

Chairperson and Committee Members
OPERATIONS & FINANCE COMMITTEE

6 JULY 2017

Meeting Status: **Public**

Purpose of Report: For Decision

WAIKANAЕ EMERGENCY RAIL CROSSING

PURPOSE OF REPORT

- 1 This report seeks a recommendation from the Committee to Kāpiti Coast District Council (Council) on the funding and construction of an emergency rail access to Waikanae East.

DELEGATION

- 2 *The Operations and Finance Committee has the following delegation: "This Committee will deal with monitoring and decision-making on all broader financial management matters. Key responsibilities will include: approval of non-budgeted expenditure".*

BACKGROUND

- 3 Waikanae is divided east and west by the existing State Highway 1 (SH1) and adjacent North Island Main Trunk (NIMT) railway line. Currently the only access to eastern Waikanae is via the level crossing on Elizabeth Street, or from Akatarawa Road via Upper Hutt.
- 4 In a typical week day 24 hour period, around 80 Metlink electric suburban passenger trains pass over the single track Elizabeth Street level crossing, along with (approximately) 16 Kiwirail freight trains and 3 long distance passenger services.
- 5 Based on information provided by Kiwirail from their incidents database, since April 2012 there have been the following incidents that affected the use of the level crossing:
 - barrier arms incidents: 4
 - track defect incidents; 1
 - stationary train blocking the crossing: 0
- 6 The barrier arms and track incidents will have led to some delay in local road traffic and SH1 traffic and potentially have blocked access to Waikanae East as a result for a short period of time (10-45 minutes). Evidence for these assumptions (duration of blockage) is not recorded in the Kiwirail database.
- 7 Even though the likelihood of full blockage of the intersection by a train may be low in terms of likelihood, the potential consequence of emergency services not being able to access Waikanae East in case of an incident if there was a blockage is deemed to be high.

- 8 The Waikanae community has raised concerns about emergency vehicles possibly not being able to reach an incident in Waikanae East due to the level crossing being obstructed. Discussions between concerned community groups including the Kāpiti Emergency Services Coordinating Committee (KESCC) have taken place with the New Zealand Transport Agency (NZTA), KiwiRail, Council and Hon Steven Joyce, as previous Minister of Transport, since late 2010.
- 9 It is understood that a possible emergency crossing site south of Elizabeth Street level crossing was proposed in 2012, however this idea did not result in action as no agreement on this site was reached.
- 10 Council approached Kiwirail and NZTA again in 2016 and it was agreed that a report would be commissioned to explore the options available for an emergency rail access to Waikanae East to enable discussion between Kiwirail and Council. This report was finalised by AECOM on 21 March 2017 with input from Kiwirail and Goodman Contractors Ltd (Goodmans) and was forwarded to these parties and NZTA for their approval. The report is attached to this report as **Appendix 1**.

ISSUES AND OPTIONS

Issues

Waikanae Towncentre Underpass

- 11 In 2008, NZTA commissioned OPUS to develop a Waikanae Interchange Investigation report to table potential options to resolve congestions on SH1 in Waikanae. The options were revisited by OPUS in 2010 when the decision was made that the new SH1 Expressway would bypass Waikanae town centre. The 2010 study (SH1 Expressway-Sensitivity Tests by OPUS) was to determine if there still was a need for the project and to assess the economic efficiency of the options to build an underpass below SH1 between Te Moana Road and Elizabeth Street.
- 12 The 2010 study found that the cost estimate was in the order of \$40million. If it is assumed that the project could meet the NZTA minimum funding requirements, this would mean that NZTA could potentially fund around 50% of the project cost for an underpass and Council would have to fund the remaining \$20million from rates. If it was not able to meet NZTA funding requirements then Council would be required to fund the full \$40million. For this reason this report does not consider the underpass between Te Moana Road and Elizabeth Street further but focusses on the two options that can be considered as 'temporary' options until a permanent solution has been developed, planned and budgeted.
- 13 The Options report for an emergency access considers two options for a temporary emergency access which would be used by emergency vehicles only and not by the general public in case the Elizabeth Street crossing is blocked.

Kiwirail, NZTA and Goodmans approval

- 14 All three land owners have provided approval for construction of an emergency access as proposed in the report.
- 15 Kiwirail has emphasised that it approves an emergency access on the basis that Council will not abandon pursuing a second permanent access to Waikanae East in the future either using the Hadfield Road crossing or planning for the

construction of an underpass/bridge over 'old SH1' south of Waikanae or in Waikanae town centre.

- 16 NZTA has provided approval considering that current volumes on 'old SH1' have reduced and the highway designation will be revoked in the next 24 months.
- 17 Goodmans has been very supportive of exploring a route option across their yard as they acknowledge the importance of an emergency access to the Waikanae community. Goodmans has provided their approval conditional on Council funding the construction of a deer fence alongside their yard from Bunnings to the Waikanae River.

Option 1

Hadfield Road route

- 18 This route would be achieved by constructing an unsealed track through multiple privately owned rural lots that would connect Hadfield Road or Octavius Road with Huia Street and would make use of the existing level crossing on Hadfield Road. This option has a number of geographical challenges that would have to be overcome including varying topography and a number of water courses that bisect the proposed track alignment.
- 19 Initial consultation with property owners has indicated a strong lack of support for an emergency access over their properties.
- 20 The cost estimate for construction provided by AECOM for this option after a site visit and estimating earthworks based on topography maps is \$2,000,000. This estimate excludes the potential cost of compulsory property acquisition.
- 21 Risks identified with regard to the Hadfield option are:
 - Compulsory acquisition may be required (potentially a lengthy process)
 - On-going maintenance of track required
 - Potential for a gate on the track to be padlocked by property owner(s) during emergency.
- 22 As a long term solution a 'notional road' to connect Hadfield Road to Waikanae East is incorporated in the current District Plan and also in the Proposed District Plan. This shows Council's desire to in the future establish this connection. It has no legal status as such.

Option 2

Goodmans yard route

- 23 Establishing an emergency route through the Goodmans site would involve the construction of a new level crossing at a layover location off the side of SH1, approximately 60m north of the Waikanae River Bridge. This crossing would be protected by gates on either side of the rail corridor, and would only be for use by authorised emergency services vehicles with a verified height of 4m or less as requested by Kiwirail. The NZ Fire Service Technical Details on Crossing Requirements stipulate a 4m minimum height for safe passage of their general appliances and its proposed to use the higher type used by the Waikanae Fire Station (the higher pump rescue tender appliance) to design the crossing. After

crossing the railway line, the route would pass through the Goodmans yard to Anne Street.

- 24 The primary concern associated with the Goodmans crossing is the potential for a stationary freight train to block both Elizabeth Street and the proposed Goodmans emergency crossing. The proposed crossing is located 480m to the south of the Elizabeth Street crossing. Although freight trains passing through Waikanae are typically around 650m long and can be up to 900m long, nearly 90% of the approximately 90 trains that traverse the Elizabeth Street level crossing on a typical 24 hour weekday period are short electric multiple units, of between 40 and 160m long. Therefore the risk of a long freight train blocking both Elizabeth Street and the Goodmans crossing site simultaneously is deemed to be low.
- 25 Two cost estimates were developed for the Goodmans option:
 - 1) base schedule of cost which assumes a simple padlock gated level crossing; and
 - 2) base schedule plus additional cost for lifting the overhead lines and providing remotely controlled electronic gates.
- 26 The padlock would be a coded padlock and the code would be provided to Emergency Services and Kiwirail. Kiwirail has in reply to the report informed Council that Kiwirail does not think that remotely controlled gates would be appropriate and that they would not approve lifting the overhead lines.
- 27 Therefore the second (higher) cost estimate is no longer relevant for further consideration.
- 28 The total construction cost estimated for padlocked gate variation is \$322,000 and includes contingency, professional and design fees. There are potentially further opportunities to reduce this cost as Goodmans have indicated willingness to commissioning the fencing at a reduced rate and Kiwirail have indicated a willingness to look at reduced licensing fees and on-going maintenance costs.
- 29 The risks that were identified with regard to the Goodmans option:
 - long freight train blocking both crossings to Waikanae East
 - pedestrians and vehicles unlawfully using the crossing
 - ensuring security of Goodmans site after construction of the crossing
 - water main located where access ramp proposed
 - vertical clearance restricting usage (4m or less vehicle height – verified vehicles only)
 - maintenance of the crossing (in rail corridor KiwiRail has agreed to provide the maintenance)

CONSIDERATIONS

- 30 Although the likelihood of a situation requiring emergency vehicle response in Eastern Waikanae coinciding with a stationary train blocking Elizabeth Street is considered very low, if Council wishes to provide an alternative access to Waikanae East for emergency vehicles, then the Goodmans crossing is the preferred and recommended option for following key reasons:

- The Goodmans crossing would be located 450 m south of Waikanae compared to Hadfield road which is 5 km north. This translates to a 10 minute faster response time.
 - Discussions with KiwiRail and Goodmans indicate that agreement can be reached easily on a simple and well defined process for the use of this crossing.
 - Goodmans is in agreement with the construction of a crossing to their site. Some land owners on the Hadfield Road route are strongly opposed to construction of a track through their land and compulsory property acquisition may be necessary for this option.
 - The risks identified for this option can be mitigated through further discussion with KiwiRail and Emergency Services, the construction of a fence on the Goodmans boundary and a well-designed and informed construction process.
 - The only risk that cannot be mitigated is a freight train blocking both crossings but this risk is considered low as discussed previously.
 - The estimated Capital Cost of \$322,000 compared to \$2,000,000 for the base schedule cost for the Hadfield Road connection.
- 31 A budget of \$322,000 would have to be approved for construction of this access. This budget is not available in the current 17/18 budgets and would have to be incorporated into the Long Term Plan 2018 budget.
- 32 This means that the first opportunity to construct this access is the 2018/19 year.
- 33 A discussion will be held with NZTA as part of the 18-21 budget with regard to the question whether NZTA would consider subsidising this project through the minor works budget. Taking into account NZTA's funding requirements however it is unlikely that NZTA will consider this as the emergency access could be viewed as not resolving a road safety issue as such. As funding budgets will only be final by June 2018, Council should proceed with planning this project as not attracting any subsidy.

Legal considerations

- 34 Legal counsel will be asked to review the draft Deed of Grant when provided by Kiwirail.
- 35 A formal agreement between Council and Goodmans will be drafted to formalise Goodmans' approval of access through their yard.
- 36 A memorandum of understanding will be drafted to be signed by all parties to further formalise their approval for the construction, maintenance and use of the emergency access. Approval at this moment in time has been obtained in writing by email.

Financial considerations

- 37 There is no additional budget available for capital works in the roading budget in the 17/18 year that could be used for this project. It is proposed that the required budget is approved as part of the Long Term Plan 2018 budget to be available in the 18/19 financial year.

SIGNIFICANCE AND ENGAGEMENT

Degree of significance

38 This matter has a low level of significance under Council policy.

Consultation already undertaken

39 The Waikanae Community Board has initiated the re-start of the discussion that has now led to the options report and this report for decision.

40 Kiwirail, NZTA and Goodmans have been consulted and the Kāpiti Emergency Services Coordination Committee has been informed that the report was being prepared and is supportive of the proposal.

Engagement planning

41 It is envisaged that engagement would be done in the form of advising the community about Council's decision, and providing information to explain that decision.

Publicity

42 If Council decides to approve funding for the construction of an emergency access a media release should be developed as this project will resolve concerns that have been raised by the community and emergency services since 2010.

RECOMMENDATIONS

43 That the Council approves the construction of an emergency vehicle access off SH1 north of the Waikanae River Bridge to Waikanae East at an estimated construction cost of \$322,000 in the 18/19 financial year as set out in report IS-17-214.

Report prepared by	Approved for submission	Approved for submission
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ATTACHMENT

Appendix 1: Waikanae Rail Emergency Vehicle Access – Options feasibility report

Waikanae Rail Emergency Vehicle Access

Options Feasibility Report



Waikanae Rail Emergency Vehicle Access

Options Feasibility Report

Client: Kapiti Coast District Council

Co No.: N/A

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Quality Information

Document Waikanae Rail Emergency Vehicle Access

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			Name/Position	Signature
A	25-Jan-2017	Initial Draft		
B	17-Feb-17	Internal Review		
C	9-Mar-2017	Draft for Client Review	Simon Wood Associate Director	
D	21-Mar-2017	Final Issue after Client feedback	Simon Wood Associate Director	

Table of Contents

Executive Summary	i
1.0 Introduction	1
2.0 Background	1
3.0 Waikanae Town Centre	1
4.0 Options	2
4.1 Hadfield Road Summary	2
4.2 Goodmans Summary	4
4.2.1 Description	4
4.2.2 Rail Crossing Design Requirements	5
4.2.3 Construction	6
4.2.4 Constraints	6
4.2.5 Operation	7
4.2.6 Services	8
4.2.7 Consultation	8
4.3 Hadfield Road (Northern)	8
4.3.1 Site Description	8
4.3.2 Hadfield Zoning and Resource Management Overlays	9
4.4 Goodmans (Southern)	11
4.4.1 Site Description	11
4.4.2 Goodmans Zoning and Resource Management Overlays	13
4.5 Resource Consenting Requirements	13
4.5.1 Hadfield Road Route	13
4.5.2 Goodmans Route	14
4.6 Planning Approval Strategies	15
4.6.1 Notice of Requirement	15
4.6.2 Combined Resource Consent Application	15
4.6.3 Additional Approvals Required for Both Routes	15
4.7 Risk Management	16
4.7.1 Statutory Risk	16
4.7.2 Construction Risk	16
5.0 Summary of Options	17
6.0 Consultation	17
6.1 Hadfield Road	17
6.2 Goodmans	18
7.0 Access, Operation and Maintenance	18
7.1 Hadfield	18
7.2 Goodmans	18
8.0 Cost Estimate Summary	18
8.1 Hadfield	19
8.2 Goodmans	19
9.0 Risks	19
10.0 Conclusions	19
Appendix A	
Mackays to Peka Peka Expressway	A
Appendix B	
NZ Fire Service Technical Details on Crossing Requirements	B
Appendix C	
Operative and Proposed Plan Maps 18 and 20 and PNRP Map 21e	C
Appendix D	
Operative and Proposed Plan Maps 10A and 10B and PNRP Map 2	D
Appendix E	
Detailed Cost Estimation Breakdown	E
Appendix F	
Drawings	F

Executive Summary

This document contains a feasibility report which explores options for a construction of an emergency access route from State Highway 1 in Waikanae, to Waikanae East.

This report has been developed following request of Kapiti District Council (KDC) as presently there is only one existing vehicle crossing to access Waikanae East from State Highway 1. In the last five years, there has been one reported instance where the level crossing has been blocked by a stationary train at the Waikanae Station, and two reported instances of the access to eastern Waikanae being prevented due to a fault with the barrier arms at the crossing. These incidents have raised community concerns regarding the ease of access of vehicles to Waikanae East in the event of an emergency.

Two options have been developed which seek to address the above issue, which are referred to as Hadfield Road and Goodmans.

Hadfield Road

This route would be achieved by constructing an unsealed track through multiple privately owned rural lots that would connect Hadfield Road or Octavius Road with Huia Street and would make use of the existing level crossing on Hadfield Road. This option has a number of geographical challenges including varying topography and a number of water courses that bisect the proposed track alignment. Initial consultation with property owners has indicated a strong lack of support with a key property owner stating they were “neither willing to progress matters further and are not prepared to consider any access through our property.” Compulsory property acquisition would be the only way to proceed with this option.

Goodmans Route

Establishing an emergency route through the Goodmans site would involve the construction of a new level crossing at a layover location off the side of SH1, approximately 60 m north of the Waikanae River Bridge. This crossing would be protected by gates on either side of the rail corridor, would be only be for use by authorised emergency services vehicles up to 4 m in height and would not be open to the public. After crossing the railway line, the route would pass through the Goodmans Site to Anne Street. The construction of this new crossing would not solve the height restriction issues encountered by Goodmans at the Elizabeth Street crossing when transporting maximum load size earthmoving plant.

The primary concern associated with the Goodmans crossing is the potential for a stationary freight train to block both Elizabeth Street and the proposed Goodmans emergency crossing. Although freight trains passing through Waikanae are typically around 650m long and can be up to 900m long, nearly 90% of the approximately 90 trains that traverse the Elizabeth Street level crossing on a typical 24 hour weekday period are short electric multiple units, of between 40 and 160m long. Therefore for most of the time a train passing over Elizabeth Street will not simultaneously block the Goodmans emergency crossing site.

Routes Risks and Benefits

Route	Risks/Cons	Benefits
Hadfield Road	<ul style="list-style-type: none"> Multiple natural watercourse crossings Mixed topography Multiple landowners Uncertain property access agreements More expensive to implement Track will require ongoing maintenance Likely compulsory property acquisition 	<ul style="list-style-type: none"> Access will not be affected by a train stopped at the Elizabeth Street Crossing Level crossing is already in place
Goodmans	<ul style="list-style-type: none"> A stalled train at the Elizabeth Street Crossing may also block the proposed crossing at this location Safety concern over unauthorised use of crossing Unknown level of contamination in soil and risk of uncovering archaeological material. 	<ul style="list-style-type: none"> Cheaper to construct and operate Two landowners to approach (whom have both provided conditional approval) More accessible for emergency services coming from Paraparaumu and Waikanae

Conclusions

The Goodmans option is preferred for the following key reasons:

- Location: Goodmans crossing is located 450 m south of Waikanae compared to Hadfield road which is 5 km north. This translates to a 10 minute faster response time.
- Process of use: Discussion with KiwiRail has resulted in a simple and well defined process for the use of this crossing.
- Land owner agreement: Goodman Contractors Limited is in agreement with the construction of a crossing to their site. Some land owners on the Hadfield Road route are strongly opposed to construction of a track through their land and compulsory property acquisition may be necessary for this option
- Estimated Capital Cost: \$322,000 compared to \$2,000,000 for base schedule cost estimate excluding GST and land acquisition.

Although the likelihood of a situation requiring emergency vehicle response in Eastern Waikanae coinciding with a stationary train blocking Elizabeth Street is considered very low, if KCDC wishes to provide an alternative access to Eastern Waikanae for emergency vehicles, then the Goodmans crossing is the preferred location.

1.0 Introduction

Kapiti Coast District Council (KCDC) has engaged AECOM New Zealand Ltd (AECOM) to prepare a feasibility report assessing options for providing emergency vehicle access to eastern Waikanae in the event that access via the single level crossing on Elizabeth Street is prevented.

Two potential locations for a new emergency vehicle route have been identified by KCDC following discussions with KiwiRail. Access from north of Waikanae could be obtained through the construction of a track through farmland to connect Hadfield Road to Huia Street. An existing level crossing located approximately 5 km north of Elizabeth Street on Hadfield Road would be utilised for this approach. Alternatively, a new level crossing, for use by emergency vehicles, could be constructed approximately 450m south of Elizabeth Street to provide a connection from State Highway 1 (SH1) to Anne Street via an existing track on land owned by Goodman Contractors Limited (Goodmans).

