Site Specific Environmental Management Plan

– Peka Peka to Ōtaki Project

SSEMP BR01: Waitohu Stream Bridge (Bridge 1)

Stage One

FCCL-EV-MPN-0045

September 2018 – Rev C

NZ TRANSPORT AGENCY WAKA KOTAHI
Peka Peka to Ōtaki Expressway
New Zealand Government

Contents

AUTHORISATION AND REVISION RECORD

Revision	Status	Author	Date	Description
A	Draft	Alice Naylor	16/08/18	Draft For Review
A.1	Draft	Alice Naylor	06/09/18	Updated following PA review
B	For Review	Alice Naylor	17/09/18	Enabling earthworks only
C	Updated	Alice Naylor	17/12/18	Addition of MSE Walls

Certification Record

Revision	Action	Name	Position	Date	Signature
	Approved by:	Richard Percy	Project Leader	21/12/18	
	On behalf of GWRC:				

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	Approved by:				
	On behalf of KCDC:				

CERTIFIED
VIJAY SOMA
Resource ConsentS & Compliance Manager
Kapiti Coast District Council
DATE: 19/12/18

1 INTRODUCTION

This Site Specific Environmental Management Plan (SSEMP) provides the necessary information to demonstrate how the project team plan to avoid or mitigate potential adverse environmental effects relating to construction of the Peka Peka to Ōtaki Expressway.

This document covers enabling earthworks required to allow access to the proposed Waitohu Stream Bridge (Bridge 1) which will carry the new Expressway alignment over the Waitohu Stream and Taylors Road realignment located at the northern end of the Project. Stage One works covered under this SSEMP will involve localised cut to fill and cut to stockpile to create haul routes to the Waitohu Stream. Enabling earthworks will also be carried out along the proposed local road footprint to allow the completion of the overhead powerline relocation works through this section of the site.

Following a change to this document from Revision B to Revision C, this document now includes earthworks associated with the construction of the Mechanically Stabilised Earth (MSE) Walls at the Bridge Abutments.

The next stage of works in this area will include the construction of the full Waitohu Stream Bridge (Bridge 1) to be covered under a separate SSEMP or major change to this document once final details have been confirmed.

This SSEMP reflects the requirements of the Construction Environmental Management Plan (CEMP) and its appendices, and is intended to be utilised by the construction team to clearly identify any site specific environmental requirements that must be adhered to prior to, and during works. A suite of over-arching environmental management plans have been drawn from to inform the contents of this SSEMP. All works will be carried out in general accordance with these management plans.

Works are not to commence on site until certification of this SSEMP has been confirmed in writing by Kapiti Coast District Council (KCDC) and Greater Wellington Regional Council (GWRC).

1.1 Location and Site Description

Works will be undertaken at the northern end of the Expressway between chainage 300 – 1350, approximately 175m west of the existing State Highway 1 (SH1) and north of the North Ōtaki Interchange. The surrounding land is relatively flat farm land to the north of the Waitohu Stream, and sand dunes to the south. The ground in the vicinity of the Waitohu Stream is mainly comprised of clean river gravels overlying interbedded beach alluvium

Figure 1: General location of enabling earthworks in yellow.

1.2 Programme

Works are planned to start in late September 2018 and will take approximately two months to complete. Construction of the northern MSE Wall will commence early 2019, followed by the southern MSE later in 2019. Following these works, the Waitohu Stream Bridge (Bridge 1) structural works will commence under a separate SSEMP document.

2 PLAN IMPLEMENTATION

2.1 Responsibilities

The following provides a summary of responsibilities relevant to the planning and implementation of this SSEMP.

Table 2: Roles and responsibilities

Role	Person	Contact Details	Responsibilities
Construction Manager	Steve Findlay	stevef@fcc.co.nz	• Ensures there is a system in place so that construction works do not proceed until required environmental sign-offs are completed. • Overviews systems and processes to ensure consent requirements are captured for construction works. • Ensures adequate resources are provided to ensure environmental issues are appropriately managed. • Reviews environmental incidents and complaints with the Environmental Manager and acts to address issues where needed. • Reviews and monitors construction work methods to ensure compliance with RMA conditions
Environmental Manager	Alice Naylor	A.Naylor@Higgins.co.nz	• Develops, implements and reviews environmental management systems and environmental management plans. • Coordinates all environmental auditing functions and ensures relevant records are maintained. • Responds to and investigates all environmental complaints, issues or incidents. • Coordinates the SSEMP implementation process and pre-works requirements to ensure that environmental requirements are adhered to. • Provides training and briefings to site staff to ensure that there is sufficient

			knowledge of environmental requirements in the field. • Acts as the primary point of communication between regulatory bodies and the project. • Coordinates a team of experts in specialist disciplines such as contaminated land, ecology, groundwater, noise and vibration. • Communicates environmentally sensitive areas to the construction team.
Environmental Coordinator	Sevasti Hartley	sevastih@fcc.co.nz	• Supports the Environmental Manager and provides leadership to ensure all staff comply with environmental management systems. • Provides support in the formation of SSEMPs. • Undertakes as-builting of environmental controls. • Undertakes regular site inspections and audits. • Coordinates all site monitoring including but not limited to groundwater, water quality, ecological, dust, noise, and vibration monitoring. • Manages maintenance and monitoring of Chemical Treatment Systems (if used). • Ensures spill kits are available and stocked and provides training on equipment use. • Conducts regular site inspections of erosion and sediment control devices and co-ordinates maintenance where necessary. • Monitors site controls during rain storms. • Trains staff in site specific environmental procedures.
Stakeholder & Communications Manager	Ed Breese	ebreese@tonkintaylor.co.nz	• Organises, co-ordinates and facilitates engagement with affected property holders and community prior to and during construction.

			• Works in partnership with Environmental Manager on engagement and construction activities in accordance with RMA conditions
Site Superintendent / Supervisors / Foreman	Simon Fifield	SimonF@fcc.co.nz	• Provides leadership to the site construction team. • Ensures environmental controls including erosion and sediment control works are protected and maintained on a day to day basis. • Ensures that the SSEMPs and Archaeological Authority requirements are implemented appropriately by the construction team. • Maintains contactability 24/7 during construction and has authority to initiate immediate response actions. • Reports all environmental incidents, compliance issues and complaints to the Environmental Manager. • Reviews the need to use a water cart or sprinklers to control dust.
Project Engineers	Richard Rakovics (Civil) Craig Service (Structural)	RichardR@fcc.co.nz CraigS@fcc.co.nz	• Responsible for ensuring environmental controls and erosion and sediment control works are installed and modified as appropriate for each stage of construction. • Develop, implements and monitors construction methods and environmental protection measures to ensure compliance with the SSEMPs. • Demonstrate understanding of major environmental and community issues and environmentally sensitive areas. • Coordinate environmental interfaces with subcontractors and suppliers. • Reports all environmental incidents, compliance issues and complaints to the Environmental Manager.

Specialist support (contaminated land, ecology, noise and vibration)	Dean Miller (Principal Ecologist) Genevieve Smith – Contaminated land Brendon Shanks – Noise and Vibration	DCMiller@tonkintaylor.co.nz Genevieve.Smith@beca.co.nz Brendon.Shanks@marshallday.co.nz	• Provide expert advice to the Environmental Manager and Environmental Coordinator regarding specific site requirements. • Submits reports to the Environmental Manager to fulfil requirements of consents relevant to their field. • Briefs the construction team of site specific requirements for environmentally 'sensitive areas'.
Iwi	Te Waari Carkeek (Ngā Hapū o Ōtaki Kiarahi)	TeWaariC@fcc.co.nz	• Provide input into project documentation such as management plans, design processes, planning documents. • Reviews permits to work and coordinates the level of involvement of kaitiaki in site activities • Coordinates all aspects of iwi monitoring. • Key point of contact for Ngā Hapū o Ōtaki.
	Caleb Royal (Ngā Hapū o Ōtaki Consents Processing Officer)		• Reviews consent applications and coordinates cultural monitoring activities. • Provides specialist advice to Ngā Hapū o Ōtaki
Iwi	Muaupoko Tribal Authority		• Point of contact for any archaeological discoveries in accordance with the agreed accidental discovery protocols and MTA agreement.

2.2 SSEMP Changes

In the event that changes in works scope or methodology are required, changes may need to be made to this document in accordance with resource Consent Condition's DC.18B and / or G.21A. Any 'major' changes will be submitted to the respective Manager for certification at least 5 working days prior to implementation of that change.

In accordance with Condition G.21A, a 'minor change' may be submitted to the Manager for certification at least 2 working days prior to implementation of that change, unless an alternative process of approving a 'minor change' is agreed to by the Manager, Greater Wellington Regional Council.

3 GENERAL SITE MANAGEMENT

3.1 Site Access

Access to the site will be as follows:

- Southern access – Site Access Point 13 (SAP-13) off SH1
- New Site Access Point from Taylors Road (currently under review by the relevant Controlling Authority)
- Site Access Point 13a from SH1

Physical access to the Waitohu Stream has been indicated on Appendix C 'ESC Layout' drawings via use of haul roads. The legal property IDs to pass through to access the Waitohu Stream are as follows:

Northern access points to the Waitohu Stream:

- ID CT WN12C/1232
- ID 604572

Southern access to the Waitohu Stream:

- ID 604572
- ID 12: 604571

The access/egress points will be stabilised using clean aggregate or sealed to avoid any construction related material leaving the site. Any migration of material from the site onto SH1, the local road or footpaths will be removed immediately.

Stormwater from the local road or SH1 will not be impeded by vehicle crossing during and after construction and any damage made to road infrastructure as a direct result of these works shall be recorded and repaired immediately. Refer to the attached Site Specific Traffic Management Plan for a general layout of Site Access Points (SAPs).

3.2 Site Establishment

Site access points will be utilised for parking, sign-in sheds, storage of miscellaneous materials and portaloos (refer to Appendix C ESC layout drawings).

All areas of the site will be maintained in a tidy state with redundant materials removed off-site once no longer required.

3.3 Construction Plant

The plant items to be used are generally as follows:

- 6 – 20T excavators
- Motor scrapers
- Dump trucks
- Dozers
- Water cart as required
- Light vehicles

Where practicable, plant will refrain from working within 10m of a live watercourse to minimise any risk of causing bank instability or spills to the receiving environment.

All plant is required to be inspected prior to commencing works and during construction activities at regular intervals. Unwanted vegetation, seeds or contaminants will be cleared prior to plant entering the site to avoid the introduction or spread of weeds or pest species.

Plant inspections will be recorded on daily plant inspection forms to demonstrate that all plant used on this project are in good working order and have been cleared of unwanted weeds and pest species. Any faulty equipment will be stood down until the necessary repairs are carried out and the given plant is fit for purpose.

Spill control kits will be available on site in areas where heavy machine is working. Refuelling activities will take place using a mini-tanker at least 10m away from any watercourse to prevent additional risk of spillage to water.

3.4 Pre-works Requirements

Prior to works commencing on site the following mitigation measures will be implemented to avoid or minimise adverse environmental effects:

- Site specific information, including environmental constraints and requirements, will be discussed at the relevant pre-construction site meetings with input from specialists as required.
- Prior to works commencing in this area, the project surveyors will use GPS to identify the extent of works. The works area will be clearly marked-out with regular input from the survey team throughout works as required.

- Areas identified as 'retained vegetation' as per the approved vegetation retention plans will be clearly delineated using physical markers on site.
- Environmental requirements for any given area will be noted on each project "Permit to Work'. These permits are required for any activity on site and must be in place and signed off by the environmental team prior to works commencement.
- Signage and safety fencing will be erected to clearly discourage the public from entering the site. Regular updates will be provided to the community regarding upcoming works and changes to works sequencing.

3.5 Water Supply

Construction water may be required to prevent dust discharge from site during works. Water required for these works will be collected from off-site.

Any water supply bores required on site must be constructed in accordance with Resource Consent Conditions BC.1 – 4 with any water take done so in accordance with GT. 4-7.

4 WORKS METHODOLOGY

Works covered under this SSEMP will typically be sequenced as follows:

Enabling works

- Establishment of Site Access Points and laydown areas
- Installation of erosion and sediment controls in accordance with Section 5.2 below
- Construction of a suitable haul road to the future bridge site as indicated on Appendix C drawings
- Completion of the powerline relocation works (currently covered under SSEMP PW2) including localised filling along the local road footprint and power pole locations.
- Construction of the Bridge 1 northern and southern abutment MSE Walls.

4.1 Enabling Earthworks

The primary focus of any earthworks at this early stage will be to allow other disciplines (i.e. structures and utilities) to access the site and provide adequate connectivity across the full length of this section of the site. Following initial set-up of site access points and lay-down areas, relocation of the powerlines through this section will be critical to progressing subsequent works.

The Greenwood Stream crosses the site at chainage 400. Access across this stream is not required at this stage and will instead be covered at a later date under a change to this SSEMP. This will be in the form of a temporary culvert or temporary bridge to allow access across the stream prior to permanent culvert construction in this location.

Enabling earthworks will involve the following:

- Stripping topsoil from haul road locations, site access points and power pole locations. Clean aggregate will be used to stabilise the site access points to prevent material tracking offsite.
- Local cut to fill along the local road footprint and power pole locations.
- Topsoil will be temporarily stockpiled on site in the allocated areas (refer to Appendix C ESC Layout Drawings).
- Exposed ground will be contained within sediment control measures (refer to Section 5.2).
- Establishing localised site sheds and amenities including piling equipment.
- Establishing localised temporary construction fencing to isolate construction site from public or adjacent properties.

4.1.1 Temporary Diversion – Unnamed Tributary of the Waitohu Stream

An unnamed tributary of the Waitohu Stream passes through the site at chainage 950. The unnamed tributary comprises modified and vegetated drain habitat that rarely flows. Refer to Figure 2 below.

Figure 2: Unnamed tributary of the Waitohu Stream looking upstream from the Expressway alignment

Prior to transverse culvert construction at this location (to be carried out at a later date), access will need to be maintained between the north and south of this tributary. To allow ongoing access, it is proposed to temporarily divert this tributary along the eastern boundary of the site (refer to ESC Layout_3 and 6 for further details). This will be sequenced as follows:

- A temporary open channel will be constructed in accordance with the dimensions outlined in Appendix C ESC Layout_6 drawing.
- The temporary channel dimensions are based on the proposed cross sectional area of what will become the *permanent* stream channel for this tributary.

