Te Ararata Flood Resilience Works – Walmsley Road Bridge Replacement

Assessment of Effects on the Environment

Prepared for Auckland Council Healthy Waters
Prepared by Beca Limited

8 November 2024

Contents

Appendices

List of Acronyms

AC-OiC	Severe Weather Emergency Recovery (Auckland Flood Resilience Works) Order 2024
ADT	Average daily traffic
AMP	Avifauna Management Plan
ASM	Auckland System Management, responsible for the maintenance and management of Auckland's State Highway network.
AUP:OP	Auckland Unitary Plan: Operative in Part
Auckland Council	Auckland Council Healthy Waters
CAR	Corridor Access Request
CEMP	Construction Environmental Management Plan
CNVA	Construction Noise and Vibration Assessment
CNVMP	Construction Noise and Vibration Management Plan
Consent authority	Auckland Council Regulatory
CTMP	Construction Traffic Management Plan
CVA	Cultural Values Assessment
EcIA	Ecological Impact Assessment
EMP	Ecological Management Plan
ESCP	Erosion and Sediment Control Plan
FMP	Fish Management Plan
HAIL	Hazardous Activities and Industries List
HPMV	High productivity motor vehicles
LNCEA	Landscape and Natural Character Effects Assessment
MHWS	Mean High Water Springs
MMP	Mokomoko (skink) Management Plan
NES:CS	National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health
NZTA Waka Kotahi	New Zealand Transport Agency Waka Kotahi
OD	Over dimension
PSI	Preliminary Site Investigation
RMA	Resource Management Act 1991
SSESCP	Site Specific Erosion and Sediment Control Plan
SWERLA	Severe Weather Emergency Recovery Legislation Act 2023
TTM	Temporary traffic management
Te Ararata Creek/ Tarata Creek	Creek that runs through the Project site. Is known by both names.
VMP	Vegetation Management Plan

Revision History

Revision N°	Prepared By	Description	Date
1.0	Adriene Grafia	Final for lodgement	8/11/2024

Document Acceptance

Action	Name	Signed	Date
Prepared by	Adriene Grafia		8/11/2024
Reviewed by	Jenny Vince		8/11/2024
Approved by	Jenny Vince		8/11/2024
on behalf of	Beca Limited		

1 Introduction

1.1 Purpose of this report

This Assessment of Effects on the Environment (**AEE**) report has been prepared on behalf of Auckland Council Healthy Waters by Beca Limited (**Beca**) to support a resource consent for the proposed Te Ararata Walmsley Road bridge replacement works (**'the Project'** or **'flood resilience works'**) which are flood resilience works. A more detailed description of the activities to be authorised is provided in Section 3.1.

The application is made to Auckland Council (**the consent authority**).

This report has been prepared in fulfilment of section 88 of the Resource Management Act 1991 (**RMA**), as modified by the Severe Weather Emergency Recovery (Auckland Flood Resilience Works) Order 2024 (**AC-OiC**). Specifically, it has been prepared under the AC-OiC Clause 11 process. Further details on the AC-OiC, information requirements, and related processes are discussed in Section 2 of this report.

This report assesses the construction, and operational effects of the Project based on an indicative construction methodology and concept design developed to support the resource consent application. A reasonable worst case and effects envelope has been assumed within this assessment to account for potential changes to activities and programme. Any changes to the final methodology and detailed design are unlikely to change the overall envelope of effects as presented in this report.

1.2 Background

1.2.1 Project background

The Te Ararata[1] catchment was one of the worst affect areas of Auckland following the January 2023 floods. Auckland Council identified significant flooding, causing risk to life, and widespread flood damage to approximately 321 homes, which occurred due to poor flood conveyance along Te Ararata Creek with blockage points at the existing Walmsley Road bridge culverts and Mahunga Drive culverts. At the existing Walmsley bridge location, large debris from properties such as fences and outdoor furniture were caught within or around the existing twin 2.5m wide and 3.7m tall culverts beneath the bridge (see Figure 1-1 below).

This application and report focus on works required at the existing Walmsley Road bridge (i.e., the Project or flood resilience works). The Project seeks to achieve greater flow capacity, reduce blockage risk at the existing Walmsley Road bridge location and therefore reduce flood risk on surrounding properties. The supporting design drawings are provided in **Appendix A**.

The Project is one of a series of interventions anticipated within the Te Ararata catchment. Other interventions are to be progressed through separate resource consent applications or other approvals (as required) and are not subject of this application. Further discussion is provided in Section 3.1.

[1] It is noted that the creek within the Project area is referred to both as Te Ararata Creek and Tarata Creek, and therefore these names are interchangeable within the application documents.

Figure 1-1: Debris caught in and around the existing Walmsley Road bridge culverts during the 2023 flood events - left-hand image shows a piece of fencing in within the culvert. Right hand image shows outdoor furniture in front of the culvert (source: Auckland Council Healthy Waters)

1.2.2 Legislative framework

The Severe Weather Emergency Recovery Legislation Act 2023 (**SWERLA**) commenced on 12 April 2023 for the principal purpose of assisting communities and local authorities affected by severe weather events to respond to, and recover from, the impacts of the severe weather events. Section 7 of the SWERLA provides for the Governor-General to grant exemptions from, modify or extend any legislation listed in Schedule 2, including the RMA, by way of Order in Council. Subsequently, the AC-OiC was enacted on 21 October 2024. This application is to be considered under the AC-OiC.

1.3 Summary of resource consent requirements

Resource consent is required for a **Controlled Activity** (as specified in Clause 8 of the AC-OiC) pursuant to Section 9, 13 and 15 of the RMA for flood resilience works:

- on land;
- in, on, under or over the beds of rivers or lakes; and
- involving the taking, use, damming, or diversion of water

that are not expressly allowed by a national environmental standard, district rule or regional rule, or contravenes a national environmental standard, district rule or regional rule. The relevant activities are outlined in more detail in Section 5 of this AEE report.

1.4 Appended information

The following information is appended to and form part of this AEE report:

Appendix A. Indicative Construction Area and Design Drawings

Appendix B. Proposed Resource Consent Conditions

Appendix C. Record of Titles

Appendix D. Ecological Impact Assessment

Appendix E. Arboricultural Assessment of Effects

Appendix F. Landscape and Natural Character Effects Assessment

Appendix G. Integrated Transport Assessment

Appendix H. Preliminary Site Investigation

Appendix I. Geotechnical and Groundwater Assessment

Appendix J. Archaeological Assessment

Appendix K. Draft Planting Plan

Appendix L. Evidence of consent to carry out the flood resilience works

Appendix M. Flood Hazard and Risk Assessment

Appendix N. Draft Construction Environmental Management Plan

Appendix O. Draft Construction Traffic Management Plan

Appendix P. Draft Temporary Traffic Management Drawings

Appendix Q. Draft Erosion and Sediment Control Plan

Appendix R. Draft Ecological Management Plan

Appendix S. Relevant matters of control

Appendix T. Engagement Plan

Appendix U. Construction Noise and Vibration Assessment

Appendix V. Draft Construction Noise and Vibration Management Plan

Appendix W. Clause 11(2)(n) contact details of people consulted with

Appendix X. List of the names and contact details required under Clause 14(2)(a)

Appendix Y. Engagement Collateral

2 Modified Legislative Framework

2.1 Background

The SWERLA commenced on 12 April 2023 for the principal purpose of assisting communities and local authorities affected by severe weather events to respond to, and recover from, the impacts of the severe weather events. The SWERLA provides for economic recovery and the planning, rebuilding and recovery of affected communities and persons, including:

- Rebuilding of land, infrastructure, and other property of affected communities or of any affected persons;
- Development, building, or rebuilding of land, infrastructure, or other property or access to resources or services in areas not affected by the severe weather events;
- Safety enhancements to, and improvements to the resilience of, that land, infrastructure, or other property;
- Facilitating co-ordinated efforts and processes for short-term, medium-term, and long-term recovery;
- Facilitating the restoration and improvement of the economic, social, and cultural well-being, and enhancing the resilience, of affected communities or of any affected persons; and
- Facilitating the restoration and resilience of the environment.

Section 7 of the SWERLA provides for the Governor-General to grant exemptions from, modify or extend any legislation listed in Schedule 2, including the RMA, by way of Order in Council.

Subsequently, the AC-OiC was enacted on 24 October 2024.

The AC-OiC sets out a truncated process for making and considering resource consent applications under the RMA, which provides certainty that applications for recovery works will be approved in an expedited manner. Details of the OIC relevant to this application are described in the following sections.

The SWERLA and AC-OiC will be repealed/revoked by 31 March 2028.

2.2 Key qualifying definitions under Clause 6 of the AC-OiC

Clause 6(1) of the AC-OiC specifies the meaning of flood resilience works as follows:

*(1) In this order, **flood resilience works** means works that—*

(a) are of a kind described in subclause (2); and

(b) are carried out—

(i) by or on behalf of the Auckland Council; and

(ii) in any part of the severe weather events affected area that is at a location in the Auckland region specified in subclause (3); and

(iii) for the sole or principal purpose of responding to the impacts of 1 or more severe weather events; and (c) for the purposes of the RMA,—

(c) involve or are concerned with either or both of the following:

(i) improving the resilience of land or infrastructure, or both, to flooding:

(ii) making safety enhancements to land or infrastructure, or both, to avoid or mitigate risks posed by flooding; and

(d) for the purposes of the RMA,—

(i) would ordinarily require a resource consent; and

(ii) are not described in any plan or national environmental standard as a permitted activity; and

(iii) are not a prohibited activity.

Details of how the proposed flood resilience works meet this Clause is provided in the sections below.

2.2.1 Flood resilience works (Clause 6(1)(a))

Flood resilience works is defined as*:*

(2) Works of the kind referred to in subclause (1)(a) are—

(a) any activity that is listed in subclause (3) and that involves or is concerned with either or both of the following:

(i) improving the resilience of land or infrastructure, or both, to flooding:

(ii) making safety enhancements to land or infrastructure, or both, to avoid or mitigate risks posed by flooding; and

(b) any incidental or subsidiary activity.

(3) The activities referred to in subclause (2)(a) are—

(a) regrading and naturalising watercourses:

(b) removing sediment:

(c) removing vegetation, including clearing mangroves:

(d) installing debris capture structures:

(e) replacing or removing dams, including embankment dams:

(f) replacing or removing culverts:

(g) replacing or constructing bridges, including footbridges and pipebridges:

(h) installing, replacing, or removing pipes:

(i) constructing or improving accessways for the maintenance of infrastructure:

(j) relocating infrastructure, such as cables, poles, and roads:

(k) earthworking:

(l) stabilising slopes, including by constructing retaining walls:

(m) landscaping.

The works subject to this resource consent application meet the definition of flood resilience works.

The existing twin culverts beneath Walmsley Road bridge were one of the blockage points along Te Ararata Creek which contributed to widespread flooding within the Te Ararata catchment during the 2023 flooding event. Approximately 321 houses were flooded as described further in Section 4.2.

To mitigate flood risk and improve resilience to flooding, the Project seeks to reduce the identified flood blockage risk at the Walmsley Road bridge location and provide for increased flow capacity along Te Ararata Creek by:

- Removing the existing twin culverts beneath Walmsley Road bridge which are prone to trapping large debris and subsequent blockage;
- Constructing a replacement bridge that achieves an increased cross-sectional area beneath the bridge structure of approximately 60m^2 (an increase from the 17m^2 available with the twin culverts);
- Regrading the existing Te Ararata Creek banks to achieve a wider creek profile and increased cross-sectional area; and
- Relocating the existing Watercare watermain pipe bridge foundations to achieve a wider clearance over Te Ararata Creek and enable the proposed wider creek profile.

To achieve the works above, ancillary construction works including earthworks, vegetation clearance, retaining wall construction, service relocation, landscaping and temporary traffic management will be required.

Further discussion on the flood resilience outcomes being achieved by the Project are set out in Section 4.2 and 4.3 below.

2.2.2 Auckland Council (Clause 6(1)(b)(i))

These resource consent applications are made by Auckland Council, specifically the Healthy Waters Department.

2.2.3 Severe weather affected area (Clause 6(1)(b)(ii))

The Project works area for this application is within a “severe weather affected area”, being the Te Ararata location specified in Schedule 1 of the AC-OiC as shown in Figure 2-1.

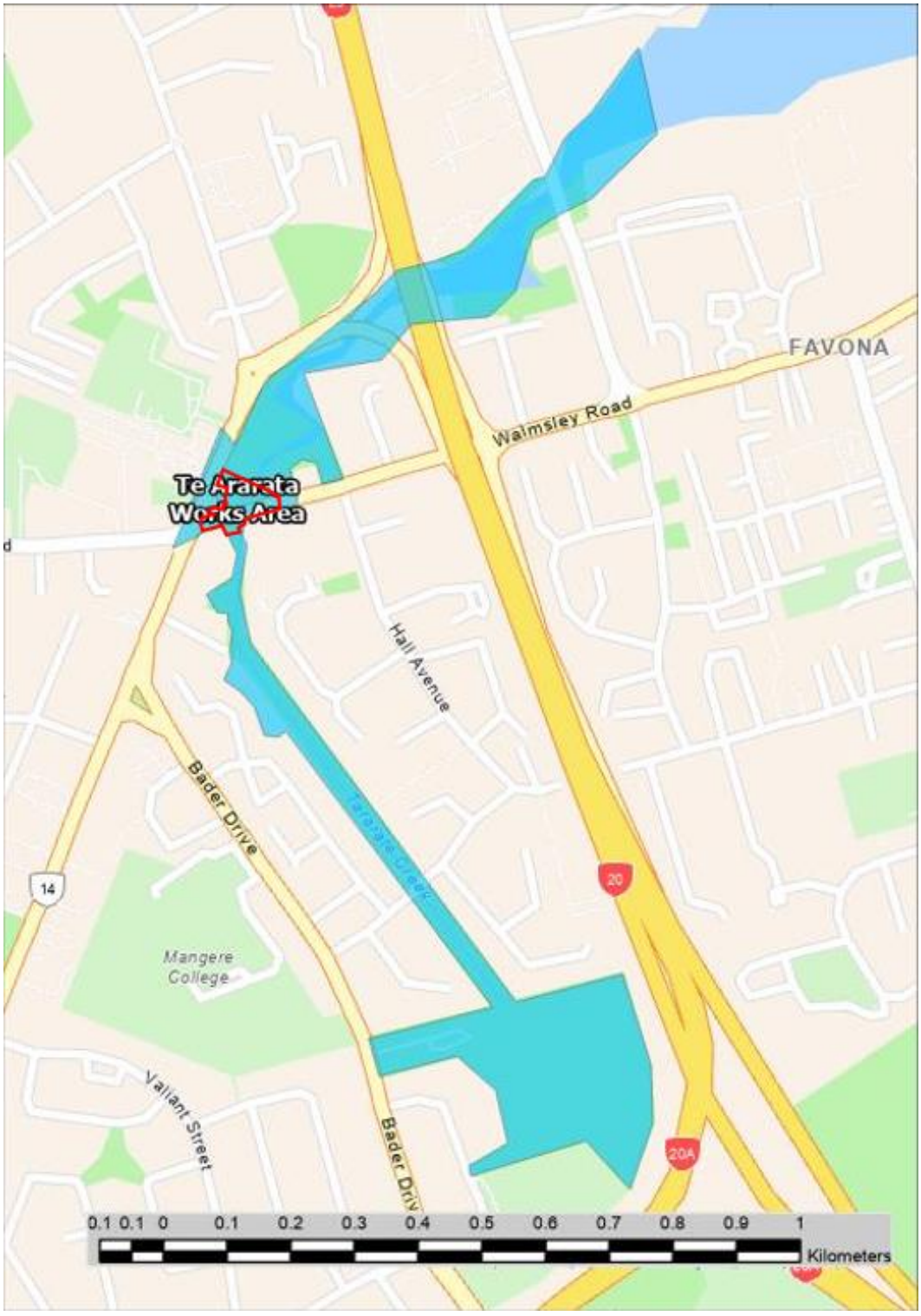


Figure 2-1: Te Ararata location (shown in blue) and proposed Project works area (indicatively shown in red) (Source AC-OiC Schedule 1)

2.2.4 Responding to the impacts severe weather events (Clause 6(1)(b)(iii))

The purpose of the flood resilience works is to respond to impacts of the January 2023 Auckland Anniversary floods. The Te Ararata catchment experienced significant flooding, causing risk to life, and widespread flood damage to approximately 321 homes.

2.2.5 Resource consents (Clause 6(1)(c))

Section 5 of this report details the permitted activities and resource consents required for the flood resilience works. The proposed flood resilience works are not a prohibited activity.

2.3 Controlled activity status and non-notification

Under Clause 8 of the AC-OiC, any work done by, or on behalf of, Auckland Council Healthy Waters is to be classified as a controlled activity for the purposes of section 87A(2) of the RMA. Controlled activity status means the relevant consent authority must grant applications for the flood resilience works.

Clause 13(2) of the AC-OiC states that a resource consent application for recovery work must not be publicly notified or given limited notification.

2.4 Content of this application

Clause 11 of the AC-OiC details the type and extent of information required in resource consent applications. Table 2-1 outlines the information requirements and the location of the information within this report.

An assessment of the proposal against the objectives and policies of national policy statements, regional policy statements, and plans or proposed plans of the RMA, is not required under Clause 11 of the AC-OiC. Therefore, such an assessment is not included in this report.

Table 2-1: Clause 11 Application Summary of Information provided

Sub-clause	Information requirement under Clause 11	Report reference
(2)(a)	a detailed description of the flood resilience works:	Section 3.1
(2)(b)	a map that shows— (i) the area (the works area), at the relevant location specified in clause 6(3), in which flood resilience works are to be carried out; and	Section 2.2.3, Figure 2-1
	(ii) any AUP overlays that apply in the works area or any area that adjoins the works area, or both:	Section 3.2, Figure 3-2
(2)(c)	a list of any AUP overlays that apply in either or both of the following: (i) the works area:	Section 3.2
	(ii) any area that adjoins the works area:	Section 3.2
(2)(d)	a map that shows each proposed work site in the works area:	Section 3.1, Figure 3-1
(2)(e)	a general description of each proposed work site in the works area:	Section 3
(2)(f)	for each proposed work site in the works area, a description of — (i) how the works align with existing resource consents relating to the proposed work site; and	Section 3.13
	(ii) any conflicts with existing resource consents relating to the proposed work site:	Section 3.13
(2)(g)	a map that shows each allotment that is wholly or partly within the boundaries of each proposed work site in the works area:	Section 3.1, Figure 3-1
(2)(h)	for each proposed work site in the works area, the name and address of each owner and each occupier of each allotment that is wholly or partly within the boundaries of the proposed work site:	Section 3.1
(2)(i)	a description of any cultural values in the works area that have been identified by a relevant Māori entity:	Section 3.8.2
(2)(j)	an assessment of all potential effects of the works with input from appropriate experts, including consideration of— (i) all information reasonably available to the applicant; and	Section 6 and Appendix package
	(ii) the potential effects on any cultural values in the works area identified by a relevant Māori entity; and	Section 6.3
	(iii) the potential effects on any values identified in AUP overlays that apply in the works area or any area that adjoins the works area, or both:	Section 6 and Appendix package

Sub-clause	Information requirement under Clause 11	Report reference
(2)(k)	*proposals to avoid, remedy, or mitigate potential adverse effects identified by the assessment described in paragraph (j):*	Section 7 and Appendix package
(2)(l)	*any conditions that the applicant proposes for the resource consent that are—* *(i) set out in Schedule 2; or*	Appendix B
	(ii) a variation of, or additional to, a condition set out in Schedule 2:	Appendix B
(2)(m)	*the reasons for any conditions that the applicant proposes for the resource consent that are a variation of, or additional to, a condition set out in Schedule 2:*	Appendix B
(2)(n)	*a description of any consultation undertaken in relation to the flood resilience works (including with relevant Māori entities) and the names and contact details of all persons consulted:*	Section 8, Appendix W
(2)(o)	*a list of all relevant Māori entities:*	Section 8.3
(2)(p)	*a list of the names and contact details of all persons the consent authority is required to notify under clause 14(2)(a):*	Appendix X
(2)(q)	*if the proposed flood resilience works involve the carrying out of any activity that could affect infrastructure that is owned by a person other than the applicant,—* *(i) a description of the infrastructure; and*	Section 3.3
	(ii) a description of the location of the infrastructure; and	Section 3.3
	(iii) evidence that the owner of the infrastructure has consented to the carrying out of the activity:	Appendix L
(2)(r)	*if the applicant intends to undertake any permitted activity relating to the proposed flood resilience works in the works area, a description of the permitted activity that demonstrates that it complies with the requirements, conditions, and permissions for the permitted activity, if any, specified in the Auckland Unitary Plan (so that a resource consent is not required for that activity under section 87A(1) of the RMA).*	Section 5.1
3	*If the applicant has not carried out any consultation (see subclause (2)(n)), the application must explain why.*	N/A

2.5 Processing timeframes

Clause 17(1) specifies that the consent authority must give notice of its decision on the application under section 114 of the RMA within 30 working days after the date on which the application contains all the information the consent authority requires to make a decision on an application.

Also, Clause 17(2) specifies that the timeframe above cannot be extended or deferred in any way (e.g. s37, s92(1) further information requests, or s92(2) commissioning of reports).

2.6 Resource consent conditions

Clause 16(2) of the AC-OiC specifies that the consent authority may impose resource consent conditions set out in Schedule 2 of the AC-OiC. Clauses 16(3) and 16(4) of the AC-OiC specify that the consent authority may amend any resource consent condition set out in Schedule 2 of the AC-OiC (except clause 1) or impose additional conditions only if is considered the amendment or additional condition is necessary for the purposes of the authority's responsibility for a matter of control.

Appendix B of this report outline the Schedule 2 conditions that are relevant to these resource consent applications and any proposed amendments and additional conditions.

3 Description of the Site

This section sets out the information requirements of Clause 11(2)(b)-(i) and (q)(i) and (ii) which require:

(2) Instead of complying with section 88(2)(b) of the RMA, an application for a resource consent for flood resilience works must include the following information:

(b) a map that shows—

(i) the area (the works area), at the relevant location specified in clause 6(3), in which flood resilience works are to be carried out; and

(ii) any AUP overlays that apply in the works area or any area that adjoins the works area, or both:

(c) a list of any AUP overlays that apply in either or both of the following:

(i) the works area:

(ii) any area that adjoins the works area:

(d) a map that shows each proposed work site in the works area:

(e) a general description of each proposed work site in the works area:

(f) for each proposed work site in the works area, a description of—

(i) how the flood resilience works align with existing resource consents relating to the proposed work site; and

(ii) any conflicts with existing resource consents relating to the proposed work site:

(g) a map that shows each allotment that is wholly or partly within the boundaries of each proposed work site in the works area:

(h) for each proposed work site in the works area, the name and address of each owner and each occupier of each allotment that is wholly or partly within the boundaries of the proposed work site:

(i) a description of any cultural values in the works area that have been identified by a relevant Māori entity:

(q) if the proposed flood resilience works involve the carrying out of any activity that could affect infrastructure that is owned by a person other than the applicant,—

(i) a description of the infrastructure; and

(ii) a description of the location of the infrastructure;

3.1 Site description and location

The Project is located across Black Bridge Reserve, Walmsley Road Reserve, Tarata Creek Reserve, Te Ararata Creek and Walmsley Road (particularly along the existing Walmsley Road bridge) in the Auckland suburb of Māngere Bridge as shown in Figure 3-1 below.

The Project is within the Te Ararata catchment (approximately 550 hectares) which is a primarily urban catchment located on the southern side of the Māngere Inlet. The property details of each of the sites

comprising the Project works area and details of any occupiers or owners are presented in Table 3-1 below. Record of Titles for the below properties are provided in **Appendix C**.

Table 3-1: Works site address and owner/occupier details

Property address		Legal description	LINZ Parcel Description	Owner/ occupier name	Owner/occupier address
5R Walmsley Road	Black Bridge Reserve	PT ALLOT 31 SBRS OF MANGERE	5131429	Auckland Council	Owner: Auckland Council Private Bag 92300 Victoria Street West Auckland 1142
7R Walmsley Road	Walmsley Road Reserve	PT SO 30799	4968888		
6R Walmsley Road	Tarata Creek Reserve	PT ALLOT 309 PSH of MANUREWA	5068174		
		LOT 3 DP 35540	5049290		
		LOT 12 DP 45822	4933001		
		PT LOT 1 DP 45822	5158838		
Walmsley Road		N/A – Road Reserve		Auckland Transport	Owner: Auckland Transport Private Bag 92250 Auckland 1142 New Zealand

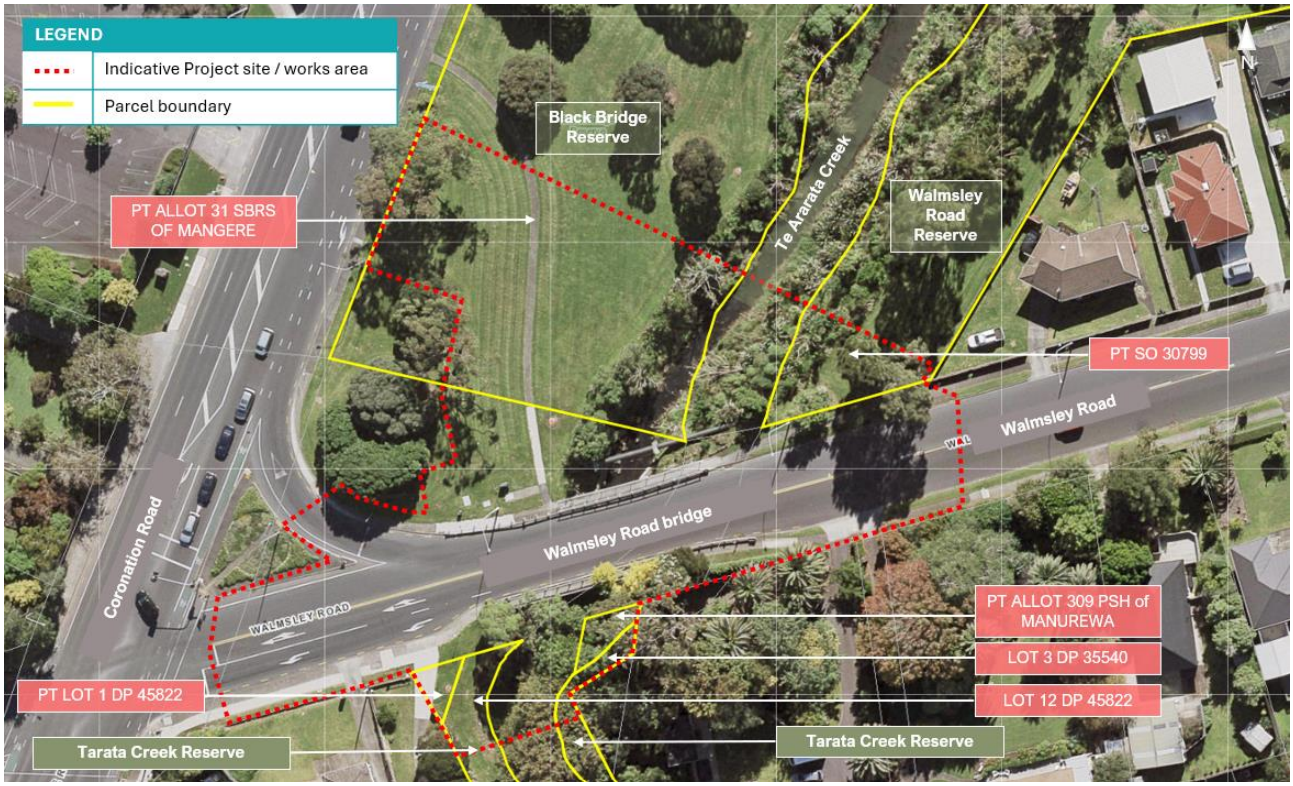


Figure 3-1: Map showing the indicative Project site or works site (outlined in red dashed line) and each allotment (annotated and outlined in yellow) within the work site boundaries (Auckland Council Geomaps, 2024)

3.2 Land use, zoning and overlays

The proposed work site and adjoining sites are subject to the zones, overlays, controls, and designations under the Auckland Unitary Plan: Operative in Part (**AUP:OP**), listed in Table 3-2, and shown in Figure 3-2 below.

As noted in Section 3.1 above, the Project is located across Black Bridge Reserve, Walmsley Road Reserve and Tarata Creek Reserve, which are zoned Open Space – Informal Recreation or Open Space – Conservation. Te Ararata Creek also flows south to north between these open spaces and is zoned Water. An existing public footpath is located within Black Bridge Reserve, connecting between Walmsley Road (west of the existing Walmsley Road bridge) and Coronation Road. The Project also involves a section of Walmsley Road (including Walmsley Road bridge) which is an arterial road that connects to Coronation Road, Miller Road and McKenzie Road to the west and State Highway 20 (**SH20**) on and off-ramps and Mahunga Drive to the west.

The wider surrounding area is predominantly residential in nature (including new build and suburban residential development) within Residential – Mixed Housing Urban and Residential – Mixed Housing Suburban zoning. A property zoned Special Purpose Zone – School is located to the northwest of the Project site but is currently used for a church (Siasi Tokaikolo ‘ia Kalaisi - ‘Api ko Nasaleti). A Historic Heritage Overlay Extent of Place associated with the ‘Topping House’ (ID 1439) is located at to the west of the Project site and another associated with a residence (ID 1433) is located to the northwest. Other existing land use features in the surrounding area include the existing BP service station on Coronation Road.

Table 3-2: Zoning, overlays, controls, and designations under the AUP: OP that apply to the works area and any area that adjoins the works site, or both

AUP: OP Zones, Overlays, Controls and Designations	
Zones	• Open Space – Informal Recreation Zone • Open Space – Conservation Zone • Residential – Mixed Housing Urban Zone* • Residential – Mixed Housing Suburban Zone* • Water • Road
Precincts	None
Overlays	• Quality-Sensitive Aquifer Management Areas Overlay [rp] – Auckland Isthmus Volcanic • Regionally Significant Volcanic Viewshafts and Height Sensitive Areas Overlay [rcp/dp] – M4, Mount Mangere, Viewshafts
Controls	• Coastal Inundation 1 per cent AEP Plus 1m Control – 1m sea level rise • Macroinvertebrate Community Index – Exotic • Macroinvertebrate Community Index – Urban • Arterial Roads – Walmsley Road and Coronation Road
Designation	• Airspace Restriction Designations – 1D 1102, Protection of aeronautical functions – obstacle limitation surfaces, Auckland International Airport Ltd[2]
Modification	• Plan Changes, Plan Change 78 – Intensification, Multiple Layers
**AUP: OP notations for areas that adjoins the works area*	

[2] The proposed works do not intrude into the airspace designation. The obstacle limitation surface (OLS) at the site is approximately 55m above mean sea level. Whilst a crane will be required for the proposed works, it will not extend into the OLS.

