



**Far North
District Council**

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THE RESOURCE MANAGEMENT ACT 1991

SECTION 221 : CONSENT NOTICE

REGARDING RC 2030509

the Subdivision of Lot 1, 4 & 5 DP 56174
North Auckland Registry

PURSUANT to Section 221 and for the purpose of Section 224 (c)(ii) of the Resource Management Act 1991, this Consent Notice is issued by the **FAR NORTH DISTRICT COUNCIL** to the effect that conditions described in the schedule below are to be complied with on a continuing basis by the subdividing owner and the subsequent owners after the deposit of the survey plan, and these are to be registered on the titles of the allotments specified under each condition below.

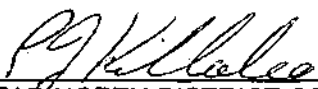
SCHEDULE

- In conjunction with any Building Consent lodged for any building development on any of the Lots the applicant shall provide to Council a report prepared by a suitably qualified Chartered Professional Engineer addressing the suitable design of foundations, any earthworks required for construction and/or access formation and the design of any retaining structures required. In preparing such a report the engineer is to give due regard to the recommendations made in the attached report prepared by Brown and Thomson Consultants Engineers provided as part of the subdivision. (All Lots)
- All stormwater generated from impermeable surfaces (building, paving, access etc) on all Lots is to be directed to and disposed of via the approved stormwater connections. (All Lots)
- Any building to be constructed within Lot 1 is to be designed and completed in accordance with the attached Engineering report prepared by Brown and Thomson Consulting Engineers.

Note a resource Consent Application will be required for the construction of a dwelling within the Coastal Hazard 1 and 2 Zones, and due consideration will be given to the Brown and Thomson Report as part of the consent process. (Lot 1)

- Any access point formed onto the legal road is to be constructed and completed in accordance with the Councils Urban Crossing Standard FNDC/S/02 (Councils Engineering Standards and Guidelines June 2000). (Lots 1-7, 16-18)
- Any access point formed to serve Lot 1 is to be constructed a minimum distance of 15 metres from the Foreshore Road intersection. (Lot 1)

SIGNED:


By the FAR NORTH DISTRICT COUNCIL
Under delegated authority:
RESOURCE CONSENTS MANAGER

Mr Pat Killalea

DATED at Kerikeri this 18th day of June 2008

ENGINEERING & SITE APPRAISAL REPORT

16 NOVEMBER 2002

PROPOSED SUBDIVISION OF LOTS 4 & 5, DP 56174,
FORESHORE ROAD, AHIPARA

FOR MELVILLE HOLDINGS LIMITED

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- 1.0 INTRODUCTION
- 2.0 SOIL TYPES AND STABILITY ISSUES
- 3.0 ACCESS
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- 5.0 SEWERAGE
- 6.0 EARTHWORKS AND RETAINING WALLS
- 7.0 CONCLUSIONS

- Appendix A FNDC Engineering Standards (Rural roads & Cul-de-sacs)*
- Appendix B Fig 2.4 Earthworks volume calculation & drawings*
- Appendix C Fig 4.2 Stormwater reticulation layout*
- Appendix D Fig 4.2 Stormwater reticulation layout*
- Appendix E Fig 5.2 Sanitary sewer reticulation layout*

1.0 Introduction

This report has been prepared at the request of Melville Holdings Limited, being the owners of lots 4 and 5, DP56174. The report addresses engineering issues relevant to subdivision of the lots which adjoin Foreshore Road, Ahipara.

The report specifically addresses those engineering issues required by the Far North District and Northland Regional Councils for Resource Consent. This includes soil conditions and stability of the proposed 23 lots and outlines the access, earthworks, stormwater drainage and effluent disposal works required. Brown & Thomson Northland Ltd have prepared this information to accompany and form part of an application for consent, to be submitted by Bay of Islands Planning Ltd.

2.0 Soil Types and Stability Issues

2.1 General Description of the Site

The proposal is to create 20 residential lots varying in size from 800 m² to 1500m² from a parcel of approximately 25,000m² of land situated on a central part of Ahipara beach. The land is bounded on the west by Foreshore Road and the beach, on the north and south by other domestic titles and on the east by steep bush covered slopes.

The general landform of northwest facing coastal slope from Foreshore Road to the summit ridge approximately one kilometre above is covered in mixed grasses and has been residentially occupied in part for many years. The site generally falls from the upper slopes of lots 12 and 13 at gradients of up to 1 in 4 to gentler sloped, central and lower areas and the roadside boundary of lot 1. There is a predominant spur on the northern side of the site, which is bounded by a natural watercourse. The site has not yet been developed and is covered by low scrub, pampas grass and some gorse.

2.2 Geology

The coastal geological suite is Tangihua Volcanics, expressed near the surface as Te Kie Awapuka steepland soils which are noted as having severe limitations for pastoral usage.

The soils investigation of the site has included hand-augured bore holes and undrained shear vane strength tests, supplemented by a desk study of available information.

