

TECHNICAL MEMO

Subject:	Engineering, Flooding & Infrastructure 151, 155-157 Brigham Creek Road and 69-71 Trig Road in Whenuapai, Auckland	Date:	6/09/2021
		Memo No:	44315-ME-C-EG01
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Memo

1.0 Introduction

A subdivision is proposed at 151, 155-157 Brigham Creek Road and 69-71 Trig Road in Whenuapa Auckland. This memo summarises the anticipated content of the upcoming engineering and infrastructure report for the proposed development. The memo is not to replace the engineering report but to provide the expected information in the upcoming report. The content shall support an application to the Minster for the Environment to have this project referred to an Expert Consenting Panel under the Covid-19 Recovery (Fast-Track Consenting) Act 2020

The purpose of this memo is to provide a brief design and the assessment of the earthworks, the flood hazard risk, the infrastructure network connections, and the proposed methods of mitigating the stormwater runoff from the development in compliance with Auckland Council Requirements.

2.0 Site Description

The development is to extend over four sites being Lot 2 DP 334953 Lot 2 DP 101583, Lot 3 DP 101583, Lot 4 DP 101583, Lot 5 DP 101583, and LOT 2 DP 117365 with a combined area of 228,944m². The sites are currently accessible through the existing driveways from Trig Road and Brigham Creek Road.

The existing land falls from RL42m at the southern boundary to RL13m at the north-eastern corner, and to RL15m at the south-eastern corner of the subject sites. An unnamed stream and multiple overland flow paths discharge to the unnamed stream that discharges to Waiorahia Stream. Separate overland flow paths within the eastern section discharge directly to Waiorahia Stream.

The subject sites have been designated as future Business – Light Industrial Zone and Residential-Single Housing Zone on the Proposed Plan Change 5 Zoning Map. The site location is shown in Figure 1.

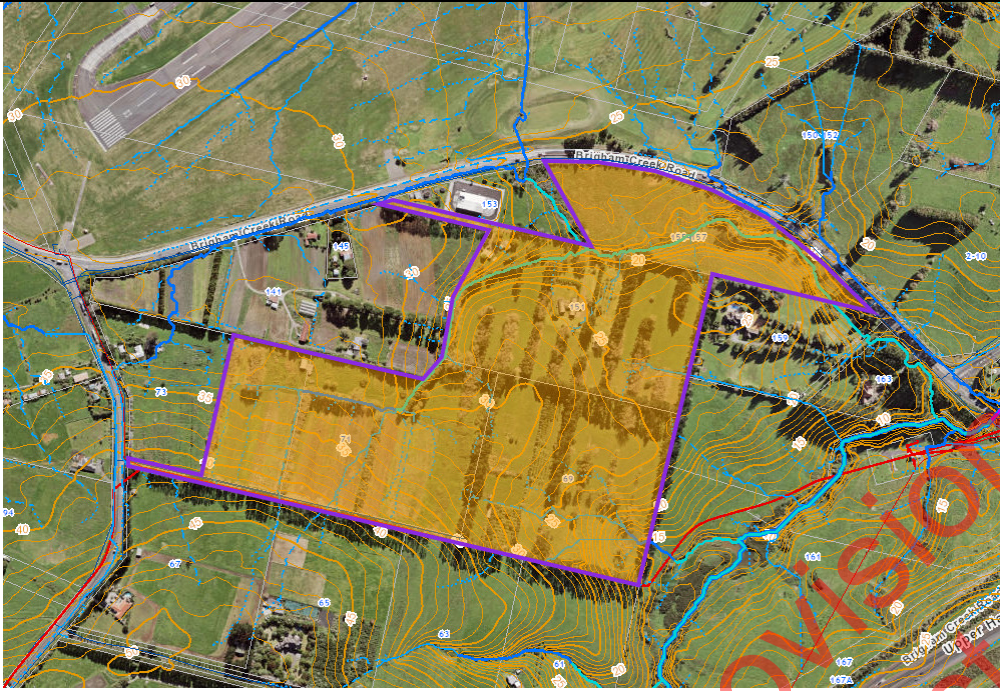


Figure 1: Site Location

3.0 Proposed Development

The proposal is to create 21 Industrial lots and 4 residential lots including 2 residential super lots. Four public roads are proposed to service the proposed development. One of these roads will intersect Brigham Creek Road at a proposed signalised traffic intersection to service the development. Drainage infrastructure and utility services are proposed.

