



Transportation Impact Assessment

Porangahau Stopbank

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1. INTRODUCTION

Civil & Transportation Design Limited (CTD) has been engaged by Hawke’s Bay Regional Council (HBRC) to undertake a Traffic Impact Assessment (TIA) in relation to the proposed stopbank in Porangahau. Traffic Concepts Limited is providing specialist advice around traffic engineering and road safety matters.

The works involve protection measures to increase flood resilience to the Porangahau community during adverse river events. The work involves the construction of approximately 1.6 km of flood protection, consisting of four stop banks and two flood retaining walls.

This TIA is required to support the consent process under *the Severe Weather Emergency Recovery (Hawke’s Bay Flood Protection Works) Order 2024*, Order in Council legislation (OIC).

2. SITE LOCATION AND DESCRIPTION

The site of the proposed works is within the Porangahau community along the Porangahau River, and construction will be adjacent several streets and land parcels. Porangahau is a small rural community with an estimated population of 150 people and is situated in the Central Hawkes Bay District. The Central Hawkes Bay District Council are the road controlling authority.

The majority of river works will be on the north side of the Porangahau River. There is also the “Urupa” stop bank which will be constructed on the south side of the river.

Figure 1 shows the Porangahau Settlement and the existing roading network.

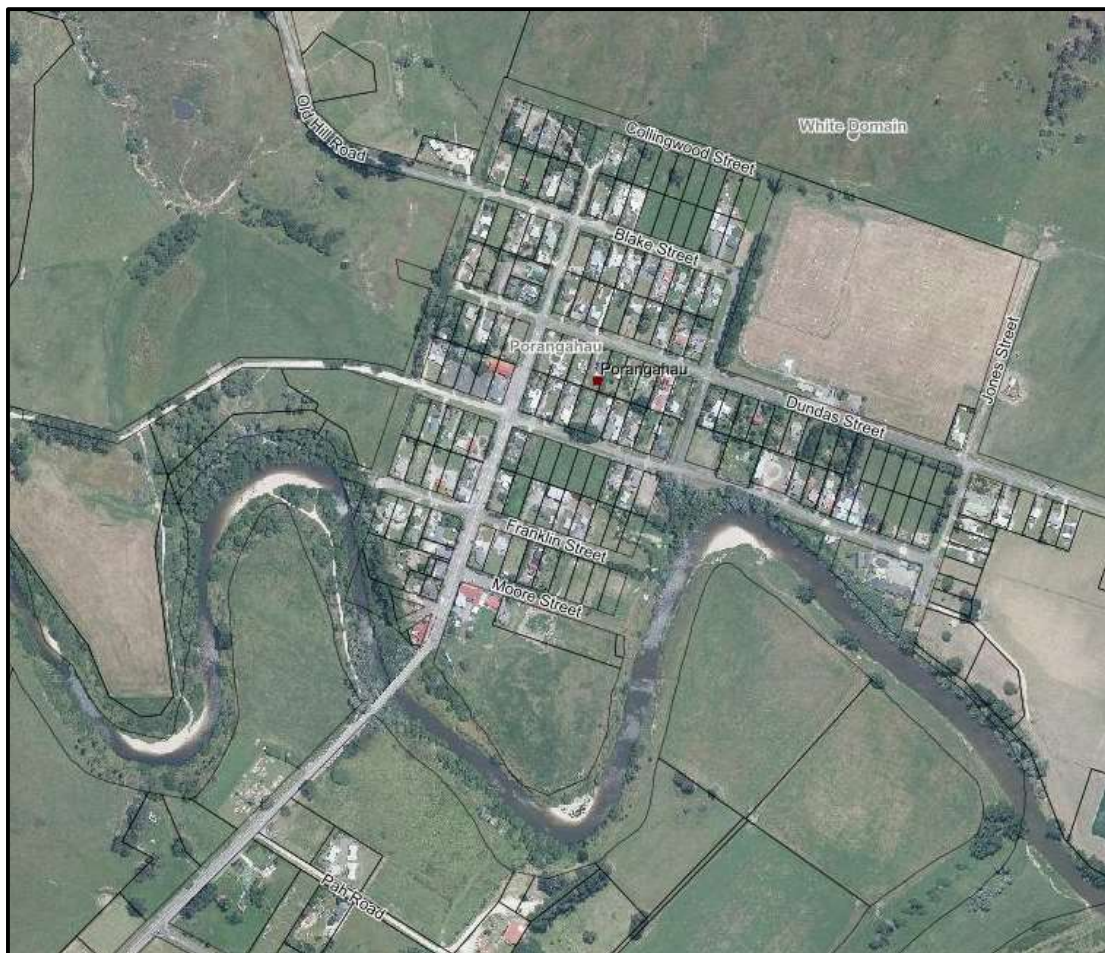


Figure 1 - Existing Roading Network (Source: Central Hawkes Bay District Council GIS)

As shown the Porangahau Settlement is located along the northern side of the river and proposed works. The street network is in a grid pattern with the roads mostly sealed within the Settlement. There is the local school which is located on the northern banks of the river. Access to the Settlement is across a bridge that goes across the Porangahau River.

Figure 2 shows the proposed flood protection works.



Figure 2 Proposed Flood Protection Works. (Source Hawkes Bay Regional Council)

As shown above, Stopbank 1 begins at the western end of Keppel Street before transitioning to Retaining Wall 1 and then heads south and following the Porangahau River until it intersects Porangahau Road. From there, Stopbank 2 continues east following the riverbank. Where the riverbank meets Keppel Street Retaining Wall 2 is proposed for approximately 190 metres before ending with Stopbank 3 further to the east.

A separate section of stopbank is planned on the south side of the Settlement to protect the local Urupa.

3. PROPOSAL

3.1 Project Overview

