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50 PUKEKOHE EAST ROAD & 47
GOLDING ROAD, PUKEKOHE
PRIVATE PLAN CHANGE

INFRASTRUCTURE REPORT

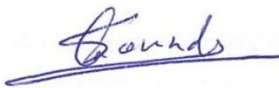
50 Pukekohe East Road & 47 Golding Road, Pukekohe – Private Plan Change | Infrastructure Report

Dear Omac Ltd. & Next Generation Properties Ltd.,

Thank you for the opportunity for Civix to provide an infrastructure report to support the proposed 50 Pukekohe East Road & 47 Golding Road, Pukekohe – Private Plan Change. This report and the associated drawings, details, and appendices detail the required infrastructure to support the private plan change and rezoning.

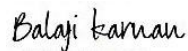
Please do not hesitate to contact us if you have any questions on this report,

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Appendices:

- Appendix A – Auckland Unitary Plan Zoning
- Appendix B – Geotechnical Desktop Study
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- Appendix D – Concept Development Masterplan
- Appendix E – WaterCare Early Engagement Consultation Review
- Appendix F – Cut and Fill Plan
- Appendix G – Tuflow 100YR Flooding Results and Flood Modelling Methodology
- Appendix H – Stormwater Management Plan
- Appendix I – Wastewater Servicing Plan
- Appendix J – Counties Energy Letter

Link to the appendices:

https://civixlimited-my.sharepoint.com/:f:/g/personal/balaji_civix_co_nz/EmvAY8D9my5JlwcOtF4TWxUBzXuMJEv9brioDMur2cElSw?e=ib6JpV

Executive Summary

Civix Ltd is a Planning, Surveying and Engineering company assisting Omac Ltd. & Next Generation Properties Ltd. with a proposed Private Plan Change Application (the “**application**”) under the *Auckland Unitary Plan Operative in part (10 September 2021)*, referenced as the “**AUP**”. The land subject to this application is located in Pukekohe with the listed addresses of 50 Pukekohe East Road and 47 Golding Road.

The proposal is to seek a Private Plan Change to rezone the land within the identified sites, from Future Urban Zone to primarily Residential – Mixed Housing Urban Zone. Sufficient land will be zoned for reserves (or protected via covenant) and public roading will be included to establish a logical and efficient street network. Refer to Appendix A - Auckland Unitary Plan Zoning.

This report outlines earthworks, roading, stormwater, wastewater, water supply, power and communications infrastructure including the necessary upgrades to support development in accordance with the proposed precinct provisions. A summary of the report is outlined below:

- Soil and Rock Consultants provided a geotechnical assessment report to be submitted with this report as part of the plan change application. The report identified a number of geotechnical considerations and concluded that the site is considered to be geotechnically suitable for the extent of development enabled by the proposed plan change. Refer to Appendix B - Geotechnical Desktop Study.
- Site specific sediment and erosion controls consistent with Auckland Councils Guideline Document 2016/005 (GD05) will be sufficient to protect the surrounding environment during Bulk Earthworks.
- The design of the roading networks will be carried out in accordance with Austroads Design Manual and the Auckland Transport Cop and TDM with a speed environment are intended to be 30km/h for local roads and 40km/h for the Collector roads.
- Existing watercourses will be retained and upgraded, with stormwater outfalls recharging watercourses, and overland flow paths will allow conveyance of 1 in 100 year storm event runoff into the Whangapouri Stream catchment, generally expected to be channeled via Road Reserves.
- ‘SMAF1 - Retention (5 mm) and detention (95th percentile) measures should be implemented for stormwater runoff for roof areas for all dwellings via tanks with non-potable reuse. Retention is not feasible for public roads, COALs and driveways. This solution has been chosen as it is the SMAF 1 specified outcome, which is the most restrictive outcome and will achieve equivalent hydrology (infiltration, runoff volume, peak flow) to pre-development (grassed state) levels for the dwellings.
- There is sufficient capacity to service the site with public infrastructure for wastewater, stormwater, and water supply, which can be achieved through existing and proposed infrastructure.
- Counties Energy have been contacted to confirm availability of supply within the vicinity of the site to service the site for power reticulations and a response is awaited, although we do not anticipate any servicing issues. Similarly, Chorus have been contacted to confirm network capacity, and although a response is yet to be received, we do not anticipate any servicing capacity issues. Refer to Appendix J – Counties Energy Initial Assessment Letter provided for the proposed neighbouring western site Golding-Birch Private Plan Change (Plan Change 76) for further details.

