

Engineering Report for Proposed Development

Lots 3 to 5 DP 333811

Yorke Road, Haruru Falls

for

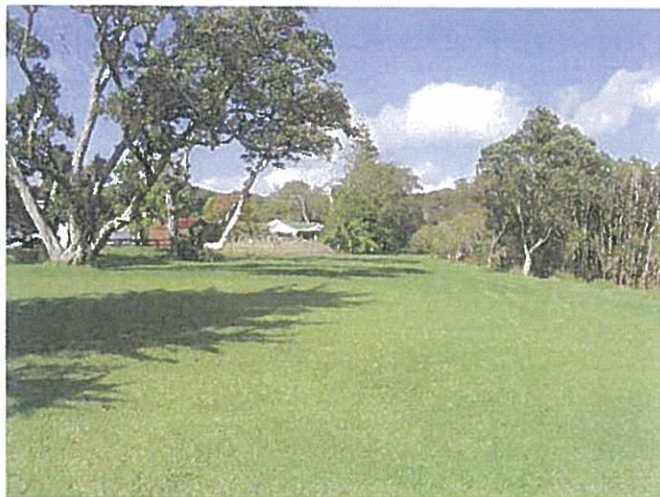
Woolston Family Trust

*Prepared for Black Box Architecture
Supporting Report for an Application to the Far North District Council*

Haigh Workman reference 16 245

Engineering

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Approved by



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Executive Summary

It is proposed to construct six residential dwellings on a 15,942 m² property at Yorke Road, Haruru Falls. The property is currently in three titles Lots 3 to 5 DP 333811. A resource consent (2140360-RMAVAR/A) has been approved for a boundary adjustment of Lots 4 and 5 to create Proposed Lots 1 and 2. Under the Far North District Plan the site is zoned Residential.

The proposal is to apply for land use and building consents to enable the dwellings to be built. A subdivision around the six houses may follow at a later stage.

This report assesses the suitability of the site for development with particular regard to flood hazard, stormwater management, access and services. The report may be used in support of applications for land use consent and referred to for future building consent and subdivision consent.

Site Suitability

The site is suitable for developing as proposed. None of the conditions listed in Section 106 of the Resource Management Act are applicable to the building sites shown on the subdivision scheme plan.

The site contains natural hazards (flooding) that would warrant action under Section 71(1) of the Building Act 2004. However, we consider that with the minimum building levels recommended in this report, 'adequate provision' under Section 71(2) will be made to protect the land, building work, or other property from the natural hazard.

Geotechnical

Site specific geology has been investigated and reported in the Haigh Workman Geotechnical Investigation Report ref 16 245 dated November 2016. The Geotechnical Report should be referred to for recommendations on fill, building foundations and retaining walls.

Machine CPT testing was carried out as discussed in the Geotechnical Report. The investigations indicate substantial low strength superficial deposits exist 5 metres below the building platforms.

Potential settlement can be expected under fills. Settlement of the final development can be reduced to tolerable levels set by the New Zealand Building Code by constructing the fills at least 6 months in advance of building construction.

Flood Hazard

We recommend the following minimum levels apply to development on each Lot

Development	Recommended Criterion	Recommended minimum level (OTP datum)
House (minimum floor level)	0.5 m above 2115 1% AEP Flood Level	4.00 m
Non-habitable buildings (minimum floor level)	0.3 m above 2115 1% AEP Flood Level	3.80 m
Building platform	2115 1% AEP Flood Level	3.50 m

Stormwater

We recommend the following stormwater management:

- Kerb & channel on the common driveway discharging to the Waitangi River via an open drain;
- Swale drain on the western boundary of the Site discharging to the Waitangi River;
- Piped stormwater system from roofs to the western drain;
- Overland flows from lawns, gardens and paved areas to the drains.
- Stormwater detention on this site is not desirable and is not proposed.

Access

Driveways can be formed from the vehicle crossings to building platforms on the proposed Lots in compliance with the Far North District Plan permitted activity rules.

Parking and associated manoeuvring can be accommodated within the proposed lots.

Earthworks

Earthworks will be required to raise and form house platforms and excavate swale drains.

This scale of earthworks will exceed the permitted activity in the Residential zone of 200 m³ per year per Lot [District Plan Rule 12.3.6.1.3]. The total earthworks volume on the Site is within the 5,000m³ permitted under the Regional Water and Soil Plan for Northland.

An assessment of effects is included in this report.

Water Supply

The site is served by reticulated water from the Paihia Town Water Scheme. A water connection can be made to each building.

A new fire hydrant will be provided near Lot 3a to provide a primary source of water for firefighting to all proposed dwellings. All dwellings except the Lot 2 dwelling would be within 270m of the secondary supply at the Falls View Road hydrant. A swimming pool could be used as the secondary supply for the dwelling on Lot 2.

Wastewater

It is proposed to connect each dwelling to the FNDC wastewater system via a small diameter pressurised sewer (rising main).

Each dwelling will have a storage tank, grinder pump and connector pipe with a boundary kit at the rising main to prevent backflow.

1. Introduction

1.1. Introduction

It is proposed to construct six residential dwellings on a 15,942 m² property at Yorke Road, Haruru Falls. The property is currently in three titles: Lots 3 to 5 DP 333811.

A resource consent (2140360-RMAVAR/A) has been approved for a boundary adjustment of Lots 4 and 5 to create Proposed Lots 1 and 2. Lot layouts referred to in this report are based on the approved resource consent 2140360-RMAVAR/A as follows:

- Proposed Lot 1 3180 m²
- Proposed Lot 2 7790 m²
- Lot 3 DP 333811- 4972 m²

It is proposed to construct one dwelling on Lot 2, two on Lot 1 and three on Lot 3. Lot 2 contains the shared right of way. Under the Far North District Plan the site is zoned Residential.

1.2. Objective and Scope

Haigh Workman Ltd (Haigh Workman) was commissioned by the Woolston Family Trust (the Client) to undertake a site specific engineering report for subdivision of land at Lots 3 to 5 DP 333811, Yorke Road, Haruru Falls (the "Site").

This report addresses the suitability of the site for residential development in respect of the following engineering issues:

- Natural hazards
- Earthworks
- Building foundations
- Access
- Stormwater management
- Water supply / firefighting
- Wastewater management.

This report may be used in support of applications for land use consent and future building consent and subdivision consent. Site specific geology has been investigated and reported in a separate Haigh Workman Geotechnical Investigation Report ref 16 245A dated November 2016.

This report should be read in conjunction with specialist reports being undertaken by others for planning aspects.

1.3. Applicability

This report has been prepared for the use of Woolston Family Trust with respect to the particular brief outlined to us by Black Box Architects. This report is to be used by our Client and their Consultants and may be relied upon when considering engineering advice for building, land use and subdivision consents. The information and opinions contained within this report shall not be used in other context for any other purpose without prior review and agreement by Haigh Workman Ltd.

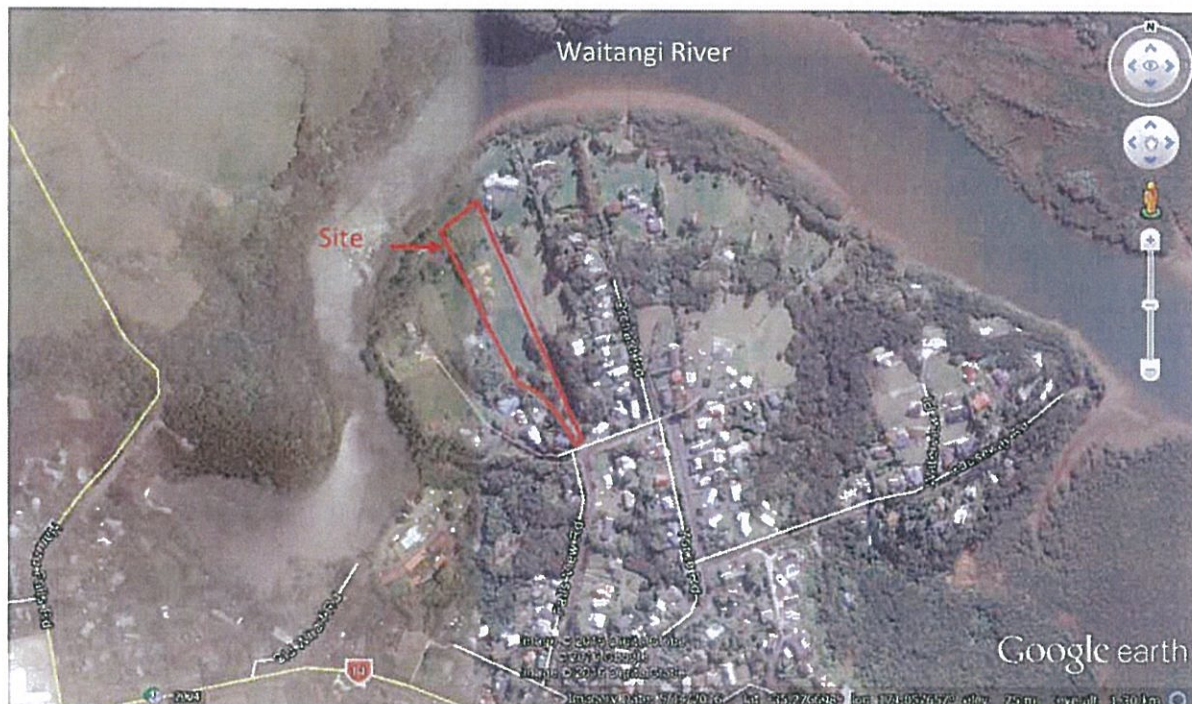
2. Site Description

2.1. Location

Site Address: Yorke Road, Haruru Falls

Legal Description: Lots 3 to 5 DP 333811

Figure 1 Locality Plan



2.2. Existing Site

This site is bound by Waitangi River to the north and by residential properties east and west.

