CIVILPLAN
CONSULTANTS

HUGH GREEN LIMITED

Engineering Report to Support the Request for Change to the Auckland Unitary Plan Operative in Part

Hingaia 1 Precinct

DOCUMENT CONTROL RECORD

Client:	Hugh Green Limited
Project:	Park Green
Document:	Engineering Report to Support the Request for Change to the Auckland Unitary Plan Operative in Part (Hingaia 1 Precinct)
CP Project No:	2197
CP Document No:	R002v1
Date of Issue:	November 2020
Status:	Final

Originator: .....

Ryan Pitkethley

Engineering Manager

Reviewed By .....

Matt Richards

Civil Engineer

Approved By: .....

Ryan Pitkethley

Engineering Manager

Contact Details:

Ryan Pitkethley

CivilPlan Consultants Ltd

PO Box 97796, Manukau 2241

P: 09 222 2445

M: 0274 612 316

E: ryan@civilplan.co.nz

TABLE OF CONTENTS

1. Introduction

1.1 Applicant and Property Details

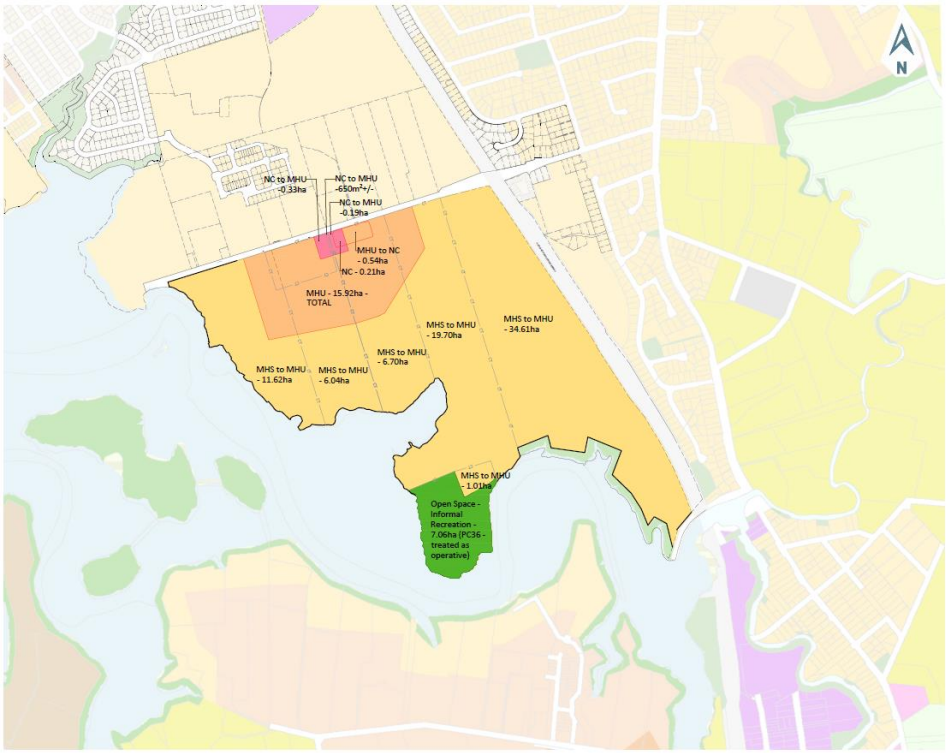
Applicant Details:	Hugh Green Limited
Address for Service	Hugh Green Limited C/- CivilPlan Consultants Limited PO Box 97796, Manukau 2241
Site Address:	All sites subject to the Hingaia 1 Precinct, but specifically 144 to 252 Park Estate Road, Hingaia
Relevant Plan:	Auckland Unitary Plan Operative in Part ('AUP')
Zoning:	Residential – Mixed Housing Suburban and Business – Neighbourhood Centre
Precinct:	Hingaia 1 Precinct

1.2 Purpose of the Report

CivilPlan Consultants Limited have been engaged to undertake this report to support a Plan Change Application to rezone 79.7 ha of Hingaia 1 Precinct land from Mixed Housing Suburban (MHS) to Mixed Housing Urban (MHU) on behalf of the applicant Hugh Green Limited.