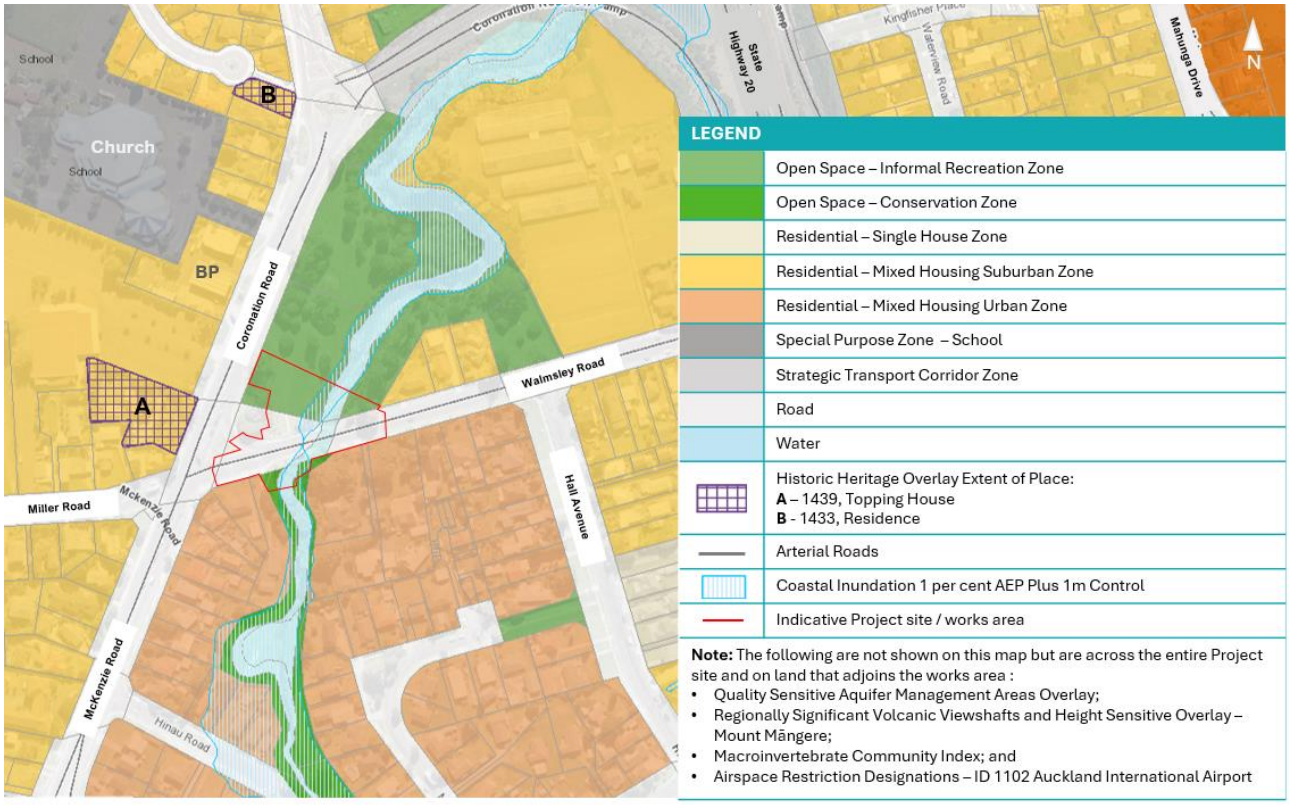


Figure 3-2: Map that shows relevant AUP: OP zoning, overlays and controls that apply in the works area or any area that adjoins the works area, or both (Auckland Council Geomaps, 2024)

3.3 Infrastructure

The Project will involve activities that will affect the existing Walmsley Road bridge owned by Auckland Transport and the existing 810mm diameter Māngere watermain pipe bridge owned by Watercare Services Limited (**Watercare**). The infrastructure is shown in Figure 3-3 below, with a more detailed description of the works proposed on each piece of infrastructure discussed in Section 4.4 below:

Protection, relocation and/or realignment of existing services / infrastructure within or adjacent to the Project site may also be required on a temporary or permanent basis to enable the Project. The existing services include the following and are indicatively shown in Figure 3-3 below:

- 300mm diameter water pipe– owned by Watercare
- Bulk water supply point (which connects to the 810mm Māngere watermain pipe bridge)– owned by Watercare
- 150 – 300mm diameter wastewater pipes – owned by Watercare
- 300mm diameter stormwater pipe – owned by Auckland Council Healthy Waters (the applicant)
- Medium voltage power cable – owned by Vector
- 150mm diameter medium pressure gas distribution line - owned by Vector
- Telecommunications cable – owned by Chorus

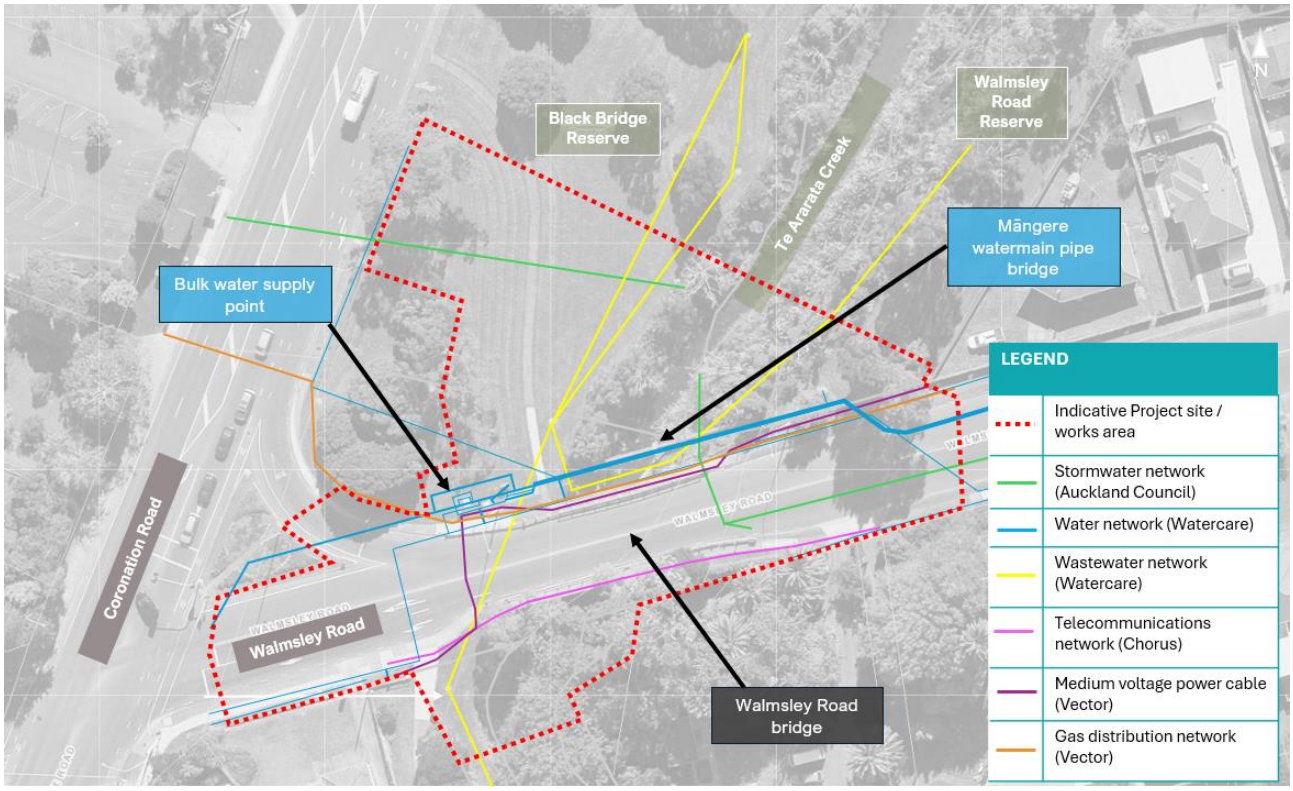


Figure 3-3: Map that shows the indicative location of existing infrastructure and services, that are present in the works area and immediate surroundings (Auckland Council Geomaps, 2024 and **Appendix A**)

3.4 Watercourses, hydrology and coastal inundation

As shown in Figure 3-4, the Project area includes Te Ararata Creek. Te Ararata Creek flows south to north under Walmsley Road Bridge and intersects Black Bridge and Walmsley Road Reserves. It also flows beneath the Coronation Road off-ramp, SH20 and Mahunga Drive culverts before discharging into the Māngere Inlet. The system is fed by open and piped watercourses from the surrounding residential and commercial areas.

Figure 3-5 shows the flood hazards applicable to the works site and surrounding area. A large portion of the Project area is within flood plains and flood prone areas. Overland flow paths are also identified within the Project site. The identified flood hazards generally overlap and align with the existing Te Ararata Creek which is the natural low point within the area.

The Project site is also within the coastal storm inundation 1% annual exceedance probability (AEP) area and 1% AEP plus 1m sea level rise as shown in Figure 3-6.

The Te Ararata catchment was one of the worst affected areas of Auckland following the January 2023 floods. Healthy Waters identified significant flooding, causing risk to life, and widespread flood damage to approximately 321 homes, which occurred due to poor flood conveyance along Te Ararata Creek with partial blockage points at the existing Walmsley Road bridge culverts and Mahunga Drive culverts.

Figure 3-4: Watercourses within and surrounding the works site (shown approximately in red) (Auckland Council Geomaps, 2024).

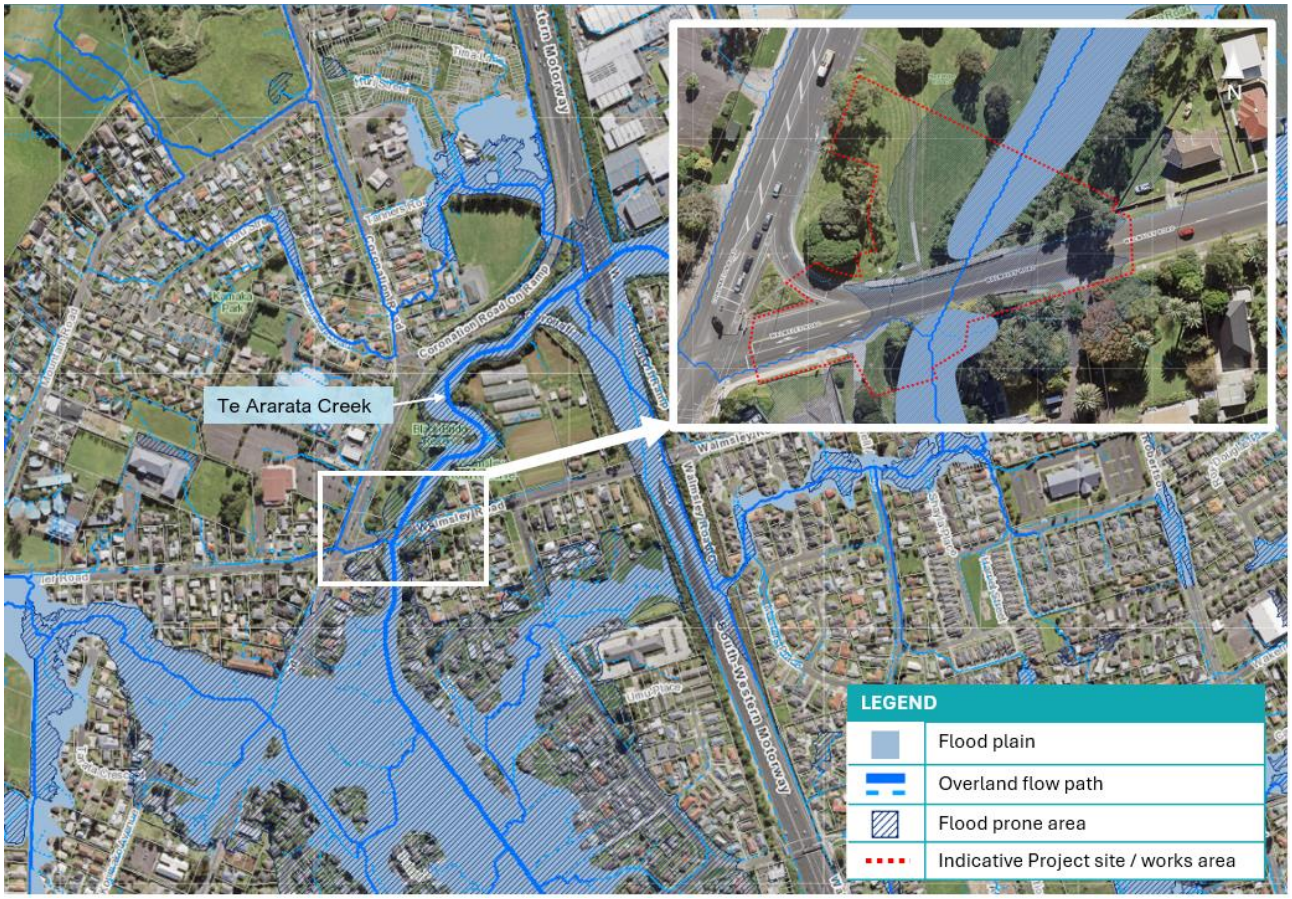


Figure 3-5: Flood plain, Flood prone and overland flow paths within and surrounding the works site (shown approximately in red) (Auckland Council Geomaps, 2024).

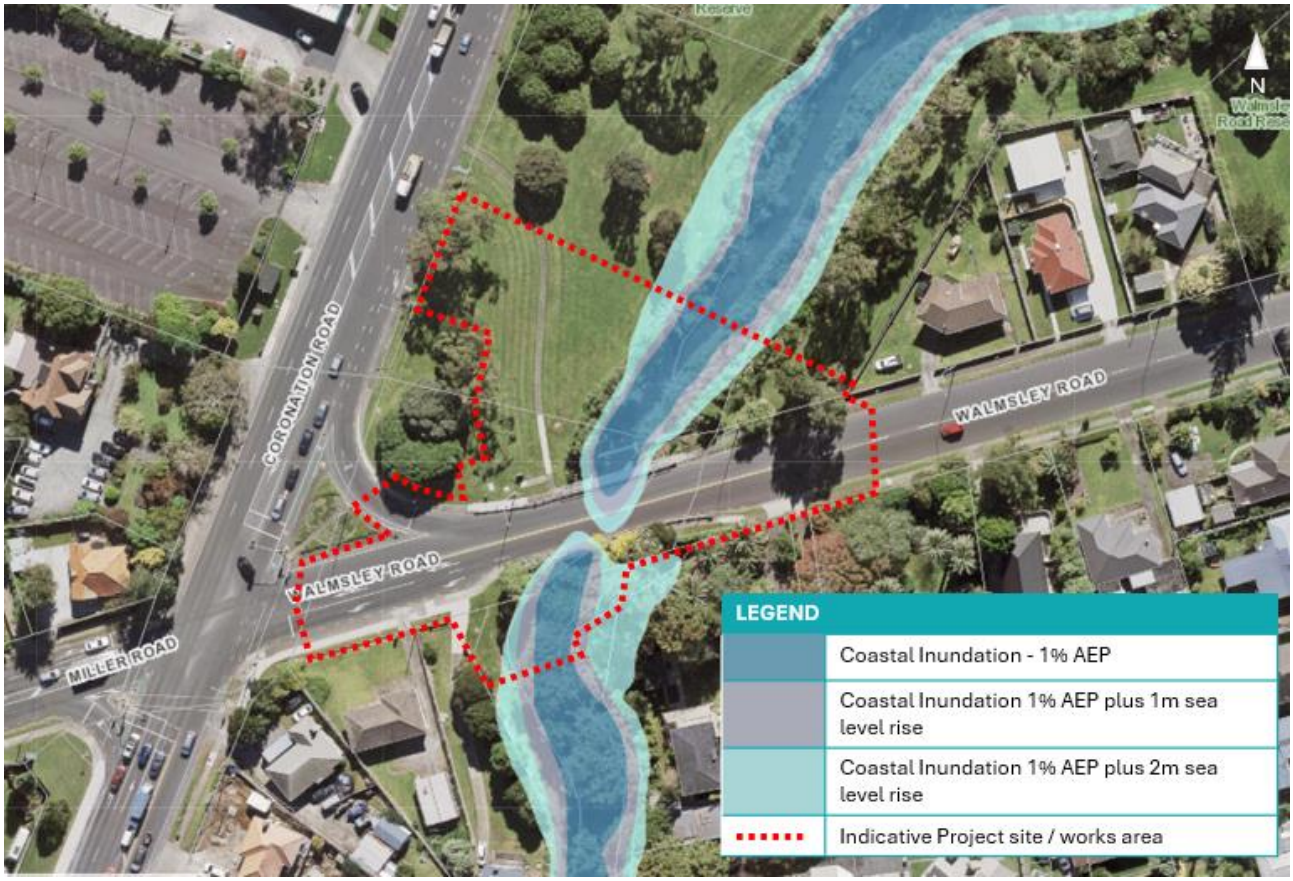


Figure 3-6: Coastal inundation areas within the works site (shown approximately in red) (Auckland Council Geomaps, 2024).

3.5 Ecological values

An Ecological Impact Assessment (**EcIA**) has been undertaken by Tonkin & Taylor Ltd (**Appendix D**), which describes the ecological characteristics and values present at the works site in further detail. The Project site is located in the Tamaki Ecological District and Te Ararata Creek catchment, with ecological characteristics consisting of specimen pōhutukawa and exotic trees, and native riparian plantings bordering Te Ararata Creek. The ecological values identified within the works area is summarised below and an overview of the features are shown in Figure 3-7.

3.5.1 Freshwater values

Te Ararata Creek is a modified urban stream that flows north under Walmsley Road bridge and intersects Black Bridge and Walmsley Road Reserves as noted above. Te Ararata Creek has limited in-stream habitat heterogeneity and is effectively unshaded contributing to increased solar access leading to elevated instream temperatures and aquatic plant growth. In summer, the stream is known to become choked with macrophytes and algae.

Various sampling and assessment have been undertaken along different sections of Te Ararata Creek (upstream and downstream of the Project site) over the past few years as part of other Auckland Council programmes and LEAD Alliance work. In summary, the findings included indications that the creek had poor ecological function (owed to poor habitat provision and biodiversity values), poor water quality, exceeded the Australian and New Zealand guidelines for fresh and marine water quality (ANZG) 95 % default guideline

values (DGV) for zinc and exceeded the national bottom line for *E.coli* set out in the National Policy Statement for Freshwater Management.

The current ecological value of the stream habitat is assessed to be **moderate**.

3.5.2 Freshwater fauna

Eight native fish species have been recorded in Te Ararata Creek, including longfin eel, inanga and giant kokopu, all of which are nationally At Risk – Declining. Giant kokopu is also classified as Threatened – Regionally Critical at a regional level. Redfin bully and smelt are not threatened nationally but have regional threat classifications of At Risk – Declining and Threatened – Regional Vulnerable respectively. The ecological value of freshwater fauna ranges from **Low to Very high.**

3.5.3 Terrestrial flora

The Project area comprises terrestrial habitat as follows:

- Terrestrial ecosystem types comprise native riparian planting as well as native and exotic specimen trees and vegetation. The native and exotic vegetation supports native bird and lizard species:
  - Native riparian planting to the north of Walmsley Road Bridge and across both Black Bridge Reserve and Walmsley Road Reserve were approximately 5m tall and dominated by typical riparian planting species. Canopy species include manuka, pūriri, tī kōuka, karaka, mahoe, lemonwood and ngaio with the understory dominated by harakeke and with occasional native ferns, groundcovers and seedlings including trembling brake, mercury bay weed and purei. Introduced she-oak trees and saplings occurred on the eastern side of Te Ararata Creek. The native riparian planting is of **Moderate** ecological value.
  - Exotic forest to the south of Walmsley Road Bridge on the eastern side of Te Ararata Creek was dominated by flame tree and phoenix palm with the understory dominated by common introduced species including bear's britches, nasturtium and tradescantia. The western side of Te Ararata Creek dominated by introduced grasses and herbs including kikuyu grass, nasturtium, montbretia, creeping buttercup and board-leaved doc. The exotic forest is of **Low** ecological value.
- Vegetation in the works area comprises:
  - A number of specimen pōhutukawa trees within Black Bridge Reserve (approximately 11m tall). Other vegetation includes kānuka, manuka and ngaio which are all classified as Threatened – Regionally Vulnerable. The threat classifications for kanuka, manuka and pōhutukawa are raised due to the potential threat of myrtle rust. Ngaio has a heightened threat classification due to hybridisation with exotic species. Korokio has been planted under specimen pōhutukawa and may be a garden variety, classified as nationally Not Threatened, but At Risk – Regionally Declining. As a result of their threat classifications, kānuka, ngaio, manuka, pōhutukawa and korokio are of **moderate** ecological value.
  - All other identified species are of **low** ecological value due to their threat classification, age/size (five to six metres) and having been planted.

3.5.4 Terrestrial fauna

- The following has been considered in relation to terrestrial fauna in the Project area:Bats
  - No native bats have been recorded in the suburbs in the vicinity of Māngere. The site is highly urbanised, with no direct linear habitat features or corridors to known bat populations. Noise and light disturbance at the site further limit the likelihood of potential bat presence. As a result no native bats are considered to be present at the site.
- Avifauna

  - A total of 15 native birds were recorded at the site through desktop investigations, two of which are classified as nationally At Risk and regionally At Risk and Threatened, with the remaining classified as nationally and regionally Not Threatened. Four native species were identified during the site visit, including rirororiro, tauhou, pīwakawakawa, and tūī. Two nationally At Risk species were identified as potentially being present at site, North Island kākā, nationally At Risk – Recovering and At Risk – Regionally Recovering and tarāpunga/red-billed gull, At Risk – Declining and Threatened – Regionally Vulnerable. Due to their threat classifications, nationally Not Threatened bird species are of **low** ecological value, North Island kāka are of **moderate** ecological value and tarāpunga are of **high** ecological value. Tūī and kererū, despite being nationally Not Threatened, are considered of **moderate** ecological value as key pollinators and seed dispersers.
- Lizards
  - Copper Skinks and Ornate Skinks (both 'At Risk – Declining') are likely to be present in the works area. Suitable habitat includes comprising logs, harakeke, and dense exotic groundcovers. One copper skink was recorded within the Project footprint during Artificial Cover Objects checks on 23 September 2024. The ecological value has been assessed as **High.**

Figure 3-7: Ecological features in the Project site – note the southeastern site boundary shown above has since been refined, refer to Figure 3-1 for Project site boundaries (Source: Tonkin & Taylor Ltd, 2024, **Appendix D**)

3.6 Arboriculture

An Arboricultural Assessment of Effects has been undertaken by the Tree Consultancy Company (**Appendix E).** A full schedule of vegetation present on the works site (and immediately adjacent to it) is provided in **Appendix E** of the Arboricultural Assessment of Effects, a summary is provided below with the relevant trees in the Project area and immediately adjacent to the Project area shown on the Tree Location Plan in Figure 3-8.

Within Black Bridge Reserve and Walmsley Road Reserve, a total of 64 specimen trees were identified including native and exotic trees ranging approximately 4 m and 18 m in height. At the entrance of Black Bridge Reserve from Coronation Road, there is a pōhutukawa tree (Tree 15). At the stream banks of the Te Ararata Creek, there are low native plants such as flax, cabbage tree, karo and karamu. The western banks are of higher quality than the eastern banks, largely because of the presence of wilding sheoke (Trees 6, 7 and 9) to the east.

South of Walmsley Road bridge (within the Tarata Creek Reserve), a total of 17 specimen trees were identified across both sides of the stream. These trees are predominantly exotic species including a group of oak trees on the eastern side (near 8 Walmsley Road). There are also some Category B and Category C native and exotic trees growing on both stream embankments. As noted in Section 3.4 of the Arboricultural Assessment of Effects, the trees in the project site can be categorised into four categories, being A, B, C and U, in descending order of quality.

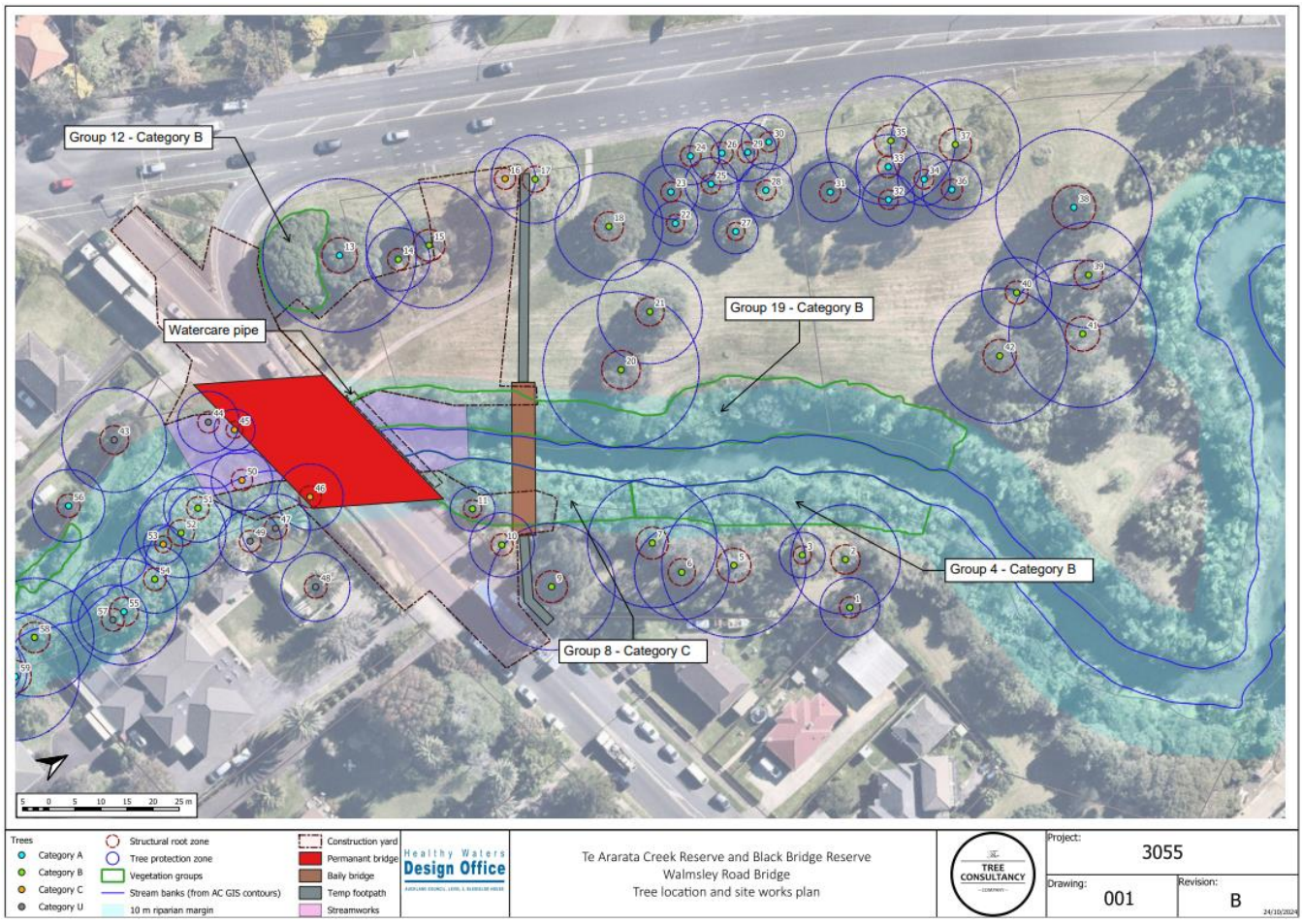


Figure 3-8: Tree Location Plan showing relevant trees within the Project area and immediately adjacent (Source: The Tree Consultancy Company, **Appendix E**)

3.7 Landscape and Natural Character

A Landscape and Natural Character Effects Assessment (**LNCEA**) has been undertaken by Boffa Miskell and is provided at **Appendix F**. The LNCEA describes the existing natural character of the works area in relation to the physical, perceptual and associative attributes which reflect the extent that natural elements, patterns and processes occur and the extent of human modification. Secondary experiential aspects associated with the context of waterbodies and their margins have also been considered.

The key natural and physical environmental elements of the Project works area include:

- Surrounded by or along busy arterial roads (Walmsley Road and Coronation Road).
- Surrounded by predominantly residential land.
- Comprised of existing reserves (Black Bridge Reserve, Walmsley Road Reserve and Tarata Creek Reserve).
- Te Ararata Creek (low point in the wider landscape) with steep banks.
- Extensive indigenous riparian vegetation.
- Existing Watercare pipe bridge north of the existing Walmsley Road Bridge.
- Low lying generally flat topography on either side of the stream banks.
- Amenity tree planting within the Black Bridge Reserve and Walmsley Bridge Reserve.

There are no Notable Trees, Outstanding Natural Landscapes, Outstanding Natural Features, Outstanding Natural Character Areas or High Natural Character Areas within the Project site or immediate surrounding context. The Mount Māngere Regionally Significant Viewshaft Overlay is across the site at a height of approximately 24m above the existing ground level.

The existing watercourse has a **Moderate – High** (in relation to the biophysical attributes) and **Moderate** (in relation to the experiential attributes) natural character due to the combination of modified and unmodified elements within the stream and its margins. The channelised and culverted sections of the stream around the Walmsley Road bridge, are the most apparent examples of human modification. The majority of the stream remains unmodified to the north and immediate south of Walmsley Road bridge. Further upstream, the Te Ararata Creek was modified during the establishment of farmland and later channelised in the 1960s as Mangere was urbanised.

3.7.1 Visual catchment

The works area is located within a built-up urban area at the confluence of two arterial roads (Coronation Road and Walmsley Road). The combination of low-lying topography, surrounding built environment and existing vegetation, limits the visual catchment of the site and proposal. The proposal will predominantly be visible from the adjacent roads, Black Bridge Reserve and immediately adjacent residential audiences.

3.8 Cultural Values

3.8.1 AUP:OP and GIS features

As shown in Figure 3-9 below, the proposed works are not located in any Treaty Settlement - Statutory Acknowledgement Areas as mapped on the AUP:OP maps. The nearest Statutory Acknowledgement Area(s) are located within the Māngere Inlet approximately 800m downstream of the works and are associated with Ngāti Tamaoho and Te Kawerau a Maki.

In addition, none of the following features have been identified within the Project site on the Auckland Council Geomaps viewer:

- Properties or land returned under a Treaty settlement;
- Marae,
- Māori freehold land; and/or
- Tupuna Maunga Affected Areas (with the nearest being approximately 500m west of the Project site).

Figure 3-9: Treaty Settlement - Statutory Acknowledgement Areas and Tupuna Maunga Affected Areas in relation to the works site (Source: Auckland Council Geomaps, 2014 and AUP:OP)

3.8.2 Cultural values identified

Clause 11(2)(i) of the AC-OiC requires a description of any cultural values identified by a relevant Māori entity (see full list in Section 8.3) to be provided. A description of cultural values identified by Te Ākitai Waiohua and Te Ahiwaru in Cultural Values Assessments (**CVA**) prepared for the flood resilience works is provided below. Both CVAs are confidential and available to the consent authority on request.

It is noted that Te Ararata Creek is also referred to as Tarata Creek and is considered a misspelling by Mana Whenua[3]. For the purposes of this Report, Te Ararata will be used except when referring to the existing Tarata Creek Reserve

Te Ākitai Waiohua

The CVA prepared by Te Ākitai Waiohua outlines the interests of Te Ākitai Waiohua in the South Auckland area. Historical occupation included within Māngere and Ihumātao including Papahinau, opposite the Waokauri Creek along the Puhinui Peninsula and Te Motu a Hiaroa (Puketutu Island) in the Manukau Harbour. Ancient urupa (burial sites), pa sites and wāhi nohoanga (temporary living sites), wāhi tapu (sacred

[3] As identified in the Cultural Values Assessment prepared by Te Ākitai Waiohua – available on request by the consent authority

sites) as well as waka hauling, and portage sites are located throughout the area. Archaeological evidence reveals that the wider area was settled from at least 1200AD.

Te Ākitai Waiohua have a strong spiritual association with the land which provide its people with a sense of meaning, connection and purpose. Specifically, this relates to tribal landmarks and resources such as maunga and waterways, including Te Ararata Creek and Harania Creek which traditionally fed the settlements further west. This made the area an obvious source of kaimoana (seafood) and a strategically important transport route that linked the Manukau Harbour to the Tamaki River in the east.

The CVA identifies the main interests of Te Ākitai Waiohua as:

- The recognition and acknowledgment of Te Ākitai Waiohua and its history in Tāmaki Makaurau (Auckland);
- The opportunity for Te Ākitai Waiohua to exercise its role as Kaitiaki in Tāmaki Makaurau; and
- The ability for Te Ākitai Waiohua to protect and preserve its interests, resources and taonga in Tāmaki Makaurau.

Te Ahiwaru

The CVA prepared by Te Ahiwaru takes a cultural landscape approach to identify the specific sites and culturally important features surrounding the flood resilience works and considers the relationship of Te Ahiwaru with these sites and features.

The non-negotiables identified by Te Ahiwaru are to restore and enhance mauri within the surrounding environs including restoring the native vegetation and dynamic systems along the coastline of the Manukau Harbour and margins of ancestral waterbodies, rejuvenating native biota and improving the ecological systems of waterbodies and retaining and protecting riparian margins.

The land under and around Ngaa Hau Maangere features various sites of archaeological and historical importance, evidenced in the cultural values of customary and traditional importance to Te Ahiwaru identity. Key cultural features of the area include Te Pane o Mataaoho (Maangere Mountain), Maangere Lagoon, Te Ararata awa, Harania awa, Te Maanukanuka o Hoturoa (Manukau Habour) and Te Motu a Hiaroa (Puketutu Island). These sites all have links to tuupuna (ancestors) through physical remnants of iwi ancestral occupation, cultivation and koorero tawhito (oral history). The landscape and cultural sites act as a source for the whakapapa, mana, tikanga and traditions for current and future generations.