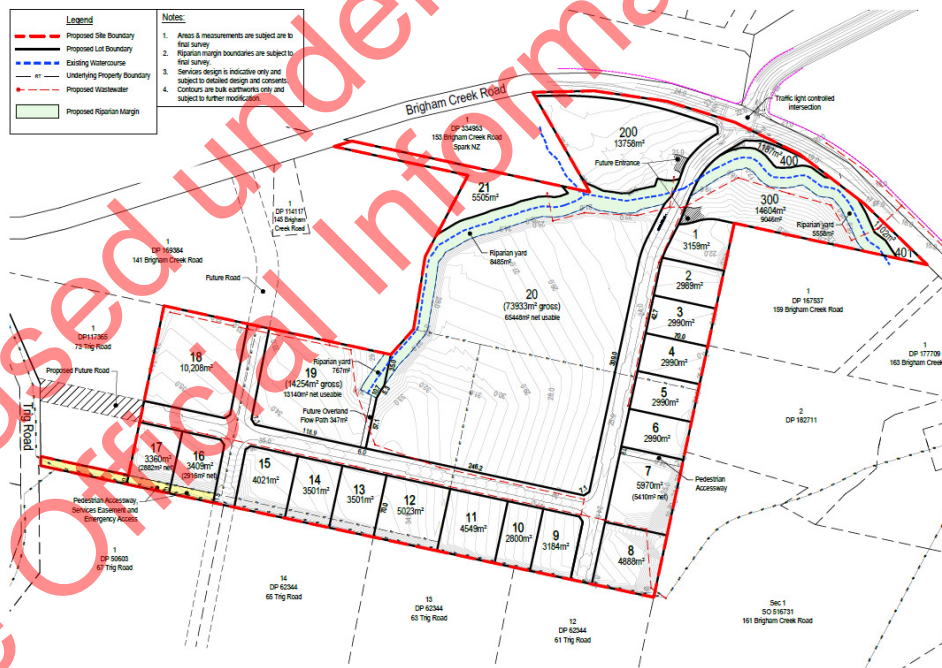


Figure 2: Proposal

4.0 Earthworks

Proposed Earthworks

The construction of the Bulk earthworks at 69 Trig Road and 151-151,153-157 Brigham Creek Road are progressing under a consent LUC60350837. A Resource consent application for the bulk

earthworks in 71 Trig Road is being processed.

Further earthworks are proposed to trim the roads and reshape the lots to the final level under this resource consent application.

Sediment and Erosion Control

Erosion and sediment controls for the bulk earthworks shall be reviewed, adjusted, and maintained as the work progress in accordance with GD05.

Super silt fences and runoff diversion bunds/channels shall remain along the edge of the riparian boundary until the vegetation has established. The completed surface shall be progressively stabilised to reduce the exposed area.

5.0 Rooding

Four proposed collector Roads and an intersection of the proposed road with Brigham Creek Road are consistent with the Plan Change 5 - Whenuapai Structure Plan Integrated Transport Assessment Report. No vehicle crossings are proposed on Brigham Creek Road. The existing vehicle crossing to 151 Brigham Creek Road shall remain to service the proposed Lot 21 due to being isolated by the watercourse.

Consultation with SGA and AT was undertaken regarding Brigham Creek Road widening and the intersection with the proposed Road. Under this resource consent application, the Brigham Creek Road carriageway will be widened at the proposed intersection and a separated cycleway with footpath will be constructed at northern side of Brigham Creek Road between Kauri Road intersection and the proposed intersection.

The proposed collector roads consist of 2 lane carriageways, parking bays, separated cycleway and footpath with berms to accommodate the landscaping, raingardens and common service trenches.

A bridge on the proposed Road 1 will be constructed at the stream crossing to reduce the impact on the existing small wetland which is stated in the watercourse assessment report provided by Bioreasearches.



Figure 3 Proposed Road Layout

6.0 Wastewater

Existing wastewater

There are two trunk wastewater lines in the area with potential to accommodate the flows from the proposed development. The first trunk wastewater line is a 450PE transmission pipe along the south boundary to the Brigham Creek Road Pump station with a satellite manhole within the subject site. A second line is a 315uPVC local wastewater line from the Brigham Creek Road roundabout adjacent to Upper Harbour Motorway, which runs along Brigham Creek Road to the same pump station.

