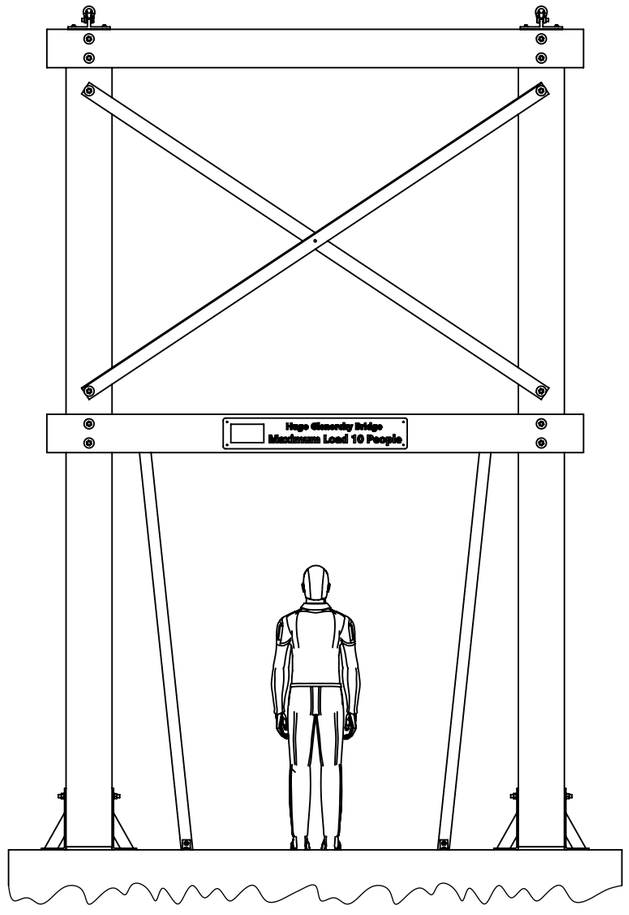
DETAIL T
SCALE 1 : 40

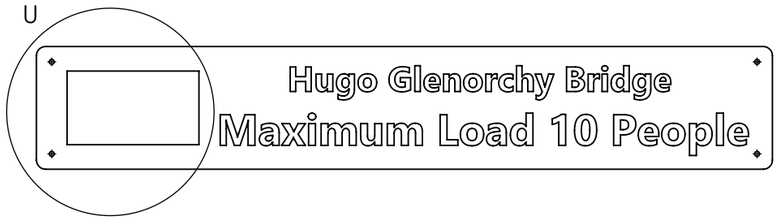


FRP Panel specifications	
Deck width	1.5m
Outer dimensions	735x1495mm
Panel depth	50mm
Holes (prior to notching)	39x19 (typical, prior to cuts)
Mesh type	Heavy duty
Colour	RAL 6010 (grass green)
Design pattern	4 per 3.0m bay

Localised notching around bracing bolt heads to be done on site.
Layout plan indicative only.
Note additional notching to typical pattern around end termination required (denoted with asterix).

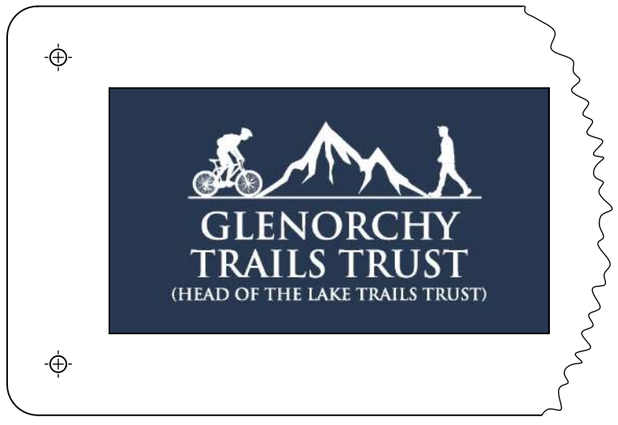
Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	FRP details	Drawing Number: AA-1829-DWG-02-14		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G





Sign Notes:

1. Background colour: RGB (40, 56, 82)
2. Text font: Segoe UI
3. Text colour: White
4. Text height: Upper = 50mm, Lower = 40mm
5. Logo image: Use high resolution glenorchy trails trust logo
6. Printed on 3-5mm composite board
7. 2 signs required
8. Install sign on tower horizontal brace
9. Fixed with 12G x 35mm 316SS Tek screws
10. Proof to be confirmed by client prior to manufacture



DETAIL U
SCALE 1 : 3

Client: Glenorchy Trails Trust	Sheet Title: Shop Drawings	Location: Buckler Burn, Glenorchy	ABSEIL ACCESS	Design	Drawn: DC
Project: Hugo Glenorchy Bridge	Load restriction sign	Drawing Number: AA-1829-DWG-02-15		Checked	Date: 17/03/2025
				Approved	Scale: Various
				Status: Constr.	Revision: G

15 Bute Street, Te Aro, Wellington
New Zealand 6011
Phone: +64 4 801 5336
Email: admin@abseilaccess.co.nz
Web: www.abseilaccess.co.nz

Reference Project

Bridge Construction

This 48m long suspension bridge across the Buckler burn at Glenorchy

Location	Buckler burn, Glenorchy
Date	June 2025
Client	Glenorchy Trails Trust
Consultant	Abseil Access design and build

The Buckler burn cuts through a narrow gorge just south of Glenorchy, nr Queenstown. The adjacent road bridge is too narrow for the pedestrians so they directly engaged Abseil Access to build an economic suspended structure for the local trail. Several options were considered including trying to utilize the old road bridge abutments.

The work included:

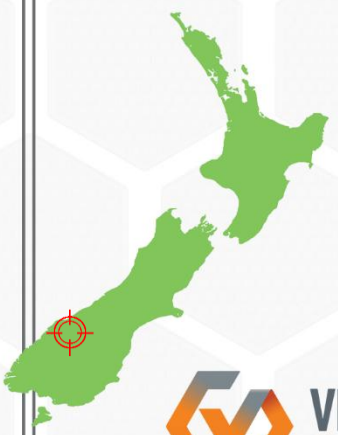
- Installation of 2 load tested rock anchors at 11m deep
- 5m deep piles under the tower foundations
- Galvanised steel rigid frames for increased deck stability
- FRP decking for alpine environment
- 10 person load capacity
- 1.5m wide deck suitable for cyclists in 2 directions

The 3 man team stayed nearby in the remote village of Glenorchy and worked through the winter to complete this build in a 6 week time frame.

Abseil Access Ltd were a pleasure to work with on the Buckler Burn suspension bridge project. Their team worked closely with the Glenorchy Trails Trust to deliver a stunning 48m bridge that met both our budget and design needs—friendly, professional, and a great result in a truly scenic location.

Steve Hewland, Chairman, Glenorchy Trails Trust

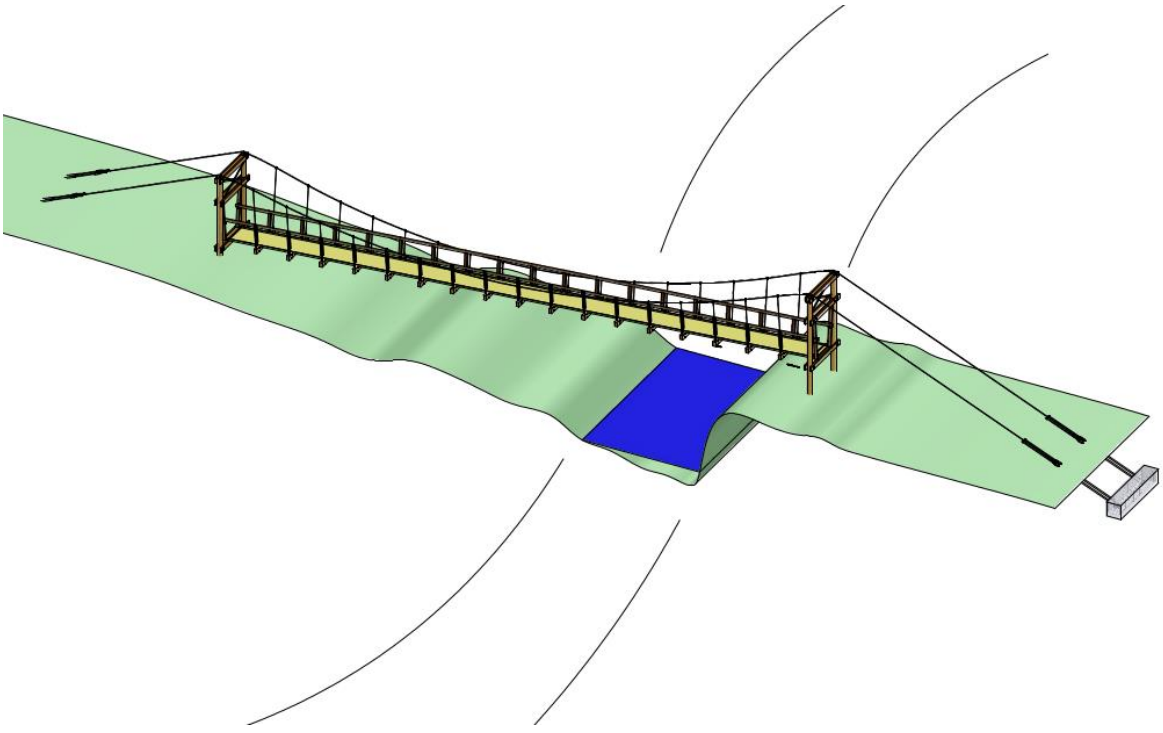
This bridge was funded by the Hugo Charitable Trust



VERTECH GROUP · VERTECH NZ · GEO OCEANS · SONOMATIC

Waitekohekohe Suspension Bridge

Construction Method Statement



Document Ref:	AA-MS-Waitekohekohe
Revision:	7
Issue Date:	11/12/24

Uncontrolled Document

Contents

1 Introduction

The construction of a 36m suspension bridge over the Waitekohekohe Stream is required as part of the new cycle trail.