3.9 Transport

An Integrated Transport Assessment (**ITA**) has been prepared by Tonkin & Taylor Ltd (**Appendix G)** which provides an overview of the existing transport network surrounding the works area (including proposed signed diversion routes). A summary of the existing transport network is provided in the following sections below.

3.9.1 The existing road network and traffic conditions

Adjacent to the Project site

The existing road network adjacent to the Project site comprises of Walmsley Road, Coronation Road, Miller Road, McKenzie Road and the SH20 off and on-ramps (refer to Figure 3-10 below). These are arterial and collector roads, with posted speed limits ranging between 50 km/h – 100 km/h. The average daily traffic (**ADT**) flows on these roads and heavy vehicle percentage split are summarised in Table 3-3 below.

Table 3-3: Summary of average daily traffic flows on existing surrounding road network

Existing road / section of road	ADT vehicles / day (heavy vehicles %)
Coronation Road	16,021 (9%)
Walmsley Road	17,525 (8%)
Miller Road	4,364 (8%)
McKenzie Road	17,809 (16%)
Coronation Road (north after the SH20 on/off ramps)	10,288 (7%)
SH20 off-ramp at Coronation Road (one-way traffic)	4,401 (8%)
SH20 on-ramp at Coronation Road (one-way traffic)	7,099 (3%)

Congestion is indicated in some locations within the adjacent network during the morning (AM) peak between 8am – 9am, afternoon (PM) peak between 3pm – 4pm and within the 5pm – 6pm period. This includes:

- On the Walmsley Road approach extending back to the SH20 on / off ramps intersection and for the right turn from McKenzie Road to Walmsley Road (forming a queue back to Bader Drive) during the AM peak.
- On McKenzie Road back to Bader Drive during the PM peak.
- On Walmsley Road back to the SH20 overbridge, between the SH20 on-ramp to the Walmsley Road / McKenzie Road / Miller Road intersection, on McKenzie Road, Miller Road and Coronation Road during the 5pm – 6pm period.

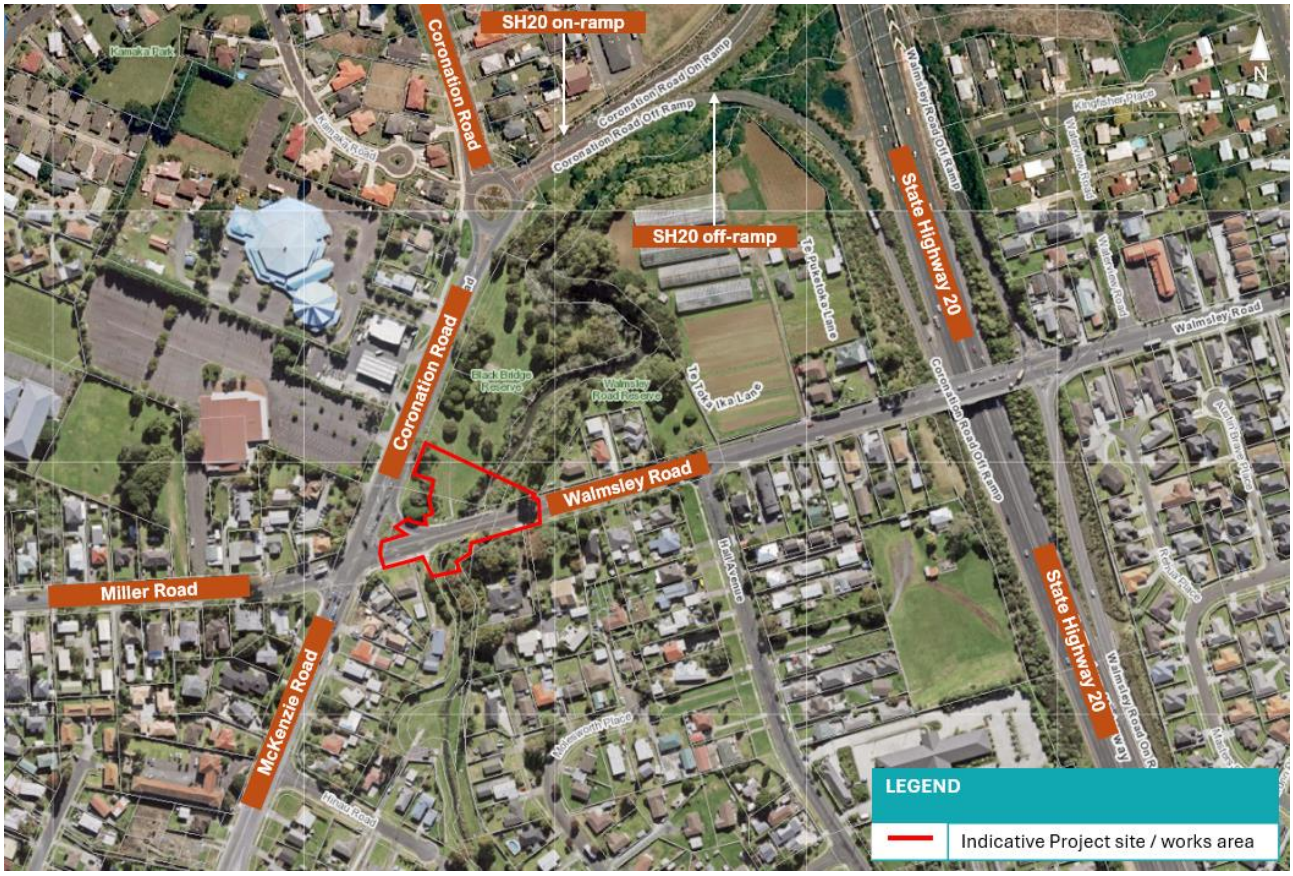


Figure 3-10: Existing road network adjacent to the Project site or works area (Source: Auckland Council Geomaps)

Along the proposed diversion routes

The Project involves the temporary closure of Walmsley Road bridge for an approximately 7-month duration during construction. To facilitate this, five signed diversion routes are proposed as part of the Project. This is further discussed in Section 4.5.3 below. In addition to adjacent roads already described above, Table 3-4 summarises the roads that comprise the diversion routes, ADT and locations of indicated congestion. The diversion routes comprise of collector and arterial roads with posted speed limits ranging between 50 km/h – 100 km/h. The location of all roads on the routes are also shown in Figure 3-3 below.

Table 3-4: Summary of roads on the proposed signed diversion routes, ADT and indicated congestion locations

Roads*	ADT vehicles / day (heavy vehicles %)	Indicated congestion locations
Mahunga Drive	15,445 (7%) to 19,096 (8%)	• 5pm – 6pm period - Rimu Road / SH20 on-ramp extending approximately 500m bank on Mahunga Road and Mahunga / Walmsley Road and Rimu Road / Coronation Road intersections.
Rimu Road	12,696 (6%) to 15,332 (6%)	
SH20 on-ramp at Rimu Road	12,170 (4.9%)	
SH20 off-ramp at Walmsley Road	11,544 (4.7%)	
Hall Avenue	4,152 (5%) to 5,980 (2%)	• AM Peak – Small amount at the Bader Drive / Elmdon Street intersection. • 5pm – 6pm period – Bader Drive at McKenzie Road intersection extending approximately 150m back to Ventura Street.
Elmdon Street		
Bader Drive (north of Elmdon Street)	8,086 (6%) to 8,189 (7%)	
Bader Drive (south of Elmdon Street)	11,587 (4%) - 14,737 (3%) north of SH20A 24,479 (5%) to 26,986 (4%) west of SH20	• AM Peak – Small amount on Bader Drive between its intersection with Idlewild Avenue and SH20A off - ramp, at Bader Drive / Mascot Avenue intersection and at Kirkbride / SH20A intersection. • 5pm – 6pm period – small amount on Bader Drive / SH20A off ramp, the Kirkbride Road / Ascot Road intersection and the Robertson Road / Bader Drive intersection
Robertson Road	11,538 (4%) to 18,095 (4%)	
Kirkbride Road	20,808 (15%)	
SH20A northbound on-ramp at Kirkbride Road	5,508 (10.1%)	
SH20A off-ramp at Bader Drive	3,182 (4.9%)	
*in addition to those roads adjacent to the Project site described in the section above		

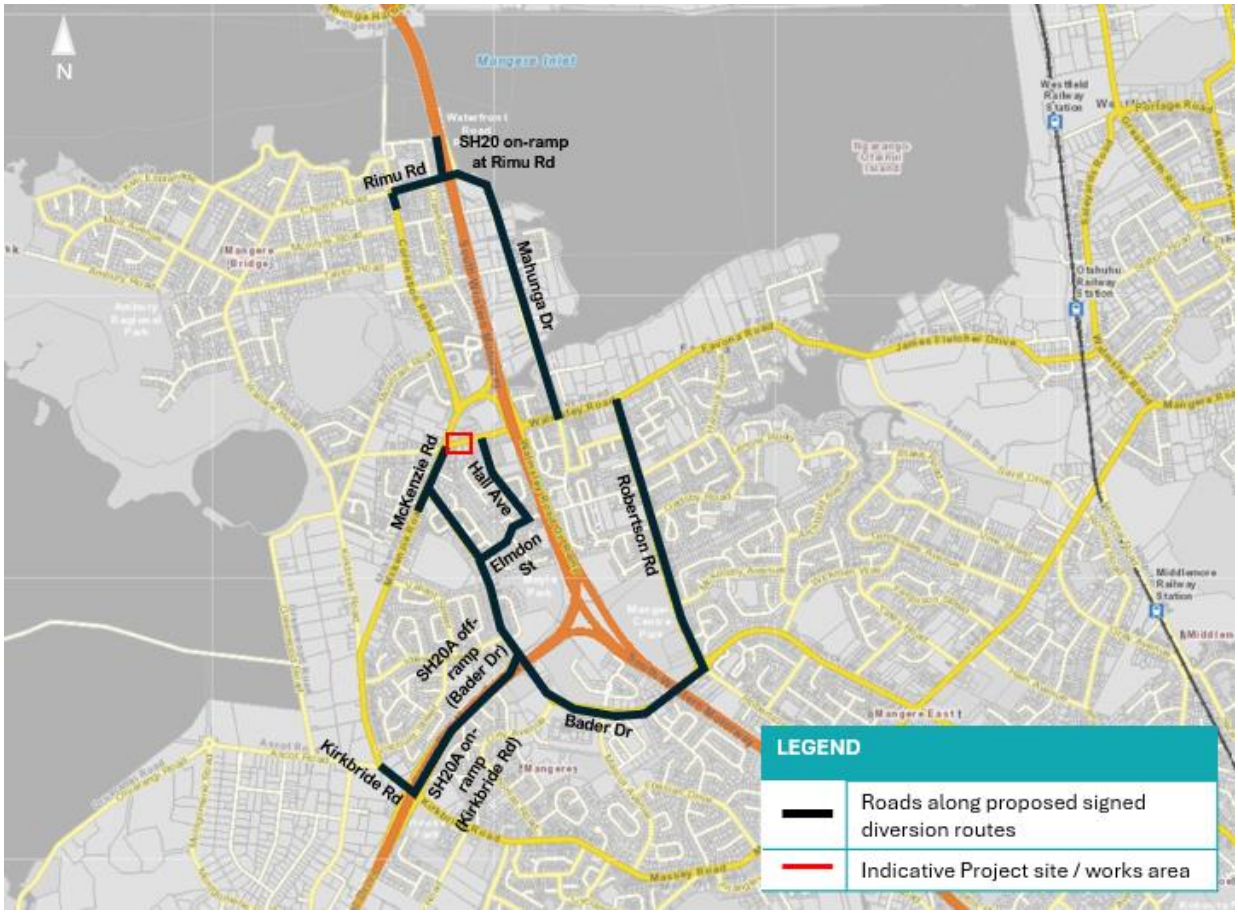


Figure 3-11: Roads along the proposed signed diversion routes (refer to Section 4.5.3 for further discussion on the proposed routes)

3.9.2 Public transport

Adjacent to the Project site

There are four bus services that pass through the McKenzie Road / Miller Road / Coronation Road / Walmsley Road intersection which are 36, 38, 309 and 309X bus routes. Routes 309 and 309X serves bus stops on Walmsley Road and Miller Road, with four buses going through the intersection in the AM peak period and five in the PM peak period.

Route 36 serves bus stops on McKenzie Road and Miller Road. Route 38 travels down both Coronation Road and McKenzie Road but only has bus stops on McKenzie Road. These routes all have bus stops within 200 m of the Project area. Eight buses go through the Walmsley Road / Coronation Road / Miller Road / McKenzie Road intersection during the AM and PM peak periods for both the 36 and 38 bus routes.

Auckland Transport has indicated that in October 2025, the 309X service will be withdrawn and replaced with a new 311 service from Western Māngere Bridge to Otahuhu Station. This timing will overlap with the proposed Project construction timeframe. The exact routing of the service has not been confirmed, but AT metro have confirmed this new service would not be affected by the temporary Walmsley Road closure.

Along the proposed diversion routes

Various existing Auckland Transport bus services utilise roads along the proposed diversion routes. In summary:

- The existing 309 and 309X bus route runs along Rimu Road, the SH20 on-ramp at Rimu Road, SH20 off-ramp at Walmsley Road, Bader Drive (south of Elmdon Street) and Robertson Road.
- The 38 bus route runs along Bader Drive (north of Elmdon Street) and on Kirkbride Road.
- The N10 bus route runs along Bader Drive.
- The 324 service runs along Robertson Road and Bader Drive (south of Elmdon Street).
- The 31, 32, 36, 28, 313, 325, and 326 services run along Bader Drive (south of Elmdon Street).
- There are no bus routes along Mahunga Drive (though noted there are existing bus stops), Elmdon Street, Hall Avenue, the SH20A on-ramp at Kirbride Road or the SH20A off-ramp at Bader Drive.

3.9.3 School buses

Adjacent to the Project site

There are various Auckland Transport contracted school bus routes that utilise Walmsley Road and the adjacent road network. These include the following:

- S084 (St Joseph's School Onehunga to Māngere Town Centre).
- S062 (Favona to Onehunga Schools via Māngere Bridge).
- S061 (Royal Oak Intermediate to Māngere Town Centre; Māngere Town Centre to Onehunga Schools; and Onehunga High to Māngere Town Centre).
- S058 (Favona to Onehunga Schools).
- S002 (Onehunga High to Favona).
- S001 (Royal Oak Intermediate to Favona; Onehunga High to Māngere East).

There are no Ministry of Education contracted school bus services on Walmsley Road and the adjacent road network.

Along the proposed diversion routes

Existing school bus routes have been identified along the following roads:

- Mahunga Drive (1, 2 and 62).
- Rimu Road (2, 3, 5, 58, 59, 61, 62 and 8).
- SH20 on-ramp at Rimu Road (2, 3,5, 58, 59, 61, 62 and 84).
- SH20 off-ramp at Walmsley Road (1, 2, 3, 5, 61 and 84).
- Elmdon Street and Hall Avenue (61).
- Bader Drive south of Elmdon Street (1, 12, 61 and 84).
- Robertson Road (1, 12, 41 and 84).
- Kirkbride Road (1 and 59).

There are no existing school bus services along the SH20A on-ramp at Kirkbride Road, the SH20A off-ramp at Bader Drive or on Bader Drive north of Elmdon Street.

3.9.4 Walking and cycling

Adjacent to the Project site

A summary of the existing walking and cycling facilities on the adjacent road network is set out in Table 3-5 below.

Table 3-5: Summary of existing walking and cycling facilities on the adjacent road network

Road / section of road	Overview of existing walking and cycling facilities
Coronation Road	• On-road unbuffered southbound cycle lane (commencing at the BP egress) • On-road unbuffered northbound cycle lane (ending at the BP egress and merges onto a shared path) • 1.6m wide footpath on both sides
Coronation Road (north after the SH20 on/off ramps)	• 1.5m wide footpaths on both sides
Walmsley Road and bridge	• 1.5 m wide footpath on both sides and approximately 1.2 m footpaths on the bridge section. • Footpath through Black Bridge Reserve joins the north side of the Walmsley Road footpath • Cyclists are signed to 'use pedestrian signals' noting that no specific cycle provision is made at the pedestrian signals
Miller Road	• 1.5m wide footpaths on both sides
McKenzie Road	• 1.5m wide footpaths on both sides
SH20 off-ramp at Coronation Road	• No pedestrians or cyclists allowed / facilities
SH20 on-ramp at Coronation Road	

Along the proposed diversion routes

Footpaths are present on both sides of the road along Mahunga Drive, Rimu Road (though reducing to the southern side only across the motorway overbridge), Hall Avenue, Elmdon Street, Bader Drive, Robertson Road and Kirkbride Road. Along the northwestern side of the SH20A northbound on-ramp at Kirkbride Road and the SH20A off-ramp at Bader Drive there is an adjacent off-road cycleway and footpath. Along Bader Drive (south of Elmdon Street) there are eastbound cycle lanes between the SH20A offramp and Robertson Road and westbound cycle lanes between Mascot Avenue and the SH20A off-ramp. On Robertson Road there is a bi-directional cycle way for approximately 600m from Bader Drive to 70 Robertson Road.

There are no pedestrians or cycling facilities along the SH20 on-ramp at Rimu Road or the SH20 off-ramp at Walmsley Road.

3.9.5 Over dimension and high productivity motor vehicles

Adjacent to the Project site

Coronation Road, Walmsley Road and McKenzie Road are all part of the Auckland Transport's High Productivity Motor Vehicle (**HPMV**) detour route (i.e. when there are Motorway closures). Walmsley Road and McKenzie Road are also part of Auckland Transport's identified over dimension vehicle routes.

On Miller Road, there are signs that indicate that heavy goods service vehicles are prohibited unless loading or unloading. It is however noted that despite this signage, approximately 14 trucks were observed using Miller Road using peak periods. Given the predominantly residential nature of Miller Road, these truck

movements are unlikely to be loading or unloading and it is considered that these signs are not currently followed by truck drivers.

Along the proposed diversion routes

Mahunga Drive, the SH20 on-ramp at Rimu Road, SH20 off-ramp at Walmsley Road and Kirbride Road are all part of the Auckland Transport HPMV detour route. Kirkbride Road is also on the Auckland Transport Over dimension vehicle routes. The SH20A northbound on-ramp at Kirkbride Road is also noted to have a dedicated truck lane.

All other roads along the proposed diversion routes (i.e., Rimu Road, Bader Drive, Elmdon Street, Hall Avenue and Robertson Road) are not on over dimension and/or HPMV routes.

3.9.6 Road safety

Adjacent to the Project site

Overall, the number of crashes as well as the severity of crashes is considered to be low and there is no inherent safety issues present in the vicinity of the Coronation Road, Walmsley Road, Miller Road and McKenzie Road intersection. From 2019 – 2024 there were 31 total crashes on or along the approaches to this intersection, with no common crash type / rationale across the five types assessed. None of the crashes within the study period involved cyclists or pedestrians and there was only one series crash and no fatal crash.

Along the proposed diversion routes

A total of 320 crashes were recorded between 2019 and 2024 along the proposed diversion routes, with 25 serious crashes and one fatal crash. 17 of the total crashes involved either pedestrians or cyclists, 5 of which were serious and 8 being minor crashes. The four highest number of crashes along the proposed diversion routes were at:

- Rimu Road (near the on/off ramps) with 49 crashes - 41 of the crashes were either a result of factors described as bend (lost control / head on collision east of the SH20 off-ramp), crossing / turning, or rear end / obstruction collision (including where eastbound vehicles on Rimu Road not giving way to right turning traffic turning into the Rimu Road onramp). The road layout at this location is considered unusual as traffic going east-bound on Rimu Road have to give way to traffic turning right onto the SH20 on-ramp. Similar intersections across Auckland would usually be traffic signal controlled or have right turning traffic giving way to straight moving traffic.
- Walmsley Road / Mahunga Drive intersection with 48 crashes – crossing /turning and read end / obstruction were the movement factors involved in 21 of the 28 crashes. In early 2022, Auckland Transport implemented an improvement scheme at this location. It is noted that there was a reduction in the number of crashes with only 1 crash in 2022 and 3 in 2023.
- Walmsley Road / Favona Road / Robertson Road intersection with 22 crashes. Two thirds of the crashes involved overtaking and rear end / obstruction movement factors.
- Bader Drive / Robertson Road / Buckland Road intersection with 21 crashes. Two thirds of the crashes involved rear end / obstruction and bend loss of control / head on movement factors.

Based on interpretation of NZTA Waka Kotahi calculated collective and person risk ratings, the following road sections are also identified to have an existing high overall safety risk:

- SH20 on-ramp at Rimu Road (north of the Rimu Road intersection)
- McKenzie Road between Betula Place to Bader Drive.

- Bader Drive between Idlewild Avenue to the Māngere Fire Station
- Bader Drive between Ashgrove Road to Rye Court.

3.9.7 Future transport improvements

Auckland Transport have confirmed that there are no planned works adjacent to the Project site or along the proposed signed diversion routes during the anticipated construction period.

While funding has not been confirmed yet, Auckland Transport have proposed works adjacent to the Project site along Coronation Road and McKenzie Road (at the intersection with Walmsley Road and Miller Road) as part of the Māngere West Cycling Improvements Project. This has been considered during the design process as further discussed in Section 4.4.1 below.

3.10 Contaminated soils

A Preliminary Site Investigation (**PSI**) for the Project has been undertaken by Tonkin & Taylor Ltd (**Appendix H**) to identify the potential historic contaminating land activities and assess the likelihood and potential magnitude of ground contamination.

Historical aerial imagery shows that the current site configuration has been largely in place since at least 1940. There is evidence of some filling in the centre of the site north of Walmsley Road. Construction occurred in the southwestern portion of the site in 1975 associated with adding an extra lane to the intersection of Walmsley Road and Coronation Road, and again in or around the 1980s for the installation of a water pipeline across the banks of Te Ararata Creek, north of Walmsley Road.

A walkover inspection on 29 August 2024 revealed no evidence of spills, staining or hazardous materials. Historic borehole logs at Black Bridge Reserve in 1995 did not encounter any fill materials or abnormal gas readings. Geotechnical investigations undertaken at the site for the Project indicate some fill but no obvious indications of contaminants (odour, discolouration or demolition material). Soil testing at the site in conjunction with these geotechnical investigations also showed that contaminant concentrations are below both the National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (**NES:CS**) for commercial / industrial land use and recreation land use and the AUP:OP Permitted Activity criteria. Therefore, the contamination identified does not present a risk to human health or the environment. The preliminary conceptual site model also indicates that the pathways by which the fill can affect people, and the environment are considered incomplete both during and following development of the Project.

The PSI concluded that it is more likely than not that a Hazardous Activities and Industries List (**HAIL**) activity has not occurred on the site. Contaminant concentrations also comply with the AUP:OP Permitted activity criteria.

3.11 Groundwater and geotechnical

A Geotechnical and Groundwater Assessment Report for the Project has been undertaken by Tonkin & Taylor Ltd (**Appendix I**) to identify the geotechnical and groundwater conditions at the Project site. A summary of the geological conditions, groundwater conditions, and land subject to instability, is summarised as follows:

- The works site is underlain by Auckland Volcanic Field (**AVA**) and Pilocene to Holocene Takaanini Formation. The AVA comprises stiff to very stiff clay or silt (approximately 0.6 – 3.m thick to approximately 1.5m depth) and on the western bank of the Te Ararata Creek slightly weather basalt (approximately 2.5m

– 3.3m thick at approximately 1 – 1.7m depth). The Takaanini Formation is approximately 1.5m – 24m below ground level.
- Topsoil is between 0.1 – 0.3 m in thickness
- Groundwater level measurements at the Project site showed levels ranging from 1.4 to 3.4mbgl (+1.9 to + 3.0 mRL) in July and August 2024 (i.e., during winter). Groundwater is measured to generally follow the ground surface and flows towards the Te Ararata Creek which is consistent with normal groundwater patterns around waterways. As shown in Figure 2.2 of the Geotechnical and Groundwater Assessment Report, a groundwater level of 3.0mbgl (+3.0mRL), tapering down to 0.9mbgl (+0.9mRL) at the creek has been adopted for assessment purposes. This is considered a reasonably representative (winter) groundwater level at the Project site prior to the Project development. It is noted that in summer (and in droughts) the groundwater levels will be lower than modelled.
- The existing Te Ararata streambanks are identified as land that may be subject to instability (as defined by the AUP:OP), due to the ground comprising of Holocene to Pleistocene Takaanini Formation with slopes of approximately 2.4H:1V or steeper in proximity of the Project works.

3.12 Archaeology

An Archaeological Assessment for the Project has been undertaken by Origin Archaeology (**Appendix J**).

In summary, there are no archaeological sites identified within, or close to, the bounds of the proposed worksite. As such, the proposed worksite has no current identified archaeological value. There is limited potential for previously unrecorded in-situ archaeological sites to be exposed as a result of the Project. The most likely (though limited potential) remains to be encountered are shell midden deposits associated with pre-1900 Māori settlement and use of the Te Ararata Creek and remains of the pre-1900 bridge crossing.

3.13 Existing resource consents

Clause 11(f) of the AC-OiC requires a description of how the works align with existing resource consents relating to the proposed work site and any conflicts with existing resource consents relating to the proposed work site. A review of the property files of the proposed work sites (or in relation to the Walmsley Road road reserve, review using Auckland Council Healthy Waters internal Geomaps viewer) has been undertaken to identify any existing and relevant resource consents. A summary of each address is provided below. In summary, the proposed flood resilience works will not conflict with any existing resource consents.

3.13.1 Black Bridge Reserve (5R Walmsley Road), Walmsley Road Reserve (7R Walmsley Road) and Walmsley Road bridge road reserve

There is no existing resource consents associated with these properties or sites.

3.13.2 Tarata Creek Reserve (6R Walmsley Road)

Four resource consents were identified within the property file for this address. A summary of these consents and the consent's relevance to the work site is provided in Table 3-6. It is noted that some of these consents relate to works in the wider area (and not proposed Project site) as Tarata Creek Reserve spans a greater area upstream and downstream of the proposed Project works.

Table 3-6: Summary of consents in relation to the Project

Consent reference	Consenting Authority	Date and Consent Lapse	Summary of proposal	Relevance to the works site

36008	Auckland Regional Council	8 August 2008, 5 years	Installation of a coastal structure in the Manukau Harbour, east of the existing Manukau Harbour Bridge SH20 Manukau City.	This consent relates to works outside the Project site. The Project site is approximately 2.1km south of the Manukau Harbour Bridge. As such, the proposed works are not considered to generate conflicts with this existing consent.
Earthworks (41551) & LUC (41884)	Auckland Council	23 May 2013, 5 years	Installation of network utility services and works within the dripline of trees, and consent under the NESCS; For the replacement and upgrade of a 589m section of rising main between Blackbridge Pump Station within Tarata Creek Reserve on Hinau Road, Māngere Bridge and existing manhole at Māngere College.	This consent relates to works outside the Project site. The Project site is approximately 110m downstream of the Black Bridge Pump Station and does not involve works on these sections of the asset. As such, the proposed works are not considered to generate conflicts with this consent.
32626	Manukau City Council	04 September 2007, 1 year	Removal of unsafe English Oak Tree	This consent has been implemented with this tree no longer onsite. Therefore, the proposed works do not conflict with this consent.

4 Description of the Flood Resilience Works

This section sets out the information requirements of Clause 11(2)(a) which requires:

(2) Instead of complying with section 88(2)(b) of the RMA, an application for a resource consent for flood resilience works must include the following information:

(a) a detailed description of the flood resilience works:

4.1 Background

The January 2023 floods, followed closely by Cyclone Gabrielle, marked a period of unprecedented weather challenges for Auckland. The floods, and the subsequent cyclone caused significant infrastructural damage, with an estimated 8,000 homes destroyed or damaged and thousands of residents' lives affected. The events underscored the city's vulnerability to extreme weather, prompting Auckland Council to endorse the "Making Space for Water Programme" (**Programme**) developed by Auckland Council Healthy Waters. This initiative aims to mitigate flood risks through a series of blue-green networks, addressing critical flood-prone areas with sustainable stormwater solutions.

4.2 Te Ararata catchment

As outlined in Section 1.2.1 above, the Te Ararata catchment was one of the worst affected areas of Auckland following the January 2023 floods.

As part of the overall Programme, Auckland Council Healthy Waters identified a combination of interventions and flood resilience works within the Te Ararata catchment that could collectively improve flood resilience and reduce flood risk within the catchment (overall referred to as the **Te Ararata Project**).

The estimated number of properties that were affected during the January 2023 flood events within the catchment and within 'intolerable risk to life', 'habitable floor' and 'flood affected' levels of flooding is set out in Table 4-1 below. The estimated flood extent and location of these properties are also illustrated on the left-hand side map in Figure 4-1. The implementation of the Te Ararata Project is estimated to reduce the number of properties at risk of flooding within the catchment as shown in Table 4-1 below and the right-hand side map in Figure 4-1 below.

Table 4-1: Overview of flood affected properties in January 2023 and post the overall Te Ararata Project (source: Auckland Council Healthy Waters)

Level of flooding	Definition	Number of properties affected in catchment	Number of properties remaining affected post flood resilience works
Intolerable risk to life	Intolerable risk to life using a rapid risk assessment methodology where the flood level from the January 2023 event was likely in excess of 0.5 m above floor level and the house was surrounded by floodwaters.	43	5
Habitable flood flooding	Properties where the rapid risk assessment methodology indicated that	132	<10

Level of flooding	Definition	Number of properties affected in catchment	Number of properties remaining affected post flood resilience works
	the flood level was likely to be above a habitable floor level.		
Flood affected properties	Dwellings surrounded by floodwater of any depth (includes all previous categories).	321	132

Figure 4-1: Estimated flood extent January 2023 and flood risk to properties (left), estimated flood extent post works (right) (Source: Auckland Council Healthy Waters, 2024)

For the purposes of the resource consenting and implementation process, the Te Ararata Project is being split into separate flood resilience works packages as summarised and indicative locations shown in Figure 4-2 below:

- **The Walmsley Road bridge replacement works** – This is the subject of this application and described further below. The works seek to achieve greater flow capacity and reduce blockage risk beneath Walmsley Road and within Te Ararata Creek.

- **Te Ararata Creek debris screen works** – This will be covered by a separate subsequent application. The works are anticipated to involve the creation of a new debris management area and floodplain recontouring along a section of the Te Ararata Creek (between 3 – 11 Pito Place). This area is intended to catch any large debris (e.g., trampolines, fences, picnic tables) in the event of heavy rain events and flooding.
- **Mahunga Drive culverts maintenance access works –** This will be covered by separate subsequent application. The works are anticipated to involve the creation of formal access tracks to improve access to the existing Mahunga Drive culverts for regular maintenance and to minimise risk of sediment build up.

Figure 4-2: Overview of the overall Te Ararata Project

4.3 Purpose of the flood resilience works – Walmsley Road bridge replacement

The first package of flood resilience works as part of the Te Ararata Project is for the Walmsley Road bridge replacement works (i.e. **the Project or flood resilience works**) and is the subject of this assessment.

During the 2023 flood events, large debris from properties such as fences and outdoor furniture were caught within or around the existing twin 2.5m wide and 3.7m tall culverts beneath Walmsley Road. Further investigations following the 2023 flood events have identified the significant role that blockage has on the floodplains of Te Ararata Creek. If there were a near total blockage of the Walmsley Road bridge culverts (or the Mahunga Drive culverts) in a 1% AEP flood event, there is potential for upstream flood levels to reach 6.65mRL, which is between 1.2m and 1.4m above the observed January 2023 flood levels and approximately

2m above the predicted 1% AEP flood level. The flood prone area covers nearly 1km^2 and there are 1,114 property parcels and 1,253 buildings exposed to the resultant flooding. While 43 properties were within the 'intolerable risk to life' category during the 2023 flood events, further modelling suggests that the intolerable risk to life could have been more than 1,000 properties if there had been complete blockage[4].

The proposed flood resilience works will reduce blockage likelihood of Te Ararata Creek at the existing Walmsley Road bridge location and increase conveyance potential. Addressing one of the potential blockage points along the Creek is important in achieving the overall outcomes sought by the Te Ararata Project as set out in Section 4.2 above.