- The temporary stream diversion will tie-in with the existing tributary at the Designation boundary.
- The redundant section of the existing tributary that runs through the Designation will be blocked using a clean water diversion bund at the top end, and a dirty water diversion bund at the bottom end (required for general site sediment control in accordance with Section 5.2).
- The existing tributary where it crosses through the alignment is dry and therefore fish salvage and relocation procedures are not required. If this changes and water is present within the channel then fish salvage and relocation will be carried out in accordance with the methods outlined in the Ecological Management Plan (EMP).

4.1.2 Disposal Sites

Temporary stockpile locations have indicatively been marked on the drawing in Appendix C. Stockpiles will typically be located greater than 50m distance away from all watercourses. However, in instances where this is not practical due to space restraints then in accordance with D.C 25(g), appropriate treatment of stormwater runoff from this stockpile will be managed by use of dirty water diversion bunds to prevent sediment laden stormwater entering the adjacent watercourses. This level of protection is considered appropriate to provide sufficient treatment.

4.2 Mechanically Stabilised Earth (MSE) Wall Construction

The Bridge 1 abutments will consist of a reinforced concrete bank seat beam that is supported on an MSE (Steel strap) vertical faced wall.

The construction sequence for each Reinforced Earth (RE) walls is as follows:

- Undercut and replace any unsuitable materials from abutment areas and prepare abutment ground for MSE walls.
- Construct base layer
- Excavate for footing beam
- Construct footing beam
- Construct MSE Wall layers and any earthworks that ties into these. All pre-cast panels to be delivered progressively

As the MSE wall progresses the earthworks tying into the wall will be placed at the same time which will allow better access to the site.

Approximately 11,500m³ of gravel fill will be sourced from the Waitohu Quarry to be used as reinforced earth fill and final abutment backfill.

The MSE Walls are located within proposed / existing erosion and sediment controls in accordance with Rev C of this document.

5 ENVIRONMENTAL REQUIREMENTS

5.1 Contaminated Land

The Bulk Earthworks Contaminated Land Management Plan (BECLMP) provides a framework and general procedures for the management of contaminated soil and other contaminated materials/structures potentially present in ground that may be disturbed or require removal to complete the Project. A number of potentially contaminated sites located within the Project corridor were identified during the desk based Phase 1 Contaminated Land Assessment.

85 SH1 (legal description CT WN30D/831) was not identified through the original desk based Phase 1 Contaminated Land Assessment but based on visual inspections which identified undulating ground profile, it has since been recommended by the project contaminated land specialists that sampling be carried out at the site. Until the status and requirements have been confirmed with GWRC, this area immediately south of the Greenwood Stream (identified in Figure 4 below) will remain a no-go area in regards to any soil disturbance except investigation works.

Figure 4: Location of potentially contaminated site at 85 SH1 in red

5.2 Erosion and Sediment Control

Location and heights of erosion and sediment control (ESC) measures are outlined on Appendix C 'Methodology / Layout' Drawings. In general terms the work area will be contained by diversion bunds to isolate the work area with impounded water discharge to ground via the insitu sand soils, or discharged in a controlled manner via floating T-Bar decants. To achieve this the following will be undertaken:

- Clean water diversion bunds will used to divert the eastern clean water catchment away from the work area.

- In some areas of the site, clean water will be accepted into the site and contained on the site within dirty water diversion bunds.
- North of Waitohu stream, the existing State Highway is approximately 1m higher than the site and therefore dirty water controls are not required along the eastern boundary.
- Dirty water diversion bunds will be installed along the western extent of the site.
- Dirty water and clean water diversion bunds have been sized in accordance with the project ESCP to convey the 5% AEP rainfall event. Contributing catchment areas have been identified on Appendix C ESC Layout Drawings.
- Floating T-Bar decants may need to be installed at the low points of dirty water diversion bunds with a stabilised emergency spillway in accordance with the ESCP to ensure that site runoff is sufficiently treated prior to discharge. The exact location of the floating T-Bars will be determined on site. Any decants will be held up using a pulley system or suitable alternative as the default position and be lowered as required following sufficient treatment. Any lowering of decants will be carried out under an approved permit to pump as specified in the project Erosion and Sediment Control Plan (ESCP), and as a minimum must adhere to the following general conditions:
    - Downstream turbidity levels (measured as NTU using a calibrated hand-held turbidity meter), must not exceed >20% difference compared to upstream NTU levels.
    - The discharge must not cause obvious visual discolouration of the downstream environment beyond 'reasonable mixing' (deemed as 30m from initial discharge point unless otherwise specified due to access restrictions).
    - Permit to pump documentation must be available for inspection by GWRC upon request.
- In instances where it is not required to fit a decant at the low point (i.e. if ground soakage proves to be adequate) then this will be identified and documented through the Condition E.6 certification process.

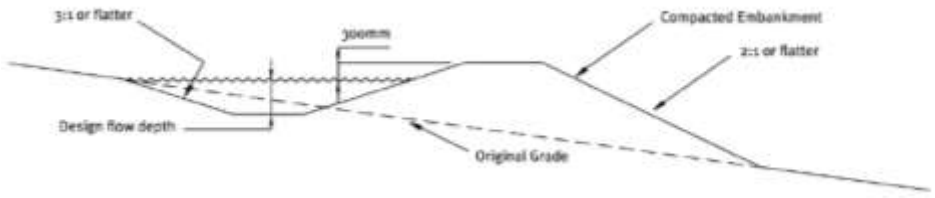


Figure 5: Typical cross section of dirty water diversion bund in accordance with the project ESCP.

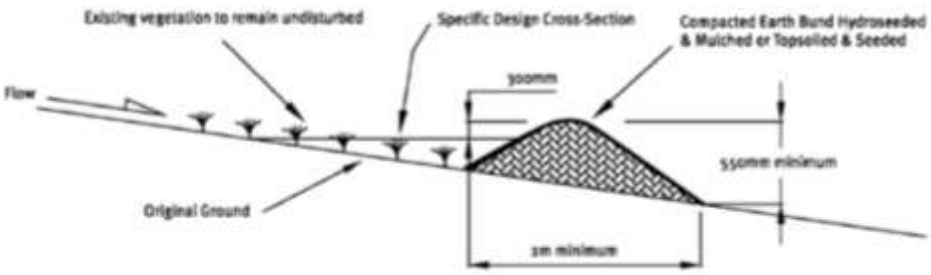


Figure 6: Typical cross section of clean water diversion bund.

5.2.1 Installation and decommissioning

Where required, erosion and sediment controls (ESCs) will be installed prior to all construction activities. Upon completion of the installation of all approved structural ESCs as-built certification plans will be provided to Council in writing prior to the activity commencing. The Project will submit certification documentation 2 Working Days prior to the commencement of construction in that area of work as per Condition E.6 and will retain the as-built record on site.

5.3 Ecological Requirements

Project ecological requirements are set out in the Ecological Management Plan (EMP) which outlines a number of locations that have specific requirements in regards to terrestrial and aquatic species that need to be considered prior to and during works. These have been further refined following input from the project ecologists to ensure that potential effects are minimised as far as practicable.

5.3.1 Terrestrial Ecology

All pre-works terrestrial surveys are now complete in this area. No further surveys are required prior to works under this SSEMP.

5.3.2 Aquatic Ecology

Macroinvertebrate baseline surveys have been completed within the Waitohu Stream. Construction monitoring will be carried out in accordance with the EMP to monitor any change over the course of the Project with reports provided to GWRC on a quarterly basis.

5.3.3 Water Quality Monitoring

Turbidity monitoring will be carried out in accordance with the PP2Ō Updated Turbidity Monitoring Proposal (12/4/18) as updated into the ESCP as well as EMP. In summary, this will involve:

- Use of calibrated hand-held turbidity meters to monitor turbidity changes between upstream and downstream levels within the Waitohu Stream.
- Triggered response actions will occur in accordance with rainfall and turbidity trigger exceedances outlined in Section 6.6.4 of the EMP and 6.3 of the ESCP.

5.4 Cultural Monitoring

Pre-works baseline monitoring is to be undertaken by Ngā Hapu o Ōtaki in accordance with the Cultural Monitoring Plan (CMP) within selected watercourses prior to earthworks. Both Waitohu Stream and Greenwood Stream cross the site in this area which will both undergo pre-works baseline monitoring prior to works.

A Kaiarahi (iwi guide / leader) is the key point of contact and coordination for Ngā Hapū o Ōtaki. The Kaiarahi will be involved in the design process, construction supervision and environmental monitoring. The Kaiarahi will be supported by Pūkenga (specialists / experts) and Kaitiaki (guardians)

who provide support in supervision, monitoring activities and provision of specialist advice in regards to cultural monitoring. Ngā Hapū o Ōtaki will be informed of all works on site and invited to be present for all works with particular emphasis placed on initial topsoil stripping.

Contact must also be maintained with Muaupoko Tribal Authority (MTA) in accordance with MTA agreement and confirmed accidental discovery protocols.

5.5 Archaeology

All works under this SSEMP will be carried out in accordance with the approved archaeological authority and the Archaeological Site Management Plan. The Archaeological Site Management Plan outlines high, medium, and low probability archaeological areas across the Project footprint.

The southern extent of this site is identified as 'high probability' in the Archaeological Management Plan and therefore pre-works investigations were undertaken.

The following is required as a minimum during works:

- The Project Archaeologist and kaitiaki will be on site during topsoil stripping in areas identified in Figure 7 below.
- If in situ archaeological features or deposits are identified, the protocols outlined in the Archaeological Site Management Plan will be adhered to.

Figure 7: High probability area – North Ōtaki Dunes (outlined in yellow).

5.6 Noise and Vibration

The Construction Noise and Vibration Management Plan (CNVMP) identifies the noise and vibration performance standards that must, where practicable, be complied with. It also sets out best practicable options for noise and vibration management for the Project, including mitigation

measures, monitoring requirements, and communication and complaint procedures. All works under this SSEMP will be carried out in general accordance with the CNVMP.

Sensitive areas in regards to potential noise and vibration effects as a result of works have been identified in Appendix C. Individual dwellings located within these sensitive areas have also been listed below.

In accordance with the CNVMP, works carried out under this SSEMP will generally be restricted to take place between the hours of:

- 0630 and 2000hrs on weekdays; and
- 0730 and 1800hrs on Saturdays.

As far as practicable, works will be scheduled to avoid noisy activities in areas identified as sensitive receivers on the attached drawings between 0630 – 0730hrs in the morning, and between 1800 – 2000hrs in the evening to align with noise level criteria outlined in the CNVMP.

It is not anticipated that works will be required to take place outside of normal working hours for works outlined in this SSEMP. In the event that this changes, the procedures outlined in the CNVMP will be followed. Any works outside of the hours of 7am to 7pm require written approval from the Project Engineer.

The primary mitigation measure in regards to reducing the impacts from construction noise and vibration will be ongoing effective community consultation, particularly when transitioning from one works phase to another.

Noise and vibration monitoring will take place throughout the works to assess the impacts on adjacent properties at various locations. In the event that noise or vibration criteria is exceeded, mitigation options will be reassessed in an effort to comply with the construction limits, and a site specific noise 'schedule' will be submitted to Kapiti Coast District Council in accordance with the CNVMP.

Dwellings located within the noise and vibration boundary are as follows:

- Nil

Dwellings within the vibration boundary only are as follows:

- Pt Lot 2 DP 7971 Parcel 7227139

5.6.1 Pre-condition building surveys

Section 7 of the CNVMP outlines activities that are expected to generate vibration that will potentially cause medium and high level vibration and therefore must be assessed to determine whether a pre-condition building survey is required. There are no dwellings that trigger the requirement for a pre-condition building survey prior to these specific works.

5.7 Air Quality

There is potential for works to generate dust discharge if the site is not managed effectively. The Construction Air Quality Management Plan (CAQMP) outlines methods to be used to prevent dust and odour nuisance during construction from the site. All works under this SSEMP will be carried out in general accordance with the CAQMP.

To ensure that dust does not become an issue across the boundary of the site, the following measures will be implemented as a minimum:

- Use of water carts as required, particularly around public interface points such as site entry/exits to local roads
- Imposing a speed limit if required
- Use of stabilising agents such as polymers if required
- Assessing wind speed and direction on a daily basis and implementing additional mitigation based on conditions (or ceasing / re-programming works as required)

Due to the location of the works, risk of causing air quality issues beyond the boundary of the site is very low. Two properties are located within the 'high risk air quality' zone as identified in Appendix C 'Environmental Constraints Drawings' at the very southern extent of the site (291 SH1), and the very northern extent of the site (115 SH1). Provided that the site is managed effectively, it is not anticipated that these works will cause any adverse impacts.

6 WAITOHU STREAM FLOOD RESPONSE

Stage One works are limited to earthworks only which will be carried out away from the Waitohu Stream above 25.0 mRL. Prior to bridge works commencing (to be covered under a separate SSEMP for Stage Two), a more detailed Flood Response Plan will be finalised given that works will be required within the Waitohu Stream flood plain.

Water level and flow information has been reviewed by the PP2O stormwater team based on previous flood frequency analysis at the 'Waitohu Stream at Water Supply Intake' gauge. From the 10% AEP event a stage-discharge rating curve has been derived to determine the water level at the proposed Bridge 1 site for a given flow at the Water Supply Intake location or vice versa based off the flood modelling results. Note that the following conservative triggers will become more relevant when Stage Two bridge works commence but will be reviewed during Stage One Enabling works and adapted if required.

Mean Annual Flood

The mean annual flood discharge (approx. 2.3y ARI) is approximately 46 m^3/s (Flow at Water Supply Intake) and the corresponding water level at the bridge site – 24.4 mRL.

Flow relating to water level at bridge of 23.5mRL (future working platform level)

Water level at bridge – 23.5 mRL

Flow at Bridge - 6 m^3/s
Flow at Water Supply Intake – 5.1 m^3/s

The Waitohu Stream catchment is relatively small and steep with its response quick to rainfall and the flow gauge relatively close to the bridge (approx. 5km). For these reasons, a conservative low flow trigger level has been recommended for the flow gauge. There will be limited time (as little as 0.5-2 hours potentially) to move gear to high ground after experiencing a specified flow at the gauge.

After looking at the flow gauge results over 12 months it has been recommended that a preliminary trigger be set at **3 m³/s.** This trigger requires an action to check the gauge activity and rain forecast. If the flow is rising quickly then gear should be moved away from the stream to a level of >RL 25.0 mRL (outside of the 20y ARI), and at least 50m back from the stream before the flow reaches 10 m^3/s. The operational procedures and trigger levels for heavy rain forecasts, and gauge trigger flows can be adapted following some observation of the response on site. Rainfall forecast monitoring for the Tararua Ranges will be undertaken on a daily basis.

