15 Network utilities

Overview

The Project directly affects a number of network utilities, including electricity and gas distribution, water supply, wastewater and stormwater disposal utilities. NZTA has consulted with KCDC and other network utility operators to identify network utilities that will be directly affected and how they can be protected and /or how relocation can be appropriately undertaken. The outcomes of these initial discussions concluded that all adverse effects on network utilities directly affected by the Project will be able to be appropriately avoided, remedied or mitigated.

15.1 Introduction

This Chapter identifies network utilities that are potentially adversely affected by the Project, and how they will be protected or relocated. Initial consultation with KCDC and other network utility providers has included phone conversations, letters, and meetings to discuss the Project and its potential effects on their utilities.

The NZTA have worked closely with network utility providers to seek to ensure that their infrastructure is maintained both during construction and when the proposed Expressway is operational. The process for managing protection and relocation works will be set out at a high level in the proposed Network Utilities Management Plan (NUMP) proposed as a condition of the Designation.

15.2 Existing environment – network utilities

Existing network utilities within the Project area include infrastructure for:

- electricity transmission;
- electricity distribution;
- gas transmission;
- gas distribution;
- water, wastewater and stormwater;
- telecommunications facilities;
- airports; and
- railways.

15.2.1 Electricity transmission infrastructure

Transpower's Bunnythorpe to Haywards A (BPE-HAY-A) and B (BPE-HAY-B) 220 kV lines cross the proposed Expressway alignment ("the alignment") at one point north of Smithfield Road between chainage 14900m and 15100m. The lines are carried by steel lattice towers. Two transmission towers (towers) referred to as T233 and T248 are located in close proximity to the alignment. There are no Transpower substations within the Project area or that are located near the proposed Expressway alignment.

15.2.2 Electricity distribution infrastructure

The sole electricity provider for the whole project area is Horowhenua Energy Limited (Electra). Electricity distribution infrastructure will be affected in a number of locations and will need to be protected or relocated. The network consists of above and below ground cables, typically 400V, 11kV and 33kV. None of the Electra substations are located in close proximity to the proposed Expressway alignment, with the Raumati substation being the closest at a distance of 0.5km to the east of the proposed alignment.

15.2.3 Gas transmission infrastructure

A Vector Gas (Vector) transmission pipeline corridor crosses the alignment a number of times north of the Waikanae River between chainage 11000m and 12200m. The corridor contains two pipelines being the "100Line Kapuni Pipeline" and the "601Line Kapuni – Wellington Duplication Waikanae Loop Pipeline". They are recorded to be approximately 700 – 800mm deep and are 200 - 300mm in diameter. The pipelines service the greater Wellington Region and originate from the Kapuni gas fields in Taranaki. A Vector delivery station is located on the northern banks of the Waikanae River at chainage 10700m. The delivery station is approximately 12.5m to the east of the proposed Expressway alignment, a new access way to El Rancho will also pass through the current delivery station site. As a result the delivery station will need to be relocated.

15.2.4 Gas distribution infrastructure

Vector has a gas distribution system servicing the Kāpiti urban areas, generally located in the local roads. The pipes are typically polyethlene (PE) 32-100mm nominal bore and 400 kilopascals (kPa). The pipes cross the alignment at most local road intersections and crossings along the alignment.

15.2.5 Water, wastewater and stormwater infrastructure

KCDC provides water, wastewater and stormwater services for all the urban areas on the Kāpiti Coast. These services are predominantly located in the road corridors, with the exception of approximately five wastewater pipes.

There are three critical watermains (300 – 600 mm diameter) that cross the proposed Expressway. One watermain is in Kāpiti Road and two are in Otaihanga Road. There is a wastewater pump station near the corner of Leinster Avenue and State Highway 1. The KCDC wastewater treatment plant is located approximately 53m to the east of the alignment on Flyfield Place, Otaihanga.