4.4 Overview of the flood resilience works or the Project

An overview of the Project is shown in Figure 4-3. The indicative construction layout plan prepared by HEB Construction is provided in **Appendix A** and design drawings prepared by Holmes NZ and Tonkin & Taylor Ltd to support the application (at preliminary or concept stages) are provided in **Appendix A**. The works are located within the existing Walmsley Road bridge, Te Ararata Creek, Te Ararata Creek Reserve, Black Bridge Reserve and Walmsley Road Reserve. In summary, the Project includes the following key elements, which are discussed in more detail in the sections below:

- Demolition and removal of the existing Walmsley Road twin 2.5m wide and 3.7m tall culvert. The existing culvert base will however be retained to minimise stream disturbance;
- Construction of a new Walmsley Road replacement bridge over Te Ararata Creek;
- Works to tie in the new replacement bridge with the existing road network;
- Reshaping or recontouring of the existing Te Ararata Creek stream banks beneath the replacement bridge structure and over an approximately 30m extent upstream and downstream of the new bridge structure;
- Relocation and strengthening of the existing 810mm diameter Watercare watermain pipe bridge foundations to achieve a wider stream clearance beneath the structure;
- Existing service relocation and/or realignment (including Vector, Chorus and Watercare utilities);
- Vegetation clearance, including within riparian margins and the removal of up to 28 individual trees;
- Earthworks associated with temporary and permanent works, including within the riparian margins;
- Landscaping and replanting (a draft planting plan is provided in **Appendix K);**
- Other temporary works as shown in **Appendix A** to facilitate the construction of the permanent Project including:
  - The formation and operation of laydown areas within Walmsley Road Reserve and a main site compound predominantly within Black Bridge Reserve. The laydowns will be used for the storage of materials, machinery and other construction related activities. The site compound will contain site offices (e.g. portacom and containers), ablutions and carparking;
  - Traffic management measures including a temporary bailey bridge to facilitate pedestrian and active mode diversions between Coronation Road and Walmsley Road. Vehicular traffic will be diverted to the wider existing road network, with Walmsley Road bridge to be closed during construction of the replacement bridge for approximately 7 months. The proposed signed diversion routes are discussed further in Section 4.5.3;
  - Temporary diversion of the existing Te Ararata Creek within the works area via a pipe;
  - Temporary groundwater dewatering associated with earthworks that intercepts groundwater; and

[4] Blue-Green Networks - Te Ararata Creek – Walmsley Rd Bridge - Flood Hazard and Risk Assessment prepared by Tonkin + Taylor (dated November 2024)

– Basalt rock breaking where earthworks may encounter basalt rock along the Te Ararata Creek western banks.

The list above is not exhaustive, and whilst further details are provided in the sections below, the intent of the AC-OiC is for the details to be developed in parallel with, and following the granting of the necessary statutory approvals. Therefore, for clarity, Auckland Council seeks all necessary RMA s9, s13 and s14 resource consents for the construction and use of the flood resilience works, and all associated construction works.

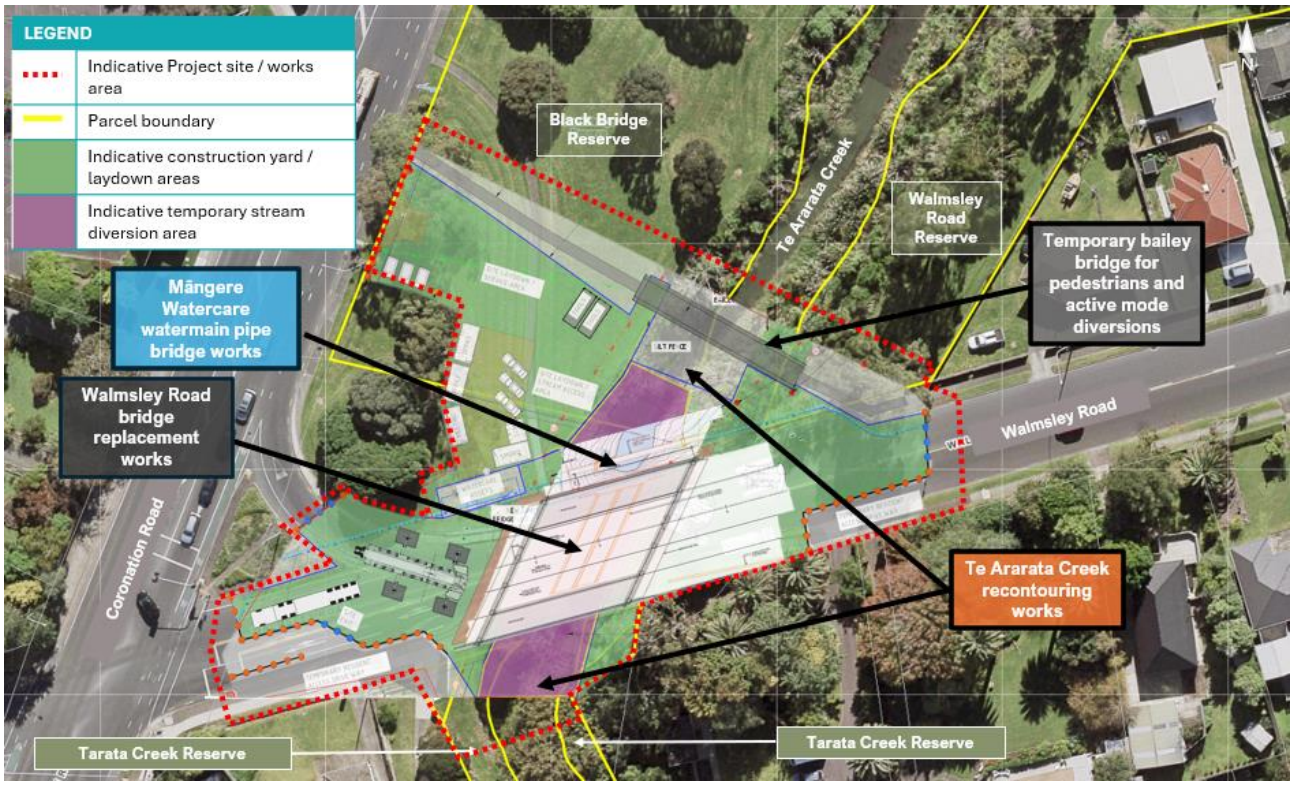


Figure 4-3: Overview of the proposed works and location

4.4.1 Walmsley Road bridge replacement

Figure 4-4 to Figure 4-6 below provides an overview of the Walmsley Road bridge replacement works. This includes the removal of the existing twin culvert over Te Ararata Creek (with exception of the culvert base), removal of the existing road bridge and the construction of a replacement bridge structure. The existing bridge is an Auckland Transport asset and evidence that they consent to carrying out these replacement works is provided in **Appendix L** and discussed further in Section 8 below. Preliminary design plans and drawings are provided in **Appendix A**. As the design is at preliminary design stage, it is subject to further development at the detailed design phase, including via the processes set out in the AC-OiC consent conditions.

The new replacement bridge has been designed to achieve a greater clearance over the Te Ararata Creek at Walmsley Road compared with the existing situation with the twin culverts. The available cross section area below the new bridge structure increases from approximately 17m^2 to approximately 60m^2 which reduces the blockage risk issues at this location as outlined in Section 4.3 above. Flood modelling considerations that have helped inform the concept bridge design are further identified in the accompanying Flood Hazard and Risk Assessment prepared by Tonkin & Taylor Ltd **Appendix M**.

The new bridge has also been designed to accommodate the future traffic capacity anticipated by Auckland Transport for Walmsley Road. It will have the following characteristics:

- A finished road level of approximately RL 6.3m;
- A vertical clearance over the existing creek of approximately 4.9m;
- A clear bridge span of 23m from inner abutment face to inner abutment face; and
- A road corridor width of maximum 20m accommodating three vehicle lanes (two west-bound lanes and one east-bound lanes), shared use paths, channels, and concrete edge barriers (on both the upstream and downstream sides) and services. The road corridor has been designed to accommodate over-dimension vehicles and HPMV.

The design of the Walmsley Road bridge has also considered Auckland Transport's anticipated upgrades along Coronation Road and McKenzie Road as part of the Māngere West Cycling Improvements Project (as outlined in Section 3.9.7 above). The Project does not preclude integration with this future Auckland Transport project.

The bridge will be supported by piled concrete abutments located on the eastern and western banks of the Creek. The abutments will not be located within the existing stream corridor or bed. Each abutment will require approximately 6 of maximum 1.5m diameter driven piles, located 4m apart and 30m deep.

The road surface of the bridge will be asphalt and will tie into the adjacent roading network upon completion. Stormwater runoff from the replacement bridge will continue to be managed as per the existing Walmsley Road bridge by diverting it into the existing public stormwater network. The existing catchpits will likely be relocated to optimal locations and to tie into the existing public network.

Existing services (or infrastructure) along or in the immediate vicinity of the existing Walmsley Road bridge (which includes Watercare, Vector and Chorus utilities) may need to be realigned or relocated to provide for the upgrade (as indicated in **Appendix A**). This may be on a permanent or temporary basis. This will be undertaken in accordance with asset owner requirements and will be confirmed at the time of detailed design. Watercare and Vector have provided in principle approval of carrying out the activity and the Project team have commenced engagement with Chorus and will continue to work with them. Evidence of this is supplied in Appendix L and discussed further in Section 8 below.

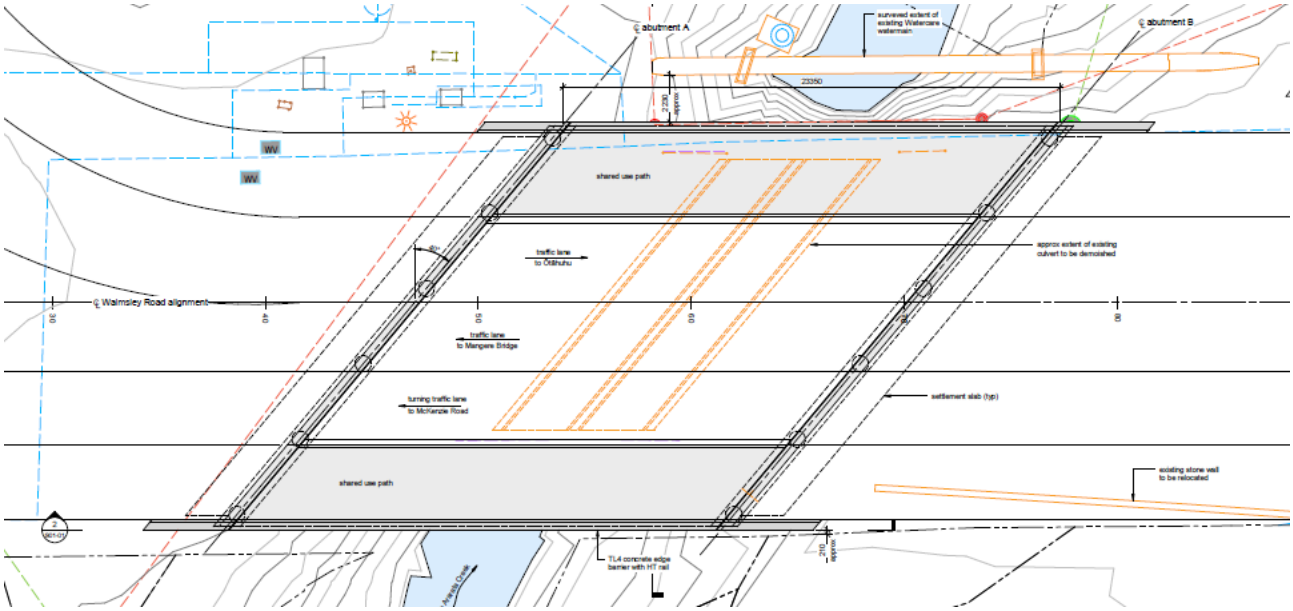


Figure 4-4: Proposed new replacement bridge on Walmsley Road in plan view, with existing twin culvert (marked in yellow dashed below the bridge) to be removed – refer to **Appendix A.**

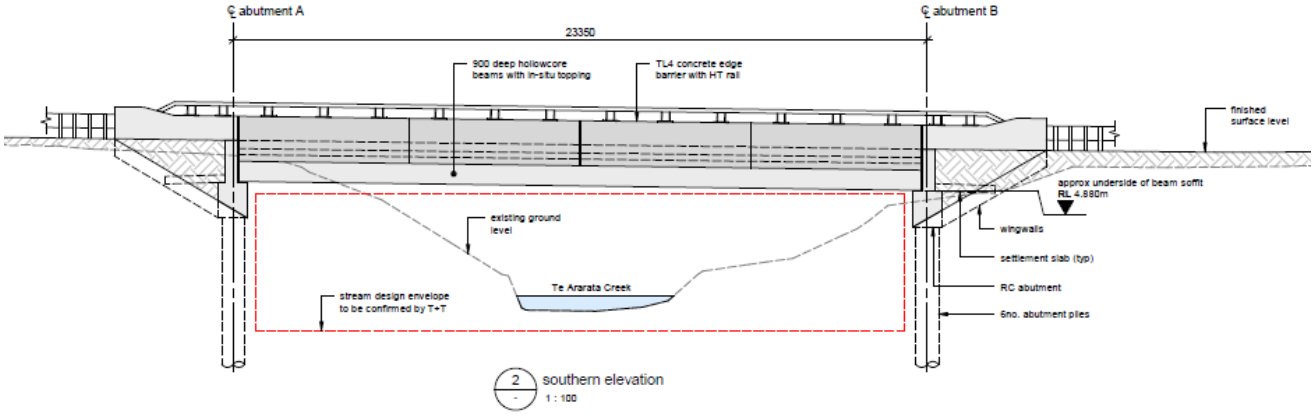


Figure 4-5: Proposed new replacement bridge on Walmsley Road and over Te Ararata Creek cross section (east-west) - refer to **Appendix A**

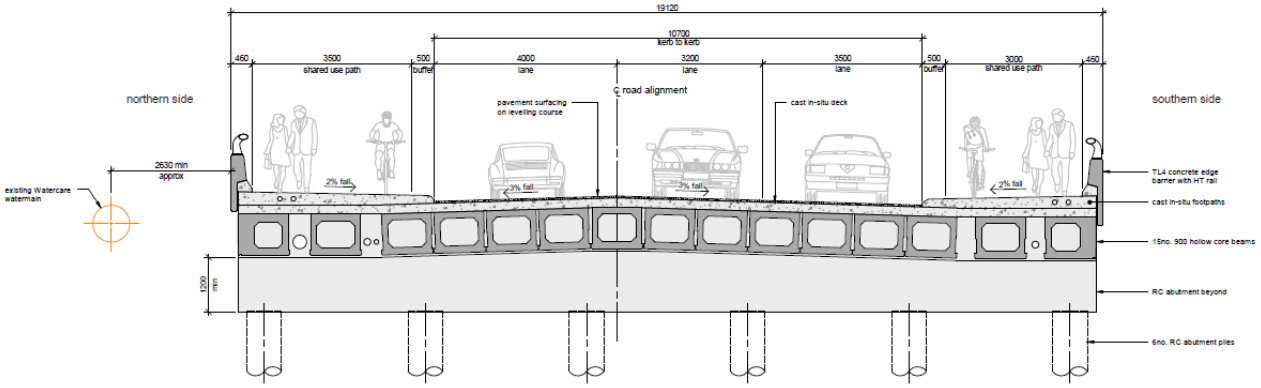


Figure 4-6: Indicative cross section (north-south) showing proposed corridor layout - refer to **Appendix A**

4.4.2 Te Ararata Creek stream bank recontouring

Permanent recontouring or reshaping of the Te Ararata Creek stream banks is proposed below the proposed bridge structure and approximately 30m downstream and 25m upstream of the proposed replacement bridge. The recontouring works will provide for a wider stream cross section that ties in with the new replacement bridge abutments. The combination of recontouring and bridge replacement results in a more open channel which improves conveyance and alleviates a previous ‘pinch-point’ along Te Ararata Creek.

The anticipated extent of recontouring and final stream profile is shown in Figure 4-7 to Figure 4-8 below and in **Appendix A**. In summary, the new stream cross section comprises of the following key elements:

- In some sections, retaining walls are proposed to stabilise the banks. These are anticipated to be between 0.5m – 2.5m in height and 6m – 25m in length;
- Beneath the replacement Walmsley Road bridge, batter slopes of 1V:3H up to the bridge abutments (which will also act as retaining walls). The slopes will be lined with rip-rap or rock armouring; and
- On the upstream and downstream of the bridge, batter slopes of 1V:3H up to the tie into existing ground levels. The slopes will be lined with rip-rap or rock armouring with low level riparian planting.

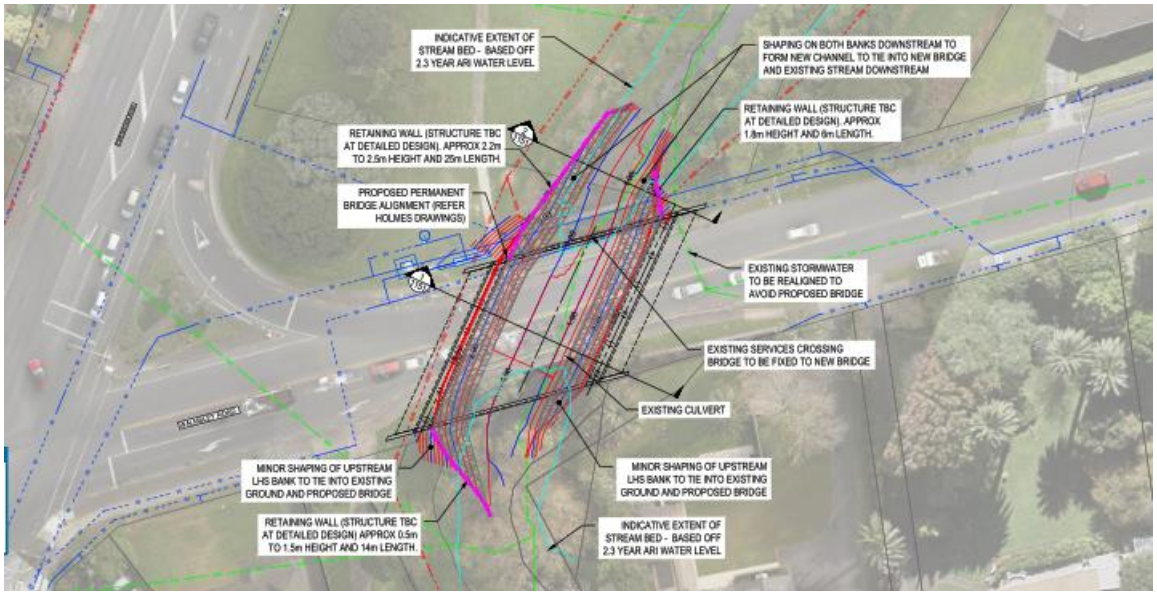


Figure 4-7: Extent of proposed stream bank recontouring including indicative retaining wall details (in magenta) and rock armouring – refer to **Appendix A**

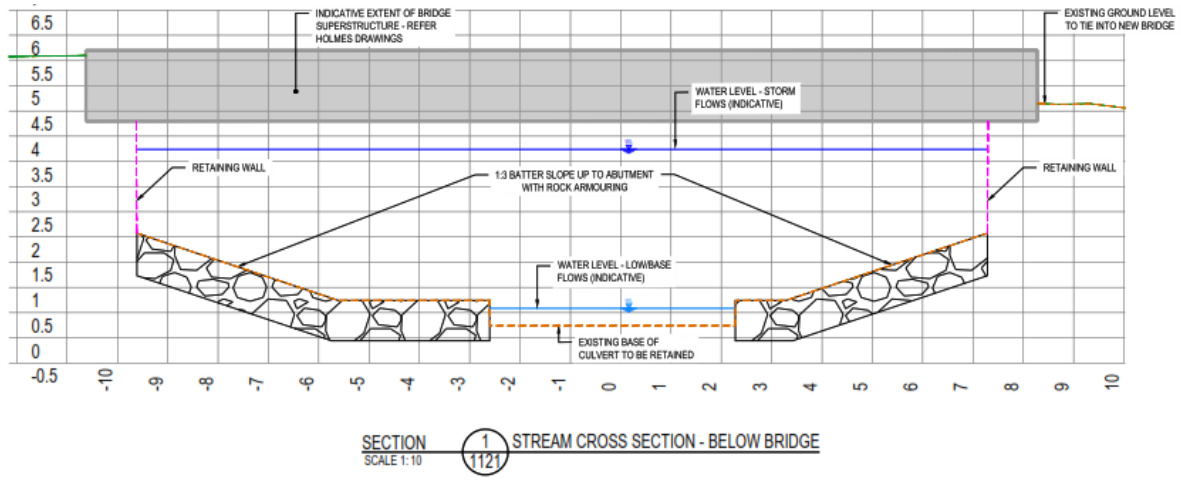


Figure 4-8: Indicative cross section for section below the bridge and upstream and downstream – refer to **Appendix A**

4.4.3 Existing Watercare pipe bridge works

An existing 810mm diameter Watercare watermain pipe bridge (hereafter **Watercare pipe bridge**) is located north of the existing and proposed Walmsley Road bridge. The existing pipe bridge abutments conflict with the proposed widened stream profile proposed downstream of the Walmsley Road bridge. New abutments are proposed further back on each side of the stream to accommodate the final stream profile sought beneath the footprint of the existing Watercare pipe bridge as shown in the indicative concept in Figure 4-8 and Figure 4-9 below and in **Appendix A.** The existing pipe itself will remain unchanged but will be supported by new steel girder beams spanning streambank to streambank.

Once the new abutments and support structures are in place, the existing abutments will be removed.

The concept will be further refined in conjunction with Watercare and their asset owner requirements. Evidence that Watercare consent to the carrying out of these works is provided in **Appendix L** and discussed further in Section 8 below.

The abutment relocation and strengthening works will result in the Watercare pipe bridge having the following characteristics:

- A vertical clearance over the existing creek of approximately 3.5m (noted that the vertical clearance remains relatively unchanged from existing);
- A clear bridge span of 22m from inner abutment face to inner abutment face;
- Located approximately 2.0m downstream of the replacement Walmsley Road bridge;
- Shallow abutments located outside the streambed; and
- Distance between north and south girder beams (measured centre to centre) approximately 2.5m.

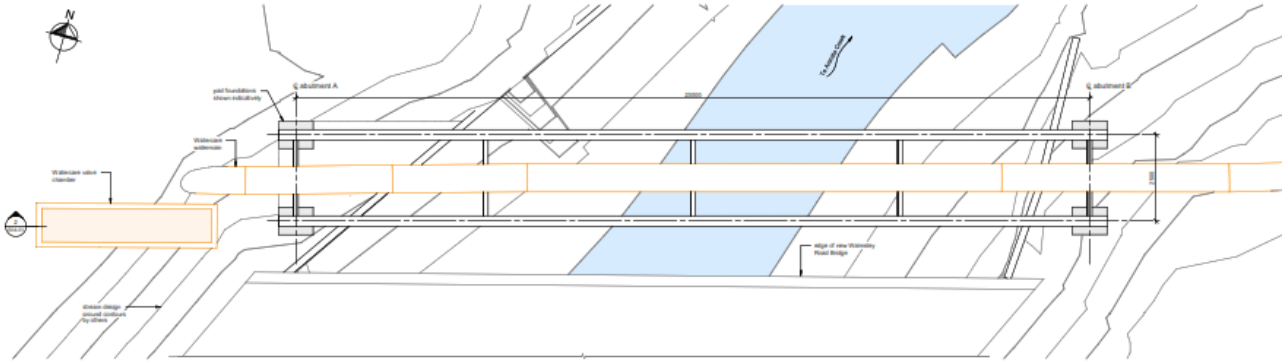


Figure 4-9: Plan view of Watercare pipe bridge following relocation of bridge abutments and installation of new steel girder beams along the existing pipe spanning streambank to streambank- refer to **Appendix A**

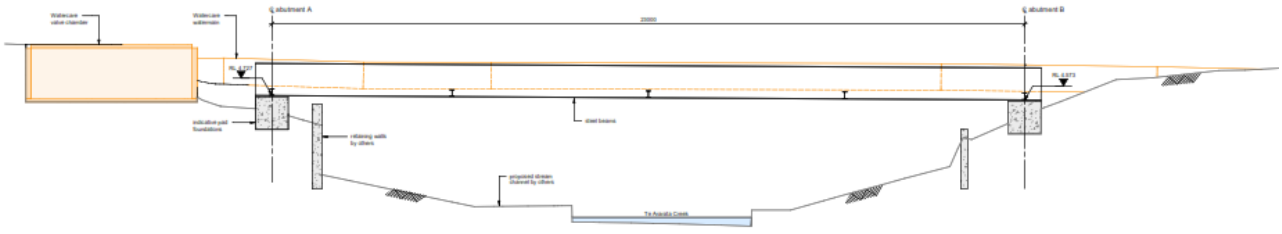


Figure 4-10: West-East cross section of Watercare pipe bridge following upgrade works – refer to **Appendix A**

4.4.4 Landscaping and planting

A draft planting plan is provided in **Appendix K** but will be finalised at detailed design in accordance with the final conditions. The plan has been prepared considering the Ecology, Landscape and Arboriculture Assessment outcomes and recommendations (as further discussed in Section 6 below).

The draft planting plan anticipates reinstatement of grass within Black Bridge Reserve and replanting over an approximately 1,032m^2 area, which includes planting along the stream edge and recontoured banks. The planting palette includes native vegetation and aligns with the preliminary recommendations on planting identified in the CVAs and discussed further in Section 6.3 below. The relocation of an existing Pohutukawa (if practicable) and planting of up to 14 specimen trees is also required, with final locations and species to be confirmed.

4.5 Indicative construction methodology

The following provides an overview of the anticipated construction methodologies for the Project. This is based on an indicative construction methodology and details provided by the contractor[5]. Whilst the construction methodology below has not been finalised, the summary below represents a reasonable worst-case scenario to account for potential changes to the activities and programme. As such, minor changes to the final construction methodology will not change the overall envelope of effects as presented in this report.

Some flexibility in construction methodology is sought at this stage given the constrained implementation timeframes and to accommodate outcomes from ongoing engagement with Auckland Transport, Watercare, Māori entities and other relevant stakeholders (e.g. New Zealand Transport Agency Waka Kotahi (**NZTA Waka Kotahi**) local schools, adjoining property owners, churches). The final construction methodology will be confirmed by the contractor closer to the time of construction and in accordance with the proposed Construction Environmental Management Plan (**CEMP**) condition requirements. A draft CEMP is provided in **Appendix N** with the intent of finalising this prior to construction and submitting this Council for certification.

4.5.1 Construction programme and sequencing

The construction of the Project is likely to occur over a period of 10 – 12 months, with closure of the existing Walmsley Road bridge (and resultant diversion of traffic) required for approximately 7 months during this period. Construction will be carried out in stages and generally in a continuous manner as set out below, however, it is likely that some construction specific activities can occur concurrently:

1. Site setup and establishment including vegetation clearance, set up of erosion and sediment controls, site access and laydown areas, fencing and temporary traffic management (including construction of a temporary bailey bridge for pedestrian and active mode diversions).
2. Existing culvert removal and temporary stream works:
    a. Set up temporary pipe diversion of Te Ararata Creek through the work site.
    b. Excavation to the top of the culvert roof.
    c. Progressive excavation to expose the eastern and western culvert side walls (down to the base slab of the culvert).
    d. Removal and lifting out (in sections) of the culvert roof.
    e. Removal and lifting out (in sections) of the culvert side walls.

[5] Based on information from HEB Construction, appointed contractor for the Project

3. Bridge substructure construction:
    a. Identification of existing services and subsequent protection or temporary relocation/realignment.
    b. Drill/core oversized holes through upper basalt layer (as required) in preparation of western abutment piling.
    c. Drive close end tube piles to founding depth for each abutment and concrete.
    d. Excavation and construction of the pile caps, wingwall and settlement slab (this may coincide with excavation to the top of the culvert roof).
4. Existing Watercare pipe strengthening
    a. Construct new foundations on either side of the pipe.
    b. Install new steel girder beams on either side of the pipe.
    c. Transfer weight of existing pipe to new foundations and support structure.
    d. Demolish and remove existing foundations.
5. Stream bank recontouring
    a. Excavation for final stream profile / cross section upstream, downstream and below bridge.
    b. Construct retaining walls (as required).
    c. Install rock armouring / rip rap.
    d. Remove temporary piped stream diversion and open stream up into the widened channel.
6. Bridge superstructure installation
    a. Lift bridge beams into place.
    b. Construct bridge deck, deck edge and fall protection.
    c. Install concrete barriers.
    d. Cast wingwalls and settlement slabs from within the initial abutment excavation.
    e. Place and compact engineered fill.
    f. Divert services including through new ducts placed within the bridge superstructure or where appropriate (as agreed with relevant asset infrastructure owners)
7. Tie in works including connection to existing public stormwater network, realignment of existing footpaths and kerblines, new roading pavement, line marking, streetlight installation (as required), reinstatement work including fencing and vegetation planting.
8. Demobilisation including removing any temporary structures, equipment and environmental controls.

An high-level indicative timeframe of the works is set out in Table 4-2 below.

Table 4-2: Indicative timeframe for key construction activities

Construction scope	Indicative timeframes
Site establishment and temporary bailey bridge construction	Two months
Existing culvert removal, temporary stream works, and bridge substructure works	Four months
Watercare pipe strengthening and permanent stream works	Four months

Construction scope	Indicative timeframes
Bridge superstructure, civil tie in road works and site disestablishment	Two months

Construction works will generally be undertaken during standards working hours (Weekdays, 7:00am – 7:00pm, Saturday, 8:30am – 7.00pm and no planned works on Sundays and public holidays).

Works outside of the standard hours are anticipated to be limited and may include:

- Approximately 3-4 early morning concrete pours (starting from 4:00am) for the replacement bridge;
- Approximately 4-5 nights at each end of the replacement bridge for road tie-in works;
- Deliveries for large equipment and construction materials (e.g., bridge beams) which need to be undertaken during minimal traffic conditions; and
- Dewatering or over-pumping (as required).

4.5.2 Site compound and access

The anticipated site compound, laydown areas and Site Access Points (**SAP**) are shown in Figure 4-11 below and in **Appendix A**. The main construction compound will be located within Black Bridge Reserve. This is an approximately 1200m^2 extent. Access to the compound will be via a stabilised temporary SAP off Coronation Road (immediately across the Plymouth Brethren Christian Church access). The SAP will be left in/left out only movements only. The compound provides for approximately 3 visitor/staff parking spaces, however, it is anticipated that staff will utilise existing surrounding roads (such as Walmsley Road, east of the existing bridge) for parking.

Another laydown area will be formed within Walmsley Bridge Reserve (to the northeast of the existing bridge) and is an approximately 300m^2 extent. The SAP for this laydown area is off Walmsley Road (on the eastern side of the existing bridge). Both these areas will be stabilised with a geotextile layer and clean aggregate following topsoil removal and vegetation clearance.

Additional laydown areas for construction equipment will be located on the closed off portions of Walmsley Road on both the western and eastern sides of the existing bridge. These areas are existing road so do not require any further surface works. The western side is approximately 800m^2 and is accessed via the existing left turn lane from Coronation Road to Walmsley Road. Egress from this area is via the left turn (on give way) to McKenzie Road. The eastern side is approximately 750m^2 and is accessed via Walmsley Road (on the eastern side of the existing bridge).

The compound and laydown areas will be fenced (1.8m construction fence) with gates to keep the site secure and provide separation from the public.

The following temporary access arrangements are proposed for those properties located adjacent to the proposed laydown and work areas:

- 2 and 4 Walmsley Road residents' access and egress
  - Residents access via left turn only from Coronation Road at the Coronation Road/Miller Road/McKenzie Road intersection into a temporary resident access driveway. This is a separate access to the construction traffic access.
  - Residents egress via left turn (on give way) to McKenzie Road from the temporary resident access driveway. This is in a separate egress lane to the construction traffic egress.
  - The proposed site layouts allow for temporary driveway access for resident cars, emergency, delivery and refuse collection vehicles.
- 10 and 12 Walmsley Road residents' access and egress

– Access and egress via temporary resident access driveway to Walmsley Road.

Figure 4-11: Indicative construction plan showing location of construction areas

4.5.3 Temporary road closure and diversions

To construct the Project, Walmsley Road bridge will need to be temporarily closed to all modes for approximately 7 months.