1. Existing Site Description

The Plan Change Area totals approximately 27.23 hectares and is located southeast of the Pukekohe township (refer to Figure 1 below). It is bound by Pukekohe East Road to the north, Golding Road to the west.

Below is a table of all the properties affected by the Proposed Plan Change (date sourced – 02/11/2021):

Property Address	Legal Description	RT Number	Title Area	Registered Owner(s)
50 Pukekohe East Road, Pukekohe, Auckland 2677	PT ALLOT 15 Parish Pukekohe District	NA903/239	18.1881 Ha	
47 Golding Road, Pukekohe, Auckland 2677	Lot 1 DP 392968	372520	9.0420 Ha	

A copy of the record of titles for the parcels forming the plan change area have been included in Appendix C of this report.

The subject site is comprised of moderately sloped farmland with one dwelling located in the north-west corner and another to the southwestern corner of the site. One dwelling to the northwest is accessed from Pukekohe East Road and the others from Golding Road via their individual access driveways.

There are several gullies and overland flow paths (OLFP's) generally traversing in an east-west direction. There is a permanent stream running from the south-east end to the north-west ends of the site. Two smaller streams join this stream, one from the northeast and one from the east.

All natural permanent stream areas (approximately 5.4hectares) will be retained and areas (approximately totalling 3.1hectares) immediately adjacent to these streams will be designated as public open space and drainage reserves.

(Refer to Figure 2 below for plan change area and refer to Appendix D – Plan Change Concept Masterplan)