Proposed Wastewater

A consultation with Watercare (Ilze Gotelli) was undertaken regarding the wastewater catchment and the proposed wastewater layout. It was agreed to split the wastewater catchment of the subject site into two sub-catchments to avoid extremely deep lines.

A new wastewater pipeline will be extended from the existing satellite manhole within the site to service the western and southern section of the proposed development. Stubs from the proposed manholes will be provided to service the future development in 73 Trig Road and 141 Brigham Creek Road.

Another public wastewater line will be extended from an existing manhole (GIS ID 257089) on 315uPVC line at the eastern side of the existing pump station to service the northern and middle section of the development, and future development at Kauri Road. This line will also service the future development at 153 Brigham Creek Road.

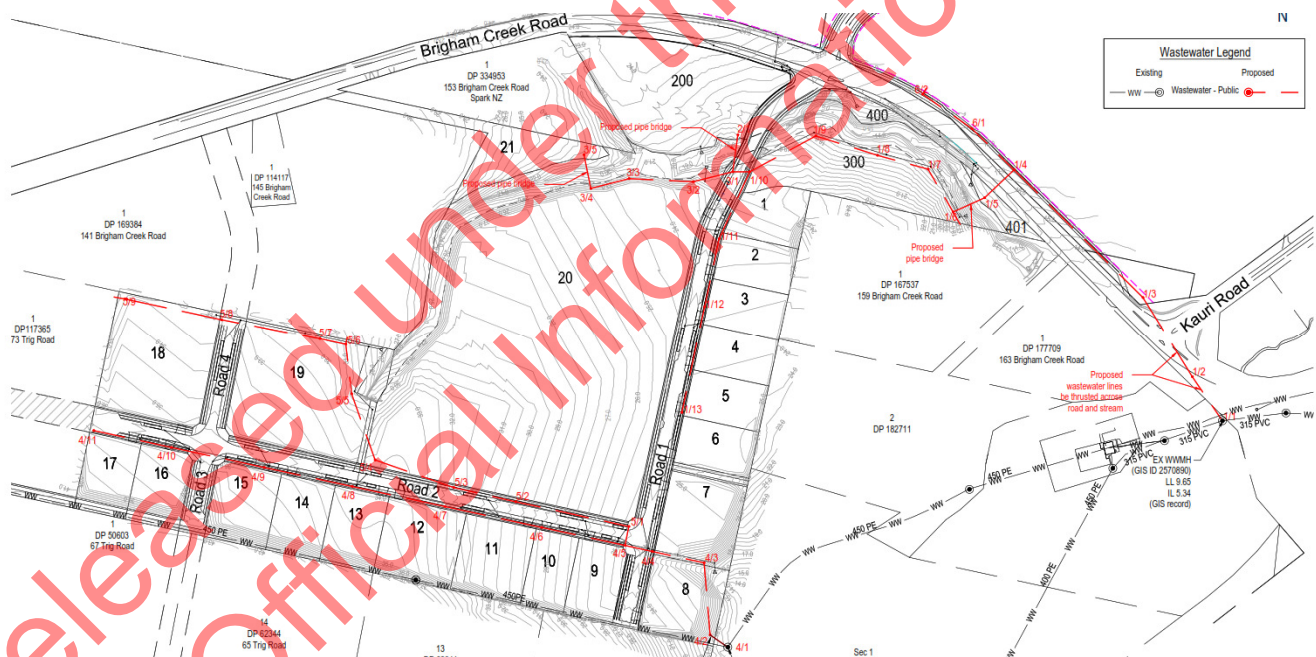


Figure 4 Proposed Wastewater Layout

7.0 Flood Assessment

Flood assessment is being finalised for both predevelopment and post development situations using HEC RAS 2D software. The assessment focuses on the proposed development at Trig Road and Brigham Creek Road, the upgrade of Brigham Creek Road with future development at Kauri Road.

The impervious areas are based on the Auckland Council Proposed Whenuapai Plan Change Variation 1 Zoning Map, which is considered as the representative of the Maximum Probable Development (MPD) in the catchment. This consideration allows to investigate the flooding effects on

the proposed development and vice-versa, and to the downstream environment.

The extent of the proposed and future developments has dictated the extent of the overland flow paths catchment to be assessed. This resulted in a total catchment area of approximately 368ha being considered in the model.