The site is largely in pasture. Topographically the site slopes towards the Waitangi River, with Lots 1 and 2 on a flood plain and Lot 3 on rising ground.

2.3. Proposed Development

The attached plan shows the layout of the site including access and proposed building sites.

The proposed development includes six dwellings, with associated earthworks, access ways and services.

3. Geology

3.1. Geotechnical Report

Site specific geology has been investigated and reported in the Haigh Workman Geotechnical Investigation Report ref 16 245 dated November 2016. The Geotechnical Report should be referred to for recommendations on fill, building foundations and retaining walls.

3.2. Mapped Geology

Superficial Geology (Soils)

The site and the surrounding area comprising the inside bend of the river is shown to be directly underlain by soils of the 'Coastal Sand Dune Complex' comprising Whananaki sand (WD) according to NZMS mapping. Superficial soils at the site comprising WD are typically described and categorised as '*excessively to somewhat excessively drained*'.

Bedrock Geology

The superficial deposits are indicated to be underlain, although most likely at considerable depth at the building location by solid geology comprising Waipapa (composite) Terrane strata of Jurassic to Permian age (c. 150 to 260 million years). The GNS rock map identifies the Waipapa (composite) Terrane (TJw) at the site as part of the Waipapa Group and describes it as '*massive to thin-bedded, lithic volcaniclastic sandstone and argillite*'.

3.3. Site Investigations

Machine CPT testing was carried out as discussed in the Geotechnical Report.

The investigations indicate substantial low strength superficial deposits exist 5 metres below the building platforms.

Potential settlement can be expected under fills. Settlement of the final development can be reduced to tolerable levels set by the New Zealand Building Code by constructing the fills at least 6 months in advance of building construction.

4. Hazards, Land Stability and Foundations

4.1. Hazards

Hazards identified in Section 106 of the Resource Management Act are: erosion, falling debris, subsidence, slippage, or inundation from any source. Hazards listed in the Building Act include: erosion, falling debris, subsidence, inundation or slippage.

We assess the susceptibility of this site to those potential effects as;

Erosion	No
Falling debris	No
Subsidence (vertical settlement)	No with appropriately designed engineered foundations
Inundation	Yes; flooding from Waitangi River and storm surge
Slippage	No with appropriately designed retaining walls

The specific hazards listed as potentially applicable to this site are discussed further below.

4.2. Flooding

The District Plan Hazard Map FL2, NRC and FNDC GIS databases indicate the site as an area subject to flooding. A flood hazard assessment has been carried out in Section 5 of this report.

4.3. Land Stability

Land stability and settlement is addressed in the separate Haigh Workman Geotechnical Investigation Report ref 16 245 dated November 2016.

4.4. Building Foundations

The buildings will be constructed on engineered fill and will require specifically designed foundations as detailed in the separate Haigh Workman Geotechnical Investigation Report ref 16 245 dated November 2016.

5. Flood Hazard Assessment

5.1. Published Flood Data

Introduction

Northland Regional Council (NRC) engaged a consulting Engineering company to complete detailed computer aided flood hazard modelling in the Waitangi river catchments including in the vicinity of this site. That work was carried out in a one dimensional model, which primarily models channel flow by cross sections. The study and its predictions include allowance for climate change and maximum probable development.

The use of LIDAR ground level mapping has enabled accurate flood prediction depths for the site. The flood maps reflect flooding originating from the river, and as such may not represent flooding caused by ponding or runoff of local water or overflow of stormwater networks.

Refer to the full copy of the appended NRC Flood Maps Disclaimer attached.

Glossary of Terms

OTP datum - This is the adopted survey point datum for Northland which is in reference to mean sea level at One Tree Point, Whangarei (ie the ground levels quoted in OTP datum is the height above mean sea level).

LIDAR - Light Detection and Ranging. This is a method of aerial mapping for measurement of ground levels using a laser that is generally accurate to 150 mm vertical and 250 mm horizontal.

100 year ARI – 100 year Average Recurrence Interval Some publications use the more accurate term Annual Exceedence Probability (AEP). A 100 year ARI is equal to a 1% AEP.

10 year ARI – 10 year Average Recurrence Interval (10% AEP)

CC – Climatic Change. For rainfall this allows for future increased rainfall intensity, being a 16.8 % increase in intensity over the next 100 years based upon 2.1 degrees increase in temperature.

SLR – Sea Level Rise as a result of Climate Change.

1d – one dimensional model, which primarily models channel flow by cross sections

1d Flood Model Results

The 100 year ARI CC flood level prediction for the property shows that flood water covers the entire area of Lots 1 and 3 and part of Lot 3. The predicted flood level varies from 2.7 to 3.0 m OTP datum for the bulk of the Site.

There is an abrupt drop in flood elevation in the middle of the subject site which can be seen in the 100 year ARI CC flood depth plot. This abrupt change is a slight anomaly in the model and the actual change in levels would not occur so steeply as no features exist to warrant what is shown. We have conservatively assumed a modelled 100 year ARI CC flood level of 3.0 m OTP applies over the entire site.

The model allows for sea level rise of 0.5 m for the 100 year ARI CC model run. Since the model results were published, the Northland Regional Council adopted a new Regional Policy Statement (May 2016) which allows for a sea level rise of 1.0m by the year 2115. A rise in sea level will cause flood levels to rise upstream. With the higher flood elevations, the waterway area will occupy more of the floodplain and flood level increases will be

less than the increase in sea level rise. However, until the model is re-run on the basis of the higher sea level rise, it is conservative to assume that flood levels will increase by 0.5 m.

Allowing for the higher increase in sea level by 2115 adopted by the Regional Policy Statement, the 100 year ARI CC flood level is estimated to be 3.5 m OTP at the Site.

The LIDAR shows that Lots 1 and 2 generally lie between 2.2 and 2.7 m OTP datum. Lot 3 rises steeply from 2.4 m OTP. The 100 year ARI CC flood depth therefore varies up to 1.3 m depth.

The published 10 year ARI flood level is based on existing climate and sea level. It indicates a flood level of 2.4 m OTP datum. The map shows shallow inundation over the western part of Lot 1 and around much of the perimeter boundary of Lot 2 with shallow surface ponding in places. The flood depths are minor and limited to 100-200 mm.

Coastal Hazard Flood Level

The level adopted by Northland Regional Policy Statement for the 100 year ARI coastal storm surge for the east coast (excluding wave run up) is 1.8 m OTP datum plus a SLR of 1.0 m by 2115 (total 2.8 m OTP).

A report by Tonkin + Taylor Ltd 'Coastal Flood Hazard Zones for Selected Northland Sites' dated May 2016 evaluated the factors that contribute to high tides (astronomical tide, medium term fluctuations in sea level, long-term sea level change, low barometric pressure and wave set-up) and estimated the 1% AEP combined storm tide levels at various Northland sites. For the Waitangi Estuary, the report estimates a 1% AEP storm tide level of 2.7 m OTP datum, including 1.0 m SLR by 2115. This is consistent with the Northland Regional Policy Statement.

The potential for wave run-up is negligible given that the Site is protected by the narrow harbour opening and large ponding area within the Waitangi estuary.

Tsunami

The Northland Regional Council commissioned a number of reports by NIWA on the tsunami risk along the Northland coast. The report relevant to this site is an August 2008 report by NIWA entitled 'Northland Regional Council Tsunami Modelling Study 2'.

The report identified the following credible sources:

- Remote source: South American origin. Return period 50-100 years. This represents the most probable tsunami risk in the next 100 years.
- Local/Region: Tonga Kermadec. Two events were modelled, M_w 8.5 and M_w 9.0. The return period of these events is much longer (500-2000 years) but these represent a worst-case scenario for a tsunami striking the Northland coast.

Tsunami propagation from these scenarios to the Northland coastline was simulated using a computer model and subsequent inundation at fifteen specific communities was modelled. The simulations were performed for current sea levels and for a mean sea level elevated by 50 cm, representing the 100 year projection by the IPCC Fourth Assessment Report.

The report maps show a remote South American tsunami affecting the esplanade reserve in front of the Site. This represents a tsunami level of 2.0 m OTP datum for the existing sea level and 2.4 m OTP datum for 0.5m sea level rise. Flood levels from the M_w 8.5 Tonga-Kermadec subduction zone tsunami were similar at the Site.

The modelled South American tsunami can be adopted as representing the 1% AEP tsunami risk. The flood levels need to be adjusted to allow for the 1.0m sea level rise estimated by the Northland Regional Policy Statement by 2115. Extrapolating linearly between the 0 and 0.5m SLR estimates, the estimated tsunami flood level for 1.0m SLR is 2.8 m OTP datum.

We consider this estimate to be conservative as the Site is protected by the narrow harbour opening and large ponding area within the Waitangi estuary.

Summary

The design 100 year ARI (1% AEP) flood level at the site is the maximum of the following independent flood events allowing for 1.0m sea level rise by 2115:

- Waitangi River flood level adjusted for 1.0m SLR 3.5 m OTP datum
- Regional Policy Statement coastal storm surge level 2.8 m OTP datum
- NIWA South American Tsunami adjusted for 1.0m SLR 2.8 m OTP datum

5.2. Floor Level Assessment

Statutory Guidelines for Buildings

FNDC Engineering Standards & Guidelines Clause 4.3.2.5.2 specifies all habitable buildings shall be set above the 100 year return period flood level plus 500 mm.

The New Zealand standard NZS4404:2010 'Land Development and Subdivision Engineering' states;

4.3.5.2 Freeboard

The minimum freeboard height additional to the computed top water flood level of the 1% AEP design storm should be as follows or as specified in the district or regional plan:

Freeboard	Minimum height
Habitable dwellings (including attached garages)	0.5 m
Commercial and industrial buildings	0.3 m
Non-habitable residential buildings and detached garages	0.2 m

The minimum freeboard shall be measured from the top water level to the building platform level or the underside of the floor joists or underside of the floor slab, whichever is applicable.