A temporary bailey bridge is proposed for pedestrian and active mode diversions between Coronation Road and Walmsley Road. The bridge will be located within Black Bridge Reserve and Walmsley Road Reserve, crossing over the existing Te Ararata Creek. Footpaths will be constructed to connect to the bailey bridge from Coronation Road to the west and to Walmsley Road to the east. This is shown in Figure 4-12 below and in **Appendix A**. The temporary bailey bridge is anticipated to have the following characteristics:

– A vertical clearance over the existing creek of approximately 4m;
– A clear bridge span of 16m from inner abutment face to inner abutment face.
– A width of approximately 2.5m – 3m

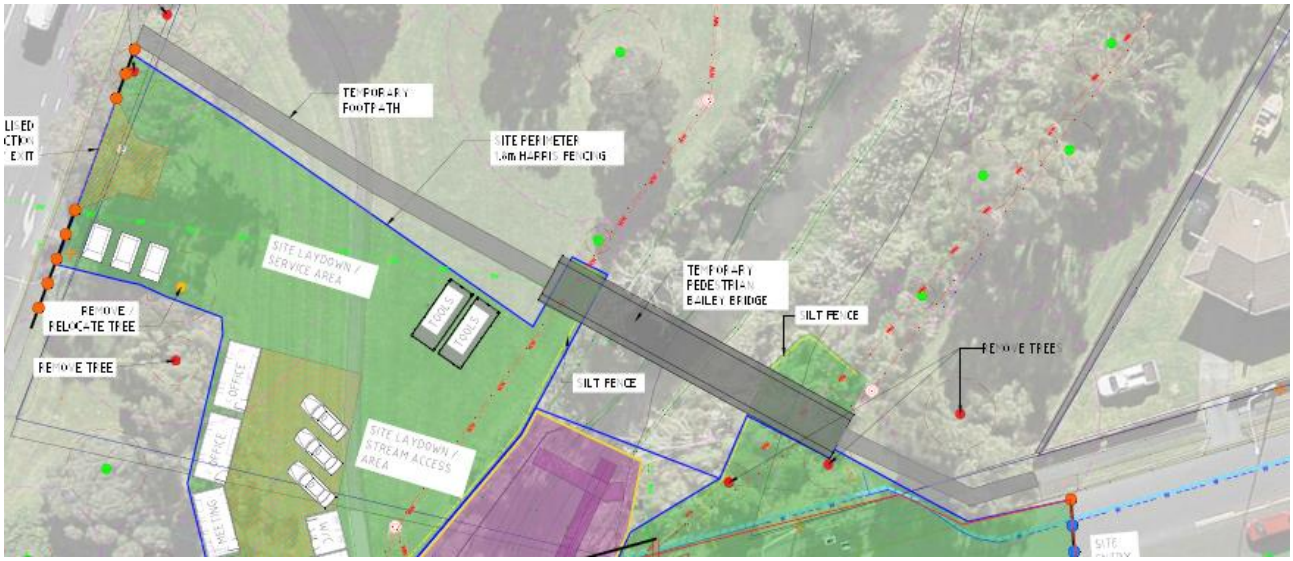


Figure 4-12: Indicative location of temporary pedestrian and active modes bridge with associated footpaths to connect between Coronation Road (to the west) and Walmsley Road (to the east).

Vehicular traffic will be diverted to the existing surrounding road network via signed diversion routes. This is discussed in further detailed in the accompanying ITA in **Appendix G.** In summary, five signed diversion routes are proposed as shown in Figure 4-13 below noting:

- Red = All vehicle diversion Walmsley Road to SH20 northbound on ramp and to/from Māngere Bridge Centre.
- Yellow = Light vehicle diversion SH20 northbound off ramp to Walmsley Road.
- Blue = Heavy vehicle diversion SH20 northbound off ramp to Walmsley Road.
- Green = Light vehicle two-way diversion Walmsley Road to/from Miller Road and McKenzie Road.
- Orange = Heavy vehicle two-way diversion Walmsley Road to/from McKenzie Road and Miller Road.

A Draft Construction Traffic Management Plan (**CTMP**) prepared by Tonkin & Taylor Ltd has also been included as part of the application in **Appendix O** which will set out details of diversions. Specific temporary traffic management measures along the proposed diversion routes are also shown in the draft temporary traffic management (**TTM**) plans included in **Appendix P.** This will be finalised prior to commencement of the Project works in accordance with the final conditions.

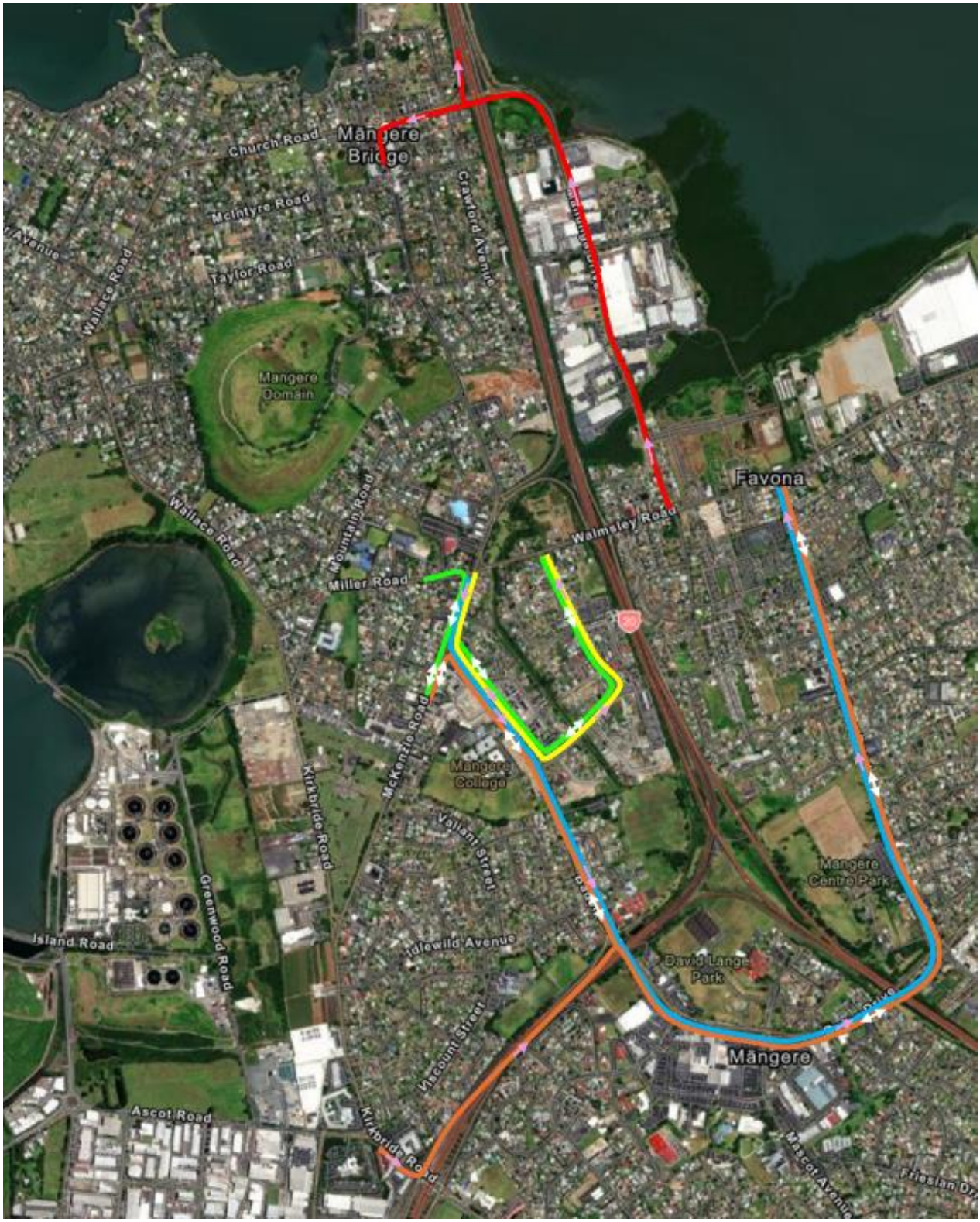


Figure 4-13: Proposed signed diversion routes during the approximately 7-month closure of Walmsley Road bridge (refer to the ITA in **Appendix G)**

4.5.4 Construction traffic

The anticipated construction traffic volumes and anticipated movements are discussed further in the ITA in **Appendix G**. In summary, Table 4-3 outlines the expected construction traffic associated with different construction activities.

Table 4-3: Indicative construction traffic

Construction activities	Type of vehicles	Approximate vehicles movements per day
Site Establishment and temporary bailey bridge construction	Construction vehicles	10 – 20 vehicles
	Labour and Staff Vehicles	5 – 10 vehicles
Road Closure • Permanent Bridge Substructure Construction • Permanent Bridge Superstructure Construction	Construction vehicles	20 – 30 vehicles
	Labour and Staff Vehicles	10 – 15 vehicles
Road open, Site disestablishment	Construction vehicles	10 – 20 vehicles
	Labour and Staff Vehicles	5 - 10 vehicles

Deliveries for the Project are anticipated to be from the Auckland Urban Region. Some plant deliveries (approximately 20 deliveries) will be from Tauranga. The estimated average number of deliveries per day are as follows:

- **Site establishment and temporary bailey bridge construction**: 5 – 10 deliveries per day
- **Road closure:** 10 – 20 deliveries per day

The size and types of trucks anticipated include the following:

- Plant and equipment - combination of transporters and flat deck trucks. The crane car body and 50t drill rig will be delivered using a low-loader transporter with dolly arrangement.
- Aggregate deliveries - will be predominately truck and trailer or 6-wheeler.
- Culvert demolition - 6 wheelers, artic trucks with large bins or truck and trailers.
- Bridge beam deliveries - a truck and jinker.
- Superstructure material deliveries - a combination of flat deck Hiab and non-Hiab trucks.
- Transport of the 120-180t crane - typically involves 8-12 truckloads depending on the amount of boom.
- Transport of the 50t drill rig - typically involves 2 truckloads (one for the car body and the other for the Kelly bar).
- Transport of the 200-300t mobile crane - typically involves 2-5 truckloads depending on the amount of counterweight being carried.
- Transport of the 100-150t mobile crane - typically involves 2-3 truckloads depending on the amount of counterweight being carried.

4.5.5 Construction Equipment

The following types of construction equipment in Table 4-4 are anticipated to facilitate construction of the Project. The final equipment required will be confirmed closer to the time of construction.

Table 4-4: Indicative types of construction equipment required for the Project construction

Construction activities	Equipment assumptions
Site compound	• Assume that the compound will run on a 35KVA generator. • 25t rough terrain crane • 8-16t excavators

Temporary bailey bridge and permanent bridge construction	• Piling will be completed using the following equipment.
	  ○ Mini piling rig (5-10t) – for temporary bailey bridge micropiles if required for additional stability
	  ○ Piling rig (50t)
	  ○ Mobile or crawler crane (100t)
	  ○ Vibro hammer
	  ○ Hydraulic hammer (9t)
	  ○ 20t excavator with rock breaker to locally break through near surface basalt
	  ○ 24m concrete boom pump
	  ○ Excavators
	• Bridge construction
	  ○ 25t service crane (full time)
	  ○ 300t mobile crane for the beam installation
	  ○ 150t mobile crane for the barrier installation
	  ○ 24m Concrete boom pump
	  ○ Dewatering equipment
	• Civils work to approaches.
	  ○ 12-20t excavators
	  ○ 8t roller
	  ○ 6wheeler trucks
	  ○ Standard asphalt paver and rollers to approaches and top of bridge.

Culvert removal and stream recontouring	• 20-30t excavators with concrete breakers and hydraulic crushers • 150t mobile crane • 8-16t excavators working close to the stream bed • Dewatering equipment

4.5.6 Erosion and sediment control

At the site establishment stage and prior to any ground disturbance works, erosion and sediment control measures will be implemented by the contractor in accordance with GD05[6] and the requirements of the final condition set. This will include works being undertaken in accordance with the CEMP and following the protocols of the subsequent final Erosion and Sediment Control Plan (**ESCP**).

To support the application, a draft CEMP prepared by HEB Construction and ESCP prepared by Tonkin & Taylor Ltd have been prepared to outline the anticipated requirements and protocols. These are provided as

[6] Auckland Council Guideline Document GD2016/005, known as GD05

Appendix N and **Appendix Q** respectively. These will be finalised closer to the time of construction and following consent authority certification. In summary, the anticipated erosion and sediment controls will include:

- Clean water diversion bunds
- Silt fences
- Stabilised controls
- Sediment treatment devices
- Decanting earth bund or sediment tanks

4.5.7 Temporary bailey bridge

Prior to the closure of Walmsley Road bridge during construction, a temporary bailey bridge for pedestrian and active mode diversions will be constructed as described in Section 4.5.3 above. This will involve the following:

- **Construction of temporary abutments on either side of the stream** – the foundation system is expected to comprise shallow pad concrete abutments. If required to provide additional slope stability, micro piles will be installed using a 5-10t mini piling rig. To construct each abutment, only localised clearing and minor earthworks using excavators will be required at the top of the stream banks. No works within the streambed are required.
- **Bailey bridge unit installation** – bailey bridge units will be delivered to the site laydown area and lifted into place using a mobile or crawler crane.
- **Approach footpath construction** – approach footpaths will then be constructed using typical civil works machinery and the site will be prepared to accommodate pedestrian and active modes across the temporary bridge.

4.5.8 Temporary stream works and existing culvert removal

To remove the existing twin culvert, works will be undertaken in and around the existing Te Ararata Creek. This will involve the following:

- **Establish temporary access tracks** – Temporary access tracks will be cut down from both upstream and downstream ends of the existing culvert. The access tracks will be stabilised with clean aggregate in accordance with the ESCP. The areas will be reinstated with suitable vegetation at the end of construction.
- **Temporary stream diversion** – Prior to any demolition or removal of the twin culverts, the existing Te Ararata Creek will be temporarily diverted into a suitably sized PE or steel pipe that extends through the work site. These will be supported by sandbag head walls at the upstream and downstream ends. The standing water contained between the sandbagged headwalls will be de-fished by the Project Ecologist. An EcIA in **Appendix D**, draft Ecological Management Plan (**EMP**) in **Appendix R** and the draft ESCP have been prepared which considers these proposed temporary stream works. The stream diversion and culvert removal will be completed in two stages as shown in Figure 4-14 below and discussed further below. The left-hand image below illustrates the pipe diversion located within the eastern culvert opening as the western section of culvert is removed. The right-hand image shows the second stage, with the pipe moved to the western side as the eastern section of culvert is removed.

Figure 4-14: the proposed stream diversion will be undertaken in two stages

- **Existing culvert removal** – A staged approach to exposing and removing the existing culvert is anticipated as follows:
  - The existing roadway will be excavated down to the culvert roof (refer to Figure 4-15). Any services will be temporarily suspended/bridged across the excavation. Temporary retention structures will be installed close to the existing culvert headwalls to provide stability during next stages of excavation.
  - Further excavation will then be undertaken to expose the eastern and western side walls of the existing culvert, down to the base slab of the culvert (refer to Figure 4-16). The excavation will be progressively undertaken using excavators sitting on Walmsley Road on either side of the culvert so as not to unevenly load the culvert. Where basalt is encountered on the western bank, this will be broken out.
  - The culvert lid will be concrete cut and lifted out in sections (refer to Figure 4-16).
  - The culvert side walls will then be progressively cut out and lifted out in sections (starting on one half of the culvert, whilst the piped diversion is sitting within the other half; then vice versa – refer to Figure 4-17 and Figure 4-18). The existing culvert base will remain in place. Necessary equipment will be located within the dry area between the sandbagged headwalls and accessed via the temporary access tracks established for the temporary pipe diversion works. The piped diversion will remain until the final stream profile is completed.

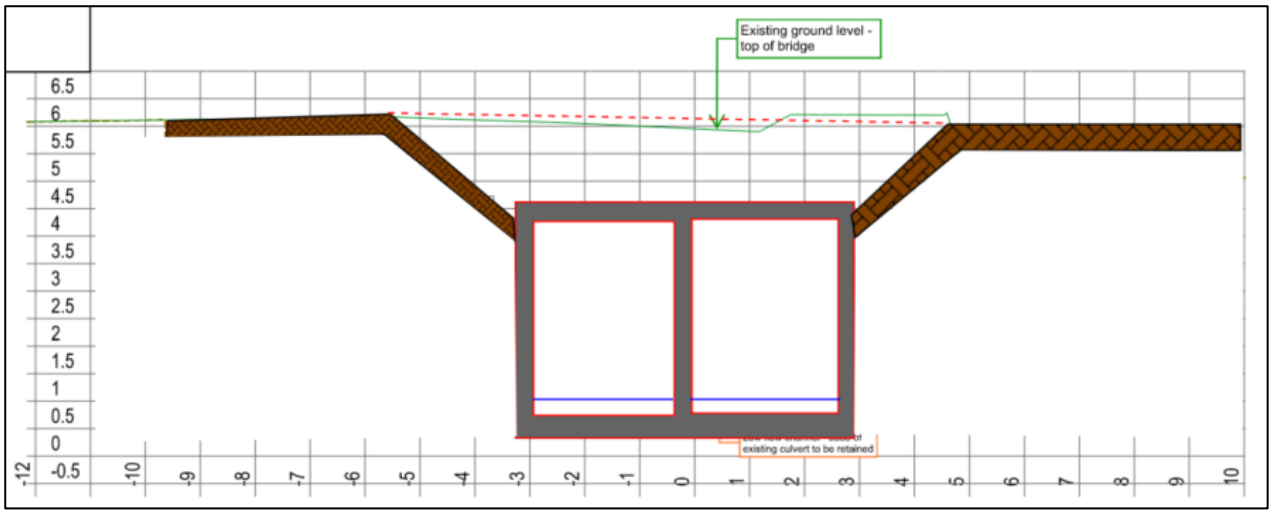


Figure 4-15: the roof of the culvert will be initially exposed

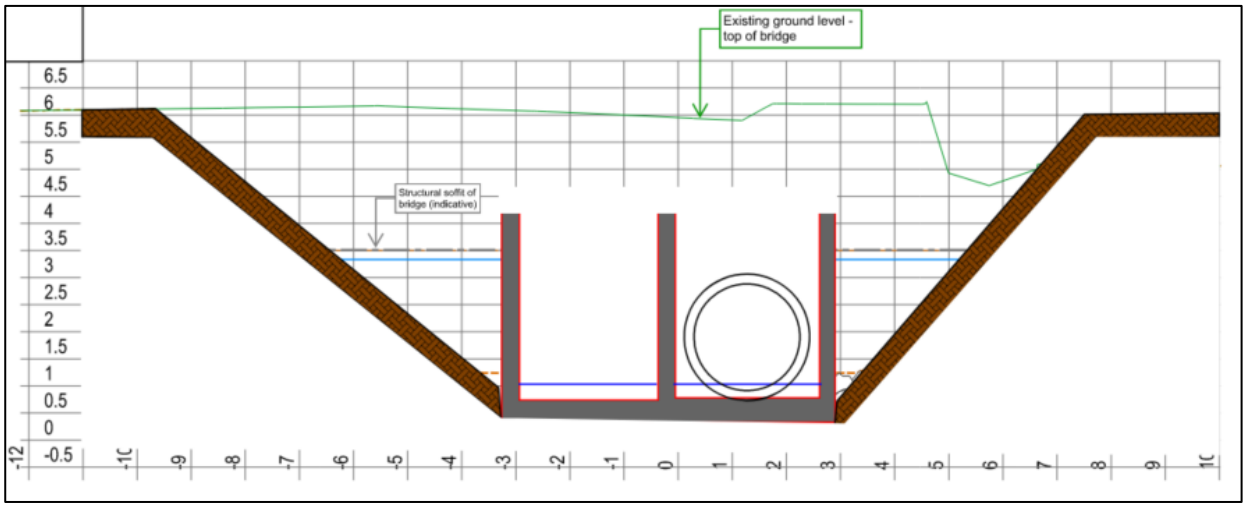


Figure 4-16: An excavator will progressively dig down and expose the culvert walls and the culvert lid will be removed.

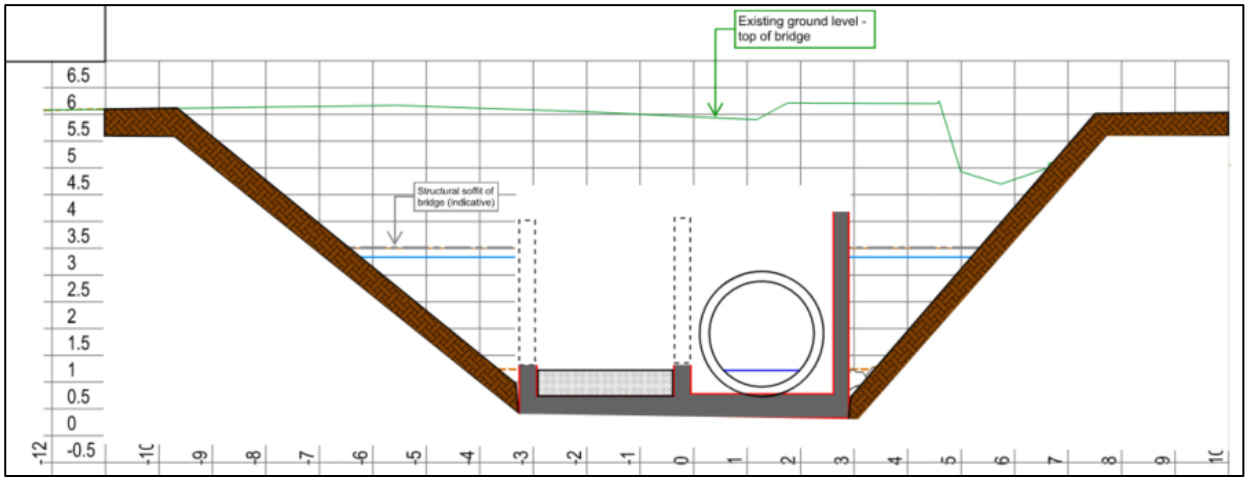


Figure 4-17: The temporary working platform will be placed into the empty side of the culvert once the stream has been diverted through the pipe. The middle and side wall will then be cut and removed in manageable sections.

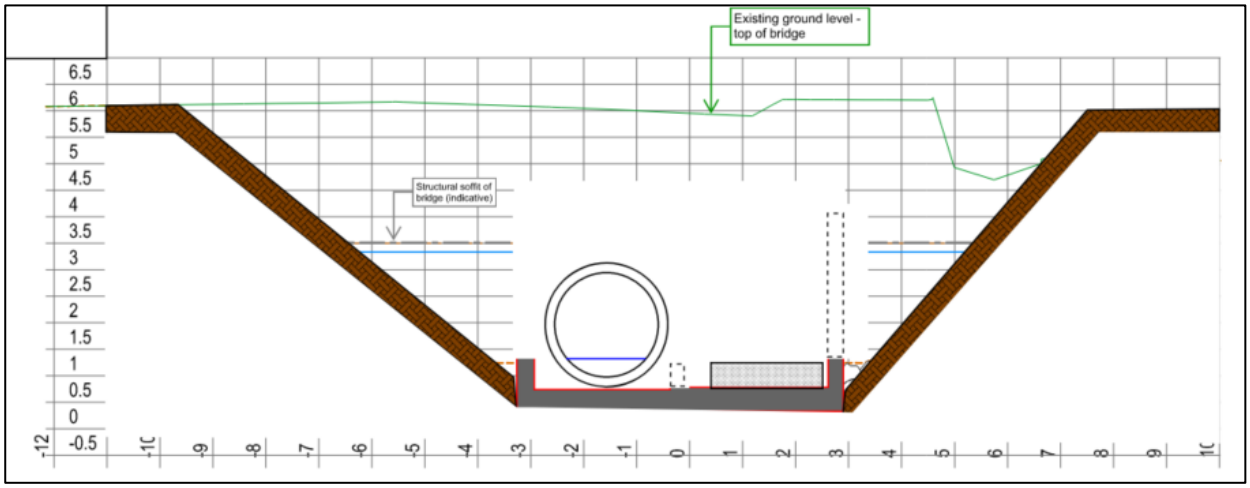


Figure 4-18: the piped diversion will be switched to the other side of the culvert and the remaining side wall and mid wall stub will be cut/demolished in manageable sections.

4.5.9 Bridge substructure construction

The construction of the bridge substructure (e.g., bridge abutments) will require piling and excavation work. The bridge abutments will be constructed before the full excavation and removal of the existing culvert, likely to coincide with the initial excavation to the top of the culvert as set out in Section 4.5.8 above.

- **Piling** –The following is anticipated:
  - Piling equipment will be located on the existing roadway behind the proposed abutments, with piling to be undertaken from the existing road. Existing services will be identified, then protected and/or temporarily realigned.
  - A drill rig will be used to core an oversized hole through the upper basalt layer (as required) on the western bank. A closed end tube casing will then be pitched and driven into the ground using a vibro hammer, with a hydraulic hammer used to drive the pile to its design founding depth. The hydraulic hammer will also be used to prove the loading carrying capacity of each pile. No spoil is anticipated to be removed with this methodology.
  - The reinforcing cage will then be lifted and placed inside the casing and then the pile concreted. Temporary caps will be placed over the pile casing to prevent the ingress of rain-water (as required) at the end of each day or when the pile is not being driven.
- **Bridge abutment excavation** – The following is anticipated:
  - Before excavating down to the underside of the abutment capping beams, suitable temporary retention will be installed (as required) around the perimeter of each capping beam to stabilise the surrounding ground and nearby utility assets.
  - The abutment, wingwall, and settlement slab footprint will be excavated, and the piles cut down to the underside of the abutment beam. The abutment, wingwalls, and settlement slab will then be constructed using conventional “reinforce, box, and pour” construction techniques. Concrete pours will be completed using a boom pump from behind the abutments. These works may encounter and require dewatering, which will be undertaken in accordance with CEMP and ESCP measures. Exact methodology for dewatering will be confirmed at the time of construction.

4.5.10 Existing Watercare pipe bridge works

To create the new abutments and strengthen the existing pipe, new shallow pad pipe footings or footings founded on micro piles will be constructed either side of the existing pipe. Localised excavation and clearance will be required using excavators. Piling (if required) will be undertaken using a mini rig. New steel girder beams will then be installed on either side of the pipe. The weight of the pipe will be transferred from the existing foundations to the new girder beam supports. The existing foundations will then be demolished.

4.5.11 Te Ararata Creek stream bank recontouring

Prior to installing the bridge beams, the streambanks will be cut to their final profile. Excavators will work from behind both abutments to service smaller excavators positioned on working platforms within the stream area (between the upstream and downstream sandbag headwalls). At this stage, any temporary retention or protection structures used to safeguard utility assets during abutment construction will also be removed.

Construction of retaining walls (as required) and rip rap, rock armouring and/or other stream protection works will be undertaken across the entire recontoured bank extent before the temporary piped stream diversion is removed.

These works may encounter and require dewatering, which will be undertaken in accordance with the CEMP and ESCP measures. Exact methodology for dewatering will be confirmed at the time of construction.

Once the final stream profile has been constructed, the piped diversion and sandbag headwalls will be removed, opening the stream up to it's the widened channel.

4.5.12 Bridge superstructure

Bridge beams will then be delivered to site and a mobile crane will be set up and used to lift the beams into place (refer to Figure 4-19 below). The bridge deck, deck-edge formwork and fall protection will then be constructed. Wingwalls and settlement slabs will be cast concurrently to the bridge deck construction from within the initial abutment excavation. Gaps between the beams will be sealed as required, deck reinforcing will be placed and the deck concrete pour undertaken using a boom pump. Footpath reinforcing and formwork will be completed, with concreted placed using a boom pump.

Precast concrete barriers will be delivered to site and placed in position using a mobile crane located behind the abutments. Engineered fill will be placed and compacted to the top of subgrade level using conventional compaction equipment such as rollers, compactors and excavators. Services will then be diverted or relocated as required including through new ducts placed within the bridge superstructure or another location as agreed with the respective asset infrastructure owners.

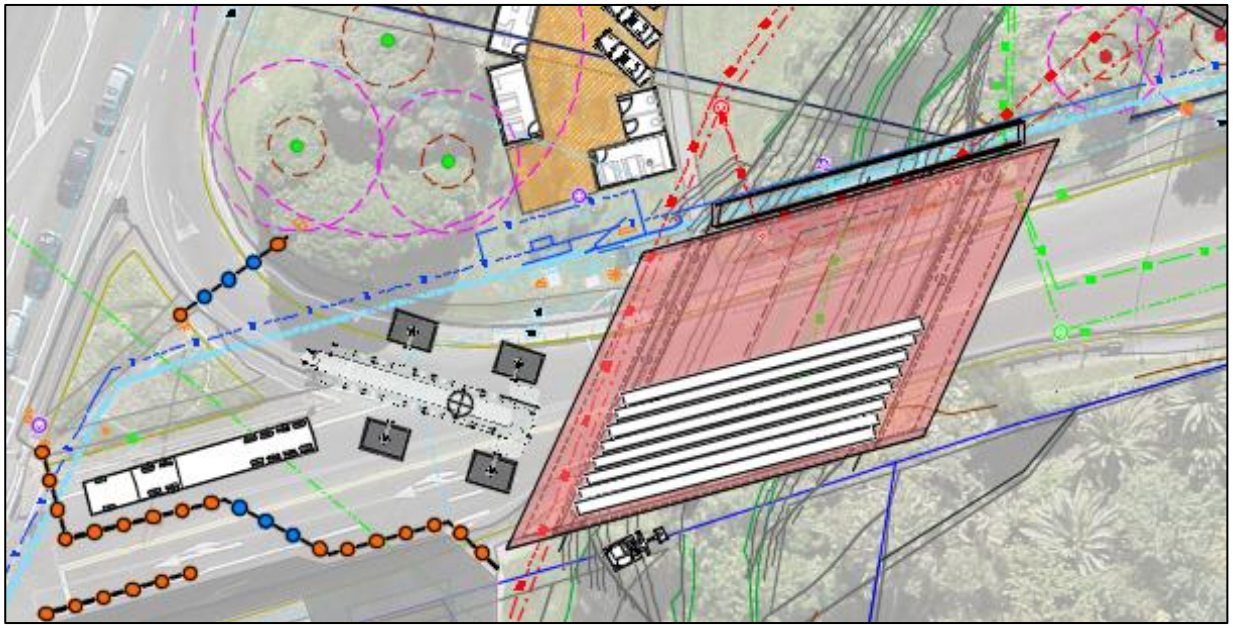


Figure 4-19: Plan arrangement of crane and truck delivers for installing bridge beams from behind the western abutment

4.5.13 Earthworks

The estimated earthworks can be differentiated between those required for the permanent and temporary elements of the Project. Earthworks associated with the permanent works / structures are set out in Table 4-5 with a further breakdown of location (i.e., stream bed, riparian yard or sediment control protection area) in Table 4-6. Earthworks associated with the temporary works / structures are set out in Table 4-7 with a further breakdown of location in Table 4-8

Overall, it is estimated that the total earthworks will be over an **area of approximately 3,190m^2** and a **volume of 2,950m^3**.

Table 4-5: Estimated earthworks required - permanent works / structures

Purpose of earthworks	Estimated area (m^2)	Estimated cut (m^3)	Estimated fill (m^3)
Finished design (including Watercare bridge abutment relocation and stream recontouring)	820	1,771	4
Excavation to reach the top of the pile level and construct the bridge abutment caps	400 (200 per abutment)	500	N/A – Cut to be replaced with the concrete abutment, wingwalls, settlement slab and engineered fill back to road level

Table 4-6: Breakdown of earthworks within the stream bed, riparian yard and sediment control protection area associated with the permanent works / structures

Location	Estimated area (m^2)	Estimated cut (m^3)	Estimated fill (m^3)
Stream bed	200	111	4
Riparian yard	1,153	1,026	0
Sediment Control Protection Area (includes stream bed and riparian yard)	1,220	2,271	4

Table 4-7: Estimated earthworks required - temporary works / structures

Purpose of earthworks	Estimated area (m^2)	Estimated volume (m^3)
Site access and laydown areas	1,500	500
Bailey bridge structure including abutments	170 (eastern side) 100 (western side)	85 (eastern side) 50 (western side)
Approach pathways to the bailey bridge	50 (eastern side) 150 (western side)	10 (eastern side) 30 (western side)

Table 4-8: Breakdown of earthworks within the stream bed, riparian yard and sediment control protection area associated with the temporary structures

Location	Estimated area (m^2)	Estimated volume (m^3)
Stream bed	0	0
Riparian yard	270	135
Sediment Control Protection Area (includes stream bed and riparian yard)	1,970	675

4.5.14 Vegetation removal and tree works

Up to approximately 28 individual trees and approximately 741m^2 of vegetation (571 m^2 of terrestrial native riparian vegetation and 170m^2 exotic vegetation) may require removal to enable the works. It is noted that one of the individual trees (a Pohutukawa) has the potential to be relocated within Black Bridge Reserve and will be pursued if practicable (refer to Section 6.7 and **Appendix E** for further discussion). Any protected

trees and vegetation removed will be replaced through replacement planting as shown in the draft planting plan in **Appendix K** and in accordance with the landscaping plan condition. Approximately 1,500m^2 of grass within Black Bridge Reserve may also need to be removed to construct the construction compound but this will be reinstated at the completion of the works.