Abseil Access has been engaged by Western Bay of Plenty District Council to design and build the new suspension bridge.

Project Information				
Project Name:	Waitekohekohe **bridge**	Project Number:		
HWN:				
Location of Project:	Address:	272 Thompsons Track, Aongatete – 3178		
	Legal Description	Part Section 11 Block I Aongatete SD		
	Location at Address:	Waitekohekohe stream, nr Katikati At Thompsons track Bike Park		

	Project Management	Project Supervisor	Client	Engineer
Contact	Martin Wilson	Matt Thom	Scott Parker	Simon Devoy
Company	Abseil Access	Abseil Access	Western Bay Of Plenty District Council	Gray Matter
Position	Director	Site Supervisor, H&S and Environmental management	Client	CPENG
Ph #	0274495408	027 486 4803		021 165 7028
Email	Martin.wilson@abseilaccess.co.nz			Simon.Devoy@graymatter.co.nz

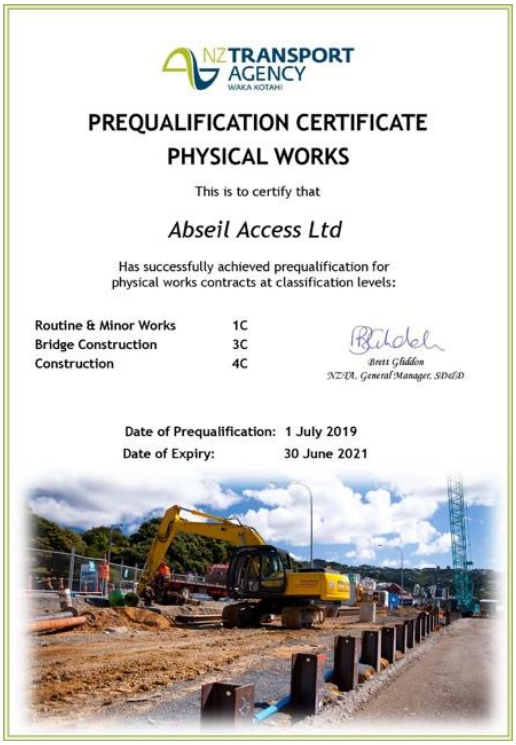
2 Scope of Work

This Scope of Work has been broken down into the below categories and specific controls and methodologies have been outlined in this document. The works will be completed by Abseil Access who are being directly engaged by Western Bay Of Plenty District Council

- Pre Works
- Site setup and clearing vegetation.
- Anchor and tower foundation installation
- Tower construction and erection
- Cable installation
- Deck Formations
- Load testing and final inspection

3 Health & safety

Abseil Access have achieved ISO 9001, 14001 and 45001 quality health and safety and environmental management systems, NZTA 1C, 3C & 4C. This is now recognised in the CHASNZ Totika system.



NZ TRANSPORT AGENCY
WAKA KOTAHI

PREQUALIFICATION CERTIFICATE
PHYSICAL WORKS

This is to certify that

Abseil Access Ltd

Has successfully achieved prequalification for physical works contracts at classification levels:

Routine & Minor Works	1C
Bridge Construction	3C
Construction	4C

Brett Gliddon
NZTA, General Manager, SD&D

Date of Prequalification: 1 July 2019
Date of Expiry: 30 June 2021

DNV

MANAGEMENT SYSTEM CERTIFICATE

Site certificate No.:
275460-2018-AE-AUS-JAS-ANZ-CC5

Valid:
15 May 2022 – 14 May 2025

Belongs to main certificate number:
275460-2018-AE-AUS-JAS-ANZ

This is to certify that the centrally implemented management system for

Abseil Access Ltd
15 Bute Street, Te Aro, Wellington, New Zealand, 6011

has been found to conform to the Environmental Management System standard:
ISO 14001:2015

This certificate is valid for the following site scope:
Management, development, research and engineering operations relating to access, maintenance, geotechnical and bridge-building services.

Place and date:
North Sydney, 11 April 2022

JAS-ANZ

For the issuing office:
DNV - Business Assurance
Level 7, 124 Walker Street, North Sydney, NSW, 2060, Australia

Yngve Amundsen
Management Representative

It is the management system of the whole organisation which is certified. The validity of this certificate depends on the validity of the main certificate.
Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.
Accreditation by the joint accreditation system of Australia and New Zealand (www.jas-anz.org/register).
ACCREDITED UNIT: DNV Business Assurance Australia Pty Limited, Level 7, 124 Walker Street, North Sydney, NSW, 2060, Australia
TEL: +61 2 9900 9500. https://www.dnv.com.au/assurance/

DNV

MANAGEMENT SYSTEM CERTIFICATE

Site certificate No.:
275461-2018-AQ-AUS-JAS-ANZ-CC5

Valid:
15 May 2022 – 14 May 2025

Belongs to main certificate number:
275461-2018-AQ-AUS-JAS-ANZ

This is to certify that the centrally implemented management system for

Abseil Access Ltd
15 Bute Street, Te Aro, Wellington, New Zealand, 6011

has been found to conform to the Quality Management System standard:
ISO 9001:2015

This certificate is valid for the following site scope:
Management, development, research and engineering operations relating to access, maintenance, geotechnical and bridge-building services.

Place and date:
North Sydney, 11 April 2022

JAS-ANZ

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DNV

MANAGEMENT SYSTEM CERTIFICATE

Site certificate No.:
275462-2018-AHSO-AUS-JAS-ANZ-CC5

Valid:
15 May 2022 – 14 May 2025

Belongs to main certificate number:
275462-2018-AHSO-AUS-JAS-ANZ

This is to certify that the centrally implemented management system for

Abseil Access Ltd
15 Bute Street, Te Aro, Wellington, New Zealand, 6011

has been found to conform to the Occupational Health and Safety Management System standard:
ISO 45001:2018

This certificate is valid for the following site scope:
Management, development, research and engineering operations relating to access, maintenance, geotechnical and bridge-building services.

Place and date:
North Sydney, 11 April 2022

JAS-ANZ

For the issuing office:
DNV - Business Assurance
Level 7, 124 Walker Street, North Sydney, NSW, 2060, Australia

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TEL:+61 2 9900 9500. https://www.dnv.com.au/assurance/

A Site-Specific Safety Plan will be developed prior to works starting and submitted WBOPDC for review. The safety plan is to include safe work method statements for any high-risk activities and a site-specific hazard register for bridge building activities.

Daily toolbox meetings will be held, and minutes kept.

All workers will complete a site induction. New workers, visitors and subcontractors will need to complete a site induction and sign on to the safety plan.

Subcontractors: these firms will have to complete the AA subcontractor assessment and follow SSSP procedures.

Expected subcontractors:

- Concrete Supplier & Pumpers
- Various delivery trucks and digger contractor

3.1.1 Covid Management

A specific Covid Management Plan will be implemented prior to the works to reflect the current government guidelines on management of work sites. Due to the changing nature of Covid-19 and government guidelines and specific plan will be prepared close to the anticipated start date and submitted to the client for review.

4 Construction site management

- Work hours:

7.30am to 5pm on week days. 8.30am to 5pm on weekends

- Programme:

Stage 1: Foundations December 2024

Stage 2: Superstructure: cable and deck installed February 2025

- Rubbish:

All rubbish materials to be stored in wind proof container and removed daily from site

- Noise management:

Noisy activities (eg digger operation, concrete pumping and truck deliveries) to be done between 8am and 5pm weekdays.

- Management of public

Access to the adjacent tracks is to be maintained at all times. 'Danger Construction site' sign to be installed at the boundary. Security cameras and warning signs installed.

- Dust mitigation:

Spoil piles to be covered or kept damp on dry windy days. All sawdust piles to be cleared immediately.

- Weather checking:

Daily weather check to be conducted and the daily/weekly activities adjusted to suit. Monitor for dry windy days, heavy rain fall, high wind, stream water levels.

- Vegetation:

No vegetation to be cut without permission. Tawa tree identified in the site report may need to be removed if required for optimum bridge alignment.

Following bridge construction disestablishment, WBOPDC staff will assess and revegetate if required (with complimentary native species), the bridge and approaches construction area within the 2025 planting season.

- Spill mitigation and contingency:

Refuelling of machinery to only take place in the designated area away from the stream and vegetation.

Spill kit to be on hand at all times in the event of hydraulic or diesel line breakage

- Machinery Hygiene

Machinery, vehicles and tools must be clean and free of dirt or mud prior to arrival on site. All visible plant debris must be cleaned of with high pressure blasting.

- Mitigation of flood damage

Weather check to be done daily to predict any possible high-water event through the site. No machinery, fuels or oils or construction materials to be used or stored in the flood zone (on this site within 8m of the riverbanks). Exclusion zone marked. Silt fences to be positioned above the flood line to prevent damage by high waters.

