

Oyster Capital
PO Box 105-558
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Attention: Mr McCarthy

Dear Andrew

Oyster Capital Fast Track Referral Application Stormwater Preliminary Assessment

1 Introduction

Oyster Capital ("Oyster") propose to lodge an application for a referred project under the Covid-19 Recovery (Fast-track Consenting) Act 2020 (the "Act") to utilise the fast-track consenting process via an expert consenting panel. This application relates to the development of a contiguous landholding at 76, 76A, 116, 136 and 140 Waihoehoe Road ("the site"). This landholding forms part of a larger land area within Drury East that is currently subject to a private plan change process – Waihoehoe Precinct Private Plan Change ("PC50") – to rezone the land from Future Urban to the Terraced Housing and Apartment zone under the Auckland Unitary Plan ("AUP") which will enable quality urban development and well-functioning urban environments. Oyster has a sale and purchase agreement for the site, and has full control of the site for the purpose of rezoning and future residential development. This proposal for a referred project will give effect to the purpose of the Act to promote employment and New Zealand's recovery to the economic and social impacts of Covid-19 by enabling the construction and delivery of a comprehensive development that offers employment opportunities and an accelerated supply of quality housing choice and diversity.

To support the application for a referred project, this memo provides a high-level review of the stormwater aspects of the proposal, including:

- Summary of the proposal and site description;
- Summary of work completed to date;
- High level stormwater assessment of proposal; and
- Overview of works required to achieve the proposal.

2 Site description and proposal

2.1 Site description

The site comprises 34.65 hectares of land at 76, 76A, 116, 136 and 140 Waihoehoe Road which is currently zoned Future Urban ("FUZ") under the AUP.