2.0 Background

Waikanae is divided east and west by the existing SH1 and adjacent North Island Main Trunk (NIMT) railway line. Currently the only access to eastern Waikanae is via the level crossing on Elizabeth Street, or from Akatarawa Road via Upper Hutt.

In a typical weekday 24 hour period, around 80 Metlink electric suburban passenger trains pass over the single track Elizabeth Street level crossing, as well approximately 16 KiwiRail freight trains and 3 long distance passenger services.

In the last five years, there has been one reported instance where the level crossing has been blocked by a stationary train at the Waikanae Station, and two reported instances of the access to eastern Waikanae being prevented due to a fault with the barrier arms at the Elizabeth Street level crossing. These incidents have raised community concerns about emergency vehicles possibly not being able to reach a future incident in Eastern Waikanae due to the level crossing being obstructed by an immovable object, such as a broken down train. While a fully grade separated crossing of the railway between West and East Waikanae would provide the optimum solution to this problem, AECOM understands that this is not considered to be feasible in the immediate future. Therefore a possible alternative solution to this problem would be the construction of a new route that can provide access to eastern Waikanae in an emergency situation where access via the Elizabeth Street crossing is prevented.

Discussions between concerned community groups including the Kapiti Emergency Services Coordinating Committee (KESCC) have been taken place with the New Zealand Transport Agency (NZTA), KiwiRail, KCDC and Hon Steven Joyce, as previous Minister of Transport, since late 2010. AECOM understands that a possible emergency crossing site south of the Elizabeth Street level crossing was proposed in 2012 for use when there was a fault with the Elizabeth Street barriers; however this idea was not actioned possibly because of the likelihood that it might also be blocked by a train standing across Elizabeth Street.

The recent opening of the Mackays to Peka Peka expressway and planned revocation of the existing SH1 route through Waikanae presents a new opportunity to resolve this problem. Annual average daily traffic (AADT) volume data in Paraparaumu indicates that traffic volumes have halved on SH1 through town centres. A similar reduction of traffic is expected to be observed in Waikanae when AADT data is collected on Te Moana Road. The management of this asset will shift from NZTA to KCDC following revocation. The exact date of revocation is to be determined. Details of the Mackays to Peka Peka expressway can be found in Appendix A.

3.0 Waikanae Town Centre

The planned revocation of SH1 to a local road has also provided an opportunity for KCDC to work with the community to identify design solutions that can better link the Waikanae Town Centre.

KCDC's priorities for Waikanae now include:

- Projects that relate to turning SH1 into a local road – the redesign of the local road, parking and pavement space in front of the shops on the existing SH1;
- Improving pedestrian crossing from the railway station to Ngaio Road, which was a clear priority project when the community were consulted;
- Improving access to the river via the Te Moana Road/SH1 intersection.

Future plans for SH1/Main Road include:

- SH1 to become a distributor road but through a town centre;
- Single traffic lanes with traffic calming – potentially 50kph down to 30kph;
- Encourage east-west movements (pedestrian/cyclists);
- Improved parking and access to the railway station.

4.0 Options

4.1 Hadfield Road Summary

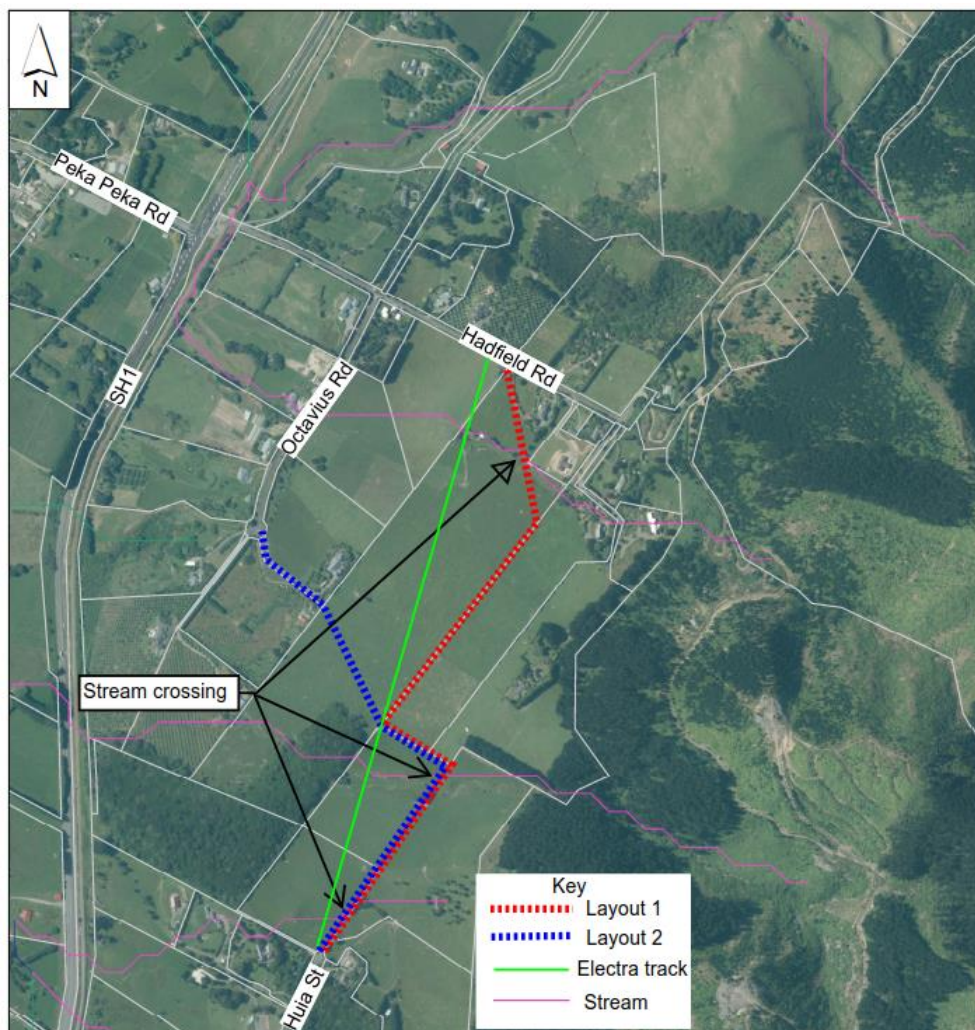


Figure 1: Indicative Alignment Options for New Track Construction

A new route for emergency vehicle access could be achieved by constructing an unsealed track through rural land that would connect Hadfield Road or Octavius Road with Huia Street. This option will make use of the existing level crossing on Hadfield Road. Two preliminary alignment options have

been considered as shown in Figure 1. Multiple land owners are involved in both cases, so the outcome of the consultation process with these stakeholders will govern the final alignment selected.

The potential route length could vary between 900 m and 1200 m depending on the final alignment. A nominal width for the track of 8.2 m has been allowed which would accommodate the construction of a 4m wide carriageway including batter slopes and a drainage swale as shown in Figure 2.

Geographical challenges for this option include varying topography and three watercourses that bisect the potential track. The maximum catchment discharge of each of these watercourses will need to be determined. If the discharge is sufficiently small then the watercourse could be piped under the track however if this is not appropriate then precast concrete box culverts would be required to create basic bridges. For the purposes of this report we will assume that the two small streams can be piped while the larger stream will require concrete culverts to bridge. Ongoing maintenance to the track will be required to ensure it is trafficable during all weather conditions.

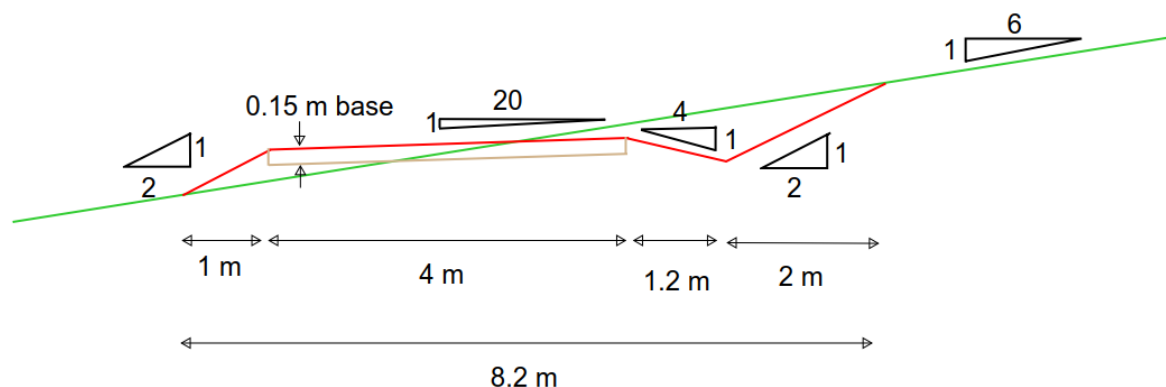


Figure 2: Indicative Carriageway Width for Track Construction

Hadfield road has an existing level crossing of the NIMT and is approximately 5km north of Waikanae so any obstruction to the Elizabeth Street level crossing is unlikely to affect this crossing. This distance does however mean that emergency vehicles travelling from Waikanae West or Paraparaumu will need to travel an extra 10km to get to Waikanae East which will delay response time by approximately 10 minutes.

Response to the initial correspondence with KCDC from affected land owners has been unfavourable or this option. The owners of a key property on Huia Street that would be needed for the construction of either track arrangement, have stated “please be advised that we are neither willing to progress matters further and are not prepared to consider any access through our property.” Another response was received from a land owner on Octavius Road who stated that they were not in support of the track being constructed on their land. This would remove track layout 1 from contention. The land owner suggested that the logical route for an emergency vehicle track would be along the still existing Electra pylon track from Hadfield Road. The two routes proposed by AECOM would be less disruptive to land owners than this proposed alignment. The pylons have been removed but the track remains. It is not currently in a suitable condition for use as an emergency access. Compulsory property acquisition would have to be pursued through the Public Works Act for the Hadfield Road option to progress. We have not estimated the purchase price of these properties however the current government property valuations of the potentially effected land are summarised in Table 1. The cost of this land acquisition has been omitted from the cost estimation for this option.

Table 1: Rating valuations of affected properties in Hadfield Road option

Property	Rating Valuation (01 August 2014)
59 Octavius Road	\$580,000
57 Octavius Road	\$860,000
62 Hadfield Road	\$1,100,000
76 Hadfield Road	\$870,000

Property	Rating Valuation (01 August 2014)
278 Huia Street	\$435,000
269 Huia Street	\$835,000
271 Huia Street	\$525,000
273 Huia Street	\$530,000

A lack of land owner support increases the possible risk of unauthorised locking of gates along the new route if it were to be built.

4.2 Goodmans Summary

4.2.1 Description

Emergency vehicle access to eastern Waikanae via the Goodmans site involves the construction of a new level crossing at a layover location off the side of SH1, approximately 60 m north of the Waikanae River Bridge. This crossing would be protected by gates on either side of the rail corridor, would be only be for use by authorised vehicles and would not be open to the public. After crossing the railway line, emergency vehicles can drive to Anne Street using an existing gravel path on the Goodmans quarry site that is currently used to move plant around their site. An existing electronic gate secures the site from the Anne St entrance. This gate opens automatically when approached from inside the yard however it would close again and would not open automatically for the return trip. This causes problems if an ambulance is taking somebody to hospital. The operation of this gate for returning vehicles is an issue that will need to be resolved with Goodmans. The indicative location of the new level crossing is shown in Figure 3.



Figure 3: Indicative Location of New Crossing and Existing 600 mm Bulk Water Main

4.2.2 Rail Crossing Design Requirements

The primary aim of a new level crossing over the existing rail corridor is to provide unhindered access for emergency services vehicles in the event that the Elizabeth Street crossing is unavailable for a prolonged period.

A 4m high New Zealand Fire Service 'Type 2 General Appliance' has been assumed as the design vehicle for the level crossing governing both the height requirements and vehicle swept paths. Refer to Appendix B for the full technical details on crossing requirements. These parameters have been used to check the horizontal and vertical swept paths for the design vehicle based upon survey data provided by KCDC and KiwiRail. Drawings detailing these are included in Appendix F.

In the KiwiRail Wellington 1500v DC electrified area from Wellington to Waikanae and Upper Hutt, the overhead wire height at public road level crossings is 5.2 m above rail level. However at the proposed crossing location, the overhead lines in the proposed location are lower - at 4.7 m above rail level. Discussions with KiwiRail have identified that in order to avoid having to raise the overhead wires at this location; any vehicle that may use the crossing will need to have its height verified as 4m or less. It would be possible to raise the overhead lines to the height of a standard level crossing. Advice from KiwiRail would suggest this would involve the replacement of approximately six masts at a cost of around \$150,000.

4.2.3 Construction



Figure 4: Example of the Polycorp Epflex Railseal Interface being Installed on a KiwiRail Level Crossing

The KiwiRail standard practise for construction of a new level crossing makes use of the Polycorp Epflex Railseal Interface as shown in Figure 4. This consists of rubber boots enclosing the rails plus an asphalt infill.

Approach ramps will be constructed by excavating in-situ soils, placing a layer of geotextile material to retain fines, then placing and compacting aggregate to shape the ramp. Grasscrete tiles will be used to finish the surface of the ramps to minimise construction expense and avoid drawing attention to the crossing. The grass will require trimming on a regular basis depending on seasonal growth.

4.2.4 Constraints

AECOM understands that an emergency rail access located approximately half way between the proposed Goodmans site and the existing Elizabeth Street crossing was designed and almost built in 2012. A major problem with that location was that if a freight train was blocking the Elizabeth Street crossing, it was likely to also be obstructing the emergency access.

This issue is not completely avoided at the Goodmans site, which is approximately 480m from Elizabeth St. While nearly 90% of the approximately 90 trains that traverse the Elizabeth Street Level crossing on a typical weekday are electric multiple units, between 40 and 160m in length, KiwiRail has advised that freight trains to and from Wellington can be up to 900m long with an average length of around 650m. Therefore there remains a possibility that both Elizabeth Street and the proposed Goodmans emergency vehicle crossing could be blocked by a stationary freight train.

For this reason, several KiwiRail staff members who we have engaged with in our investigations have expressed doubts about the potential usefulness of the Goodmans crossing. Similarly staff at the Waikanae Fire Station, contacted by AECOM in early 2017 as part of this study, indicated that the construction of the Goodmans crossing in isolation was not supported due to the potential of an obstruction at Elizabeth Street also preventing access at Goodmans crossing.

Discussions with the manager of the Goodmans site has identified that trespassing is a current problem at the site with people crossing the railway tracks to gain river access. The construction of a gate or barrier at the new level crossing may compound this issue by bringing more attention to the access point. To remedy this, a fence could be constructed from the edge of the Bunnings site to the river. A 1.8 m deer fence in the rail corridor would be an economical and effective means of preventing trespassers. However as there is no legal requirement in New Zealand for rail corridors to be fenced, KiwiRail may not wish to contribute to the cost of providing and maintaining such a fence.

4.2.5 Operation

A process will need to be agreed between KiwiRail and the Emergency Services for the use of this crossing in the event that a train is blocking access via the Elizabeth Street crossing for an extended period. This will ensure that the Elizabeth Street crossing is not operational, other train movements have stopped and that the crossing is safe to use at this time. It is expected that KiwiRail will apply conditions of entry to this crossing because the existing height of the 1500V DC overhead lines is lower than that of a standard level crossing. All vehicles that wish to use this crossing must be height verified by KiwiRail as 4m or less, and users must seek authorisation from the train control centre prior to every crossing. AECOM understands from KiwiRail however that the Police and Fire Service have the statutory right to request that train movements be halted in order for them to enter the rail corridor in the course of their duties, so it would be expected that any such authorisation to use the crossing would be procedural to confirm that it was safe to do so. The construction of this crossing would not be a solution to height restriction problems currently encountered with heavy earthmoving plant at the Elizabeth Street crossing.

The opening/unlocking of the crossing barriers can be handled in several ways. The cheapest option would be a key and padlock, similar to the process used by authorised Heavy Haul operators at number of special heavy vehicle level crossings on the KiwiRail, including one between Paraparaumu and Waikanae. However unlike movements across such crossings, which are planned weeks if not months prior to the event, disadvantages of simple padlocked gates at the Goodmans crossing would include the potential for the key(s) to be forgotten or lost; delays in accessing the key in an emergency situation where minutes are crucial and potential unauthorised entry to the rail corridor if the gates were left open.

A more sophisticated option could involve the remote operation of a barrier arm or gate by a Train Controller at the KiwiRail National Train Control Centre (NTCC) in Wellington which operates on a 24 hour 7 day per week basis. The emergency vehicle would telephone the NTCC who would then be able to confirm that a train is blocking the crossing at Elizabeth Street and that the emergency crossing is safe to use, and then open the barriers or gate remotely without delay. This option is preferable from a safe operational perspective, however it would more expensive from a capital and operating cost perspective than a simple padlock.

In a situation where both crossings were blocked by a freight train for an extended period, it may be possible to push rail vehicles that are not immobilised off one of the crossings. Depending on the availability of a suitable rescue locomotive, which may have to come from Wellington, this could take several hours.

While outside the scope of this report, discussions with KiwiRail staff identified several options for enabling the Elizabeth Street level crossing barriers to be raised in the event that they have failed in the lowered position delaying traffic without a train blocking the crossing. Training could be provided to authorised non KiwiRail personnel, such as police officers, to manually operate the barriers in such a situation. However AECOM understands that a recent KiwiRail risk assessment has identified that it would be possible for the barriers to be manually raised without the signalling system needing to establish that any trains approaching the level crossing had stopped, thus creating a risk that the train entered the crossing with the barriers raised. While a modification to the signalling system would address this risk, an alternative possibly more cost effective solution would be to enable the Train Control to remotely raise the barriers as they are able to both see the position of trains and confirm by radio that trains have stopped.

4.2.6 Services

A 600mm diameter water main is located in the general vicinity of the proposed crossing location as shown in Figure 3. Consideration must be given during the detailed design phase to not interfere with this pipe during the construction of the access ramps for the crossing.

4.2.7 Consultation

One major advantage of the Goodmans site is that all the land required for the emergency access belongs to a single owner. Initial consultation with Goodmans indicated that they are in support of the construction of an emergency crossing to their site, although they would also wish to be able to use the crossing to enable heavy plant up to 5m high, which are unable to use the Elizabeth Street level crossing, to access their site periodically.