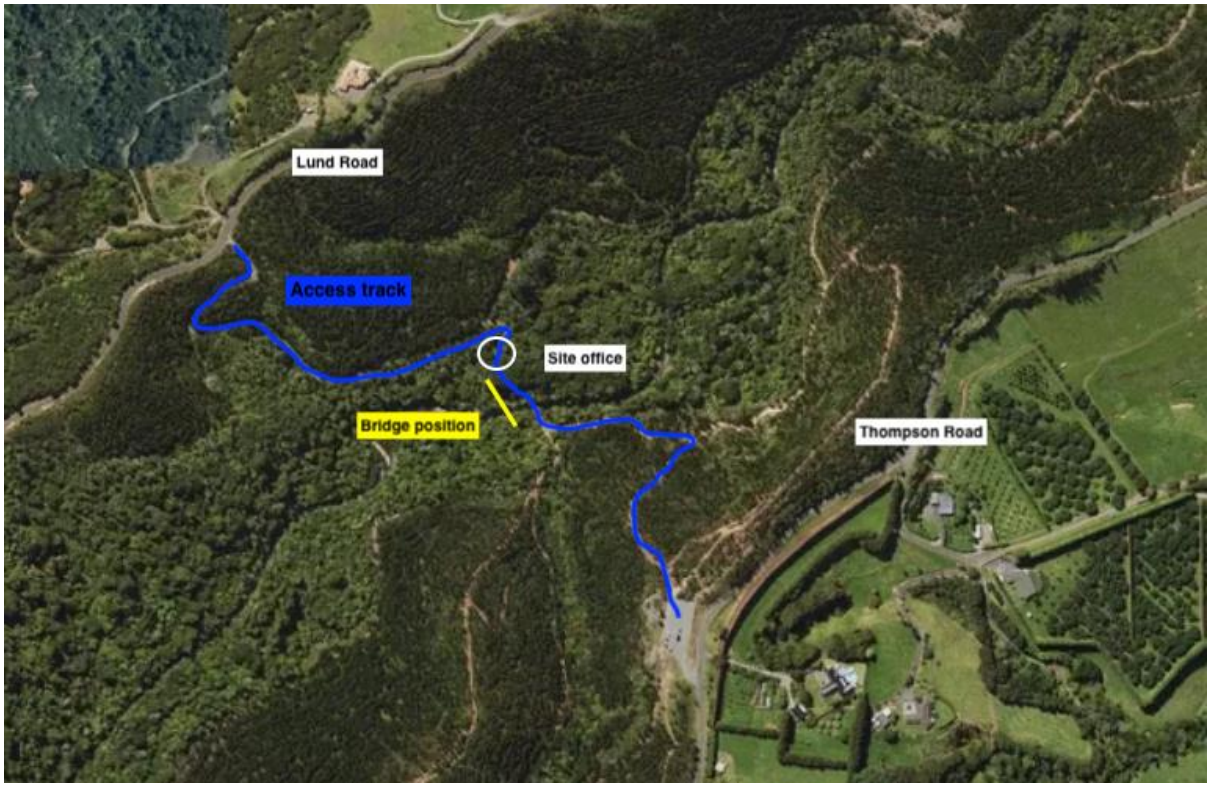
5 Site Setup

5.1 Site access

The bridge site can be access by either side by foot or small 4wd vehicles. The TL side is the easier access side.

Site office and site induction station will be positioned on the True Left side forestry road at the junction/bend near the bridge. Road will not be blocked

Signs will be posted warning pedestrians and other users about the construction site. There is no need to close any tracks



5.2 Traffic Management Requirements

5.2.1 Overview & site access

Traffic management is not required on nearby roads. There will be off road parking. All site vehicles and delivery vehicles will pass through the locked gate at Lund road and terminate at the site office.

5.2.2 Materials drop-off

During delivery of materials to site a medium size hi-ab truck will be required to lift off materials. The truck will stay on the formed roads. Materials will be carried to site manually.

5.2.3 Concrete delivery

We intend to use small concrete trucks (mini mixers) to reduce the width of track and damage to side vegetation. If the truck cannot reach the excavations then the concrete will be transported on the last section by wheel barrow. To get the concrete to the opposite side we will use a concrete pump truck.

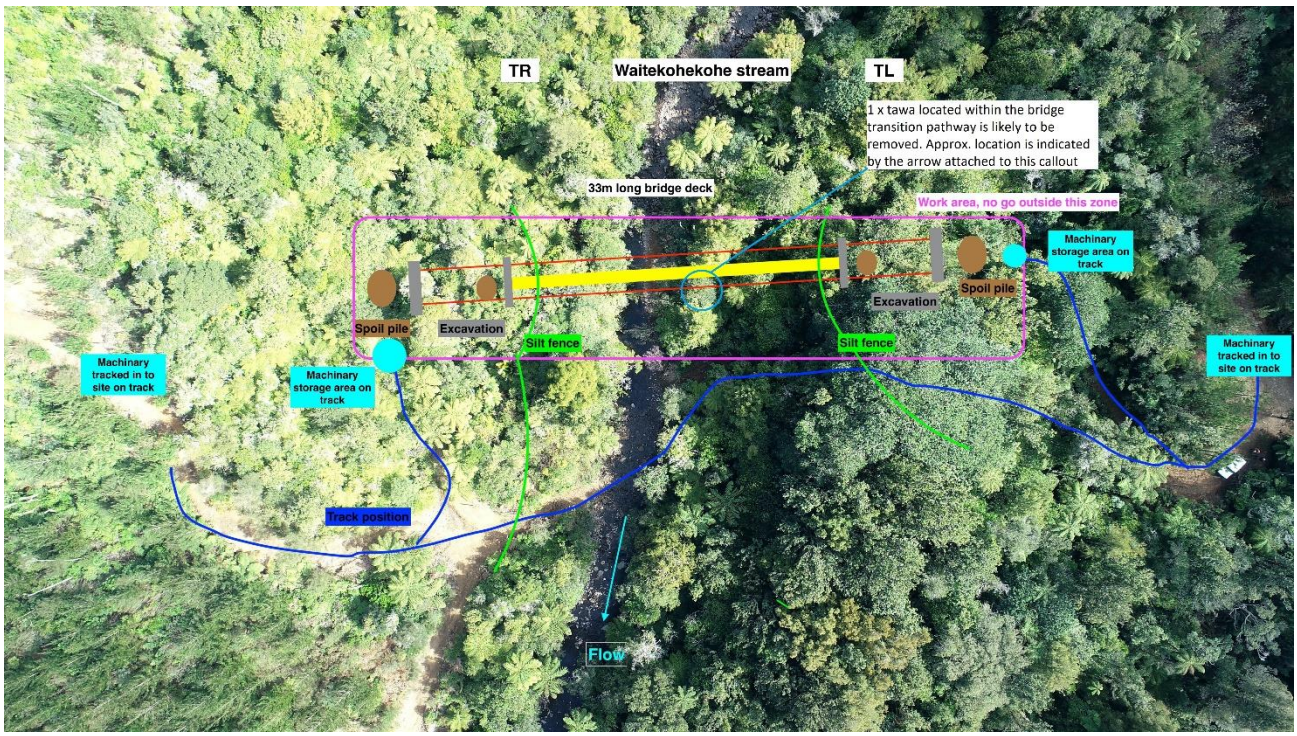
If getting a concrete truck to site is too difficult we can also hand mix from certified pre-mix bags.

5.2.4 Site Layout

Site perimeter will be clearly marked with Danger No Access tape. This will also define the work area and the no-go areas.

Bridge position will be adjusted for minimal damage to significant vegetation. Final location will be decided with client.

6 Erosion and Sediment Control Plan (E&SCP). Tower and anchor excavations.



6.1 Underground Services checks

A service check is to be completed prior to excavations for all four areas to be excavated. No known services are in this area.

6.2 Excavation method

All excavation will be completed using a 1.7t tracked excavator. The excavator is to follow the formed track to the excavation sites to limit disturbance to the area. There will be no access required to the river. Four areas are to be excavated to a maximum depth of 1.8 meters. All spoil is to be stored beside excavation on the non-river side, all spoil will then be used at backfill and ballast on the anchor blocks. Back fill be compacted to reduce future erosion.

Clearance for the digger will be minimised and will be approximately as shown in the drawings. Some vegetation in the construction area may be cut down for access and safe use of the bridge in the future.

Having built 101 bridges so far, many of which were in National Parks for DoC we are experts at minimal damage to the vegetation.

Excavation QA:

Verification Criteria: The number of blows per 100 mm depth of penetration below the underside of the proposed footing at each test site must meet the following criteria:

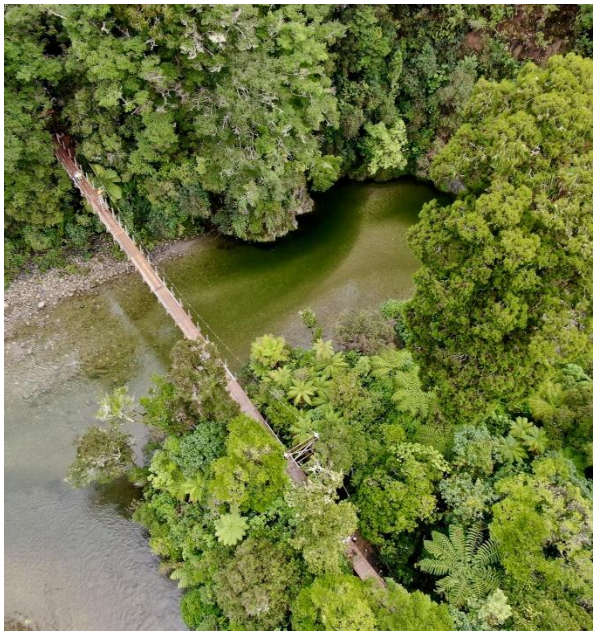
- Five blows down to a depth equal to twice the width of the widest footing below the underside of the proposed footing.
- Three blows at greater depths.
- If the set blow count is relatively uniform, the number of blows per 100 mm may be averaged for depths not exceeding 300 mm.