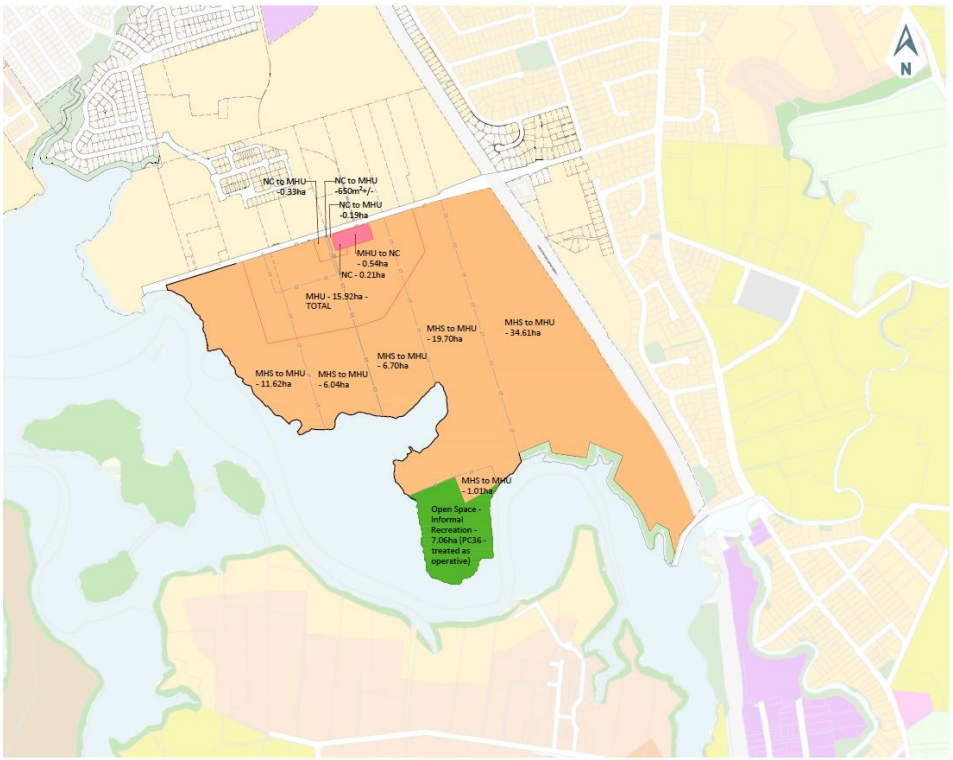
This report investigates and confirms the suitability of the existing infrastructure for new bulk infrastructure to provide adequate servicing for progressive development of the site to accommodate the ultimate yield of approximately 1,660 dwellings, enabled by a change of zoning (that increases yield by approximately 360 dwellings).

This proposal is shown in Figures 1 and 2.



LOT AREA & ZONING		
-	Existing	Proposed
Mixed Housing Suburban (MHS)	79.7ha	0
Mixed Housing Urban (MHU)	16.45ha	96.1ha
Neighbourhood Centre (NC)	0.8ha	0.75

Figure 1 – Subject Site with Existing Zoning (MHS, MHU, and Neighbourhood Centre)



LOT AREA & ZONING		
-	Existing	Proposed
Mixed Housing Suburban (MHS)	79.7ha	0
Mixed Housing Urban (MHU)	16.45ha	96.1ha
Neighbourhood Centre (NC)	0.8ha	0.75

Figure 2 – Subject Site with Proposed Zoning (MHU and Neighbourhood Centre)

2. The Subject Site

The Park Estate Road site covers approximately 96.2 hectares of mainly pastoral land and is located in the southern portion of the Hingaia South Catchment. The site comprises properties 144, 152, 180, 200 and 252 Park Estate Road and is bordered by Park Estate Road to the north, the Southern Motorway to the east and the northern bank of the Drury Creek to the west and south. The site is fully located in the Hingaia South Catchment.