Wastewater services will be affected at the following locations:

- a wastewater pump station is located at the end of the Leinster Avenue at approximately chainage 3000m of the proposed Expressway (at the intersection with SH1). This pump station will be relocated clear of the alignment;
- two wastewater pipes which service the properties located at 246 and 242 SH1 cross the alignment north of Leinster Avenue between chainage 3100m and 3400m. These properties will need to be serviced by a new wastewater line;
- a gravity sewer crosses the proposed Expressway alignment in Kiwi Road at chainage 5200m. The pipe is a vital service and needs to be maintained at all times. The pipe will be replaced under the alignment to protect the service from increased soil pressure created by the proposed Expressway embankment, as well as from infiltration pressures created by the wetlands that are proposed to be built above the pipe next to the proposed Expressway in its vicinity;
- a 300mm diameter asbestos cement (AC) reticulation main is located on the north side of Kāpiti Road, which crosses just west of Arawhata Road and runs along the south side of Kāpiti Road (under the proposed Expressway alignment) to Te Roto Drive. At this point, there is a tee junction with 250mm AC reticulation main running up Te Roto Drive and a 250mm diameter AC reticulation main continuing westwards along the south side of Kāpiti Road. The existing 300mm and 250mm diameter AC water mains on the south side of the road are to be replaced with new Ductile Iron (DI) pipes under the new berm and footpath. This will likely require a short term shut-down and cut-over connection at night to be coordinated with KCDC's services department. These mains are essential services and will remain live during construction The method of protecting these essential mains will be selected during construction depending on the scale of ground improvements required in this area;
- a 100mm diameter wastewater rising main crosses the proposed Expressway alignment from the pump station at Te Roto Drive to Cypress Grove at approximately chainage 6900m. This pipe needs to be replaced with a more robust pipe where it crosses the alignment to protect against pipe rupture;
- a 150mm diameter Polyvinal Cloride (PVC) wastewater pipe currently runs northward from Flyfield Place along the west side of Mazengarb Road, reducing to a 100mm diameter pipe and crossing over to number 353 Mazengarb Road (on the eastern side). It is expected that the pipe will need to be replaced as it is not expected to have sufficient cover where it goes under the proposed alignment. It is likely to be protected by a concrete encasement as it will be at a shallow depth under the road;
- two wastewater rising mains cross the alignment to the wastewater treatment plant north of Mazengarb Road between chainage 8200m and approximately chainage 8600m. These are essential services and need to be maintained at all times. The 450mm diameter AC rising main will need to be replaced with a more robust pipe material where it crosses the alignment to protect against possible pipe rupture. The 350mm diameter PE rising main from Rauparaha pump station will need to be replaced with a more robust pipe material to protect against possible rupture. The pipe also runs through an area identified as a proposed stormwater management wetland, this pipe will need to be relocated around any wetland area to maintain access for maintenance;

- a 100mm diameter AC wastewater rising main crosses the alignment at 10700m to service El Rancho (Christian Holiday Park). This rising main will be replaced by a 125OD[123] diameter SDR11[124] PE100 risings main along the driveway, which is being lowered to pass under the alignment within an encasement pipe;
- a 450mm diameter AC sewer runs northward along Te Moana Road, and a 150mm diameter AC pipe also connects into it at a manhole located where the proposed roundabout on the southern side of the proposed Expressway alignment will be. A new replacement pipe is proposed to run along the eastern side of Te Moana Road under the Te Moana Road Interchange. To protect the pipe during construction of the interchange the pipe may need to be positioned under the road carriageway or for additional protection a stronger pipe may be used; and
- a 520mm diameter reinforced concrete gravity fed sewer crosses the proposed Expressway alignment approximately 500m east of Ngarara Road at chainage 14100m. The length of the pipe in this vicinity will be replaced to ensure it has an acceptable lifespan following the construction of the proposed Expressway.

Water services will be affected at the following locations:

- an existing 250mm diameter AC pipe runs along the west side of Mazengarb Road. Mazengarb Road will be lowered by up to 2m to go under the proposed Expressway, and therefore the pipe will be need to be replaced over a length of approximately 350m;
- The existing 100mm diameter PVC water pipe which crosses the alignment from Kauri Road at chainage 10900m will be replaced. This will be located along the El Rancho driveway which is being lowered to pass under the proposed Expressway; and
- An existing 300mm diameter unplasticised polyvinyl chloride pipe (uPVC) water supply rising main runs along Ngarara Road at chainage 13600m and supplies water to Waikanae from emergency bores in the area. This emergency supply may not be needed during the winter, although KCDC will need access to this bore over the summer months. A new 300mm diameter pipe similar to the existing pipe will be attached to the side of the Ngarara Road bridge proposed to be constructed over the proposed Expressway.