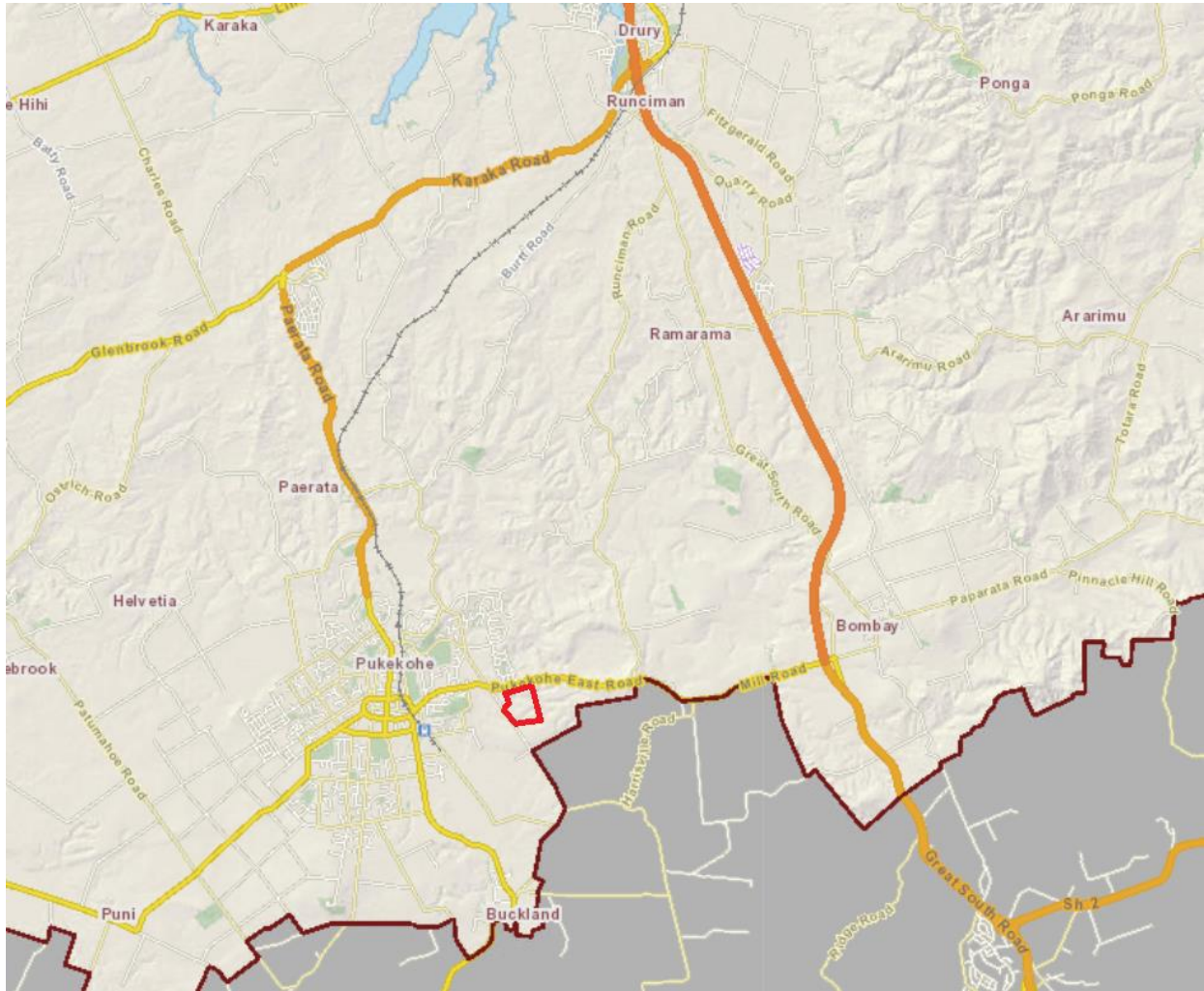


Figure 1 – Site Locality Plan



Figure 2 – Golding-Pukekohe East Private Plan Change Area

2. Proposal

The proposed Plan Change, and precinct provisions will enable residential development in the order of 580 new residential dwellings within a developable area of approximately 12.7ha, comprising of a mixture of standalone housing, terraced and duplex housing. In addition to the residential aspect, the site contains wetlands and streams (approximately 5.4ha) which are to be protected via the existing Chapter E Auckland-wide provisions of the Unitary Plan along with precinct provisions which reference a precinct plan showing drainage reserve areas (approximately 2.5ha) with a minimum 10m riparian buffer to the wetlands and streams and includes requirements for riparian planting plans and stormwater management devices. A public open space is also proposed (giving opportunity to have recreational facilities incorporated into the landscape design) surrounded by riparian planting and streams (approximately 0.6ha).

The Master Plan is designed to integrate with the plan change to the west (Plan Change 76) including a collector road linking Pukekohe East Road, Golding Road, and Birch Road to the south-west. The combined master plan is shown in Appendix D – Concept Development Masterplan Combined. A shared path is also proposed through the site running centrally alongside the watercourse and riparian margin from west to east and to the north of the Public Open Space Reserve to the east of the area.

The full extent of the proposed Plan Change Area has been modelled in 3d to ensure compliant road grades are achievable across the development and ensure levels and grades for the proposed lots are feasible. The masterplan has undergone multiple revisions to ensure the future development of roading and lots are structured in an efficient manner and are feasible to construct. Refer to Figure 3 below and Appendix D – Concept Development Masterplan.