The flood assessment for the predevelopment and preliminary assessment for the post-development situations showed no issue that would alert significant flooding hazard resulting from the proposed development. The flood assessment for the post-development scenario is being finalised in compliance with Auckland Council requirements. The HEC RAS model results will reveal more detail whether the overland flow will require mitigation. The effects on Brigham Creek Road at the existing box culvert location are also being considered in the post-development situation. Recommendations on any appropriate remedial works will be provided to mitigate any detrimental effects for the protection of neighbouring properties and downstream environment. A detailed flood analysis will be covered in the flood assessment report.

8.0 Stormwater Management

Existing Stormwater

There is no existing public stormwater reticulation within the site. The site is naturally draining to the existing gully and the stream. Existing culverts under Brigham Creek Road discharge to the subject site.

An existing stream flows from the north-west to the north east and an existing pond at the south-eastern corner of the site.

Proposed Stormwater

Stormwater Management Rules

The site falls in SMAF1 zone under Proposed Plan Change 5. SMAF 1 control and treatment shall be provided to comply with the Auckland Unitary Plan operative in Part (AUPO) and Whenuapai 3 Precinct Stormwater Management Plan, September 2017.

The proposed public stormwater pipelines shall be designed to accommodate the 10% AEP storm event for the Maximum Probable Development (MPD). The maximum impervious area is not limited in the light industrial zone while 60% is recommended in the single house residential zone.

SMAF 1 control requires to provide retention for 5mm runoff depth from the impervious areas and provide detention for the difference between the pre-development and post-development runoff volumes from the 95th percentile 24 hours rainfall event minus the retention volume.

Treatment systems shall be provided to treat the runoff from the impervious area.

The existing and proposed overland flow paths shall be managed to avoid any detrimental effects to the neighbouring properties and to the downstream environment.

Stormwater Network

New public stormwater networks are proposed to convey the 10% AEP flow from the proposed development. The runoff from south-eastern section of the subject site will be discharged through a proposed outlet structure to the existing gully at the north-eastern corner of the proposed Lot 8. The runoff from remaining site will be discharged to the unnamed stream through the proposed outlet structures. Given the difficulties in providing a stormwater network with a single outlet, multiple outlet structures are proposed at a set back from the stream and the riparian margin protection area. Energy

dissipation is proposed to minimise scouring.

Stormwater Mitigation

Bioretention (raingardens) are proposed in the front berm of the roads to provide the required detention for the difference between the pre-development and post-development runoff volumes from the 95th percentile 24 hours rainfall. According to the Memo provided by GNW Geosciences, the percolation rates from the test are below 2mm/hr. Therefore, the required retention for the impervious area in the road reserve will be compensated within the detention volume.

Retention and Detention volumes shall be provided in private stormwater devices such as tanks, bioretention (raingardens) or approved similar devices during the development of individual lots in the future. The detention and retention volumes shall be calculated in accordance with GD01 and the Auckland Council Unitary Plan.

Stormwater Treatment

Raingardens are proposed in the road reserves to also provide the required treatment. For the major road intersection with Brigham Creek Road, raingardens are not a practical option due to the limited space and complicated existing services in this area. Therefore, stormfilters with vortcaptures (GPT system) or similar are proposed to provide the required treatment.

Wherever the impervious areas are over 1,000m² or the proposed carparks are over 30 carparks for each future lot, treatment shall be provided within the individual lots.

Stormwater Management Plan

The site falls in large brownfield category under Auckland-wide Stormwater Network Discharge Consent (NDC). A detailed specific stormwater management plan for the site will be provided separately.