Shear Vane Testing

Dacite and Andecite rock generally weathers to a clay, if clay is encountered at the bridge site then shear vane testing to NZGS guidelines should be completed in place of or in addition to DCP testing.

Design Parameters

No test data is available at the time of writing. The design will assume 'Good Ground' to NZS3604 cl 3.1, which gives a maximum reliable bearing capacity of 100kPa.



Pakuratahi bridge (90m) built by us in the Kaitoke Regional Park with minimal damage to vegetation

6.3 Control of runoff from spoil piles, sediment control plan.

1. Waterways: Silt fences are to be installed around the excavation areas such that they prevent the flow of silt into the waterways. Location to be discussed on site in order to position fences in the silt flow areas. Fences are to be made from silt cloth and star pickets. Follow construction guidelines in the appendix. The bottom edge of the silt fence is to be dug in or buried 200mm. Temporary silt socks 200mm deep are to be used around spoil pile from anchor blocks and tower foundations.
2. Silt fences to be cleared periodically or if they appear to be maxing out. Silt to be taken off site.
3. No excavation to happen during wet weather.
4. Minimal vegetation to be removed - see aerial plan
5. 'No Go area' to be observed in order to reduce surrounding vegetation damage
6. No Clean fill on site without prior planning
7. All spoil piles to be covered each night in case of rain. Spoil pile locations indicated on the sediment management plan. Spoil piles positioned such that run off returns to the excavation.
8. In the event of a heavy rain forecast return the spoil to the excavation hole and compact down. Cover with tarp. Check run off direction is not directly toward waterways.
9. No discharge of dirty water or run off into the Waitkohekohe stream.
10. Erosion and Sediment control plan and site environmental protection to be checked every morning before work starts and during any new excavations. Note changes or improvements on the daily toolbox form.

11. Matt Thom to be responsible for environmental management operations and maintenance and all sediment control structures.
12. Concrete spill. When pumping and pouring wet concrete precautions should be in place for the immediate reactive management to spills. Grout socks are required to immediately contain the spill and prevent it spreading. Excess concrete should be removed from site.

6.4 Reinstatement of disturbed ground

All ground that has been cleared will be reinstated by planting or sowing at the discretion of the client as stated at Section 4 Vegetation. Ground reinstatement is to be done as soon as the bridge is constructed and further site work is minimised. The timing of any re-planting will best suit the specific native species but generally between May to June 2025.

Excavation summary:

Excavation	Volume	Distance from riverbed	comments
True right Deadman trench	5m3	25m+	Area: 4m long 1m wide
True right tower pad	2m3	10m+	Area: 2 x 60mm diameter holes
True left tower pad	2m3	10m+	Area: 2 x 60mm diameter holes
True left Deadman trench	5m3	25m+	Area: 4m long 1m wide

7 Approach track (TL&TR)

Approach tracks will be built by others.

8 Tower Erection and Main Cable installation

8.1 Tower Erection

The towers will be assembled on site in a horizontal orientation. Tower and digger will then be flown to site via helicopter.

Towers are to be raised using a combination of lifting with the excavator and then winching up to vertical. The tower feet are to be restrained on the pad then the top is to be lifted to the extents of the small excavator. Once raised to this height the rest of the lift is to be done using 2 winches attached to the opposite side anchors and the top of the towers.

Winch cables are to remain on place holding the tower until the towers are secured by the main bridge cables.

8.2 Main Cable Installation

The main cables are to be lifted into place after the towers are erected using ropes and pulleys.

9 Deck Construction

The deck will be built out from either end in stages using fall arrest lines and harnesses once towers and main cables have been secured.

All persons working at height must be trained and competent and rope access techniques may be required for work in the tower structure or for accessing the main cables.

10 Quality Assurance

Item	QA
Timber	Tanalising certs
Galvanising on plate and brace	Dry Film Thickness measurements
Geotech Bearing capacity	DCP test following excavation
Concrete	Mix certs
Main Cables	Mill Certs

11 Load test

The bridge will be load tested once completed using waterbags and bulk containers filled with water pumped from the river. It is expected to take approx. 4 hrs.

After load test has been completed the bridge deck height can be adjusted to its final position and engineer can complete final inspection.

12 Refuelling

No storage, refuelling or servicing of machinery in locations which could lead to a spill to the watercourse.

Spill management:

A spill kit is required to be always on site. Diggers and hydraulic machinery shall be monitored at all times for hydraulic oil leaks.

13 Construction Duration

The construction will be delivered in 2024 and this bridge build is estimated at five weeks on site.

14 Completion

All construction materials will be removed from site and a sweep of the greater area will be done to ensure nothing is left behind.

15 Heritage Archaeological Findings

Should we discover any archaeological objects, we will comply with the Heritage New Zealand act 2014. We will stop work as required and inform the local authorities of the findings.

16 Appendix

16.1 Silt Fences: design and construction criteria

The following points are design essentials:

- Make sure that the silt fence height is 600 mm above ground level.
- Apply the maximum slope lengths and spacing of returns and angles given in Silt fence design criteria table.
- If there is a change in slope, no section of the fence should exceed a grade of 5% for more than 15 m.
- Put supporting posts/waratahs for silt fences 2–4 m apart, and use tensioned wire (2.5 mm HT) for support along the top.
- If you are using a strong woven fabric with a wire support, the distance between posts can be up to 4 m. Double the silt fence fabric over and fasten it to the wire with silt fence clips, 500 mm apart.
- Embed supporting posts/waratahs at least 400 mm into the ground.
- Always install silt fences along the contour (at a break in slope). If this is not possible, or if there are long sections of silt fence, install short silt fence returns projecting upslope from the silt fence to minimise the concentration of flows. Silt fence returns should be at least 2 m long and can incorporate a tie back. You usually make them by continuing the silt fence around the return and doubling back, to eliminate joins.
- Join lengths of silt fence by doubling over fabric ends around a waratah or by stapling the fabric ends to a batten and butting the two battens together.
- Install silt fence returns at either end of the fence, projecting upslope high enough to prevent outflanking.
- If the catchment is over 0.3 ha, you need to consider whether a silt fence works well enough for that site. A different control measure may be better, e.g. a super silt fence.

Battens joining silt fence fabric ends (Source: Southern Skies).

Doubling the fabric over at the end around the waratah (Source: Southern Skies).

Contours create the same effect as returns in this case; in other situations ensure returns are installed (Source: Southern Skies).

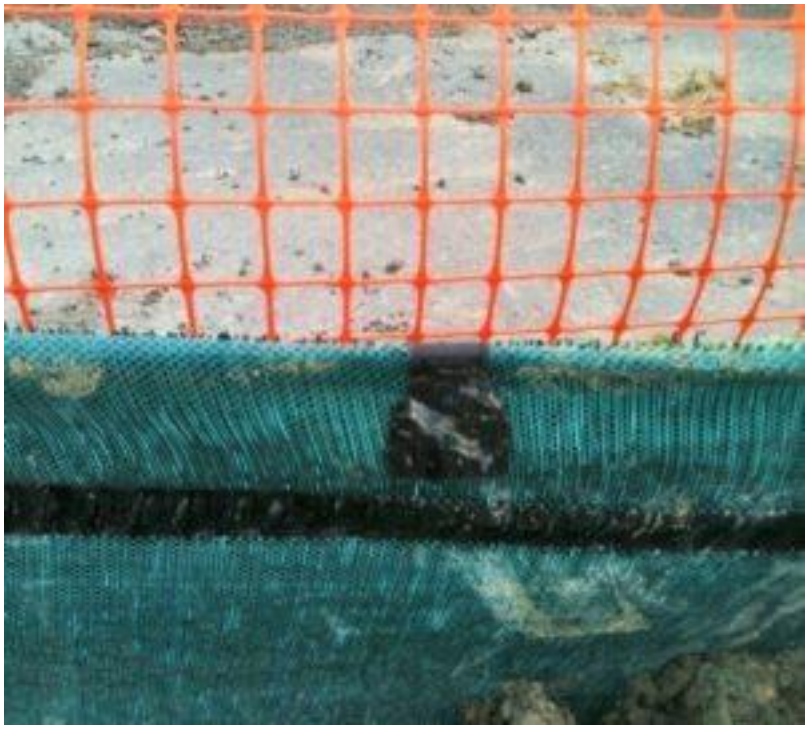
Silt fence design criteria table

Slope steepness	Slope length (m) (maximum)	Spacing of returns (m)	Silt fence length (m) (maximum)
Flatter than 2%	Unlimited	N/A	Unlimited
2–10%	40	60	300
10–20%	30	50	230
20–33%	20	40	150
33–50%	15	30	75
>50%	6	20	40