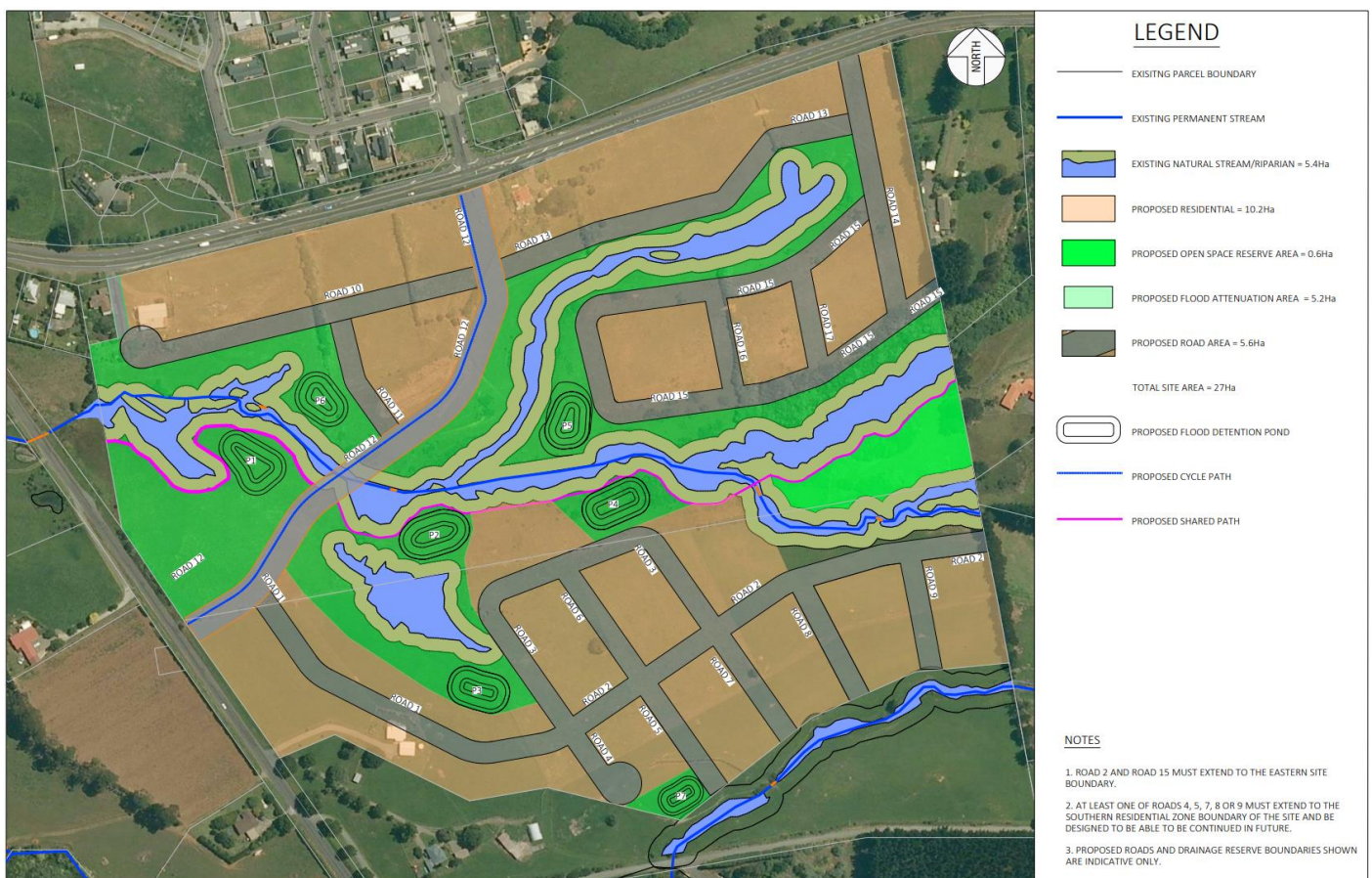


Figure 3 – showing Concept Development Masterplan

3. Earthworks

3.1. General

The proposed development of the plan change area will require bulk earthworks and recontouring across the site to improve contours to satisfy the design and layout requirements for the development. Bulk earthworks will be required for the construction of the proposed roading network and to provide suitable building platforms for the lots.

3.2. Ground Investigation

A geotechnical desktop assessment has been undertaken by Soil and Rock Consultants in support of the proposed plan change. The geotechnical assessment reviewed the suitability of the site for residential development and details the sites geology and subsurface conditions. The report identified a number of geotechnical considerations and concluded that the site is considered to be geotechnically suitable for the extent of development enabled by the proposed plan change. Refer to Appendix B - Geotechnical Desktop Study. A detailed geotechnical investigation should be carried out to further investigate hazards identified, and any recommendations stemming from this should be observed during all detailed design works.

3.3. Cut Fill

Bulk earthworks will need to be undertaken in accordance with NZS 4404, and Auckland Council Standards. Regional and district Land Use Consents will need to be obtained from Auckland Council.

A concept Cut and Fill earthworks plan has been produced to give an idea of the likely earthworks extent and possible depths of cut and fill required. Refer to Cut Fil table below and to Appendix F - Cut and Fill plans for further details.