As mentioned earlier, the construction of several proposed stop banks and flood retaining walls are required to provide flood resilience to the Porangahau community. A section of Keppel Street is also required to be raised to meet the future flood levels where the stopbank intersects with the road.

To build the proposed stop banks approximately 60,000 m³ of fill material will be required.

The fill material will be sourced from nearby borrow areas and stockpiled in key locations close to construction sites, or placed to directly to the stopbank areas.

Figure 3 shows the proposed borrow sites.



Figure 3 - Proposed Borrow Sites

Three borrow site locations have been identified which are shown in the figure above.

We understand it is preferred that all of the fill material for the proposed stop banks is sourced from Borrow 1. This will largely depend on the suitability of the material and the quantity fill available. Alternative borrow sites are also shown and will be used if required. The area around Borrow 1 will also serve as the project office/yard where construction materials including retaining wall materials will be stored.

The movement of materials from the borrow pit to stockpile/construction areas, adjacent the stop banks and retaining walls, is planned via multiple haulage routes. These haulage routes will be via existing roads and intersections. Access across private land will be used as much as possible with landowner agreements.

Figure 4 shows the proposed haul routes for the transportation of fill and construction materials.



Figure 4 - Construction Traffic Route

The image above assumes all material will be sourced from Borrow 1, and shows the expected route that construction traffic will take to distribute the fill material and building materials to construction locations.

The construction traffic will travel from the stockpile yard (Borrow 1) via Jones Street and will be required to use the existing intersections to access the riverbank. Construction traffic will travel in the opposite direction to return to the borrow sites.

The proposed route has been carefully planned to avoid any potential effects on Porangahau School as well as other key spots within the community. This is achieved by using private land to access some of the riverbank instead of going past the school. The school has been consulted as part of the proposed works with the school requirements being imbedded in the transport routes.

4. EXISTING TRANSPORT ENVIRONMENT

This section provides information about the existing road network that could be reasonably expected to be utilised by construction traffic during the duration of the flood protection works.

Table 1 below lists the classification, the estimated average annual daily traffic (AADT), posted speed limit, and mean operating speed of each road used during construction.