The conditions of Goodmans using the crossing for their activities still need to be discussed in detail with KiwiRail, however early conversations indicated that access would be under the same conditions as emergency vehicles – height verified as 4m or less and with authorisation from the train control centre prior to every crossing. In order for 5m high vehicles to use the new crossing, it is likely that a special design of KiwiRail overhead line equipment would need to be installed. This would allow the wire to be manually lifted to enable high vehicles to use the crossing under a Block of Line situation where all trains movements were stopped and the traction power was isolated. Consideration of such an option, and associated capital and ongoing costs, are outside the scope of the report and would need to be negotiated between Goodmans and KiwiRail.

Resource Management Constraints

4.3 Hadfield Road (Northern)

4.3.1 Site Description

The proposed route at Hadfield Road will run south from Hadfield Road and Octavius Road to connect with Huia Street.

This route will run through a number of private blocks, which are presently utilised for lifestyle/light rural activities and hold a high level of amenity.

The land slopes towards State Highway 1 and is undulating. The proposed route would pass by an area of outstanding landscape and across a waterway.

Figure 5 below depicts the properties and landowners subject to the proposed Hadfield Road (northern) route.

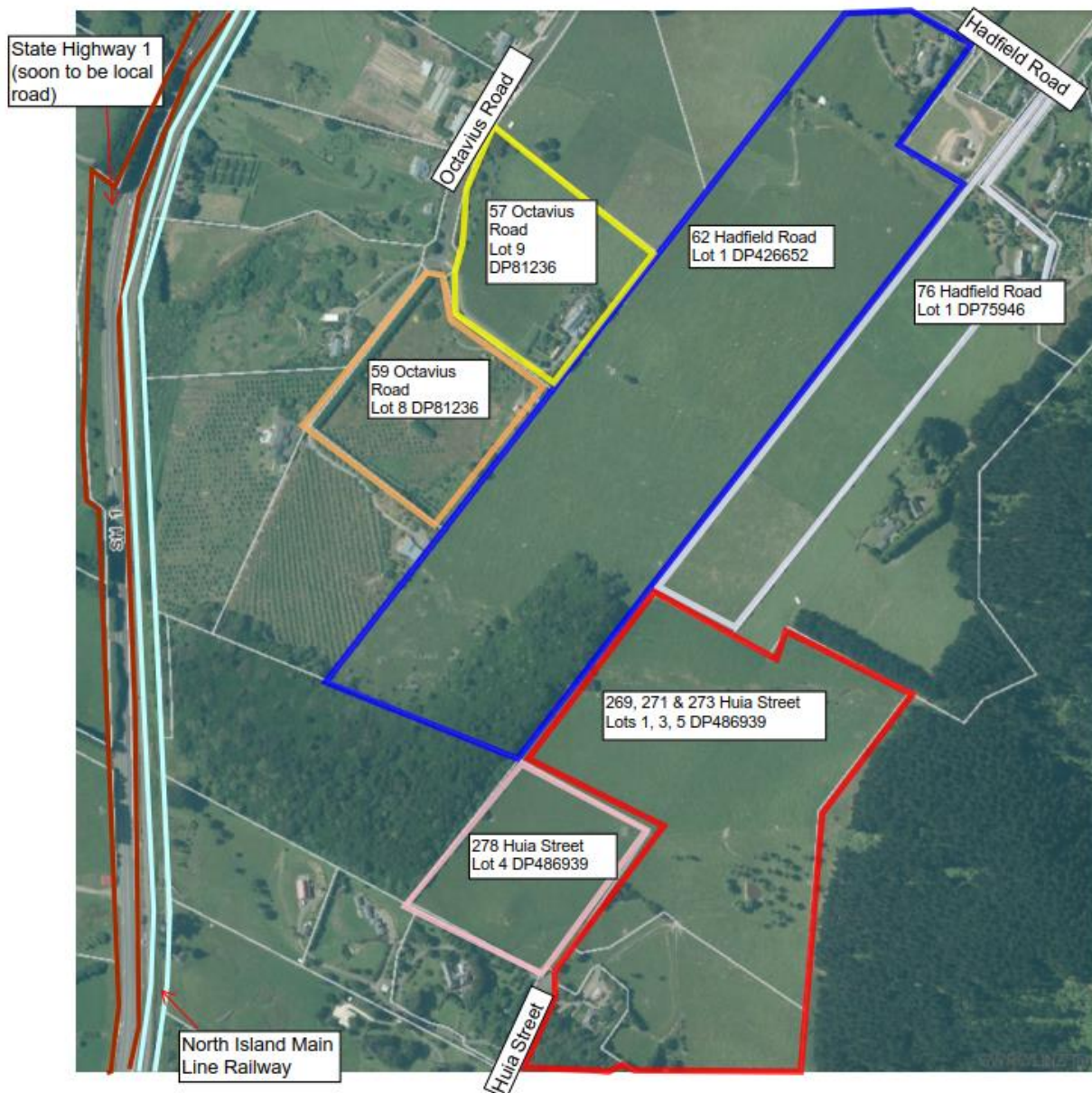


Figure 5: Property Details - Hadfield Road (Source: Greater Wellington Maps, 2017)

4.3.2 Hadfield Zoning and Resource Management Overlays

As identified in Figure 5 above, the proposed route will intersect a number of sites. The zoning and resource management overlays applicable to each of these sites are tabulated below.

KCDC is currently undergoing a review of their Operative District Plan (ODP). On 29 November 2012, the Proposed District Plan (PDP) was publicly notified and as such the rules have legal effect. As such, this section discusses the zoning and overlays of both the KCDC OPD and PDP. Any applicable resource management constraints within the Greater Wellington Regional Council (GWRC) plans are also noted in the below table.

Table 2 below lists all relevant overlays relevant to the site. The maps are contained in Appendix C.

Table 2: Kapiti District Plan (Operative and Proposed) Zoning and Overlays (Hadfield Road)

Site and Landowner	Operative District Plan Map 18 A and B Map 20 A and B	Proposed District Plan Map 18 A and B Map 20 A and B	Greater Wellington Regional Council Proposed Natural Resources Regional Plan Map 21(e)
57 Octavius Road Lot 9 DP81236	Rural	Rural Hills Zone	
59 Octavius Road Lot 8 DP81236	Rural	Rural Hills Zone	Class 2 River
62 Hadfield Road Lot 1 DP426652	Rural Outstanding Landscapes High Voltage Transmission Lines (now dismantled)	Rural Hills Zone Sensitive Natural Feature High Voltage Transmission Lines	Class 2 River
76 Hadfield Road Lot 1 DP75946	Rural Outstanding Landscapes	Rural Hills Zone	Class 2 River
269, 271 & 273 Huia Street Lots 1, 3, 5 DP486939	Rural Outstanding Landscapes	Rural Hills Zone	Class 2 River
278 Huia Street Lot 4 DP486939	Rural High Voltage Transmission Lines Outstanding Landscapes	Rural Hills Zone High Voltage Transmission Lines	Class 2 River

4.4 Goodmans (Southern)

4.4.1 Site Description

The proposed route at the Goodmans site will run from State Highway 1, near the Waikanae over-bridge, over private land to Anne Street, a cul-de-sac off Elizabeth Street.

The site is owned by Goodmans, who operate as an earthmoving company. This is being primarily used as a storage yard for ancillary vehicles and machinery. The site slopes gently from Anne Street to a bank that drops steeply to the Waikanae River. The surrounding land uses immediately adjacent to Goodmans are industrial and includes Bunnings Warehouse.

Figure 6 depicts the properties and landowners subject to the Goodmans (southern) development.

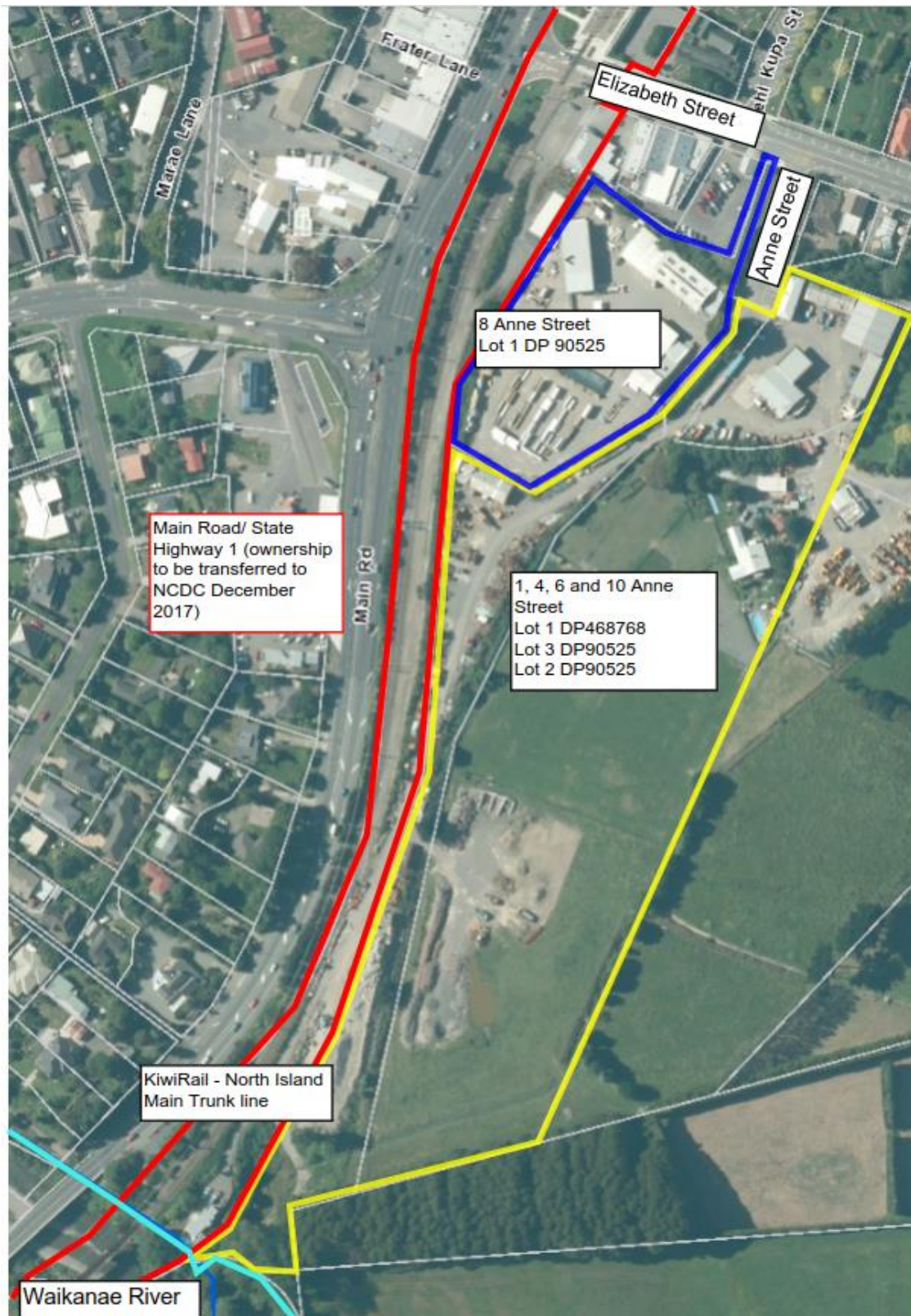


Figure 6: Property Details - Goodmans

4.4.2 Goodmans Zoning and Resource Management Overlays

As identified in Figure 6 above, the proposed route will intersect a number of sites and is planned to cross over the rail line. The zoning and resource management overlays applicable to each of these sites are tabulated below.

KCDC is currently undergoing a review of their Operative District Plan (ODP). On 29 November 2012, the Proposed District Plan (PDP) was publicly notified and as such the rules have legal effect. As such, this section discusses the zoning and overlays of both the KCDC OPD and PDP. Any applicable resource management constraints within the Greater Wellington Regional Council (GWRC) plans are also noted in the below table.

Table 3 below lists all relevant overlays relevant to the site. The maps are contained in Appendix D.

Table 3: Kapiti District Plan (Operative and Proposed) Zoning and Overlays- Goodmans Route

Site and Landowner	Operative District Plan Map 10 A and B	Proposed District Plan Map 10 A and B	Greater Wellington Regional Council Proposed Natural Resources Regional Plan Map 2
North Island Main Trunk Line New Zealand Railways Corporation (part of the KiwiRail Group)	North Island Main Trunk Railway Railway Designation	North Island Main Trunk Railway Railway Designation Archaeological Alert	
Main Road/ State Highway 1 Ownership to be transferred to KCDC December 2017	Residential Zone SH1 Designation	Residential Zone SH1 Designation Archaeological Alert	
Waikanae River Crown	River Corridor	River Corridor Sensitive Natural Features	Nga Taonga Nui a Kiwa -clean water body Significant Primary contact recreation river
1, 4 and 10 Anne Street Lot 1 DP468768 Lot 2 DP90525	Industrial/Service Zone NZTA Noise Corridor overlay	Industrial Zone NZTA Noise Corridor overlay Archaeological Alert	
6 Anne Street Lot 3 DP90525	Rural	Rural Plains	
8 Anne Street Lot 1 DP 90525	Industrial/Service Zone	Industrial Zone	

4.5 Resource Consenting Requirements

The resource consent process provides authorisation for certain activities or uses of natural and physical resources associated with the construction and operation of the proposed routes.

4.5.1 Hadfield Road Route

4.5.1.1 Regional Consent requirements

Based on the stream crossings required as part of this route it is likely that consent will be required from Greater Wellington Regional Council (GWRC) under the following regional plans:

- GWRC Regional Freshwater Plan
- GWRC Proposed Natural Resources Plan.

4.5.1.2 Kapiti District Council Consenting Requirements

Based on the proposed route location, the following activities will trigger the requirements for resource consent to be lodged with KCDC:

- Earthworks
- Farm Tracks (proposed route does not meet permitted activity criteria).

4.5.2 Goodmans Route

4.5.2.1 Requirements under National Environmental Standards

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES: Soil) applies to land as per clause 5(7):

“Land covered:

(7) The piece of land is a piece of land that is described by 1 of the following:

(a) an activity or industry described in the Hazardous Activities and Industries List (HAIL) is being undertaken on it;

(b) an activity or industry described in the HAIL has been undertaken on it;

(c) it is more likely than not that an activity or industry described in the HAIL is being or has been undertaken on it.”

Lot 1 DP468768, Lot 2 DP90525 and Lot 1 DP 90525 have been identified as potentially contaminated by GWRC. It is our understanding that approximately 75m³ of soil will be required to be removed offsite as part of constructing the route. As such the proposed works cannot comply with the permitted activity criteria (maximum 5m³ removed offsite in anyone year) relating to the proposed earthworks. It is considered likely that resource consent for soil disturbance of potentially contaminated land will be required as a controlled or restricted discretionary or discretionary activity under Regulation 9, 10 or 11 of the NES: Soil.

A Detailed Site Investigation (DSI) will be required to determine contamination risks and to inform final consenting requirements. If a DSI is not provided, the proposal will be assessed as a Discretionary activity under Regulation 11 of the NES: Soil.

4.5.2.2 Kapiti District Council Consenting Requirements

Based on the proposed route location, the route will traverse through an industrial zoned site, which has relatively permissive consenting requirements. Based on the location there are a number of additional approvals that will need to be considered:

4.5.2.3 Requiring Authority Approvals

The alignment intersects land which is subject to a designation for which KCDC is not the Requiring Authority (SH1 and the Rail crossing). Written approval will be required from the New Zealand Railways Corporation (a division of KiwiRail) and NZTA¹ in accordance with s176(1)(b) of the RMA.

4.5.2.4 Archaeological Authorities

There is an Archaeological Alert identified by KCDC in locations near the proposed route. There is a risk that unknown archaeological features may be unearthed during the course of works. As such, seeking an Archaeological Authority from Heritage NZ may be necessary in obtaining statutory approvals for the works.

It is recommended that further advice from an archaeologist on archaeology and site values in the area and the potential effects of works is obtained once preliminary design is finalised.

¹ Only if the revocation of SH1 by NZTA is not yet completed

4.6 Planning Approval Strategies

4.6.1 Notice of Requirement

KCDC can prepare and lodge a notice of requirement for either of the proposed routes, although agreement from the New Zealand Railways Corporation pursuant to Section 76(1)(b) of the RMA would be required for a level crossing to the Goodmans Site to be notified.

As a designation does not supersede the NES:Soil or GWRC Regional Plans, consent will still be required under these documents from KCDC and GWRC.

Benefits of designating the route include:

- Protection against incompatible land uses (particularly within private property)
- Strengthened process for any land acquisition which may be required (land acquisition is currently anticipated for the Hadfield Road route)
- The District Plan rules do not need to be considered (unless the works do not comply with any associated designation conditions).

4.6.2 Combined Resource Consent Application

KCDC could lodge a single consenting package to GWRC and KCDC, which would streamline the consenting process and reduce unnecessary duplication of documentation (as opposed to lodging separate applications for the requirements of each individual plans). This consent application would address requirements under the following plans:

- Kapiti Coast District Plan (Operative and Proposed)
- Greater Wellington Regional Plans (Operative and Proposed)
- NES: Soil.

4.6.3 Additional Approvals Required for Both Routes

4.6.3.1 Property Access and Acquisitions

The proposed works require access to private property. Property access agreements will need to be acquired from the relevant property owners to approve access for these works. Property acquisition/agreements may be commenced once the design process is finalised.

Pursuant to s176(1)(b) of the RMA, written approval will be required from KiwiRail as requiring authority for the rail designation prior to commencement of any works. For the Goodmans site level crossing, it would be expected that a level crossing agreement would be established between KiwiRail and KCDC that would set out the arrangements and financial responsibilities for the operation and maintenance of the crossing.

A Deed of Grant will be required to be established with KiwiRail and KCDC. This will involve KCDC making an application to KiwiRail. The following payments will be required;

- A \$3,050.00 non-refundable 'Application Fee'. This fee covers all of the internal engineering approvals and site inspections for the proposed crossing
- Once approval is given, there is then a \$1,670.00 'Documentation Fee' that relates to the cost in preparing and approving the Deed of Grant agreement
- An 'Annual Fee' of \$350.00 per annum that covers annual administrative costs including the cost to arrange annual inspections.

4.6.3.2 Mana Whenua

The Greater Wellington Proposed Natural Resources Plan encourages the involvement of Mana Whenua in the resource consent process when their relationship with air, land and water or their values is adversely affected under Method M25 6.13.

It is recommended the iwi for the Kapiti Coast Area are consulted on archaeological matters, and sites of cultural/historic significance. Consultation with Mana Whenua will be necessary should approval from Heritage NZ be required.

4.6.3.3 Building Consents

The Project will involve works subject to the Building Act which may require approvals from KCDC. When the work in question has been designed and supervised by chartered professional engineers, KCDC may provide an exemption to such building work if they consider building consent is not necessary, subject to Schedule 1, Part 1, Section 2 of the Building Act.