15.2.6 Telecommunications infrastructure

Telecom has a main fibre core line (i.e. the national line) that crosses the Waikanae River between the two Vector transmission lines. This line may need to be relocated for a section near the river. The main fibre core includes eight major ducts (100mm diameter). Services of a similar scale are also located in Kāpiti Road. Raumati and Mazengarb Roads have a fibre core of four major ducts.

[123] OD abbreviation for ‘outer diameter’

[124] SDR abbreviation for ‘standard dimension ratio’ (material pipe class)

Telecom, Telstra Clear and FX Networks all have services in the area that will be affected by the construction of the proposed Expressway. Their networks are a mixture of fibre optics, coaxial and copper cables, located both above and below ground.

There are eleven locations along the alignment where Telecom has underground copper and / or fibre optic lines:

- north of Leinster Avenue between chainage 3200m and 3300m;
- Raumati Road between chainage 4400m and 4500m;
- Kapiti Road between chainage 6300m and 6400m;
- Mazengarb Road between chainage 7900m and 8000m;
- Otaihanga Road between chainage 9100m and 9200m;
- south of Waikanae River between chainage 10500m and 10600m;
- Te Moana Road between chainage 11800m and 11900m;
- Ngarara Road at chainage 13600m;
- Smithfield Road between chainage 1460m and 14700;
- Ngarara Road (paper road) between chainage 16300m and 16400m; and
- Peka Peka Road at chainage 17400m.

There are ten locations along the alignment where Telstra Clear has underground copper and / or fibre optic lines:

- Leinster Avenue between chainage 3000m and 3100m;
- north of Leinster Avenue between chainage 3200m and 3300m;
- Raumati Road between chainage 4400m and 4500m;
- north of Raumati Road between chainage 4500m and 4600m;
- Kapiti Road between chainage 6300m and 6400m;
- Mazengarb Road between chainage 7900m and 8000m;
- Otaihanga Road between chainage 9100m and 9200m;
- north of Otaihanga at chainage 9700m;
- north of the Waikanae River between chainage 10700m and 10800m; and
- Te Moana Road between chainage 11800m and 11900m.

There are two locations along the alignment where FX Network telecommunications lines cross the alignment:

- Kāpiti Road between chainage 6300m and 6400m; and
- Mazengarb Road between chainage 7900m and 8000m.

15.2.7 Airport infrastructure

The Kapiti Coast Airport is located on Kapiti Road to the west of the alignment. The airport runway forks off in a triangular shape. The closest runway area is approximately 456m to the west of the alignment opposite chainage 5500m. The main airport terminal buildings are approximately 890m to the west of the alignment on Kapiti Road.

15.2.8 Rail infrastructure

The NIMT runs parallel to the existing SH1 within the Project area. The proposed Expressway will run in parallel to and in close proximity to the NIMT from MacKays Crossing northbound and will deviate away from the NIMT (arching away in a westerly direction) at Leinster Avenue at chainage 3100m. At Peka Peka Road, the proposed Expressway will return to the NIMT, to run in parallel with the railway approximately between chainage 17000m and 18000m. The proposed Expressway will not intersect the NIMT at any point. The existing rail crossing from the existing SH1 onto Hadfield Road will remain unchanged.

15.3 Assessment of effects on network utilities

The Project philosophy towards planning for existing network utilities is to avoid disruption to services, where practicable. However, given the large scale of the Project and the abundance of network utility infrastructure along the alignment, not all potential impacts can be avoided.

The intensity of network utilities near or within residential areas is typically higher than in rural or rural residential areas. In particular, the urban areas of Raumati, Waikanae and Paraparaumu have a greater number of network utilities that will be impacted by the construction of the proposed Expressway.