The upper soils are medium stiff brown khaki clays with grit particle inclusions. The degree of weathering varies considerably but generally is less so with depth. In some cases very stiff dry clay could be encountered within 2 metres, but in other cases there was uniform firm clay at this depth. Tangihua Volcanics often express a range of visual characteristics due to the fluctuating influences of the thermal process. The degree of variation of the mechanical properties of the soil is less than the visual change, although boreholes encountered a range from soft to very stiff dry clay.

2.3 Soil Strengths

Generally these soils offer fairly stable building platforms as long as attention is paid to stormwater management, as the soil strengths are most susceptible to moisture content changes. Without surface cover of vegetation or topsoil they are prone to extreme desiccation and cracking when allowed to dry and conversely these soils will quickly lose strength when they become over saturated. There is ample evidence of the erodability of these soils types when subjected to high velocity concentrations of stormwater run-off.

There are several smaller natural overland flow paths on the subject site, apart from the larger Moringai Stream, which forms the northern boundary. These watercourses have formed depressions leading to a central swampy area, before collecting into subsequent, well established streams passing through the lower reaches of lot 23 (access road). Some of these natural water courses exhibit indications of active erosion in the softer soils and it is intended to pipe those flows where concentration of runoff dictates.

Insitu measurements of undisturbed soils generally gave shear vane test readings in the range 80 to 100kPa, which would be adequate for NZS3604 non specific design construction, however the general absence of light forms of superstructure and unweathered rock at suitable depth leads to the recommendation that embedded pile type foundations are preferred.

Evidence was found of the tendency for groundwater runoff to collect and pond in the flatter, central area, depositing eroded soils and forming an accumulation of silt and material unsuitable for future development. In order to utilise the area to maximum potential, replacement of the unsuitable material by bulk earthworks filling is recommended.

2.4 Earthworks

The earthwork volume calculations and drawings attached at Appendix B, for roading, drainage and sewerage can be summarized as follows;

Roading earthwork volume	=	Cut 1,000m ³ , Fill 500m ³
Services reticulation volume	=	Cut & Fill, 425m ³
Total earthworks volume	=	2,000m ³

3.0 Access

3.1 Cul-de-sac

The alignment and geometry of the proposed cul-de-sac has been designed by others and we understand has been given approval by FNDC.

3.2 Private Accessway

The alignment and geometry of the proposed accessway has been designed by others and we understand has been given approval by FNDC.

4.0 Stormwater Management

4.1 Existing Stormwater System

At present two culverts passing under Foreshore Road from the front of the subdivision carry stormwater from this site and from the land above in open unlined natural watercourses. There is no evidence to suggest continued active erosion of, nor instability in the surface soils, indicating that the existing system is of adequate capacity to cope with the existing catchment flow volumes.

4.2 New Stormwater Management

The outline scheme design for stormwater management involves upgrading and reconstructing the existing central culvert to accept managed flow from the new subdivision development, and channelling a part of the runoff into the existing unlined natural watercourse, Moringai Stream. The following notes are to be read in conjunction with the attached sketch reference 4.2

The existing central culvert is to be replaced and upgraded with a new box culvert designed with sufficient capacity to accept flow from the new subdivision works. A coastal permit is required for the 3.0m wide x 0.6m high box culvert as a discretionary activity under the latest version of the Revised Proposed Regional Coastal Plan for Northland.

The new culvert will accommodate flows from the open channel "swale drains", (a) via a suitably sized piped road crossing and from the open channel "swale drains", (b).

Stormwater runoff from the cul-de-sac pavement is to be collected on one side in a roadside open channel "swale drain", (a) with sufficient capacity to accept individual flows from lots 1-6. The flows from each of these lots is to be connected via the driveway crossing culverts, to avoid any localized scouring & erosion.

An open channel "swale drain", (b) on the Southern side of the cul-de-sac is to collect stormwater runoff from a new open channel cut-off "swale drain", (c) along the Western boundaries of lots 19 & 20, together with any flow from the open unlined natural watercourse in the adjacent lot RC 1990187, should this be required.

Lots 17, 18 & 19 are to be provided with piped connections to a stormwater sewer (d) draining from a catchpit at the top of the recreational reserve to an outfall structure at the head of the open channel "swale drain", (b).

Stormwater runoff from the up slope areas of the access way pavement is to be collected in a roadside open channel "swale drain", (e) with sufficient capacity to accept individual flows from lots 10 to 15 inclusive. The flows from each of these lots is to be connected via the driveway crossing culverts, to avoid any localized scouring & erosion. This open channel is designed to discharge into the unlined natural watercourse, Moringai Stream, with outfall provisions to prevent any erosion of the existing streambed.

The access way cul-de-sac head is to drain to a new catchpit at the Western side, which is to be connected to the lower level catchpit (d).

The attached calculations supporting the Stormwater Management Plan have been designed to cope with volumes from the catchment area above the subdivision.

4.3 Northland Regional Council

The Council will require a discharge permit for stormwater control from the subdivision. Supporting documentation is provided to accompany a discharge permit application as the sealed area of the development exceeds 2500 m², together with a coastal permit for the 3.0m wide x 0.6m high box culvert (as a discretionary activity under the latest version of the Revised Proposed Regional Coastal Plan for Northland).