To apply for an exemption, an application form will need to be prepared, with the relevant plans and PS1/PS2 (as required), and a description of the works. This will need to be submitted to KCDC before construction may commence.

4.7 Risk Management

4.7.1 Statutory Risk

As described above there are a number of approvals required to authorise either route. Risks in obtaining these approvals have been identified below. It is recommended that these risks are revisited in the preliminary design phase, and are routinely reviewed as part of the Project risk review process.

Potential risks include:

- Potential opposition from:
 - Key stakeholders, such as community groups or requiring authorities
 - Iwi
 - Directly affected landowners.
- Not obtaining the necessary approval for undertaking the sections of work located on private property.

4.7.2 Construction Risk

Other design and construction risks relating to the existing environment have been identified as:

- Encountering unknown contamination which needs to be handled and disposed of in a manner which mitigates the potential risk associated with the activity
- Encountering unknown archaeological remains along the Goodmans Route without having the necessary approvals.

5.0 Summary of Options

Table 4 summaries the advantages and disadvantages of each option'

Table 4 Summary of Advantages and Disadvantages for Each Option

Site Location	Pros	Cons
Hadfield Road	Access will not be affected by obstructions at Elizabeth St crossing.	More expensive to implement
	Level crossing is already in place.	Track will require ongoing maintenance – ongoing cost.
		Emergency vehicles must drive further to access eastern Waikanae meaning response will be slower – minor delay.
		Likely compulsory property acquisition
		Multiple land owners to deal with.
		Potential for a gate to be locked which may cause delay.
Goodmans	Cheaper to implement	Both crossings may be blocked at the same time – major delay.
	Only two land owners to deal with- Goodmans and NZ Railways Corporation.	Need to agree, fund and maintain a safe and efficient means of use of the crossing by emergency vehicles – requires agreement of KiwiRail and Emergency Services
	Faster response to eastern Waikanae	May have to raise the 1500V DC overhead power line to provide sufficient vertical clearance.
	Permissive zoning - industrial area.	Safety concern over unauthorised use of crossing
		Unknown level of contamination in soil
		Unknown risk of uncovering archaeological material

6.0 Consultation

6.1 Hadfield Road

The landowners of the properties identified in Figure 5 were sent letters by KCDC in January 2017 regarding the possible use of their land for emergency access. KCDC received feedback from one property owner, 57 Octavius Road, Lot 9 DP81236. This property owner indicated the logical route would be the still existing Electra track from Hadfield along the (now removed) pylons route. In addition The owners of a key property at 273 Huia Street that would be needed for the construction of either track arrangement, have advised KCDC that they are neither willing to progress matters further nor are prepared to consider any access through their property.

No other landowners have contacted KCDC at this stage.

6.2 Goodmans

Goodman's were contacted by KCDC and have indicated that they are happy with the proposed route to be located through their property, on the conditions that matters such as opportunities for trespassing were identified and the design amended to prevent this.

7.0 Access, Operation and Maintenance

7.1 Hadfield

The northern option using Hadfield Road uses an existing level crossing. The key issues which will need to be finalised are:

- Track maintenance
- Field gates security.

See Figure 5 for detail of the land owners.

7.2 Goodmans

The handling of the crossing at the Goodmans site could be governed by a two part process.

Step 1: In the event of the Elizabeth Street level crossing being blocked to traffic for an extended period, the KiwiRail National Train Control Centre (NTCC) would inform the emergency services in the Kapiti Coast area, including whether or not the Goodmans level crossing is also blocked. If the blockage is cleared then emergency services are notified.

Step 2: If an emergency in eastern Waikanae occurs when Step 1 is active, the emergency services will notify NTCC that they need to use the Goodmans level crossing. NTCC will advise the emergency services whether the Goodmans crossing is able to be used and when it is safe to do so. Depending on the level of sophistication of the crossing gate operation adopted, the gates/ barriers protecting the crossing would be opened to allow the emergency vehicle to pass over the railway and then would be shut again to prevent unauthorised access. The Emergency Services would also need to be able to operate the powered gates at the entrance of the Goodmans Site on Anne Street

As noted in Section 4.6.3.1, it is expected that KiwiRail will require KCDC to enter into a Level Crossing agreement with KiwiRail for the operation and maintenance of the level crossing and approaches. While it is probable that KiwiRail would undertake any maintenance work within the rail corridor, it is possible that KiwiRail will expect an ongoing funding contribution from KCDC for this and costs incurred in the operation of the crossing.

Similarly it may be prudent for KCDC to enter into an agreement with Goodmans for the use and maintenance of the existing gravel path on their property by Emergency Vehicles.

8.0 Cost Estimate Summary

The cost summaries for each option are displayed below. See Appendix E for a detailed cost breakdown. All prices exclude GST and property acquisition. The unit quantities for these estimates were developed after visiting the sites and estimating earthworks volumes based on topography maps. The unit rates were developed by a senior AECOM cost estimator together with information provided by KiwiRail for some items. It should be recognised that these estimates are rough order costs for comparison of options and cannot be relied upon for budgeting or funding purposes due to the level of uncertainty and risk at this initial feasibility assessment phase.

8.1 Hadfield

The total construction estimate excluding professional and design fees is \$1,660,356. The total outturn cost is \$2,030,568 say \$2,000,000. The yearly maintenance cost is \$5000. This excludes potential compulsory property acquisition.

8.2 Goodmans

Two estimates have been developed for the Goodmans option. In addition to the base schedule which assumes a simple padlock gated level crossing, an estimate has been developed which includes the potential additional costs for lifting the overhead lines and providing remotely controlled electronic gates.

The total construction costs for the base schedule excluding professional and design fees is \$251,229. The total outturn cost for the base schedule is \$321,714 say \$322,000.

The total construction cost including the potential additional items and excluding professional fees is \$665,229. The total outturn cost including the potential additional items is \$735,714 say \$736,000.

The yearly maintenance cost estimate is \$5000 for both cases. This includes KiwiRail's annual level that covers administration fee of \$350 as outlined in section 4.6.3.1.

9.0 Risks

Table 5: Summary of Key Risks for Hadfield Option

Key Risks Identified to Date - Hadfield
Compulsory Property Acquisition may be required if land owners do not provide permission for track to Huia Rd to be constructed
Ongoing maintenance of track required
Potential for a gate on the track to be padlocked

Table 6 : Summary of Key Risks for Goodmans Option

Key Risks Identified to Date - Goodmans
Both crossings could be blocked by long freight train preventing access to eastern Waikanae
Unlawful use of crossing from pedestrians or vehicles
Security of Goodmans site after construction of crossing
Water main located where access ramp proposed
Vertical clearance will restrict usage
Maintenance of crossing

10.0 Conclusions

AECOM has investigated two options to provide alternative emergency vehicle access to Eastern Waikanae in the event that the single level crossing at Elizabeth Street is blocked. The first option would make use of an existing level crossing on Hadfield Road and involves the construction of a 1.2 km long track through rural land. The second option involves the construction of a new level crossing to provide a link between SH1 and Anne Street via land owned by Goodman Contractors Limited, approximately 450m south of Elizabeth Street. Consideration was given to location, risks, costs, response time, reliability, processes for use, maintenance, resource management requirements and the future plans for Waikanae.

The Goodmans option is preferred for the following key reasons:

- Location: Goodmans crossing is located 450 m south of Waikanae compared to Hadfield road which is 5 km north. This translates to a 10 minute faster response time.
- Process of use: Discussion with KiwiRail has resulted in a simple and well defined process for the use of this crossing.
- Land owner agreement: Goodman Contractors Limited is in agreement with the construction of a crossing to their site. Some land owners on the Hadfield Road route are strongly opposed to construction of a track through their land and compulsory property acquisition may be necessary for this option
- Estimated Capital Cost: \$322,000 compared to \$2,000,000 for base schedule cost estimate excluding GST and land acquisition.

It should be noted that the construction of this new crossing would not solve the height restriction issues encountered by Goodmans' heavy plant at the Elizabeth Street crossing. Further investigation into this is outside the scope of this report.

The primary concern associated with the Goodmans crossing is the potential for a stationary freight train to block both Elizabeth Street and the proposed Goodmans emergency crossing. Although freight trains passing through Waikanae are typically around 650m long and can be up to 900m long, nearly 90% of the approximately 90 trains that traverse the Elizabeth Street level crossing on a typical 24 hour weekday period are short electric multiple units, of between 40 and 160m long. Therefore for most of the time a train passing over Elizabeth Street will not simultaneously block the Goodmans emergency crossing site.

Although the likelihood of a situation requiring emergency vehicle response in Eastern Waikanae coinciding with a stationary train blocking Elizabeth Street is considered very low, if KCDC wishes to provide an alternative access to Eastern Waikanae for emergency vehicles, then the Goodmans crossing is the preferred site.



Appendix A

Mackays to Peka Peka
Expressway

INTERACTING WITH BRIDLEWAY USERS

Horse-riders are expected to stick to the grassed section but in some areas, or if they encounter oncoming traffic, they might need to use the shared path to complete their journey.

Horses are flight animals. They can't see who is coming up behind them so please call out and let horse and rider know you are there - before you are right behind or beside them. If you're cycling in a group, and approaching horses, drop down to single file and keep well clear. Call out BEFORE you get too close - don't ring your bell.

IF YOU'RE USING THE BRIDLEWAY

The shared pathway has been designed to accommodate horses, but there will be restrictions in some parts and signage will point out the recommended bridleway routes. The grassed bridleway has been constructed wherever possible along the pathway route, on the non-Expressway side. In a few sections, horses will need to use the cyclist/pedestrian path as it hasn't been possible to provide a separate grass facility because of available space.



Horses won't be able to use the Raumati Road or Waikanae River road bridges or the two pedestrian and cyclist footbridges - Makarini at Makarini Street and Rongomau connecting with Rongomau Lane and Leinster Avenue.

In the southern part of the Expressway route, horses can't use the shared path north of Fincham Road and south of Mazengarb Road. This is largely because of safety concerns in this busy central area. If your horse poos on a conspicuous part of the track, please be considerate of other path users and dismount to remove it.

HORSES AT THE INTERCHANGES

Kāpiti Road - Horses are not permitted because of the volume of traffic here.

Te Moana Road - There are two crossings next to each other, one for horses and one for pedestrians/cyclists. Wait for the green symbol to indicate that it's safe to cross, and then cross the road to connect to the other entrance and continue along the path. For safety reasons horse-riders should consider dismounting while waiting at and using road crossings.

IF YOU'RE A CYCLIST

You should:

- keep left and let pedestrians know you're there by politely calling out or ringing a bell when you are approaching them from behind.
- let horses know you're there by politely calling out and passing slowly once you have established that the horse and rider are aware of your presence.
- pass on the right, when possible - unless the pedestrians are on the right in which case pass them in the safest way you see fit.
- ride defensively and cycle with care at a speed that doesn't put others at risk.
- be careful at intersections and give way to motor vehicles at all times.

CONNECTIONS AND CROSSINGS

Once the Expressway is up and running, the shared pathway will connect to crossing points for pedestrians and cyclists at each of the four interchanges. At the full Kāpiti Road interchange these will be controlled by pedestrian/cyclist crossing lights and at Te Moana Road, by crossing lights for all users.

Poplar Avenue Interchange

At Poplar Avenue people can get onto the shared pathway to go north from Leinster Avenue. There'll also be a connection here to go south along Poplar Avenue and connect to the Te Ara o Whareroa cycleway through QE Park.

Kāpiti Road Interchange

Here the shared path is on the western side of the Expressway. If you're already on the shared pathway and you reach Kāpiti Road, you'll need to push the crossing button, wait for the green man to indicate that it's safe to cross, and then cross the road to connect to the other entrance to continue along the path. (Because of the traffic volumes in this area, horses aren't allowed.)

Te Moana Road Interchange

Connecting to Te Moana Road on the east side of the Expressway, cyclists, pedestrians and horse riders will be able to cross to go north or south on the shared path.

Peka Peka Interchange

Pathway users can connect here on either side of Peka Peka Road to go north to Te Kowhai Road, or south to use the other sections of shared path available.

For more help or information please get in touch:
0508 INFO (0508 627 746) or info@m2pp.co.nz
Go to www.nzta.govt.nz/how-to-use-m2pp for video guides to each interchange and more information on the Expressway connections.

Mackays to Peka Peka

Wairarapa TRANSPORT AGENCY
#fletcher #m2pp #BODC

A SHARED PATHWAY

How you'll use the Mackays to Peka Peka cycleway, walkway and bridleway



Construction of the M2PP Expressway has offered the Kāpiti Coast community and the region a unique asset that will greatly improve the recreational opportunities for local residents and visitors to the Kāpiti Coast. This guide to the pathway's key local connections will help you understand and start to explore the new cycling, walking and horse-riding routes when the Expressway opens.

WHAT'S THE EXPRESSWAY SHARED PATHWAY?

A shared cycleway and walkway, with bridleway access, running alongside the Expressway route. It includes:

- a 3 metre-wide surface for cyclists and pedestrians throughout.
- a grassed surface to one side for horses, in all rural areas and some urban sections.
- linkages to key local roads and existing tracks, shared paths or footpaths.

SHARING THE PATH AND STAYING SAFE

Shared pathways are created for everyone to enjoy, so all users need to be considerate of others. Everyone using shared pathways is required to use the paths fairly and safely, and to try and not hold anyone up. So once the new pathway is up and running, please make sure you:

- observe all the directional signage which is there for everyone's safety.
 - keep to the left and try not to hold anyone up.
 - move to the side of the pathway if you stop to take in the surroundings or to have conversations.
 - be considerate and make others aware that you're there.
 - pass each other safely and avoid harm to other users.
- The path can't be used by motorised vehicles, including scooters - but mobility scooters, wheelchairs and electric bicycles are okay.

LOCAL CONNECTIONS - where to connect on the Mackays to Peka Peka Expressway shared pathway



The shared pathway will connect with local roads throughout the region including:

- 1 A connection along Poplar Avenue into the Te Ara o Whareroa cycleway through QE Park.
- 2 A connection with the Poplar Ave roundabout.
- 3 Access from/via Leinster Avenue and Rongomau Lane including the Rongomau Footbridge for pedestrians and cyclists over the Expressway and out to the existing State Highway 1.

- 4 A link from Harry Shaw Way.
- 5 A connection into Fincham Road for horses.
- 6 Access off Raumatī Road to the west of the Raumatī Road Expressway bridge.
- 7 A link from Kiwi Road.
- 8 A link to the Wharemauku Stream recreation corridor via Rata Road.
- 9 A connection with the Wharemauku Stream recreation corridor and shared pathway bridge.
- 10 A crossing controlled by pedestrian/cyclist lights over Kāpiti Road at the interchange.

- 11 Access via Makarini Street using the Makarini Footbridge for pedestrians and cyclists.
- 12 Connections with Mazengarb and Otaihangā Roads.
- 13 Access via Kauri Road and both sides of the Waikanae River Recreation Corridor.
- 14 Access via Puriri Road.
- 15 Connections either side of Te Moana Road on the eastern side of the Expressway controlled by separate pedestrian/cyclist and horse crossing lights.
- 16 Access via Ngarara Road and the new Ngā Manu Access Road.

- 17 A connection with Smithfield Road.
- 18 A connection at the top of Peka Peka Road with a crossing to head to and from Te Kowhai Road.
- 19 A connection at Peka Peka from west of the Expressway, onto the link road and bridge footpath across to Hadfield Road.



Appendix B

NZ Fire Service
Technical Details on
Crossing Requirements

Appendix B NZ Fire Service Technical Details on Crossing Requirements

The New Zealand Fire Service (NZFS) fleet consists of different types of vehicles, which are designed to perform specific functions at an emergency incident. Such vehicles are collectively known within fire service agencies as appliances. The Waikanae Fire Station has a Type 1 and a Type 2 general appliance. The Type 2 appliance, known as a pump rescue tender, will be used as the design vehicle when considering access requirements because it is the larger of the two vehicles. The dimensions for this vehicle are outlined in the document titled Emergency vehicle access guidelines (New Zealand Fire Service, 2015) and have been summarised in Figure 7.

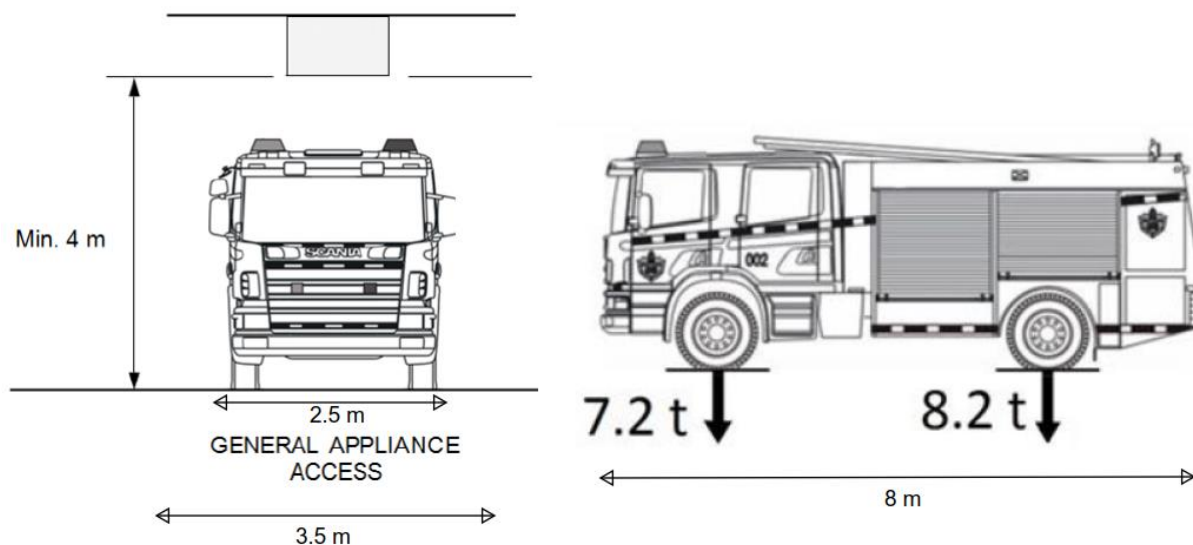


Figure 7: General appliance dimensions and axle loads.

NZFS requires a clearance height of 4 m for a general appliance to pass beneath an overhead structure or hanging wire. KiwiRail requires a minimum of 500 mm clearance from the top of a vehicle to a hanging 1500V DC overhead line. The overhead lines are approximately 4.7 m above the top of the tracks at the proposed Goodmans crossing location. KiwiRail typically brings the line height up to 5.2 m for level crossings to ensure most vehicles (up to 4.5 m high) can drive safely over the crossing. 4.7 m clearance would typically not be acceptable for a general use level crossing however as this crossing is intended to be for emergency vehicle use only then exceptions can be made. After preliminary discussions with Alan Lowrie, a traction and electrical engineer at KiwiRail, AECOM understands that emergency vehicles could use this crossing, without the need to de-energise and earth the overhead lines if each potential vehicle using the crossing has its height verified as 4 m or less. Raising the height of the overhead lines to 5.2 m for a general use crossing would cost in the realm of \$100,000 - \$150,000 as 200 meters of line either side of the crossing would need to be raised and six masts would require replacement with longer units. This is to maintain the maximum 1:300 gradient change of the wire. The approach ramp to the crossing must be sufficiently long enough such that a fire truck does not approach the crossing on an inclined gradient as this can effectively increase the height of the vehicle.