The Operative Regional Policy Statement (RPS) for Northland section 7.1.7(5) specifies:

- (5) The regional and district councils shall ensure that within the coastal environment:
- (a) Any new habitable dwelling has a minimum floor level of 3.3m above One Tree Point datum on the east coast and 4.3m above One Tree Point Datum on the west coast. New non-habitable buildings will have a minimum floor level of 3.1m above One Tree Point datum on the east coast and 4.1m on the west coast; and
 - (b) An additional allowance for wave run-up shall be assessed over and above the requirements above for exposed east coast locations where ground elevation is less than 5m above One Tree Point datum, and for exposed west coast locations where ground elevation is less than 6m above One Tree Point datum.
 - (c) Clauses (a) and (b) do not apply to:
 - i) Non-habitable buildings not designed for habitation or commercial use and where the potential impact of the building being materially damaged or destroyed by a coastal hazard event (including the replacement cost) is minor (e.g. pump sheds, car ports, farm sheds and public toilets); and
 - ii) Non-habitable buildings that have a functional need to be located in the coastal marine area (e.g. boatsheds); and
 - iii) Network utility infrastructure.
- Circumstances where (a) and (b) are not met will be subject to the resource consent process.

How minimum floor levels are derived in the RPS;

	East coast	West coast
Assessed 1% AEP sea level	1.8m OTP	2.8m OTP
Allowance for Sea Level Rise (to 2115)	1.0m	1.0m
Freeboard (habitable dwellings)	0.5m	0.5m
Freeboard (non-habitable buildings)	0.3m	0.3m

We recommend adopting the more conservative of these standards, that is freeboard above the 2115 1%AEP Flood event of:

- Habitable dwellings (including attached garages) 0.5 m
- Non-habitable residential buildings and detached garages 0.3 m

5.3. Summary of recommended levels for development

Development	Recommended Criterion	Recommended minimum level (m OTP datum)	Dwelling 2	Dwelling 1a and 1b	Dwelling 3b and 3c	Dwelling 3a
Ground Level (approx)			2.45	2.6	2.8	>4.0
			Fill Depth			
House (minimum floor level)	0.5m above 2115 1% AEP Flood Level	4.00	1.55	1.40	1.20	#
Non-habitable buildings (minimum floor level)	0.3m above 2115 1% AEP Flood Level	3.80	1.35	1.20	1.00	#
Building platform	2115 1% AEP Flood Level	3.50	1.05	0.90	0.70	#

Lot 3a is above the 1% AEP flood hazard zone. However buildings should be at least 200mm above ground level as recommended in the NZ Building Code.

5.4. Access Levels

If set at ground level, the proposed access ways are predicted to be above the 10 year ARI flood event but would be covered by up to 1.1m of water in the 100 year ARI flood. The risk associated with this is that entrance and egress could potentially be blocked off in an extreme flood event, particularly at high tide.

Raising the accessway level to be above the 100 year ARI flood level would result in a dam across the Waitangi River flood plain, potentially increasing flooding upstream. We therefore recommend that the accessways remain close to existing ground level

A concrete driveway has a design life of up to 50 years, after which it may need to be replaced. There is therefore an opportunity to review levels and potentially raise the driveway level above the new flood risk at this stage.

5.5. Building Act Section 71

Sites Subject to Natural Hazards

Under Section 71(1) of the Building Act 2004, the Building Consent Authority must refuse to grant a building consent if the land is subject to one or more natural hazards or the building work is likely to accelerate, worsen, or result in a natural hazard on that land, or any other property. However, under Section 71(2), the Section 71(1) restriction does not apply if the Building Consent Authority is satisfied that adequate provision has been made, or will be made to:

- (a) protect the land, building work, or other property from the natural hazard(s); or
- (b) restore any damage to that land or other property as a result of the building work.

In the situation of the Council considering land around a dwelling to be subject or likely to be subject to a natural hazard a Section 71 notice is registered on the title. A Section 71 notice may affect the owner's ability to obtain appropriate insurance cover.

The Site contains natural hazards that warrant consideration under Section 71(1) of the Building Act 2004. The critical potential hazard at this site is inundation from the Waitangi River. A house can be protected from inundation with the safe floor level provided by this report. The ground level around the house can be built up to the level of the 100 year ARI for a distance of 1 to 5 metres from each house to provide adequate safety for outside furniture and vehicles parked outside.

Placing fill in a flood plain potentially reduces the waterway area during extreme flood events, increasing flood levels upstream. In this case, the maximum extent of this influence is the Haruru Falls, approximately 700 metres upstream from the Site. The Waitangi River flood plain 200 to 300m upstream of the Site is constricted by ridges on either side that reduce the width to approximately 70 metres compared with well over 100 metres elsewhere below Haruru Falls. The proposed fill and buildings will be set back further from the river than the buildings on adjoining lots and will have little impact on flood flows. Keeping accessways between building platforms close to existing ground level avoids damming the floodway and further reduces the risk of increased flooding upstream.

The proposed earthworks will not accelerate, worsen, or result in a natural hazard on any other properties. We consider the assessed raised floor levels provide adequate provision for the purposes of Section 71 of the Act and compliance with the Building code.

The building work is subject to inundation, however with appropriate raised levels of buildings and building platforms, this hazard will be largely mitigated and a Section 71 notice at the time of Building Consent is not required.

Our assessment of Section 71(2) (a) for “adequate provision” as listed in the FNDC Natural Hazards Guidance Notes, is as follows;

Assessment criteria	Inundation
Confirmation that suitable mitigation of the relevant natural hazards has been or will be achieved on the site	Floor level for a dwelling set appropriately above flood hazard in accordance with FNDC Engineering requirements being 500 mm above the 100 year ARI flood. An out building floor level is set appropriately in accordance with NZS4404:2010 being 300 mm above the 100 year flood event. Ground within 1 to 5m of building envelopes will be built up to the 100 year ARI flood level.
Confirmation that the proposed design incorporates appropriate protection of the land, the building work, or other property and/or that any damage to the land or other property will be restored	Construction of a raised building platform protects the land and building work from the flood hazard. The proposed fill and buildings will be set back further from the river than the buildings on adjoining lots and will have little impact on flood flows upstream. Keeping accessways between building platforms close to existing ground level avoids damming the floodway and further reduces the risk of increased flooding upstream.
Producer Statement (PS1) certification of the design	A PS1 may be provided to accompany a building consent application once final development plans are completed for Engineering review
Assessment of compliance with the NZ Building code	The FNDC Engineering standards are more stringent than the performance requirement of the Building Code clause E1 with regard to return period. Therefore the floor level complies with a factor of safety.

6. Local Stormwater Management

6.1. Site Drainage

The Site drains from Yorke Road to the Waitangi River via overland flow and a number of shallow drains. There is a larger drain on the adjoining Lot 1 DP 166269 to the west of the Site that discharges into a pond on the boundary of the Site.

In heavy rainfall events, stormwater may pond on the surface before soaking into the soil or flow as a sheet flow towards the drains.

6.2. Impermeable surfaces – increased runoff

The development of each lot will result in an increase in impermeable surfaces, mostly access ways, paths and roofs.

We estimate the new impermeable surfaces on each proposed Lot to be typically;

Impermeable Surfaces	Proposed Lot 1	Proposed Lot 2 #	Lot 3 DP 333811	Total
House and garage roof	685	650	561	1896
Shed and pool		110		110
Concreted patios and paths	149	175	150	474
Driveway and turning area	250	1420	580	2250
Total Impermeable Surfaces	1084	2355	1291	4730
Lot Area	3180	7790	4972	15942
Percent Impermeable	34.1%	30.2%	26.0%	29.7%

Note #: Lot 2 includes the shared right of way

6.3. District Plan

The site is zoned Residential in the Far North District Plan. The rules relating to stormwater management in the Residential zone are:

7.6.5.1.6 STORMWATER MANAGEMENT The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 50%.

Impermeable surfaces are defined in the District Plan as;

IMPERMEABLE SURFACE

In relation to any site means any building or surface on or over the land which creates a barrier to water penetration into the ground. This definition includes but is not restricted to:

- (a) decks less than 1m in height above the ground where these decks have an impermeable surface [i.e. non-slotted or solid decks];
- (b) pools, but does not include pools designed to operate as a detention pond;
- (c) any surfaced area used for parking, manoeuvring, access or loading of motor vehicles, including areas covered with aggregate;
- (d) areas that are paved or covered with concrete, asphalt, open jointed slabs, bricks, gobi or materials with similar properties to those listed;
- (e) roof coverage area on plan. For the purpose of calculating impermeable surfaces, account shall not be taken of any additional areas that are overlapped by another form of impermeable surfaces.

But excludes:

- i. Water storage tanks occupying up to a maximum cumulative area of 20m²
- ii. Paths and paving less than 1 metre wide, provided they are separated from other Impermeable Surfaces by a minimum of 1 metre.

For the purpose of calculating impermeable surfaces, account shall not be taken of any additional areas that are overlapped by another form of impermeable surfaces.

In the case of multiple sites served by jointly owned access lots that contain impermeable surfaces within their boundaries, the total area of these impermeable surfaces are to be divided equally and considered as parts of the various sites served by the access lot for the purpose of determining compliance with the relevant stormwater management impermeability rules among all of the registered owners of the shared access.

It is unlikely that total impermeable surfaces on the lots when they are developed will exceed the permitted activity threshold under the District Plan.

6.4. Regional Water and Soil Plan

The Regional Water and Soil Plan for Northland permitted activity Rule 21.1.2 (a) requires that:

For new subdivision and development, the best practicable option for on-site stormwater disposal shall be identified and incorporated into the stormwater management design to avoid or minimise changes to stormwater flows after development for the 1 in 5 year return period storm event.