7 TRAFFIC

Site Access Points (SAPs) have been outlined in Section 3.1 above. A Site Specific Traffic Management Plan (SSTMP) has been included as Appendix E. To ensure that potential impacts on local traffic movements are managed effectively and efficiently, more specific information will be submitted for approval to the relevant Road Controlling Authority if required i.e. the State Highway Network (NZTA) and the local road network (KCDC).

APPENDIX A – SSEMP AUTHORS

Name	Role	Company	Input
Alice Naylor	Environmental Manager	Higgins	All
Macu Waqa	Civil Site Engineer	FCC	Earthworks Methodology
Travis Medhurst	Traffic Management Supervisor	Higgins	Traffic Management

APPENDIX B – CONSULTATION RECORD

Group	Date
Community Liaison Group	Distributed to CLG Group for comment
Nga Hapu o Ōtaki	Distributed to Nga Hapu o Otaki

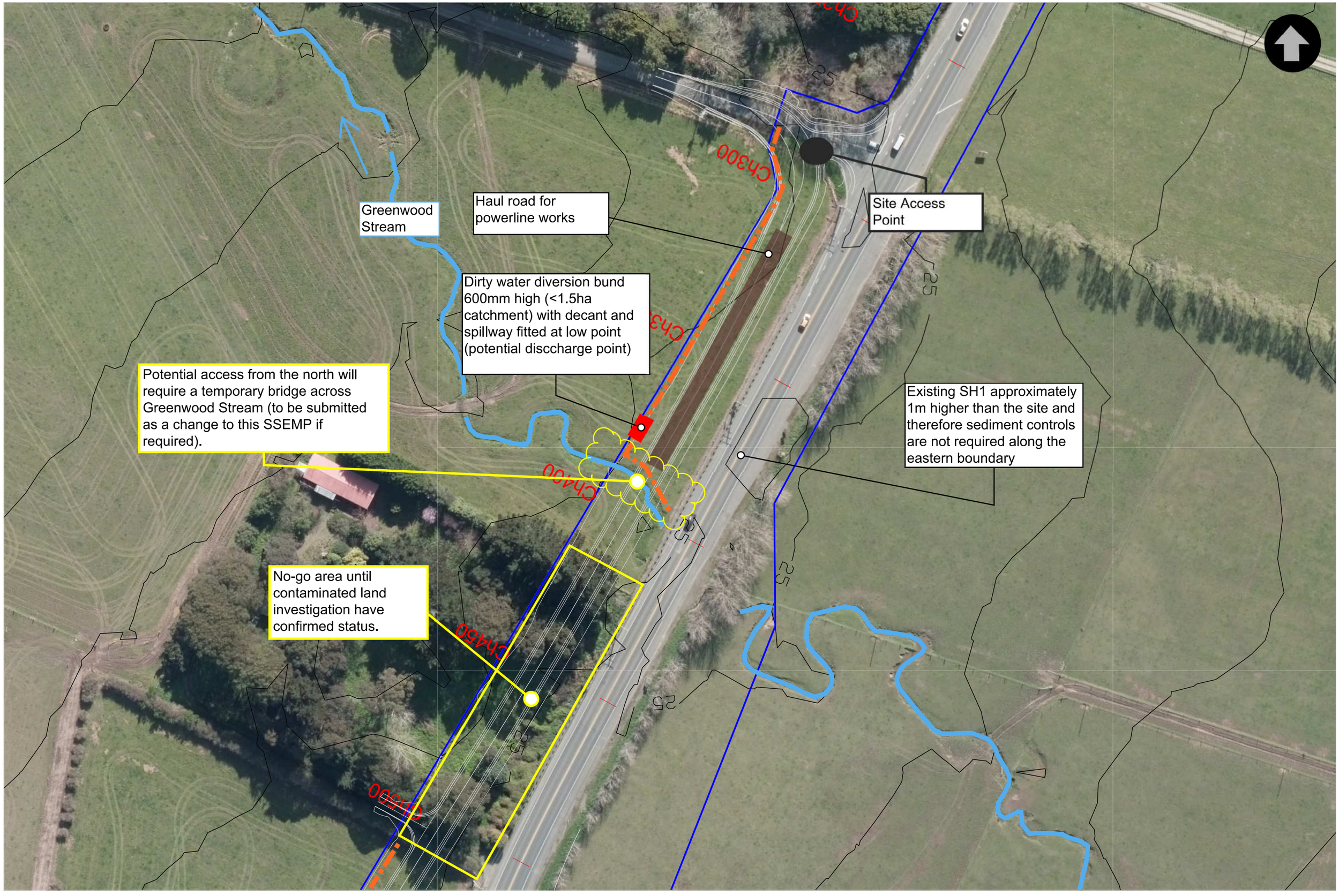
Outstanding Queries

The following outlines any queries (relevant to works covered under this SSEMP) that have not been resolved through the SSEMP preparation process, but will instead be closed out via alternative project stakeholder and communication channels:

NIL

APPENDIX C – DRAWINGS

ESC Layout Plans


Greenwood Stream
Haul road for powerline works
Site Access Point
Dirty water diversion bund 600mm high (<1.5ha catchment) with decant and spillway fitted at low point (potential discharge point)
Potential access from the north will require a temporary bridge across Greenwood Stream (to be submitted as a change to this SSEMP if required).
Existing SH1 approximately 1m higher than the site and therefore sediment controls are not required along the eastern boundary
No-go area until contaminated land investigation have confirmed status.
Ch300
Ch400
Ch450
Ch500
25

Dirty water diversion bund 600mm high (<1.5ha catchment) with decant and spillway fitted at low point (potential discharge point)

Existing SH1 approximately 1m higher than the site and therefore sediment controls are not required along the eastern boundary

Earthworks along local road footprint to provide connection between new power pole locations plus localised works for each pole

Additional stockpile area if required

SAP 13a

Laydown area and sign-in sheds / worker conveniences

Topsoil to be stripped and stabilised with clean aggregate to form new access point

Haul road to Waitohu Stream

Prior to final scour protection works, an additional control may be required at a lower level temporarily. To be assessed on site at a later date and documented through E.6 certification.

Temporary stockpile for topsoil / unsuitable material

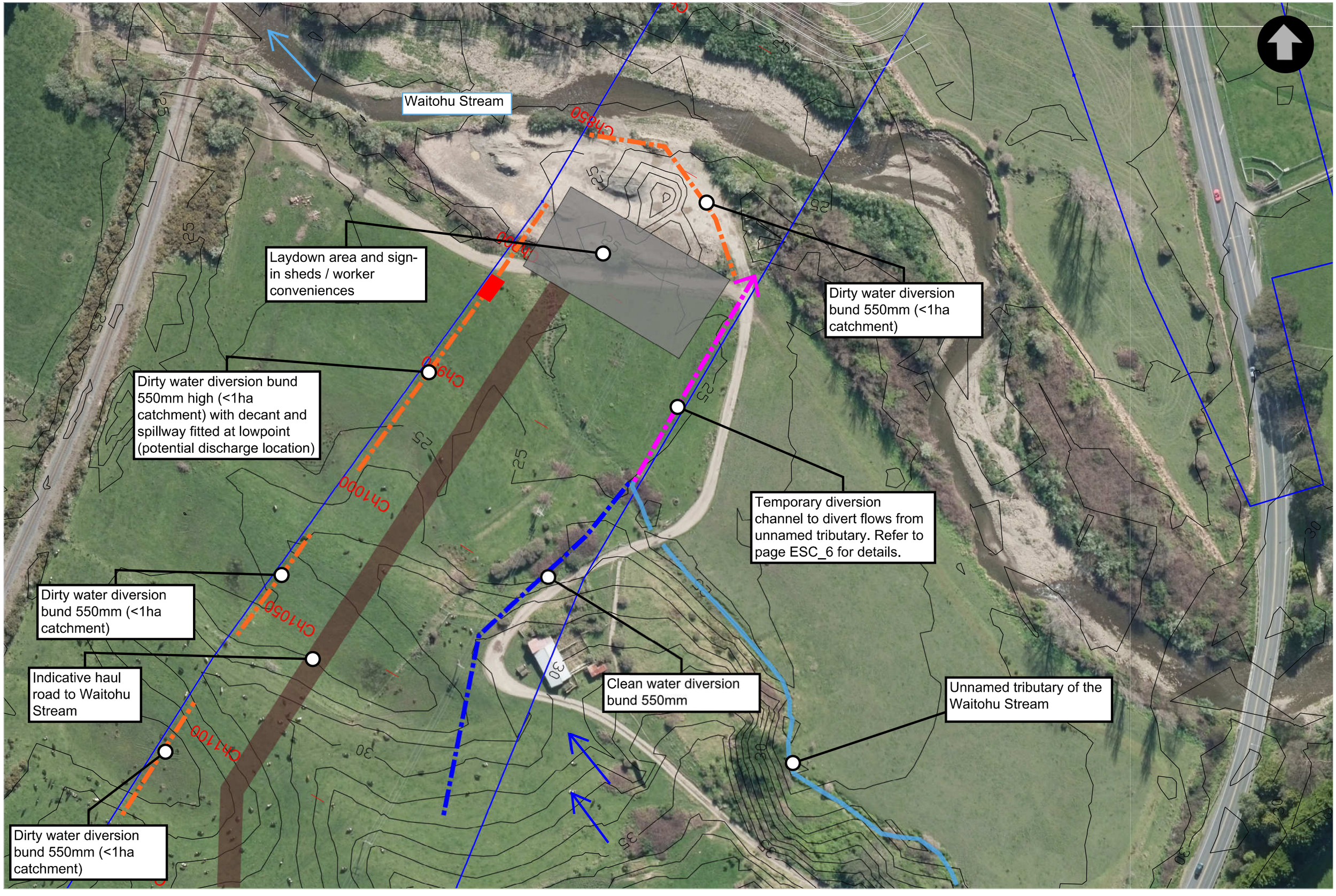
Clean water diversion bund 700mm (<2ha catchment) capturing stormwater from existing drainage channel

Dirty water diversion bund 550mm (<1ha catchment)

NZ TRANSPORT AGENCY WAKA KOTAHI

Peka Peka to Ōtaki Expressway

ESC Layout_2


Waitohu Stream
Laydown area and sign-in sheds / worker conveniences
Dirty water diversion bund 550mm high (<1ha catchment) with decant and spillway fitted at lowpoint (potential discharge location)
Dirty water diversion bund 550mm (<1ha catchment)
Temporary diversion channel to divert flows from unnamed tributary. Refer to page ESC_6 for details.
Dirty water diversion bund 550mm (<1ha catchment)
Indicative haul road to Waitohu Stream
Clean water diversion bund 550mm
Unnamed tributary of the Waitohu Stream
Dirty water diversion bund 550mm (<1ha catchment)
Ch1000
Ch950
Ch1050
Ch1100

Dirty water diversion bund 550mm (<1ha catchment)

Ch1150

Ch1200

Ch1250

Ch1300

Indicative haul road to Waitohu Stream

Dirty water diverison bund 550mm (<1ha catchment) with decant fitted at low point IF works are required along the western extent of these dunes (i.e. for new powerpoles)

Ch1350

Ch1400

Ch1450

Laydown area and sign-in sheds / worker conveniences

Clean water diversion bunds are not proposed at this stage. Any minor amount of clean water will be accepted into the site.

SAP 12

Laydown area and sign-in sheds / worker conveniences

Ch750

Northern MSE

Gravel bund approximately 300mm high in place.

Ch800

Waitohu Stream

Ch850

Southern MSE Wall

Downstream water quality monitoring location

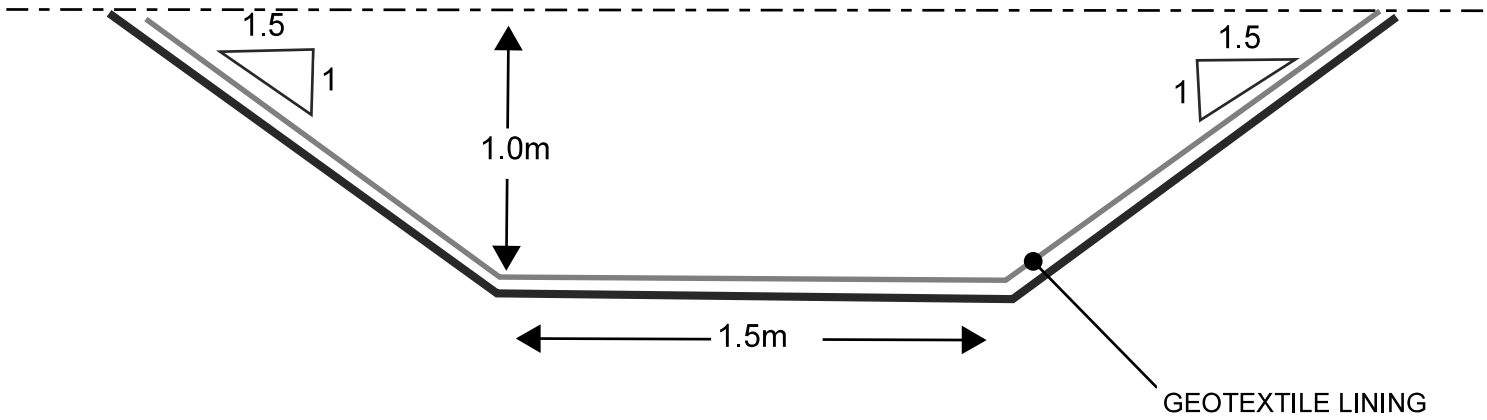
Ch900

Existing platform in place in accordance with *FCCL-EV-MPN-0058.*

Upstream water quality monitoring location

Ch950

Temporary Stream Channel - Unnamed Tributary of the Waitohu Stream



NOTES:

1. TEMPORARY STREAM DIVERSION SIZED LARGER THAN THE PERMANENT STREAM DIVERSION FOR THIS WATERCOURSE (CROSS SECTION AREA = 3m2 COMPARED TO THE PERMANENT AREA OF 2.525m2).