Carriageways should be generally 4 m wide while entranceways must be no less than 3.5 m wide to allow for manoeuvrability. The axle loads shown in Figure 7 cannot be assumed to be evenly distributed over all wheels. The Emergency vehicle access guidelines define a carriageway as “any construction specifically designed to be traversed by vehicular traffic (may or may not include a sealed top surface layer).” It must be insured that carriageways are trafficable during all weather conditions (New Zealand Fire Service, 2015).

The maximum negotiable ramp gradient is 1:5 for a general appliance however a gradient of 1:8 is preferred. Access ramps that follow a curved or circular profile in plan view should have a maximum gradient no greater than 1:10 (measured along the centre line). This is because of the way the chassis

will flex and twist when negotiating the ramp. A minimum 4 m long 1:15 transition grade is preferred for both ramp approach and departure to provide entry / exit clearances for appliance as shown in Figure 8. These requirements are to ensure that ramps do not hinder vehicle response.

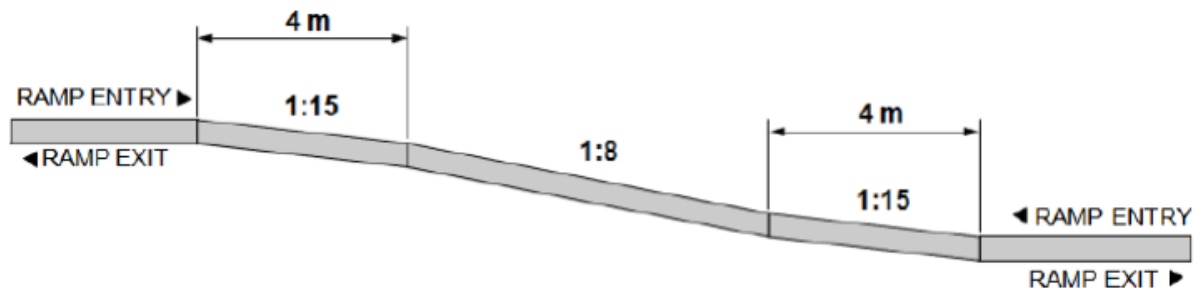


Figure 8: NZFS preferred access ramp geometry.

The radius dimensions specified in Figure 9 are for wall to wall clearance from body overhang and do not represent the vehicles wheel tracks. The NZTA road tracking curve for an 8 m Medium Rigid Truck is an appropriate representation of the wheel tracking curve of a general appliance.

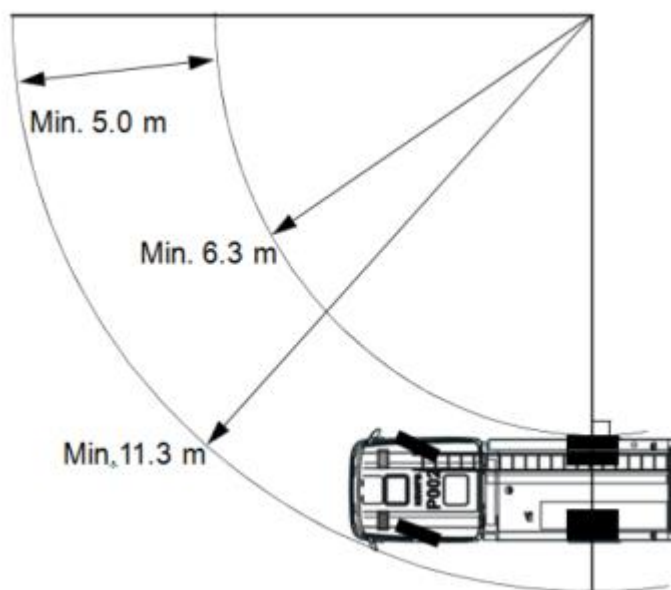


Figure 9: Minimum carriageway widths - curved sections.



Appendix C

Operative and Proposed
Plan Maps 18 and 20
and PNRP Map 21e

Map 18
Districtwide
and Urban
Plan Zones



LEGEND

ZONES

- Residential
- Rural
- Commercial / Retail
- Town Centre
- Industrial / Service
- Open Space
- River Corridor
- Conservation

AREAS

- I.R.** Infill Residential
- M.D.H.** Medium Density Housing
- L.D.H.** Low Density Housing
- TAP....**

Tourist Activity Precincts:
A,B,C and D.
See District Plan
for details

[GP...]

General Precincts:
1. Peka Peka North
Rural Residential
Redevelopment Area
2. Pekawy
3. Waikanae Garden Area
Developments Area
4. Waikanae Golf
Residential Area
5. Ferndale Area
See District Plan
for details

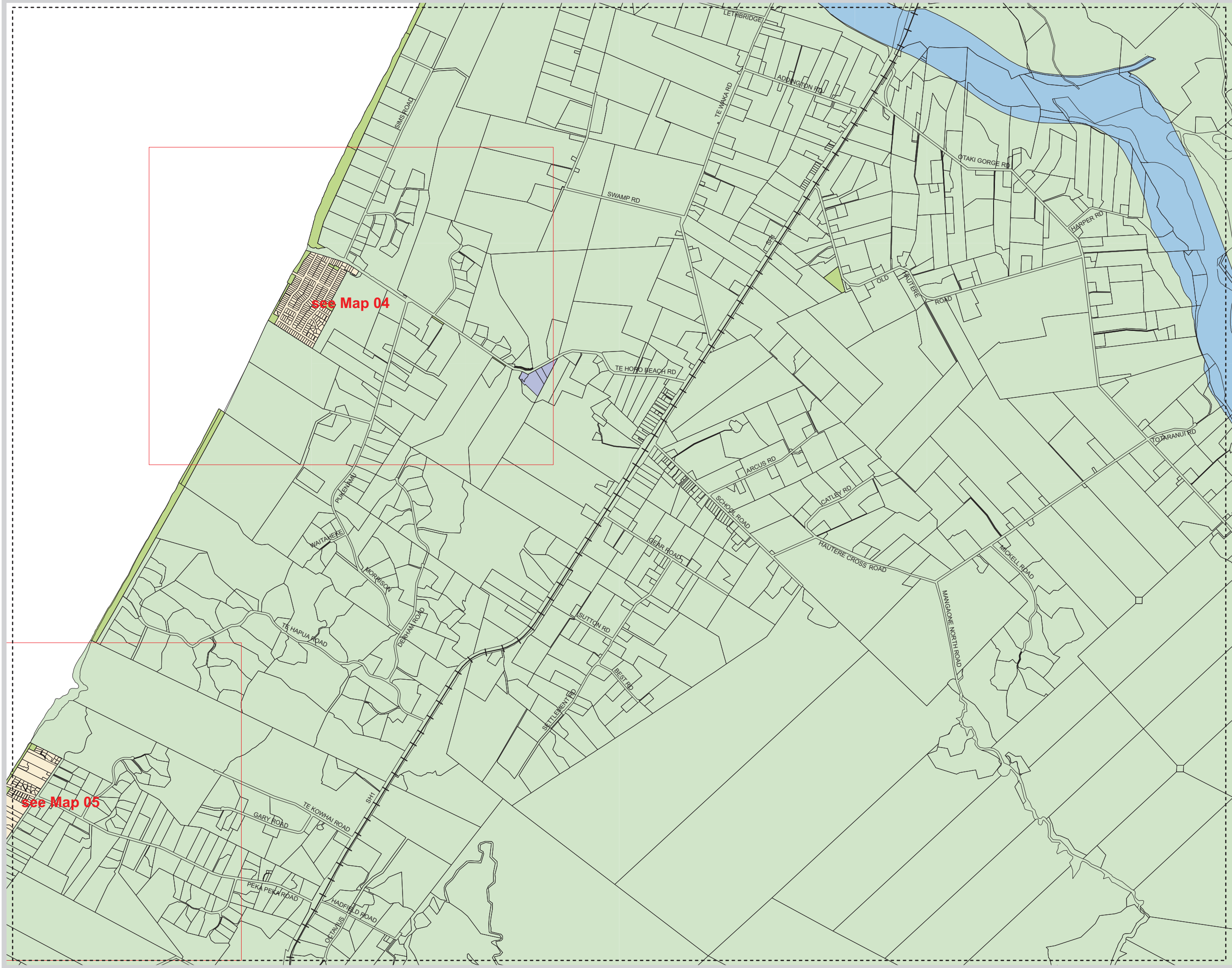
MISCELLANEOUS

- North Island
- Main Trunk
- Railway

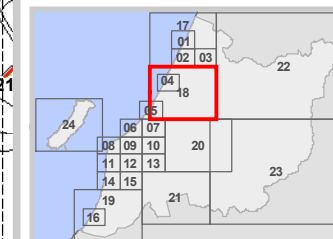
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0m 300m 600m

NORTH



Map 18 Districtwide and Urban Plan Features



LEGEND

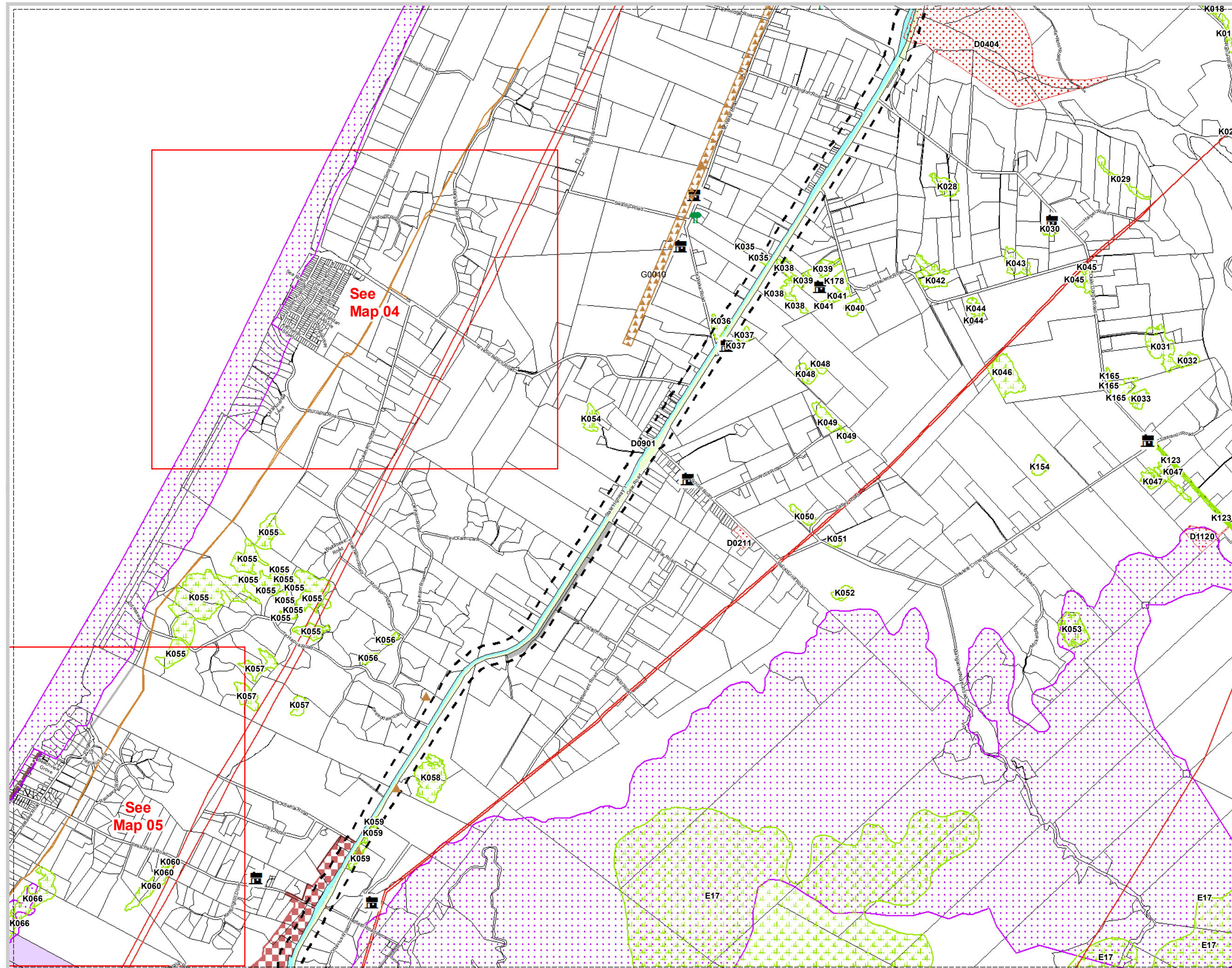
- Page Index Section 2
- General
- Railway
- SH1
- Transmission Gully
- Mackays Overbridge
- MacKays to Peka Peka Expressway

- Page Index Section 2
- Geological Site
- Geological Area
- Historic Building
- Heritage Tree
- Waahi Tapu Site
- Heritage Tree Area
- Waahi Tapu Area
- Ecological

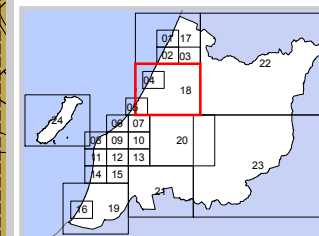
- Page Index Section 2
- Urban Visual Sensitivity Area
- Outstanding Landscapes
- Building and Earthworks Exclusion Zone
- Notional Roads
- Waikanae River Walkway
- Designation General
- 20m Building Line Restriction
- 30m Relocatable Area
- 70m Coastal Building Line
- 90m 6m Height Line
- Natural Gas
- HV Transmission Lines
- Noise Corridor

Scale 1:30,000 / A3
0 75 150 300 450 600
Meters

Last Revision:
Mackays to Peka Peka
Expressway designation
update - Aug.2015



Map 18A Plan Zones



LEGEND

ZONES

- Living Environment**
- Residential
 - Beach Residential
 - Ngarara
 - Waikanae North Development
- Working Environment**
- Airport
 - Town Centre
 - District Centre
 - Civic and Community
 - Industrial
 - Local Centre
 - Outer Business Centre
- Rural Environment**
- Rural Dunes
 - Rural Plains
 - Rural Hills
 - Rural Residential
 - Rural Eco Hamlet
 - Future Urban Development
- Open Spaces**
- Open Space (Conservation & Scenic)
 - Open Space (Recreation)
 - Open Space (Local Parks)
- Other**
- Private Recreation and Leisure
 - River Corridor

PRECINCTS

- General Precincts**
- District Centre Structure Plan Area
 - Focused Infill
 - Medium Density Housing
 - Low Density Housing
 - District Centre Structure Plan Precinct
 - Ihakara St West Precinct
 - Water Collection Area
- Airport Precincts**
- Airport Curtilage
 - Airport Core
 - Airport Mixed Use
 - Airport Heritage
 - Airport Buffer
- General Precincts (G.P.):**
1. Pekawy
 2. Peka Peka North Rural Residential
 3. Ferndale
 4. Meadows
 5. Ngarara
 6. Waikanae Golf Residential

MISCELLANEOUS

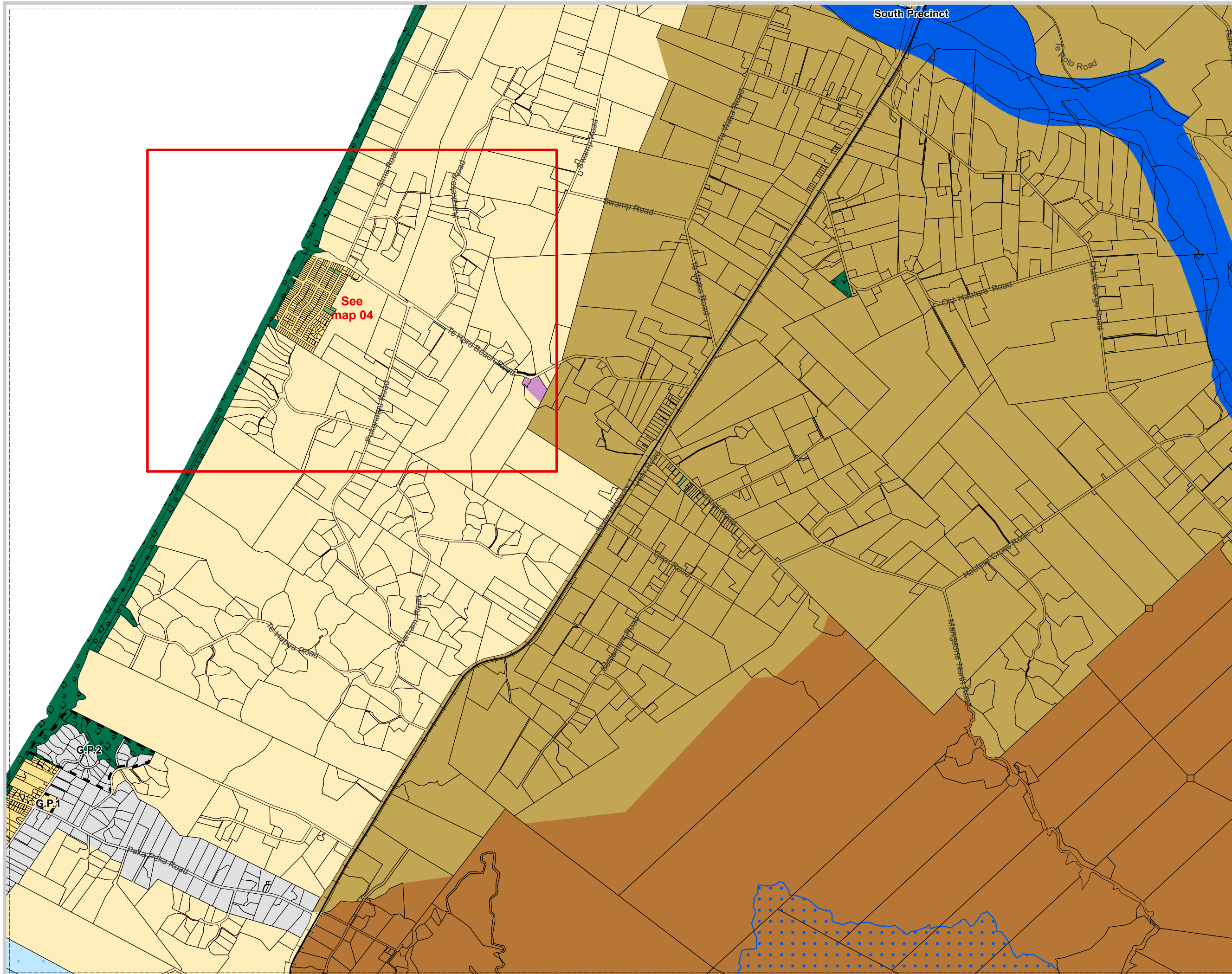
- North Island Main Trunk Railway

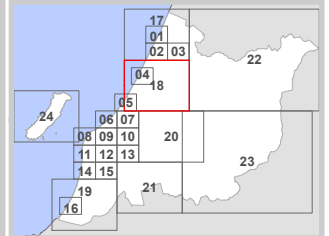
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Meters



