Barry Satchell

36a Eaglehurst Road
Ellerslie
AUCKLAND

Infrastructure Report

May 2021

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Ellerslie
AUCKLAND

Infrastructure Report

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Executive Summary

The purpose of this Infrastructure report is to undertake an assessment of the existing infrastructure in relation to the proposed development and indicate the core requirements needed to support a Resource Consent application to Auckland Council to undertake the proposed subdivision development of 21 lots for 36a Eaglehurst Road, Ellerslie Lot 2 DP 167980.

From our investigation and assessment of the existing infrastructure, together with consideration of the infrastructure required to service the proposed development, we consider the subject site is able to be adequately serviced with appropriate infrastructure and subdivided to comply with AKC Unitary Plan and standards. As the services are either within or next to the proposed development there should be no additional or extra engineering works.

Stormwater disposal has been designed in accordance with Auckland Council Stormwater Code of Practice and GD01 and will utilise on site soakage which testing has indicated sufficient soakage capacity to the underlying layers. New stormwater drainage lines and connections will be installed as described in E38. Subdivision – Urban section of this report and as shown on the drainage design plans shown in Appendix F.

The proposed development has been assessed under Network Discharge Consent – schedule 4. As the proposal is for 19 new dwellings, 1 access lot and 1 rear lot, it is considered to be a small brownfield site with proposed impervious area > 50 %. The site is proposed to be serviced by on site soakage and the stormwater from impervious carpark and access areas will be treated by proprietary systems prior to discharge to the soakholes.

A flood risk assessment has been undertaken and determines the existing Overland Flow Path (OLFP) can be adequately contained within the proposed channel design of the proposed accessway to protect persons and property as assessed under section E36 of the Auckland Unitary Plan (AUP). As the flood waters can be adequately contained within the proposed channel design from the calculated data and investigation, we consider that the site will be adequately protected in the 1% AEP storm event.

Wastewater disposal has been designed in accordance with Watercare services: Water and Wastewater code of practice V1.5 May 2015 and the proposed wastewater design is shown on the drainage design plans Appendix F

The water supply for Lot 1 is to be supplied from the existing water meter which will need to be relocated outside of the proposed ROW. 3 new water meters will be installed along the existing 100mmØ PVC watermain line located in the road boundary. A new 50mmØ rider main will be installed along the JOAW and to loop around the remainder of the proposed new lots to be supplied with water mains connection.

NZ fire Service Fire Fighting Water Supplies Code of Practice SNZ PAS 4509:2008, requires a maximum of 135m from fire hydrant to furthest point of entry. There is a fire hydrant located on Eaglehurst Road in the middle of the site approximately 90m from the rear of the site.

The earthworks will be undertaken after erosion sediment controls have been constructed in accordance with the Erosion and Sediment Control plan complying with GD05 / 2016 and Auckland Council requirements.

Vehicle access, Manoeuvring and parking for all lots has been designed.

We recommend that the scheme plan and proposed dwelling house design, location and finished floor levels be undertaken in accordance with the detailed infrastructure design and conclusions contained within this infrastructure report that will then enable a Resource Consent report to be finalized for a Resourse Consent application.

This Infrastructure Report in relation to **a proposed 21 lot subdivision for 36a Eaglehurst Road, Ellerslie, Auckland City** has been prepared solely for our client on the express condition that information contained herein is copyright and will not be transmitted to or relied upon by any other person without the express permission of Barry Satchell Consultants Ltd.

The report is based on public and privately supplied information utilized for this outline summary only and no liability is accepted by this firm or by any Principal, Director or any servant or agent of this firm in respect of any error and omission contained herein. Acceptance of this Report acknowledges it is based on information sourced from client, council or third parties and any costs are deemed to be 'rough order' at the time of writing based on the scope agreed at the time of preparation. Data, including estimates of costs, is subject to change due a range of matters beyond our control including but not limited to other stakeholder requirements and/or variation in information or prices.

This report does not guarantee council will issue any Land Use, Subdivision or other consents for this site.
Please do not hesitate to contact the undersigned should you wish to clarify/discuss any aspect of the above.