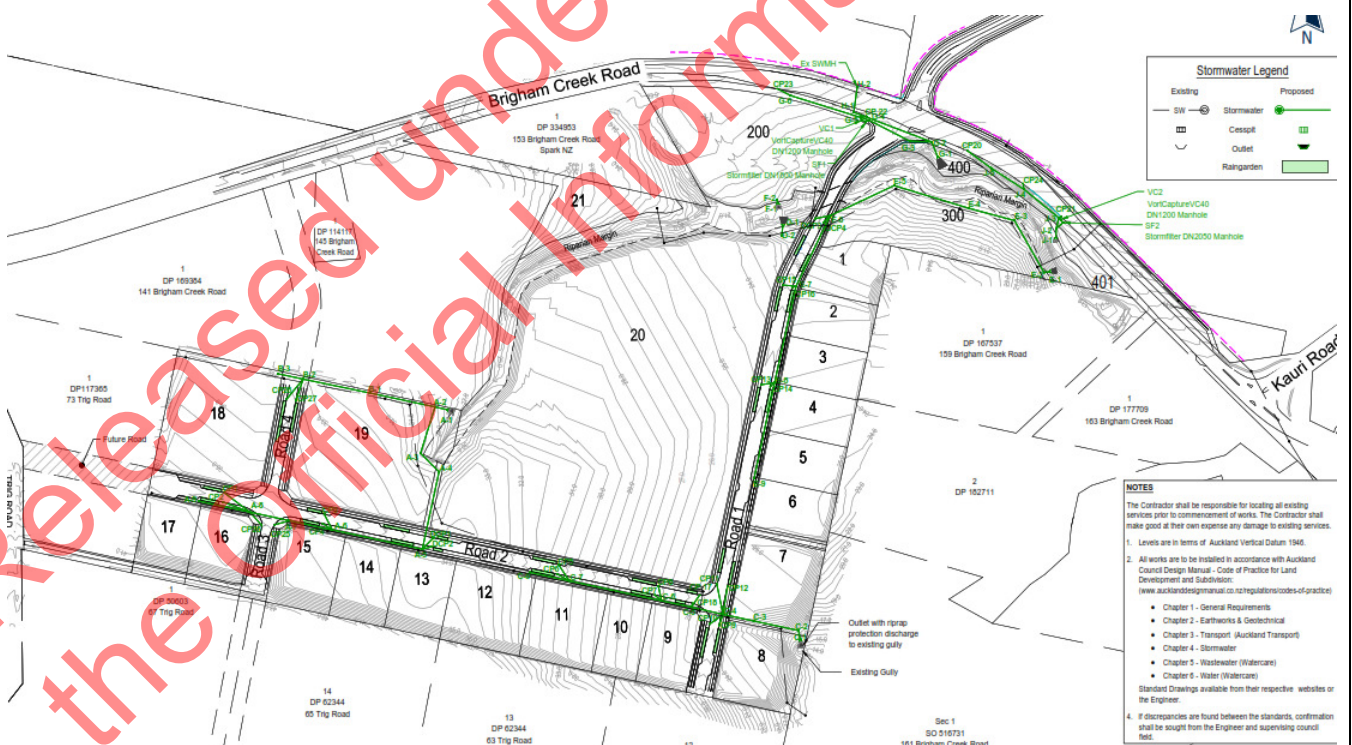


Figure 5 Proposed Stormwater Layout

9.0 Water Supply

Auckland Council's Geomap show an existing 150AC pipeline and an existing 315PE local pipe running in parallel with Brigham Creek Road in front of the site. An existing 125PE pipeline, which is

connected to 150mm AC within Trig Road, terminates at 12m within the existing driveway and extended with 40uPVC and 25 PE lot connections to service 69 and 71 Trig Road. However, the 125PE and the two connections will be abandoned.

Watercare advised that the existing 150AC pipe within Brigham Creek Road will be abandoned. Therefore, the proposed pipelines will be extended from an existing 315PE at the proposed road intersection with Brigham Creek Road. 150mm diameter and 225mm diameter watermain are proposed within the proposed Road 1 reserve to service the development. Once the future road from Trig Road is built, the new pipelines will be extended to connect to the existing 225mm diameter concrete pipe in Trig Road.

Hydrants are proposed within the site at a maximum distance 135m as per SNZ PAS 4509:2008. A hydraulic model will be provided to demonstrate the fire flow capacity of the proposed watermain. Further fire hazard shall be assessed as per SNZ PAS 4509:2008 during the development of individual lots, in future.