Concept solutions have been discussed with all affected network utility providers. The following approaches formed the basis of the Project design response:

- To seek to maintain full operation of services during construction of the proposed Expressway;
- To seek to protect existing services from potential damage caused by the proposed Expressway operation or its construction;
- To seek to protect the proposed Expressway from future damage and disruption caused by possible service failures (for example, burst water mains);
- To maintain accessibility to the services (for example, for maintenance and repairs);
- To relocate overhead services underground where they cross the proposed Expressway;

The design solutions are to be based on a like-for-like replacement of existing services: for example, new pipes and pump stations will have the same flow capacity as the existing, using materials and specifications to current standards. In some locations, the best design option was not always immediately obvious as other factors such as construction methodology, sequencing, cost, or the outcome of site investigations dictated the solution.

15.3.1 Project assumptions

With the exception of the KCDC water, wastewater and stormwater services, service providers were provided with plans highlighting the locations where their services would be affected and were asked to make the following assumptions:

- trenches within the proposed Expressway construction area will be excavated and back filled by the NZTA;
- network utility providers are to supply and install the cable/pipe in the prepared trench and make the necessary disconnections/connections; and
- the relocations will be made prior to the bulk of the earthworks.

The process for further engaging with network utility operators and exchanging information will be set out protocols in the Network Utility Management Plan (NUMP). The NUMP will include:

- protocols for liaison and information exchange between network utility providers and the NZTA;
- a process for network utility operator approval of proposed works on their utilities;
- protocols for onsite works and responsibilities for both NZTA's contractors and the network utility operator;
- protocols for utility operator design and supervision services; and
- protocols for inspections and final approval of works by network utility operators.

15.3.2 Electricity transmission infrastructure

a. Transmission lines

The Project may adversely affect the BPE-HAY-A and BPE-HAY-B 220 kV lines that cross the alignment north of Smithfield Road at chainage 15100m.

The two towers referred to as T233 and T248 are located close proximity to the proposed Expressway and the likely construction footprint creates adverse effects that relate to the maintenance and operation of the towers and / or lines. Potential adverse effects include:

- excavation will be required near two transmission towers T233 and T248 which could potentially undermine the stability of these structures. The proposed earthworks will be sufficiently separated from the towers this separation will avoid potential adverse effects. As a result it is unlikely towers T233 and T248 will need to be relocated.
- dust generated during construction could potentially settle on transmission lines and affect their integrity, the management of dust is discussed in section 15.5 below; and
- the presence of two existing towers near the eastern edge of the proposed Expressway presents a potential safety hazard. Transmission lines crossing the proposed Expressway alignment is also a safety hazard during the construction period.

The remainder of the alignment is clear from substations and transmission lines.

Transpower's high voltage transmission lines may require realignment and raising as a result of the Projects close alignment with existing towers. A further two towers (T251 & T235) may require their height to be increased to allow the Project to avoid adverse effects on the Transpower network, with specific conditions being proposed to agree necessary dust measures with Transpower, to be implemented during construction.

The NZTA has advised Transpower of the proposed Expressway alignment and potential implications for their transmission line. Transpower is currently investigating reconductoring options for both BPE-HAY-A and B lines and has acknowledged that there will be benefits to be gained by co-ordinating potential relocation of the towers with the reconductoring. Discussions on whether the two towers need to be relocated, and decisions on any other towers needing to be raised in height are on-going with Transpower. The process for carrying out works will be set out in the NUMP.

The potential adverse effects on Transpower's transmission lines are considered to be isolated to one area north of Smithfield Road where the lines cross the alignment. All adverse effects on other existing electricity transmission lines will be avoided (by relocation of the two towers identified) or adequately mitigated during the detailed design phase.

15.3.3 Electricity distribution infrastructure

Consultation has taken place with Electra to identify where the proposed Expressway will impact on its services and how these services will be maintained during construction and operation of the proposed Expressway.

Where the above ground network crosses the alignment, cables will likely be buried underground (for example, within ducting); existing below ground services which cross the alignment will require relocation or protection. Solutions for maintaining services will be incorporated into the Project and will be implemented during construction. Protocols for managing this process with Network Utility providers will be set out in the NUMP.