Road Name	Classification	AADT (HV%)	Posted Speed Limit	Mean Operating Speed
Porangahau Road (North of Pah Rd)	Secondary Collector	510 (13%)	50 km/h	<35 km/h* (*North of Porangahau Bridge)
Abercromby Street (South of Dundas St)	Secondary Collector	460 (5%)	50 km/h	<35 km/h
Abercromby Street (North of Dundas St)	Local Road	190 (3%)	50 km/h	<35 km/h
Keppel Street (East of Abercromby St)	Access	340 (3%)	50 km/h	<30 km/h
Keppel Street (West of Abercromby St)	Access	85 (3%)	50 km/h	<45 km/h
Dundas Street	Secondary Collector	460 (5%)	50 km/h	<60 km/h
Franklin Street	Low Volume	50 (3%)	50 km/h	<30 km/h
Graham Street	Low Volume	70 (3%)	50 km/h	<35 km/h
Jones Street (North of Dundas St)	N/A	N/A	N/A	N/A

Table 1: Road Environment

As shown the roads that will be used to haul fill and construction materials have posted speed limits of 50 km/h with the operating speeds generally being lower.

A brief description of each road and environment is below.

4.1 Porangahau Road

Porangahau Road is the main road into the community. This section of Porangahau Road has 3.35m wide sealed traffic lanes and wide sealed shoulders of at least 3.0m width. Porangahau Road transitions to Abercromby Road as it crosses the Porangahau Bridge.

4.2 Abercromby Street

Porangahau Road transitions into Abercromby Street over the Porangahau bridge and provides access to several residential properties and streets.

Abercromby Street is a two-lane two-way road with approximately 3.5m wide sealed traffic lanes and a 1.5m central flush median marked the majority of the length. There are wide sealed shoulders/parking lanes on both sides of the road and a footpath is provided on the west side of the street between the bridge and Keppel Street.

Key intersections on Abercromby Street that are relevant to the project construction traffic include the intersection of Dundas Street, the intersection with Keppel Street, and the intersection with Franklin Street.

- Abercromby Street transitions into Dundas Street around a right-angle bend with road marking providing delineation for this transition with no intersection marking.
- Keppel Street intersects east and west of Abercromby Street. No intersection control is marked on Keppel Street other than continuity markings, which imply priority to Abercromby Street. There is a flush median that allows some width for right turning traffic into Keppel Street. The predominant construction traffic movement at this intersection will be turning right into Keppel Street and left out of Keppel Street. The intersection has adequate sightlines and space for heavy vehicle turning.
- The intersection with Franklin Street is similar to the intersection with Keppel Street, with Franklin Street intersecting Abercromby Street to the east and west. No intersection markings are shown on Franklin Street other than continuity markings, and Abercromby Street has implied priority. There is a flush median that allows some width for right turning traffic into Franklin Street. The intersection has adequate sightlines and space for heavy vehicle turning.

4.3 Keppel Street

Keppel Street provides access to several residential properties and the Porangahau School.

East of Abercromby street, Keppel Street is a sealed two-way two-lane road around 5.5m wide with no marked centreline and no kerb and channel. Wide grass berms are along both sides of the street.

West of Abercromby Street, Keppel Street transitions into gravel surface past the intersection is approximately five metres wide with wide grass berms.

4.4 Dundas Street

Dundas Street provides access to residential properties as well as forms a link to Beach Road and the Porangahau Beach Settlement. The road has approximately 3.0m wide lanes with a marked centreline and no kerb and channel. Wide grass berms are along both sides of the road with no footpaths.

4.5 Franklin Street

Franklin Street is a sealed no exit road with a turning head at the western end of the street. East of Abercromby Street, the road is approximately 5.0m wide with wide grass berms on each side. West of Abercromby Street, the road is approximately 5.0m wide with wide grass berms on each side.

4.6 Graham street

Graham Street provides a link between Dundas Street and Keppel Street and also provides access to two properties. The sealed width is approximately 4.0m wide. An open drain runs along the eastern side of the road, and a wide grass berm is on the western side of the road. The intersection of Dundas Street is a T-intersection marked with give way control intersection giving priority to Dundas Street. The intersection with Keppel Street is a T-intersection with no markings.

4.7 Jones Street

Jones Street (north of Dundas Street) is around 3.0m wide unsealed paper road. Jones Street joins Dundas Street with a rural vehicle crossing point. A lockable farm gate currently restricts access to the road.

5. CRASH HISTORY

A search of the NZ Transport Agency crash database was carried out for the last ten calendar years. There have been three reported crashes have been recorded in the vicinity of the project site since 2015.

Figure 5 shows the location of the recorded crashes on the network.