2. DIVERSION BASE AND SIDES TO BE STABILISED WITH SUITABLE GEOTEXTILE TO AVOID EROSION.

3. GRADE 0.3%

4. REFER TO ESC LAYOUT_3 FOR THE LOCATION.

Environmental Constraints Drawings

ECOLOGY LEGEND:

TERRESTRIAL ECOLOGY REQUIREMENTS:

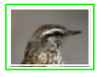
LIZARD SURVEYS, SALVAGING AND MONITORING

NATIVE TREE LOG SALVAGE

PERIPATUS MANAGEMENT

POWELLIPHANTA TRAVERSI OTAKI SURVEY

BIRD SURVEY



PIPIT SURVEY

BANDED DOTTEREL SURVEY

NOISE VIBRATION LEGEND:

VIBRATION - LOW RISK (RESIDENTIAL)

VIBRATION - LOW RISK (COMMERCIAL)

COMMERCIAL STRUCTURES WITHIN VIBRATION BOUNDARY

DWELLINGS WITHIN VIBRATION BOUNDARY

DWELLINGS WITHIN BOTH NOISE AND VIBRATION BOUNDARIES

AIR QUALITY:

AIR QUALITY SENSITIVE RECEIVERS

DRAINAGE LEGEND:

DESIGNATION

RAILWAY DESIGNATION

EXISTING STREAMS

STORMWATER WETLAND/POND

SITE COMPOUNDS:

HARD STAND AREA

SITE ENTRY AND EXIT

LANDSCAPE:

EXISTING VEGETATION RETAINED

No.	Revision	By	Chk	Appd	Date
B	SSEMP FOR INFORMATION	WW			14.09.17
A	SSEMP FOR INFORMATION	AK	GD	AN	06.07.17

Scale (A1) 1:1000 Scale (A3)	Design	AN	13.07.17	Approved For Construction
	Drawn	AK	13.07.17	
	Dsg Verifier	-	-	
	Drg Check	-	-	Date
	* Refer to Original Hardcopy for Signature			

NZ TRANSPORT AGENCY WAKA KOTAHI

Peka Peka to Ōtaki Expressway

Fletcher HIGGINS Beca Tonkin+Taylor

Subject: SSEMP PW2

Title: LEGENDS

Discipline: CIVIL

Drawing No.: SSEMP PW2-00

Rev.: B

Document No.: \\WZPSP-FCC.INTERNAL\DAVWWWROOT\2002\21270 SECTOR GENERAL\PRECAST WORKING SHOP DRAWINGS\PP2\0\FOR ALICE\PP2\0-DR-CE-0801-0816 2017-08-28- STANDARD\PP2\0-DR-CE-0801-0816_14-09-ZMIANA TABELKI, REWIZJA- DO WYRZUCANIA.DWG

Save Date: 02 Nov 2017 10:14 a.m.

1:680 - START OF ALIGNMENT

MATCHLINE - REFER SHEET 2

NOTE:
REFER TO DRAWING PP2O-DR-CE-0800 FOR LEGEND

ORIGINAL IN COLOUR

FOR INFORMATION
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
B	SSEMP FOR INFORMATION	WW			14.09.17
A	SSEMP FOR INFORMATION	AK	GD	AN	20.07.17

Scale (A1) 1:1000	Design	AN	13.07.17
Scale (A3)	Drawn	AK	13.07.17
	Dsg Verifier	.	.
	Drg Check	.	.

Approved For Construction
. .
Date . .
* Refer to Original Hardcopy for Signature

NZ TRANSPORT AGENCY WAKA KOTAHI

Peka Peka to Ōtaki Expressway

JFC_logo_SMALL_Colour_40%.jpg

HIGGINS

Beca

Tonkin+Taylor

Subject: ECOLOGY

Title: LAYOUT PLAN
SHEET 1 OF 18

Discipline: CIVIL

Drawing No.: PP2O-DR-CE-0801

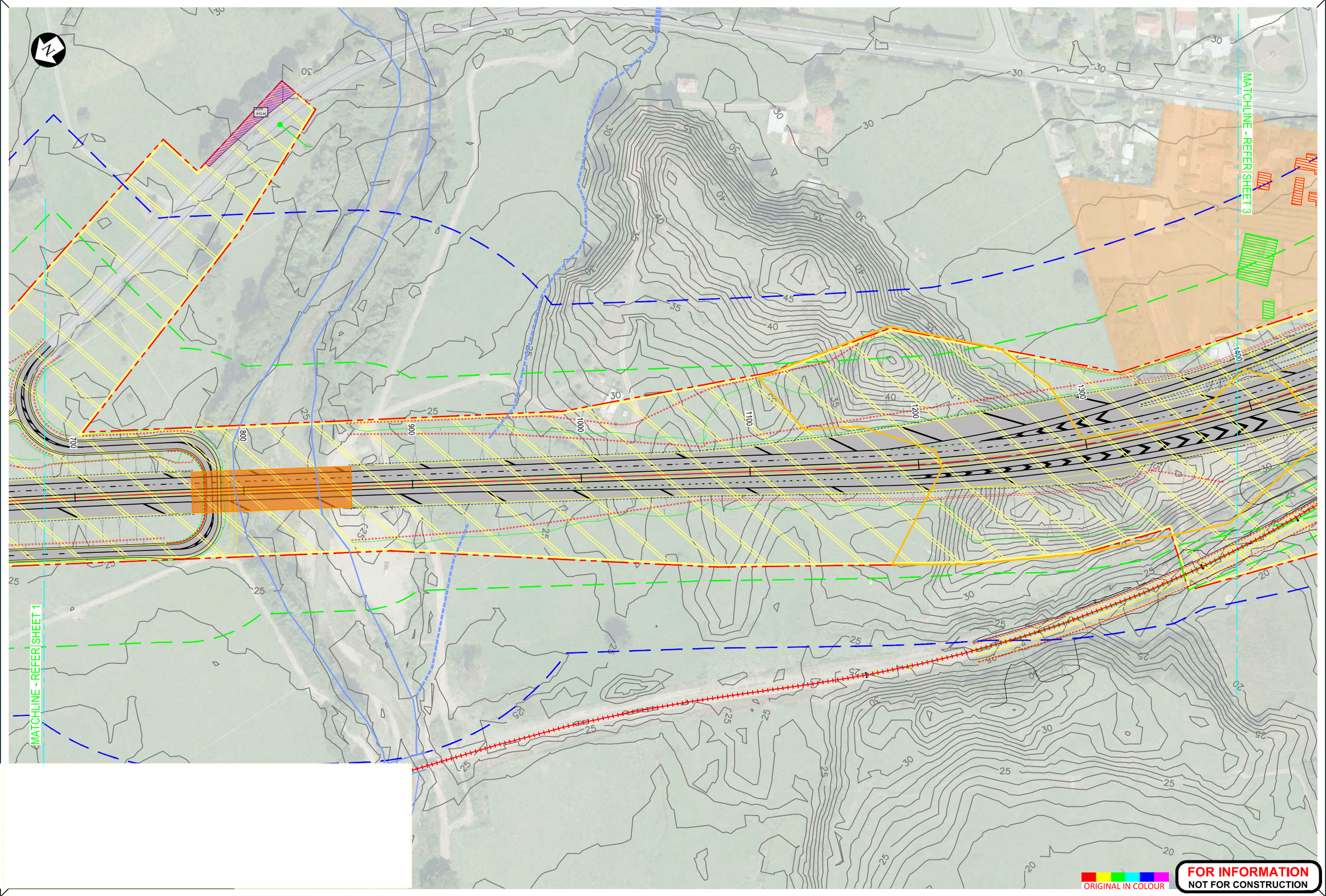
Rev.: B

Document No.: \\W2PSP.FCC.INTERNAL\DAV\WWROOT\2002\2\270 SECTOR GENERAL\PRECAST WORKING SHOP DRAWINGS\PP2O\FOR ALICE\PP2O-DR-CE-0801-0818 2017-09-29- STANDARD\PP2O-DR-CE-0801-0818_29.09-SET2.DWG

ORIGINAL SIZE A1 : DO NOT SCALE

IF IN DOUBT ASK

Save Date: 02 Nov 2017 10:15 a.m.



No.	Revision	By	Chk	Appd	Date
B	SSEMP FOR INFORMATION	WW			14.09.17
A	SSEMP FOR INFORMATION	AR	GD	AN	20.07.17

Scale (A1) 1:1000
Scale (A3)

Design	AR	13.07.17	Approved For Construction
Drawn	AR	13.07.17	
Dsg Verifier	-	-	
Drg Check	-	-	Date

* Refer to Original Hardcopy for Signature

NZ TRANSPORT AGENCY WAKA KOTAHI
Peka Peka to Ōtaki Expressway
Beca
HIGGINS
Tonkin+Taylor

Subject: ECOLOGY
Title: LAYOUT PLAN SHEET 2 OF 18

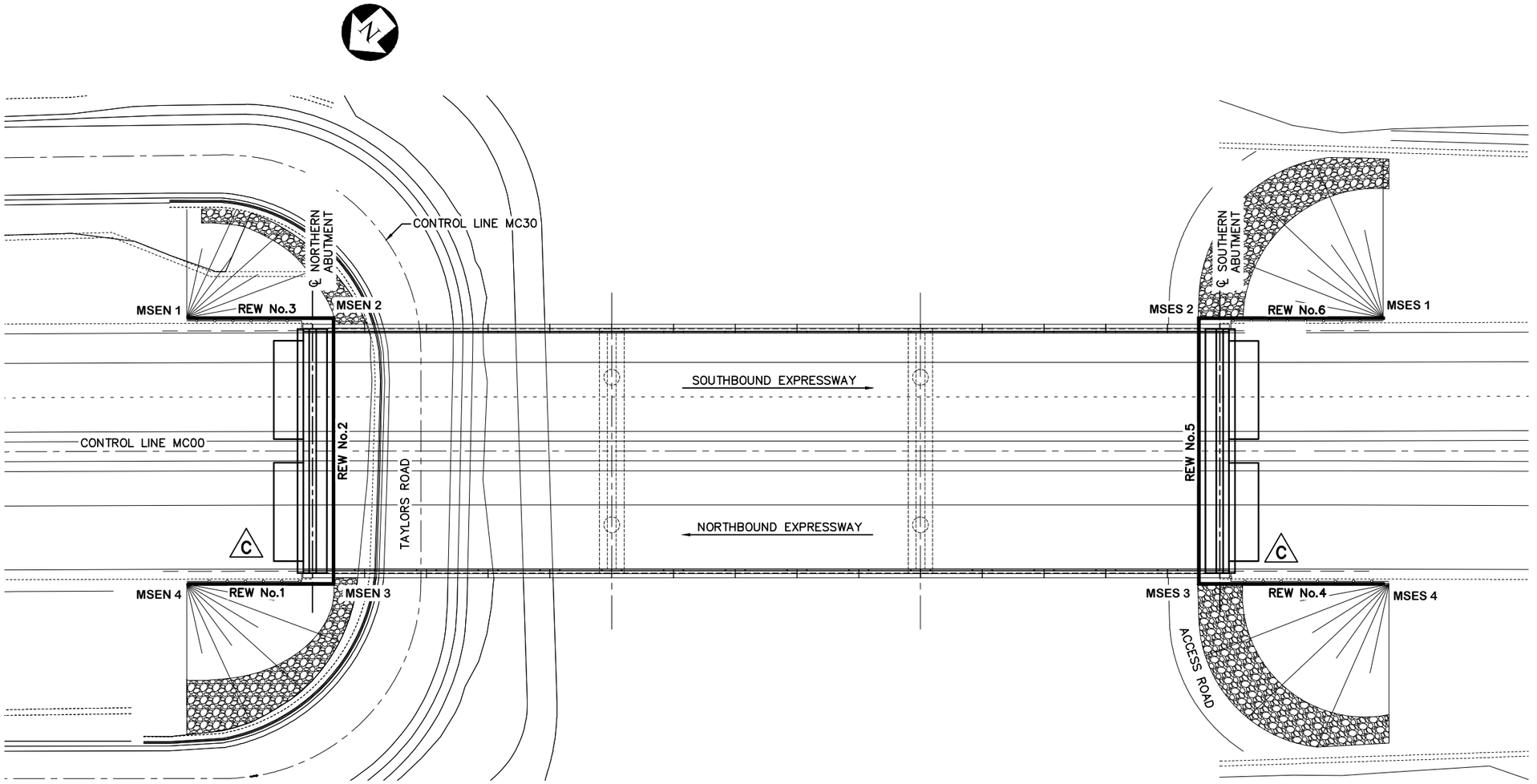
Discipline: CIVIL
Drawing No.: PP2O-DR-CE-0802
Rev.: B

Document No.: \\WZPPSP.FCC.INTERNAL\DAV\WWWROOT\2000\27\270 SECTOR GENERAL\PRECAST WORKING SHOP DRAWINGS\PP2O\FOR ALICE\PP2O-DR-CE-0801-0818_29;09-SET2.DWG

ORIGINAL SIZE A1 : DO NOT SCALE

IF IN DOUBT ASK

Construction Drawings



PLAN LAYOUT
SCALE 1:500

BOTTOM OF WALL AT FRONT FACE SETOUT POINTS		
POINTS	EASTING (m)	NORTHING (m)
MSEN 1	1782788.531	5486662.596
MSEN 2	1782780.888	5486649.811
MSEN 3	1782757.567	5486663.752
MSEN 4	1782765.210	5486676.536

BOTTOM OF WALL AT FRONT FACE SETOUT POINTS		
POINTS	EASTING (m)	NORTHING (m)
MSES 1	1782726.108	5486558.171
MSES 2	1782735.803	5486574.389
MSES 3	1782712.482	5486588.329
MSES 4	1782702.787	5486572.111

ISSUE	DRAWN	DESIGNER	APPROVED	DATE	AMENDMENTS
C	RB	CL	DAP	11.04.18	100% STAGE DESIGN FOR REVIEW
B	RB	CL	DAP	12.10.17	85% STAGE DESIGN FOR REVIEW
A	RB	CL	DAP	08.09.17	50% STAGE DESIGN FOR REVIEW

ORIGINAL DRAWING PRODUCTION SIZE: A3
CLIENT: FLETCHER
SIGNATURE OF THE "APPROVED" BOX INDICATES THAT THE DESIGN SHOWN ON THIS DRAWING HAS BEEN VERIFIED IN ACCORDANCE WITH THE REINFORCED EARTH COMPANY QUALITY SYSTEM.