4.5.15 Reinstatement and replanting

Following completion of the works, the construction area will be disestablished including the removal of temporary structures such as the temporary bailey bridge, the area reinstated, and the erosion and sediment controls removed.

The proposed planting as described in Section 4.4.4 will be undertaken on site as shown in the draft planting plan (refer to **Appendix K**) and in accordance with the final landscaping plan condition. The planting of specimen trees at the Project site (including in Black Bridge Reserve) will also be undertaken at this stage, with the final tree locations determined with Auckland Council Community Facilities and in accordance with the landscaping plan condition.

5 Permitted Activities and Resource Consents Sought

This section sets out the resource consents being sought for the flood resilience works under the AC-OiC and the information requirements of Clause 11(2)(r) which requires:

(2) Instead of complying with section 88(2)(b) of the RMA, an application for a resource consent for flood resilience works must include the following information:

> *(r) if the applicant intends to undertake any permitted activity relating to the proposed flood resilience works in the works area, a description of the permitted activity that demonstrates that it complies with the requirements, conditions, and permissions for the permitted activity, if any, specified in the Auckland Unitary Plan (so that a resource consent is not required for that activity under section 87A(1) of the RMA).*

5.1 Permitted activities

Clause 11(2)(r) of the AC-OiC requires that if permitted activities relating to the proposed flood resilience works are required in the works area, a description of the permitted activity that demonstrates that it complies with the requirements, conditions, and permissions for the permitted activity specified in the AUP:OP must be provided. Table 5-1 details the works to be undertaken as permitted activities under the AUP:OP and compliance with the relevant permitted activity standards.

Table 5-1: Permitted Activities under the AUP:OP

Activity	Rule	Comment
Planting in the stream.	E3.4.1(A2) Conservation planting complying with the standards in E3.6.1.2.	Planting is proposed within Te Ararata Creek as shown in the draft planting plan provided in **Appendix K.** Conservation planting in a stream is a Permitted Activity under Rule E3.4.1(A2). The proposed planting complies with the permitted standards in E3.6.1.2 as the planting involves: • Non-invasive species in aquatic conditions. • Species native to the area. • No pest species identified in a pest management strategy prepared under the Biosecurity Act 1993 or declared as an unwanted.
Replacement of the existing Walmsley Road bridge. Upgrade of the existing Watercare pipe bridge (to relocate and strengthen its foundations).	E3.4.1 (A23) Replacement, upgrading or extension of existing structures complying with the standards in E3.6.1.12.	The proposed replacement of the existing Walmsley Road bridge and upgrade of the existing Watercare pipe bridge will comply with Permitted activity standards in E3.6.1.12 as: • Works will comply with Standard E3.6.1.10 as any bed disturbance (if required) will not exceed 10m downstream and upstream, best practice erosion and sediment controls will be implemented and works will be undertaken to not compromise the structural integrity of remaining structures. • Both structures will not have lengths that exceed 30m measured parallel to the direction of water flow. • Construction material and ancillary structures will be removed from the bed following completion of the activity. • The final replacement or upgraded structures will not prevent fish passage. The proposed replacement and upgrade works will also be undertaken to comply with the general Permitted activity standards under E3.6.1.1 as it will not result in: • any of the specified effects in receiving waters. • an increase of existing flood levels on land other than owned by the person undertaking the activity. • machinery sitting directly on the wetted cross section of the bed and no explosives being used. • Mixing of construction materials and refuelling or maintenance equipment within 10m of the bed. Best site management practice will be used to avoid contaminant discharges. • Destruction, modification or damage of any scheduled sites. It is noted that consent under Section 13 of the RMA (set out below) is sought to cover the temporary stream diversion works, recontouring of the stream banks and removal of the existing culvert below the Walmsley Road bridge. These works above have therefore been separated out to reflect the indicative construction methodology.

Activity	Rule	Comment
Diversion of groundwater associated with excavation for the Walmsley Road bridge abutments / pile caps, stream recontouring (including installation of retaining walls and rock armouring) and piling.	E7.4.1(A27) Diversion of groundwater caused by any excavation (including trench) or tunnel.	The Project involves excavations and piling that may encounter groundwater and diversion of groundwater. The diversion of groundwater from these activities will meet the Permitted activity standards under E7.6.10 as: • Piles required for the bridge abutments (Walmsley Road bridge, replacement Watercare pipe bridge abutments (if required) and temporary bailey bridge (if required)) will be less than 1.5m in external diameter and are exempt from needing to meet Standards E7.6.10(2) – (6). • Groundwater level will not be reduced by more than 2m on the boundary of the closest adjoining site. • The proposed structures (e.g., retaining walls and bridge abutments) will in some locations be over a length of 20m but will not extend more than 2m below natural groundwater level. • The maximum depth of excavation is 6m and the closest building or structure is more than 6m (approximately 7.2m from the nearest driveway for the western abutment/excavation and 12.5m from the nearest building on the eastern abutment/excavation). • The distances of the excavations will meet the requirements under Clause 6(a) – (c) relating to the nearest Wetland Management Area, Historic Heritage Overlay and lawful groundwater take.
Diversion of stormwater runoff from the replacement Walmsley Road bridge.	E8.4.1(A1) Diversion of stormwater runoff from lawfully established impervious areas directed into an authorised stormwater network or a combined sewer network that complies with Standard E8.6.2.1.	Stormwater runoff from the replacement Walmsley Road bridge will continue be directed to the existing public stormwater network as per the existing bridge.
Redevelopment of existing impervious area for a high use road (Walmsley Road).	E9.4.1(A1) Development of new or redevelopment of existing impervious areas for any high contaminant	The existing Walmsley Road bridge meets the definition of a high-use road. Stormwater runoff from the replacement/redeveloped Walmsley Road bridge will continue to be directed to the existing public stormwater network / system as per the existing bridge. No further management devices or systems are required for the replacement.

Activity	Rule	Comment
	generating car park or high use road where stormwater runoff is directed to an existing authorised stormwater management device or system.	
Temporary construction signage between 10 – 12 months.	E26.2.3.1 (A12) Temporary signage during the construction of network utilities and electricity generation facilities, which is in place for no longer than 12 months.	The works will involve temporary signage and can be implemented to meet all the relevant standards under Standard E26.2.5.1 and E26.2.5.2.
Construction of the replacement Walmsley Road bridge, tie in works and use as a multi-modal transport corridor.	E26.2.3.2 (A67) Construction, operation, use, maintenance and repair of road network activities.	The replacement of the existing Walmsley Road bridge will continue to accommodate road network activities and will be within the road reserve. It will meet the Permitted activity standards under E26.2.5.4 as: • Temporary works, buildings and structures will be removed from the road on completion of the work. • Following completion of works, ground will be reinstated to at least the condition existing prior to any work starting. • Works within the formation width of the road are incidental to the Walmsley Road bridge replacement. • In relation to specific vibration requirements under clause (4) for scheduled Historic Heritage sites, the works will be more than 20m away from the nearest scheduled Historic Heritage site (Historic Heritage Overlay Extent of Place – 1439, Topping House).
	E26.2.3.2 (A68) Transportation of people, goods and services.	The replacement Walmsley Road bridge will provide for the transportation of people, goods and services following its completion (as per the existing bridge). There are no specified Permitted activity standards for this activity.

Activity	Rule	Comment
Pest plant removal within the riparian area.	E26.3.3.1(A74) Pest plant removal.	Pest plant removal within the riparian area may be required as part of the works and is a Permitted activity under Rule E26.3.3.1(A74). There are no relevant permitted activity standards.
Pest plant removal within the open space zone (of any tree less than 4m in height and less than 400mm in girth).	E26.4.3.1(A82) Pest plant removal *of any tree less than 4m in height and less than 400mm in girth.	Pest plant removal (of trees less than 4m and less than 400mm girth) within the open space zone may be required as part of the works and is Permitted activity under E26.4.3.1(A82). There are no relevant permitted activity standards.
New network utilities (temporary bailey bridge, upgraded Watercare pipe bridge and replacement Walmsley Road bridge) within the Regionally Significant Volcanic Viewshafts and Height Sensitive Overlay – Mount Mangere.	E26.11.3.1 (A152) Buildings and structures for network utilities and electricity generation facilities that do not intrude into a scheduled viewshaft.	The proposed new, upgraded or replacement structures for network utilities are within the Regionally Significant Volcanic Viewshaft Overlay. They will not however intrude into the viewshaft which is at approximately 22-28m above ground level. The max. height of the structures above ground level is 6.5m (Walmsley Road replacement bridge).
Construction equipment – operation of anticipated crane within the Regionally Significant Volcanic Viewshafts and Height Sensitive Overlay – Mount Mangere.	E26.11.3.1 (A163) Temporary construction and safety structures.	A crane is required to construct the Project. This is likely to temporarily intrude into the Regionally Significant Volcanic Viewshaft Overlay which is approximately 22-28m above ground level. The overall construction works are anticipated to be between 10 – 12 months. This is a Permitted activity as the temporary construction structure (i.e., crane) will meet Standard E26.11.5.1(6) which requires removal of temporary construction and safety structures within 30 days or upon completion of the construction works. The crane will be disestablished and removed from the site following completion of the construction works.
Construction of the new replacement Walmsley Road bridge (a road network	E36.4.1 (A53) Construction, operation, maintenance,	The project involves construction of a new replacement Walmsley Road bridge (a road network activity) within the legal road or road formation width. The bridge is located within the costal storm inundation area (1% AEP, 1% AEP Plus 1m sea level rise), 1% AEP floodplain, overland flow paths and on land which may be subject to instability. There are no relevant permitted activity standards.

Activity	Rule	Comment
activity and within the road) within hazard areas.	renewal and repair of road network activities within the legal road or road formation width in areas listed in the heading above.	
	E36.4.1 (A54) Infrastructure within roads or the Strategic Transport Corridor Zone in areas listed in the heading above.	The project involves construction of a new replacement Walmsley Road bridge and realignment/ relocation of existing services within road. The bridge (and any realigned/relocated services onto the bridge) will be located within the costal storm inundation area (1% AEP, 1% AEP Plus 1m sea level rise), overland flow paths and on land which may be subject to instability. There are no relevant permitted activity standards.
Construction compounds and works areas.	E40.4.1 (A20) Temporary activities associated with building or construction, (including structures and buildings that are accessory activities), for the duration of the project, or up to 24 months, whichever is the lesser	The proposed site compounds and works areas will be in use for approximately 10-12 months. Construction compounds / laydowns that operate for less than 24 months in duration are a Permitted Activity under Rule E40.4.1(A20). There are no relevant permitted activity standards.

Further to the above and considering the findings of the PSI supplied in **Appendix H** it is noted that:

- The proposed earthworks will be undertaken on land not considered to contain elevated levels of contaminants. Therefore, Chapter E30 of the AUP is not relevant for this application.
- The proposed earthworks will not be undertaken on land that has been subject to a HAIL activity. Therefore, the National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health is not relevant for this application.

5.2 Resource consents sought

Under Clause 8 of the AC-OiC, any flood resilience works undertaken by, or on behalf of, Auckland Council is to be classified as a controlled activity for the purposes of section 87A(2) of the RMA.

This application seeks to authorise flood resilience works associated with the Walmsley Road bridge replacement Project. Table 5-2 outlines the resource consents required. Overall, resource consent is required as a **Controlled Activity**. Clause 13(2) of the AC-OiC states that a resource consent application for recovery work must not be publicly notified or given limited notification.

Table 5-2: Resource consent requirements and duration

Activity
Section 9 Land
Flood resilience works on land that is not expressly allowed by a national environmental standard or regional rule or contravenes a national environmental standard or regional rule. Activities include: • Construction noise and vibration. • Construction of a temporary bailey bridge (considered a temporary network utility as it is associated with the Walmsley Road bridge replacement) that exceeds the maximum 30m^2 building area and maximum 2.5m height. • Minor upgrading of existing network utilities (water, gas, communications, power, stormwater – consent sought on a precautionary basis as final location of realigned services are still to be confirmed in coordination with the relevant asset owners). • Replacement and relocation of the existing Watercare pipe bridge abutments (as the girder beam structures proposed to support the existing pipe and location of the new abutments will increase the width of the overall structure by more than 10% of what is existing). • Erosion protection (rock armouring and retaining walls) beneath the new structure and immediately upstream and downstream that exceeds maximum 30m^2 building area and/or maximum 2.5m height. • Vegetation removal within the riparian area including up to six trees over 6m in height or 600mm in girth and more than 50m^2 of vegetation (approx. 571m^2 of native riparian vegetation and 170m^2 exotic vegetation). • Works within the root protection zone (conservatively sought in relation to works around Tree 51). • Alteration or removal of trees greater than 4m in height and/or 400mm in girth within the Open Space Zone (Up to approximately 28 individual trees). • Earthworks greater than 2500m^2 (anticipated to include a total of approximately 3,190m^2 across all work areas, within the Sediment Control Protection Area and more than 5m^2 in the riparian yard). • Earthworks greater than 2500m^3 (anticipated to include a total of approximately 2,950m^3 in across all work areas and more than 5m^3 in the riparian yard). • Construction of the temporary bailey bridge (infrastructure) within the costal storm inundation area (1% AEP, 1% AEP Plus 1m sea level rise), 1% AEP floodplain, overland flow paths and on land which may be subject to instability. • Widening and recontouring of the existing Te Ararata Creek along the eastern and western banks to achieve the final stream profile below, upstream and downstream of the Walmsley Road Bridge within the costal storm inundation area (1% AEP, 1% AEP Plus 1m sea level rise), 1% AEP floodplain, overland flow paths and on land which may be subject to instability. • Replacement and relocation of the existing Watercare pipe bridge abutments (as the girder structures proposed to support the existing pipe and location of the new abutments will increase the width of the overall structure by more than 10% of what is existing) and is within the costal storm inundation area (1% AEP, 1% AEP Plus 1m sea level rise), 1% AEP floodplain, overland flow paths and on land which may be subject to instability. • Retaining walls (considered new buildings) along the recontoured stream banks that do not comply with the riparian setback standards relating to the Open Space zone.
Section 13 River and lake beds (including wetlands)
Flood resilience works in, on, under or over the beds of rivers or lakes that is not expressly allowed by a national environmental standard or regional rule, or contravenes a national environmental standard or regional rule. Activities include: • Widening and recontouring of the existing Te Ararata Creek along the eastern and western banks to achieve the final stream profile (including erosion and protection structures and retaining walls). • Temporary diversion of Te Ararata Creek into a pipe within the works site to provide a dry working area and minimise impacts on the live stream during construction (approximately 6 – 8 months).

Activity
• Temporary culvert (i.e., the diversion of Te Ararata Creek into a pipe) installed during construction that is likely to result in an increase in velocity and potential for the pipe to be a velocity barrier to upstream migration of fish under some flow conditions. • Partial demolition of the existing twin culvert below Walmsley Road bridge (with the culvert base to be retained to minimise channel disturbance). • Construction of a temporary bailey bridge over Te Ararata Creek that will be in place for longer than 14 days within any six-month period (approximately 10 – 12 months).
Section 14 Water
Flood resilience works involving the taking, use, damming, or diversion of water that is not expressly allowed by a national environmental standard or regional rule, or contravenes a national environmental standard or regional rule. Activities include: • Temporary dewatering or groundwater level control exceeding the maximum water take of 30 days associated with the Walmsley Road bridge abutment/pile cap excavation and the recontouring of Te Ararata Creek stream banks.

6 Assessment of Effects on the Environment

This section sets out the information requirements of Clause 11(2)(j) which requires:

(2) Instead of complying with section 88(2)(b) of the RMA, an application for a resource consent for flood resilience works must include the following information:

> *(j) an assessment of all potential effects of the flood resilience works with input from appropriate experts, including consideration of—*
>
> > *(i) all information reasonably available to the applicant; and*
> >
> > *(ii) the potential effects on any cultural values in the works area identified by a relevant Māori entity; and*
> >
> > *(iii) the potential effects on any values identified in AUP overlays that apply in the works area or any area that adjoins the works area, or both:*

This section provides an assessment of effects as they relate to the matters of control specified in Schedule 3 of the AC-OiC. **Appendix S** details the matters of control that are relevant to the Project and where these are addressed in the following sections.

6.1 Positive effects

The Project and flood resilience works have been designed to reduce the likelihood of blockage at the existing Walmsley Road bridge location in direct response to the January 2023 flood events. As described in Sections 1.2.1 and 4.2 the Te Ararata catchment was one of the worst affect areas with significant flooding, causing risk to life, and widespread flood damage to approximately 321 homes. This occurred due to poor flood conveyance along Te Ararata Creek with blockage points at the existing Walmsley Road bridge culverts where, large debris from properties such as fences and outdoor furniture were caught within or around the existing twin culverts beneath the bridge. As previously described, full blockage at the existing Walmsley Road bridge culverts has the potential to affect over 1000 properties.

In addition to the removal of blockage risk, the Project will increase flow capacity and contributes infrastructure that is more resilient to extreme flood events. It will also contribute towards the wider flood resilience strategy within the Te Ararata catchment (i.e., the wider Te Ararata Project) which is collectively anticipated to reduce the number of properties at risk of flooding, particularly within ‘intolerable risk to life’ levels of flooding. The new infrastructure and works will form part of the wider Auckland infrastructure network and contributes towards improved safety in the catchment.

Alongside the flood resilience outcomes, the Project also contributes upgraded transport infrastructure. The new replacement Walmsley Road bridge accommodates a three-lane corridor for vehicles (increasing from the existing two-lanes) as well as wider improved shared active mode paths on either side of the carriageway. These improvements provide for the anticipated transport movements and role of Walmsley Road within the wider transport network.

The works proposed to the existing Watercare pipe bridge also improves the resilience of the asset. The relocation and replacement of the existing abutments mean they do not conflict with the widened stream profile and can provide for the flood resilience outcomes described above. The new support structure / girder beams proposed along the length of existing pipe will also strengthen the existing asset.

The Project also proposes replanting including native vegetation as shown in **Appendix K**. This provides the opportunity to increase native planting coverage, reestablish natural landscape and amenity values and contribute to Auckland

Council's aspiration for a connected green network and urban ngāhere. The anticipated planting is an improvement from the existing vegetation proposed to be removed as the new planting involves native species and existing pest species will also be removed.

6.2 Ecology

An Ecological Impact Assessment (**EcIA**) has been prepared to assess the potential ecological effects of the proposal and is provided in **Appendix D**. A draft Ecological Management Plan (**EMP**) is also provided as part of this application in **Appendix R**. The EMP, which has been prepared by a suitably qualified and experienced ecologist(s), includes a Fish Management Plan (**FMP**), Avifauna Management Plan (**AMP**), Mokomoko (skink) Management Plan (**MMP**) and Vegetation Management Plan (**VMP**). The intent is to finalise the EMP prior to construction and to provide this to the consent authority for certification as part of a CEMP.

The EcIA, Draft EMP and assessment below have been prepared to address the following:

General

(b) Potential adverse effects on wildlife, habitats, and ecosystems.

(c) Potential adverse effects on biodiversity values (other than terrestrial indigenous biodiversity values).

(d) Potential adverse effects on protected trees…, and measures to avoid, remedy, or mitigate those effects.

(e) Potential adverse effects on…surface water flows, terrestrial and freshwater ecosystem habitats,… and measures to avoid, remedy, or mitigate those effects.

(f) The management of construction works to avoid, remedy, or mitigate potential adverse effects on receiving environments, including adverse effects of hazardous substances, spills, and stormwater run-off.

Freshwater

(a) Potential adverse effects on the ecological values of any river or wetland.

(b) Provision for the passage of fish.

(c) Application of the effects management hierarchy to flood resilience works affecting any river or wetland.

(d) The use of structures and diversion to facilitate flood resilience works.

(e) The management of flood resilience works to avoid, remedy, or mitigate potential sedimentation or contamination effects on any freshwater receiving environment.

(f) Potential adverse effects of the flood resilience works on freshwater fisheries, and measures to avoid, remedy, or mitigate those effects.

Soil, land and ecology

(c) Potential adverse effects on terrestrial ecology, and measures to avoid, remedy, or mitigate those effects.

(d) Potential adverse effects on terrestrial indigenous biodiversity values, and measures to avoid, remedy, or mitigate those effects.

(f) Potential adverse effects of land disturbance and sediment discharge on water bodies, particularly sensitive receiving environments.

The potential adverse effects of the Project are largely due to the construction phase and include the following:

In relation to potential adverse effects on freshwater ecological values:

- Injury and mortality to freshwater fauna during demolition of the existing culvert and associated in-stream works.
- Sediment and contaminant discharge to the freshwater environment during demolition, earthworks, concrete pouring, chemical spills, and rainfall events.
- Obstruction of fish passage during construction.

In relation to potential adverse effects on terrestrial ecological values:

- Temporary loss of native riparian plantings (approximately 571m^2)
- Temporary loss of exotic forest (approximately 170 m^2)
- One specimen pōhutukawa tree is proposed to be translocated if practicable. However, if the pōhutukawa cannot be translocated, or dies as a result of translocation, there is the potential loss of one specimen pōhutukawa tree.
- Disturbance, injury or mortality to birds and lizards.

As described in Section 3.5.4, native bats are not considered to be presented in the works area and are therefore not considered further below.

A summary of the potential effects is provided below.

6.2.1 Sedimentation and contaminant effects during construction

Without management, earthworks and works within and adjacent to the bed of streams can result in uncontrolled discharge of sediment laden water during construction. Sediment laden discharges can have negative effects on freshwater fauna, including fish and macroinvertebrates. Excess in-stream sedimentation can impact water clarity, the available physical habitats within streams, food sources being altered, removal of egg laying sites for freshwater fauna and fish migration. Banded kokopu and redfin bully, which have been recorded within Te Ararata Creek, are the most likely to exhibit avoidance behaviours related to elevated levels of sedimentation.

An ESCP (as outlined in Section 4.5.6 above, with draft provided in **Appendix Q**) is proposed to be implemented, which outlines the necessary management methods for desilting and sediment removal to minimise sedimentation and discharge within Te Ararata Creek. With the implementation of the ESCP, effects of discharging sediment laden water are assessed as **Low**.

In the unlikely event of an unexpected, uncontrolled discharge of sediment from the works area during low flow conditions, it is expected that sediment sensitive species (banded kōkopu and redfin bully) would be able to easily avoid small sediment plumes. Should there be an uncontrolled discharge of sediment during higher flow events, the contribution of the project related works area to the sediment load within Te Ararata Creek would be negligible (given the scale of works compared to the contributing catchment). As such, potential effects on banded kokopu and redfin bully would be **negligible**, which results in a **very low or low** overall level of effect.

6.2.2 Instream habitat modification

Permanent modification of the wetted stream channel has been minimised by retaining the existing concrete culvert base. During construction, a section of dry working environment will be established by sand bagging Te Ararata Creek and temporarily diverting flows through a closed piped system. Some rock or stabilising material may need to be placed into the dry sections of the stream channel to provide suitable working platforms. Following completion of works, all materials in the stream will be removed to the extent practicable

to return the stream channel to a similar state to prior construction. The temporary effects are considered necessary to contribute to the management of sediment and to minimise permanent damage to the stream bed. The potential adverse effects following completion of works is expected to be an overall **very low** level of effect.

6.2.3 Injury or mortality of freshwater fauna during construction

Instream works have the potential to cause injury or mortality to native freshwater fauna. Effects on freshwater fauna as a result of the works will be avoided to the extent practicable by salvage and relocation of fauna prior to construction commencing.

A FMP prepared as part of a draft EMP (refer to **Appendix R)** outlines the measures proposed to be implemented to minimise the potential for injury and mortality effects on freshwater fauna. The draft plans will be updated following confirmation of the final methodology and provided to the consent authority for certification prior to construction.

In the absence of stream diversion measures and native fish salvage, the magnitude of effects of stream works is likely to be high given the potential for fish injury or mortality. With appropriate mitigation measures adopted, the anticipated effects are assessed to be an overall **low** level of effect.

6.2.4 Effects on fish passage

Temporary restrictions to fish passage during construction may impact a population's reproductive success by preventing fish to move upstream during their migration period. The resultant decrease in fish mobility can cause fragmented populations, a reduction in population size, and limit overall available habitat for freshwater fauna. The proposed temporary stream diversion via closed pipe (for a period of 6 – 8 months during construction works) is likely to be much smaller than the current width of the stream channel. While the pipe size has not been confirmed, there is likely to be an increase in velocity and potential for the pipe to be a velocity barrier to upstream migration of fish under some flow conditions. The proposed works anticipated from early 2025, are likely to coincide with the peak upstream migration of some species including redfin bully, long fin eel, common bully, shortfin eel, common smelt and banded kokopu, with greater overlap anticipated with the upstream migration period for inanga.

It is not possible to avoid these temporary potential adverse effects without potentially causing sediment effects or increasing the works footprint. It is considered that the pipe may form a partial or complete barrier under certain flow conditions for a total period of 6-8 months and will primarily affect elvers (juvenile eels), banded kokopu and inanga. The anticipated overlap of works and migration period for these species (approximately one month) is limited and both species are likely to still be able to travel upstream through the pipe, albeit sometimes restricted. The overall level of effect on elvers (high value) and banded kōkopu (low value) is assessed as **low**.

For inanga, the potential overlap in peak migration period and works proposed is two months. Inanga are poor swimmers, being restricted to low flows and shallow grades. It is expected that for flows where inanga cannot pass the pipe, they will congregate downstream where there is plentiful habitat. Following removal of the barrier they will be able to continue their upstream passage. On this basis and acknowledging the temporary nature of the barrier, it is considered that the magnitude of effect on inanga is low, resulting in an overall **low** level of effect.

It is anticipated that all other species will be able to move downstream over the construction period without restriction. As such the magnitude of effect is considered negligible, resulting in an **overall low** or **very low** level of effect.

6.2.5 Loss of terrestrial vegetation

The Project is anticipated to result in the temporary loss of 571m^2 of native riparian planting, 170m^2 of exotic forest and potential loss of one Pōhutukawa (if translocation is not practicable or fails)[7]. The potential loss of vegetation will be remediated following construction and will comprise of replanting as shown in the draft planting plan **in Appendix K.** The proposed species aligns with the planting recommendations of Te Ahiwaru Trust in their CVA. A VMP has also been prepared (as part of the EMP) which outlines measures so that vegetation management is undertaken in a way that minimises vegetation loss where possible. This includes vegetation clearance protocols such as clearance extent demarcation, removal being undertaken by suitably experienced arborists and seasonal restrictions. In summary the potential effects from the loss of vegetation are assessed as the following:

- Temporary loss of native riparian planting as well as mānuka and ngaio – moderate level of effects during construction, then low level effects in the medium term (following replanting).
- Temporary loss of exotic specimen forest (comprising species such as she-oak and flame tree) – overall very low level of effect during both construction and in the medium term (following replanting)
- Potential loss of the Pōhutukawa (if it cannot be relocated) – moderate level of effects during construction, then low level of effects in the medium term (following mitigation planting). If the tree can be successfully translocated, the overall effect is assessed as very low.

6.2.6 Birds

Potential adverse effects on birds include temporary habitat loss of native riparian planting and exotic forest (total of 741m^2) and injury or mortality during habitat clearance, including harm to nests, eggs and nestlings. The temporary loss of vegetation is assessed as a relatively minor loss of habitat for native birds (with over 10,000m^2 of similar habitat along the upstream of Te Ararata Creek riparian zone). The proposed replanting (refer to **Appendix K**) will provide replacement habitat following construction of the Project and once vegetation has become established.

Given the Project timeframes, it may not be possible to avoid habitat clearance during peak bird breeding season. Where this occurs, works will be undertaken in accordance with a finalised EMP which includes an AMP. The AMP includes necessary protocols for undertaking works including bird nest checks.

Following implementation of the EMP, including an AMP, an overall **low to very low level** of effect for terrestrial birds is expected.

6.2.7 Lizards

Potential adverse effects on native lizards (including copper and ornate skinks) include temporary habitat loss (total of 741m^2) and injury or mortality during habitat clearance.

Following completion of construction works, new habitat will be achieved through the replanting proposed (refer to **Appendix K**) and lizard habitat reconstruction (such as placement of rock piles). As a result, in the short term (0 - 5 years) there will be no overall loss in potential lizard habitat.

A draft MMP has also been prepared alongside the draft EMP to set out protocols to manage potential lizard injury or death during habitat clearance. This includes salvaging, relocation, and reporting protocols.

Following implementation of the MMP, the overall effects are assessed to be **low** for copper and ornate skinks.

[7] The arboricultural effects of the loss/ translocation of the Pōhutukawa are discussed in Section 6.7

It is noted that a Wildlife Act Authority has been sought from the Department of Conservation to enable lizard management on the site.

6.2.8 Summary of ecological effects and proposed management measures

A summary of the overall ecological effects and management measures proposed is provided in Table 6-1 below.

Table 6-1: Summary of ecological effects and management measures

Ecological characteristic or activity	Ecological value	Proposed effects management	Magnitude of effect after effects management	Overall level of effect
Sedimentation or contaminant generation during construction – stream habitat	Moderate	ESCP including use of silt fences, transportation of excavated material, dirty water diversions; CEMP	Low	**Low**
Sedimentation or contaminant generation during construction – sediment sensitive species	Low and High		Negligible	**Very low and low**
Instream habitat modification	Moderate	CEMP and EMP	Negligible	**Very low**
Injury or mortality of freshwater fauna	Low to very high	FMP including fish and relocation protocols and CEMP	Negligible	**Low**
Fish passage (elvers, banded kokopu, inanga) during construction	Low to high	CEMP	Low	**Low**
Riparian native planted vegetation	Moderate	Remediation planting, VMP	Moderate (construction phase) Low (medium term)	**Moderate (construction phase)** **Low (medium term)**
Exotic forest	Low		Low (construction phase) Negligible (medium term)	**Very low (construction phase)** **Very low (medium term)**
Pōhutukawa specimen tree	Moderate	Relocation of existing Pōhutukawa condition including relocation methodology.	If translocation is successful: low If translocation is not possible or unsuccessful:	**If translocation is successful: Very low** **If translocation is not possible or unsuccessful:**

Ecological characteristic or activity	Ecological value	Proposed effects management	Magnitude of effect after effects management	Overall level of effect
		If relocation not practicable, remediation planting	Moderate for the construction phase, low in the medium term.	**Moderate (construction phase)** **Low (medium term)**
Kānuka, mānuka, ngaio	Moderate	Remediation planting, VMP	Moderate (construction phase) Low (medium term)	**Moderate (construction phase)** **Low (medium term)**
Not Threatened native vegetation	Low		Low	**Very low**
North Island kākā, tūī, kererū	Moderate	AMP: bird nest checks, habitat remediation	Low	**Low**
Not Threatened terrestrial birds	Low		Low	**Very Low**
Copper and ornate skink	High	MMP: salvage and relocation, habitat remediation, habitat enhancement measures including pest mammal control if certain thresholds	Low	**Low**

6.3 Cultural values

This section details the potential effects on any cultural values in the works area identified by a relevant Māori entity. It has considered the following matters:

> ***Cultural values***
>
> *(a) Potential adverse effects on cultural values identified by Māori entities.*
>
> *(b) Whether the flood resilience works will affect sites of significance to Māori entities, including wāhi tapu.*
>
> *(c) Measures proposed to monitor adverse effects on cultural values throughout flood resilience works.*

As set out in Section 3.8.1 above, the Project is not located within a Sites and Places of Significance to Mana Whenua Overlay (as identified in the AUP:OP) nor is it within any identified Treaty Settlement – Statutory Acknowledgement Areas. The nearest Statutory Acknowledgement Area(s) are located within the Māngere Inlet approximately 800m downstream of the works and are associated with Ngāti Tamaoho and Te Kawerau a Maki. The Project does not involve any properties or land returned under a Treaty settlement, Marae, Māori freehold land or Tupuna Maunga Affected Areas identified in Auckland Council Geomaps viewer.