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1 Introduction

The following Infrastructure report is an assessment of the existing infrastructure in relation to the proposed development and will indicate the core requirements needed to support a Resource Consent application to Auckland Council to undertake the proposed 21 lot subdivision development, consisting of 19 new dwellings, 1 access lot and 1 rear lot, at 36a Eaglehurst Rad, Ellerslie.

The following activities were undertaken as part of the assessment process to compile the Infrastructure report.

A review of the topographic survey plan and proposed development plan was undertaken.

Engineering calculations to determine capacity of existing systems, flooding criteria and in ground soakage.

The Engineering design for the servicing of the proposed development servicing was undertaken for the various elements that are reported within.

2 Site Description and Proposed Development

2.1 Site Description and Property details

The site is located at 36a Eaglehurst Road, Ellerslie, Auckland. The property is legally described as Lot 2 DP 167980 NA101D/827.

The property has a total an area of 3,342m^2 and under the Auckland Unitary Plan the zoning is Residential - Mixed Housing Urban zone and Business – Light Industry Zone.

The site is rectangular in shape with the short western boundary end facing Eaglehurst Road and the rear south-west end boundary backing onto Eaglehurst industrial court. The site is relatively flat with a slight fall toward the north-west. There are 2 existing houses located on the central and eastern half of the site respectively. There is also a pool attached to the eastern part of the central house and a number of associated small sheds western and eastern boundaries. There is a number of medium trees and vegetation on the western road frontage of the property, including a large protected Pohutukawa tree on the boundary between the site and 36 Eaglehurst Road which has been identified and, on our site, will be protected and used as a communal area. Please refer Appendix A.

2.2 Proposed Development

The proposed development is to undertake a joint Land Use and Subdivision resource consent to subdivide the property into 20 fee simple lots and 1 JOAW and comply with AKC Unitary Plan and Standards to gain an approved Resource Consent.

The current formed vehicle entrance will be relocated to the north of the site to provide access and parking for the development. Pedestrian access to Lots 1 - 20 is provided from the JOAL.

Auckland Council GIS indicates there is limited existing public stormwater a considerable distance from the subject site and there is no Public stormwater connection to the site as it is assumed that the existing impervious areas either go to non-complying soakholes or discharge to the ground via old ceramic pipes. Please refer Appendix A. New drainage lines and connections will be installed as described in following sections of the Infrastructure Report and as shown on the Engineering drainage design plans.

Service connections for electricity, telecommunications and water will be linked to the existing infrastructure on the road frontage on Eaglehurst Road and provided via the JOAL and easements shown on the Scheme Plan.

The proposal involves earthworks to create the building platform, outdoor living areas and JOAL;

3 Infrastructure servicing of proposed development:

3.1 Stormwater:

3.1.1 Existing Private Drainage

Auckland Council GIS indicates there is no public stormwater connection to the site, and it is assumed that the existing impervious areas either go to non-complying soakholes or discharge to the ground. From Councils GIS there is limited existing public stormwater a considerable distance from the subject site. The majority of the existing stormwater public system appears to be in the form of soakhole that allow for public cesspits discharge. Please refer Appendix A.

3.1.2 Proposed Stormwater

There is an existing public stormwater line a considerable distance to the northeast of the subject site. Although a proposed public stormwater line extension could be undertaken to the subject site, it is considered the existing line will be undersized requiring extensive detention tank systems.

As there is no existing Public stormwater in the vicinity of the subject site to service this proposed subdivision, it is considered a more water sensitive alternative stormwater disposal solution is required. We have undertaken extensive investigation into possible disposal of stormwater on site via soakage which can be achieved with a number of soakholes across the site.