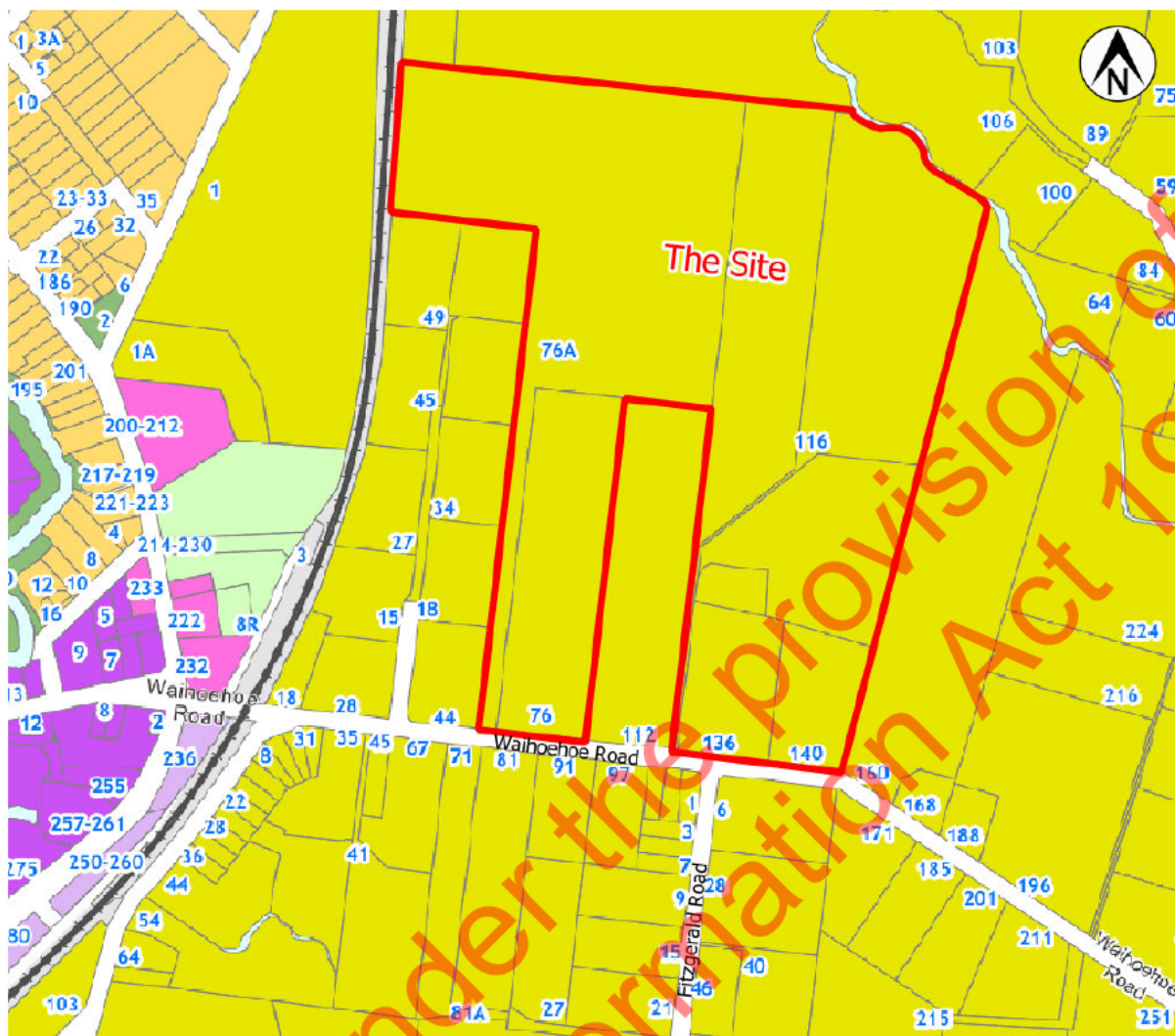


Figure 1: The site extent.

The site generally drains in a north westerly direction and forms two sub-catchments which will be maintained by the development (refer to Figure 3). The southern sub-catchment drains toward the west to a railway culvert beneath the North Island Main Trunk railway. The northern catchment drains to Waihoihoi Stream and then subsequently into Slippery Creek. Slippery Creek eventually flows into Drury Creek, which is the receiving watercourse of all streams within Drury East.

Both sub-catchments lie within the Slippery Creek (Waihoihoi Stream) flood plain, which is a constraint to development. Flooding in the southern sub-catchment is caused in part by a railway culvert downstream, throttling peak flows and causing ponding during floods.

According to Land Environments of New Zealand ("LENZ") soil drainage data¹, soil drainage is poor for the north eastern, and moderate to good for the south-west part for the subject site.

The current land use is predominantly agricultural and lifestyle residential land use. There are a number of natural and manmade hydrological features in the area including streams, wetlands, farm drains and artificial online ponds. These have been identified by Freshwater Solutions (refer to Figure 2) and are further described in their memo².

¹ Ministry for the Environment, Imported on Oct. 13, 2011 from Binary Grid in NZGD49 / New Zealand Map Grid, *Land Environments of New Zealand (LENZ) – soil drainage database*, revision 4

² Freshwater Solutions, February 2021, *Ecology memo – Oyster Capital Fast Track Referral Application*



Figure 2- Stream status and hydrological features within the site.

2.2 Proposal

Oyster are proposing the staged development of this land into a mix of terrace and detached housing, 9 residential super lots and supporting roading and servicing infrastructure. A total of 376 dwellings are proposed. A masterplan for the Oyster Capital site has been prepared by Holistic Urban Environments and is shown with the sub-catchment delineation overlaid in Figure 3.



Figure 3: Masterplan of proposed development with sub-catchment indicated by the two shades of green. The symbols represent the location of proposed attenuation basins – Refer section 5.2.

3 Background Analysis

A Stormwater Management Plan³ (SMP) has been prepared by Tonkin + Taylor to support the Plan Change application for the Waihoehoe Precinct, within which the referred project site is located.

³ Tonkin + Taylor, June 2020, *Drury East – Waihoehoe Precinct Plan Change Area – Stormwater Management Plan for 116 Waihoehoe Road and surrounds*. Prepared for Oyster Capital in support of the Plan Change Application (Job number 1008200.3000)

The requirements for stormwater management are based primarily on the AUP provisions with consideration of the Future Urban Land Supply Strategy for the area, the relevant SMPs for the Drury-Opāheke area and the region-wide Network Discharge Consent.

The following table summarises the main stormwater management proposed for the Waihoehoe Precinct. The proposed stormwater management is considered the best practicable option, taking into consideration the existing site features and the future land use. The additional stormwater management approach for sub-catchments contributing to wetlands has been added and is discussed in Sections 4 and 5.