Table 1 Cut Fill Table

EW ID	UNITS	EW01	EW02	EW03	EW04	TOTAL
AREA	m ²	54,914	5,896	103,385	107,353	271,549
CUT	m ³	1,673.1	0.0	254,440.4	284,777.8	540,891.3
BULK TOT. CUT	m ³	1,673.1	0.0	254,440.4	284,777.8	540,891.3
MAX. CUT DEPTH	m	2.6	0.0	11.1	11.3	25.0
FILL	m ³	2,045.2	0.0	11,133.1	9,710.5	22,888.8
FILL +15% BF.	m ³	2,351.9	0.1	12,803.1	11,167.1	26,322.1
BULK TOT. FILL	m ³	2,351.9	0.1	12,803.1	11,167.1	26,322.1
BULK CUT OFFSITE	m ³	-	-	-	-	514,569.2
BULK CUT TO FILL	m ³	-	-	-	-	26,322.1
BULK FILL IMPORT	m ³	-	-	-	-	0.0
BULK TOT. VOL.	m ³	4,025.0	0.1	267,243.5	295,944.9	567,213.5
MAX. FILL HEIGHT	m	3.6	0.0	4.2	3.9	11.6
BULK TRUCKS	Trucks	-	-	-	-	85,762
TOPSOIL TOT. PLACE	m ³	12,355.8	1,326.6	23,261.7	24,154.5	61,098.6
TOPSOIL TOT. VOL.	m ³	12,355.8	1,326.6	23,261.7	24,154.5	61,098.6
TOPSOIL TRUCKS	Trucks	-	-	-	-	10,183
EW TOT. VOL.	m ³	16,380.7	1,326.7	290,505.2	320,099.4	628,312.0
EW TOT. TRUCKS	Trucks	-	-	-	-	95,945

Existing Surf. is finished ground level

Proposed Surf. is Finished Surface

3.4. Erosion and Sediment Control

All earthworks within the Plan Change Area will be supported by erosion and sediment control measures to ensure all adverse effects are mitigated. Proposed measures for erosion and sediment control will be designed in accordance with Auckland Council Guideline Document GD005 – Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region.

Based on the size of the development and likely volume of earthworks involved, the earthworks will need to be staged, with completed areas progressively stabilised throughout the earthworks phase.

The general principles to be used during the earthworks phase will be based on erosion and sediment control plans to be prepared for any future resource consent application. The general principles to be used as part of the erosion and sediment control plan are likely to include the following items:

- Ensure the contractor undertaking the earthworks understands all requirements on the approved erosion and sediment control plan and approved resource consent decision prior to commencing works on site.
- Stage earthworks where possible to allow completed areas to be progressively stabilized.
- Divert all clean water runoff away from the site where possible to help reduce catchment sizes for the open earthwork catchments.
- Divert dirty water runoff from the works areas to the sediment control devices prior to discharging into the downstream environment. Consider a treatment train approach adjacent to high-risk environments like streams.
- Install appropriate stabilized construction entrances into the development to ensure sediment is not discharged onto the public roads.
- Undertake regular inspections and maintenance on all erosion and sediment control devices to ensure they are always performing to their maximum potential.
- Review the erosion and sediment control devices design, catchments, and appropriateness as the works progress, and make any changes (approved by Auckland Council) required to ensure they are performing as intended.

4. Rooding

In order to service the proposed development enabled by the plan change, a new public road network will be required throughout the plan change area. The new rooding network is designed to integrate with the plan change to the west (Plan Change 76) including a collector road (labelled as Road 12 in the Concept Masterplan in Appendix D) connecting Pukekohe East Road, Golding Road, and Birch Road to the south-west.

Using the current masterplan as an example, the road reserve widths will likely adopt the following widths as set out in the below table:

	Road Reserve Width	Carriageway Width	Footpath Widths
Local Road	16.0m	6.0m	1.8m
Collector Road	21.0m	7.0m	1.8m
Arterial Road	25.0m	tbc	1.8m

It is expected that the following existing road upgrades will be required when the next stages of development occur:

- Pukekohe East Road – upgrade the sites frontage to an Arterial Road standard. Any land take required to achieve this will be determined by using the current centreline of Pukekohe East Road and offsetting half of the total road reserve width, i.e., offset 12.5m and this line would be the required road reserve boundary along the site’s frontage, as it is unlikely the existing carriageway cross-section will change based on the existing layout.
- Golding Road – upgrade the carriageway and sites frontage to a Collector Road standard. The center of the existing road reserve will become the center of the carriageway and then offset 11.5m towards the development frontage to set the road reserve boundary.