In conjunction with Niederer drilling, and in accordance with Auckland Council (AKC) Stormwater Disposal via Soakage in the Auckland Region (October 2013) TR 2013/040, we undertook eleven test holes across the site and determined five drill holes could be utilised to provide soakage. All drill holes were 100mm diameter and drilled up to 20m. The holes were pre-soaked for 10 minutes and then tested for a continuous period of 10 minutes, and in the case of SH 20, 21 & 23 these were all tested at the same time due to being within 10m of each other. Soakage results were as follows

SH 20 = 27L/s

SH 21 = 6.1L/s

SH 23 = 2.7L/s

SH 03 = 1.7L/s

SH 04 = 1.1L/s

SH01, SH05, SH06, SH07, SH08 & SH022 had an insufficient flow rate and were not used.

3.1.3 Soakage analysis

In order to assess the equivalent impervious area that the new development proposed soakage can serve, the site has been divided into a number of sub catchments for each soakhole. The total site area of 3342m² has been split into four areas denoted as A, B, C and D, indicated on Soakhole Location Plan in Appendix C. We have used TR 2013/040, worksheets 2 and 4 for each soakhole to ascertain the maximum impervious area that each proposed soakhole can serve.

Area A = 662m² (driveway, parking and grass) will discharge to soakhole 21 and the calculations indicate additional storage is required for soakhole 21 = 5.3m³. Runoff for the driveway and parking areas is to be directed to cesspits before being discharged in to the soakage area and the storage chamber could be utilised as settling chambers. The stormwater from impervious carpark and access areas will be treated by proprietary systems prior to discharge to the soakholes which will be designed in accordance with Code of Practice chapter section 4 Stormwater section 3.19 Soakage Areas and Auckland Council Technical report TR2013/040.

Area B = 360m² (driveway and parking) will discharge to soakhole 23 and the calculations indicate additional storage is required for soakhole 23 = 5.2m³ . Runoff for the driveway and parking areas is to be directed to cesspits before being discharged in to the soakage area and the storage chamber could be utilised as settling chambers. The stormwater from impervious carpark and access areas will be treated by proprietary systems prior to discharge to the soakholes which will be designed in accordance with Code of Practice chapter section 4 Stormwater section 3.19 Soakage Areas and Auckland Council Technical report TR2013/040.

Area C 1,760m² (residential roof and grass) will discharge to soakhole 20 with no additional soakage as the calculations demonstrate that, if the Council Criteria for rockbore soakhole design is used as a standard 1050mm manhole 1.5m deep, it will have more than adequate storage to cater for the soakhole storage needs and confirms that the proposed soak hole can cope with the residential part of this development. We recommend a new private drainage network be provided for the new residential roof runoff in Area C and the settling chamber be incorporated into this network.

Area D 556m² (to be left vacant to cater for MPD under the AUP for 60% impervious and 40% grass) will discharge to soakholes 03 & 04 and the calculations indicate additional storage is required for soakholes 03 & 04 = 5.0m³. A storage chamber is be established between soakholes 03 & 04 to distribute the runoff to each soakhole and a new stormwater connect from the storage chamber is to be provided to Area D for possible future development.

In our opinion the proposed rockbore soakholes and storage is more than adequate to cater for onsite ground soakage for stormwater discharge for the proposed development. The calculations indicate that storage is required for soakholes 21, 23, 03 & 04, and the calculations demonstrate that for soakhole 20 there is

adequate storage within the rockbore chamber. From our investigation and soakage testing undertaken on site, it was determined that adequate deep bore soakage can be achieved to provide stormwater disposal for the 10 % AEP storm event as detailed appendix C.

It is also recommended that the proposed soakholes be maintained on regular basis as per attached Operation and Maintenance plans to ensure their effectiveness. Council may impose conditions to this effect.

Internal Stormwater disposal has been designed as new private lines, as detailed appendix D, in accordance with Auckland Council Stormwater Code of Practice and GD0 and new drainage lines and connections will be installed as described in E38. Subdivision – Urban section of this report and as shown on the drainage design plans shown in Appendix F.

3.2 Overland Flowpath and existing Flooding Issues:

3.2.1 Overland Flowpath

The proposed development is at the top of the catchment and Auckland Council GIS Maps indicates a minor overland flowpath (OLFP) begins at the south west corner of the site and exits approximately midway along the western road boundary and then continues down Eaglehurst Road to the north, as detailed in appendix H.