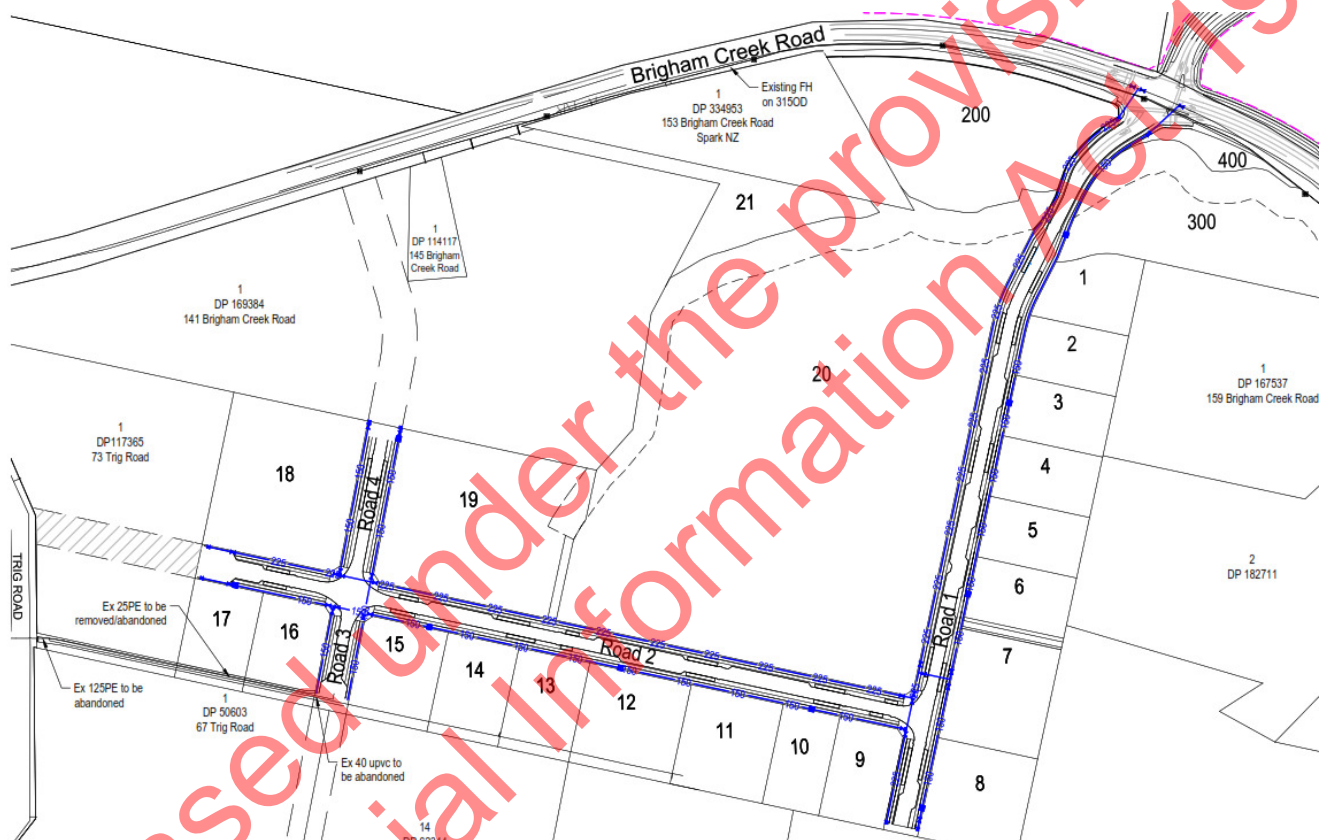


Figure 6 Proposed Watermain Layout

10.0 Utilities & Services

Power and telephone services are currently located within Brigham Creek Road reserve in front of the subject site. The power and telephone services will be extended throughout the proposed development to service each Lot.

11.0 Summary

The proposal is consistent with the Draft Variation 1 to Plan Change 5, the Auckland General Design Manual and Auckland Code of Practice for Land Development and Subdivision.

Public wastewater reticulations will be extended from the existing wastewater manholes to service the development.

Stormwater networks are proposed to convey the 10% AEP stormwater runoff from the proposed

development. The runoff from the impervious area will be treated on site before discharging to the corresponding outlet structure.

Stormwater systems will be provided to mitigate volumes in compliance with SMAF1 controls requirements. Additional mitigation systems will be provided during the development of individual lots.

The overland flow paths are assessed and managed to minimise detrimental effects to the neighbouring properties and downstream environment. The existing flood hazard risks are not exacerbated.

Public watermains and other utility services are proposed to service the development.

12.0 Limitations

This Memo is prepared for the applicant, Neil Construction Limited, in relation to an application under the Covid-19 Recovery (Fast-track Consenting) Act 2020 for 151, 155-157 Brigham Creek Road and 69-71 Trig Road.

The comments within this report are limited to the purpose stated. Cato Bolam accept no liability for the use of this report by any other person that that stated above, or use for any other purpose, and any such person who relies upon any matter contained in this report does so entirely at their own risk.

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