Last Amended
Notification Date: 29 November 2012





LEGEND

DESIGNATIONS

- Designations
- MacKays Overbridge
- Railway Designation
- SH1
- M2PP Proposed Expressway Designation
- Transmission Gully 2012
- Western Link Road

HERITAGE

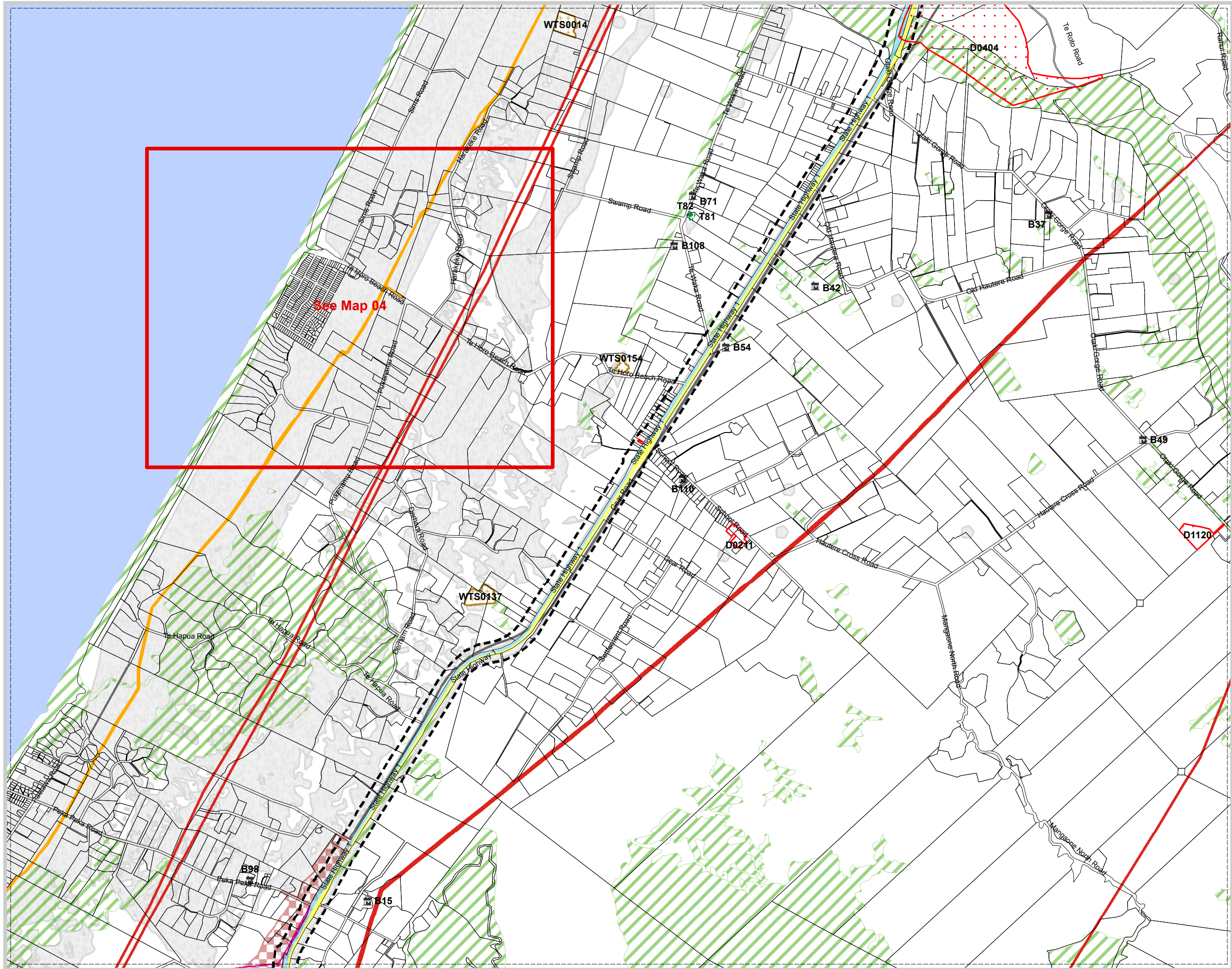
- Notable Trees
- Historic Heritage Places
- Historic Heritage Area
- Waahi Tapu
- Notable Tree Area
- Archaeological Alert

AIRPORT

- Noise Corridor
- Air Noise Boundary
- Outer Control Boundary
- Airport Noise Notification
- 45dBA Area
- 55dBA Area
- Restricted Area

MISCELLANEOUS









- HV Transmission Lines
- Natural Gas
- Otaki North Indicative Roads
- Waikanae North / Otaki North Urban Edge
- ✕ Westfield Building Exclusion Zone
- Notional Roads
- Sensitive Natural Features







Map 20
Districtwide
and Urban
Plan Zones

18		
07 10 13	20	
21		23


LEGEND

ZONES	
	Residential
	Rural
	Commercial / Retail
	Town Centre
	Industrial / Service
	Open Space
	River Corridor
	Conservation

AREAS	
	Infill Residential
	Medium Density Housing
	Low Density Housing
	

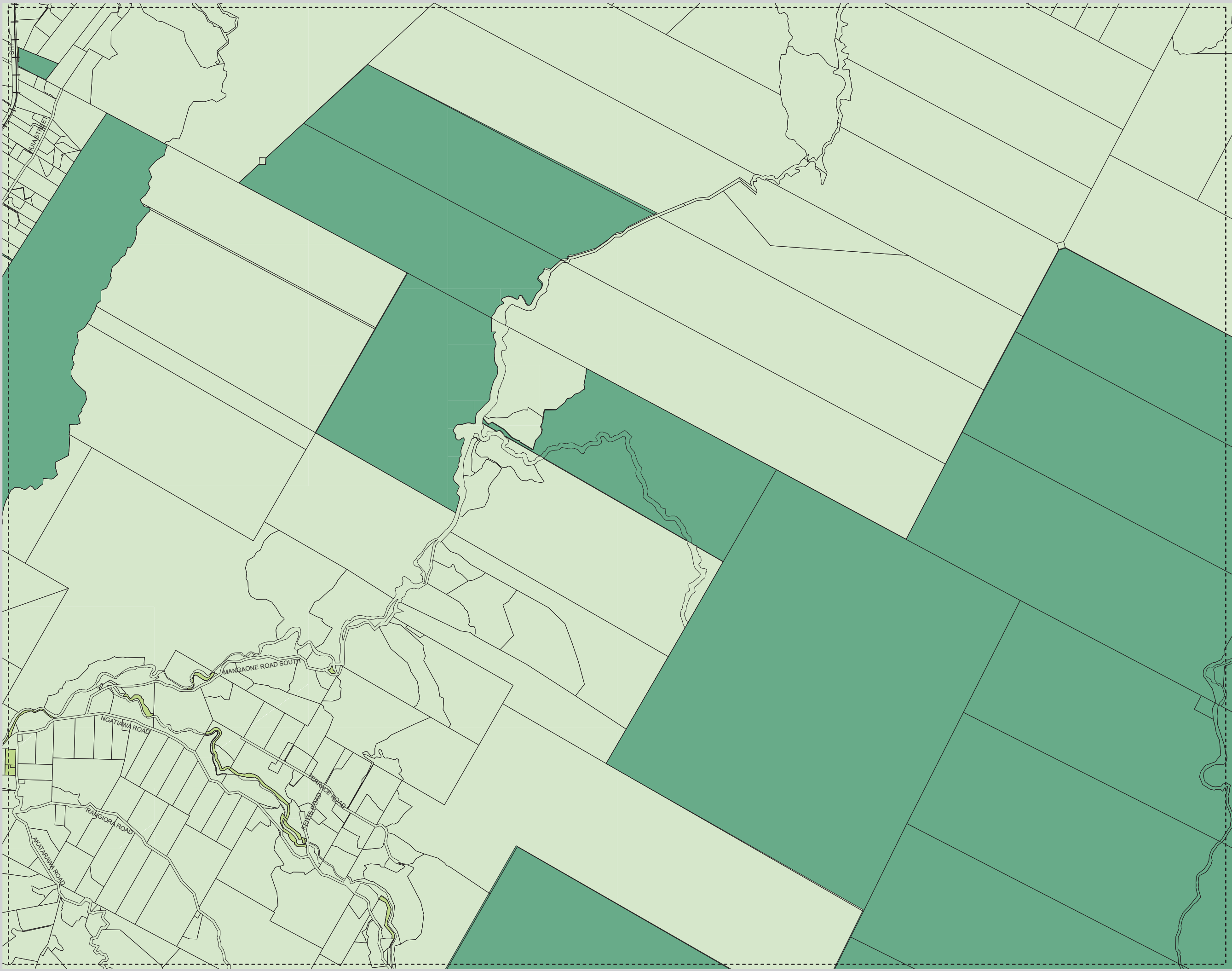
Tourist Activity Precincts:
A,B,C and D.
[See District Plan for details](#)

 General Precincts:
1. Peka Peka North
Rural Residential
Redevelopment Area
2. Pekawy
3. Waikanae Garden Area
Developments Area
4. Waikanae Golf
Residential Area
5. Ferndale Area
[See District Plan for details](#)

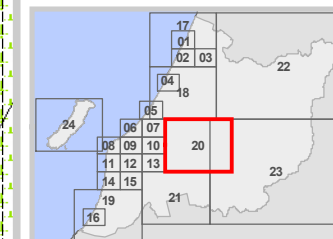
MISCELLANEOUS	
	North Island Main Trunk Railway

Scale 1:30,000 / A3
0m 300m 600m

NORTH



Map 20
Districtwide and Urban
Plan Features



LEGEND

DESIGNATIONS

- General
- Railway
- SH1
- Transmission Gully
- Mackays Overbridge
- MacKays to Peka Peka Expressway

HERITAGE

- Geological Site
- Geological Area
- Historic Building
- Heritage Tree
- Waahi Tapu Site
- Heritage Tree Area
- Waahi Tapu Area
- Ecological

MISCELLANEOUS

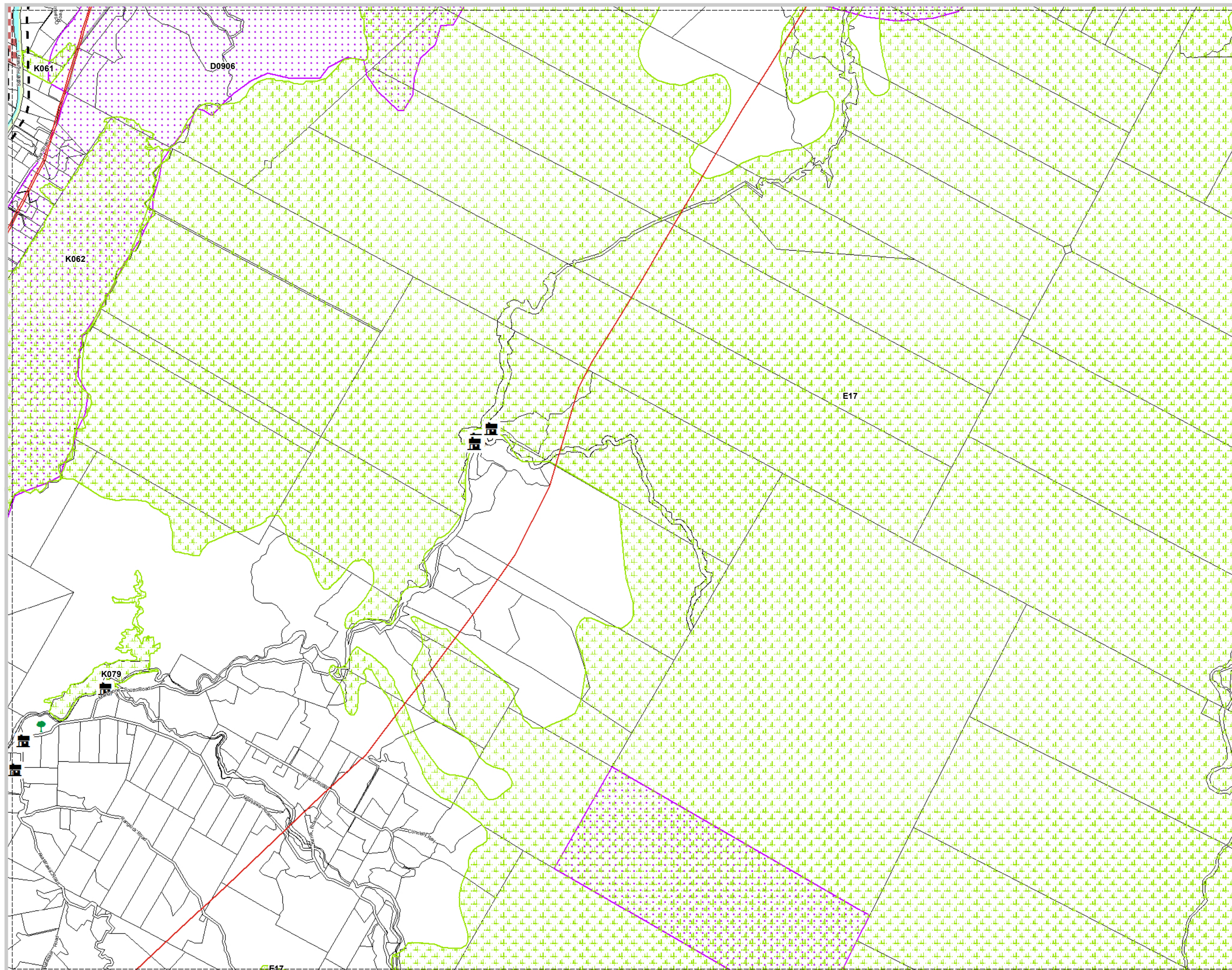
- Urban Visual Sensitivity Area
- Outstanding Landscapes
- Building and Earthworks Exclusion Zone
- Notional Roads
- Waikanae River Walkway
- Designation General
- 20m Building Line Restriction
- 30m Relocatable Area
- 70m Coastal Building Line
- 90m 6m Height Line
- Natural Gas
- HV Transmission Lines
- Noise Corridor

Scale 1:30,000/A3

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 Meters

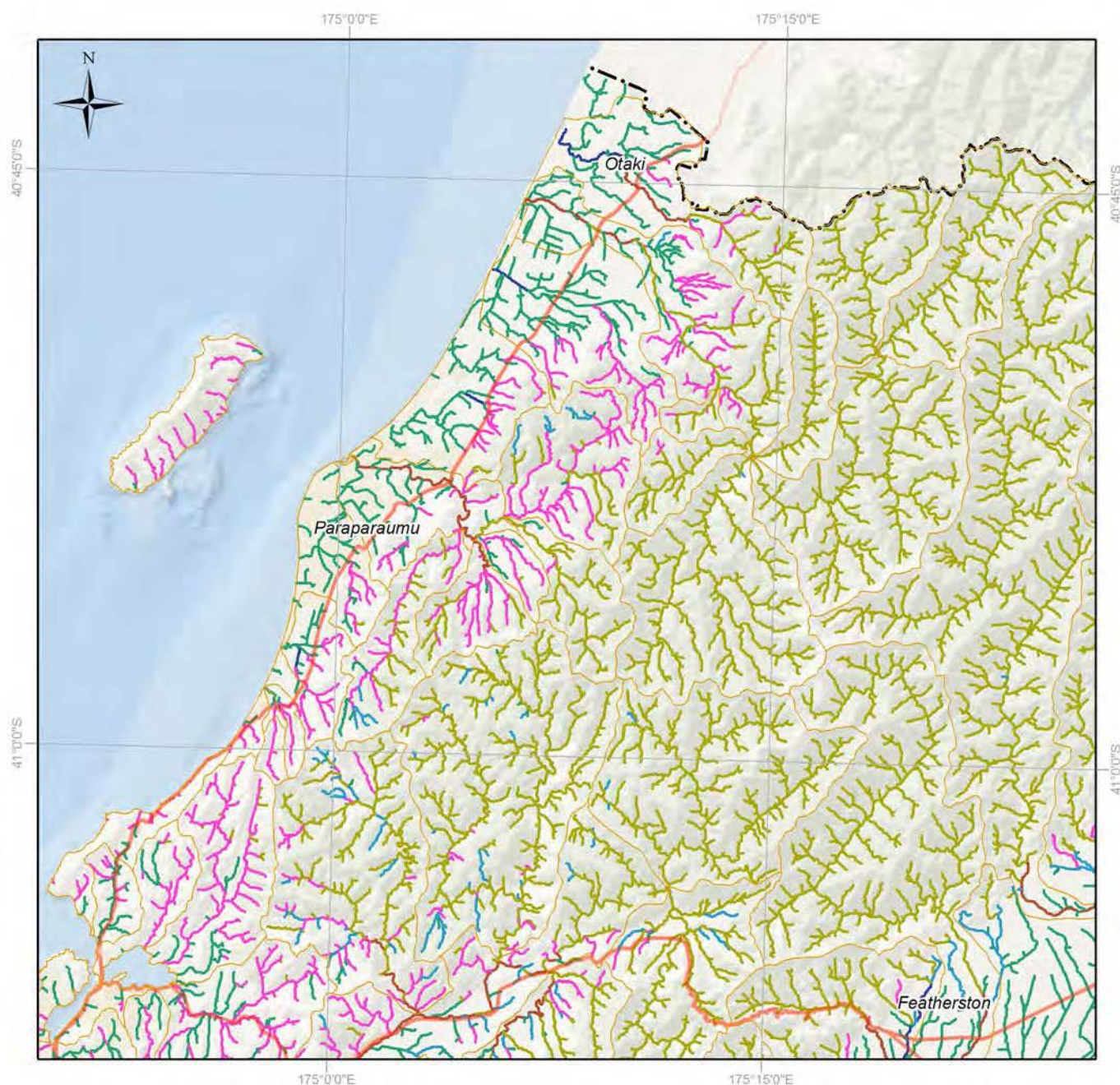


Last Revision:
Mackays to Peka Peka
Expressway designation
update - Aug.2015



Modelled river classes - Kāpiti Coast catchments (Table 3.1)

Map 21e



This version of the map is not complete. The version of this map available online through the online web map viewer shows the complete, detailed information on a GIS overlay that is not shown on this hard copy. The online version is available on the Council's website at <http://mapping.gw.govt.nz/gwrc/> (select theme Proposed Natural Resources Plan 2015) and can be accessed from the Council offices or public library.