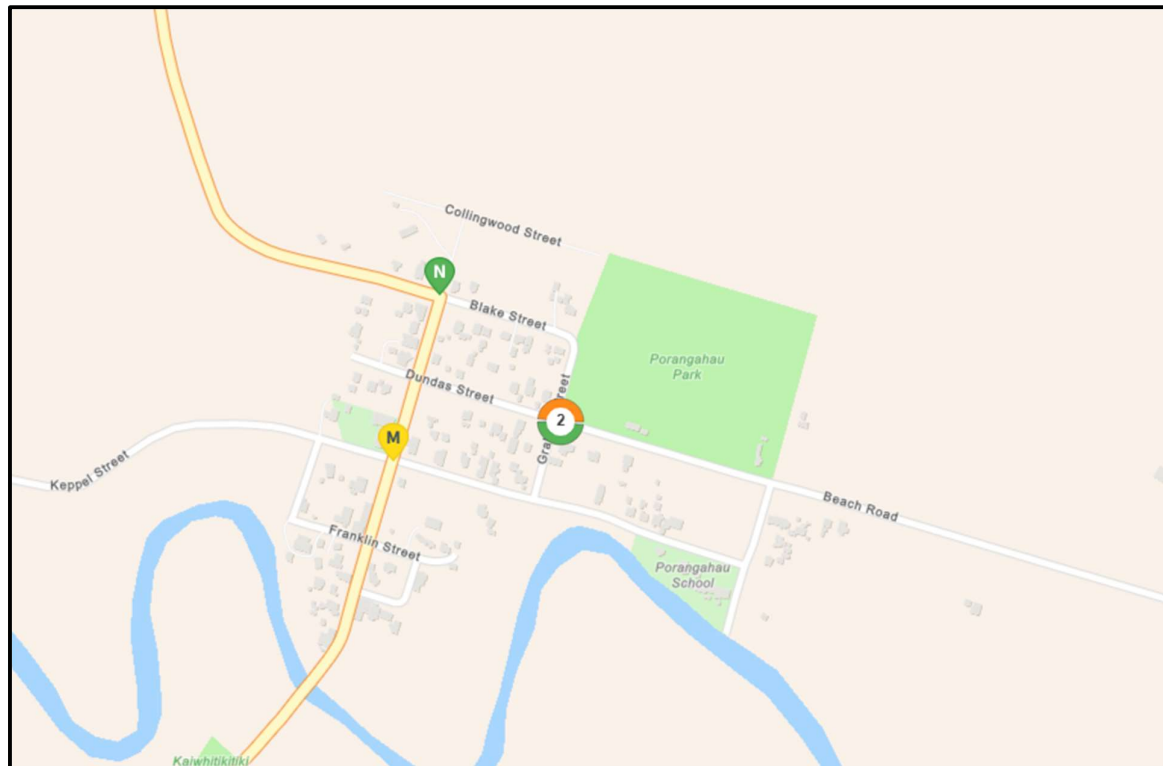


Figure 5 - Crash Locations. (Source: NZ Transport Agency)

The green tags are non-injury crashes, the yellow tag is a minor injury crash, and the orange tag is a serious crash. None of the crashes had a common cause factor. The serious crash involved a cyclist on an e-bike turning in front of a following car without checking. The minor injury crash involved a pedestrian walking on the road at 2am and an intoxicated driver.

The CAS data does not indicate a traffic safety problem within the current network that will be impacted by the construction works.

6. ASSESSMENT OF EFFECTS

This section of the report considers the proposed construction, analyses the transportation matters, and provides an assessment on the impacts.

6.1 Temporary Traffic Management

It is expected that all works and all access to site will be undertaken under Temporary Traffic Management (TTM) which will require a temporary traffic management plan (TTMP). This will be provided to the road controlling authority for approval before construction can begin.

We have assumed the traffic management plan will be prepared and implemented by a suitably qualified contractor and the TTM will be monitored for any issues within the existing roading network. Any delays or queues are required to be monitored and managed by the on-site traffic management supervisor. That said due to the nature of the work and the relatively low traffic volumes any queues or delays will be less than minor.

It is recommended that the contractor implements a temporary speed limit of 30 km/hr on all roads and haul routes during the construction period.

6.1 Construction Traffic Generation

To understand the impact of the construction traffic generated as a result of this project, the volume of trucks required to move the material has been estimated using the information below.