4.4 Drainage Permits for Far North District Council

FNDC drainage permits are to be applied for in conjunction with the detailed design of the new sewerage and drainage systems.

5.0 Sewerage

5.1 Existing Sewerage System

Foreshore Road is on a reticulated sewerage system and the existing main passes along the front boundary of the development, parallel with the road.

5.2 New Sewerage Reticulation

New pegged 100 mm connections will be provided to all residential lots on the subdivision. The individual lots are to be connected to a new gravity fed sewer reticulation system located in the services verge of the new access way, cul-de-sac and recreation reserve and connected into the existing system via a new sewer manhole intercepting the existing line.

The outline scheme design for the new sewerage reticulation scheme includes approximately; 5 no. manholes, 330 metres of sewer main and 330 metres of pipework for individual connections. The proposed system is indicated on the attached sketch, reference 5.2

6.0 Earthworks and Retaining Walls

The unsuitable material located in the centre of the site within the area designated for the cul-de-sac head turning circle is to be removed and replaced with suitable free draining fill. Any fill to be placed beneath areas for development, i.e. carriageways or retaining walls, must be properly designed & engineered fill, certified as suitable by a Registered Engineer.

Cut and fill drawings and volume calculations are provided in Appendix B to ensure a properly engineered solution is provided.

Both the cutting slopes from road pavement construction and provision of driveway access to the individual lots dictate the provision of several suitably designed

retaining walls around the subdivision. Past experience indicates that for similar situations, pole type, timber faced retaining walls provide the ideal solution in terms of availability and appearance. They are thus recommended for use here, in a range of different heights, adapted to suit site conditions.

7.0 Conclusions

This report addresses scheme engineering issues relevant to statutory authority consent in principle for the proposed subdivision. Detailed design, addressing specific consent issues, construction supervision and commissioning is included where appropriate.

All new building structures on this subdivision are to have specific foundations designed by a suitably qualified Engineer and it is recommended that embedded pole construction using light timber buildings be the preferred form. These requirements are to be suitably notified on the property titles.

Buildings on the lower Lots 1, 2 and possibly 3 will require floor levels to be a minimum of 600mm above ground level, to avoid the potential effects of any future flooding, as they fall within the confines of the Coastal Hazard II zone.

Please contact Dave Brierley in our Kerikeri office for more specific information on how we may be of service to you.

Prepared by
BROWN & THOMSON NORTHLAND LTD
per



D W Brierley

6. ROADING

6.1 Cross Section Standards

6.1.1 New roads shall be constructed and/or upgraded to the standards set out in Tables 1 and 2, and shown in drawing FNDC/S/07 attached (H.E. = household equivalents).

Table 1 Road Cross Section Standards for Rural Roads.

Description of Road	Carriageway	Formation	Legal (minimum)
Type A Roads: Ultimate development 5 to 15 H.E.	5.5	7.5	16.0
Type B Roads: Ultimate development greater than 15 H.E, all Collector Road	6.5	8.5	20.0
Type C Roads : All Arterial and Strategic Roads	7.5	9.5	20.0

Table 2. Road Cross Section Standards for Urban Roads.

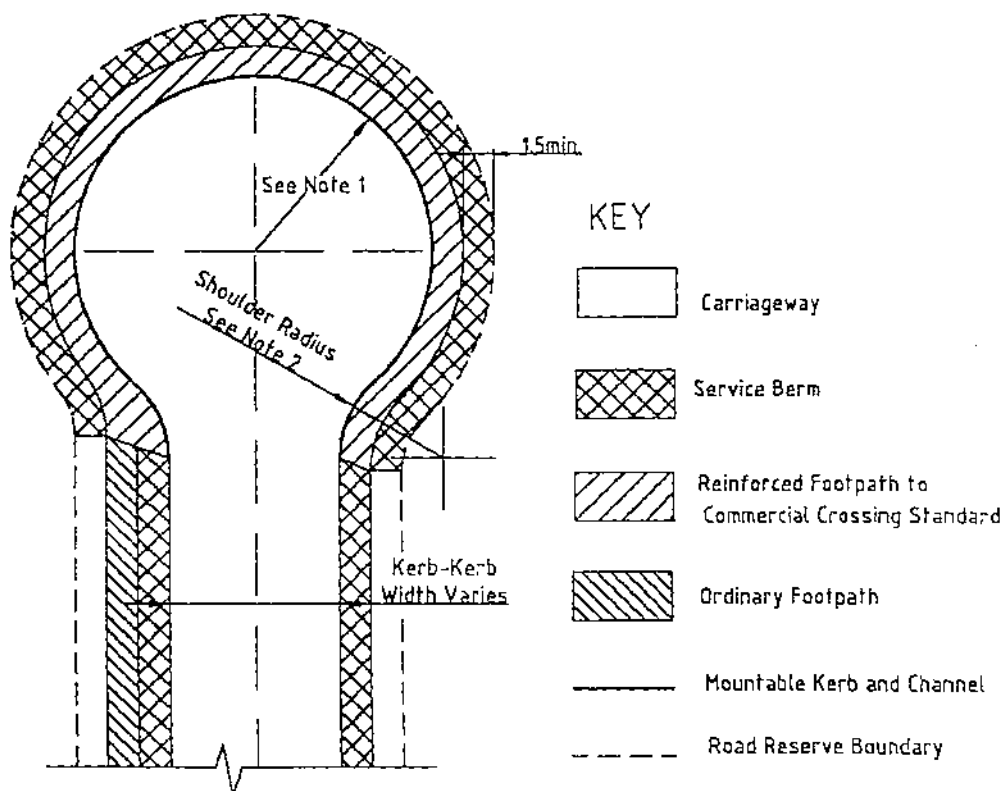
Description of Road	Carriage-way	Form-ation	Legal (min.)	Kerb	Lights Ref. NZS 6701	Footpath and Berm
Type A Roads: Ultimate Development 5 to 15 H.E. All service lanes.	6.0	9.0	12.0	Yes	Yes (Minor road)	Footpath one side, no berm
Type B Roads : Ultimate Development 15 H.E. or more (except service lanes)	8.0	12.5	16.0	Yes	Yes (Minor road)	One side.
Type C Roads (See notes)	12.0	18.0	20.0	Yes	Yes (Minor road)	Both sides.
Type D Roads with cycle paths (See notes)	14.0	20.0	22.0	Yes	Yes (Intermediate road)	Both sides.