- River class 1 — River class 4 □ Catchments
- River class 2 — River class 5 — State Highway
- River class 3 — River class 6 - - - Region boundary line

0 4 8 16
1:300,000 km

Basemap: World Oceans Base
Projection: NZTM 2000


greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Talao
Copyright
Basemap: Esri, DeLorme, GEBCO, NOAA NGDC,
and other contributors
Topographic and Cadastral: LINZ & CoreLogic Ltd



Appendix D

Operative and Proposed
Plan Maps 10A and 10B
and PNRP Map 2

Map 10
Districtwide
and Urban
Plan Zones

06	07	
09	10	20
12	13	

LEGEND

ZONES	
	Residential
	Rural
	Commercial / Retail
	Town Centre
	Industrial / Service
	Open Space
	River Corridor
	Conservation
	Waikanae North Development

AREAS	
	Infill Residential
	Medium Density Housing
	Low Density Housing

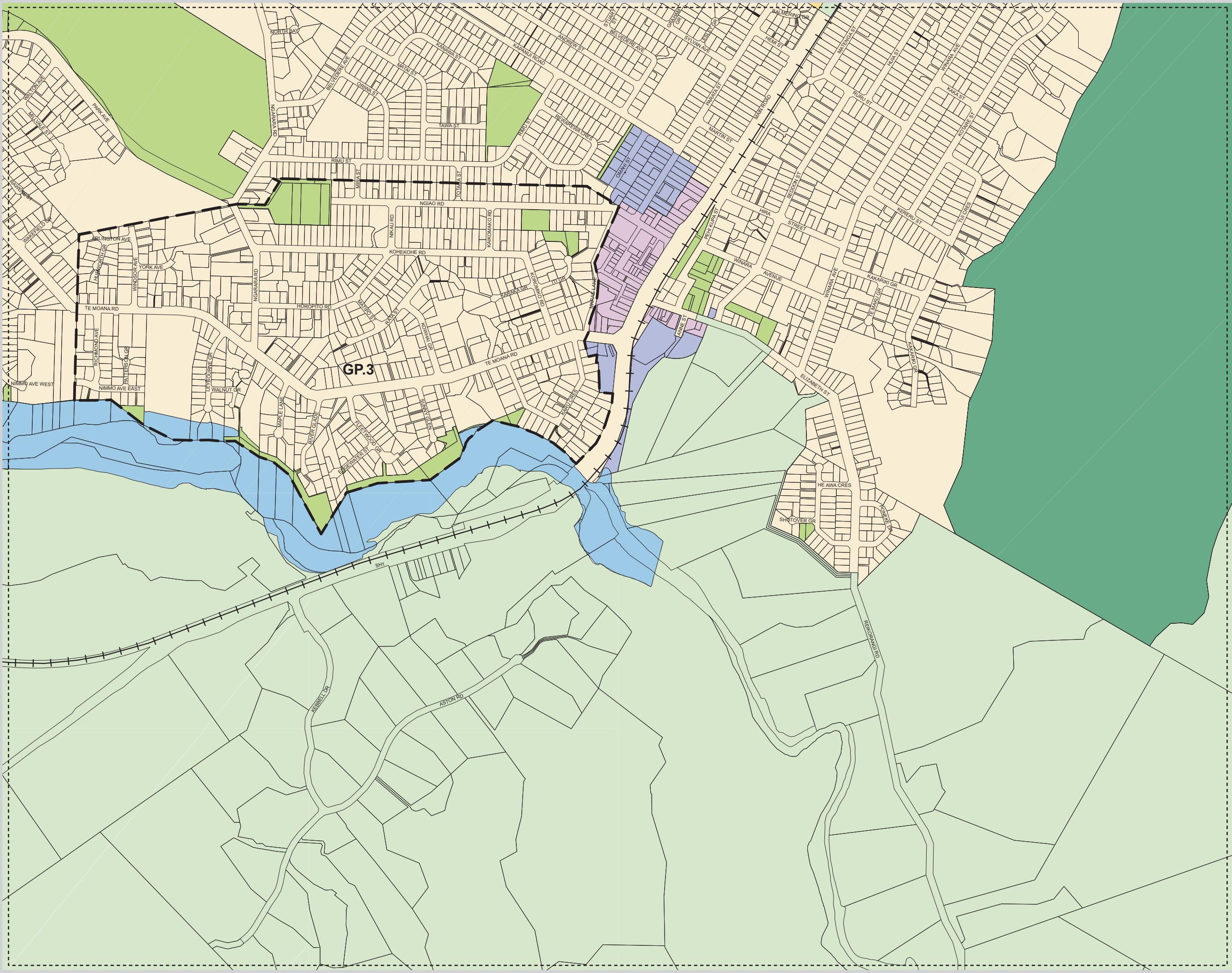
TAP....
Tourist Activity Precincts:
A, B, C and D.
See District Plan
for details

GP....
General Precincts:
1. Peka Peka North
Rural Residential
Redevelopment Area
2. Pekawy
3. Waikanae Garden Area
Developments Area
4. Waikanae Golf
Residential Area
5. Ferndale Area
See District Plan
for details

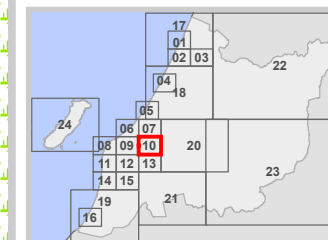
MISCELLANEOUS	
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Scale 1:10,000 / A3
0m 100m 200m

NORTH

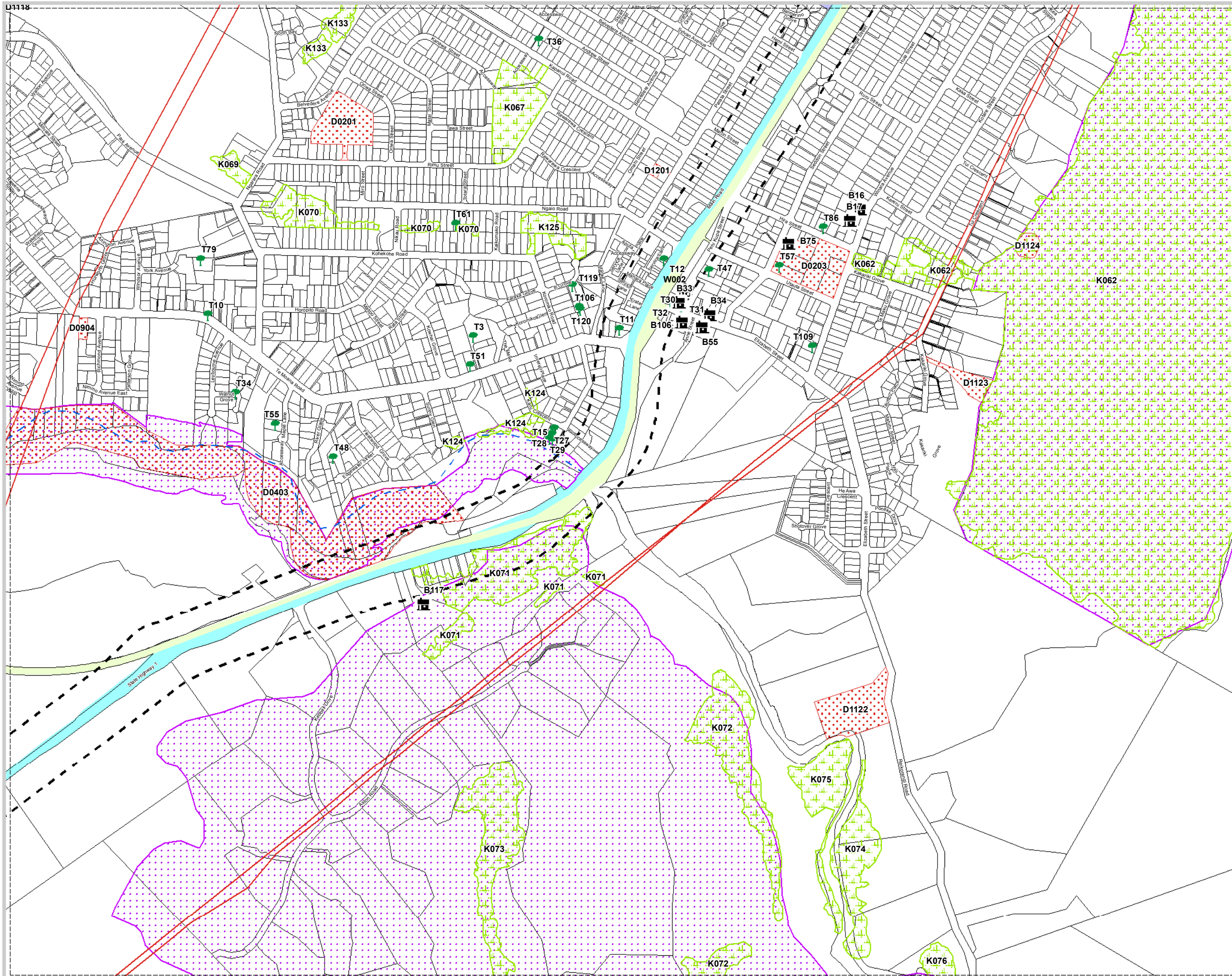


Map 10 Districtwide and Urban Plan Features

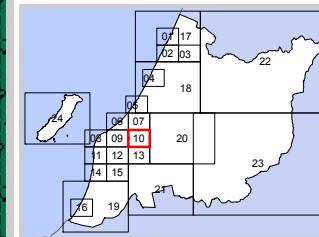


LEGEND

- DESIGNATIONS**
 - General
 - Railway
 - SH1
 - Transmission Gully
 - Mackays Overbridge
 - MacKays to Peka Peka Expressway
 - Peka Peka to Otaki Expressway
- HERITAGE**
 - Geological Site
 - Geological Area
 - Historic Building
 - HeritageTree
 - Heritage Tree Area
 - Waahi Tapu Site
 - Waahi Tapu Area
 - Ecological
- MISCELLANEOUS**
 - Urban Visual Sensitivity Area
 - Outstanding Landscapes
 - Building and Earthworks Exclusion Zone
 - Notional Roads
 - Waikanae River Walkway
 - Designation General
 - 20m Building Line Restriction
 - 30m Relocatable Area
 - 70m Coastal Building Line
 - 90m 6m Height Line
 - Natural Gas
 - HV Transmission Lines
 - Noise Corridor



Map 10A Plan Zones



LEGEND

ZONES

- Living Environment**
- Residential
 - Beach Residential
 - Ngarara
 - Waikanae North Development
- Working Environment**
- Airport
 - Town Centre
 - District Centre
 - Civic and Community
 - Industrial
 - Local Centre
 - Outer Business Centre
- Rural Environment**
- Rural Dunes
 - Rural Plains
 - Rural Hills
 - Rural Residential
 - Rural Eco Hamlet
 - Future Urban Development
- Open Spaces**
- Open Space (Conservation & Scenic)
 - Open Space (Recreation)
 - Open Space (Local Parks)
- Other**
- Private Recreation and Leisure
 - River Corridor

PRECINCTS

- General Precincts**
- District Centre Structure Plan Area
 - Focused Infill
 - Medium Density Housing
 - Low Density Housing
 - District Centre Structure Plan Precinct
 - Ihakara St West Precinct
 - Water Collection Area
- Airport Precincts**
- Airport Curtilage
 - Airport Core
 - Airport Mixed Use
 - Airport Heritage
 - Airport Buffer
- General Precincts (G.P.):**
1. Pekawy
 2. Peka Peka North Rural Residential
 3. Ferndale
 4. Meadows
 5. Ngarara
 6. Waikanae Golf Residential

MISCELLANEOUS

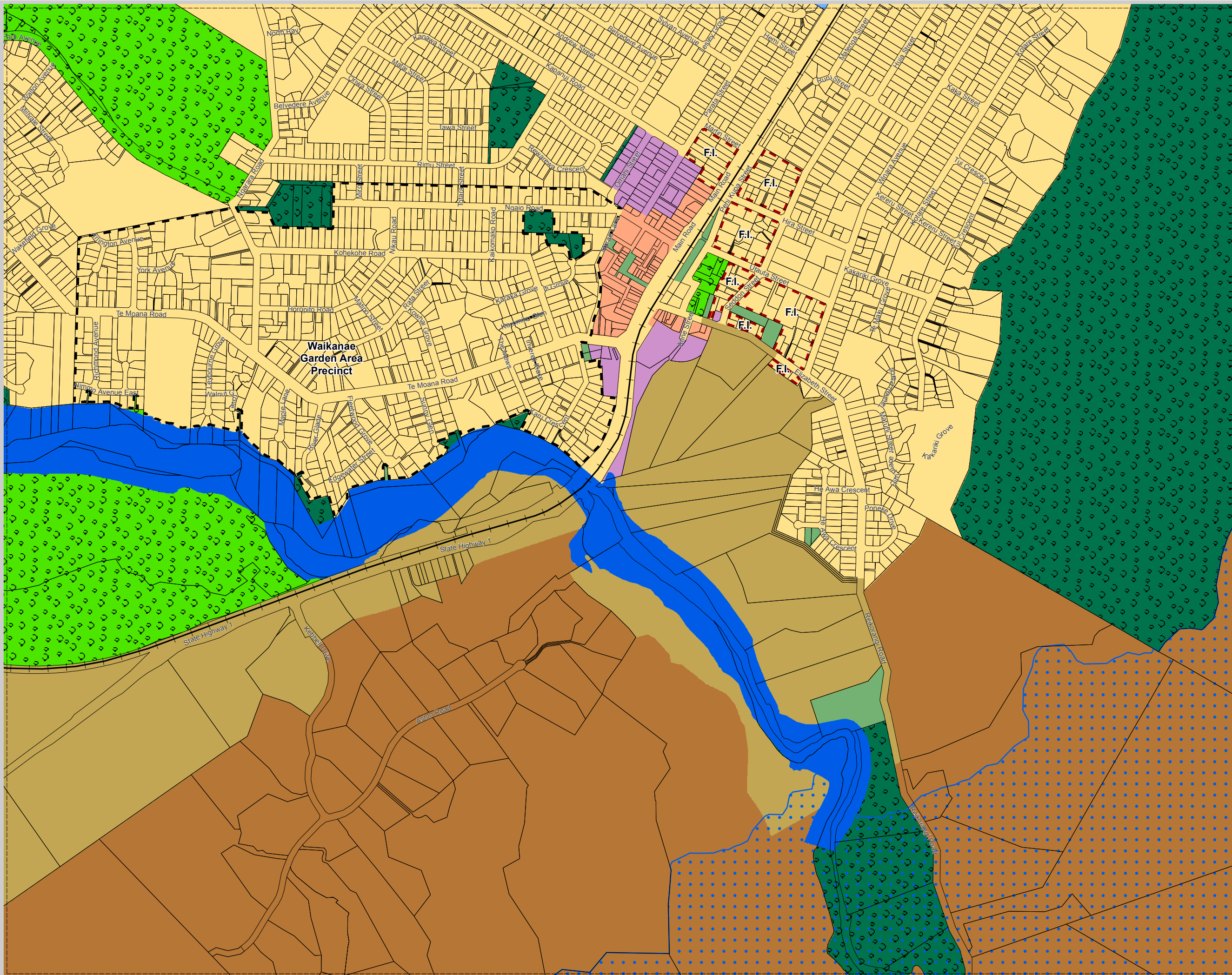
- North Island Main Trunk Railway

Scale 1:10,000 / A3

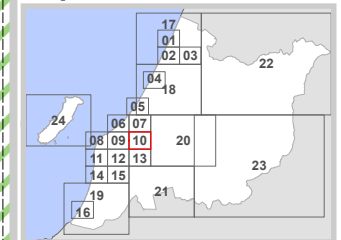
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Meters



Last Amended
Notification Date: 29 November 2012



D1118



LEGEND

DESIGNATIONS

- Designations
- MacKays Overbridge
- Railway Designation
- SH1
- M2PP Proposed Expressway Designation
- Transmission Gully 2012
- Western Link Road

HERITAGE

- Notable Trees
- Historic Heritage Places
- Historic Heritage Area
- Waahi Tapu
- Notable Tree Area
- Archaeological Alert

AIRPORT

- Noise Corridor
- Air Noise Boundary
- Outer Control Boundary
- Airport Noise Notification
- 45dBA Area
- 55dBA Area
- Restricted Area

MISCELLANEOUS

- HV Transmission Lines
- Natural Gas
- Otaki North Indicative Roads
- Waikanae North / Otaki North Urban Edge
- Westfield Building Exclusion Zone
- Notional Roads
- Sensitive Natural Features

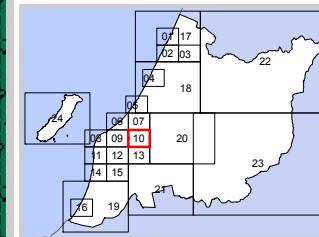
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0 25 50 100 150 200
Meters

Last Amended
Notification Date: 29 November 2012



Map 10A Plan Zones



LEGEND

ZONES

- Living Environment**
- Residential
 - Beach Residential
 - Ngarara
 - Waikanae North Development
- Working Environment**
- Airport
 - Town Centre
 - District Centre
 - Civic and Community
 - Industrial
 - Local Centre
 - Outer Business Centre
- Rural Environment**
- Rural Dunes
 - Rural Plains
 - Rural Hills
 - Rural Residential
 - Rural Eco Hamlet
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- Open Spaces**
- Open Space (Conservation & Scenic)
 - Open Space (Recreation)
 - Open Space (Local Parks)
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 - River Corridor

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 - Low Density Housing
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 - Ihakara St West Precinct
 - Water Collection Area
- Airport Precincts**
- Airport Curtilage
 - Airport Core
 - Airport Mixed Use
 - Airport Heritage
 - Airport Buffer
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 2. Peka Peka North Rural Residential
 3. Ferndale
 4. Meadows
 5. Ngarara
 6. Waikanae Golf Residential