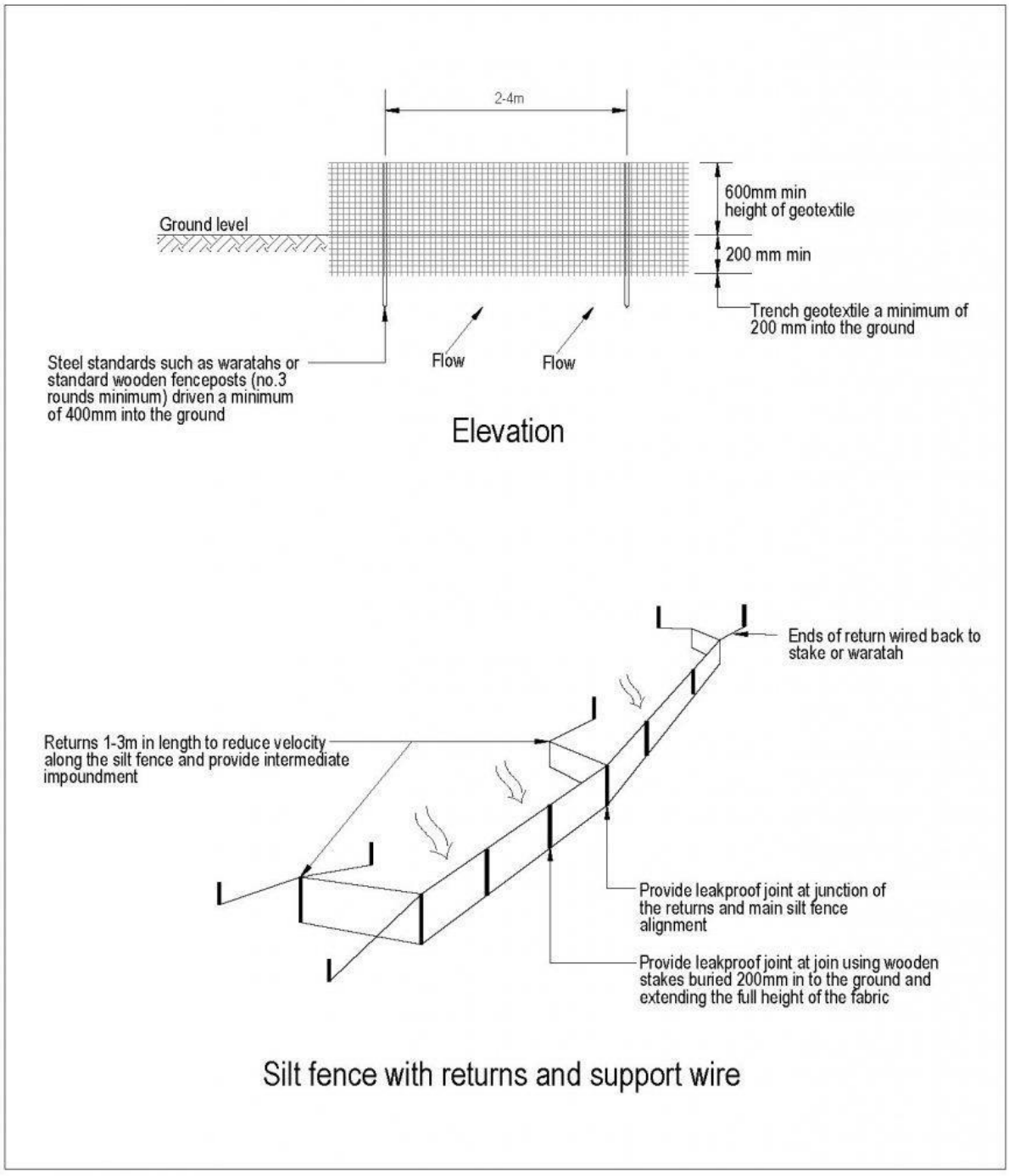
- If water might pond regularly behind the silt fence, give the fence extra support with tie backs from the silt fence to a central stable point on the upward side. You can also string wire between the support stakes and connect the filter fabric to this wire.
- As a minimum, the silt fence cloth must meet the following criteria for geotextile fabric:
    - Grab tensile strength: >440N (ASTM D4632)
    - Tensile modulus: 0.140 pa (minimum)
    - Apparent opening Size: 0.1–0.5 mm (ASTM D4751).

Construction and operation of silt fences

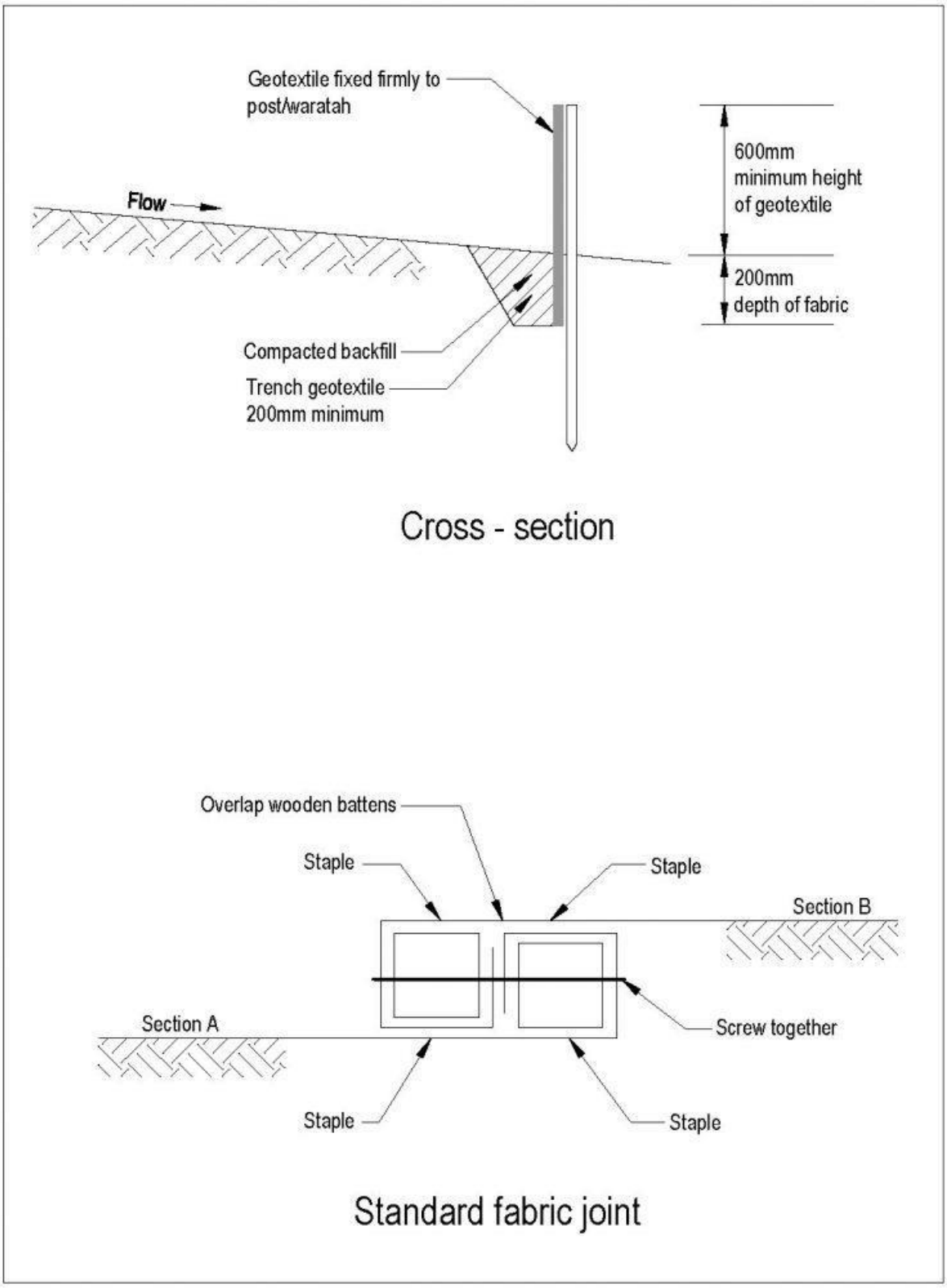
- Use silt fence material appropriate to the site conditions and according to the manufacturer's specifications.
- Always install silt fences along the contour.
- Excavate a trench at least 100 mm wide and 200 mm deep along the proposed line of the silt fence.
- Use waratahs at least 1.5 m long.
- Install the support waratahs on the **downslope edge of the trench** and silt fence fabric on the **upslope side of the support waratahs** to the full depth of the trench. Then backfill the trench with compacted soil.
- **Install the waratahs so that they are as flat as possible against the silt fence.** If the waratah edge is against the silt fence, it will rub and eventually rip against the waratah.
- Use the right silt fence clips to secure the fence material to the top wire. Don't use wire ties and staples because these rip the material if the weight of the impounded water pushes against it.
- Reinforce the top of the silt fence fabric with a support made of high tensile 2.5 mm diameter galvanised wire. Tension the wire using permanent wire strainers attached to angled waratahs at the end of the silt fence.
- Where the ends of silt fence fabric come together, make sure that they are overlapped, folded, and stapled or screwed to stop sediment bypass.