Footpath widths are likely to vary depending on the road typology, with a minimum 1.8m width expected in accordance with Auckland Transport TDM standards, with some roads including separated cycle paths. Underground services will generally be installed in the berms of the proposed roads and the carriageways will be utilised to convey the overland flow paths for 1 in 100-year storm event. On-street parking will also be provided with the inclusion of parking bays adjacent to the carriageway.

The geometric design of the proposed road network and upgrades to the existing network will be carried out in accordance with the Austroads Design Manual and the Auckland Transport Cop and TDM.

The speed environment for the new local rooding design is intended to be 30km/h with a number of traffic calming measures included in the design and 40km/hr for the collector roads. These will include speed tables, kerb narrowing’s, etc.

5. Flooding & Stormwater

Please refer Appendix G - Tuflow 100YR Flooding Results and Flood Modelling Methodology for details on Flooding and Appendix H - Stormwater Management Plan for this development.

6. Wastewater Servicing

6.1. Existing

Council Geomaps indicates the site has no wastewater network.

6.2. Proposed Connection to the Site

The entire wastewater catchment will flow towards the lowest point on the west of the site in line with the new collector road to a connection point just east of Golding Road/site boundary. The line then crosses under Golding Road as part of the proposed network on adjacent site (19 Golding Road) where new reticulation is proposed including a new pump station under a separate private plan change as described below.

The Golding-Birch Private Plan Change (Plan Change 76) catchment required a new local wastewater pump station located at the lowest point in their catchment (shown as location number 5 in Figure 4 below). With wastewater flows being then pumped-up a rising main to the high point located approximately at the intersection of Ngahere Road and Birch Road, where it is to then flow via a new gravity network down Birch Road and connect into the new 800mm diameter transmission gravity network proposed by others. The 800mm gravity main will connect into the existing gravity main located within the Pukekohe Park Raceway where it discharges into the existing Buckland Road Transmission Pump Station. It is anticipated that the wastewater pump station proposed within PC76 area will be designed and built to accommodate the future wastewater flows from the Future Urban Zoned land which includes the subject (Golding-Birch proposed private plan change) catchment as well.

Watercare has an approved business case for Isabella Pump Station and gravity main from Cape Hill inlet pipe to Isabella Rd Pump Station in order to decommission Cape Hill PS. No improvement/relocation is proposed in Franklin Pumpstation. Watercare's intention is to deliver these works by mid-2025. Refer to Wastewater Servicing Catchment Boundary in Appendix I for details.

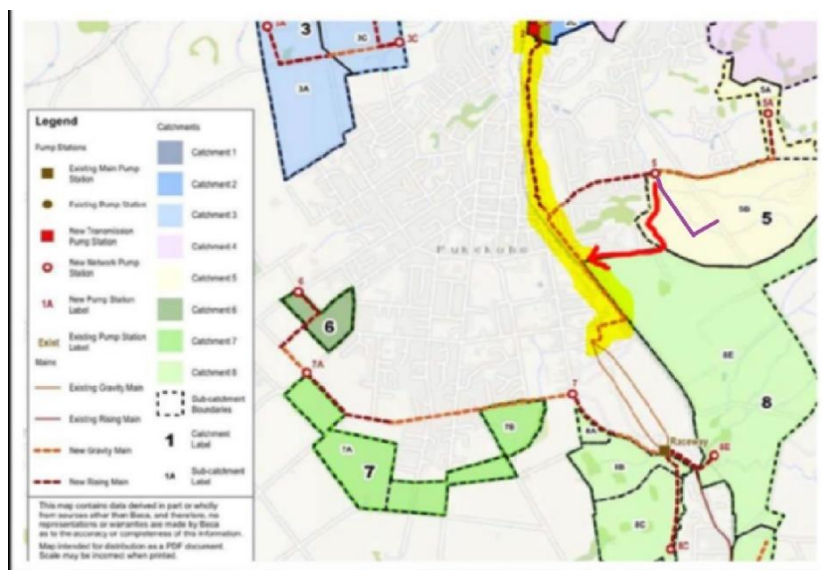


Figure 4 – Screenshot from Paerata/Pukekohe High Level Wastewater Servicing Plan

6.3. Proposed Reticulation

The wastewater reticulation layout will be a gravity system designed in accordance with Watercare design standards as outlined in the code of practice. Collection systems will run along the upslope edge of floodplain and stream areas collecting wastewater from the immediate development. These systems will be directed to the Wastewater pump station location shown in *Figure 4* above. Local collection will be provided in the form of a 150 – 375mm public networks in the roadways and into development JOAL areas to collect Wastewater from development areas. The size of the public wastewater network for the site is anticipated to be 150mm to 375mm in diameter. Refer to Appendix I - Wastewater Plans.