Rule 21.1.2 (d) requires that:

The stormwater collection system is designed to cater for stormwater flows resulting from not less than a 1 in 5 year return period storm event and a stabilised overland flow path is provided for to allow flows up to and including a 1 in 50 year storm event in excess of the capacity of the primary system.

The existing stormwater drainage will satisfy the Regional Plan rules.

6.5. Proposed Stormwater System

The stormwater system proposed for the subdivision is shown on the attached Haigh Workman drawing and comprises:

- Kerb & channel on the common driveway discharging to the Waitangi River via an open drain;
- Swale drain on the western boundary of the Site discharging to the Waitangi River;
- Piped stormwater system from roofs to the western drain;
- Overland flows from lawns, gardens and paved areas to the drains.

6.6. Effect on-site

Using these practical measures, the on-site effects will be minor.

6.7. Effect off-site

Stormwater drainage from the site discharges to the Waitangi River. The slight increase in impermeable surfaces as a result of future development on the Site will have an imperceptible effect on flows in the Waitangi River.

In a spatially uniform rainfall event, the peak flow in the Waitangi River will occur several hours after the peak rainfall due to the time of concentration from the upper catchment. It is therefore desirable to discharge stormwater from the lower catchment early so it does not coincide with the peak river flow. Stormwater detention on this site is not desirable and is not proposed.

Being a tidal area, water quantity control is not an issue. A number of practices to achieve water quality goals such as utilising grassed swale drains are available.

7. Access

7.1. Introduction

Access to the subdivision is proposed via separate existing vehicle crossings off Yorke Road near the corner of Falls View Road.

Yorke Road and Falls View Road are local road with a legal speed limit of 50km/h. Operating speeds are limited by the corner on the road, on-street parking and the number of vehicle accesses. The 85%ile operating speed is estimated to be less than the 50km/h speed limit.

The Yorke Road and Falls View Road carriageways are sealed, approximately 7.0 m wide.

7.2. Traffic Intensity Factor

Traffic Intensity Factors (TIF) for each existing / proposed Lot have been assessed in accordance with Appendix 3A of the Operative Far North District Plan Rule 7.6.5.1.11. A single residential unit is exempt from this rule. The TIF for each lot is calculated as follows:

Lot	Calculation	TIF
Proposed Lot 1	1 extra dwelling x 10 / unit	10
Proposed Lot 2		Exempt
Lot 3 DP 333811	1 extra dwelling x 10 / unit	20

The site is zoned Residential in the Far North District Plan. Permitted Activity Rule 7.6.5.1.11 allows for a TIF of up to 20 daily one way movements per site. 'Site' is defined as one allotment in one certificate of title. The proposed development complies with this rule.

7.3. Yorke Road Vehicle Crossing

The existing vehicle crossing is a concrete crossing formed to FNDC standard.

Visibility from the vehicle crossing complies with FNDC standards as follows:

Traffic Direction	Visibility	FNDC/S/6 Minimum Sight Distance
From Falls View Road	80 m	65 m
From Yorke Road	110 m	65 m

7.4. Accessways

Driveways can be formed from the vehicle crossing to building platforms on the proposed Lots in compliance with the Far North District Plan permitted activity rules.

Far North District Plan permitted activity rule 15.1.6.1.2 / Appendix 3B specifies the following minimum access standards for the new number of dwellings proposed:

Distance from Yorke Rd	Proposed Dwellings	Minimum Legal Width	Minimum Carriageway width
0 to 70m	6	7.5 m	5.0 m
70 to 260m	3	7.5 m	3.0 m with passing bays
Lot 3 Loop	3	7.5 m	3.0 m with passing bays

Passing bays are required at a maximum of 60 m apart and wherever visibility is less than 60m.

It is proposed to widen the existing concrete carriageway to comply with FNDC standards as shown on the Haigh Workman site plan.

7.5. Parking and manoeuvring

Parking and associated manoeuvring can be accommodated within the proposed lots.

8. Earthworks

8.1. Proposed Earthworks

Earthworks will be required for the building development. These earthworks will typically comprise;

- stripping of topsoil,
- forming accessways
- raising and forming house platforms
- formation of swale drains, and
- landscaping.

We estimate the volume of works required for this purpose as follows:

Dwellings	Earthworks Area	Earthworks Volume
2	2300 m ²	1550 m ³ fill
1a & 1b	1700 m ²	1400 m ³ fill
3b & 3c	1300 m ²	1000 m ³ fill
3a	650 m ²	200 m ³ cut
Total	5950 m ²	4150 m ³ cut and fill

This scale of earthworks will exceed the permitted activity in the Residential zone of 200 m³ per year per Lot. However it will not exceed 1.5m depth of cut or fill [District Plan Rule 12.3.6.1.3]. Earthworks with a volume greater than 500 m³ per year per Lot is a Discretionary activity in the Residential Zone.

The total volume over the Site remains within the 5,000m³ per year permitted under the Regional water and Soil Plan for Northland rules.

8.2. Contaminated Land

Based on a review of historical aerial photography and a site walkover survey it is considered the site is subject to assessment under Hazardous Activities and Industries List (HAIL); as such the proposed development will be subject to assessment under the Resource Management National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (NES) above and in addition to the FNDC District Plan.

The 'piece of land' which has been subject to horticultural cultivation is classified as HAIL code A10 'persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds'. Contaminants of concern associated with orchards include heavy metals, pesticides and/or certain organic compounds.

A Preliminary Site Investigation (PSI) report is currently underway by Haigh Workman at the time of writing.

8.3. Assessment Criteria

The proposed earthworks has been assessed against the Assessment Criteria in Section 12.3.7 of the Far North District Plan as follows:

Criterion	Assessment
(a) the degree to which the activity may cause or exacerbate erosion and/or other natural hazards on the site or in the vicinity of the site, particularly lakes, rivers, wetlands and the coastline;	The proposed fill and buildings will be set back further from the river than the buildings on adjoining lots and will have little impact on flood flows upstream (refer Section 5.5 of this report)
(b) any effects on the life supporting capacity of the soil;	Soil beyond the building foundations and paved areas will be suitable for lawn and landscape planting
(c) any adverse effects on stormwater flow within the site, and stormwater flow to or from other properties in the vicinity of the site including public roads;	The proposed fill will not obstruct local drainage paths.
(d) any reduction in water quality;	Sediment control will be implemented during the earthworks operation using the Auckland Council TP90 guidelines. Once built on or grassed the proposed fill will have no adverse effect on water quality.
(e) any loss of visual amenity or loss of natural character of the coastal environment;	Refer Planner's report
(f) effects on Outstanding Landscape Features and Outstanding Natural Features (refer to Appendices 1A and 1B in Part 4 , and Resource Maps);	Refer Planner's report
(g) the extent to which the activity may adversely affect areas of significant indigenous vegetation or significant habitats of indigenous fauna;	Refer Planner's report
(h) the extent to which the activity may adversely affect heritage resources, especially archaeological sites;	Refer Planner's report
(i) the extent to which the activity may adversely affect the cultural and spiritual values of Maori, especially Sites of Cultural Significance to Maori and waahi tapu (as listed in Appendix 1F in Part 4 , and shown on the Resource Maps);	Refer Planner's report
(j) any cumulative adverse effects on the environment arising from the activity;	Refer Planner's report
(k) the effectiveness of any proposals to avoid, remedy or mitigate any adverse effects arising from the activity;	The proposed fill is required to raise buildings above flood level. The sediment control plan is designed to avoid or mitigate erosion and sediment runoff.
(l) the ability to monitor the activity and to take remedial action if necessary;	The sediment control plan is required to be monitored and action taken to avoid, remedy or mitigate risks.
(m) the criteria in Section 11.20 Development Plans in Part 2 .	Not applicable

9. Water Supply

9.1. Potable Water Supply

The site is served by reticulated water from the Paihia Town Water Scheme. A water connection can be made to each building as shown on the drawings.

9.2. Fire Fighting

Council Engineering Standards require a water supply that is adequate for firefighting purposes. Where a reticulated supply is available SNZ PAS 4509:2008 recommends a firefighting flow for a non-sprinklered home of 12.5 l/sec within a distance of 135 m plus an additional 12.5 l/sec within 270 m.

Fire hydrants are located 16 m south of the vehicle crossing on Falls View Road and 93m east of the vehicle crossing on Yorke Road. The distance from these hydrants to each proposed dwelling is as follows:

Dwelling	Distance from Falls View Road hydrant	Distance from Yorke Road hydrant
3a	130	210
3b, 3c	200	280
1a, 1b	250	330
2	310	390

The proposed dwellings on Lots 3b, 3c, 1a, 1b and 2 are further away from a hydrant than specified in SNZ PAS 4509:2008. If a new fire hydrant is provided near Lot 3a, all proposed buildings would be within 135m of this hydrant and all except the Lot 2 dwelling would be within 270m of the secondary supply at the Falls View Road hydrant. The 100mm diameter water main would need to be extended down the accessway to provide adequate pressure at the hydrant.

Alternatively, for a single family home without reticulated water the New Zealand Fire Service Fire Fighting Water Supplies Code of Practice SNZ PAS 4509:2008 recommends for a firefighting supply a minimum water storage capacity of 45 m³ within 90 m of the dwelling, fitted with an adequate means for extracting the water from the tank. A swimming pool would provide this capacity and could be used as the secondary supply for the dwelling on Lot 2.

Another option for firefighting on the site would be to have a water supply of at least 45 m³ on Lot 1 located within 90 metres of all buildings. The water supply could be contained in tanks or a pond.