During construction there is potential for dust to settle on insulators which may interfere with the lines. This will be managed through use of dust suppressant which is outlined in Appendix H – Erosion and Sediment Control Plan. With implementation of the CEMP, the potential adverse effects on Electra's utilities will be avoided or mitigated to an acceptable level.

15.3.4 Gas transmission infrastructure

As outlined above Vector has a gas pipeline corridor that crosses the alignment a number of times near Te Moana Road. The corridor contains two gas pipelines which service the greater Wellington Region. Vector has been consulted with respect to the proposed Expressway design and its implications for their pipelines.

There is a delivery point station located to the north of the Waikanae River that will likely require relocating. Vector is aware that the delivery point station is currently located within the alignment. NZTA and Vector have discussed options for relocation of the pipeline and delivery point station, although a final decision on this yet to be made.

Any required protection or re-alignment of the gas pipelines and/or delivery point station is intended to be co-ordinated with the construction of the proposed Expressway. NZTA will work closely with Vector to avoid and mitigate potential adverse effects on their gas pipeline network to an acceptable level.

15.3.5 Water, wastewater and stormwater infrastructure

No particular issues are anticipated with re-alignment of these services. A number of pipes cross the proposed Expressway along the entire length of the alignment, and the NUMP will guide how these relocations are to be carried out during the construction period. Further detail on the works required is set out in section 15.2.5 above. Any potential adverse effects on local water, wastewater and stormwater systems will be avoided or appropriately mitigated to an acceptable level.

15.3.6 Telecommunications infrastructure

Telecom, TelstraClear and FX Networks have fibre optic cables that will be affected by the Project. Telecom also has copper lines which cross the alignment. NZTA has consulted with these organisations to identify the number of cables affected and options for maintaining these utilities during construction and operation of the proposed Expressway.

The options available are protection of cables where they cross the alignment, and / or realigning the cables so they are not affected. These solutions will be incorporated into the Project and will be undertaken in conjunction with proposed Expressway construction works.

Any adverse effects on telecommunications infrastructure will be appropriately avoided or mitigated.

15.3.7 Airport infrastructure

During construction of the proposed Expressway the potential for dust generation could adversely affect the operation of the Kāpiti Coast Airport. Particularly during the summer months, if not managed appropriately, dust has the potential to settle on airport facilities and interfere with aircraft and other airport equipment.

The CEMP has addressed the potential effects of dust. The potential for dust will be suitably mitigated by use of dust suppressants during the construction phase. Once the proposed Expressway is constructed there are not anticipated to be any potential dust effects. Any adverse effects from construction activities on the operation of the Kāpiti Coast Airport will therefore be avoided or mitigated to an acceptable level.

15.3.8 Rail infrastructure

As noted above, the NIMT is located in close proximity to the proposed Expressway alignment in Raumati and Peka Peka.

The operation of the NIMT could be adversely affected during the construction period. Potential effects include dust becoming airborne during excavation works as dust. Dust could settle on railway infrastructure and interfere with its operation. Dust control will be managed appropriately in accordance

with the CEMP (for example, by the use of dust suppressants). Subject to implementation of the CEMP, any adverse effects on the operation of the NIMT will be avoided or mitigated to an acceptable level.

The proposed Expressway does not cross the NIMT at any point within the Project Area. Therefore, once the proposed Expressway is operational there will be no adverse effects on the operation of the Rail corridor.

15.4 Measures to avoid, remedy or mitigate actual or potential adverse effects on network utilities

The actual and potential adverse effects on network utilities are likely to occur during construction of the proposed Expressway. A number of the utility services that cross the proposed Expressway alignment have not had potential relocation plans finalised (i.e. the Vector distribution pipe and Transpower towers) these agreements are to be completed prior to construction of the proposed Expressway.

Potential construction effects identified above in sections 15.3 would be managed by the CEMP. The NUMP will also be used to set out the process of undertaking the works. This document does not intend to directly provide mitigation of effects, but is more concerned with operational activities.