Notwithstanding the mapped features and areas, it is acknowledged that only Mana Whenua or Māori entities can speak to the impact that a Project may have on their cultural values, heritage and aspirations. Therefore in order to understand any potential effect on cultural values, Healthy Waters has established an engagement process (set out in Section 8) to provide the opportunity for Māori entity representatives to be part of the Project team and provide input on the potential impacts of the Project should they wish to do so. Engagement with Māori entities will also be ongoing through the Project in accordance with the proposed 'Engagement and communication' conditions and in accordance with engagement plan supplied in **Appendix T**.

As outlined in the Consultation and Engagement section below (see Section 8 of this AEE), all 11 relevant Māori entities identified by Auckland Council were initially contacted through the Auckland Council Healthy Waters kaitiaki forum in 2023. Interest was received from Te Ākitai o Waiohua, Ngāti Tamaoho and Te Ahiwaru to be involved in the Project. In April 2024 a formal Mana Whenua kaitiaki forum was established for the Project with those interested in the Project invited to attend with opportunity to discuss the Project, design, progress and identify key design meetings they would like to attend.

CVA have since been received from Te Ākitai Waiohua and Te Ahiwaru as set out in Section 3.8.2. The CVAs are confidential and can be provided to the consent authority on request. Ngāti Tamoho have confirmed they do not wish to complete a CVA for the Project. The values and outcomes from the Te Ākitai Waiohua and Te Ahiwaru CVA are summarised below.

6.3.1 Te Ākitai Waiohua

The CVA prepared by Te Ākitai Waiohua is considered a tool to obtain a better understanding of Te Ākitai Waiohua, its history and aspirations. Its primary purpose is to provide information before consultation so that all parties are fully informed of their position.

The main interests of Te Ākitai Waiohua include:

- The recognition and acknowledgment of Te Ākitai Waiohua and its history in Tāmaki Makaurau (Auckland);
- The opportunity for Te Ākitai Waiohua to exercise its role as Kaitiaki in Tāmaki Makaurau; and
- The ability for Te Ākitai Waiohua to protect and preserve its interests, resources and taonga in Tāmaki Makaurau.

The CVA sets out the longstanding history of Te Ākitai Waiohua within South Auckland, Māngere and their association with features in the area including Te Ararata Creek. The CVA discusses the importance of tribal landmarks and resources such as maunga and waterways. If these resources are damaged, contaminated or destroyed the consequences can manifest themselves in the spiritual, physical and mental detachment of people, cultural dissociation, ill health and even death.

The CVA recognises that Te Ākitai Waiohua are not opposed to the use of an Order in Council process to undertake urgent flood resilience measures if cultural conditions and requirements are included as safeguards so that adverse environmental and cultural effects are avoided, remedied or mitigated.

Project recommendations set out in the CVA include in summary the following:

- Ongoing participation, consultation and involvement in all phases of the Project to support the traditional role of Te Ākitai Waiohua as kaitiaki.
- Providing for blessings (karakia) and cultural inductions before commencement of earthworks and future works.
- Acknowledging where possible, the history and status of Te Ākitai Waiohua as mana whenua and kaitiaki of the project area.
- Incorporation of cultural design and mahi toi (artwork) elements throughout the entire project.
- Management and improvement of water quality.

- Permitting iwi monitoring of earthworks, erosion and sediment control, stream works and ecological works such as fish salvage and relocation.
- Use of native plants and specimen trees, utilising the Kāinga Ora Ngā Hau o Māngere Ngāhere Planting guide to inform planting and developing a final landscaping plan.
- Utilise ecological assessments and management plans to account for Te Ākitai Waiohua cultural values in stream works.
- Taking a precautionary approach to works in the area by applying for Archaeological Authority.

6.3.2 Te Ahiwaru

The CVA prepared by Te Ahiwaru provides an overview of cultural values associated with Maangere and the potential effects (both positive and adverse) on those values as a result of the Project. The CVA sets out Te Ahiwaru's association and longstanding history in the area.

In summary, the CVA outlines that:

- While there are no archaeological sites recorded within the Project area, the Project has the potential to uncover or damage unknown subsurface archaeological remains. As such, the project has potential risk to sites of significance, and further protections of waahi tapu need to be negotiated.
- The Project provides many opportunities to improve and enhance the area, re-establishing connections for Te Ahiwaru to these waterbodies and therefore a healthier cultural landscape.
- The site and adjacent areas are part of a wider cultural landscape, and the cultural values associated with the site are to be protected.
- That any design of infrastructure or public space should adhere to Te Ahiwaru design principles, and the Ahi Kaa framework.
- That there are limitations of the CVA and ongoing consultation is best for a tikanga-led engagement.

The CVA also provides a series of initial generic recommendations, which is anticipated to be developed through further information and engagement. This includes:

- To have high quality stormwater solutions and zero discharge to their waterbodies.
- Taking a precautionary approach to archaeological values on the site, including consultation with Historic Places Trust and adopting the Te Ahiwaru Accidental Discovery Protocols on site.
- Prioritise natural solutions like daylighting and naturalisation of streams where possible. Ensure that all plantings along the stream banks consist of native species from the local ecological district.
- Reinstatement of cultural names for this area to acknowledge tupuna and ancestral land uses and to consult with Te Ahiwaru for their placement within the site.
- Ongoing monitoring and maintenance of the stormwater network to provide flood resilience in Te Ararata awa (and Harania).
- Incorporate cultural health indicators that assess the health of the mauri, biodiversity and mahinga kai resources.
- Te Ahiwaru involvement in negotiation for areas that will be demarcated as open space within the Project.
- That Ahiwaru aspirations for ecological and ancestral landscape enhancement is supported. The planting palette should comprise of a traditional WF7 Puuriri Forest. Te Ahiwaru highly recommend that procurement of plants come from Makauru Marae nursery and utilise their services for planting, pest plant and animal control that support the Maangere Ngahere Guide.
- Adoption of the Ngaa Hau o Maangere Ngahere Plan and its recommendations.
- Provision of further documentation which inform the development.

6.3.3 Response to the CVAs

Overall, the ongoing participation and involvement of Te Ākitai Waiohua and Te Ahiwaru (as well as any Māori entity that wish to be involved) is recognised as an important way to addressing how the Project avoids, remedies and mitigates potential effects on cultural values.

The engagement to date has demonstrated the commitment Auckland Council Healthy Waters has to involving Te Ākitai Waiohua and Te Ahiwaru (and any Māori entity that wish to be involved) in the Project. This will continue in accordance with the proposed conditions which requires the consent holder to invite Māori entity representatives to comment on the proposed CEMP, which includes the EMP (refer to Section 6.2), Construction Traffic Management Plan (**CTMP**) (refer to Section 6.13) and Construction Noise and Vibration Management Plan (**CNVMP**) (refer Section 6.6). The proposed Landscaping Plan condition also requires that it be prepared in consultation with Māori entity representatives. The proposed conditions are provided in **Appendix B**.

The various specialist assessments including Ecology, Landscape and Natural Character, and Archaeology, as well as the draft plans supporting the application including Ecology, Planting, CEMP and ESCP recognise Te Ākitai Waiohua and Te Ahiwaru's recommendations. This includes aligning with the planting recommendations, monitoring protocols and applying for an Archaeological Authority out of precaution.

6.4 Landscape, visual, natural character and open space

A Landscape and Natural Character Effects Assessment (**LNCEA**) has been prepared for the Project and is provided in **Appendix F**. A draft planting plan, which has been prepared in collaboration with the Project Ecologist and the Project Arborist, is also provided as part of this application **Appendix K**. The intent is to finalise the planting plan prior to completion of the Project and provide this to the consent authority for certification in accordance with the proposed Landscaping Plan condition.

The LNCEA has been prepared to address the following:

General

(a) Potential adverse effects on protected trees or amenity values associated with protected trees, and measures to avoid, remedy, or mitigate those effects.

Landscape and amenity

(a) Potential adverse effects on the characteristics and qualities that contribute to the area's natural character, or landscape values, or both.

(b) Potential adverse landscape, visual, and amenity effects.

(c) Potential adverse effects on the use of open spaces, including on public access.

(e) Measures to avoid, remedy, or mitigate the effects described in paragraphs (a) to (f).

Adjoining land uses

(a) Potential adverse effects on the use of land on which flood resilience works are carried out and adjoining land, and measures to avoid, remedy, or mitigate those effects.

Access and transport

(a) Potential adverse effects on access to and along or around watercourses and water bodies, and measures to avoid, remedy, or mitigate those effects.

The potential adverse effects on landscape and amenity of the Project are largely due to the construction phase and permanent works along the Te Ararata Creek, and are summarised in the following sections.

6.4.1 Landscape character

Landscape character effects are anticipated from the removal of indigenous riparian vegetation along the stream, removal of established amenity trees within the reserves (including Black Bridge Reserve, Walmsley Road Reserve, and the riparian margins of Te Ararata Creek), associated construction activities and permanent changes to the banks of Te Ararata Creek.

Specifically, the removal of standalone trees will be an apparent change in the open space. There will be reduced canopy coverage and vertical vegetated mass within the reserve, reducing the sense of enclosure within the park and the separation between the reserve and the surrounding arterial roads. In addition, the removal of riparian vegetation either side of the stream will also have a localised impact on the amenity and natural qualities of the stream. The loss of existing vegetation and trees are, however, temporary effects that can be mitigated through replanting as proposed in the draft planting plan in **Appendix K**. Replanting is proposed to include 45L trees (14 trees if the existing Pōhutukawa can be relocated and 17 trees if it is unsuccessful) as recommended in the Arboricultural Assessment of Effects (refer to Section 6.7 and **Appendix E**). The trees will be planted at the Project site, with final locations to be determined in accordance with the proposed Landscaping Plan condition (see **Appendix B**).

The works along the stream banks (including the installation of rock armouring and regrading) and relocation of the Watercare pipe bridge abutments will alter the structure and form of the existing banks. The wider area of the banks will be regraded but will be replanted to have a natural appearance.

Overall, the construction activities within the Te Ararata Creek will result in **Low** adverse effects. Immediately after the construction phase has finished and all construction plant and temporary bridge structures have been removed, adverse landscape effects are assessed as **Neutral.** It is noted however that the anticipated replanting will be an improvement of the vegetation removed as part of the works. As a result, after approximately 3 years when mitigation planting has established there will be **Positive** effects on landscape character.

6.4.2 Visual effects

As part of the Project, new elements such as construction machinery and areas will be introduced into the environment and can change the visibility and viewing experience. It is however recognised that most of these works are temporary and are within permitted activity requirements. On this basis, visual effects are largely associated with works in and around Te Ararata Creek, removal of vegetation and trees, the installation of the temporary bailey bridge and Watercare pipe bridge works.

Overall, residential, road and pedestrian audiences (including those within/using available areas of Black Bridge Reserve) potentially affected by the works will be limited to those with short distance views of the Te Ararata Creek construction works. Many of these road and pedestrian audiences are transient and will experience views within the context of a dynamic arterial road environment. The works proposed to the existing Watercare pipe bridge (including the overall increase in width with the supporting girders) is not considered to change the overall dominance of the structure given the open nature of the support structure. While there will be temporary changes for residential audiences, they will largely be glimpsed views and/or oblique views of construction. The level of visual effects during construction are assessed to be between **very low – low**.

After implementation of the Project and with mitigation planting maturing, there will be no long term adverse visual effects on any audiences.

6.4.3 Natural Character

Natural character effects are anticipated to be localised to the construction footprint and will not extend to the wider landscape. Abiotic effects are anticipated from vegetation clearance, works along Te Ararata Creek and bridge structures. Biotic effects will be related to the temporary culverting of the stream, removal of existing vegetation and impeding aquatic fauna in the stream. Following completion of the Project and with the proposed planting (refer to **Appendix K),** it is anticipated that these effects can be mitigated to **very low – low adverse levels**.

6.4.4 Open space use

It is noted that the construction laydown areas will occupy parts of Black Bridge Reserve and Walmsley Road Reserve and works will be undertaken along Te Ararata Creek. Construction areas will be fenced off to prevent public access and maintain safety. A portion of Black Bridge Reserve, which has an existing pathway running through it (connecting between Coronation Road and Walmsley Road) will be temporarily publicly inaccessible. The loss of vegetation and trees as set out above can also change how audiences experience and view the existing open spaces.

While there may be some impacts on open space during construction, these are temporary. A temporary bailey bridge is also proposed during the closure of Walmsley Road to provide an alternative route for pedestrians and active modes between Coronation Road and Walmsley Road. The open spaces will be reinstated following completion of the Project, including the public access within Black Bridge Reserve. Planting will also be undertaken (as per **Appendix K**).

6.5 Natural Hazards

The proposed works including the new, upgraded and replacement infrastructure are located within floodplains, coastal inundation zones, overland flowpaths (as identified through Auckland Council Geomaps) and land which may be subject to instability (as outlined in Section 3 above). It is noted that the replacement Walmsley Road bridge and relocating/realignment of existing services which are located within the road reserve, can be undertaken within these hazard areas as a permitted activity (refer to Section 5.1 above).

To support the application and inform the design parameters, a Flood Hazard and Risk Assessment has been undertaken for the Project to consider flood hazard, coastal inundation and overland flow paths as provided in **Appendix M**.

In addition, a Geotechnical and Groundwater Assessment Report has also been prepared for the Project which considers risks associated with land which may be subject to instability and is provided in **Appendix I**.

Both technical reports and the assessment below have been prepared to address the following:

Natural hazards

(a) The risks from natural hazards to people, property, infrastructure, and the environment, and measures to avoid or mitigate those risks.

(b) The risk of flood resilience works increasing risks from existing natural hazards or creating new natural hazards, and measures to avoid or mitigate that risk.

Coastal environment (Note: relevant for the Flood Hazard and Risk Assessment only)

(a) The methods to be used to avoid, remedy, or mitigate the effects of the flood resilience works on any identified coastal hazard.

Adjoining land uses

(a) Potential adverse effects on the use of land on which flood resilience works are carried out and adjoining land, and measures to avoid, remedy, or mitigate those effects.

6.5.1 Flood hazard, coastal inundation and overland flow paths

Whilst the overall purpose of the works is to address flood risk by reducing blockages, the permanent wider channel works also significantly increases conveyance potential. Modelling undertaken for the permanent structures and widened channel indicates small changes in floodplain and flood levels. There is approximately 100mm – 200mm reduction in water level upstream of Walmsley Road bridge and 20 – 30mm increase downstream. The reduction in water level upstream reduces the flooding potential and is a positive outcome of increasing the width of the channel. Notwithstanding that there will be a small increase downstream, the floodplain lies within a well-defined floodplain located in public property (largely within Black Bridge Reserve and Walmsley Road Reserve) and this small increase does not alter the flood risk profile to either the SH20 bridge or the Coronation Road offramp bridge. On this basis there are no identified downstream flood effects, and the downstream risk remains the same.

In relation to risks associated with the coastal inundation area, the Walmsley Road bridge (in either its current or proposed replacement form) does not provide an impediment to coastal inundation. The underside of the bridge (approximately 4.9mRL) is situated approximately 2.9m above Mean High Water Springs (**MHWS**) and approximately 2.2m above the 1% AEP extreme sea level.

The Flood Hazard and Risk Assessment also concludes no changes to risk as a result of the Watercare pipe bridge works and temporary bailey bridge structure. In relation to risks associated with the coastal inundation area, the underside of the temporary bailey bridge (approximately 4.4mRL) is situated approximately 2.4m above MHWS and approximately 1.7m above the 1% AEP extreme sea level. The Watercare pipe bridge (approximately 4.57-4.73mRL) is situated approximately 2.6m above MHWS and approximately 1.8m above the 1% AEP extreme sea level. Therefore, these structures are all located above the coastal inundation levels which is up to 2.73mRL. The underside of the temporary bailey bridge and Watercare pipe bridge also mean they are located above the post-development 1% AEP flood level of approximately 3.74mRL.

In addition, while the works are shown to overlap with existing overlap with existing overland flowpaths (in Auckland Council Geomaps), the planned works do not involve changes to the overland flowpaths. As such, there are no changes to the risks associated with the overland flowpaths.

Overall, as there are no anticipated increases in risk as a result of the Project, and no additional measures to avoid or mitigate risks are considered necessary.

6.5.2 Land subject to instability

The existing banks of Te Ararata Creek are underlain by Holocene to Pleistocene Takaanini Formation, with slopes of approximately 2.4H:1V or steeper in the proximity to the existing culvert structure. With these characteristics, the stream banks are considered to be 'land that may be subject to instability' as defined by the AUP:OP. The proposed infrastructure works including the temporary bailey bridge, permanent bridge and stream recontouring are located within this potential hazard area.

A quantitative slope stability assessment was undertaken to assess the effects of the works on this land (and is set out in **Appendix I**). Based on the analysis and site observations, it is considered that the existing land meets the target factors of safety. Furthermore, it was assessed that:

- The new / upgraded foundations for the Watercare asset will improve the slope stability;
- The temporary bailey bridge can be designed to meet appropriate stability requirements. The detailed design will consider slope stability, geometry and foundation interaction. As such, no adverse effects in relation to instability are expected while the structure is in place temporarily and after it is demolished; and
- Excavations will be undertaken to include normal measures such as retention, benching or battering to mitigate the risk of instability during temporary excavation.

It is also noted that the final works include retaining walls, rock armouring, battered slopes and piling which will also contribute to long-term stability of the works and structures.

6.6 Construction noise and vibration

A Construction Noise and Vibration Assessment (**CNVA**) has been prepared by Tonkin & Taylor Ltd to assess the potential construction noise and vibration effects of the proposal and is provided in **Appendix U.** A draft Construction Noise and Vibration Management Plan (**CNVMP**) prepared by Tonkin & Taylor Ltd is also provided as part of this application in **Appendix V**. The intent is to finalise the CNVMP prior to construction and to provide this to the consent authority for certification as part of a CEMP.

The CNVA, draft CNVMP and assessment below have been prepared to address the following matters:

Landscape and Amenity

(c) Construction noise, vibration, odour, and dust generation, including having regard to the sensitivity of the receiving environment..

(d) Potential adverse effects of the hours of operation of flood resilience works.

(f) Potential adverse effects on public health and safety during flood resilience works.

(g) Measures to avoid, remedy, or mitigate the effects described in paragraphs (a) to (f).

Heritage and archaeology

(a) Potential adverse effects on identified heritage values, and measures to avoid, remedy, or mitigate those effects.

Adjoining land uses

(a) Potential adverse effects on the use of land on which flood resilience works are carried out and adjoining land, and measures to avoid, remedy, or mitigate those effects.

The potential adverse effects of the Project are largely due to the construction phase, with the nosiest and/or most disruptive works likely to be associated with piling, rock breaking and works outside of standard hours. It is noted that most of the noisiest work will be undertaken within the road reserve between 7am – 10pm and

can be undertaken as Permitted activity under the AUP subject to submission of a CNVMP. Works for the Project are still, however, proposed outside of the road reserve including Black Bridge Reserve and along the Te Ararata Creek stream banks, where non-compliances with AUP:OP standards may be generated in the worst-case scenarios assessed.

The potential adverse effects are summarised in the following sections and include those within the road reserve as these still need to be understood and managed by the CNVMP:

6.6.1 Noise effects

For bridge piling works (within road reserve), eight residential receivers (4, 6, 8, 14, 15, 18 Walmsley Road, 1B Miller Road and 2 McKenzie Road) are predicted to exceed the daytime construction noise limit of 70 dB LAeq. A maximum noise level of 80 dB LAeq is predicted at 4 Walmsley Road with no mitigation in place. The maximum noise levels at façades are not expected to be continuous (it will be intermittent in nature and temporary) and are only likely to occur as a worst-case scenario when piling is occurring at the closest location to receivers. Due to the reasonably short duration and intermittent nature of the piling activities, it is considered that noise effects can be effectively managed via the CNVMP. Noise levels at all other receivers are predicted to comply with the AUP limit.

Predicted noise levels also indicate culvert demolition / rock breaking activities (some of which may be outside the road reserve) may exceed the daytime construction noise limit at 19 receivers (no mitigation in place) with a maximum noise level of 84 dB LAeq at 4 Walmsley Road. Due to the local terrain of the works, partial screening is likely achievable and maximum noise levels can be reduced to 76 - 79 dB LAeq with seven receivers exceeding the daytime noise limit. An external noise level of 76 - 79 dB LAeq is not considered uncommon for rock breaking and demolition works for large construction projects and can be effectively managed on site.

Predicted noise levels for other activities assessed such as bridge construction works, are lower than for the worst case scenarios of bridge piling and culvert demolition, but may still exceed the 70 dB LAeq daytime limit at up to two receivers (4 and 8 Walmsley Road).

With mitigation (including adopting the best practicable option) and consultation as set out the proposed draft CNVMP, the overall noise effects can be appropriately managed and reduced so that construction noise effects are acceptable for receivers. The draft CNVMP includes the following key measures:

- General noise mitigation measures such selection and location of equipment, utilising noise barriers and/or enclosures where appropriate and liaison with neighbours around work hours.
- Communication and consultation measures
- Adoption of specific mitigation / alternative measures where practicable if barriers are not feasible during the rock breaking activities including using a shroud around the breaker attachment, a three-sided screen or use of smaller machine and attachments.
- Measures for working outside of standard construction hours such as noise (and vibration) monitoring, increasing the frequency of communication with stakeholders or temporary relocation if unreasonable noise (and vibration) cannot be avoided.

6.6.2 Vibration effects

With the exception of eight properties, construction vibration at the majority of receivers is not likely to exceed the relevant DIN 4150-3:2016 limits for cosmetic building damage.

Six properties (4, 6, 8, 14, 15 Walmsley Road and 2 McKenzie Road) may experience vibration levels above the 5 mm/s during the use of the hammer pile and two listed Heritage building (164 Coronation Road) are predicted to experience vibration over the 3 mm/s threshold for sensitive structures. To manage any potential effects, it is proposed to undertake building condition surveys in accordance with the draft CNVMP.

97 properties within 190 m of hammer pile works may experience vibration levels over the 2 mm/s amenity limit but under the 5 mm/s DIN threshold. Notification of these properties can be undertaken prior to construction works and can be managed via the CNVMP.

The draft CNVMP includes the following:

- Managing times of activities to avoid night works and other sensitive times where practicable.
- Liaison and consultation with neighbours.
- Equipment selection and methodology to minimise vibration.
- Monitoring of vibration during activities predicted to exceed the 5mm/s PPV and at the heritage buildings.
- Building condition surveys and associated protocols where vibration levels are predicted to exceed the applicable DIN 4150-3:2016 limit (5mm/s for residential, 3mm/s for heritage).

6.7 Arboriculture

An Arboricultural Assessment of Effects Report is provided in **Appendix E**. It has been prepared to address the following matters:

> *General*
>
> *(d) Potential adverse effects on protected trees or amenity values associated with protected trees, and measures to avoid, remedy, or mitigate those effects.*

The potential adverse effects of the Project are largely due to the construction phase. The removal of trees results in vegetation loss and potential loss of arboricultural value. Alteration (pruning) of trees and works within the protected root zone of trees can also lead to unexpected damage to trees that could impede their health and stability, and may result in the death of tree.

Overall, the Project is anticipated to require removal of up to 27 individual trees and 571m^2 of terrestrial native riparian vegetation yielding a 1,639m^2 canopy cover deficit by 2050. A Pōhutukawa tree (Tree 15) is anticipated to be relocated within Black Bridge Reserve if practicable, however, if this becomes unachievable this will result in the loss of an additional tree with an additional 70m^2 canopy cover loss (total trees removed then becomes 28). The stream recontouring works may also result in the disturbance of the root system of Tree 51 that will likely yield some short-term stress, but is anticipated to recover.

To manage the potential arboricultural effects from the Project, activities that may affect vegetation will be undertaken under the supervision of suitably qualified and experienced arborist. The works are proposed to be undertaken following a tree protection methodology and relocation methodology (for the Pōhutukawa) as set out respectively in Appendix A and Appendix C of the Arboricultural Assessment of Effects. A final tree protection methodology and relocation methodology (if the Pōhutukawa can be relocated) will be prepared in accordance with the Arboriculture and Landscaping conditions in **Appendix B**.

Vegetation removal will also be undertaken in accordance with the VMP as outlined in Section 6.2 above. Effects from the loss of protected trees can be mitigated through replanting requirements as indicated on the draft planting plan (refer to **Appendix K**). As noted on the draft planting plan, replanting is proposed to include 45L trees (14 trees if the existing Pōhutukawa can be relocated and 17 trees if it is unsuccessful). The trees will be planted at the Project site with final locations to be determined in accordance with the proposed Landscaping Plan and Arboricultural conditions and through agreement with Auckland Council Urban Tree arborist.

6.8 Groundwater and settlement

An assessment of potential groundwater effects is included in the Geotechnical and Groundwater Assessment Report provided in **Appendix I.** The Geotechnical and Groundwater Assessment Report and assessment below address the following matters:

> *General*
>
> *(e) Potential adverse effects on aquifer availability, surface water flows…neighbouring bores, and ground settlement, and measures to avoid, remedy, or mitigate those effects.*
>
> *Adjoining land uses*
>
> *(c) Potential adverse effects on the use of land on which flood resilience works are carried out and adjoining land, and measures to avoid, remedy, or mitigate those effects.*
>
> *(d) Potential adverse effects on infrastructure assets and facilities (including those of network utility operators), and measures to avoid, remedy, or mitigate those effects.*

The potential adverse effects of the Project are largely due to the construction phase. Temporary dewatering may potentially be required over 30 days associated with separate excavations for the Walmsley Road bridge abutment pile caps (on either side of the Te Ararata Creek) and recontouring of the Te Ararata Creek to achieve the final stream profile. This is based on adopting an existing assumed groundwater level for assessment of 3mbgl.

The Geotechnical and Groundwater Assessment Report has concluded that in relation to groundwater and settlement effects, any potential effects on nearby structures are negligible. This is based on the construction methodology proposed, the nature of the underlying geology and the distance from any nearby structures. As no adverse effects are identified, no monitoring (including a groundwater and settlement monitoring and contingency plan) is considered necessary during or after construction. Once construction works are completed, no ongoing groundwater or settlement effects are anticipated. Notwithstanding this, it is noted that building surveys are proposed related to potential vibration-related effects (refer to Section 6.6). These are scheduled for 4, 6, 8, 14 and 15 Walmsley Road, 2 McKenzie Road and 164 Coronation Road. These surveys can also provide confirmation that no adverse effects have occurred.

In addition, the groundwater drawdown influence zone assessed in the Geotechnical and Groundwater Assessment Report is predominantly within open space zoning and in public ownership. There are no known consented bores or water takes on this public land following review of the relevant property files (refer to Section 3.13 above). The works and immediate surroundings are also not within any Wetland Management Area Overlays or High Use Aquifer Management Area Overlays under the AUP:OP (refer to Section 3.2 above).

Pumped water from dewatering will be appropriately managed and treated to remove any sediment prior to discharge from the site as set out in the draft erosion and sediment control plan in **Appendix Q**. Final dewatering methodology will be confirmed closer to the time of construction in accordance with the CEMP and requirements of the proposed groundwater diversion and dewatering condition.

6.9 Erosion and sedimentation

The following provides an assessment considering the following matters:

General

(f) The management of construction works to avoid, remedy, or mitigate potential adverse effects on receiving environments, including adverse effects of hazardous substances, spills, and stormwater run-off.

Freshwater

(e) The management of flood resilience works to avoid, remedy, or mitigate potential sedimentation or contamination effects on any freshwater receiving environment.

Soil, land and terrestrial ecology

(a) Potential soil erosion and other adverse effects on soil stability and the safety of surrounding land, infrastructure, buildings, and other structures, and measures to avoid, remedy, or mitigate those effects.

(b) Potential soil run-off and sedimentation, and measures to avoid, remedy, or mitigate those effects.

(e) The design and suitability of proposed erosion and sediment control measures.

(f) Potential adverse effects of land disturbance and sediment discharge on water bodies, particularly sensitive receiving environments.

(g) The proportion of the total area of the catchment that is exposed by flood resilience works.

(h) The staging of flood resilience works and the progressive stabilisation of earthworks.

Adjoining land uses

(a) Potential adverse effects on the use of land on which flood resilience works are carried out and adjoining land, and measures to avoid, remedy, or mitigate those effects.

The proposed works involves earthwork generating activities, including works within, and within the riparian margins of Te Ararata Creek. Where not appropriately managed, earthworks have the potential to cause erosion and generate sediment laden runoff being discharged to the Te Ararata Creek and wider receiving environment.

To manage the potential for discharges of sediment during construction, erosion and sediment controls will be installed in accordance with Auckland Council's Technical Publication GD05, for the duration of land disturbance activities and until the land is returned to an erosion resistant state. A draft ESCP for the project is provided in **Appendix Q**. Proposed erosion and sediment controls include:

- Runoff diversion channels and/ or bunds to prevent clean surface water and stormwater from the surrounding area entering the work site (clean water diversion), or to divert sediment-laden runoff to an appropriate sediment control device.
- Staged construction of works.
- Stabilisation of exposed areas.
- Stabilised construction access.
- Use of secondary treatment devices and chemical flocculation including decanting earth bunds (DEBs), settling tanks and chambers, silt busters and turkey's nest.
- Silt fences and super silt fences along the perimeter of the work area where 'dirty water' run-off from the work area will discharge.
- Undertaking earthworks to minimise the accumulation/ponding of surface water and managing any dewatering of such water.
- Dust control measures.

- Monitoring and maintenance requirements.

The appointed Contractor will be responsible for preparing a site-specific, or final, ESCP (**SSESCP**) which will detail design specifications of all erosion and sediment control devices aligned with the finalised design and Contractor's earthworks methodology.

In summary, appropriate mitigation and management measures will be put in place in accordance with GD05 and the final ESCP, such that any potential adverse effects can be managed appropriately.

6.10 Construction effects

The following provides an assessment considering the following matters:

> *Landscape and amenity*
>
> *(c) Construction noise, vibration, odour, and dust generation, including having regard to the sensitivity of the receiving environment.*
>
> *(f) Potential adverse effects on public health and safety during flood resilience works.*
>
> *(g) Measures to avoid, remedy, or mitigate the effects described in paragraphs (a) to (f).*

The Project involves construction activities that will use a range of methodologies and equipment as set out in the Indicative Construction Methodology in Section 4.5 above. The works are proposed to be undertaken following best practice and in accordance with a finalised CEMP. A draft CEMP is provided in **Appendix N** setting out the proposed protocols, responsibilities and additional management plans required to manage and mitigate potential effects as far as practicable and in accordance with best practice. The various construction management plans identified throughout this report, including CNVMP, EMP and ESCP, form part of the CEMP.

6.11 Archaeology

An Archaeological Assessment for the Project is provided in **Appendix J**. The Archaeological Assessment has been prepared to address the following matters:

> *Heritage and archaeology*
>
> *(a) Potential adverse effects on identified heritage values, and measures to avoid, remedy, or mitigate those effects.*
>
> *(b) Accidental discovery protocols to reduce risk to unidentified archaeological sites.*

The assessment concluded that there are no archaeological sites identified within, or close to, the construction area of the Project. As such, the area has no current identified archaeological value and as such there is limited potential for previously unrecorded in-situ archaeological sites to be exposed during construction. The most likely (though limited potential) remains to be encountered are shell midden deposits associated with pre-1900 Māori settlement and use of the Te Ararata Creek and remains of the pre-1900 bridge crossing. In the event that archaeological remains are encountered, the provisions of the Heritage NZ Pouhere Taonga Act 2014 and the AUP: OP Accidental Discovery Rule will be complied with. A discovery of sensitive material condition is also proposed in **Appendix B**. Notwithstanding that there is a low likelihood of accidental discovery, out of an abundance of caution an Archaeological Authority is being sought under the Heritage NZ Pouhere Taonga Act 2014.