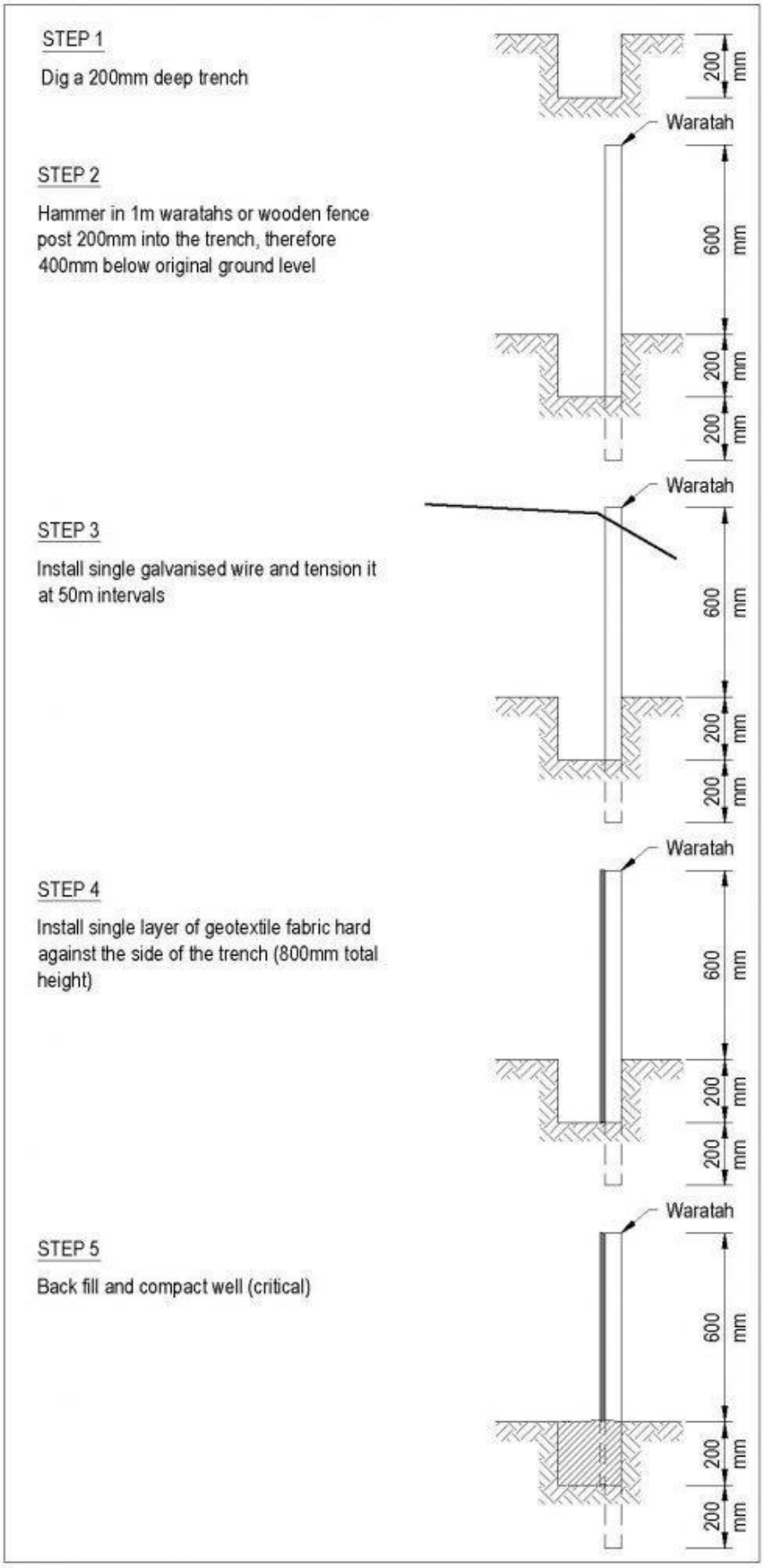
Silt fence correctly secured to the top wire using silt fence clips (Source: Southern Skies).



Schematic of silt fence construction, showing returns and support wires.

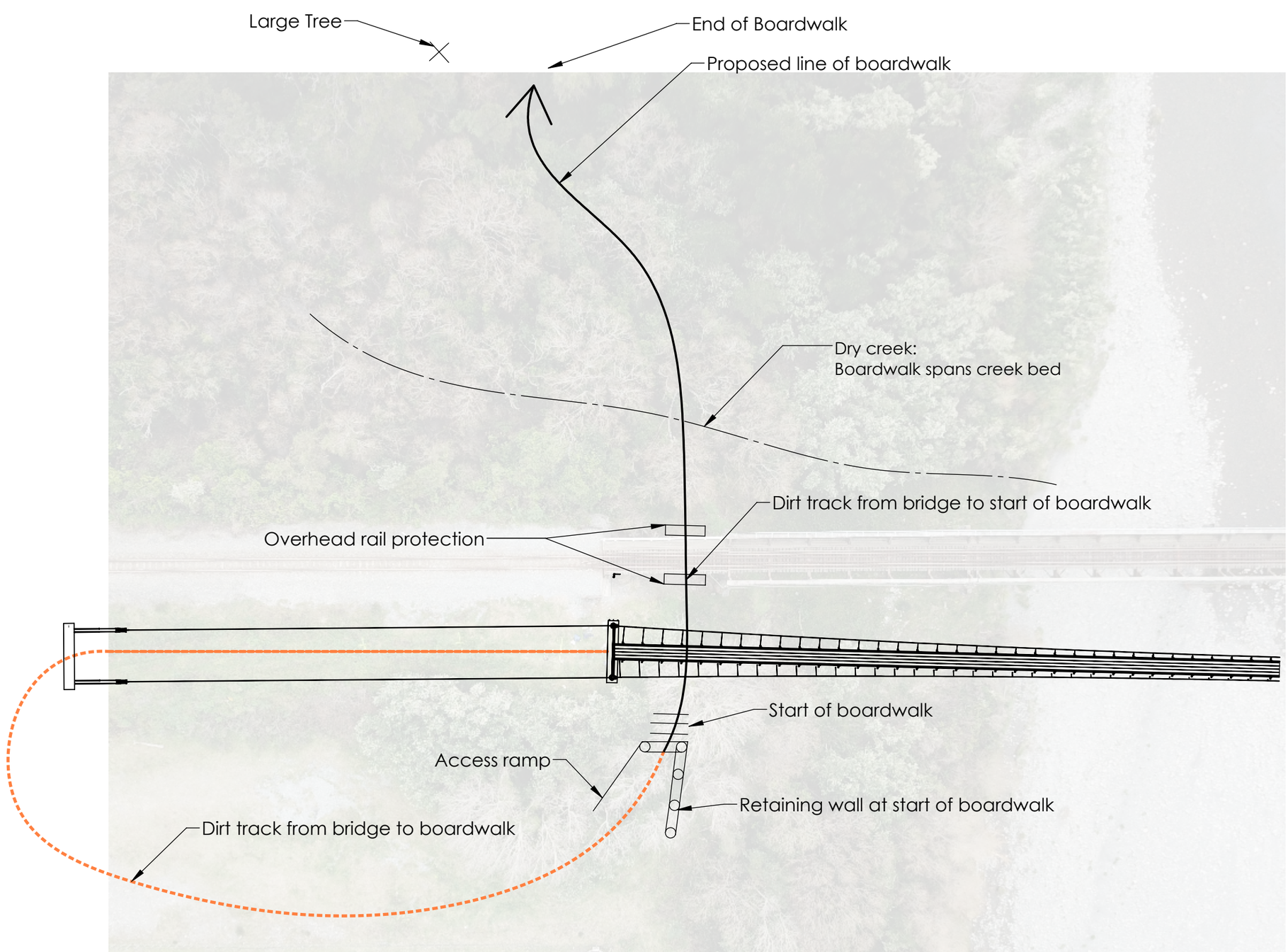


Silt fence cross section and fabric joint.


STEP 1
Dig a 200mm deep trench
200 mm
Waratah
STEP 2
Hammer in 1m waratahs or wooden fence post 200mm into the trench, therefore 400mm below original ground level
600 mm
200 mm
200 mm
Waratah
STEP 3
Install single galvanised wire and tension it at 50m intervals
600 mm
200 mm
200 mm
Waratah
STEP 4
Install single layer of geotextile fabric hard against the side of the trench (800mm total height)
600 mm
200 mm
200 mm
Waratah
STEP 5
Back fill and compact well (critical)
600 mm
200 mm
200 mm


Wichelube Stream Bridge 2025
10 Person Load Limit

Appendix G – Example Timber Bridge Crossings



True Right

ABSEIL ACCESS
CIVIL · INFRASTRUCTURE · ENVIRONMENTAL

Location
Tauherenikau River

Project
Tauherenikau Cycle Bridge

Client
Greytown Trails Trust

Engineer
Malcolm Nielsen

Sheet Title
Boardwalk Drawings
Design Overview

Design	MW	Scale	1:420
Drawing	SG/DC	Date	21/06/2021
Checked		Status	Design Review
Approved			

Drawing Number
AA-1283-DWG-06-1

Revision
G

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Location
Tauherenikau River

Project
Tauherenikau Cycle Bridge

Client
Greytown Trails Trust

Engineer
Malcolm Nielsen

Sheet Title
Boardwalk Drawings
3D Model

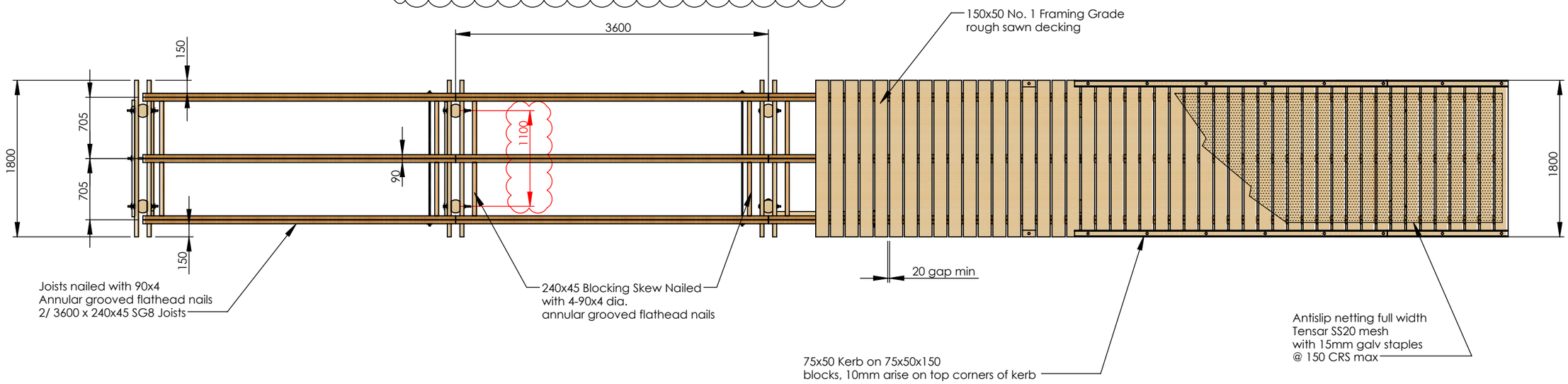
Design	MW	Scale	-
Drawing	SG/DC	Date	21/06/2021
Checked		Status	Design Review
Approved			