The site is composed of rolling topography with maximum elevations of 20 to 25m. The area contains up to 3 terraces associated with previous interglacial sea levels, with the highest of these inland and in the northern area of the site and dropping to the foreshore, along Drury Creek. Elevations along the coastal margin are typically 1 to 6 m above mean sea level.

3. Existing Servicing

The proposed site area is currently being developed with an upgrade to Park Estate Road and servicing to the newly subdivided MOE site, as well as the first stages of residential super lot development.

Therefore, new local extensions and connections are being made to extend servicing to the wider area, although these are not yet vested/shown on Council GIS.

A map showing servicing in the vicinity of the site is provided below:

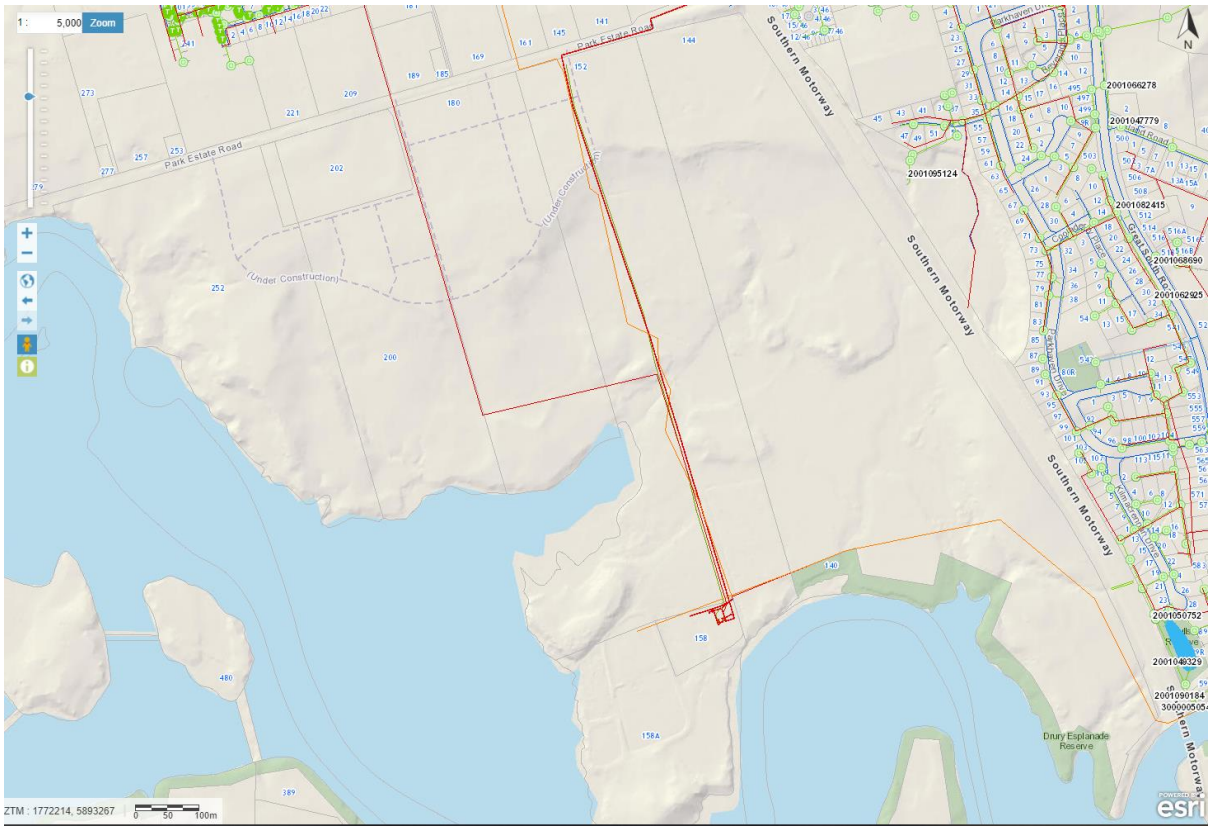


Figure 3 – Subject Site with Existing Servicing (Wastewater Gravity Line and Rising Main)