6.12 Contaminated land

A PSI has been prepared for the Project and is supplied in **Appendix H.** The PSI has been prepared to address the following matters:

Contaminated land

(a) Potential adverse effects on human health and the environment from disturbance or use of contaminated soil.

(b) Measures to avoid, remedy, or mitigate the effects described in paragraph (a), including—

(i) remediation or management methods proposed to reduce risk posed by contaminants; and

(ii) timing of remediation; and

(iii) standard of remediation on completion of flood resilience works.

The PSI confirms that the works will not be undertaken on land with elevated levels of contaminants and/or where a HAIL activity has been undertaken. As such, there are no contamination-related effects or risks associated with undertaking the Project.

6.13 Transport

An ITA has been prepared for the Project and in supplied in **Appendix G**. A draft CTMP and draft TTM drawings that correspond with site-specific mitigation measures in the CTMP are also provided in **Appendix O** and **Appendix P** respectively. The intent is to finalise the CTMP prior to construction and to provide this to the consent authority for certification with the CEMP. The CTMP will also be provided to Auckland Transport as part of the Corridor Access Request (**CAR**) process. The ITA, draft CTMP, draft TTM drawings and assessment below has been prepared to address the following matters:

General

(a) The timing and duration of flood resilience works.

Landscape and amenity

(d) Potential adverse effects of the hours of operation of flood resilience works.

(e) Potential adverse effects on the use of open spaces, including on public access.

(f) Potential adverse effects on public health and safety during flood resilience works.

(g) Measures to avoid, remedy, or mitigate the effects described in paragraphs (a) to (f).

Access and transport

(b) Potential adverse effects on the safe and efficient operation of the transport network, and measures to avoid, remedy, or mitigate those effects.

Adjoining land uses

(e) Potential adverse effects on the use of land on which flood resilience works are carried out and adjoining land, and measures to avoid, remedy, or mitigate those effects.

(f) Potential adverse effects on infrastructure assets and facilities (including those of network utility operators), and measures to avoid, remedy, or mitigate those effects.

The potential adverse effects of the Project are largely due to the construction phase, particularly the closure of Walmsley Road for approximately 7 months within the overall construction period. A temporary diversion route via a bailey bridge for pedestrian and active modes will be accommodated in proximity to the Walmsley Road bridge. The road closure however requires the temporary diversion of existing vehicular traffic (including over dimension vehicles**, HPMV,** school buses, public buses and general traffic) within the surrounding existing road network. The proposed temporary road closure has the potential to result in greater traffic congestion (especially in peak hours) and increased safety risk at particular locations along the Auckland Transport network. There is however not expected to be any adverse effects on the NZTA Waka Kotahi network with the proposed mitigation and management measures in place. Discussions are ongoing with the Auckland System Management (ASM) Team in order to manage these effects and prevent queue lengths on the SH20 off-ramp at Rimu Road from blocking back to the SH20 mainline.

It is noted that during the preparation of the ITA, engagement with various Council, Auckland Transport Subject Matter Experts (SMEs) and NZTA Waka Kotahi (ASM) was undertaken as set out in Appendix A of the ITA.

In summary, the potential adverse effects are assessed to the include the following:

- **Temporary significant adverse impact** on the proposed signed diversion route using Mahunga Drive and Rimu Road from increased traffic flows, increased safety risks and congestion. A particular area of concern is the area along Mahunga Drive and Rimu Road where it intersects with the State Highway 20 off and on-ramps as there is existing crash history. Mitigation is not expected to reduce the traffic effects assessment but can help to address increased safety risks. Noting that there is already a large number of crashes that have occurred on the route, road safety mitigation such as temporary traffic signals and safe hit sticks could address existing crash problems and could offset the increased exposure and likelihood crash risk on the route resulting from additional diversion traffic. While there is still an overall significant adverse impact with the potential capacity issues on the Auckland Transport network, from a road safety perspective, mitigation is expected to **reduce the effects to a temporary adverse impact**. It should be noted that the impact is temporary and the calculated diverted traffic flow is a maximum, worst case traffic flow since it has been assumed that all the surveyed existing traffic will use the diversion route. In reality, depending on the end destination and trip purpose, drivers may reroute to a wider alternative route choice.
- **Temporary significant adverse impact** on the proposed signed diversion route using Bader Drive (north of Elmdon Street), Elmdon Street and Hall Avenue from increased traffic flows, congestion and increased safety risks and travel times. Mitigation is not expected to reduce the traffic effects assessment but can help to address increased safety risks. While the increase in traffic could have a significant impact on the safety risk in terms of increased exposure and likelihood on this route, it is considered that this could be offset by the significant reduction in road safety risk on Walmsley Road (and the roads currently used by drivers to access Walmsley Road) with Walmsley Road closed. Road safety mitigation such as traffic calming, reduced speed limits and parking restrictions could also offset the increased exposure and likelihood of crash risk on the route resulting from the additional diversion traffic. While the overall impact is assessed as significant adverse, from a road safety perspective, mitigation is expected to **reduce the effects to a temporary adverse impact.** It should be noted that the impact is temporary and the calculated diverted traffic flow is a maximum, worst case traffic flow since it has been assumed that all the existing surveyed traffic will use the diversion route. In reality, depending on the end destination and trip purpose, drivers may reroute to a wider alternative route choice.
- **Temporary significant adverse impact** on buses and school buses on Walmsley Road due to increased travel distance and changes in routing. Mitigation is expected to **reduce the effects assessment to a temporary adverse impact**.
- **Temporary adverse impact** on 2 and 4 Walmsley Road residents as there will be temporary increases in journey time to/from their properties. Mitigation is not expected to reduce the traffic effects assessment.

- **Temporary adverse impact** for access for Walmsley Road residents east of the bridge and for emergency vehicle access as there will be temporary increases in journey time to/from their properties. Mitigation is not expected to reduce the traffic effects assessment.
- **Negligible impact** on the traffic capacity at the Miller Road / McKenzie Road / Coronation Road and the Coronation Road / SH20 on and off-ramps intersections as the SIDRA results indicate that with the Walmsley Road closure, both intersections work well within capacity with minimal queues and delays.
- **Negligible impact** on pedestrians, cyclists, on street parking and OD and HPMV detour routes on Walmsley Road as there are alternative acceptable diversion routes.
- **Negligible impact** on the proposed signed diversion route using Bader Drive (south of Elmdon Street), Robertson Road, SH20A on ramp at Kirkbride Road and SH20A off ramp Bader Drive.

Post construction, the upgraded replacement Walmsley Road bridge is considered to have a **significant positive impact.** As set out in Section 4.4.1 the new bridge has been designed to accommodate the future traffic capacity anticipated by Auckland Transport for Walmsley Road and includes improved facilities for walking and cyclists along the bridge.

Overall, the assessment identifies some potential significant adverse effects from the road closure. The effects are however temporary, and some effects can be managed and mitigated over the approximately 7-month Walmsley Road closure period either through standard approval processes / practices or proposed conditions. Several mitigation measures to address safety, bus routing and traffic capacity effects have been identified and are included within the draft CTMP. This includes the following:

- Ongoing communications through the Project Engagement Lead with residents, schools, churches and businesses to rapidly address any traffic issues should they arise.
- Liaison with Fire and Emergency New Zealand, NZ Police, St Johns, Auckland Transport (and the relevant teams within Auckland Transport such as the Over dimension), Auckland Transport Operation Centre (ATOC) and Auckland System Management (ASM) as required.
- Clear signing of diversion routes.
- Measures to ensure the safety of pedestrians when construction traffic needs to enter the construction site and needs to cross a footpath such as warning signs, provision of traffic marshals at site entrances and construction driver education programmes.
- In relation to bus route impacts – identification of final diversion routes and associated infrastructure (and any supporting Traffic Resolutions), communications (e.g., posters and social media to advise of route changes) and any other mechanisms to help maintain bus service reliability (e.g., supporting financial contributions towards operation costs including extra kilometres, driver's hours and potentially extra busses).
- A Pavement Condition Assessment (PCA) on the diversion routes.
- In relation to Mahunga Drive and Rimu Road – introduction of specific TTM measures including traffic signal control at the Rimu Road/SH20 on ramp intersection and safe hit poles on the centre line to increase conspicuity of the bend at Mahunga Drive / Rimu Road (east of the SH20 intersection), working with ATOC and ASM to review and optimise traffic signal timings at intersections such as the Rimu Road/SH20 on and off-ramp.
- In relation to Bader Drive (north of Elmdon Street), Elmdon Street and Hall Avenue –Work with Auckland Transport to introduce temporary reduced 30km/h speed limits and introduce specific TTM measures including traffic calming, change priorities of the Walmsley Road/ Hall Avenue intersection, provide either a roundabout or traffic signal control of the Bader Drive / Elmdon Street priority intersection and No Stopping At All Times parking restrictions on Hall Avenue and the Elmdon Street / Hall Avenue bend.
- Monitoring and fortnightly reporting of traffic conditions pre and during closure of Walmsley Road. Outcomes from fortnightly reporting to be shared with the stakeholder advisory group, Auckland Transport and can also inform further changes the CTMP including additional mitigation in consultation with Auckland Transport.

The full suite of recommendations including site specific measures are outlined in the ITA and draft CTMP.

The potential adverse effects from the road closure should be considered in light of the approximately 7-month duration, the need for the Project to deliver and implement critical flood resilience works in the catchment at pace (to align with government funding requirements and reduce the risks in case of another high rainfall event), and the need to use resources efficiently.

6.14 Network utilities / infrastructure

This section addresses the following matters:

> ***Adjoining land uses***
>
> *(b) Potential adverse effects on infrastructure assets and facilities (including those of network utility operators), and measures to avoid, remedy, or mitigate those effects.*

The Project involves works to existing infrastructure assets and facilities. If works are not appropriately managed or designed there is potential to damage these assets or result in poor performing infrastructure which can have subsequent impacts on the wider network as well as safety and public health risks.

The Project primarily involves two key existing infrastructure assets being the existing Walmsley Road bridge (and adjoining road tie ins) and the Watercare pipe bridge. The concept for the proposed replacement of Walmsley Road bridge has been designed in accordance with feedback from Auckland Transport Subject Matter Experts (SMEs). Engagement has been ongoing with Auckland Transport. The final design will also be subject to the necessary AT approvals (alongside and outside the resource consent process). Evidence that Auckland Transport has consented to carrying out this activity is provided in **Appendix L.**

Similarly, works undertaken to the existing Watercare asset will be undertaken according to the requirements of Watercare as owner including any works over approvals. Engagement has been ongoing with Watercare. Best practice construction methodology will also be used so that the existing pipeline can continue to operate and will be unaffected during the strengthening works. Evidence that Watercare has consented to carrying out this activity is provided in **Appendix L**.

There are various other existing services along or in the immediate vicinity of the proposed works. This includes water, wastewater, gas, communications and power services as shown in **Appendix A** and outlined in Section 3.3 above. Stormwater infrastructure is also present but is under the ownership of Auckland Council. During the construction process, services will be identified and subsequently protected and/or realigned to minimise risk of damage. Services may also be permanently realigned as part of the final design. These are considered typical minor works for infrastructure projects and will be undertaken in accordance with the service provider / asset owners' requirements. The final details will be confirmed at the time of detailed design. Watercare and Vector have provided in principle approval of carrying out the activity and the Project team have commenced engagement with Chorus and will continue to work with them. Evidence of this is supplied in **Appendix L**.

7 Proposed Mitigation and Management Measures and Consent Conditions

This section sets out the information requirements of Clause 11(2)(k), (l) and (m) which requires:

(2) Instead of complying with section 88(2)(b) of the RMA, an application for a resource consent for flood resilience works must include the following information:

(k) proposals to avoid, remedy, or mitigate potential adverse effects identified by the assessment described in paragraph (j):

(l) any conditions that the applicant proposes for the resource consent that are—

(i) set out in Schedule 2; or

(ii) a variation of, or additional to, a condition set out in Schedule 2:

The proposal has been developed to avoid and mitigate adverse effects where this is practicable. In addition, a range of measures are proposed for the project to avoid, remedy or mitigate the potential adverse effects identified in this AEE. Specific measures identified in Section 0 and/or the respective technical assessments (refer to Appendix package) are summarised in Table 7-1 below. The measures will be implemented prior to, and during construction, and once the permanent works are completed.

The measures in Table 7-1 are proposed to be captured in resource consent conditions. Clauses 16(2)-(4) of the AC-OiC specifies that the consent authority may impose any of the conditions set out in Schedule 2 of the AC-OiC and may amend or impose additional conditions it considered necessary for the purposes of the authority's responsibility for a matter of control.

Clauses 11(2)(l) and (m) require the Applicant to provide detail of any conditions that the applicant proposes for the resource consent that are set out in, a variation of, or additional to Schedule 2; and the reasons for any variations to, or additional conditions.

Therefore, the table in **Appendix B** outlines the conditions within Schedule 2 that are relevant to the activity and are proposed as conditions of consent. The table also outlines proposed amendments to the Schedule 2 conditions and proposed additional consent conditions to better reflect the site context, proposal, technical assessment outcomes and information available at the time of preparing this application. Amendments to the Schedule 2 conditions are identified with ~~strikethrough~~ for deletion and **<u>underline bold</u>** for additions. A clean set of proposed conditions is provided in **Appendix B**.

Table 7-1: Summary of measures to avoid, remedy or mitigate potential adverse effects

Section	Topic	Specific mechanism to Implement Measures
Section 6.2	Ecology	• EMP – FFMP – AMP – MMP – VMP • CEMP • ESCP • Landscaping Plan – Planting Plan • Rivers and wetland conditions • Arboriculture conditions

Section	Topic	Specific mechanism to Implement Measures
Section 6.3	Cultural values	• Engagement and communications conditions including Māori entity conditions, • EMP (and subplans as above) • CEMP • ESCP • Tree Protection Methodology • Archaeological Authority (outside RC process)
Section 6.4	Landscape, visual, natural character and open space	• Landscaping Plan – Planting Plan
Section 6.5	Natural hazards - Coastal inundation, flood hazard and overland flow paths	Rivers and wetland conditions
Section 6.5	Natural hazards - Land subject to instability	Not required.
Section 6.6	Construction noise and vibration	• CNVMP • CEMP • Construction noise and vibration conditions
Section 6.7	Arboriculture	• Arboriculture conditions including Tree Protection Methodology and Relocation of existing Pōhutukawa • CEMP • Landscaping Plan – Planting Plan • VMP
Section 6.9 and 6.10	Earthworks and construction activities	• CEMP • ESCP • Earthworks conditions • Groundwater diversion and dewatering conditions
Section 6.11	Archaeology	• Archaeological Authority (outside RC process) • Discovery of sensitive material condition
Section 6.12	Contaminated land	• Not required
Section 6.13	Transport	• CTMP • CEMP • Engagement and communications conditions
Section 6.14	Network utilities / infrastructure	• Engagement and communications conditions

8 Consultation and Engagement

This section sets out the information requirements of Clause 11(2)(n) – (q)(iii) of the AC-OiC which requires:

(2) Instead of complying with section 88(2)(b) of the RMA, an application for a resource consent for flood resilience works must include the following information:

> *(n) a description of any consultation undertaken in relation to the flood resilience works (including with relevant Māori entities) and the names and contact details of all persons consulted:*
>
> *(o) a list of all relevant Māori entities:*
>
> *(p) a list of the names and contact details of all persons the consent authority is required to notify under clause 14(2)(a):*
>
> *(q) if the proposed flood resilience works involve the carrying out of any activity that could affect infrastructure that is owned by a person other than the applicant,—*
>
> > *(iii) evidence that the owner of the infrastructure has consented to the carrying out of the activity:*

8.1 Overview

Auckland Council Healthy Waters commenced a comprehensive consultation and engagement process in 2023 on the wider Making Space for Water programme of work, and more specifically on the Te Ararata project from July 2024. The purpose of this engagement has been:

- To provide up-to-date information about the project and the outcomes it is aiming to achieve to those directly impacted and the wider community, and
- To provide project partners, key stakeholders, impacted parties and utility provides an opportunity to feed into the design of the project including the construction methodology so as to minimise as far as practicable any potential impacts during construction.

This section sets out the consultation and engagement undertaken to date, the various forums and groups that have been established, and the ongoing consultation and engagement that Auckland Council Healthy Waters are intending to continue to undertake throughout the development and construction of the project.

In accordance with Clause 11(2)(n) and (p) of the AC-OiC, a list of the names and contact details (where available) of all persons consulted in relation to the proposed works and those the consent authority is required to notify under Clause 14(2)(a) of the AC-OiC is provided in **Appendix W** and **Appendix X**.

8.2 Approach to Communication and engagement

Auckland Council Healthy Waters has established and are implementing a comprehensive communications and engagement plan for the Te Ararata Creek Flood Resilience project. A copy of the engagement plan is provided in **Appendix T**.

8.3 Relevant Māori entities

As required by Clause 11(2)(o) of the AC-OiC, the relevant Māori entities identified by Auckland Council are: identified in Table 8-1 below with their contact details included in **Appendix X**.

As described in Section 6.3 above, these groups were initially contacted through the Auckland Council Healthy Waters kaitiaki forum in 2023. In addition, monthly hui are held by Healthy Waters for the wider blue green network programme of work with all 19 recognised mana whenua groups in Auckland invited (record of attendance and example of presentation is provided in **Appendix Y**).

Following this engagement, Te Ākitai o Waiohua, Ngāti Tamaoho, Te Ahiwaru have indicated an interest to be involved in the project. In April 2024 a formal mana whenua kaitaiki forum was established for the project and meetings have been held weekly with those interested in the project invited to attend. The weekly time is made available to meet with mana whenua representatives should they have any questions or need updating about the project, design and progress. In addition, this time is used to identify key design meetings that they would like to attend.

Through this engagement Te Ahiwaru and Te Ākitai o Waiohua have provided CVAs for the project. Ngāti Tamaoho have confirmed they do not wish to provide a CVA. The CVAs received are summarised in Section 3.8.2 and Section 6.3. Both CVAs are confidential and are available to the consent authority on request.

A summary of the engagement with these entities is detailed in the table below.

Table 8-1: Summary of Māori entity engagement

Māori entity	Summary of engagement undertaken
Ngāi Tai ki Tāmaki	Emails and kaitiaki presentations
Ngāti Maru	Emails and kaitiaki presentations
Ngāti Tamaoho	Emails and kaitiaki presentations, one on one presentations and request to join regular design meetings.
Ngāti Tamaterā	Emails and kaitiaki presentations
Ngāti Te Ata	Emails and kaitiaki presentations
Ngāti Whanaunga	Emails and kaitiaki presentations
Ngāti Whātua Ōrākei	Emails and kaitiaki presentations
Te Ahiwaru – Waiohua	Emails and kaitiaki presentations, one on one presentations, design huis, design collaboration and feedback, site visits with specialists and establishing site monitoring and upskilling. Input into the design process and decision making (MCA options analysis). Engagement is ongoing and will continue throughout the project lifecycle. CVA is available on request and summarised in Section 3.8.2 and Section 6.3.
Te Ākitai o Waiohua	Emails and kaitiaki presentations, Site Visits, one on one presentations, design meetings and feedback into design process and decision making process. Invited to the MCA process. CVA is available on request and summarised in Section 3.8.2 and Section 6.3.
Te Kawerau ā Maki	Emails and kaitiaki presentations
Waikato - Tainui	Emails and kaitiaki presentations

8.4 Māngere-Ōtāhuhu Local Board

Auckland Council Healthy Waters and the Recovery Office have been in regular contact with the Māngere-Ōtāhuhu local board since the flooding events of early 2023. They have continued to advocate for rapid action to reduce flood risk to properties, especially for those that cannot be purchased through the Voluntary Buy-out process. The Māngere-Ōtāhuhu Local Board provided formal support for the project at its business

meeting on 19 June 2024. The local board is kept up to date on project progress via regular local board updates. The last local board meeting was held on the 6 November 2024. Full support was indicated for the project. Project updates are sent to the local board every month.

8.5 Community Working Group

A Community Working Group was established in July 2024. The group is made up of representatives of the local community from social, environmental and faith-based groups which is managed by the Project Team with assistance from the I am Mangere community group as a project partner.

The objectives of the community working group for the blue green projects are:

- To identify and select community, cultural, social and environmental outcomes whichcould be achieved, beyond the primary flood resilience of the scheme.
- To work with Auckland Council to include the identified outcomes in the design of the Blue-green Network project.
- To support the communication of the Blue-green Network project to the broader community in ways that are engaging and relevant to those groups.
- To contribute local knowledge relevant to the projects.

The group meets on a monthly basis, providing a conduit between the wider community and project team. Terms of reference for the group have been established. The first hui was held on the 13th August 2024. Subsequent hui have been held on the 3 September 2024, 10 August 2024 and 17 October 2024.

Community groups who have been invited to be part of the Community Working Group include:

- Mangere Town Centre
- I am Mangere
- Neighbourhood support
- Affirming works
- Mangere East Family Services
- 257 Times
- Te Ararata Stream
- Te Ahi Taiao
- Mangere Library
- Local board representatives
- Iwi representatives

8.6 Auckland Transport

Auckland Council Healthy Waters and the Project Team have been working closely with Auckland Transport in develop the design solution for the replacement of the Walmsley Road bridge for the flood resilience works. The full details of the design are provided in Section 4.4 of this report.

Auckland Transport are fully supportive of the project and have provided their approval in principle (as set out in **Appendix L**). Auckland Council Healthy Waters and the Project Team will continue to work with Auckland Transport to obtain the final engineering approvals for the proposed works.

Auckland Council Healthy Waters and the Project team has also been working closely with Auckland Transport to develop the temporary construction traffic management as a result of the full road closure of Walmsley Road bridge to facilitate construction. Auckland Council Healthy Waters will continue to work closely with Auckland Transport to develop appropriate mechanisms to manage temporary traffic effects as far as practicable during construction.

8.7 Watercare

A Watercare asset is located directly adjacent to the Walmsley Road bridge. To facilitate the widening of the existing Te Ararata Creek channel the Project Team has determined that the foundations of the existing pipe bridge are required to be moved. Watercare has provided their agreement in principle for the proposed works (see **Appendix L),** and the Project team will continue to work with Watercare to obtain the final engineering approvals for the proposed works. Two other smaller Watercare assets are located in the existing road which will require temporary realignment and permanent reinstatement. Auckland Council Healthy Waters will work with Watercare to develop detailed designs for these assets prior to construction. Watercare has agreed to this approach as set out in **Appendix L**.

8.8 Vector

Vector have several assets in the road corridor that will be impacted by the works at Walmsley Road Bridge. To facilitate widening of the bridge a gas main will need to be diverted to the downstream side of the bridge. Two electrical power cables will also be impacted. Vector require Healthy Waters to relocated the assets as part of the works. Approval in principle has been provided in **Appendix L**.

8.9 Chorus

Chorus have assets (telecommunication) within the road corridor which will require temporary realignment during construction and permanent reinstatement within the new bridge. Initial contact with Chorus has been undertaken (as shown in **Appendix L**) and the Project Team will continue to work with Chorus to obtain the appropriate engineering approvals. These will be provided to Auckland Council once they have been obtained.

8.10 New Zealand Transport Agency Waka Kotahi

Numerous meetings have been held with NZ Transport Agency Waka Kotahi to better understand potential requirements related to the potential impacts that may arise as a result of the Walmsley Road closure. This has been incorporated into the ITA and the draft CTMP. Healthy Waters will continue to work with NZ Transport Agency Waka Kotahi prior to and throughout construction so as to manage traffic to avoid impacts on the State Highway.

8.11 Schools

Several schools are located within the vicinity of the project and within the wider Mangere area. This includes:

- Mountain View School
- Favona School
- Waatea School
- Koru School
- Sir Keith Park School
- Mangere College
- One School Global Auckland Campus
- Auckland Seventh Day Adventist High School
- Te Kura Kaupapa Maori O Mangere

As part of consultation and engagement approach, Auckland Council Healthy Waters invited all schools the opportunity to meet to discuss the project and the potential changes to traffic as a result of the construction

disruption. Emails were initially sent to all schools on the 27 September 2024. Meetings have been since held with the following schools:

- Auckland Seventh Day Adventist High School
- Mangere College
- One School Global Auckland Campus
- Sir Keith Park School
- Favona School.

In general, the schools have indicated their support of the Project, and primarily want to be kept informed of the project start times. Additional meetings have been scheduled with the remaining schools and follow up sessions will be held before the end of term 4.

8.12 Adjoining residents

Auckland Council Healthy Waters commenced engagement with those property owners directly adjoining the project site.

Letters with an invitation to meet onsite along with project flyer and Community meeting invitation were hand delivered in early August 2024 (see **Appendix Y**). An initial meeting was then held on 10 August 2024 with directly adjacent property owners and occupiers to discuss the project and potential construction effects. A second meeting with potentially impacted residents was further held on Tuesday 1st October 2024.

Those who registered interest at the Community meeting were emailed an invitation, and all other potentially impacted residents had their invitations hand delivered by 24 September 2024.

A further meeting is proposed to be undertaken in mid- November with those specifically impacted residents/ adjacent residents once the resource consent is lodged.

A register of owners and occupiers of land whose boundary adjoins the land on which the flood resilience works are to be carried out is provided in **Appendix X**.

8.13 Wider community

Auckland Council Healthy Waters has undertaken a comprehensive consultation process with the wider community.

There are a high number of Kāinga Ora properties in the area and while they have their own communications and engagement team, residents also want hear directly from council about the causes and solutions to flood risk. With this in mind Auckland Council (including Recovery Office, Healthy Waters, AEM and Watercare) have collaborated with Kāinga Ora, Māngere-Ōtāhuhu Local Board and I Am Māngere to host several community meetings to inform and support the community.

A Mangere Faith & Community Leaders Hui was held on 29th July 2024 with approximately 40 faith and community leaders in the Mangere community. The Blue Green Network was one of several topics presented and discussed at the hui. (a list of invitees is provided in **Appendix W**)

A project webpage for Te Ararata was created at the end of July 2024 which provides information about the project. A project flyer drop which included an invitation to a community meeting was undertaken on 8 August 2024. In recognition of the diversity of the community within the wider area, simplified versions of the project flyers in Cook Island Māori, Māori, Samoan, Tongan, Traditional Chinese and Simplified Chinese were made available at the community meetings.

The community event was then held on the 27th August. The event provided information on

- Māngere flood recovery update
- Property categorisation update
- Causes of flooding
- What Auckland Council Healthy Waters has been doing in Māngere
- The Te Ararata Flood Resilience Project (including impacts and effects of physical works)
- Order in Council
- How community will be kept informed
- Storm Recovery Navigators

Following the community event, a follow up frequently asked questions (FAQ) flyer was developed and provided to project and community partners to share with the community in early September 2024. A copy is provided in **Appendix Y.**

8.14 Stakeholder Working Group

A stakeholder working group has been established for the project in June 2024. The group currently comprises the main utility and infrastructure providers impacted by the project being Watercare, Auckland Transport, Kaianga Ora and Auckland Council representatives. Meetings are held fortnightly with a more formal hui held on a monthly basis. The purpose of the meeting is to discuss the project, including developing the design and construction requirements for the project.

9 Conclusion

This AEE has been prepared on behalf of Auckland Council to support a resource consent for the proposed Te Ararata Walmsley Road bridge replacement works which are flood resilience works. The Project is critical in reducing blockage risk at the existing Walmsley Road bridge and contributes to a wider programme of interventions within the catchment. This report has been prepared in fulfilment of section 88 of the RMA, as modified by the AC-OiC.

An assessment of the proposal has been prepared to meet the requirements of the AC-OiC, specifically the process under Clause 11. The assessment has:

- Identified the potential adverse effects on the environment and the measures to avoid, remedy or mitigate them to be acceptable for the receiving environment. This includes proposed conditions of consent to address the effects;
- Identified the positive effects of the Project and flood resilience works; and
- Described the engagement that has been undertaken in relation to the flood resilience works.

In addition to the above, the assessment has demonstrated how the relevant matters of control under Schedule 3 of the AC-OiC have been addressed.

Taking all of the above into account, the consent authority has sufficient information to make a decision on this Controlled Activity application and it is appropriate for consent to be granted in accordance with the AC-OiC.

A

Appendix A – Indicative Construction Area and Design Drawings

B

Appendix B – Proposed Resource Consent Conditions

C

Appendix C – Record of Titles

D

Appendix D – Ecological Impact Assessment

E

Appendix E – Arboricultural Assessment of Effects

F

Appendix F – Landscape and Natural Character Effects Assessment

G

Appendix G – Integrated Transport Assessment

H

Appendix H – Preliminary Site Investigation

I

Appendix I – Geotechnical and Groundwater Assessment

J

Appendix J – Archaeological Assessment

K

Appendix K – Draft Planting Plan

L

Appendix L – Evidence of consent to carry out the flood resilience works

M

Appendix M – Flood Hazard and Risk Assessment

N

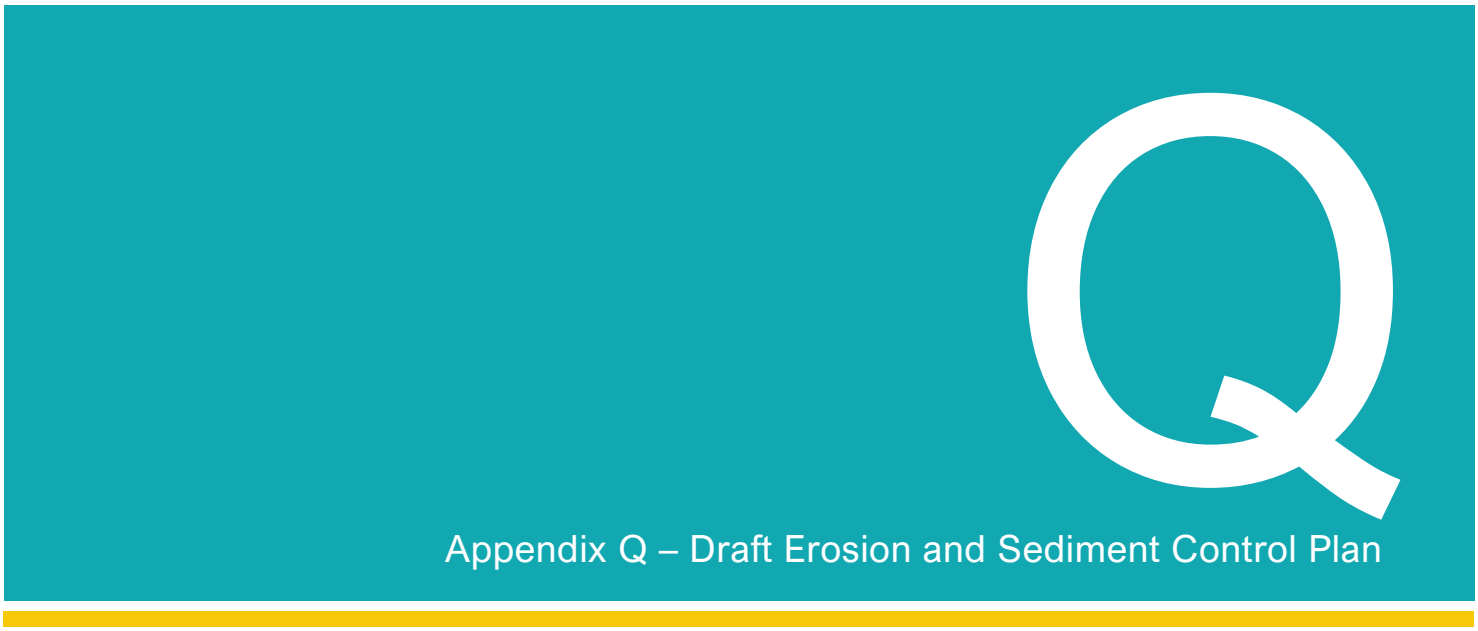
Appendix N – Draft Construction Environmental Management Plan

O

Appendix O – Draft Construction Traffic Management Plan

P

Appendix P – Draft Temporary Traffic Management Drawings


Q
Appendix Q – Draft Erosion and Sediment Control Plan

R

Appendix R – Draft Ecological Management Plan


S
Appendix S – Relevant matters of control

T

Appendix T – Engagement Plan

U

Appendix U – Construction Noise and Vibration Assessment

V

Appendix V – Draft Construction Noise and Vibration Management Plan

W

Appendix W – Clause 11(2)(n) contact details of people consulted with

Appendix X – List of the names and contact details required under Clause 14(2)(a)

Y

Appendix Y – Engagement Collateral