Notes to Tables 1 and 2

6.1.2 The legal width is the width which has been declared road in accordance with Section 114 of the Public Works Act. Legal widths shall be greater than those shown as necessary to accommodate earthwork cuts and fills.

6.1.3 Type C roads are collector roads outside commercial or industrial areas which :

- ⇒ do not have significant cycle or pedestrian movements or;
- ⇒ for which cyclists and pedestrians can easily use alternative routes (eg a nearby parallel minor street).



Notes

1. 8.5 metres for residential, 11.5 metres for commercial and industrial.
2. Shoulder radius 5.0 metres for residential, 8.5 metres for commercial and industrial. If the cul-de-sac head is offset from the road centreline by 2 metres or more, then the inside shoulder radius shall be increased by 70%.
3. Footpaths and services berms shall all slope towards the carriageway at a 3 to 5% slope.
4. Drainage shall be installed at the cul-de-sac such that no water can pond on the carriageway.



FAR NORTH DISTRICT COUNCIL ENGINEERING STANDARDS

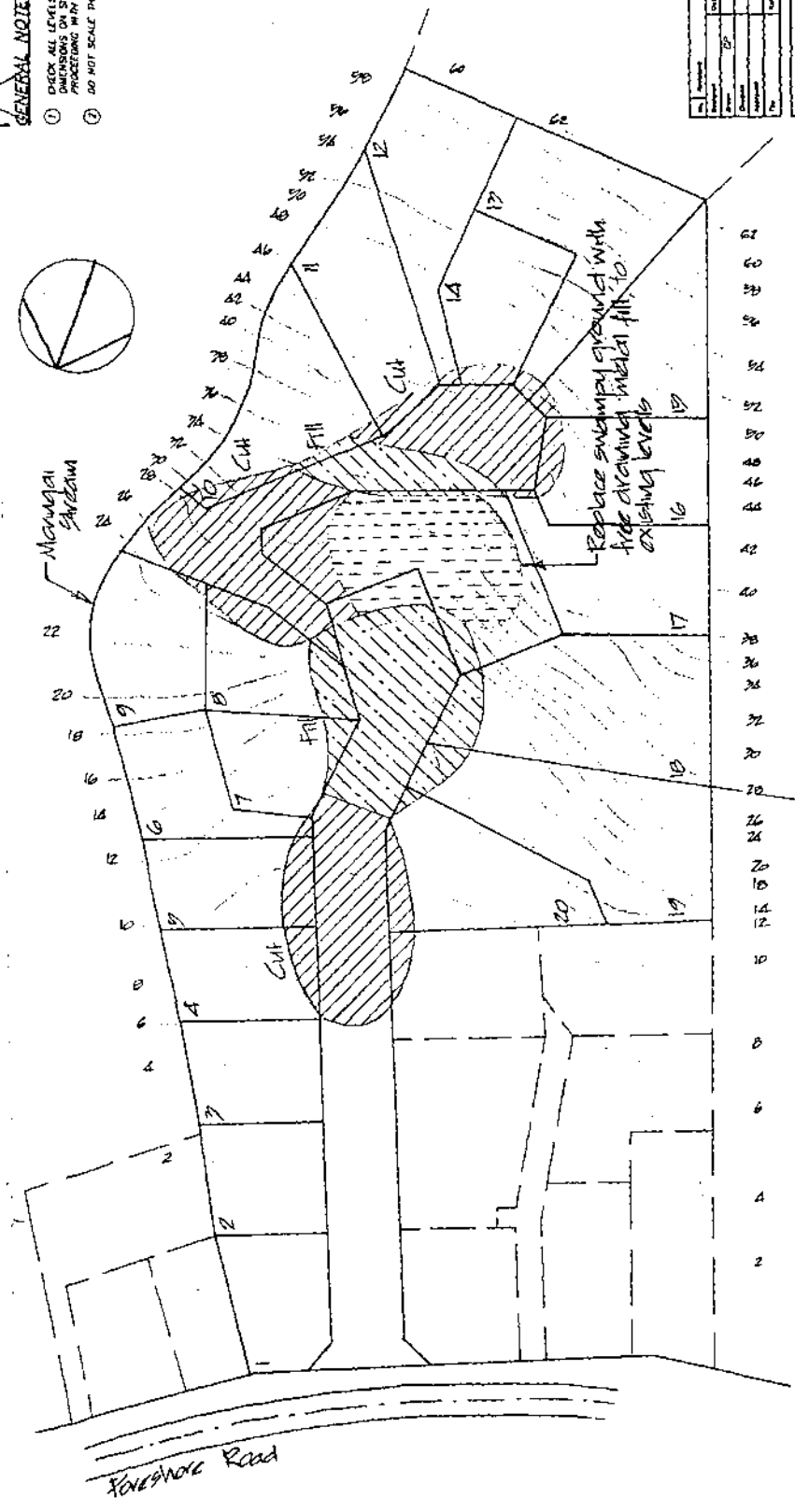
No	AMENDMENTS	DATE

URBAN CUL-DE-SAC HEADS

DATE :
MARCH 1998

FNDCC/S/22

- GENERAL NOTES:**
1. CHECK ALL LEVELS, ANGLES AND DIMENSIONS ON SITE BEFORE PROCEEDING WITH ANY WORK.
 2. DO NOT SCALE THESE DRAWINGS.



Key to Cut & Fill Areas:

- Cut Area
- Fill Area
- Metal Fill

Earthworks Plan Showing Areas of Cut and Fill
Scale 1:1000

Drawn	Checked	Date
		11/92

Client	Meiville Holdings Limited
Project	Proposed Subdivision Foreshore Road, Ahipara
Drawn By	Earthworks Plan

Drawn No.	101432-50
-----------	-----------

Engineer	BROWN & THOMSON NORTHLAND LIMITED
Consulting Engineers	

Road width 0-160 : 5.5
 160-300 : 3.5

Footpath 0-166 : 1.0

Benn	0-160	1.5
	160-300	1.5

Total width for earthwork 2-160 5' m. for
160 = 2400 5' 10' m.

Quantities

Ch	Cut / F. II
0-20	$20 \times 0 \times 0.3 = 48$
20-40	$20 \times 0 \times 0.3 = 48$
40-60	48
60-80	48
80-100	$20 \times 8 \times \left(\frac{0.3 \times 0.8}{2}\right) = 88$
100-120	$20 \times 8 \times 0.6 = 96$
120-140	$10 \times 8 \times 0.4 = 32$
	$10 \times 8 \times 1.3 =$
140-160	$20 \times 0 \times 1.05 =$
160-180	$10 \times 5 \times 0.8 =$
	$10 \times 5 \times 0.8 = 40$
180-200	$20 \times 5 \times 1.6 = 160$
200-220	$20 \times 5 \times 1.4 = 140$
220-240	$20 \times 5 \times 0.85 = 85$
240-260	$10 \times 5 \times 1.3 = 65$
	$10 \times 5 \times 1.5 =$
260-280	$10 \times 5 \times 1.5 =$
	$10 \times 5 \times 0.7 = 35$
280-300	$20 \times 5 \times 0.5 = 50$
Totals :	983

Loading:

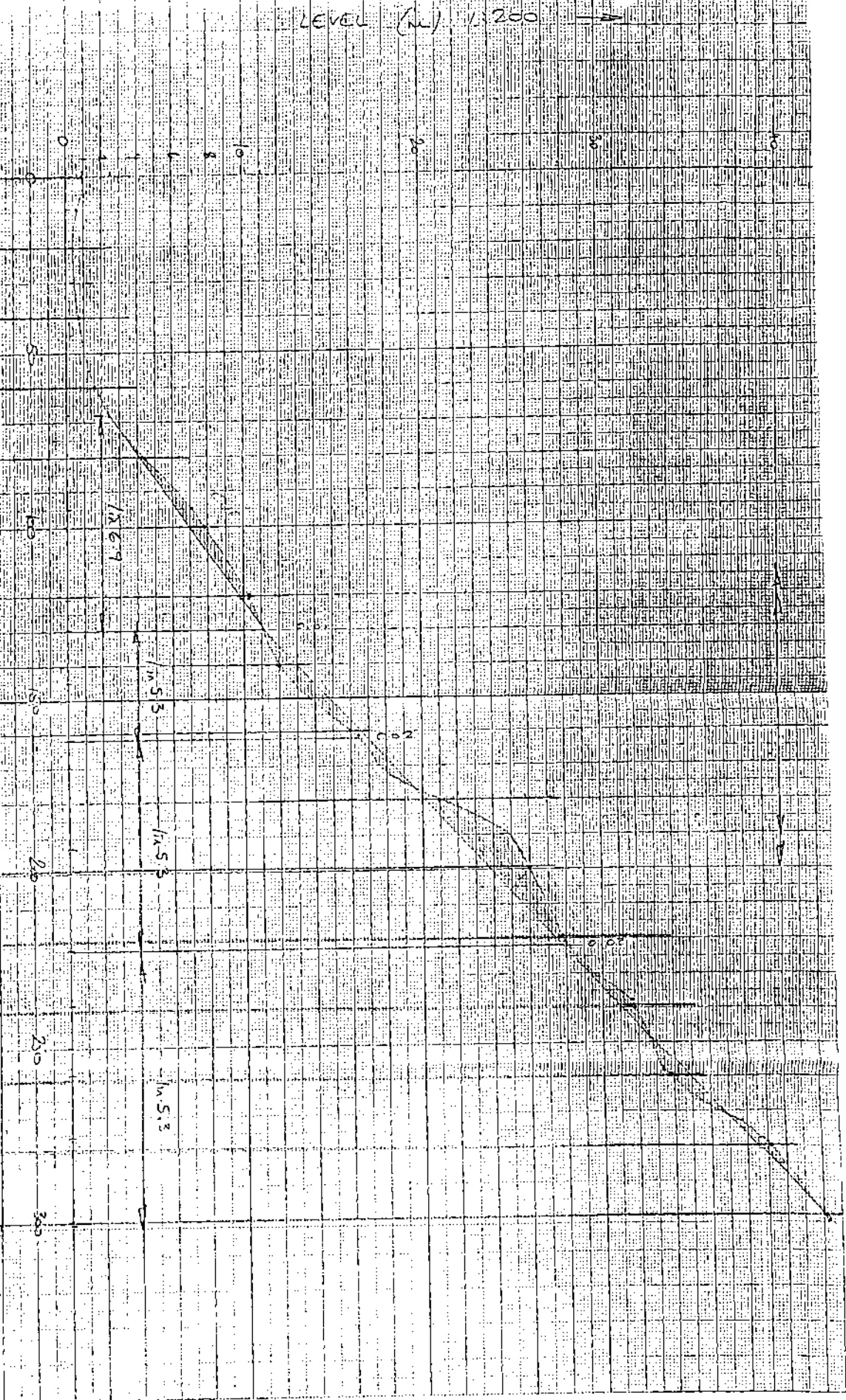
Total cut : 983 m³
fill : 462

Services : Stormwater : ... m' @ = 75m³

Sewar : m' ex

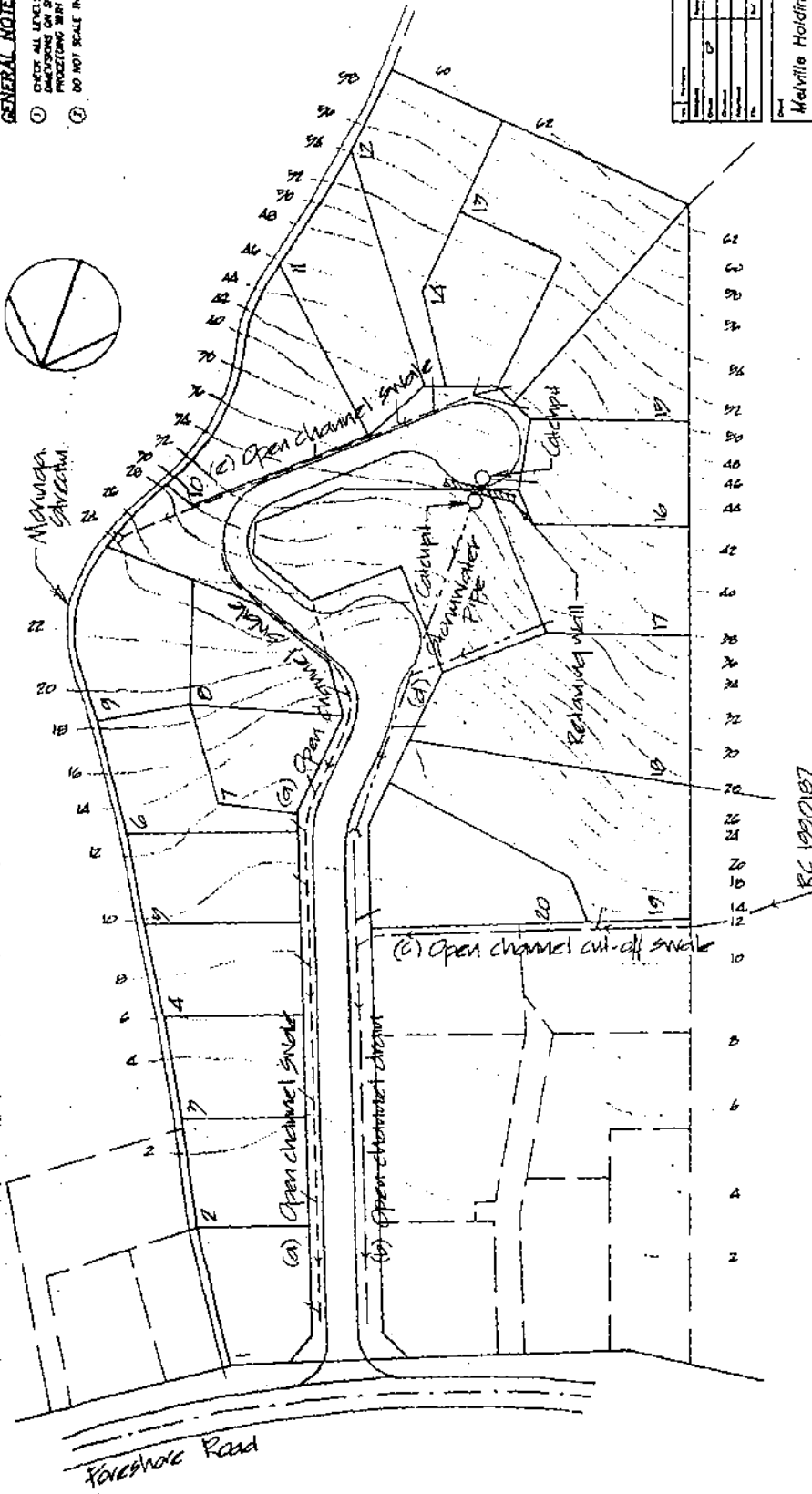
Total :