There appears to be no flooding on site. This was investigated by looking at the Auckland Council GIS and a site visit, both turned up no evidence of flooding and was undertaken for the subject property in accordance with "Auckland Council Code of Practice for Land Development and Subdivision Chapter 4 – Stormwater (Version 2.0, 1st November 2015)".

The flood risk assessment undertaken of the existing minor OLFP indicates the effect of the proposed development is considered to be less than minor. It is considered any effect of the minor OLFP can be adequately contained within the development proposed channel design which will protect persons and property as assessed under section E36 of the Auckland Unitary Plan (AUP).

The proposed development indicates a block of 4 townhouses along the road frontage and another block of 8 townhouse along the southern boundary approximately where the very minor OLFP begins. The townhouse block locations is at the start of the OLFP and with proposed landscaping works this would prevent any flood waters to concentrate. The front landscaping would be graded to the road ensuring any runoff remains as a sheet flow as it exits the property.

There is no intention to make any changes to the entry and exit point of the existing OLFP. Any new fence located within or over an OLFP that do not obstruct an OLFP must comply with standard E36.6.1.10. Our assessment shows that the OLFP entry and exit locations on the site are approximately the same positions as indicated on the AC GIS Maps. The OLFP will be diverted around the new proposed development to create an unobstructed flow for the flood water.

3.3 Assessment AUP Section E8:

3.3.1 Proposed Development

The proposed development has been assessed under Network Discharge Consent – schedule 4. As the proposal is for 19 new dwellings, 1 rear lot and 1 access lot, it is considered to be a small brownfield site with proposed impervious area > 50 %. The site is proposed to be serviced by on site soakage and the stormwater from impervious carpark and access areas will be treated by proprietary systems prior to discharge to the soakholes.

The proposed development has been assessed under AUP E8 activity Table 8.4.1 (A9) as " Diversion and discharge of stormwater runoff from impervious areas greater than 1,000m2 and up to 5,000m2 within an urban area, that complies with Standard E8.6.1 and Standard E8.6.3.1" and is classified as a Controlled Activity

An assessment of Standard 8.6.1 states the following

8.6.1.1 We submit the design of the proposed stormwater management device(s) is acceptable as, to our knowledge there is no relevant precinct plan that addresses or addressed stormwater matters.

8.6.1.2 As the proposal is to discharge to proposed soakholes, the diversion and discharge will not cause or increase scouring or erosion at the point of discharge or downstream..

8.6.1.3 As the proposal is to discharge to proposed soakholes, and the design has catered for the respective design storm events, the diversion and discharge will not result in or increase the following: (a) flooding of other properties in rainfall events up to the 10 per cent annual exceedance probability (AEP); or (b) inundation of buildings on other properties in events up to the 1 per cent annual exceedance probability (AEP).

8.6.1.4 As the proposal is to discharge to proposed soakholes, the diversion and discharge will not cause or increase nuisance or damage to other properties).

8.6.1.5 As the proposal is to discharge to proposed soakholes, there will not be any surface water

8.6.1.6 As the proposal is to discharge to proposed soakholes, the device design will comply with Auckland Council Technical report TR2013/040

8.6.3.1 As the proposal is to discharge to proposed soakholes, there will not be any discharge to a stream .

3.4 Wastewater:

3.4.1 Existing Wastewater

There is a Public wastewater water line (WaterCare) within the road berm along the western boundary of Eaglehurst Road and the current Auckland Council (AKC) private as-built drainage plan records indicate that the private wastewater drainage is connected to this Public line. There is an existing wastewater connection to the site which is proposed to be sealed and capped.

3.4.2 Proposed Wastewater

Wastewater disposal has been designed in accordance with Watercare services: Water and Wastewater code of practice V2.2 November 2019 and the proposed wastewater design is shown on the drainage design plans as detailed in Appendix F. The proposed development will be services by extending a 150mmØ public line to connect to the existing public line in Eaglehurst Road.

A separate application to WaterCare is required for the wastewater and water connection to the proposed subdivision and an engineering application will be required for the proposed public wastewater works.