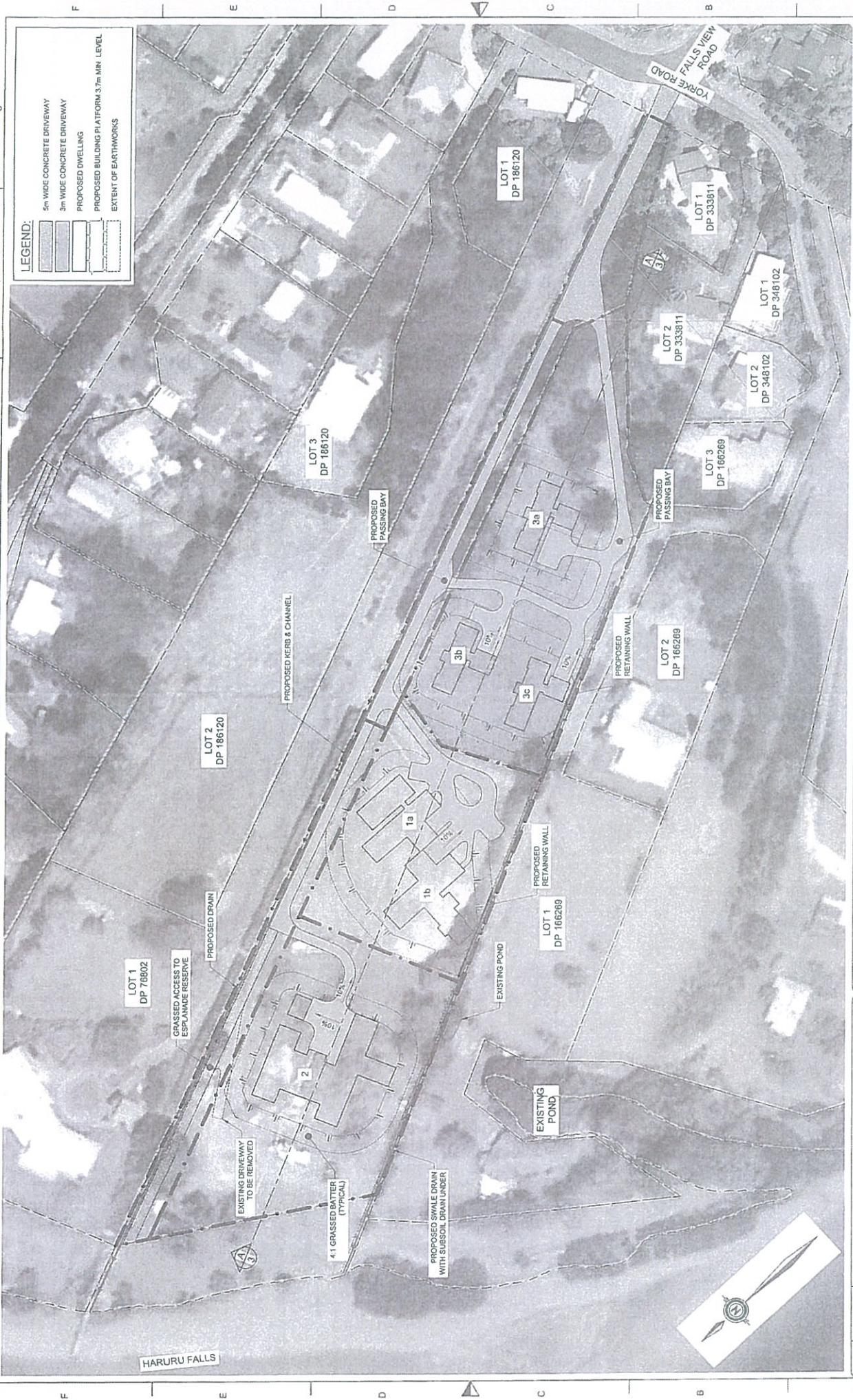
10. Wastewater

10.1. Reticulated Wastewater System

There is a FNDC reticulated wastewater system in Yorke Street.

It is proposed to connect each dwelling to the FNDC wastewater system via a small diameter pressurised sewer (rising main) as shown on the drawings.

Each dwelling will have a storage tank, grinder pump and connector pipe with a boundary kit at the rising main to prevent backflow.



LEGEND:

- 5m WIDE CONCRETE DRIVEWAY
- 3m WIDE CONCRETE DRIVEWAY
- PROPOSED DWELLING
- PROPOSED BUILDING PLATFORM 3.7m MIN LEVEL
- EXTENT OF EARTHWORKS

Issue	Date	Revision	DWG Site Plan	DWG No.	Project	Client	Project No.	RC no.	Sheet No.	1 of 3
A	10/11/2016	FIRST ISSUE		P1	Proposed Development	Woolston Family Trust	10 245			
HAIGH WORKMAN & CO Civil & Structural Engineers 100 427 8327 E: info@haighworkman.co.nz DRAFTING MUST NOT BE SCALE SEPARATED FROM THESE DRAWINGS SITE LEVELS, HEIGHTS AND ANGLES ON SITE MUST BE CORRELATED DRAWING MUST BE USED IN CONJUNCTION WITH ALL OTHERS DRAWING MUST BE USED IN CONJUNCTION WITH ALL OTHERS										



Architectural

**Architectural Report to Accompany Application
For Resource Consent Application
For Land Use Consent and
Assessment of Effects on the Environment
At Yorke Road, Haruru Falls
For the Woolston Family Trust**

Design and Development of Six New Residential Units on Lots 1 and 2 DP
504353 and Lot 3 DP 333811, Yorke Road, Haruru Falls

September 2016

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1. Application Details
2. Description
3. Assessment of Effects
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6. Owners Statement

Addenda

1.
 - A. Flood Assessment (Haigh Workman)
 - B. Waste Water Engineering Design (Haigh Workman) Included
 - C. Geotechnical Report (Haigh Workman)
2. Waste Water Discharge – Design Process (Far North District Council)
Pre-application advice notes and meeting minutes.
3. Resource Consent 2140360 – RMA – Sub

Drawings

Architectural drawings and details including elevations form the drawn part of this application.

1. Application Details

Applicant:	Woolston Family Trust
Site Address:	Yorke Road, Haruru Falls
Legal Description:	Lot 1 DP 504355, Lot 2 DP 504353, Lot 3 DP 333811
Site Area:	Lot 1 3178m ² , Lot 2 7786m ² , Lot 3 4957m ²
Zones:	Urban Environment
Activity Status:	Six Unit Residential Development
Road Classification	Local Road
Additional Limitations	Flood Protection
Special Land Features	Low lying land in relation to the Waitangi River
Description of Proposal:	Development of the above described sites with two dwellings on Lot 1, one dwelling on Lot 2 and three dwellings on Lot 3, all located at levels to mitigate potential flooding, as described in the Haigh Workman report.
Consultants:	Engineer: Haigh Workman (John Papesch / Michael Winch) PO Box 89 Kerikeri Surveyor: DMS Surveyors Ltd (David Scott) 55 Williams Road Paihia 0200 Architect: Black Box Architects Ltd (Sam Cowper / Tony Davis) P O Box 8357 Symonds Street, Auckland

2. Description

The subject site which includes three subdivided lots on DP504353 and 333811 with a total area of 15921m². The architects have had three meetings with Far North District Council in respect of the proposed Resource Consent application for the development of the property owned by the Woolston Family Trust, which has previously undergone a Resource Consent for subdivision into two lots, Lot 1 and Lot 2, and Lot 3 on a separate deposited plan. Resource Consent noted as 2140360 was applied for on behalf of the Woolston Family Trust by David Scott Surveyor and Haigh Workman Engineers with reports on both the Waitaangi River flood potential and the minimum building platform levels and also an extensive report on a proposal to treat waste water on site using an Evapo Transpiration System. Subsequent meetings and discussions with Far North District Council planning and infrastructure officers, refer Addenda 2, encompassed a resolution to design individual pumping stations from the proposed dwellings to the public waste water system sited on the adjacent road and a manhole chamber located approximately 15m from the head of existing driveway access on Yorke Road. The pumped waste water discharge system as designed by Haigh Workman is attached as Addenda 1b. (Included in single Engineers Report).

3. Assessment Effects

The development of the subject property has been assessed in respect of the Fourth Schedule of the Resource Management Act. This assessment reviews Clause 1, 'Matters that should be included in an assessment of effects on the environment'.

(a) Description

The description of what is proposed by the applicant has been briefly summarised in the introduction to this 'planning report'. The subject site is land zoned Urban Environment / Residential with some expectation the land will be developed residentially. The applicants brief for the development included low density, well spaced, well planned and well landscaped properties. The homes as proposed for Lots 2 and 3 are approximately 200m² each over either one or two levels and are clad in timber, wood panel with feature or screen walls being coated Hebel cladding all on cavity systems. Garages are attached and have an approximate area of 40m². Rooves are generally Colorsteel Maxx, colours prescribed by range, to be confirmed by applicants and architects at Building Consent stage.

(b) Activity: Adverse Effects

The proposed residential activity is comparable to surrounding properties and likely to have no significant adverse effect on the environment. Wastewater discharges are to the existing public systems and it is noted on site wastewater treatment has been removed from the application.

(c) Discharge Permit

A discharge permit is not required and all wastewater will be discharged by separate or individual pumping stations to the public wastewater drainage system.

(d) Actual or Potential Effect on the Environment of the Proposed Activity

The proposed six dwellings over the three lot subdivision are generally based on creating a building legacy with homes sensitively oriented to the major environmental elements, ie the Waitangi River and the riverside bush, trees and birdlife, and facing to a northerly aspect for all day sun. As with neighbouring properties the homes are well spaced with the existing southerly bush backdrop on Lot 3 maintained for both its existing ecosystems and for southerly protection.

(e) Hazardous Substances

All wastewater will be pumped to the public system. Stormwater will discharge by way of easement as noted on DMS Surveyors survey plan.

(f) Contaminant Discharge

- (i) The original Resource Consent for subdivision RMA 2140360 centred on site wastewater management. Subsequent discussions with Council's infrastructure officers has given rise to the potential for wastewater discharge to the public wastewater discharge system and manhole on Yorke Road, Haruru Falls.