3.1 Wastewater

The existing gravity wastewater line bisecting the site is deep (up to 13m) and has been sized to take the Hingaia catchment above and including the entire subject site. This drains by gravity to the existing wastewater pump station to the south of the site, which in turn pumps out via a 450 OD PE rising main to Park Estate Road and to the north, travelling ultimately to the Mangere treatment plant. The storage capacity of this WWPS has been upgraded in 2020 with additional tanks to cater for growth to the south.

3.2 Water

Analysis has been completed by Mott Macdonald in 2016 as a part of the wider water supply servicing strategy. The figure below shows the report's 'Option 2' which has been chosen by Watercare and proposes that the Hingaia and Papakura supplies pass through the subject site from a new Bulk Supply Point (BSP) in Flannagan Road. This is consistent with the proposed design.

As a part of this wider Hingaia network reinforcement, a new 450 OD PE water main is being extended from the Flannagan Road (Drury) bulk supply point, through the Auranga development and under Drury Creek and to the southern boundary of the subject site. This connection will be live in December 2020.

Figure 4 – Watermain servicing for the southern Hingaia area (from Karaka and Drury Strategic Infrastructure Report, Mott MacDonald, January 2016).

An agreement between the owners of the subject site and Watercare Services Limited has been entered into to facilitate the extension of the 450 OD PE main through the site via four smaller lines equivalent to a 450 OD, connecting to the existing DN150 uPVC watermain at the western end of the Park Estate Road motorway bridge.

Once the connection is made at both the subject site's southern boundary and the motorway bridge as a part of that agreement, the capacity of the water supply network will be able to serve the subject site's total yield and beyond. This water supply extension work through the subject site will be completed and live in December 2020 to match in with the work through Auranga to the south. The indicative layout is shown in Figures 5 and 6.

Figure 5 – Watermain servicing for the southern Hingaia area.