Any proposed new structure within 2m of the location of the existing Wastewater Public line will require a works over approval from WaterCare and no new structures are allowed to be within 1m of the WaterCare Public Line.

3.5 Wastewater Capacity:

The Auckland Code of Practice for Land Development and Subdivision section 5.3.5.1.2 B states the required thresholds for whether a development is required to undertake a downstream capacity assessment which is detailed in the following table.

Network Capacity Assessment

Threshold criteria	This development
The site Is not located within Watercare's defined combined network area .	Not in combined network area
The net change in Peak Design Flow from the site is < 1.0 l/s or is less than 20 new dwellings or, if the proposed development reduces the number of residential dwellings	Development is for 19 additional dwellings – Capacity check not required
There is no upstream future greenfield land that is required to network through the subject site to connect to the existing network.	Council GIS indicates there is no upstream greenfield site
Any proposed buildings are < 4 levels high	Development proposes 2 level units
The development or area of connection will connect up to a wastewater main which is usually 300mm or larger	The development connects to a 150mm wastewater main for the surrounding catchment.

The capacity of the existing Wastewater system has also been assessed to the 1st manhole downstream at Number 36 Eaglehurst Road, as detailed in Appendix E, by determining the wastewater catchment to this connecting Manhole together with capacity calculations in accordance with Watercare services: Water and Wastewater code of practice V2.2 November 2019 using the following design parameters

Average dry weather flow 180 l / person / day

Wet weather peak factor 6.7

The gradient of the existing wastewater line was determined and together with the pipe size, determined the capacity of the existing line. As the proposed flow is a small percentage of the existing flow, there is deemed to be more capacity than the design flows and the development can be serviced.

3.6 Water:

3.6.1 Existing Water Supply

Water supply has been designed in accordance with Watercare services: Water and Wastewater code of practice V2.2 November 2019 and is shown on the design plans as detailed in Appendix F. The reticulated water for the property is currently provided from the existing 100 AC line which runs in the road frontage on the western side of Eaglehurst Road and is supplied from both ends.

The empirical guides for main sizing detailed in Watercare COP 01 V2.2 November 2019, table 6.2 and table 6.3, based on number of residential lots, are

Size		One end supply	Two end supply
50	high pressure > 600 KPa	20	40
50	medium pressure 400 – 600 KPa	15	30
50	low pressure < 400 KPa	7	15
100		40	
150		160	
200		400	

3.6.2 Proposed Water Supply and Fire Fighting Supply

The water supply for Lot 1 is to be supplied from the existing water meter which will need to be relocated inside the proposed lot 1 road boundary. 3 new water meters will be installed on the 100mmØ watermain line along the existing road frontage servicing lots 2 - 4. A new 50mmØ rider main will be installed along the JOAW and to loop around the remainder of the proposed new lots to be supplied with water mains connection.

NZ fire Service Fire Fighting Water Supplies Code of Practice SNZ PAS 4509:2008, requires a maximum of 135m from fire hydrant to furthest point of entry. There is an existing fire hydrant located on Eaglehurst Road in the middle of the site approximately 90m from the rear of the site, as detailed in Appendix G.

3.7 Geotechnical Report:

To our knowledge there are no weak or soft soils on this site and we do not expect a requirement for a Geotechnical Report.

3.8 Earthworks and Erosion / Sediment Control:

The proposed land disturbance involves only minor earthworks required to strip top soil under houses and access / car parking areas and involves an area of 2730m^2 and an earthworks volume of 710 m^3 over the property in order to construct dwelling platforms and access areas. This is a Restricted Discretionary Activity under E12.4.1 (A4) as the area is at 2730m^2 and a Restricted Discretionary Activity under E12.4.1 (A8) as the volume is greater than 250m^3 up to 1000m^3.