Table 1: Stormwater management approach for the Waihoehoe Precinct with additional wetland approach

Approach	North "Passing flows forward"		South "Attenuation"		Wetland "hydrologically neutral"
Outcomes	Water quality GD01 ⁴ SMAF 1 hydrological mitigation Pass flood flows forward		Water quality GD01 ⁴ SMAF 1 hydrological mitigation Attenuate 10 to 100 year flows to predevelopment peaks		In addition for sub-catchments of wetlands target hydrological neutrality of surface and ground water
Sub catchments	Roads/car parks	Residential areas	Roads/car parks	Residential areas	All area
Water quality and quantity treatment	Bioretention by AT compliant raingardens and swales	Raingardens Rain tanks Detention tanks Permeable paving Inert building materials	Bioretention by AT compliant raingardens and swales	Raingardens Rain tanks Detention tanks Permeable paving Inert building materials	Maximise infiltration
Conveyance up to 10 year flow	Pipe drainage to green outfall		Pipe drainage to attenuation basin		Maintain surface water catchments to wetlands. Erosion protection of point discharges
Overland flow and flood management for 10 year to 100 year flow	Overland flow to green outfall		Overland flow to attenuation basin		

3.1 Water quality

The water quality management approach seeks to minimise the generation of contaminants (by using inert building materials etc) as much as possible. Where contaminants are generated, the preferred approach is to use green infrastructure to treat contaminants as close to the source as practicable.

Proposed layouts show that all roads and car parks have incorporated landscaping space adjoining the roads that has potential to be developed into vegetated bioretention devices (comprising of a combination of raingardens and swales) to provide water quality treatment. These water quality (and hydrological mitigation) devices will comply with Auckland Transport ("AT") requirements.

⁴ Auckland Council, December 2017, *Guideline Document 2017/001 (GD01) Stormwater Management Devices in the Auckland Region*, Version 1

3.2 Hydrological mitigation

The general approach to water quantity management for small storm events is to provide a minimum of Stormwater Management Flow – Area 1 (“SMAF 1”) hydrological mitigation for all impervious surfaces within the Waihoehoe Precinct plan change area. Retention will be prioritised where available/practical by infiltration through bioretention and pervious pavements, and rainwater harvesting for residential dwellings. Detention will be provided in these devices and by underground tanks where necessary.

3.3 Stormwater conveyance

Primary flows generated by a 10 year ARI storm event will be conveyed by a piped stormwater network to the downstream receiving environment. Stormwater infrastructure will be designed as per the Auckland Council Stormwater Code of Practice⁵.

For events greater than a 10 year ARI storm event and up to a 100 year ARI storm, the excess flow or secondary flows will be conveyed by using roads and drainage reserves as overland flow routes.

The downstream receiving environment will also be protected from erosion through the use of erosion protection and/or green outfalls.

3.4 Flood risk management

The SMP is supported by a flood hazard assessment, which was carried out based on Auckland Council flood modelling of the Slippery Creek. The results helped to inform and develop specific flood management strategies for each of the sub-catchments. The flood management strategy for the northern sub-catchment is a “passing flows forward” approach to discharge peak flows to the receiving stream environment.

Meanwhile, the flood management strategy for the southern sub-catchment is to attenuate flood flows up to the 100 year ARI storms to mitigate flooding in the western parts of the Waihoehoe Precinct plan change area and further downstream. Flood attenuation storage will be provided in a number of attenuation basins located in the drainage reserves and rely on culverted road crossings and other throttles in the streams to restrict/control discharge rates to mimic the existing flow regime from the existing development conditions.

To ensure that there are no adverse flooding impacts to properties downstream of the plan change area attributed to the proposed development, the following additional approaches are proposed to manage the impact of flood risk to downstream properties:

- Avoid development within the 100 year ARI floodplain where possible;
- Manage the floodplain with riparian buffers and green corridors to provide erosion protection and increase ecological amenity;
- Ensure that all building platforms are set above the flood levels for the 100 year ARI event with maximum probable development and climate change, and a suitable allowance for freeboard; and
- Maintain overland flow path capacity within the PC50 area. If required, easements and flow channels should be provided for 100 year ARI peak flows.

⁵ Auckland Council, 1 November 2015, *Code of Practice for Land Development and Subdivision – Chapter 4 Stormwater*, Version 2.0

4 The Masterplan

The stormwater management approaches investigated and tested as part of the plan change process includes site extent as part of this referred project application. Based on the level of development illustrated on the Masterplan, it is considered that the stormwater management proposed in the SMP for Waihoehoe Precinct can be successfully implemented to management stormwater flows expected to be generated by the development within the site.