DISTANCE	GROUND LEVEL (m)		ROAD LEVEL (PROP.)	CUT
	0	1		
0	0	0	0	0
20.0	0.3	0.4	0.3	0.3
40.0	0.3	0.8	0.3	0.3
60.0	0.3	1.6	0.3	0.3
80.0	0.3	4.2	0.3	0.3
100.0	0.8	7.0	0.8	0.8
120.0	0.4	9.8	0.4	0.4
140.0		11.0	11.0	
160.0		6.5	6.5	
180.0	0.8	20.2	0.8	0.8
200.0	2.1	23.6	2.1	2.1
220.0	0.4	27.4	0.4	0.4
240.0	1.3	30.5	1.3	1.3
260.0		35.0		
280.0	0.7	38.5	0.7	0.7
300.0	0.3	42.0	0.3	0.3



GENERAL NOTES

- ① CHECK ALL LEVELS, ANGLES AND DIMENSIONS ON SITE BEFORE PROCEEDING WITH ANY WORK
- ② DO NOT SCALE THESE DRAWINGS



Key to Reticulation:

- (a) & (c) Open channel snaffle
- (b) Open channel culvert
- (c) Open channel cut-off snaffle
- (d) Stormwater pipe

Proposed Stormwater Reticulation
Layout

Scale 1:1000

Drawn	Checked	Date
		11/12/17

Melville Holdings Limited

Proposed Subdivision
Foreshore Road,
Ahipara

Proposed Stormwater
Reticulation Layout

101432-50 4.2

BROWN & THOMSON
NORTLAND LIMITED

CONSULTING ENGINEERS

MELVILLE HOLDINGS FORESHORE ROAD AHIPARA

CATCHMENT AREA AND DISCHARGE CALCULATIONS

Overall site dimensions 660 m x 200 m = 120,000 m² = 12 Ha

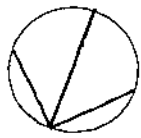
Undeveloped stage, C = 0.5

$$Q_1 = 0.5 \times 115 \times 12 / 360 = 1,916 \approx 1.92 \text{ m}^3/\text{sec}$$