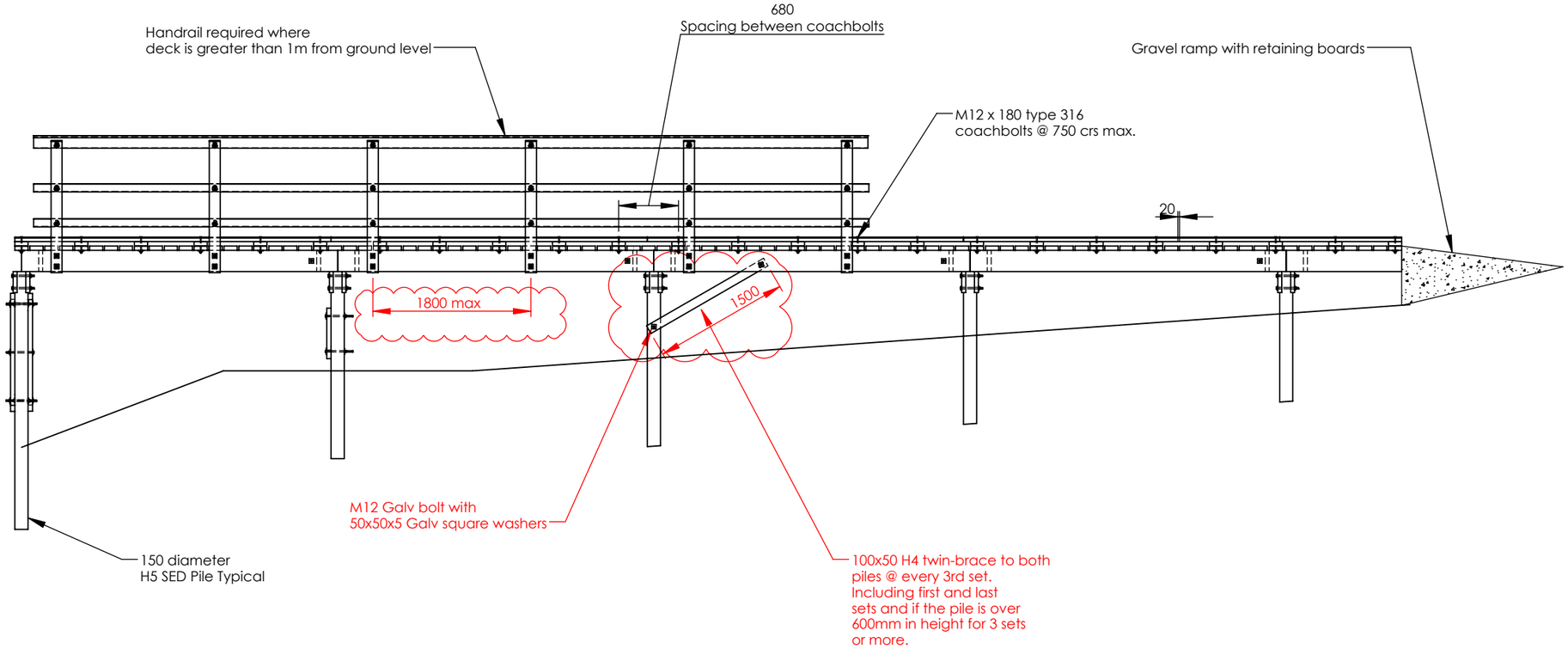
Drawing Number
AA-1283-DWG-06-2

Revision
G

Elements cut away to show foundations

2400 Crs maximum if 1.7T digger is used to drive piles from the boardwalk
3600 Crs maximum if 1.7T digger is used to drive piles from the ground





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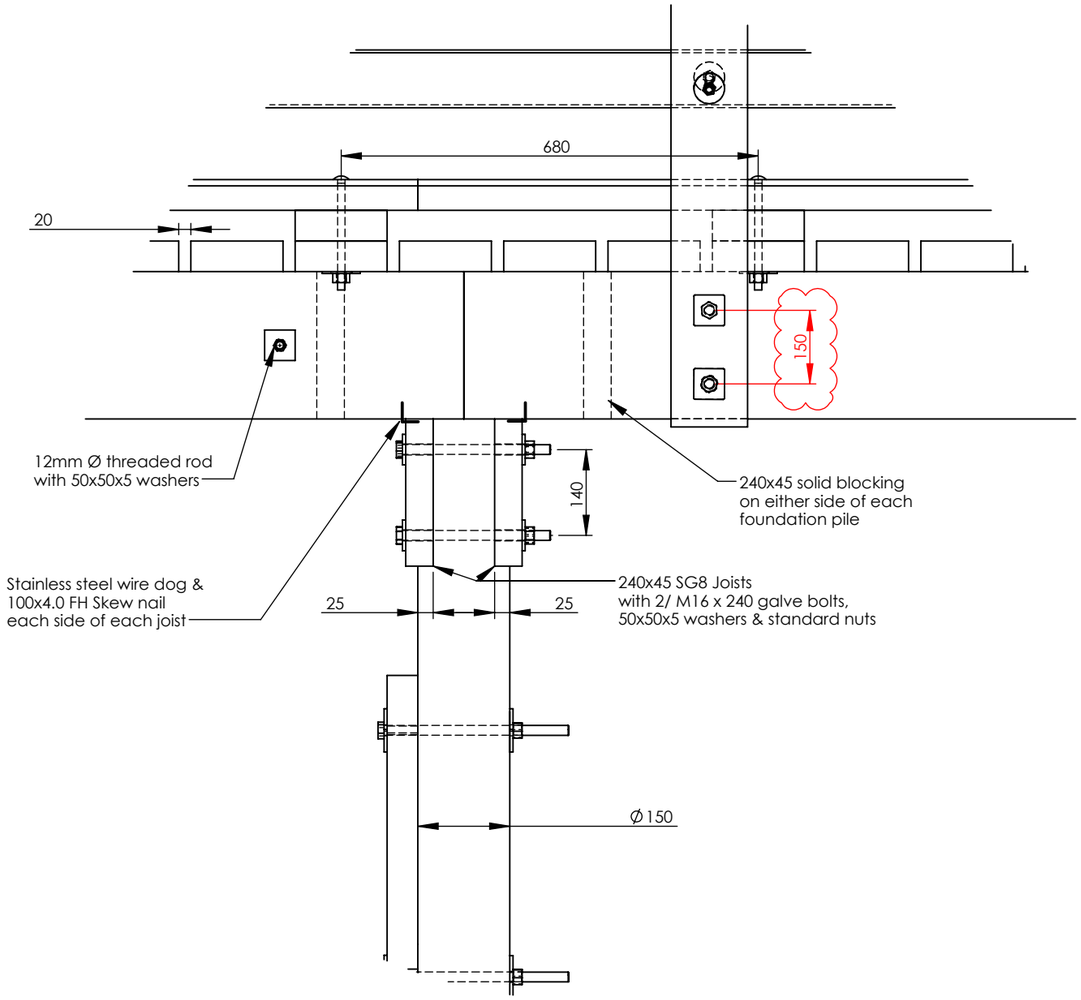
Location	Tauherenikau River
Project	Tauherenikau Cycle Bridge
Client	Greytown Trails Trust
Engineer	Malcolm Nielsen
Sheet Title	Boardwalk Drawings
	Top & Side Elevation