Erosion sediment controls will be constructed prior to commencement of the earthworks in accordance with the Erosion and Sediment Control plan complying with GD05 / 2016 and Auckland Council requirements and detailed Appendix H. These will consist of

a stabilised vehicle entrance to minimise material being tracked onto the road
Placement of stripped topsoil stockpiles such that overland flows are prevented from leaving the site
Silt fences installed along lower boundaries of the site to capture any material in site runoff

3.9 Vehicle Access:

3.1.1 Existing Vehicle Access

The current vehicle access is a metalled driveway which circles around the front of the existing house and continues along the southern boundary to the existing house at the rear of the property.

3.1.2 Proposed Vehicle Access

A new access will be required to provide vehicle access for all proposed lots. A new Joint Owned Access Way (JOAW) has been designed at 5.5m wide and will be constructed as per AKC standards and a separate engineering design and application will be required to AKC once the Resource Consent has been granted.

Pedestrian access for lots 1 – 4 will be achieved by a constructed footpath along the proposed eastern boundary of these lots and lots 5 – 20 will be achieved via a constructed footpath along the frontage of the outdoor living areas next to the JOAL .

Vehicle access, Manoeuvring and parking for all lots is kept within the JOAL and serves 19 parking spaces in total.

3.9.3 Vehicle Crossing

The existing vehicle crossing on the southwest corner is to be removed. A new vehicle crossing will need to be constructed to AT standards.

3.10 Utilities:

Utilities are currently connected to the existing house from utilities providers mains located in the road reserve. There is currently electricity and telecommunication supply to the site which will be demolished and new connections will be placed for all lots.

The proposed new lots can be supplied with power and telecommunications mains connection and lines via a trench down the JOAW to serve the rear sites.

4 Conclusion

4.1 From our investigation and assessment of the existing infrastructure, together with consideration of the infrastructure required to service the proposed development, we consider the subject site is able to be adequately serviced with appropriate infrastructure and subdivided to comply with AKC Unitary Plan and standards. As the services are either within or next to the proposed development there should be no additional or extra engineering works.

4.2 Stormwater disposal has been designed in accordance with Auckland Council Stormwater Code of Practice and GD01. New stormwater drainage lines and connections will be installed as described in E38. Subdivision – Urban section of this report and as shown on the drainage design plans shown in Appendix F.

4.3 A flood risk assessment has been undertaken to illustrate that the existing Overland Flow Path (OLFP) can be adequately contained within the proposed channel design to protect persons and property as assessed under section E36 of the Auckland Unitary Plan (AUP) and the effects of a 1 % storm event are considered to be less than minor.

4.4 Wastewater disposal has been designed in accordance with Watercare services: Water and Wastewater code of practice V1.5 May 2015 and the proposed wastewater design is shown on the drainage design plans Appendix F

4.5 The water supply for Lot 1 is to be supplied from the existing water meter which will need to be relocated inside the proposed lot 1. 3 new water meters will be installed on the 100mmØ watermain line along the existing road frontage. A new 50mmØ rider main will be installed along the JOAW and to loop around the remainder of the proposed new lots to be supplied with water mains connection.

NZ fire Service Fire Fighting Water Supplies Code of Practice SNZ PAS 4509:2008, requires a maximum of 135m from fire hydrant to furthest point of entry. There is an existing fire hydrant located on Eaglehurst Road in the middle of the site approximately 90m from the rear of the site, as detailed in Appendix G.

4.6 The earthworks will be undertaken after erosion sediment controls have been constructed in accordance with the Erosion and Sediment Control plan complying with GD05 / 2016 and Auckland Council requirements.

4.7 Vehicle access, Manoeuvring and parking for all lots has been designed.

5 Recommendations

We recommend that the scheme plan and proposed dwelling house design, location and finished floor levels be undertaken in accordance with the detailed infrastructure design and conclusions contained within this infrastructure report that will then enable a Resource Consent report to be finalized for a Resource Consent application.

6 Disclaimer

This Infrastructure Report in relation to **a proposed 21 lot subdivision for 36a Eaglehurst Road, Ellerslie, Auckland City** has been prepared solely for our client on the express condition that information contained herein is copyright and will not be transmitted to or relied upon by any other person without the express permission of Barry Satchell Consultants Ltd.

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