The only new issues that have emerged are due to the identification of wetlands and the new requirements of the National Environmental Standard for Freshwater (“NES Freshwater”). In response to this, we have added an additional stormwater management approach to Table 1 for wetlands, which is explained further in Section 5.

5 Assessment

While the general approach to stormwater management remains consistent with the SMP for the Waihoehoe Precinct, this section discusses specific stormwater matters in more detail, as they relate to the proposed development.

The items discussed below will be addressed in the technical reports which accompany the final application.

5.1 National Environmental Standards for Freshwater

The proposed masterplan keeps existing wetlands W1 and W2 within designated drainage reserves. The ornamental pond P1 which sits next to wetland W1 will be severed by the proposed road alignment. There is also a probable/indicative wetland W3 located in the floodplain on 76A Waihoehoe Road (refer to Figure 3).

The stormwater management approach to these wetlands will be to target hydrological neutrality of surface and ground water in the catchment to these wetlands, as set out in Table 1. To ensure the vitality of these wetlands it is necessary to maintain a suitable natural flow regime. This will be achieved by:

- Maintaining surface and groundwater catchments to the wetlands;
- Infiltration of stormwater to mitigate the impacts from increased impervious surfaces. Mimic existing groundwater regimes as much as is feasible;
- Maintain surface and groundwater level controls for wetlands;
- Detention of stormwater to reduce flow rates to the wetlands;
- Erosion protection of any pipe discharges to the wetlands;
- Assess changes due to attenuation storage (infrequent and short duration) over wetlands, refer to Section 5.2.

The environmental effects assessment to support the resource consent will be prepared by the ecologists supported by T+T hydrological analysis and Crang Civil designs.

5.2 Flood attenuation in the southern catchment

The flood management strategy for the southern sub-catchment is to attenuate flood flows up to the 100 year ARI storms to match pre-development flood peaks. Flood attenuation storage will be provided in a number of attenuation basins within the larger land area within Drury East in order to mitigate flooding in the western parts of the plan change area and further downstream.

Development of both the referred project area only (short term) and the entire Drury East area (long term) has been considered when selecting the location and sizing requirements of the attenuation devices.

5.2.1 Attenuation basin at 136 Waihoehoe Road

Flood attenuation storage for the eastern portion of the site is proposed to be provided over the P and W1 wetland footprints (indicated by a diamond and triangle, respectively, in Figure 3). The culverted road crossing and/or the culvert at the downstream end of the P1 at the western boundary of the site would be used to control discharge rates.

5.2.2 Attenuation basin at 76 Waihoehoe Road

Flood attenuation storage for the western portion of the site and future development of 112 Waihoehoe Road (upstream of the referred project site) is proposed to be provided in an attenuation basin located in the drainage reserve on the eastern side of the proposed road (indicated by a star in Figure 3). Placing the attenuation basin upstream of the proposed road allows the discharge rates from the attenuation device to be restricted/controlled by a proposed culverted road crossing.

We note that the small portion of the referred project southern catchment is located on the western side of the road and will not be captured for flood attenuation until another attenuation basin is constructed downstream as part of the wider Drury East development. To allow for an interim development solution, the attenuation basin at 76 Waihoehoe Road will be designed to over-attenuate flows to offset the effects from the temporarily un-attenuated area on the downstream railway culvert constraint.

This proposal will be developed as part of the resource consent application.

5.3 Industry Best Practice

In recognition of AT's preference to remove smaller treatment devices adjacent to roads, we are looking to move towards aggregated stormwater treatment devices i.e. larger raingardens and communal wetland/raingardens where best applicable within the Masterplan. The Masterplan has sufficient allowances for these stormwater treatment devices in the road cross section. Table 1 notes that bioretention devices in the road will be compliant with AT requirements.

6 Conclusion

Based on the background analysis and stormwater modelling that have been completed to date, it is expected that stormwater effects from the site can be managed safely and without adverse impacts to the receiving environment. Further detail and assessment will be developed on matters discussed in the assessment and included in the final application if the proposal is accepted as a referred project.

7 Applicability

This report has been prepared for the exclusive use of our client Oyster Capital, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement. We understand and agree that this report will be used by Ministry for the Environment in undertaking its regulatory functions in connection with the consent application.

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