It is anticipated that the wastewater connection point constructed under Plan Change PC76 will be available within the Golding Road, from where it will be extended into the subject site.

We note that there is ongoing correspondence with WaterCare on this development. Correspondence to date with WaterCare is attached to this report. Refer to Appendix E – Golding-Birch Road Early Engagement Consultation Review.

7. Water Supply

It has been identified that a minimum size of 250mm ID watermain will be required to be extended along Golding Road. This will be required for Plan Change 76, subject site and other developments to the south. Any cost sharing is yet to be confirmed. It has also been identified that the land that lies above the 60m RL contour will require a new booster pump station which the developer will need to fund and construct. Initial estimates for the cost of the booster pump station are around \$1M. The proposed development area would be serviced via watermains located in the future road reserves reticulated throughout the development area. Refer to Appendix I - Water Supply Plans

8. Power, Telecom, and Gas Supply

Counties Energy has been contacted for confirmation of power supply for this Plan Change area and their response is awaited. However, it is expected the response will be similar to that received for Plan Change 76 to the west where confirmation was given that network connection points can be made available within the road reserve and that further technical assessment (including the finalised number of connections) will be necessary to determine the extent and nature of the work required to do this. In addition, the connection of the lots to the electricity network will be further subject to compliance with the terms and conditions of the Electricity Network Provision and payment of a capital contribution towards the provision of the network connection points.

Under Plan Change 76, Counties Energy has confirmed that the existing overhead power lines along the southern side of Golding Road can be undergrounded. It is anticipated that this work will be carried under Plan Change 76 works. Refer to Appendix J – Counties Energy Letter. The approximate extent (583m) is highlighted below in Figure 5 below.



Figure 5 – Existing Overhead Power Lines along the southern side of Golding Road

9. Conclusions

- Environmental effects from erosion and sediment during construction can be mitigated.
- The site access design complies with the requirements of the Unitary Plan.
- SMAF mitigation requirements for the site are met via retention tank and extended detention in wetlands.
- The 10-year network design event can be safely conveyed through the site via a new public drainage network.
- The 100-year flood event can be safely conveyed through the site via the proposed 3D form of the site.
- The proposed development will not increase flood risk for surrounding properties through the mitigation of peak flows by 100-year detention.
- Ecology of the significant ecological areas will be maintained/enhanced.
- Wastewater servicing can be provided with extensions from the adjacent development and proposed public network.
- Water supply can be provided through the existing and proposed bulk / private water meter(s).
- Telecoms and Power Supply can be provided via new connections.

10. Limitations

- This assessment contains the professional opinion of Civix Staff relating to this development. Civix Staff used their professional judgement and acted in accordance with the standards of care and skill normally exercised by professional engineers providing similar services in similar circumstances. No other express or implied warranty is made as to the professional advice contained in this report.
- We have prepared this report in accordance with the brief provided and following our terms of engagement. The information contained in this report has been prepared by Civix for the client and is exclusively for its client use and reliance. It is not possible to make an assessment of this report without understanding the terms of engagement under which it has been prepared, including the scope of the instructions and directions given to and the assumptions made by Civix. The assessment will not address issues which would need to be considered for another party if that parties' particular circumstances, requirements and experience were known and, further, may make assumptions about matters of which a third party is not aware. No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of or reliance on this assessment by any third party.
- The assessment is also based on information that has been provided to Civix from other sources or by other parties. The assessment has been prepared strictly on the basis that the information that has been provided is accurate, completed, and adequate. To the extent that any information is inaccurate, incomplete or inadequate, Civix takes no responsibility or liability whatsoever for any loss or damage that results from any design and assessment based on information that has been provided to Civix.