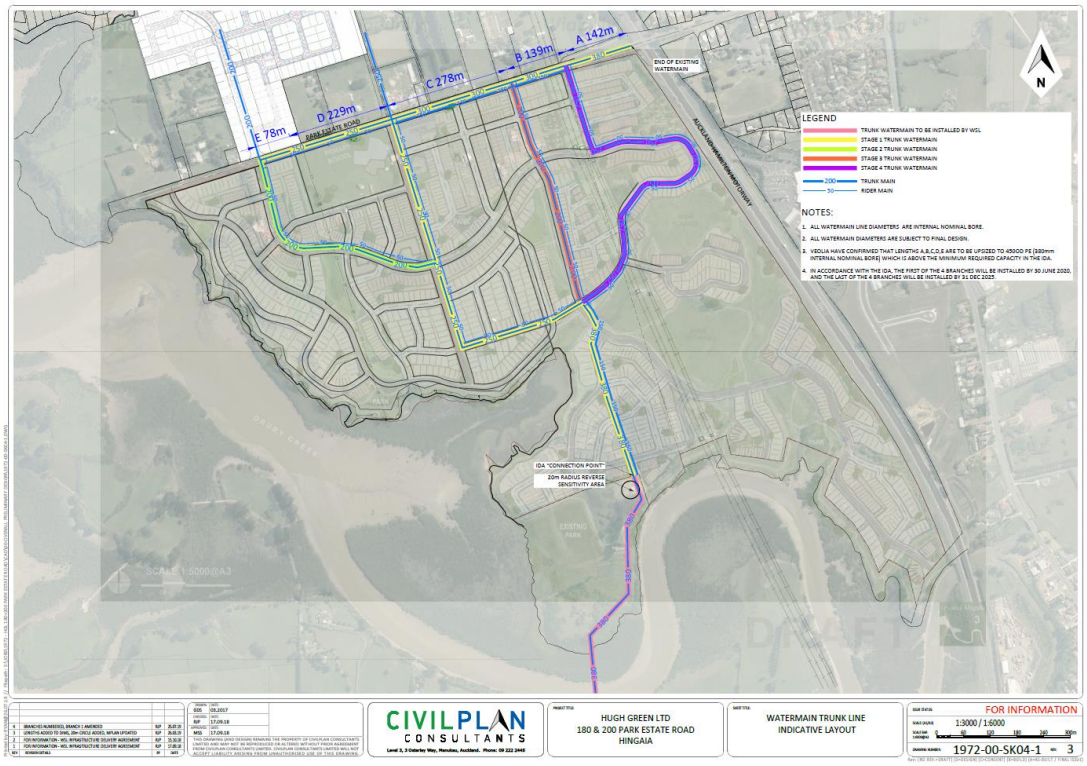


Figure 6 – Watermain servicing through subject site (part of MOU agreement)

Watercare is also ultimately planning to extend the main further into Hingaia via connections to the north, to link Park Estate Road mains with the existing 250mm main at the end of Hinau Road. The preferred route for this is the Hinau Road corridor, but land ownership and topographical issues along this route are likely to delay implementation for some time. The work completed in Park Estate Road in 2020 allows for connections on the northern side of the road to be extended through both Hinau Road and Ngakoro Road.

4. Proposed Servicing

4.1 Stormwater

4.1.1 Stormwater Management Plan

A Stormwater Management Plan ('SMP') covering the entire subject site has been authorised by Healthy Waters under the applicable network discharge consent (R/REG/2014/4245).

A copy of the latest SMP is attached as Appendix 7 to the private plan change application.

This SMP has been prepared with input from Auckland Council's Healthy Waters department and iwi and is focused around hydrology management and mitigation and the application of water sensitive design principles to protect and enhance the receiving environment.

4.1.2 Impervious Surfaces

The relevant standards of the AUP (including the Hingaia 1 Precinct) in relation to impervious surfaces are as follows:

- The maximum impervious coverage in the Mixed Housing Suburban and Mixed Housing Urban zones is 60% of the gross site area, unless the development is classified as 'integrated residential development' (defined as residential development on sites over 800 m^2 in area) in which case a maximum of 70% applies.
- There is no maximum impervious area standard for development in the Neighbourhood Centre zone, although there is a requirement for landscaping where parking or service areas adjoin the road.

Based on the zoning layout and the provisions above, the impervious areas anticipated within the development are outlined in Table 1 below:

Table 1: Impervious Surface Areas

Zone / Area (refer to Hingaia PV 1)	Percentage Impervious	Percentage Coverage	Total Percentage Impervious
Mixed Housing Suburban Zone	65% (per lot) – roofs, driveways, paved areas	30%	19.3%
Mixed Housing Urban Zone	65% (per lot) – roofs, driveways, paved areas	26%	16.6%
Neighbourhood Centre	95% (across the entire NC zone)	1%	1.2%
Roads (approximate)	75% (each road) – carriageway seal, footpaths, vehicle crossings, paved areas	30%	22.6%
Neighbourhood School	40% across the entire 3ha site	7%	3.0%

Table 1: Impervious Surface Areas

Reserves and Streams	5% (footpaths etc)	6%	0.3%
TOTAL		100%	63.0%

These impervious coverage assumptions of the SMP are not proposed to be altered as a part of the plan change.

The proposed stormwater servicing outlined in this section is to be in accordance with this SMP.

4.1.3 Primary Stormwater Network

A primary public stormwater pipe network will be designed and constructed in accordance with the requirements set out in accordance with Chapter 4 of the Auckland Council Code of Practice for Land Development and Subdivision. This sets out that the primary pipe network should be designed to convey site runoff from the 10% Annual Exceedance Probability (AEP) rain event, including for the potential effects of climate change.