DESIGN: CL — SIGNED:
DRAWN: RB
APPROVED:
DATE:

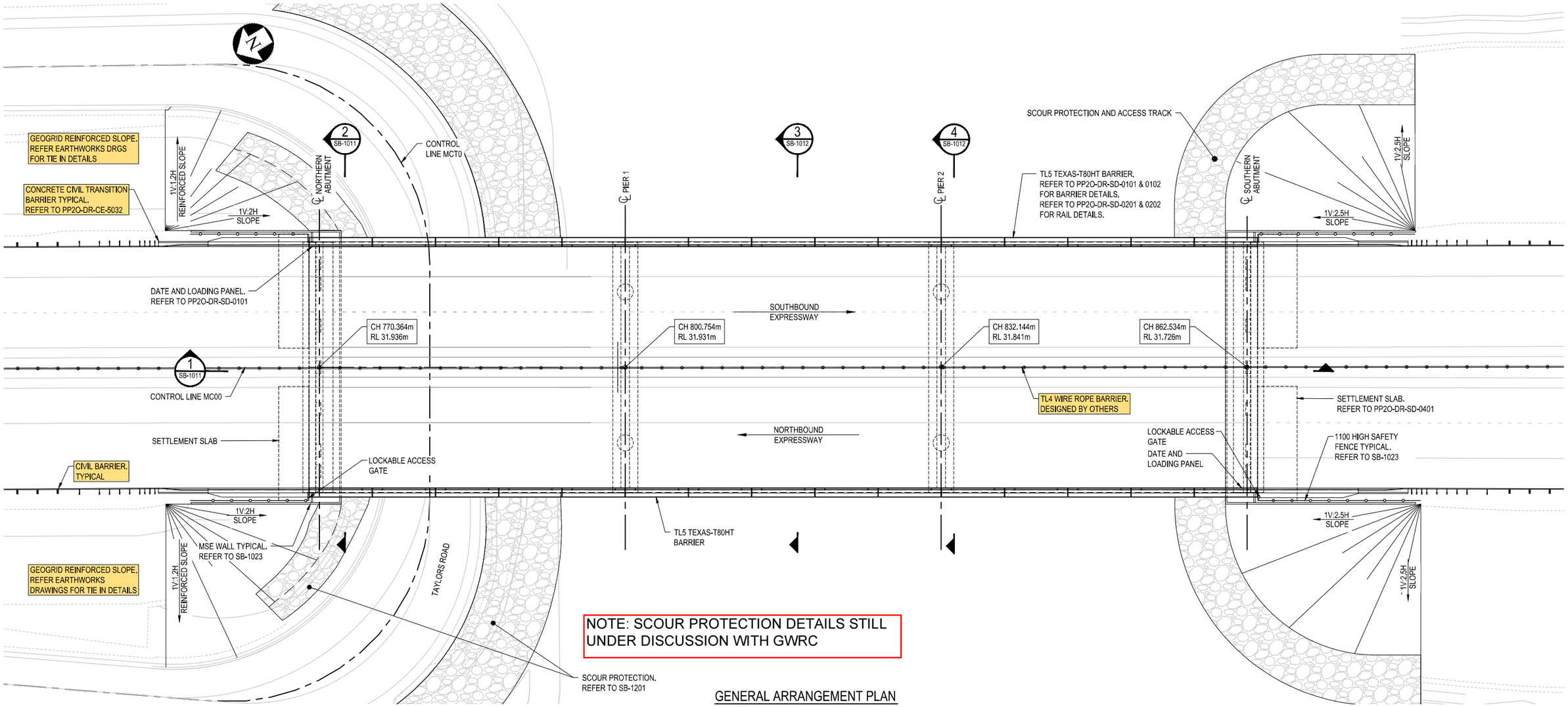
REINFORCED EARTH Sustainable Technology
COMPUTER FILE No.: 6089DC03

DESIGNED BY
Reinforced Earth Limited.
Company Number 96959
Unit 18/13 Laidlaw Way; East Tamaki; AUCKLAND
PO Box 58573; Botany; AUCKLAND 2163
Tel: +64 (0) 9274 8336
Web: www.reco.com.au

PROJECT: PEKA PEKA TO OTAKI EXPRESSWAY
WAITOHU STREAM BRIDGE
BRIDGE 1

SHEET TITLE: PLAN LAYOUT

DRAWING No.: 6089D/C/03
SHEET NUMBER: 3 OF 13
ISSUE: C



NOTE: SCOUR PROTECTION DETAILS STILL UNDER DISCUSSION WITH GWRC

GENERAL ARRANGEMENT PLAN

SCALE 1:200

NOTES:

1. REFERENCES
   - 1.1. REFER TO PP2O-DR-SA-0001 TO PP2O-DR-SA-0004 FOR GENERAL NOTES.
   - 1.2. REFER TO RELEVANT CIVIL DRAWINGS FOR CONTROL LINES ROADING GEOMETRY, BARRIER EXTENTS, LANE WIDTHS ETC.
   - 1.3. REFER TO RELEVANT CIVIL DRAWINGS FOR LOCATION OF UTILITIES AND SERVICES.
   - 1.4. ALL LEVELS GIVEN ARE TO STRUCTURAL SURFACE UNO.

2. DESIGN STANDARDS
   - 2.1. NZTA BRIDGE MANUAL, THIRD EDITION (AMENDMENT 1, SEPT. 2014), WITH PROJECT SPECIFIC AMENDMENTS.
   - 2.2. NZS 3101:2006 CONCRETE STRUCTURES STANDARD WITH PROJECT SPECIFIC AMENDMENTS.
   - 2.3. REFER TO DESIGN STATEMENT REPORT FOR FURTHER DETAILS.

3. DESIGN LOADING
   - 3.1. SUPERIMPOSED DEAD LOAD ALLOWANCE:
     - a) SURFACING = 2.0kPa (INCLUDING 0.5kPa FOR LEVELLING COURSE)
     - b) SERVICES = ALLOWANCES ARE MADE AS FOLLOWS:
     - i) 1 No 100mm TELECOMMUNICATIONS DUCT
     - ii) 2 No 150mm DUCTS FOR FUTURE SERVICES (ONE EACH SIDE)
     - iii) PLUS ADDITIONAL UNIFORMLY DISTRIBUTED LOAD APPLIED OVER ENTIRE DECK AREA OF 0.25kPa.
   - 3.1. TRAFFIC LOAD HN-HO-72
   - 3.2. SEISMIC LOAD BASED ON NZS1170.5 & SSSHA STUDY WITH:
     - a) SUBSOIL CLASS D
     - b) ULS AEP (1/2500)
     - c) ULS DESIGN PGA 0.567g.
     - d) ULS DESIGN ACCELERATION 1.05g (ONCE SLIDING TRANSVERSE DIRECTION)
   - 3.1. TEMPERATURE AND DIFFERENTIAL TEMPERATURE AS PER NZTA BRIDGE MANUAL.
   - 3.2. CREEP AND SHRINKAGE BASED ON AS3600 AND NZTA BRIDGE MANUAL 3rd EDITION FOR RELATIVE HUMIDITY 80%.
   - 3.3. JACKING OF BRIDGE DECK FOR BEARING/ HORIZONTAL RESTRAINT REPLACEMENT THE DESIGN INCLUDES THE FOLLOWING REQUIREMENTS:
     - a) TRAFFIC SHALL BE RESTRICTED TO 40km/h, ONCE BRIDGE DECK IS JACKED.
     - b) SEE ABUTMENT AND PIER DRAWINGS FOR JACKING LOCATIONS AND LOADS.
     - c) JACKING LOADS ARE BASED ON HN LOADINGS.
     - d) ALL JACKS AT EACH DIAPHRAGM SHALL BE HYDRAULICALLY LINKED AND HAVE A CENTRAL MECHANISM TO ENSURE THAT THE SAME VERTICAL DISPLACEMENTS OCCUR AT EACH JACKING POINT AT ALL TIMES DURING THE JACKING OPERATION.
     - e) AT PIER LOCATIONS BOTH BEAM ENDS ON THAT PIER SHALL BE JACKED UP SIMULTANEOUSLY.
     - f) BRIDGE BEARINGS ARE DESIGNED TO BE REPLACED USING LIFTS OF NOT GREATER THAN 10mm.
     - g) STEEL PLATES SHALL BE PLACED BETWEEN CONCRETE BEARING SURFACE AND HYDRAULIC JACK.
     - h) MAXIMUM ALLOWABLE CONTACT PRESSURE BETWEEN CONCRETE SURFACE AND STEEL PLATE SHALL BE 25MPa.
     - i) HORIZONTAL RESTRAINTS AT ABUTMENTS SHALL BE MAINTAINABLE.

4. DRAWING LIST
   - 4.1. FOR THE LIST OF ALL DRAWINGS APPLICABLE TO THIS BRIDGE, REFER TO DRG. SB-1000.

5. SPECIFICATIONS APPLICABLE TO THIS BRIDGE:
   - 5.1. C0203 - BULK EARTHWORKS
   - 5.2. C0226 - ROCK ARMOUR
   - 5.3. C0310 - INSTRUMENTATION AND MONITORING
   - 5.4. C0501 - BORED PILES
   - 5.5. C0600 - REINFORCED CONCRETE SUPPLY
   - 5.6. C0601 - REINFORCED CONCRETE CONSTRUCTION
   - 5.7. C0607 - PRESTRESSED CONCRETE ELEMENTS
   - 5.8. C0614 - ANTI-GRAFFITI COATINGS
   - 5.9. C0700 - STRUCTURAL STEELWORKS

6. CONSTRUCTION LOADS
   - 6.1. BRIDGE BEAMS ARE DESIGNED FOR CONSTRUCTION LIVE LOAD OF 1.5kPa. TEMPORARY WORK SHALL BE ADEQUATE FOR 1/500 APE (R = 1.0) SEISMIC AND WIND LOADING.

7. STRUCTURAL ELEMENTS INCLUDED IN PACKAGE:
   - 7.1. BRIDGE PILES, ABUTMENTS, SETTLEMENT SLABS, PRESTRESSED BEAMS, BEARINGS, TL5 TEXAS-T80HT BARRIERS WITH FASCIA.
   - 7.2. TRAFFIC BARRIERS DETAILED IN THE STRUCTURAL DRAWINGS TERMINATE AT THE EXTENT OF THE BRIDGE (BARRIERS BEYOND THAT ARE CONSIDERED TO BE STANDARD ROAD TRAFFIC BARRIERS. FOR THESE REFER TO THE RELEVANT CIVIL DRAWINGS).

8. COATING FOR EXPOSED CONCRETE SURFACES:
   - 8.1. FOLLOWING TYPES OF COATING SHALL BE APPLIED TO EXPOSED CONCRETE SURFACES:
     - a) GRAFFITI SOLUTION COATING OR EQUIVALENT APPROVED BY THE DESIGNERS.
   - 8.2 FOR THE APPLICATION OF SURFACE COATING, REFER TO THE SPECIFICATION C0614.
   - 8.3 TABLE 1 SUMMARISES THE EXTENT OF COATINGS TO CONCRETE SURFACES.

TABLE 1. CONCRETE SURFACE COATINGS

BRIDGE ELEMENTS	EXPOSED SURFACE	ANTI-GRAFFITI COATING
BRIDGE BARRIER	INSIDE FACES (FACING EXPRESSWAY)	YES
	TOP SURFACE, OUTISIDE OF FASCIA PANEL	YES
ABUTMENTS	FRONT FACES (FACING LOCAL ROADS)	YES
	SIDES OF ABUTMENTS	YES
PIER CROSSHEADS	ALL EXPOSED AREAS	NO
COLUMNS	ALL EXPOSED SURFACES TO FULL HEIGHT	YES
DECK SOFFIT	1.5m HORIZONTALLY FROM AN ACCESSIBLE SUBSTRUCTURE ELEMENT	YES

9. MAINTENANCE AFTER MAJOR FLOOD EVENT:
   - 9.1 THE SCOUR PROTECTION SHALL BE INSPECTED AFTER ANY MAJOR FLOOD EVENT (100 YRS FLOOD), ANY DAMAGE TO SCOUR PROTECTION SHALL BE RE-INSTATE TO THE ORIGINAL DESIGN STAGE.

10. CONSTRUCTION SEQUENCE:

TABLE 2. CONSTRUCTION SEQUENCE

SEQUENCE	ACTIVITY
1.	BORE, CONSTRUCT PIER PILES AND PLUNGE COLUMN CAGE IN WET PILE CONCRETE.
2.	PREPARE ABUTMENT GROUND FOR MSE WALLS.
3.	CONSTRUCT MSE WALLS, ALLOW TWO MONTHS CONSOLIDATION PERIOD.
4.	BUILD UP GROUND AROUND MSE WALLS. PLACE SCOUR PROTECTION.
5.	CONSTRUCT PIER COLUMNS.
6.	CONSTRUCT PIER CROSS HEAD AND ABUTMENT BANK SEAT.
7.	INSTALL BEARINGS.
8.	INSTALL PRECAST SUPER T BEAMS.
9.	CAST BEAM DIAPHRAGMS AND BACKWALL.
10.	POUR DECK SLAB.
11.	CONSTRUCT SETTLEMENT SLAB.
12.	INSTALL SERVICES.
13.	COMPLETE BACKFILL ADJACENT TO ABUTMENT BACKWALLS.
14.	INSTALL BARRIERS.
15.	LAY LEVELLING COURSE AND SURFACING.

THE ABOVE CONSTRUCTION SEQUENCE SHOWS THE SEQUENCING AS ASSUMED FOR DESIGN PURPOSES. CONSTRUCTOR TO ADVISE DESIGNER IF ALTERNATIVE CONSTRUCTION SEQUENCE IS PROPOSED.

FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
1	FOR CONSTRUCTION	CRB	ARK	JK	28.09.18

Scale (A1) AS SHOWN
Scale (A3)

Design	L.CHEN	16.05.17	Approved For Construction S.WATERS
Drawn	M.JULATON	10.05.17	
Dsg Verifier	G.BROWN	24.08.18	
Drg Check	C.BURKE	17.07.18	Date 25.09.18

* Refer to Original Hardcopy for Signature

NZ TRANSPORT AGENCY WAKA KOTAHI | Peka Peka to Ōtaki Expressway | Fletcher HIGGINS | Beca | Tonkin+Taylor

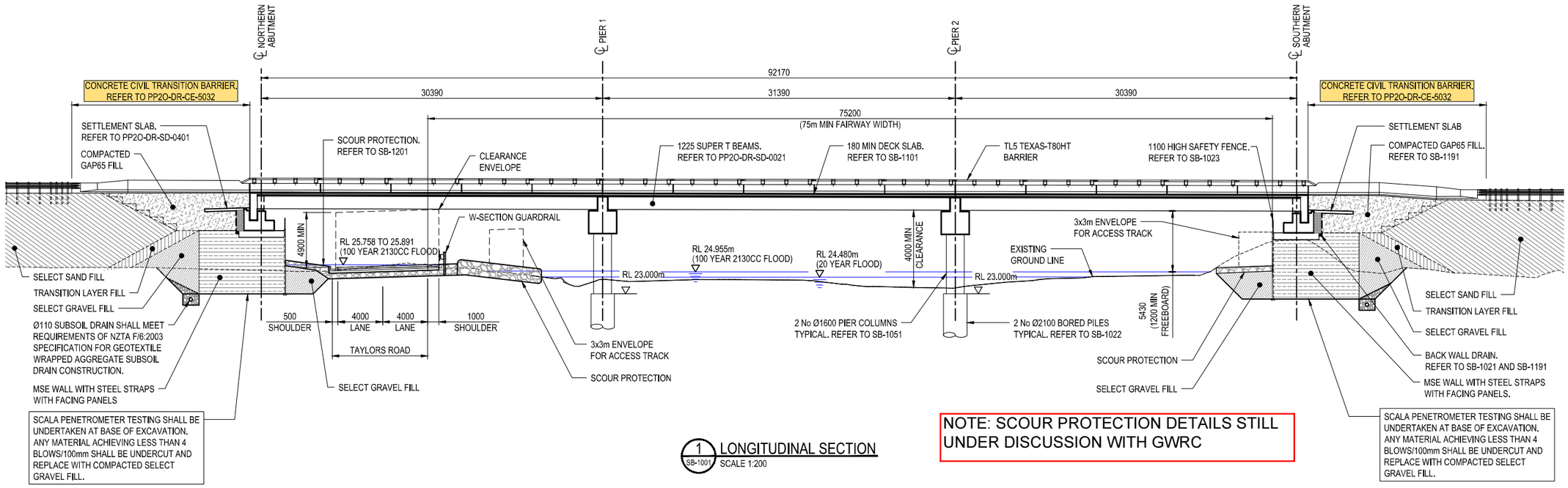
Subject: WAITOHU STREAM BRIDGE (BRIDGE 1)
Title: GENERAL ARRANGEMENT PLAN
Discipline: STRUCTURAL
Drawing No.: PP2O-DR-SB-1001
Rev.: 1
Document No.: R:\30OD - DESIGN DEVELOPMENT GENERAL\09 CAD\DRAWINGS\SE\PP2O-DR-SB-1001.DWG

ORIGINAL SIZE A1 : DO NOT SCALE

IF IN DOUBT ASK

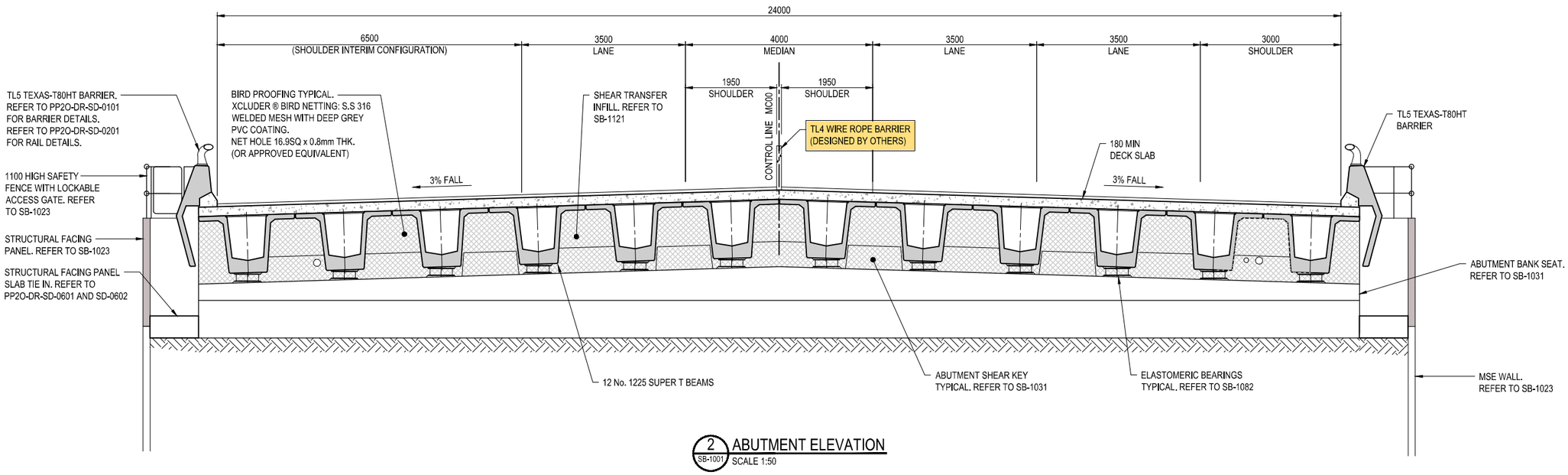
NOTES:

1. REFER TO PP2O-DR-SA-0001 TO PP2O-DR-SA-0004 FOR GENERAL NOTES.
2. REFER TO PP2O-DR-SB-1001 FOR BRIDGE SPECIFIC NOTES.
3. MSE WALLS SHALL BE DESIGNED BY REINFORCED EARTH LTD (REL). REFER TO DRAWINGS 6089D/C/01 TO 6089D/C/14 FOR MSE WALL INFORMATION.



1 SB-1001 LONGITUDINAL SECTION
SCALE 1:200

NOTE: SCOUR PROTECTION DETAILS STILL UNDER DISCUSSION WITH GWRC



2 SB-1001 ABUTMENT ELEVATION
SCALE 1:50

FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
1	FOR CONSTRUCTION	CRB	ARK	JK	28.09.18

Scale (A1) AS SHOWN
Scale (A3)

Design	L.CHEN	16.05.17	Approved For Construction S.WATERS
Drawn	M.JULATON	10.05.17	
Dsg Verifier	G.BROWN	24.08.18	
Drg Check	C.BURKE	17.07.18	Date 25.09.18

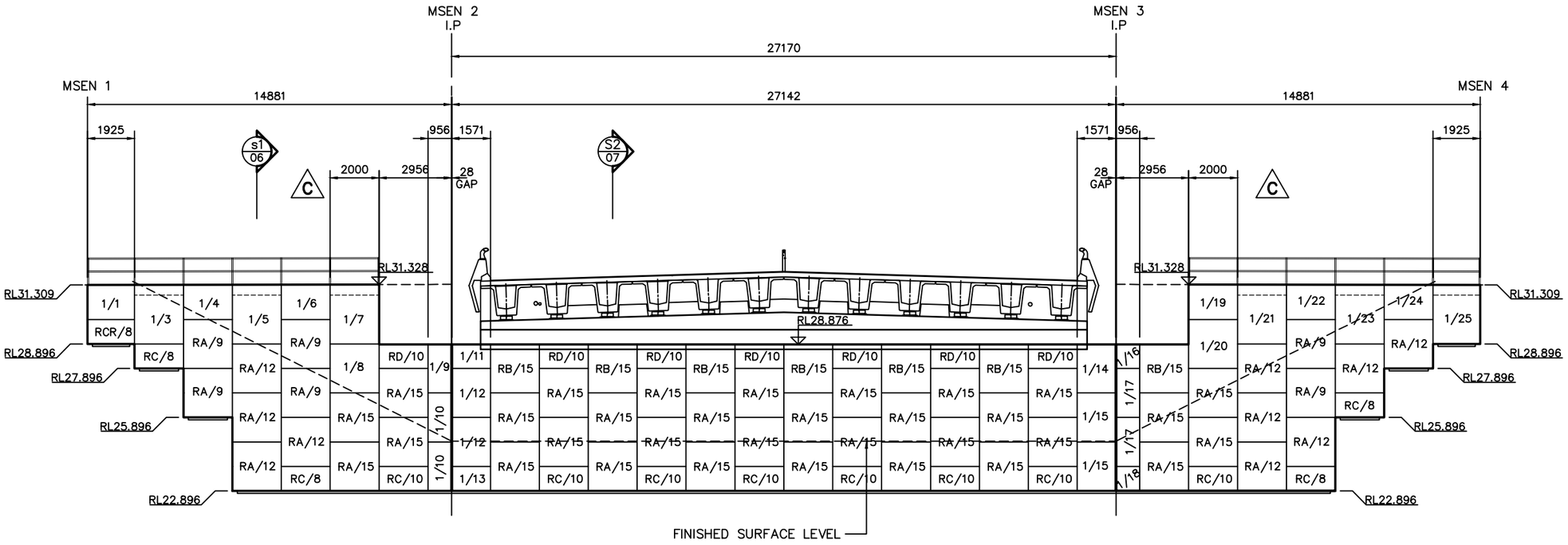
* Refer to Original Hardcopy for Signature

NZ TRANSPORT AGENCY WAKA KOTAHI | Peka Peka to Ōtaki Expressway | Fletcher HIGGINS | Beca | Tonkin+Taylor

Subject: WAITOHU STREAM BRIDGE (BRIDGE 1)
Title: GENERAL ARRANGEMENT SECTIONS SHEET 1

Discipline: STRUCTURAL
Drawing No.: PP2O-DR-SB-1011
Rev.: 1

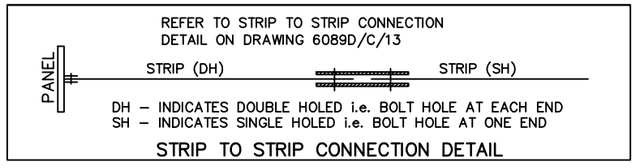
Document No. R:\30DD - DESIGN DEVELOPMENT GENERAL\09 CAD\DRAWINGS\SE\PP2O-DR-SB-1011.DWG



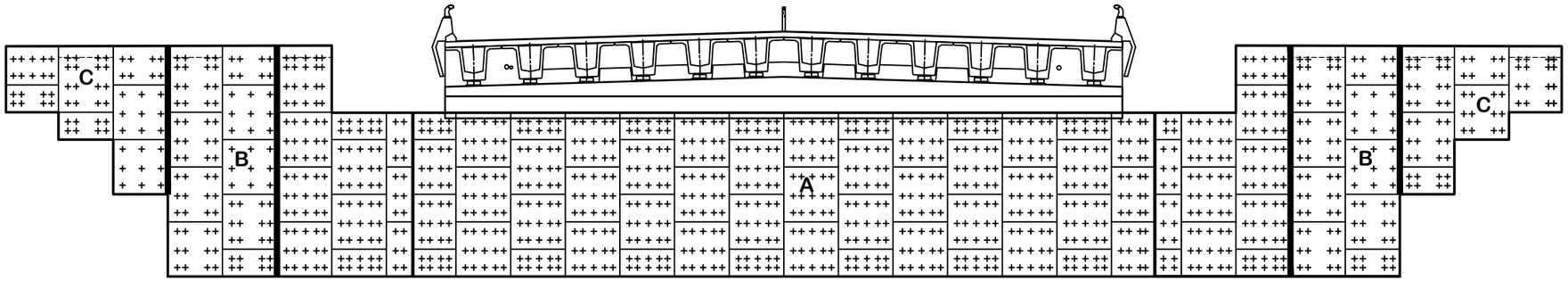
DEVELOPED REAR ELEVATION NORTHERN ABUTMENT
(TOTAL WALL AREA 344m²)
SCALE 1:200

REhas REINFORCING STRIP TABLE

TYPE	SECTION mm x mm	DESIGN LENGTH (m)	STRIP COMBINATION (m)	FINISH
A	45 x 5	10.8	5.0 (DH) + 5.8 (SH)	GALV.
B	45 x 5	8.0	5.0 (DH) + 3.0 (SH)	GALV.
C	45 x 5	5.8	N/A	GALV.
D	45 x 5	5.0	N/A	GALV.



STRIP TO STRIP CONNECTION DETAIL



REhas REINFORCING STRIP DISTRIBUTION
SCALE 1:200

ISSUE	DRAWN	DESIGNER	APPROVED	DATE	AMENDMENTS
C	RB	CL	DAP	11.04.18	100% STAGE DESIGN FOR REVIEW
B	RB	CL	DAP	12.10.17	85% STAGE DESIGN FOR REVIEW
A	RB	CL	DAP	08.09.17	50% STAGE DESIGN FOR REVIEW

ORIGINAL DRAWING PRODUCTION SIZE: A3
CLIENT: FLETCHER
SIGNATURE OF THE "APPROVED" BOX INDICATES THAT THE DESIGN SHOWN ON THIS DRAWING HAS BEEN VERIFIED IN ACCORDANCE WITH THE REINFORCED EARTH COMPANY QUALITY SYSTEM.

DESIGN: CL — SIGNED
DRAWN: RB
APPROVED
DATE

REINFORCED EARTH Sustainable Technology
COMPUTER FILE No.: 6089DC04

DESIGNED BY
Reinforced Earth Limited.
Company Number 96959
Unit 18/13 Laidlaw Way; East Tamaki; AUCKLAND
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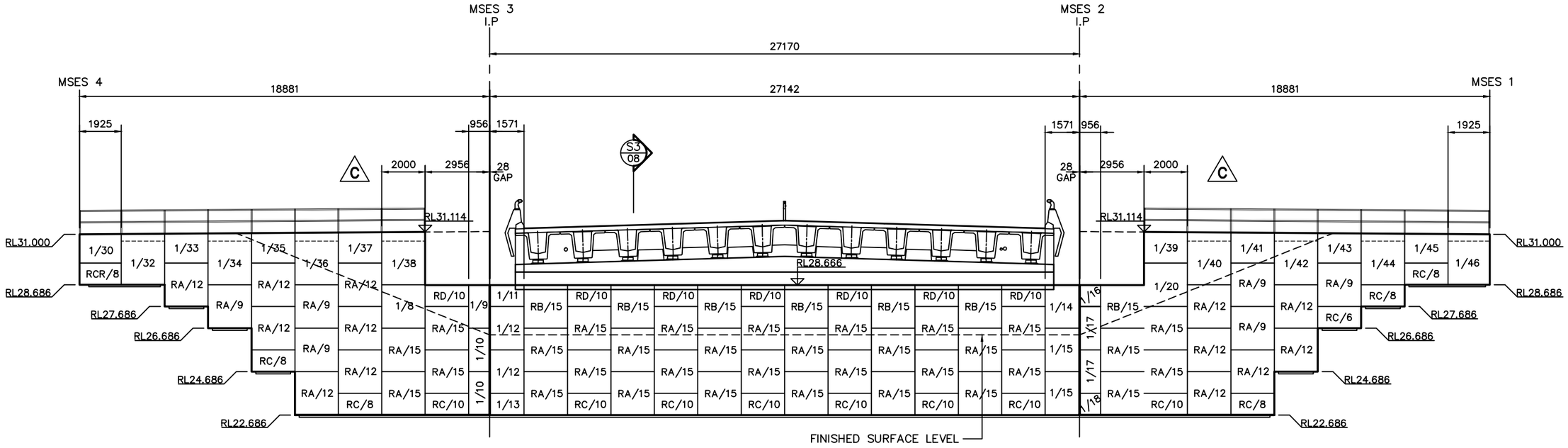
PROJECT: PEKA PEKA TO OTAKI EXPRESSWAY
WAITOHU STREAM BRIDGE
BRIDGE 1