- (ii) The alternative method of discharge will allow for better land use with landscaped areas not relying on the placement of the Evapo-transpiration System and also any limitation on plant type or species. (Refer Haigh Workman – Woolston Family Trust – Wastewater Assessment for Proposed Subdivision, Yorke Road, Haruru Falls, report accompanies Flood Hazard Assessment). The sites proximity to the Waitangi River does bring the potential for site flooding and the proposed dwellings are raised onto platforms to prevent flooding of the new homes, 6 in total to be built over the sites Lots 1, 2 and 3. The wastewater system from the dwellings are to be designed with non-return valves and engineered and supported to prevent breakage or inundation in time of flood. (Refer Wastewater Management to the Public System – Haigh Workman).
- (g) Mitigation Measures
The report by Haigh Workman fully assesses the measures to be put in place to maintain a viable wastewater management discharge system to the public sanitary sewer and its associated pumping stations. Associated with the sewage pumping will be the need to incorporate cut off system, valves and emergency warning devices in the case of a system failure. The pumping systems will require a building consent application and the installation of a monitoring programme as part of a Code Compliance Schedule regime. (Refer Haigh Workman / Pump system Manufacturer Specification and System Installer Approval Documentation).
- (h) Personal Affected by the Proposal
The existing site is bare land that has been well maintained, lawns mowed and planted in part with both palms, assorted shrubs and fruit trees. The homes as planned are described in this application are well spaced and a combination of low scale single storey dwellings on the front part of site and two storey dwellings nestling into a bush backdrop on the rear of the site. The affect as with any building development is plain – a vacant site now built on, but with homes that are well spaced separated from boundaries and addressing both each other, the river and the views across the Waitangi River and the northern orientation neighbours adjacent the lower end of the site are likely to view single storey dwellings which are raised to accommodate the flood potential as assessed in the Haigh Workman report. Neighbours have not been consulted but would be aware, as they developed their own sites, that the Woolston Family Trust property was to be developed residentially and as noted, with a degree of sensitivity and appreciation of scale, a lack of over dominance and well spaced buildings set in a park like environment. The access road has been maintained on the eastern side of the site and the access to Lot 3 adjacent and across the Yorke Road neighbouring property. The accessway is wide and well planted, and will be re-engineered with a new retained support structure as required.
- (i) Activity Significant – The activity or construction of new 200m² homes and associated 40m² garages is not considered significant, the density being 1 for 1000m² which for any substantial New Zealand residential subdivision is not great. The homes are not regimented but placed as individual dwellings addressing both

views across the river and the sun. Areas of shelter in the dwelling arrangement are provided for along with well landscaped yards and surrounds.

(ii) Matters that should be considered:

(a) Affect on the neighbourhood:

The population increase overall the entire site is likely to be approximately 40 and likely to increase or decrease depending on season. There is likely to be nil effect on socio-economic or cultural aspects except to state the population increase will bring a deeper sense of community with people and living activity taking place on an area of bare land.

(b) Physical Effect on the Location:

The development of the six homes including the proper landscaping of each site is likely to enhance the current visual state with interesting well conceived and well clad forms.

(c) Effect on Ecosystems:

The existing whole site is generally grassed with a southern area of bush and trees forming a backdrop to the entire development. Current ecosystems will naturally be disturbed in creating the platforms for the development but this will be minimised by locating the platforms on areas of grass or bare land, away from areas of bush and native ecosystems. The river and its northern side is a forest in which birdlife abound and this will provide the visual backdrop for the proposed dwellings. The existing treed area at the entrance to the site proper will be maintained and cleaned to provide retreats within its setting. In general it is anticipated with the abundant onsite natural environments, fauna and flora and the proximity of the river that the new owners of each site of the development will be set to enjoy and protect these elements and ecosystems.

(d) Effect on Natural and Physical Resources:

These dwellings in this location take full advantage of the aesthetic, recreational, scientific, historical, spiritual and cultural aspects – a recognition of the past and occupation of previous generations and the significance of the river and its flow to the sea and its significant value to future generations. The built concept takes reference from traditional Maori architecture with rooves designed to discharge rain to its edges with strong gable or part gable forms. Chimneyed fireplaces for either solid fuel heating or gas are included within residential units along with private courtyard areas and wetland gardens. In respect of sustainable additions the homes can be simply retrofitted with roof mounted solar water heating panels and solar energy units and photovoltaic's. The houses are to be built on mass concrete floors all fully insulated and with minimal glazing to south walls to enhance the passive sustainable aspects.

4. Report on the Development in Respect of Far North District Council District Scheme

Building Density (Refer Rule 7.6.5.1.2)

Each site has a net site area available to it with each dwelling unit being able to pump waste to the public line on Yorke Road. In summary:

Lot 1 (units 1a / 1b), 3178m², density 1/1589m²

Lot 2 (new home / Woolston Family Trust) 4549m², density 1/4549m²

Lot 3 (units 3a /3b /3c) 4957m², density 1/1652m²

Scale of Activities (Refer Rule 7.6.5.1.3)

Serviced sites allow for the total number of people engaged at any one period to be at a ratio of 2 per 600m². These sites will cater for a further 4/6 persons to engage in activities of a residential nature but note the mean ratio is around 2 per 600.

Building Height (Refer Rule 7.6.5.1.4)

The building heights are taken from existing natural ground levels and include the flood protection building platforms. Rule 7.6.5.1.4 of the Far North District Council District Scheme stipulates a height of 8.0m. The dwellings as designed fit within the 8.0m height restriction apart from units 3b and 3c which rise to a height of 8.5m but which fall within the Restricted Discretionary height limit of 9.0m. Due to the distances to boundaries and the fact that these dwellings sit within the river valley well below the road and ridge it would seem the effects would be less than minor. The building heights are enhanced due to the requirement to mitigate floor platform levels to avoid potential flooding events over the river plain.

In respect of this discretion it is noted:

- Adjacent properties will most likely not be adversely affected in terms of visual domination, loss of privacy and loss of access to sunlight and daylight. The new residential units are well spaced and well separated from boundaries.
- The units that rise to above 8.0m are slim, small footprint buildings in well landscaped and planted environments.

Sunlight / Height in Relation to Boundary (Refer Rule 7.6.5.1.5)

The proposed dwelling units all fit within the height in relation to boundary controls of the 2.0m vertically and a 45° recession plane. (Refer elevation drawings).

Stormwater Management

Impermeable and permeable surfaces. The overall site area of 15921m² has a total impermeable coverage of 2685m². The gross building and impermeable coverage is 4466m² including the main accessway. The creation of the three lots has been assessed in terms of individual impermeable coverage over each lot as follows:

Lot 1	Buildings	625m ²
	Impermeable	783m ²
	Gross impermeable	44%

Lot 2	Buildings	655m ²
	Impermeable	659.5m ²
	Gross impermeable	28.9%
Lot 3	Buildings	501m ²
	Impermeable	1242.5m ²
	Gross impermeable	35.2%

The coverage rule is 50% including all buildings and impermeable areas. Stormwater discharge has been assessed and covered in the Haigh Workman report including design of stormwater discharge and swale drains. The owners intend to incorporate water retention storage tanks to collect roof water for general use and potentially for emergency fire fighting purposes.

Set Back from Boundaries

All new dwellings on the development are set back from boundaries the mandatory 3.0m to meet the requirements of Rule 7.6.5.1.7. The overall lot would be considered a 'rear lot' having a limited road boundary relating to the accessway only.

Excavation and Earthworks

The excavation and site works component has been addressed by engineers Haigh Workman and acknowledged in the architectural drawings. The engineers have prescribed an excavation methodology in respect of constructing raised platforms to allow building floor levels to comply with the flood level requirements. The concept requires an excavation to form the platform base and provision of a suitable substrate for the engineered fill above. All necessary silt and sediment controls are to be installed in accordance with the Far North District Council rules and requirements.

Transportation / Vehicle Manoeuvring

The site access is by way of a 5.0m wide driveway at the head, 3.0m elsewhere with passing bays as described in the engineering drawing. A loop driveway access beginning near the head of the main access right of way forms an access to the west to units 3a, 3b and 3c. This loop driveway relieves the stress on the main access to unit 2 and units 1a and 1b. All drives and manoeuvring areas provide for minimum 90 percentile vehicle turning and reversing and include areas for boats on trailers. All vehicles can drive on and off the sites with minimum reverse manoeuvring from garages and parking spaces and allow for forward driving on and off each site. All ramping to platforms and garages to be on engineered fill and sealed, maximum gradients 1: 5 and 1:10 transitions where vehicles approaching level areas. Residential accessways will be generally steeped and where possible ramped.

Materiality

The new residential homes as conceived are to be constructed to a high quality employing selected materials limited by covenant. The owners have prescribed the use of materials favouring wood claddings and profiled steel rooves and colours that blend well with surrounding environment. Earth tones are prescribed to ensure the new units rest well in their settings. Images have been developed to reveal the proposed development and provide an insight into the materiality and the anticipated ambience

that is sought to create places to come home too and places to enjoy living in a peaceful environment. [Refer

Trees and Vegetation

The three subject sites are very different in topography and vegetation and can be described as follows:

Site 1 Lot 2 – The level site adjacent the river is intended to be developed by the property owners as their own retirement home. The site is generally flat and treed with fruit trees mostly citrus. A Puriri tree on the north west corner of the site is to remain protected and be nurtured, with only light access provided for around the tree.

Site 2 Lot 1 – This site rises slightly to the road and is relatively bare apart from native trees, ie Totara and Manuka, along the southern boundary, and feijoa trees along the same boundary.

Site 3 Lot 3 – The site has an interesting and varied topography rising to the road but interrupted by a narrow well formed and well treed valley. This site has an intensive and established bush and tree area. The unit titled Unit 3a will nestle into the bush.