Each allotment will be provided with a single connection to this network at the time of creation. The final design of this network and the connections will be determined as part of applications for engineering approval.

All reticulated networks will drain to the south (or west) towards the coast, regardless of the topography of the site, either directly to the coast (where in a coastal catchment) or via a wetland/stream (where in a wetland catchment).

These catchments are detailed in the SMP.

4.1.4 Secondary Stormwater Network (Overland Flow)

The secondary stormwater network (roads and conveyance channels) will be designed to manage flows from the site and upstream catchment for the 1% AEP rain event including for the potential effects of climate change.

In general, secondary stormwater networks will be formed within the road reserve area and be designed for safe conveyance of overland flows with minimal risk to road users and the local community. This is indicatively shown in the SMP. Maximum ponding depths in roads will generally be 200 mm in accordance with the Stormwater Code of Practice. Final details will be provided as part of the application for engineering approval.

4.1.5 Stormwater Management Devices

Hydrology mitigation (retention and detention) is to be provided for roads and future development where the reticulated stormwater network drains to a wetland or stream. However, hydrology mitigation will not be provided where the reticulated network drains to the coast.

In accordance with the SMP referenced above, retention is to be provided for the first 5 mm runoff depth from impervious areas, and detention storage has been calculated considering a runoff depth of 11.5 mm, to be discharged into the primary stormwater network over a period of 24 hours.

It is noted that the hydrology mitigation requirements outlined in the SMP do not fully align with the current requirements of Hingaia 1 Precinct Development Control 4.5 in the Auckland Unitary Plan Operative in Part. In particular, retention will not be provided in catchments draining to the coast. Land use consent is currently required for all roads and future impervious areas on the proposed allotments that drain to the coast to account for this. However, changes to the Hingaia 1 Precinct provisions requested by the private plan change application will instead only require on-site stormwater management requirements specified by the SMP, avoiding any inconsistencies.

Treatment devices will be provided for roads that are likely to be classified in the future as high use roads (carrying more than 5,000 vehicles per day), to align with the requirements in section E9 of the Auckland Unitary Plan Operative in Part.

Stormwater management is discussed further in detail in relation to roads and allotments in the sections below.

Roads

High use roads (carrying more than 5,000 vehicles per day) would require stormwater treatment under the AUP. Therefore, the full water quality volume will be treated to GD01 standards via rain gardens.

Elsewhere, the site's piped network discharges to either wetland or coastal catchments.

Coastal catchments will require water quality treatment only, via rain gardens (the focus being on water quality and not retention/detention).

Wetland/stream catchments will require raingardens to meet the requirements for retention and detention. The retention volume will be stored at the base of the rain garden and be allowed to discharge to the ground, therefore removing it from the water cycle. This will assist in reducing flows entering the watercourse as well as aid in maintaining baseflow.

The detention volume will occur within the rain garden above the retention volume within the sand, planting media and the live storage component of the raingarden.

Rain gardens will be combined into larger communal devices if space allows, to reduce maintenance requirements on Council.

At the end of roads that discharge to pasture, a bioretention conveyance channel will add to the treatment train as a treatment swale before discharging to either the coast or wetland.

Proposed Allotments

Consent notices are anticipated to be imposed on allotments creating impervious areas to specify the hydrology mitigation requirements for future impervious areas in order for compliance with the SMP to be achieved. The requested changes to the Hingaia 1 Precinct provisions requested by the private plan change application will clearly specify this.

4.2 Wastewater

As explained in section 3.1, a deep wastewater main runs through the site by gravity, and it is understood from conversations held with Veolia and Watercare that there is capacity for the proposed yield of 1,660 dwellings across Hugh Green Limited's land holdings.

This main will be connected into and extended to service the site's extremities. Each allotment will be provided with a single connection to a reticulated gravity wastewater disposal network at the time of creation. The final design of this network and the connections will be determined as part of applications for engineering approval.