SHEET TITLE: WALL ELEVATION
REW No.1, 2 & 3
NORTHERN ABUTMENT

DRAWING No.: 6089D/C/04
SHEET NUMBER: 4 OF 13
ISSUE: C

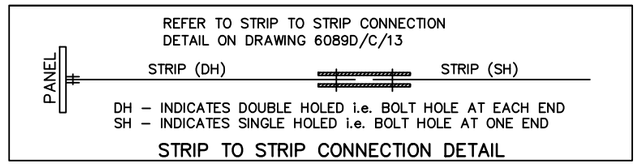


REW No.4 REW No.5 REW No.6

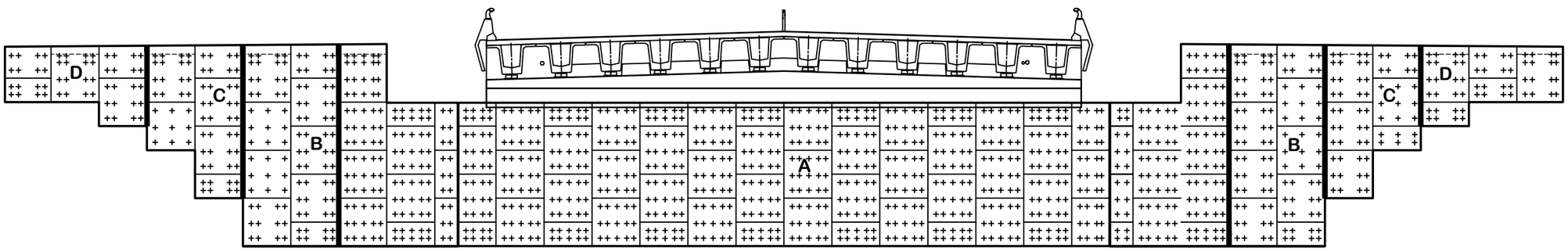
DEVELOPED REAR ELEVATION SOUTHERN ABUTMENT
(TOTAL WALL AREA 373m²)
SCALE 1:200

REhas REINFORCING STRIP TABLE

TYPE	SECTION mm x mm	DESIGN LENGTH (m)	STRIP COMBINATION (m)	FINISH
A	45 x 5	10.8	5.0 (DH) + 5.8 (SH)	GALV.
B	45 x 5	8.0	5.0 (DH) + 3.0 (SH)	GALV.
C	45 x 5	5.8	N/A	GALV.
D	45 x 5	5.0	N/A	GALV.



STRIP TO STRIP CONNECTION DETAIL



REhas REINFORCING STRIP DISTRIBUTION
SCALE 1:200

ISSUE	DRAWN	DESIGNER	APPROVED	DATE	AMENDMENTS
C	RB	CL	DAP	11.04.18	100% STAGE DESIGN FOR REVIEW
B	RB	CL	DAP	12.10.17	85% STAGE DESIGN FOR REVIEW
A	RB	CL	DAP	08.09.17	50% STAGE DESIGN FOR REVIEW

ORIGINAL DRAWING PRODUCTION SIZE: A3

CLIENT: FLETCHER

SIGNATURE OF THE "APPROVED" BOX INDICATES THAT THE DESIGN SHOWN ON THIS DRAWING HAS BEEN VERIFIED IN ACCORDANCE WITH THE REINFORCED EARTH COMPANY QUALITY SYSTEM.

DESIGN: CL SIGNED:
DRAWN: RB
APPROVED:
DATE:

REINFORCED EARTH Sustainable Technology

COMPUTER FILE No.: 6089DC05

DESIGNED BY
Reinforced Earth Limited.
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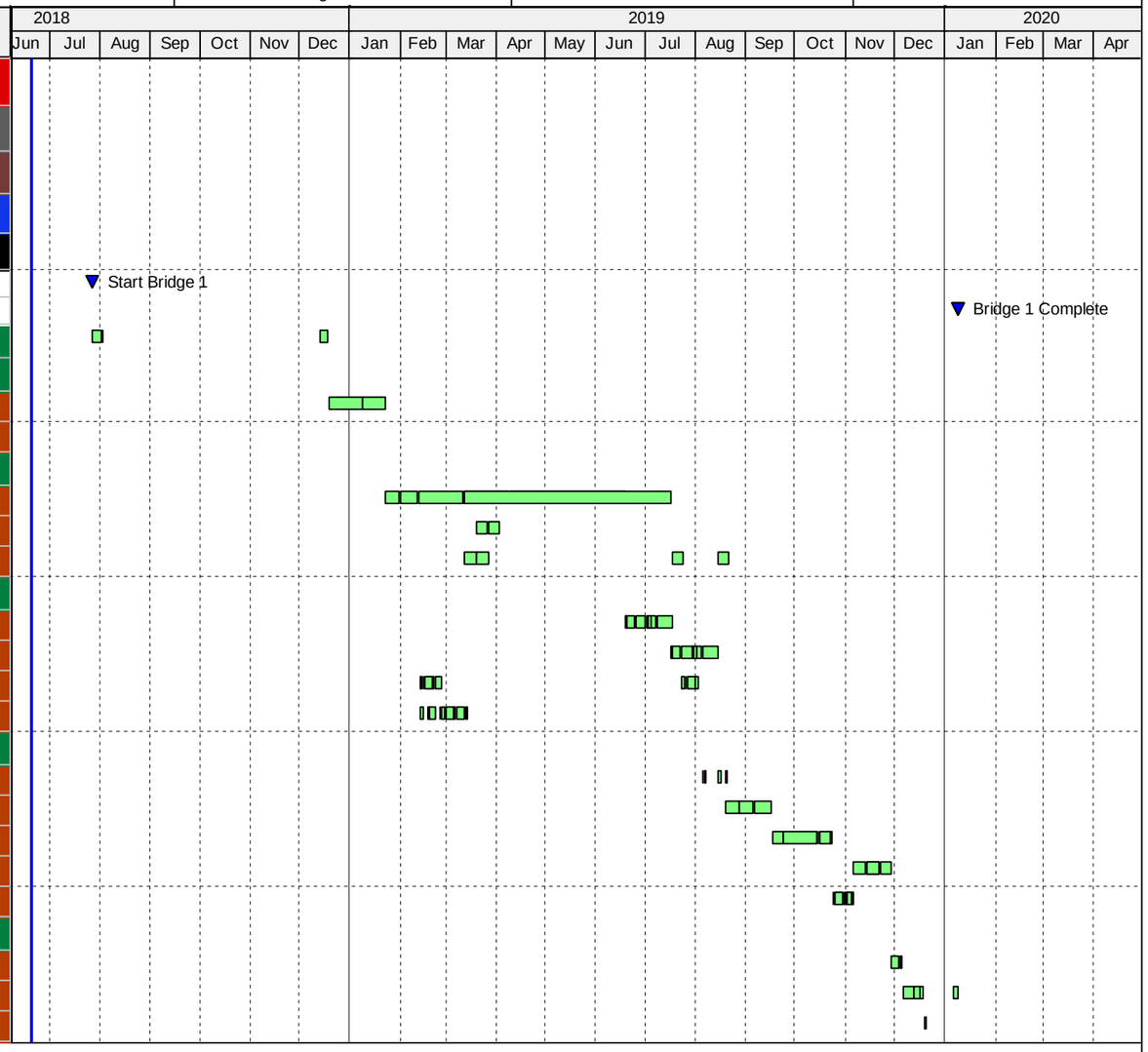
PROJECT: PEKA PEKA TO OTAKI EXPRESSWAY
WAITOHU STREAM BRIDGE
BRIDGE 1

SHEET TITLE: WALL ELEVATION REW No.4, 5 & 6 SOUTHERN ABUTMENT

DRAWING No.: 6089D/C/05
SHEET NUMBER: 5 OF 13
ISSUE: C

APPENDIX D – PROGRAMME

Activity Name	Orig Dur	Rem Dur	Start	Finish
Peka Peka to Otaki Expressway - Master	485d	351d	12-Jan-18 A	08-Jan-20
Construction	485d	351d	12-Jan-18 A	08-Jan-20
Zone 1 (North): Ch 0 - 3800	485d	351d	12-Jan-18 A	08-Jan-20
Structures	485d	351d	12-Jan-18 A	08-Jan-20
Bridge 1 - Waitohu Stream Bridge (Ch 750-850)	485d	351d	12-Jan-18 A	08-Jan-20
Start Bridge 1	0d	0d	27-Jul-18	
Bridge 1 Complete	0d	0d		08-Jan-20
Enabling Works	102d	102d	27-Jul-18	18-Dec-18
Foundations	251d	15d	12-Jan-18 A	22-Jan-19
Bored Piling	15d	15d	19-Dec-18	22-Jan-19
Proof Bore Holes	6d	0d	12-Jan-18 A	19-Jan-18 A
Ground Works	145d	145d	23-Jan-19	21-Aug-19
MSE Wall	119d	119d	23-Jan-19	16-Jul-19
Rip Rap	10d	10d	20-Mar-19	02-Apr-19
Other	113d	113d	12-Mar-19	21-Aug-19
Substructure	127d	127d	13-Feb-19	14-Aug-19
North Abutment	21d	21d	19-Jun-19	17-Jul-19
South Abutment	21d	21d	17-Jul-19	14-Aug-19
Pier 1	119d	119d	13-Feb-19	02-Aug-19
Pier 2	22d	22d	13-Feb-19	14-Mar-19
Superstructure	83d	83d	05-Aug-19	28-Nov-19
Beams	12d	12d	05-Aug-19	20-Aug-19
Diaphragms	21d	21d	19-Aug-19	16-Sep-19
Deck	27d	27d	17-Sep-19	23-Oct-19
Barriers	17d	17d	06-Nov-19	28-Nov-19
Approach slabs	8d	8d	24-Oct-19	05-Nov-19
Ancillary	19d	19d	29-Nov-19	08-Jan-20
Metalwork	5d	5d	29-Nov-19	05-Dec-19
Miscellaneous	14d	14d	06-Dec-19	08-Jan-20
Surfacing	2d	2d	19-Dec-19	20-Dec-19



APPENDIX E: SITE SPECIFIC TRAFFIC MANAGEMENT PLAN

Site Specific Traffic Management Plan

– Peka to Ōtaki Project

Bridge 1

August 2018

Contents

1 INTRODUCTION

This Site Specific Traffic Management Plan (SSTMP) provides the necessary information to demonstrate how the project team plan to avoid or mitigate potential construction traffic effects from activities associated with the construction of the Waitohu Stream Bridge (Bridge 1).

This SSTMP reflects the requirements of the Construction Traffic Management Plan (CTMP) including sections 1.3 (Performance Standards) and section 3.2.1 - specifically the need to interface with TTM on other networks. This plan is also consistent with the requirements set out in the over-arching Construction Environmental Management Plan (CEMP).

This document is intended to be utilised by the construction team to clearly identify any site specific traffic management requirements that must be adhered to prior to, and during works in any given area.

The temporary traffic management required to carry out these works across the site will consist of various types of Temporary Closures including, but not limited to, Site Access, Shoulder, Footpath, Stop/Go, Contra Flow and Temporary Concrete Barrier installations.

Specific Traffic Management methodologies will be finalised and submitted to the relevant Road Controlling Authority as the construction programme is finalised and becomes more detailed. These more specific Traffic Management Plans (TMPs) will cover specific mitigation for each individual temporary traffic management requirement. This document will be a living document that will have multiple stages and traffic layouts that will be amended as and when required to suit varying construction stages and required traffic management.

1.1 The SSTMP and TMP Process

This SSTMP provides the necessary information from a project level on how the effects of construction traffic related to the site activities will be avoided or mitigated across the two roading networks in the location of the expressway works i.e. the State Highway Network (NZTA) and the local road network (KCDC).

Each of the two Road Controlling Authorities (RCA's) has its own processes and procedures for the approvals (TMP's) and implementation of temporary Traffic management within their respective networks which is separate to the SSTMP process.

It is recognised that approval / implementation of TMPs associated with this SSTMP will be staged and implemented at differing times over the course of the works. In addition, it is recognised that the TMP's themselves may alter due to both project and surrounding community requirements.

The purpose of this SSTMP is to provide the base (minimum) standard of service / maximum practical level of mitigation to be incorporated into the development of the respective TMP's all the while ensuring that the BOI consent conditions and subsequent CTMP requirements are met during the construction process.

2 SSTMP CONSENT CONSIDERATIONS

Reference should also be made to section 3.2 of the CTMP.

2.1 Proposed Temporary Traffic Management Measures - BOI condition 34 b (i)

Each of the work areas will have the required (CoPTTM) signage and early warning delineation provided by a combination of cones and line marking – all in accordance with the respective RCA TMP requirements. Each Traffic Management Plan will be submitted to the relevant RCA and Approved prior to implementation. Until site specific construction plans are finalised a location specific Traffic Management Plan cannot be prepared. Once methodologies are finalised location specific Traffic Management plans will be prepared and submitted to KCDC for approval.

2.2 Assessment of delays - BOI condition 34 b (ii)

Each Traffic Management plan will incorporate an assessment of expected delays and will also provide delay calculations where any are expected to occur. It is not envisaged that any significant delays will occur at any time. Any oversized loads will be escorted with Pilot Vehicles again with no anticipated delays with their operations covered by Oversized Vehicle Permits. These oversized movements will be of an occasional nature only to move large plant in and off site.

2.3 Detour Routes - BOI condition 34 b (iii)

Detours are not expected to be required for works in this area. As the works progress, the necessary TMPs will be submitted to KCDC or NZTA for approval.

2.4 Existing Accesses - BOI condition 34 b (iv)

The proposed Temporary Traffic Management measures do not knowingly affect existing accesses to private or commercial properties. Should this occur consultation will be undertaken with affected parties to ensure they retain access at all times.

2.5 Pedestrian and Cyclist Access - BOI condition 34 b (v)

Detours are not expected to be required during works in this area. Sequencing of traffic management during the works is demonstrated in the attached drawings. As the works progress, the necessary TMPs will be submitted to KCDC for approval.

2.6 Maintaining Existing Transport Services - BOI condition 34 b (vi)

The proposed Temporary Traffic Management measures for implementation of the work areas will not affect any existing public transport services and facilities such as bus stops.

2.7 Temporary Speed Limits (TSL) - BOI condition 34 b (vii)

The use of TSL's will be kept to a minimum and will be identified as and when required in Site Specific Traffic Management Plans submitted to and approved by the relevant RCA.