MISCELLANEOUS

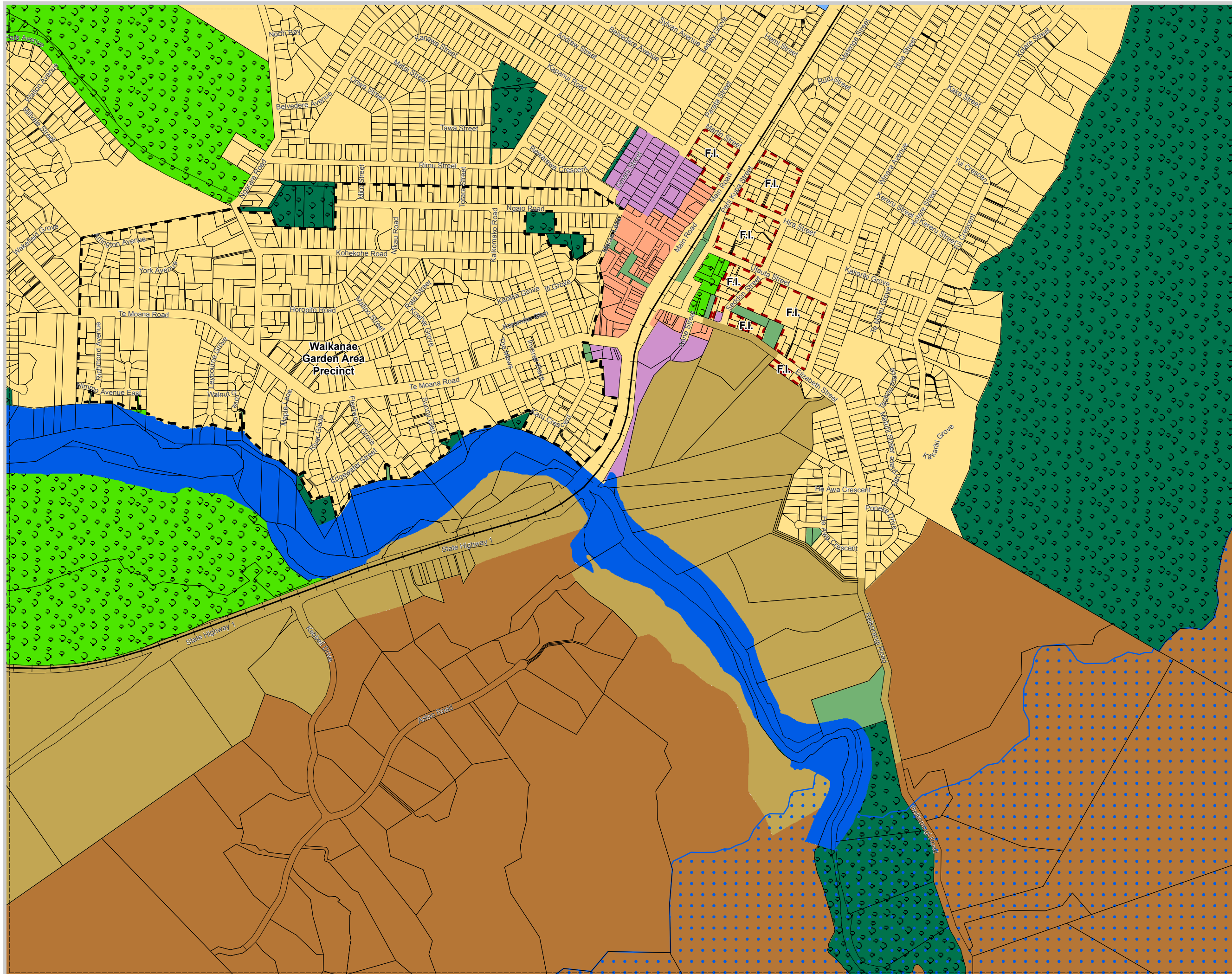
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Scale 1:10,000 / A3

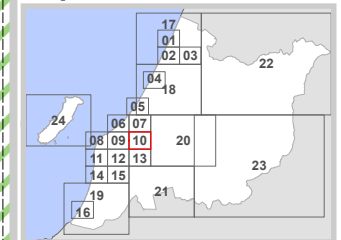
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Meters



Last Amended
Notification Date: 29 November 2012



D1118



LEGEND

DESIGNATIONS

- Designations
- MacKays Overbridge
- Railway Designation
- SH1
- M2PP Proposed Expressway Designation
- Transmission Gully 2012
- Western Link Road

HERITAGE

- Notable Trees
- Historic Heritage Places
- Historic Heritage Area
- Waahi Tapu
- Notable Tree Area
- Archaeological Alert

AIRPORT

- Noise Corridor
- Air Noise Boundary
- Outer Control Boundary
- Airport Noise Notification
- 45dBA Area
- 55dBA Area
- Restricted Area

MISCELLANEOUS

- HV Transmission Lines
- Natural Gas
- Otaki North Indicative Roads
- Waikanae North / Otaki North Urban Edge
- Westfield Building Exclusion Zone
- Notional Roads
- Sensitive Natural Features

Scale 1:10,000 / A3

0 25 50 100 150 200
Meters

NORTH
Last Amended
Notification Date: 29 November 2012

Two thin black lines intersect diagonally on the left side of the page. One line slopes upwards from left to right, and the other slopes downwards from left to right.

Appendix E

Detailed Cost Estimation Breakdown

Appendix E Detailed Capital Cost Estimation Breakdown

Hadfields Option

Ref	Description	Quantity	Unit	Rate	Total	Notes
	Investigation and design costs					
A	Road designation process (incl contingency)		Sum	Incl	\$170,000	
B	Professional fees (incl contingency)		Sum	Incl	\$200,000	
	Construction costs					
1	P & G		%	10	\$121,580.00	
2	Excavate to profile and place fill to sides incl forming of swale on uphill side	4000	m3	\$30	\$120,000	Total length x 3.0sq.m for road cut. Add allowance for batter slopes each side.
3	Prepare formation	7200	m2	\$8	\$57,600	
4	Lay Bidim geotextile full 4.0m width	7200	m2	\$6	\$43,200	Lay as a full width of roll - 4.0m wide
5	AP40 base 150mm thickness incl compacting, trimming and shaping	7200	m2	\$120	\$864,000	Lay and compact in single layer. Surface profile to falls for drainage
6	Shape to profile excavated material on both side	3600	m3	\$10	\$36,000	
7	Grass seed to the reshaped soil areas eaither side	2400	m2	\$20	\$48,000	
8						
9	Drainage - 600mm RC pipe to watercourse plus backfill with drainage metal	30	m	\$450	\$13,500	Includes excavation and profiling of watercourse to accomodate pipes, Allow for a 7.5 m length for each watercourse (3 pipe lengths)
10	Field gates	4	no	\$2,000	\$8,000	
11	Marker posts	12	no	\$250	\$3,000	Place painted marker posts at 100m centres. 100mm round timber posts 1.0m above ground
12	Culvert 4.5m wide constructed with 3x 1.5m wide concrete box culverts	1	no	\$22,500	\$22,500	

Ref	Description	Quantity	Unit	Rate	Total		Notes
	Subtotal excl investigation costs				\$1,337,380		
13	Contractors Margin		%	5	\$66,869		
14	Contingencies		%	15	\$256,107		
	Total construction costs				\$1,660,356		
	TOTAL Outturn Cost				\$2,030,356		

Goodmans Cost Estimate

Ref	Description	Quantity	Unit	Rate	Total	Notes
	Investigation and design costs					
A	Deed of Grant (Legal agreement process)		Sum	Incl	\$4,720	Cost of establishing Kiwirail agreement (allowance tbc with KiwiRail)
B	Permit to enter		Sum	Incl	\$765	Kiwirail approval for the works to proceed
C	Professional fees incl contingency		Sum	Incl	\$65,000	
	Construction Costs					
	Base schedule					
1	P & G		%	15	\$27,307.50	
2	Traffic management		Sum	Incl	\$5,000	
3	Rail Safety Observer with Electrical Safety Observer qualifications	7	day	\$700	\$4,900	Assumes KiwiRail Approved contractor provides track and electrical safety protection for work within corridor. Note work likely to have to take place within a KiwiRail Block of Line
	SH1 side					
4	Excavate to profile and cart to tip off site. Nominal 500mm depth x 4.0m width. CSA 2.0sq.m	30	m3	\$65	\$1,950	Total length x 2.0sq.m for road cut. Add allowance for batter slopes each side.
5	Prepare formation	60	m2	\$8	\$480	
6	Lay Bidim geotextile full 4.0m width	60	m2	\$5	\$300	Lay as a full width of roll - 4.0m wide
7	AP100 sub-base 0.25-1m thickness	27	m3	\$80	\$2,160	Lay and compact in two layers - allows for added depth as a ramp
8	AP40 sub-base 150mm thickness	6	m3	\$120	\$720	Lay and compact in single layer. Surface profile to falls for drainage

Ref	Description	Quantity	Unit	Rate	Total	Notes
9	150mm deep grasscrete units 4.0m wide	60	m2	\$200	\$12,000	
10	Shape to profile excavated material on both side	30	m3	\$10	\$300	
11	Provide soil to batters and grass seed and in fill to the grasscrete	60	m2	\$25	\$1,500	
12	Gate	1	No	\$2,000	\$2,000	At this stage allow for a simple steel barrier gate locked with a padlock
	Kiwirail level crossing					
13	Protection or diversion of KiwiRail cable ducts and services running alongside tracks		Item	incl	\$10,000	
14	Alterations to track to create level crossing - 4.0m width		Item	incl	\$50,000	Assume Epiflex rubber block plus asphalt level crossing
	Goodmans side					
15	Excavate to profile and cart to tip off site. Nominal 500mm depth x 5.0m width. CSA 2.5sq.m	42.5	m3	\$65	\$2,763	Total length x 2.5sq.m for road cut. Add allowance for batter slopes each side.
16	Prepare formation	85	m2	\$8	\$680	
17	Lay Bidim geotextile full 4.0m width	85	m2	\$6	\$510	Lay as a full width of roll - 4.0m wide
18	AP100 sub-base 0.25-1m thickness	85	m2	\$90	\$7,650	Lay and compact in two layers
19	AP40 sub-base 150mm thickness	85	m2	\$120	\$10,200	Lay and compact in single layer. Surface profile to falls for drainage
20	Shape to profile excavated material on both side	42.5	m3	\$5	\$213	
21	Provide soil to batters and grass seed and in fill to the grasscrete	85	m2	\$25	\$2,125	
22	2.0m high "deer fence" with single barbed wire at top	360	m	\$185	\$66,600	Along whole length from river to Bunnings

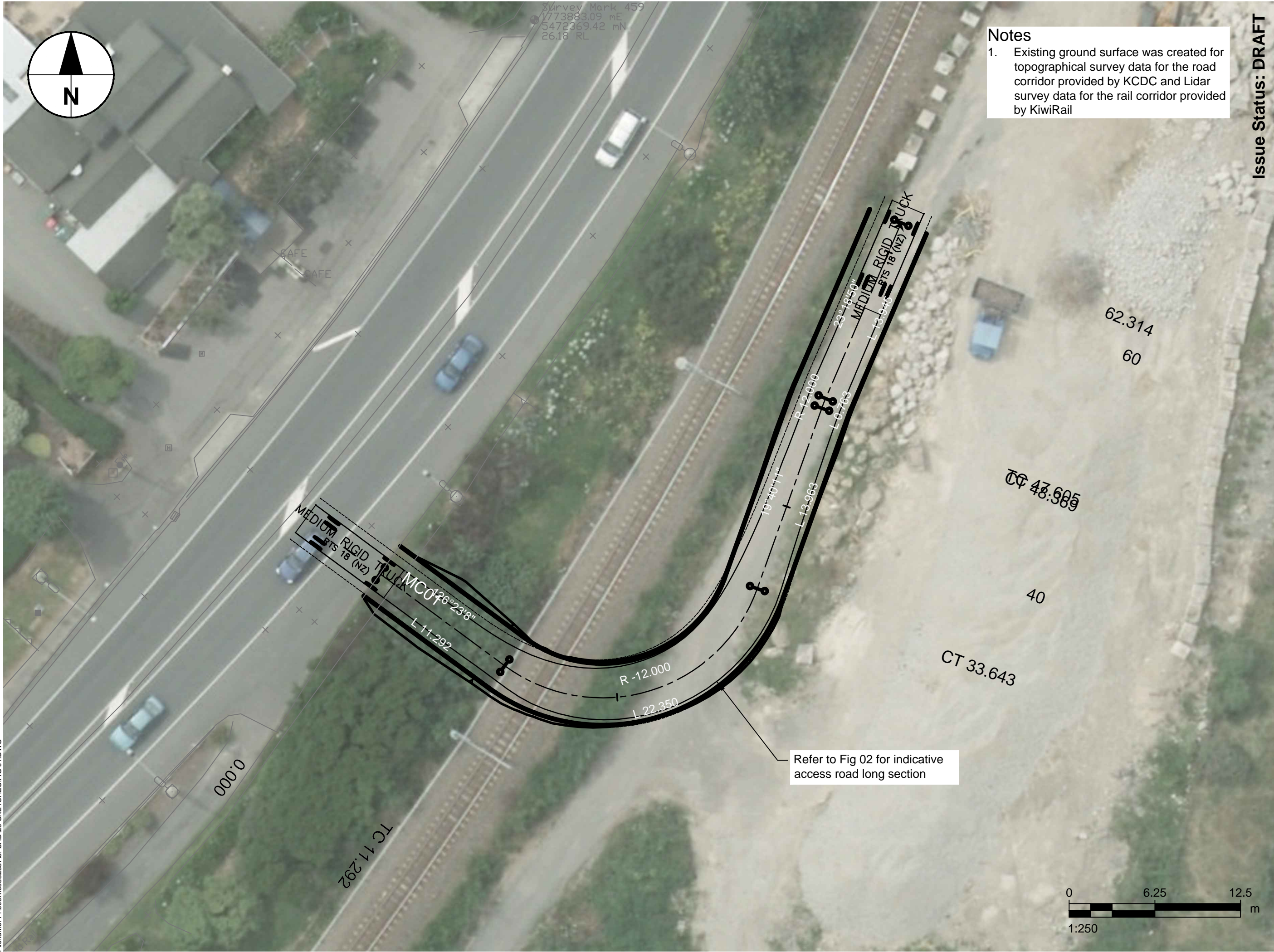
Ref	Description	Quantity	Unit	Rate	Total	Notes
	Subtotal excl investigation costs (base schedule)				\$209,358	
23	Contractors margin		%	5	\$10,467.88	
24	Construction Contingency		%	15	\$31,403.63	
	Total Constuction Costs (base schedule)				\$251,229	
	TOTAL outturn costs (base schedule)				\$321,714	
	Potential additional items					
25	P&G		%	15	\$72,308	
26	Remote Controlled powered gates option		item	incl	\$150,000	Allowance for KiwiRail telemetry system, power supply and electric gates similar to that at entrance to Goodmans site
27	Adjustments to KiwiRail overhead power lines to provide headroom		Item	incl	\$150,000	Should not be required based on swept path analysis of design vehicle
	Subtotal excl investigation costs (base schedule + additional items)				\$554,358	
28	Contractors margin		%	5	\$27,717.88	
29	Construction contingency		%	15	\$83,153.63	

Ref	Description	Quantity	Unit	Rate	Total		Notes
	Total construction costs (base schedule + additional items)				\$665,229		
	TOTAL outturn costs (base schedule + additional items)				\$735,714		

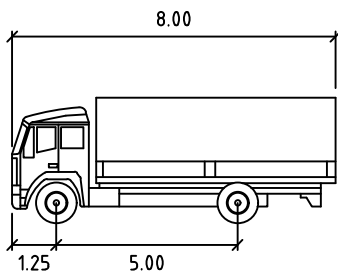
Two thin black lines intersect diagonally on the left side of the page. One line slopes upwards from left to right, and the other slopes downwards from left to right.

Appendix F

Drawings

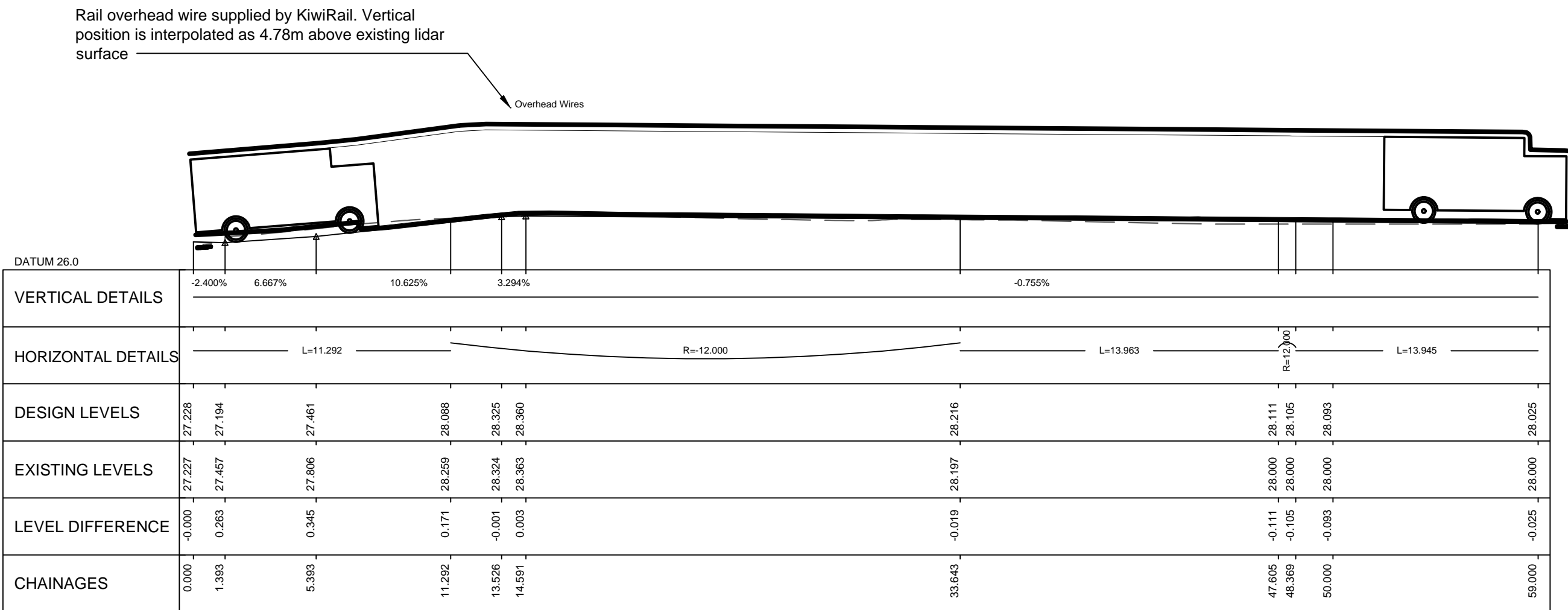


Issue Status: DRAFT

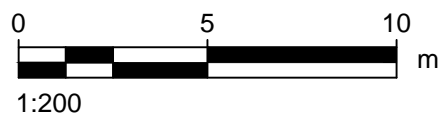


MEDIUM RIGID TRUCK
meters

Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 37.3



CONTROL LINE MC01



Issue Status: DRAFT