- Material to move = 60,000 m³ (solid in place measure)
- Assumed material bulking factor = 15 %
- $60,000 \times 1.15 = 69,000$ m³ of fill required
- Truck capacity is assumed at 12 m³ per truckload. This is an average based on a 30-tonne dump truck (15 m³) and 6x4 tipper truck (10 m³).
- Total truck loads (one-way) = $69,000 / 12 = 5,750$
- Total truck trips (round trips) = $5,750 \times 2 = 11,500$
- Total working days = 240 (estimated construction duration provided by HBRC)
- Estimated daily vehicle trips = $11,500 / 240 = 48$ trips per day
- Estimated hourly trips = $48 / 8 = 6$ trips per hour

The above calculation shows that the stopbank construction will generate an average of 48 trips per day or six trips per hour over the network. It is also noted that additional construction traffic will be generated from the construction of the proposed retaining walls, however the

construction of the retaining walls is expected to generate only a small number of movements per day.

The construction traffic will be distributed around the local road network to various construction stages and locations along the Porangahau River. While it is expected that the stopbank construction will be staged with one stopbank under construction at a time, if some sections of stopbank be undertaken concurrently the traffic generated is not likely to have an effect on the road network

The construction traffic generation calculated above shows that the traffic generated from stopbank construction is relatively low. Any effects on the existing network capacity, safety, and level of service from construction traffic generation are expected to be less than minor.

6.2 Network Effects

As outlined above, the existing road network has sufficient capacity to accommodate construction traffic without causing delays to current road users.

A review of the proposed construction route has confirmed that the existing roads are generally wide enough to support two-way construction traffic and include generous berms. Due to the narrow width, Graham Street would require widening for two-way flow or traffic control to manage flows.

Existing intersections along the construction route have sufficient sightlines for the operating speeds and are appropriately managed given existing traffic patterns.

Haul roads, and any new access points to haul roads outside of road reserve will require an all-weather metalled surface to be constructed.

Any potential impacts on the network can be effectively managed through temporary traffic controls, reduced speed limits and localised temporary widening. Any effects on the existing network are expected to be less than minor.

6.3 Porangahau School

Consultation has been undertaken with Porangahau School to understand any concerns from their perspective and ensure that any effects generated by construction are mitigated. By following the construction route diagram, most if not all construction traffic will avoid travelling within close proximity to the school.

When construction is undertaken on the river behind the school, the construction site will be fenced off with temporary fencing and a 30 k/hr speed restriction should be in place. Restrictions on hours of construction operation may also be required. Overall, any effects on the school generated by the construction traffic are expected to be less than minor.

7. CONCLUSION AND CONDITIONS

This Traffic Impact Assessment has been undertaken in accordance with the *Severe Weather Emergency recovery (Hawkes Bay Flood Protection Works) Order 2024*. The assessment has considered arrangements for site access and on-site traffic management as well as the potential effects on the safe and efficient operation of the transport network during flood protection works. There are recommended measures to avoid, remedy, or mitigate those effects on the Porangahau community.

The assessment reviewed expected traffic volumes, the capacity and layout of the local road network and intersections. The potential impacts on nearby sensitive land areas, such as Porangahau School have also been considered.

As identified in this assessment, the traffic generated during these works will be relatively low and is able to be staggered over an extended time period to reduce the peak flow loading. The existing road network has sufficient capacity to accommodate these traffic volumes safely.

Existing streets and intersections are generally wide enough to accommodate two-way construction traffic with sufficient sightlines to safely accommodate construction vehicles. Some temporary widening may be required to facilitate construction traffic, and this will be considered as part of the project establishment.

Temporary traffic management measures will include the implementation of a temporary traffic management plan, temporary speed restrictions and the use of private land to access construction sites where possible. These measures will mitigate any potential effects on road users and help maintain safe and efficient traffic operations throughout the project. Any network impacts are less than minor.

Consultation with affected landowners has been undertaken to ensure the project minimises any impact these property owners. The proposed haul routes have been carefully considered to avoid the school where feasible. Additional mitigation measures such as fencing and potential restrictions on construction hours near the school will be implemented as needed to ensure safety and minimise disruption.

Overall, the effects of construction traffic on the local road network and surrounding area are considered to be less than minor.