Ground Conditions (Engineering matters)

These aspects have been assessed and reported on by Haigh Workman Engineers. Haigh Workman have provided a Flood mitigation report with details on platform engineering and flooding dispersal amongst the new residential buildings to be constructed on site and includes summaries on Waste water discharges from private pump systems and riser mains to the main road. Haigh Workman have provided a geotechnical report and will provide a further ground assessment in respect of any purported contamination due to previous horticulture uses on the site that may have included sprays and pesticides , as hypothesised only. A HAIL report *Hazardous Industries and activities list* and an assessment in respect t of the NES National Environment standards is to be carried out as part of the diligence phase of this project and will be provided within time.

5. Summary

The applicants and owners of the subdivided land at Yorke Street, Haruru are enthusiastic and committed owners to this riverside property moving to the far north district for a change of lifestyle and to be closer to lifestyle activities and family. The applicants have an appreciation of fine architecture and appearance, in particular an objective to maintain buildings with architectural character and materials befitting the location of the site and the natural environment that provides the context for this superb development. The owners are in earnest and have the foresight to see the benefits of sustainability and 'green' architecture that promotes passive design and orientation to create warm, dry and safe living environments.

The owners have prepared a brief statement that summarises this assessment of effects and follows as Item 6.



6. Owners Statement

We have owned the adjoining property at 107B Yorke Road for 15 years and have enjoyed the lifestyle that living on the banks of the Waitangi River provides. After our busy business life in Auckland it is a joy to come to our Haruru Falls retreat and wake up to the sounds of birds rather than the noise of traffic and relax looking out over the river and the Waitangi Reserve land opposite. When the property next door was put on the market we immediately saw the potential to maintain this peaceful lifestyle and has a vision of creating a community who could enjoy the natural beauty that the river provides. We intend to build our own permanent residence on the property and have provided full river access to all the homes we intend to develop. This property has a permitted jetty and a boat ramp on our current property so it make an ideal river access.

Our vision is for a close and family community with secure access via electronic gates. Various covenants will be placed on the titles that will ensure owner occupier residences and controlled development, to maintain the desired sense of community and protect the investments of the property owners.

We have a grown up family of four children who are all now married and most of them have their own children and we see our Haruru Falls property as a family location where we can all be together and we hope that the purchasers of our development properties feel the same way. We already have interest in the development and are excited about bringing our vision to reality.





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For Resource Consent Application
For Land Use Consent and
Assessment of Effects on the Environment
At Yorke Road, Haruru Falls
For the Woolston Family Trust**

Design and Development of Six New Residential Units on Lots 1 and 2 DP
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Consultants:	Engineer: Haigh Workman (John Papesch / Michael Winch) PO Box 89 Kerikeri Surveyor: DMS Surveyors Ltd (David Scott) 55 Williams Road Paihia 0200 Architect: Black Box Architects Ltd (Sam Cowper / Tony Davis) P O Box 8357 Symonds Street, Auckland

2. Description

The subject site which includes three subdivided lots on DP504353 and 333811 with a total area of 15921m². The architects have had three meetings with Far North District Council in respect of the proposed Resource Consent application for the development of the property owned by the Woolston Family Trust, which has previously undergone a Resource Consent for subdivision into two lots, Lot 1 and Lot 2, and Lot 3 on a separate deposited plan. Resource Consent noted as 2140360 was applied for on behalf of the Woolston Family Trust by David Scott Surveyor and Haigh Workman Engineers with reports on both the Waitaangi River flood potential and the minimum building platform levels and also an extensive report on a proposal to treat waste water on site using an Evapo Transpiration System. Subsequent meetings and discussions with Far North District Council planning and infrastructure officers, refer Addenda 2, encompassed a resolution to design individual pumping stations from the proposed dwellings to the public waste water system sited on the adjacent road and a manhole chamber located approximately 15m from the head of existing driveway access on Yorke Road. The pumped waste water discharge system as designed by Haigh Workman is attached as Addenda 1b. (Included in single Engineers Report).

3. Assessment Effects

The development of the subject property has been assessed in respect of the Fourth Schedule of the Resource Management Act. This assessment reviews Clause 1, 'Matters that should be included in an assessment of effects on the environment'.

(a) Description

The description of what is proposed by the applicant has been briefly summarised in the introduction to this 'planning report'. The subject site is land zoned Urban Environment / Residential with some expectation the land will be developed residentially. The applicants brief for the development included low density, well spaced, well planned and well landscaped properties. The homes as proposed for Lots 2 and 3 are approximately 200m² each over either one or two levels and are clad in timber, wood panel with feature or screen walls being coated Hebel cladding all on cavity systems. Garages are attached and have an approximate area of 40m². Rooves are generally Colorsteel Maxx, colours prescribed by range, to be confirmed by applicants and architects at Building Consent stage.

(b) Activity: Adverse Effects

The proposed residential activity is comparable to surrounding properties and likely to have no significant adverse effect on the environment. Wastewater discharges are to the existing public systems and it is noted on site wastewater treatment has been removed from the application.

(c) Discharge Permit

A discharge permit is not required and all wastewater will be discharged by separate or individual pumping stations to the public wastewater drainage system.

(d) Actual or Potential Effect on the Environment of the Proposed Activity

The proposed six dwellings over the three lot subdivision are generally based on creating a building legacy with homes sensitively oriented to the major environmental elements, ie the Waitangi River and the riverside bush, trees and birdlife, and facing to a northerly aspect for all day sun. As with neighbouring properties the homes are well spaced with the existing southerly bush backdrop on Lot 3 maintained for both its existing ecosystems and for southerly protection.

(e) Hazardous Substances

All wastewater will be pumped to the public system. Stormwater will discharge by way of easement as noted on DMS Surveyors survey plan.

(f) Contaminant Discharge

- (i) The original Resource Consent for subdivision RMA 2140360 centred on site wastewater management. Subsequent discussions with Council's infrastructure officers has given rise to the potential for wastewater discharge to the public wastewater discharge system and manhole on Yorke Road, Haruru Falls.

- (ii) The alternative method of discharge will allow for better land use with landscaped areas not relying on the placement of the Evapo-transpiration System and also any limitation on plant type or species. (Refer Haigh Workman – Woolston Family Trust – Wastewater Assessment for Proposed Subdivision, Yorke Road, Haruru Falls, report accompanies Flood Hazard Assessment). The sites proximity to the Waitangi River does bring the potential for site flooding and the proposed dwellings are raised onto platforms to prevent flooding of the new homes, 6 in total to be built over the sites Lots 1, 2 and 3. The wastewater system from the dwellings are to be designed with non-return valves and engineered and supported to prevent breakage or inundation in time of flood. (Refer Wastewater Management to the Public System – Haigh Workman).

(g) Mitigation Measures

The report by Haigh Workman fully assesses the measures to be put in place to maintain a viable wastewater management discharge system to the public sanitary sewer and its associated pumping stations. Associated with the sewage pumping will be the need to incorporate cut off system, valves and emergency warning devices in the case of a system failure. The pumping systems will require a building consent application and the installation of a monitoring programme as part of a Code Compliance Schedule regime. (Refer Haigh Workman / Pump system Manufacturer Specification and System Installer Approval Documentation).

(h) Personal Affected by the Proposal

The existing site is bare land that has been well maintained, lawns mowed and planted in part with both palms, assorted shrubs and fruit trees. The homes as planned are described in this application are well spaced and a combination of low scale single storey dwellings on the front part of site and two storey dwellings nestling into a bush backdrop on the rear of the site. The affect as with any building development is plain – a vacant site now built on, but with homes that are well spaced separated from boundaries and addressing both each other, the river and the views across the Waitangi River and the northern orientation neighbours adjacent the lower end of the site are likely to view single storey dwellings which are raised to accommodate the flood potential as assessed in the Haigh Workman report. Neighbours have not been consulted but would be aware, as they developed their own sites, that the Woolston Family Trust property was to be developed residentially and as noted, with a degree of sensitivity and appreciation of scale, a lack of over dominance and well spaced buildings set in a park like environment. The access road has been maintained on the eastern side of the site and the access to Lot 3 adjacent and across the Yorke Road neighbouring property. The accessway is wide and well planted, and will be re-engineered with a new retained support structure as required.

- (i) Activity Significant – The activity or construction of new 200m² homes and associated 40m² garages is not considered significant, the density being 1 for 1000m² which for any substantial New Zealand residential subdivision is not great. The homes are not regimented but placed as individual dwellings addressing both

views across the river and the sun. Areas of shelter in the dwelling arrangement are provided for along with well landscaped yards and surrounds.

(ii) Matters that should be considered:

(a) Affect on the neighbourhood:

The population increase overall the entire site is likely to be approximately 40 and likely to increase or decrease depending on season. There is likely to be nil effect on socio-economic or cultural aspects except to state the population increase will bring a deeper sense of community with people and living activity taking place on an area of bare land.

(b) Physical Effect on the Location:

The development of the six homes including the proper landscaping of each site is likely to enhance the current visual state with interesting well conceived and well clad forms.

(c) Effect on Ecosystems:

The existing whole site is generally grassed with a southern area of bush and trees forming a backdrop to the entire development. Current ecosystems will naturally be disturbed in creating the platforms for the development but this will be minimised by locating the platforms on areas of grass or bare land, away from areas of bush and native ecosystems. The river and its northern side is a forest in which birdlife abound and this will provide the visual backdrop for the proposed dwellings. The existing treed area at the entrance to the site proper will be maintained and cleaned to provide retreats within its setting. In general it is anticipated with the abundant onsite natural environments, fauna and flora and the proximity of the river that the new owners of each site of the development will be set to enjoy and protect these elements and ecosystems.