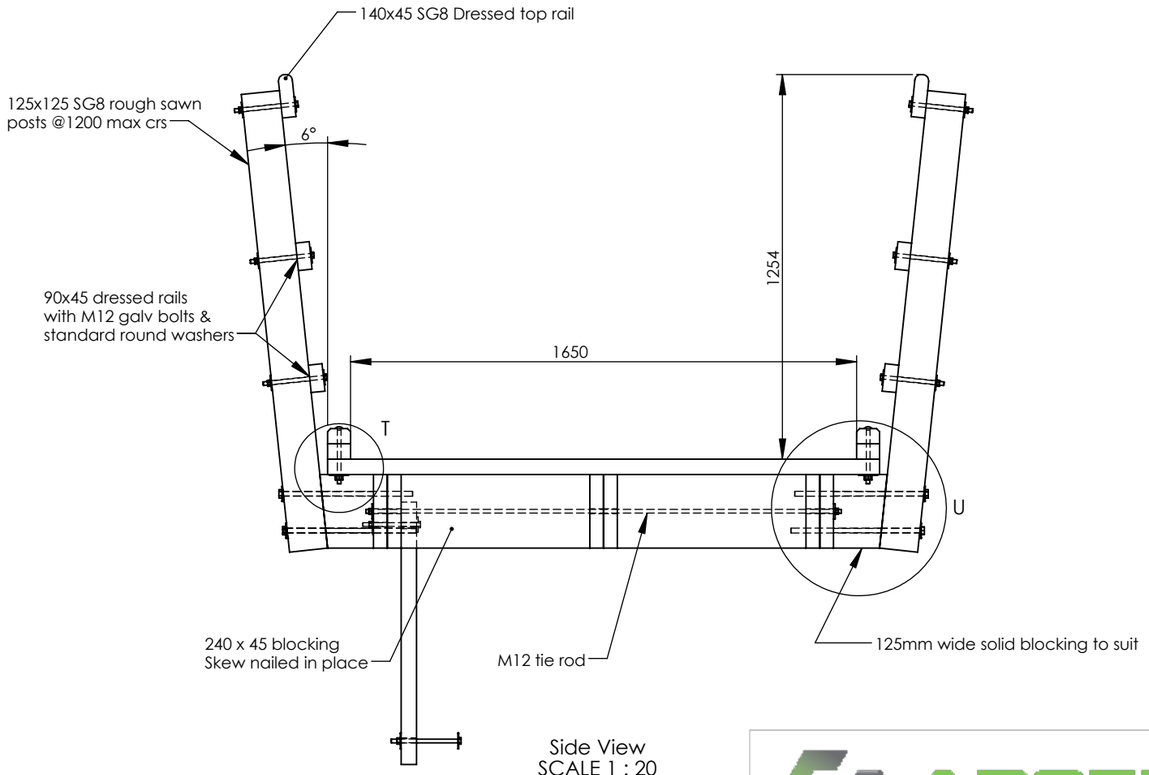
Design	MW	Scale	1:50
Drawing	SG/DC	Date	21/06/2021
Checked		Status	Design Review
Approved			

Drawing Number	Revision
AA-1283-DWG-06-3	G

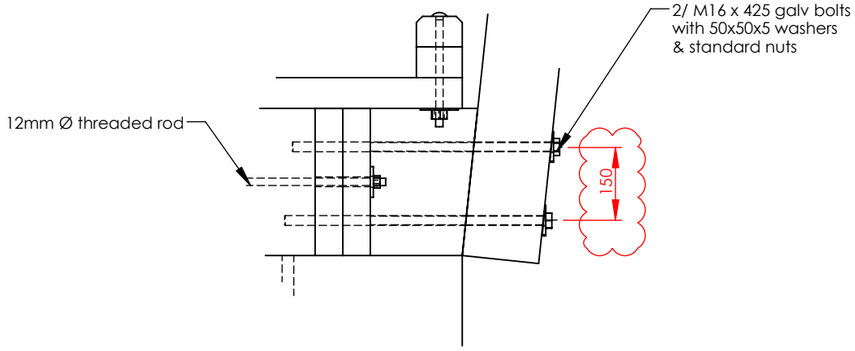


Foundations
SCALE 1 : 10

DETAIL T
SCALE1 : 5



Side View
SCALE 1 : 20



DETAIL U
SCALE 1 : 10

Note: Handrail required only when the height
of the deck exceeds 1m from the ground

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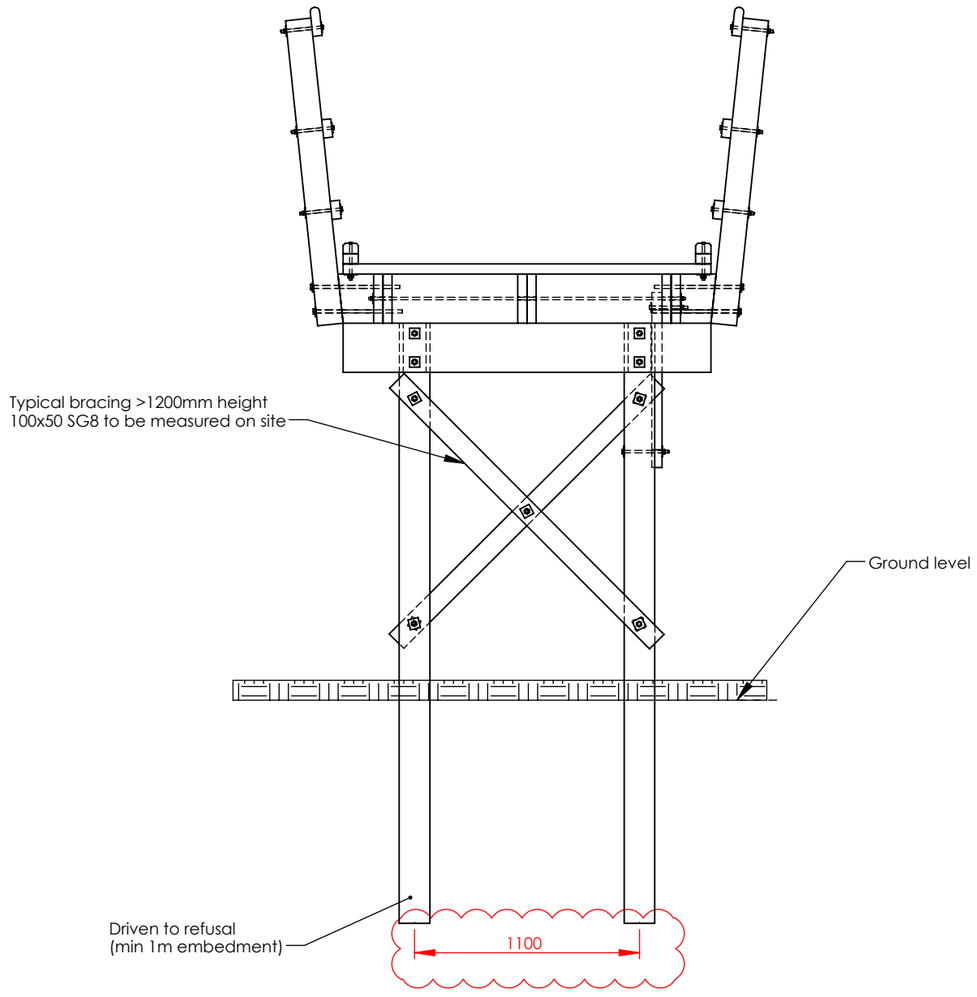
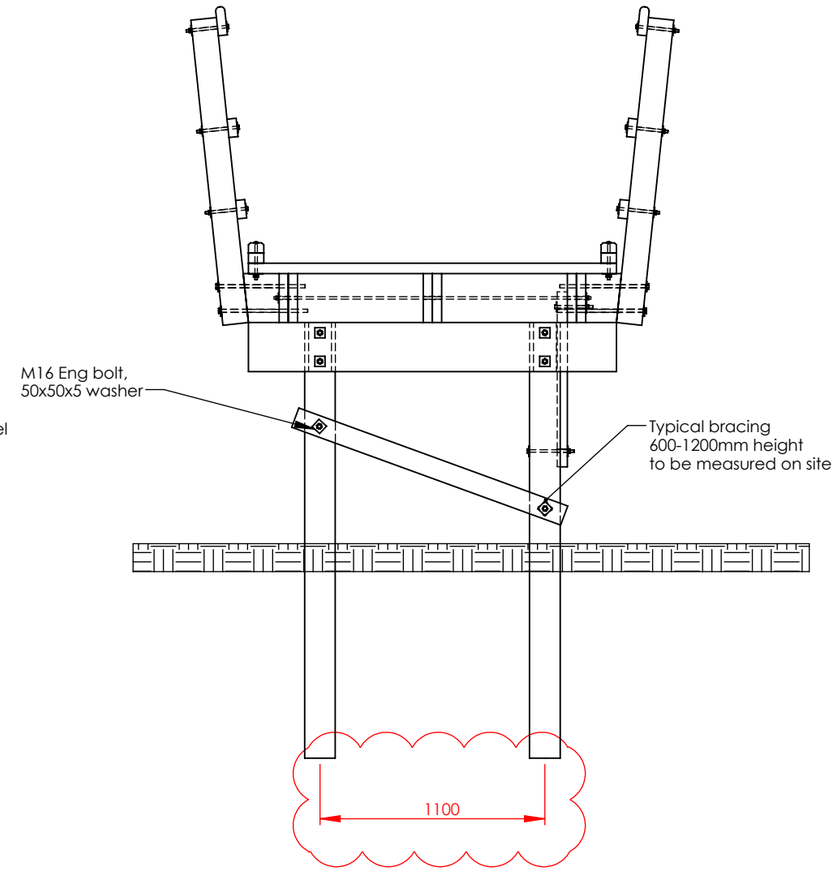
CIVIL · INFRASTRUCTURE · ENVIRONMENTAL

Location	Tauherenikau River
Project	Tauherenikau Cycle Bridge
Client	Greytown Trails Trust
Engineer	Malcolm Nielsen
Sheet Title	Boardwalk Drawings
	Section details

Design	MW	Scale	1:50
Drawing	SG/DC	Date	21/06/2021
Checked		Status	Design Review
Approved			

Drawing Number	Revision
AA-1283-DWG-06-4	G





ABSEIL ACCESS
CIVIL · INFRASTRUCTURE · ENVIRONMENTAL

Location
Tauherenikau River

Project
Tauherenikau Cycle Bridge

Client
Greytown Trails Trust

Engineer
Malcolm Nielsen

Sheet Title
Boardwalk Drawings

Bracing Alternatives

Design	MW	Scale	1:50
Drawing	SG/DC	Date	21/06/2021
Checked		Status	Design Review
Approved			

Drawing Number	Revision
AA-1283-DWG-06-5	G