A single satellite WWPS will likely be required to service the southern-eastern corner of the subject site (to be vested), of which its rising main can be located in proposed roads to discharge to the existing WWPS. This would be required regardless of the changes requested by the private plan change application.

No upgrades to the existing bulk wastewater supply gravity lines or WWPS are deemed to be necessary to provide for the proposed development.

4.3 Water

As explained in section 3.2, water supply will be live in December 2020 that will, as understood from conversations held with Veolia and Watercare, allow capacity for the proposed yield of 1,660 dwellings across Hugh Green Limited's land holdings.

Although lot connections will not be allowed directly off the four major local mains running through the site, fire hydrants will be allowed to be online to the mains, and smaller lines (DN150 and smaller) will provide the subdivisions with local fire fighting and reticulation servicing.

A reticulated water supply network will be provided along all roads at the time of creation from which each allotment can be provided with a connection to. Fire hydrants would be provided at regular intervals, in accordance with the relevant standards.

In addition, final approval from Veolia Water for the water supply for each allotment will be necessary as part of applications for section 224(c) certification.

4.4 Utilities

Electricity and telecommunication services will be extended underground along all roads at the time of creation, from which each allotment can be provided with a connection to. The ability to provide for this servicing is not impacted by the proposed rezoning or increase in potential yield.

Final approvals from Counties Power and Chorus for each allotment will be necessary as part of applications for section 224(c) certification.

4.4.1 Power

Counties Power have confirmed that the existing overhead network (high voltage lines) along the northern side of Park Estate Road can be extended underground to service the subject site to the south.

Further design discussions regarding suitable sites for transformers and switchgear within the development will ensure that the wider development can be provided for.

Counties Power's preference is for road cross sections which allow for a grassed 700mm berm (free of planting/tree roots etc) immediately adjacent to the vested road boundary for all lots requiring a connection to the electricity network, and on both sides of the road. While the private plan change application removes the Hingaia 1 Precinct subdivision control that requires this berm, new assessment criteria specifies this preference, allowing for continued consideration of Counties Power's preference.

4.4.2 Telecommunications

Chorus have advised that the network is able to be extended to supply the subject site with telecommunication services. A new fibre feed has been installed from the Papakura Exchange to Park Estate Road as a part of the Park Estate Road upgrade project. This feed has sufficient capacity to service the entire site's yield.

As per their standard practice, Chorus will only confirm their design once detailed scheme plans and detailed design is progressed.

Chorus' standard process for design and construction is as follows:

- Fees will be POA (price on application) to be paid in full prior to design starting
- Chorus will ask for design fee to start design.
- Chorus will start work once main fees are paid.
- The sub-divider is to provide trenches inside subdivision and install ducts/ribbonet.
- Chorus will supply ducts/ribbonet and subdivision will be fibre to the house.

- Chorus is required to lay duct and haul in fibre to start of subdivision.
- Chorus contractor will complete this work with ABFFP and splitters.

4.4.3 Utilities Supply Summary

In summary:

- Power can be extended to service the site.
- Chorus can be extended to service the site.

5. Conclusions

Overall it is considered that there is sufficient infrastructure available to support the increase in yield via Plan Change (by approximately 360, to 1,660 dwellings total) either by extension of existing networks or construction of new infrastructure. This is summarised below as follows:

- New stormwater infrastructure can be installed in accordance with the proposed SMP;
- Wastewater servicing can be provided to service the Plan Change area to Watercare/Veolia engineering requirements;
- Water supply can be provided from the existing Watercare network to their engineering standards;
- Power and telecom infrastructure (provided or planned) is available.

It is therefore considered that there is adequate infrastructure in the immediate vicinity to support the proposed rezoning of the land.

S:\Jobs\2197 - Hugh Green - Park Green Plan Change\reports\Engineering Report\R002v1-rjp-final.docx