2.8 Access to & From the Construction Site - BOI condition 34 b (viii)

The primary objective of this SSTMP is the planning (TMP's), approvals (RCA's) and incorporation of Site Access Points (SAP's) as outlined in this SSTMP to ensure the safe and efficient access to and from site of construction related traffic.

The operating hours of the SAP's will be in accordance with the proposed hours of work included within the **CNVMP i.e.**

- Monday to Friday 6.30am to 8pm
- Saturday 7.30am to 6pm

Operation outside those hours will be at the approval of the Engineer and in accordance with the provisions of the **CNVMP.**

2.9 Communications and Stakeholders - BOI condition 34 b (ix)

As the effects of the proposed measures are as yet unknown, implementation and operation of the SSTMP's will be communicated to stakeholders, road users and the community via the methods and processes as included within the project Stake Holder and Communications Management Plan, with particular emphasis on the key groups identified in Section 3.1 of the CTMP as required.

3 ADDITIONAL CTMP CONSIDERATIONS

3.1 Kiwirail NIMTR - CTMP section 2.1.2

The implementation and operation of some SSTMP's may involve the need to collaborate with Kiwirail as sites may cross the NIMT Railway or existing at grade carriageway crossings. Traffic Management strategies will include having no delays created for Kiwirail and the NIMT.

3.2 Emergency Action Plan(s) – CTMP section 3.2.3.8

All emergency services shall have unimpeded access along all State Highway and local roads 24 hrs. per day. Should any roads be affected by temporary traffic management any likely delays will be communicated prior to works to all Emergency Service Providers by way of weekly Road Works Reporting procedures as required by both RCA's. All major works that impact the roading network will have SSTMP's developed with consultation of Emergency Services.

3.3 Access to KCDC Owned and Operated Water and Waste Water Assets – CTMP section 3.2.1.1.7

Access to existing KCDC water and waste water assets will not be impeded by any SSTMP's.

3.4 Monitoring, Auditing & Reporting – CTMP sections 3.3 & 3.4

Monitoring, Auditing and Reporting of the Traffic Management Measure (once implemented) shall be in accordance with the CTMP and CoPTTM guidelines.

3.5 Complaints – CTMP sections 3.5

Feedback including complaints received related to the implementation of Temporary Traffic Management measures covered within this SSTMP shall be recorded and processed in line with the CTMP.

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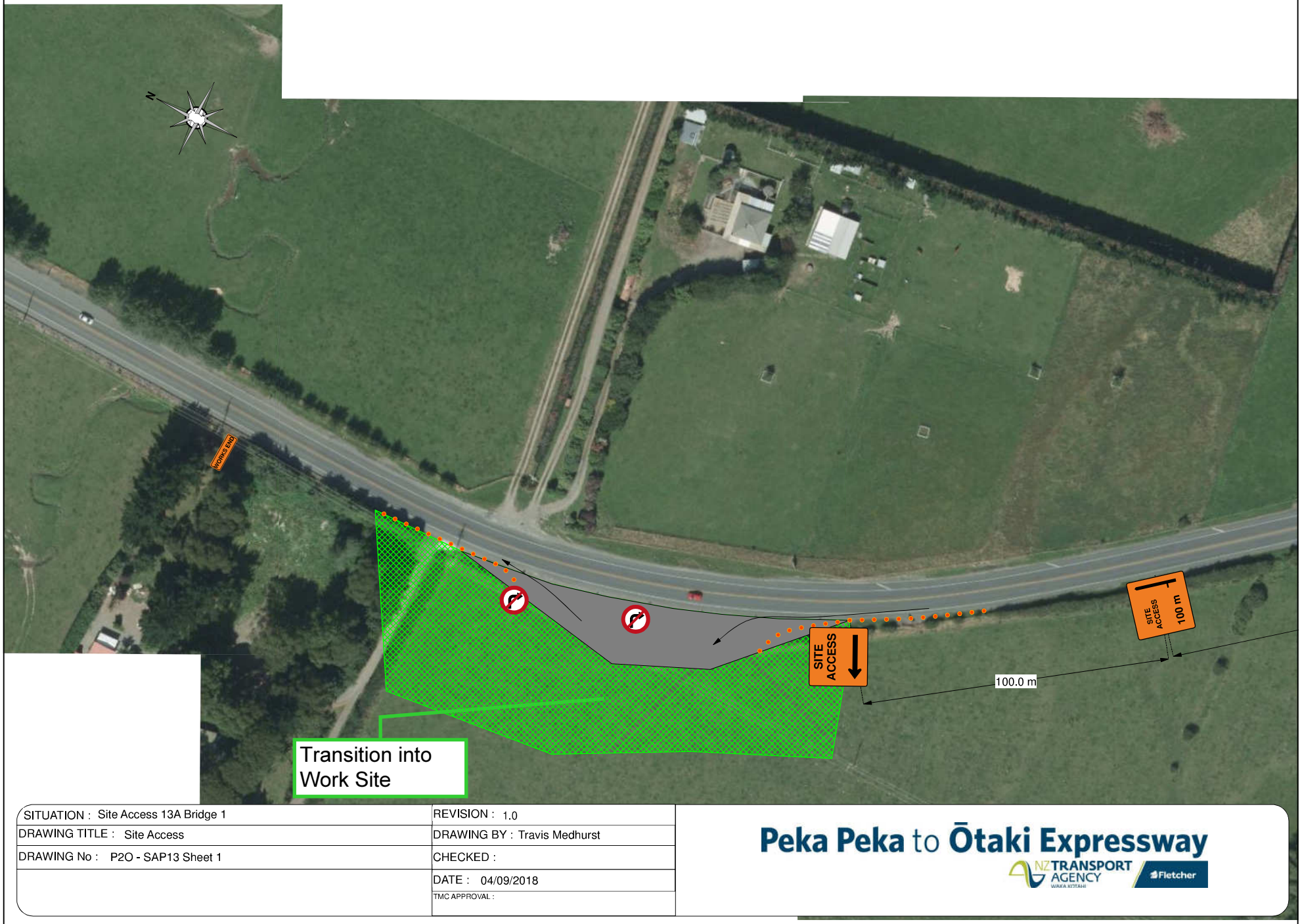

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DRAWING TITLE : Site Access	DRAWING BY : Travis Medhurst
DRAWING No : P2O - SAP13 Sheet 1	CHECKED :
	DATE : 04/09/2018
	TMC APPROVAL :

Peka Peka to Ōtaki Expressway

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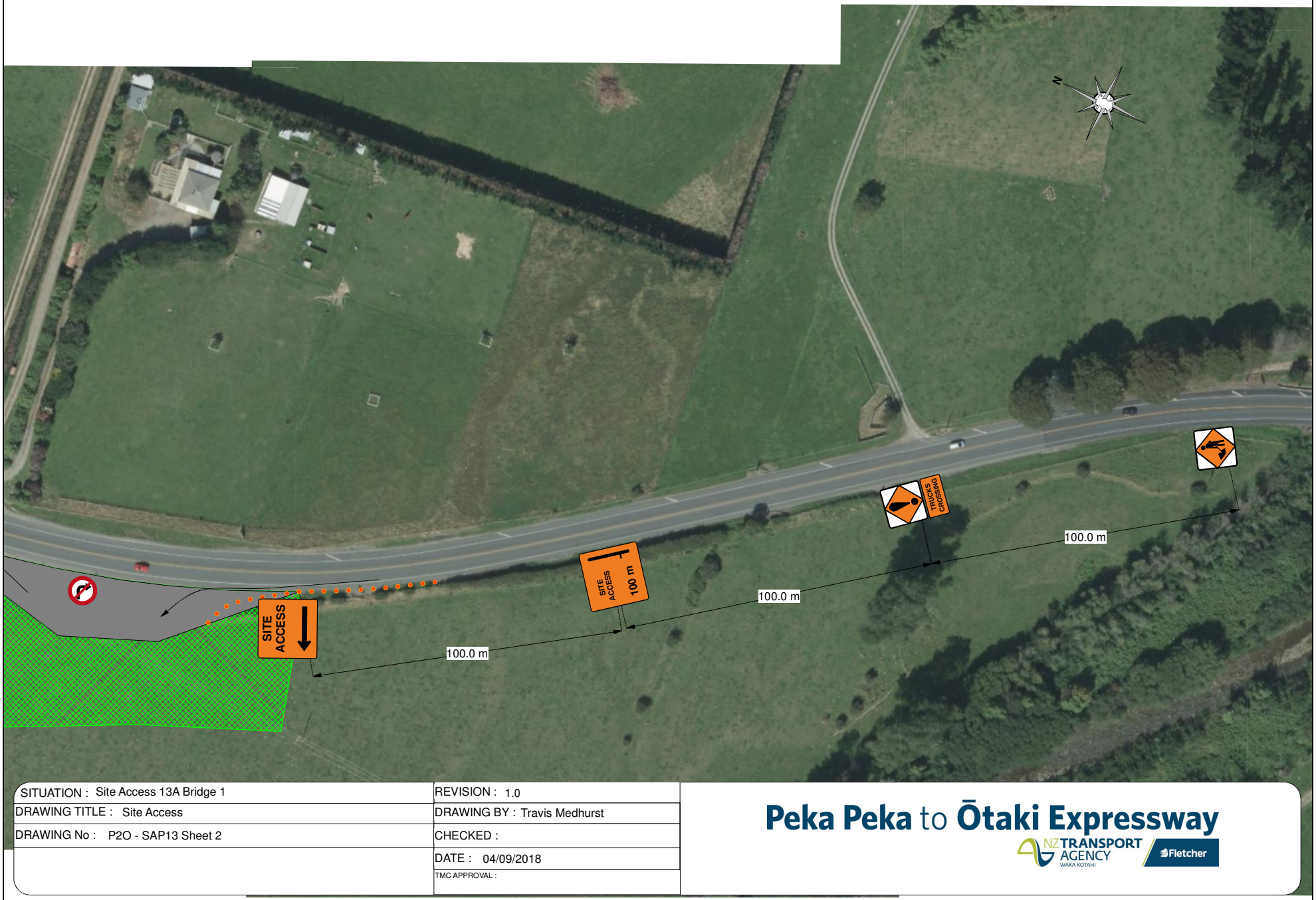

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DRAWING TITLE : Site Access	DRAWING BY : Travis Medhurst
DRAWING No : P2O - SAP13 Sheet 2	CHECKED :
	DATE : 04/09/2018
	TMC APPROVAL :

Peka Peka to Ōtaki Expressway

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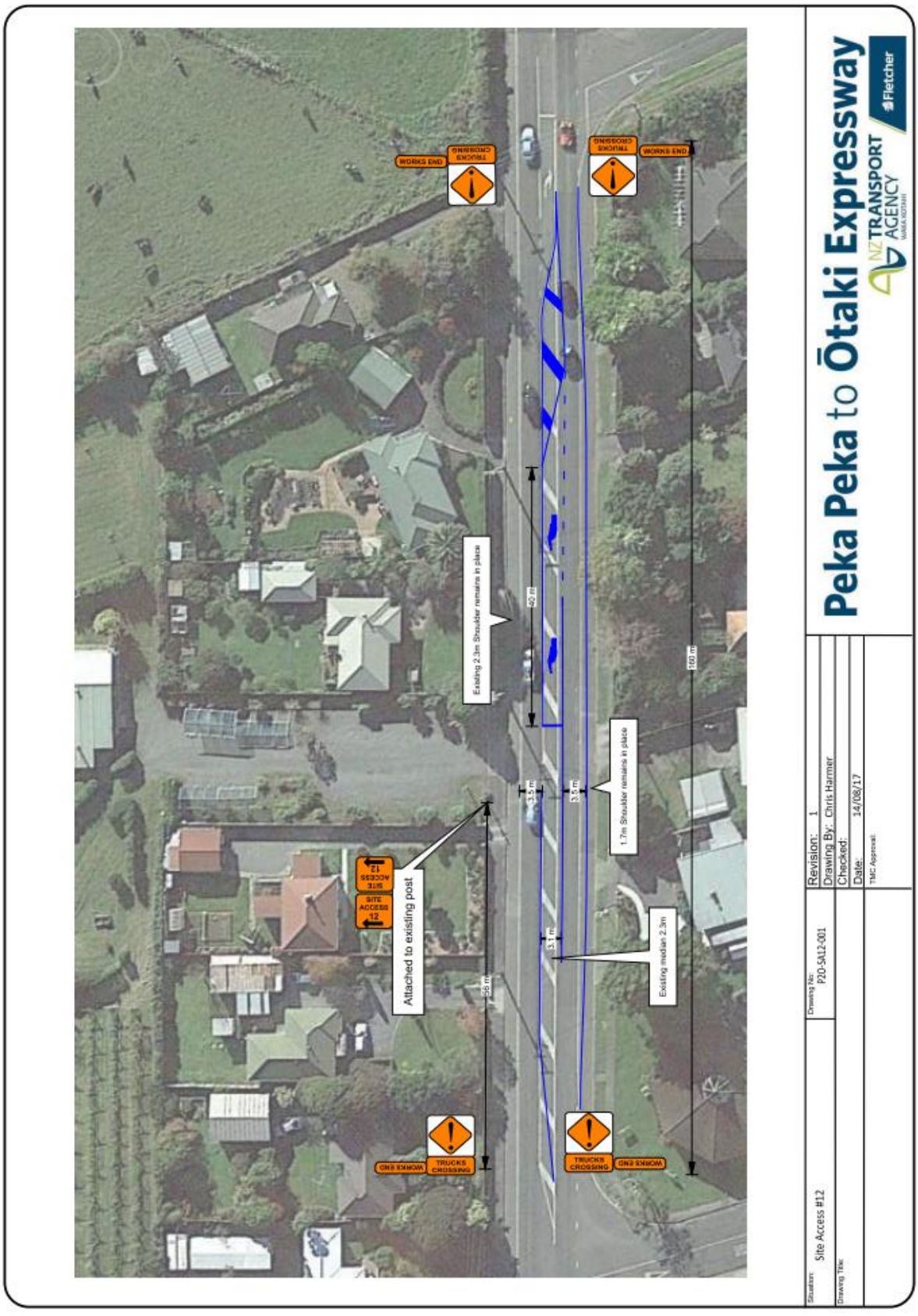
SAP 12


Peka Peka to Ōtaki Expressway
NZ TRANSPORT AGENCY
Fletcher
Site Access #12
P20-SA12-001
Revision: 1
Drawing By: Chris Harmer
Checked:
Date: 14/08/17
TMC Approval:
Existing 2.3m Shoulder remains in place
1.7m Shoulder remains in place
Existing median 2.3m
Attached to existing post
SITE ACCESS 12
TRUCKS CROSSING
WORKS END
50 m
103 m
56 m
3.5 m
3.1 m