(d) Effect on Natural and Physical Resources:

These dwellings in this location take full advantage of the aesthetic, recreational, scientific, historical, spiritual and cultural aspects – a recognition of the past and occupation of previous generations and the significance of the river and its flow to the sea and its significant value to future generations. The built concept takes reference from traditional Maori architecture with rooves designed to discharge rain to its edges with strong gable or part gable forms. Chimneyed fireplaces for either solid fuel heating or gas are included within residential units along with private courtyard areas and wetland gardens. In respect of sustainable additions the homes can be simply retrofitted with roof mounted solar water heating panels and solar energy units and photovoltaic's. The houses are to be built on mass concrete floors all fully insulated and with minimal glazing to south walls to enhance the passive sustainable aspects.

4. Report on the Development in Respect of Far North District Council District Scheme

Building Density (Refer Rule 7.6.5.1.2)

Each site has a net site area available to it with each dwelling unit being able to pump waste to the public line on Yorke Road. In summary:

Lot 1 (units 1a / 1b), 3178m², density 1/1589m²

Lot 2 (new home / Woolston Family Trust) 4549m², density 1/4549m²

Lot 3 (units 3a /3b /3c) 4957m², density 1/1652m²

Scale of Activities (Refer Rule 7.6.5.1.3)

Serviced sites allow for the total number of people engaged at any one period to be at a ratio of 2 per 600m². These sites will cater for a further 4/6 persons to engage in activities of a residential nature but note the mean ratio is around 2 per 600.

Building Height (Refer Rule 7.6.5.1.4)

The building heights are taken from existing natural ground levels and include the flood protection building platforms. Rule 7.6.5.1.4 of the Far North District Council District Scheme stipulates a height of 8.0m. The dwellings as designed fit within the 8.0m height restriction apart from units 3b and 3c which rise to a height of 8.5m but which fall within the Restricted Discretionary height limit of 9.0m. Due to the distances to boundaries and the fact that these dwellings sit within the river valley well below the road and ridge it would seem the effects would be less than minor. The building heights are enhanced due to the requirement to mitigate floor platform levels to avoid potential flooding events over the river plain.

In respect of this discretion it is noted:

- Adjacent properties will most likely not be adversely affected in terms of visual domination, loss of privacy and loss of access to sunlight and daylight. The new residential units are well spaced and well separated from boundaries.
- The units that rise to above 8.0m are slim, small footprint buildings in well landscaped and planted environments.

Sunlight / Height in Relation to Boundary (Refer Rule 7.6.5.1.5)

The proposed dwelling units all fit within the height in relation to boundary controls of the 2.0m vertically and a 45° recession plane. (Refer elevation drawings).

Stormwater Management

Impermeable and permeable surfaces. The overall site area of 15921m² has a total impermeable coverage of 2685m². The gross building and impermeable coverage is 4466m² including the main accessway. The creation of the three lots has been assessed in terms of individual impermeable coverage over each lot as follows:

Lot 1	Buildings	625m ²
	Impermeable	783m ²
	Gross impermeable	44%

Lot 2	Buildings	655m ²
	Impermeable	659.5m ²
	Gross impermeable	28.9%
Lot 3	Buildings	501m ²
	Impermeable	1242.5m ²
	Gross impermeable	35.2%

The coverage rule is 50% including all buildings and impermeable areas. Stormwater discharge has been assessed and covered in the Haigh Workman report including design of stormwater discharge and swale drains. The owners intend to incorporate water retention storage tanks to collect roof water for general use and potentially for emergency fire fighting purposes.

Set Back from Boundaries

All new dwellings on the development are set back from boundaries the mandatory 3.0m to meet the requirements of Rule 7.6.5.1.7. The overall lot would be considered a 'rear lot' having a limited road boundary relating to the accessway only.

Excavation and Earthworks

The excavation and site works component has been addressed by engineers Haigh Workman and acknowledged in the architectural drawings. The engineers have prescribed an excavation methodology in respect of constructing raised platforms to allow building floor levels to comply with the flood level requirements. The concept requires an excavation to form the platform base and provision of a suitable substrate for the engineered fill above. All necessary silt and sediment controls are to be installed in accordance with the Far North District Council rules and requirements.

Transportation / Vehicle Manoeuvring

The site access is by way of a 5.0m wide driveway at the head, 3.0m elsewhere with passing bays as described in the engineering drawing. A loop driveway access beginning near the head of the main access right of way forms an access to the west to units 3a, 3b and 3c. This loop driveway relieves the stress on the main access to unit 2 and units 1a and 1b. All drives and manoeuvring areas provide for minimum 90 percentile vehicle turning and reversing and include areas for boats on trailers. All vehicles can drive on and off the sites with minimum reverse manoeuvring from garages and parking spaces and allow for forward driving on and off each site. All ramping to platforms and garages to be on engineered fill and sealed, maximum gradients 1: 5 and 1:10 transitions where vehicles approaching level areas. Residential accessways will be generally steeped and where possible ramped.

Materiality

The new residential homes as conceived are to be constructed to a high quality employing selected materials limited by covenant. The owners have prescribed the use of materials favouring wood claddings and profiled steel rooves and colours that blend well with surrounding environment. Earth tones are prescribed to ensure the new units rest well in their settings. Images have been developed to reveal the proposed development and provide an insight into the materiality and the anticipated ambience

that is sought to create places to come home too and places to enjoy living in a peaceful environment. [Refer

Trees and Vegetation

The three subject sites are very different in topography and vegetation and can be described as follows:

Site 1 Lot 2 – The level site adjacent the river is intended to be developed by the property owners as their own retirement home. The site is generally flat and treed with fruit trees mostly citrus. A Puriri tree on the north west corner of the site is to remain protected and be nurtured, with only light access provided for around the tree.

Site 2 Lot 1 – This site rises slightly to the road and is relatively bare apart from native trees, ie Totara and Manuka, along the southern boundary, and feijoa trees along the same boundary.

Site 3 Lot 3 – The site has an interesting and varied topography rising to the road but interrupted by a narrow well formed and well treed valley. This site has an intensive and established bush and tree area. The unit titled Unit 3a will nestle into the bush.

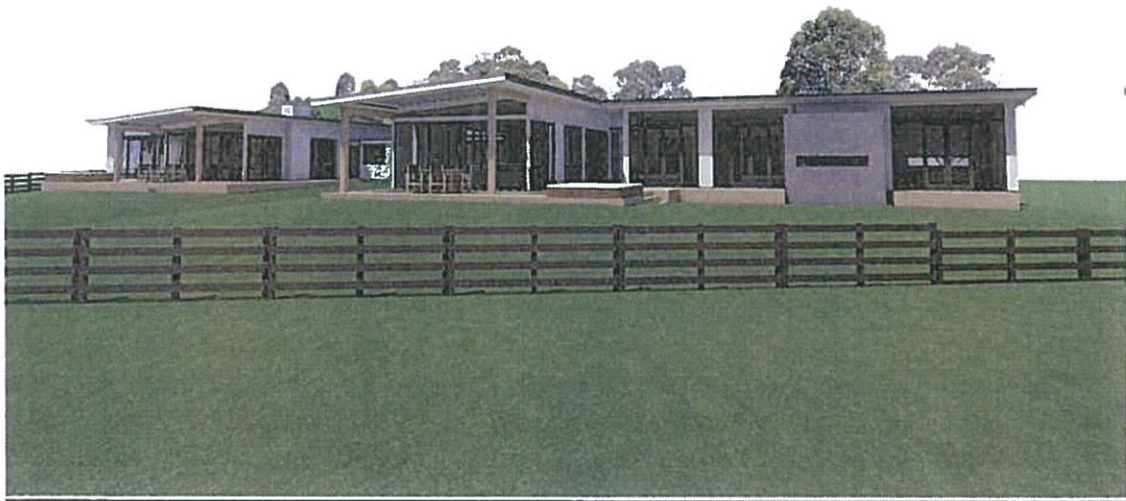
Ground Conditions (Engineering matters)

These aspects have been assessed and reported on by Haigh Workman Engineers. Haigh Workman have provided a Flood mitigation report with details on platform engineering and flooding dispersal amongst the new residential buildings to be constructed on site and includes summaries on Waste water discharges from private pump systems and riser mains to the main road. Haigh Workman have provided a geotechnical report and will provide a further ground assessment in respect of any purported contamination due to previous horticulture uses on the site that may have included sprays and pesticides , as hypothesised only. A HAIL report *Hazardous Industries and activities list* and an assessment in respect t of the NES National Environment standards is to be carried out as part of the diligence phase of this project and will be provided within time.

5. Summary

The applicants and owners of the subdivided land at Yorke Street, Haruru are enthusiastic and committed owners to this riverside property moving to the far north district for a change of lifestyle and to be closer to lifestyle activities and family. The applicants have an appreciation of fine architecture and appearance, in particular an objective to maintain buildings with architectural character and materials befitting the location of the site and the natural environment that provides the context for this superb development. The owners are in earnest and have the foresight to see the benefits of sustainability and 'green' architecture that promotes passive design and orientation to create warm, dry and safe living environments.

The owners have prepared a brief statement that summarises this assessment of effects and follows as Item 6.



6. Owners Statement

We have owned the adjoining property at 107B Yorke Road for 15 years and have enjoyed the lifestyle that living on the banks of the Waitangi River provides. After our busy business life in Auckland it is a joy to come to our Haruru Falls retreat and wake up to the sounds of birds rather than the noise of traffic and relax looking out over the river and the Waitangi Reserve land opposite. When the property next door was put on the market we immediately saw the potential to maintain this peaceful lifestyle and has a vision of creating a community who could enjoy the natural beauty that the river provides. We intend to build our own permanent residence on the property and have provided full river access to all the homes we intend to develop. This property has a permitted jetty and a boat ramp on our current property so it make an ideal river access.

Our vision is for a close and family community with secure access via electronic gates. Various covenants will be placed on the titles that will ensure owner occupier residences and controlled development, to maintain the desired sense of community and protect the investments of the property owners.

We have a grown up family of four children who are all now married and most of them have their own children and we see our Haruru Falls property as a family location where we can all be together and we hope that the purchasers of our development properties feel the same way. We already have interest in the development and are excited about bringing our vision to reality.