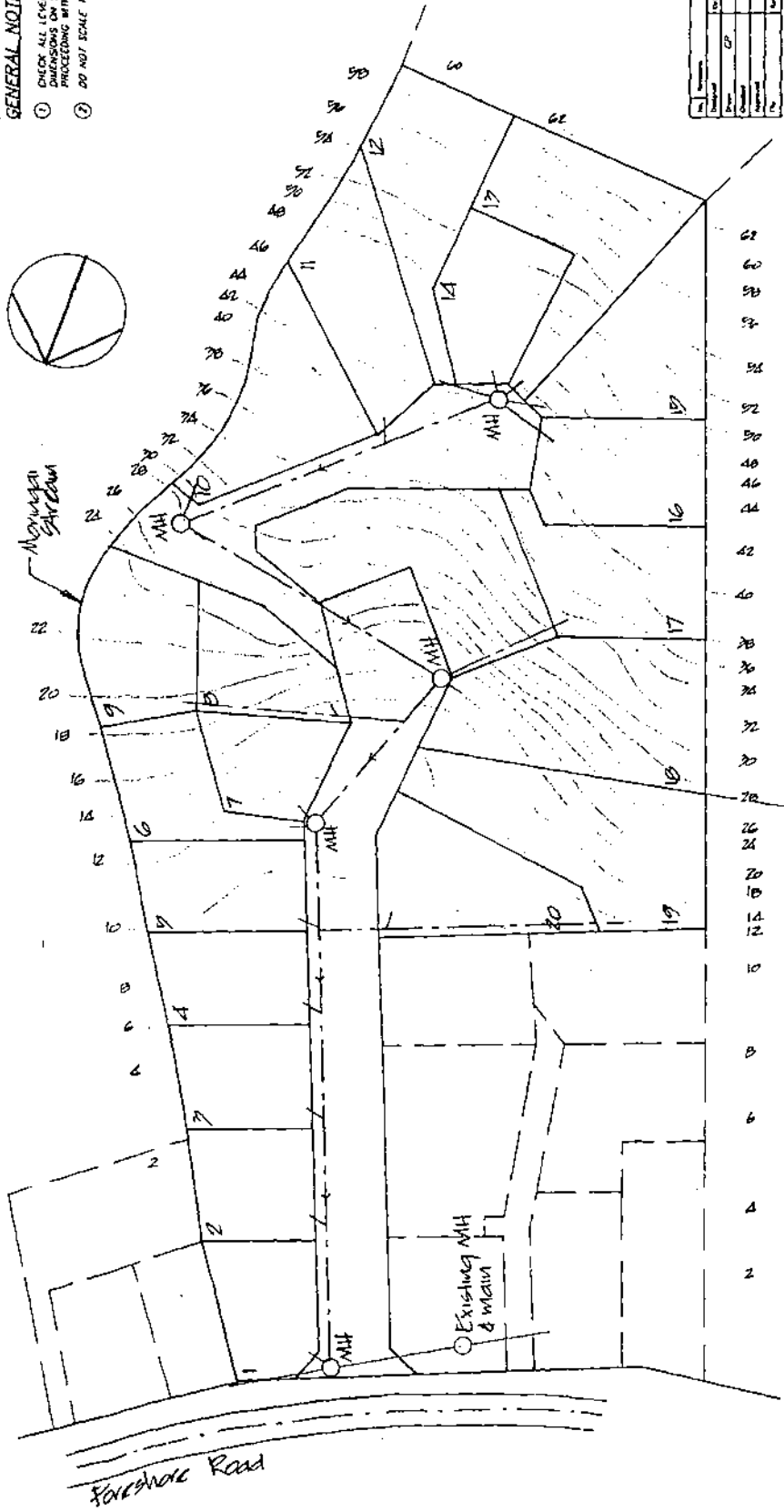
Developed stage, increase = 250 m x 6 =	1,500 m ²
20 lots x 300 =	<u>6,000 m²</u>
	7,500 m ²

$$Q_2 = (0.9 - 0.45) \times 115 \times 0.75 / 360 = 0.108 \text{ m}^3/\text{sec}$$

$$Q_{\text{tot}} = 1.92 + 0.11 = \underline{2.03 \text{ m}^3/\text{sec}}$$



Morgan
Sewer



- GENERAL NOTES:**
1. CHECK ALL LEVELS, ANGLES AND DIMENSIONS ON SITE BEFORE PROCEEDING WITH ANY WORK.
 2. DO NOT SCALE THESE DRAWINGS

No.	Description	Date	By
1	Prepared	11/02	
2	Checked		
3	Approved		

Client: **Melville Holdings Limited**

Project: **Proposed Subdivision
Foreshore Road,
Ahipara**

Drawn by: **Proposed Sewer
Sewer Layout**

Drawn No: **101432-50**

Drawn by: **BROWN & THOMSON
NORTHLAND LIMITED**

CONSULTANT ENGINEER

Proposed Sewer Layout
 Scale 1:1000



Existing culverts.



*View of site & adjoining water
course along common boundary.*



☒ KERIKERI

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Phone [64] (9) 407 9332 • Fax [64] (9) 407 7812
Email: btl@xtra.co.nz

☐ KAITIAIA

State Highway 1 • Awanui • PO Box 280 • Kaitiaia
Phone [64] (9) 408 7401 • Fax [64] (9) 408 7401

04 June 2003

Northland Regional Council

By fax to (09) 438 0012

Attn: Janarie Jongkees

*cc: Bay of Islands Planning Ltd
: FNDC*

Dear Sir

Re **MELVILLE HOLDINGS AHIKARA
PROPOSED CHANGES TO ENGINEERING DETAILS**

Following our recent discussions we wish to confirm our intention to amend the details of the stormwater management system submitted in application for consent, as follows.

Box Culvert

The box culvert will now be installed on the Moringai Stream. All stormwater discharge from the proposed subdivision will be diverted into this culvert. The existing culvert on the Moringai Stream is undersized and cannot cope with existing discharges, hence the liability of flooding currently experienced. The existing 450 mm diameter culvert at the end of the proposed subdivision road will remain as is.

Swale Drains

It is not our intention to install swale drains on any gradients steeper than 1:20. Nor is it our intention to encumber the Far North District Council with a maintenance / mowing problem. We therefore confirm that all swale drains indicated on the submitted stormwater management plan are to be replaced with piped systems. Overland flow paths will be formed directly above the pipe runs where appropriate, by dished depressions in the road verge.

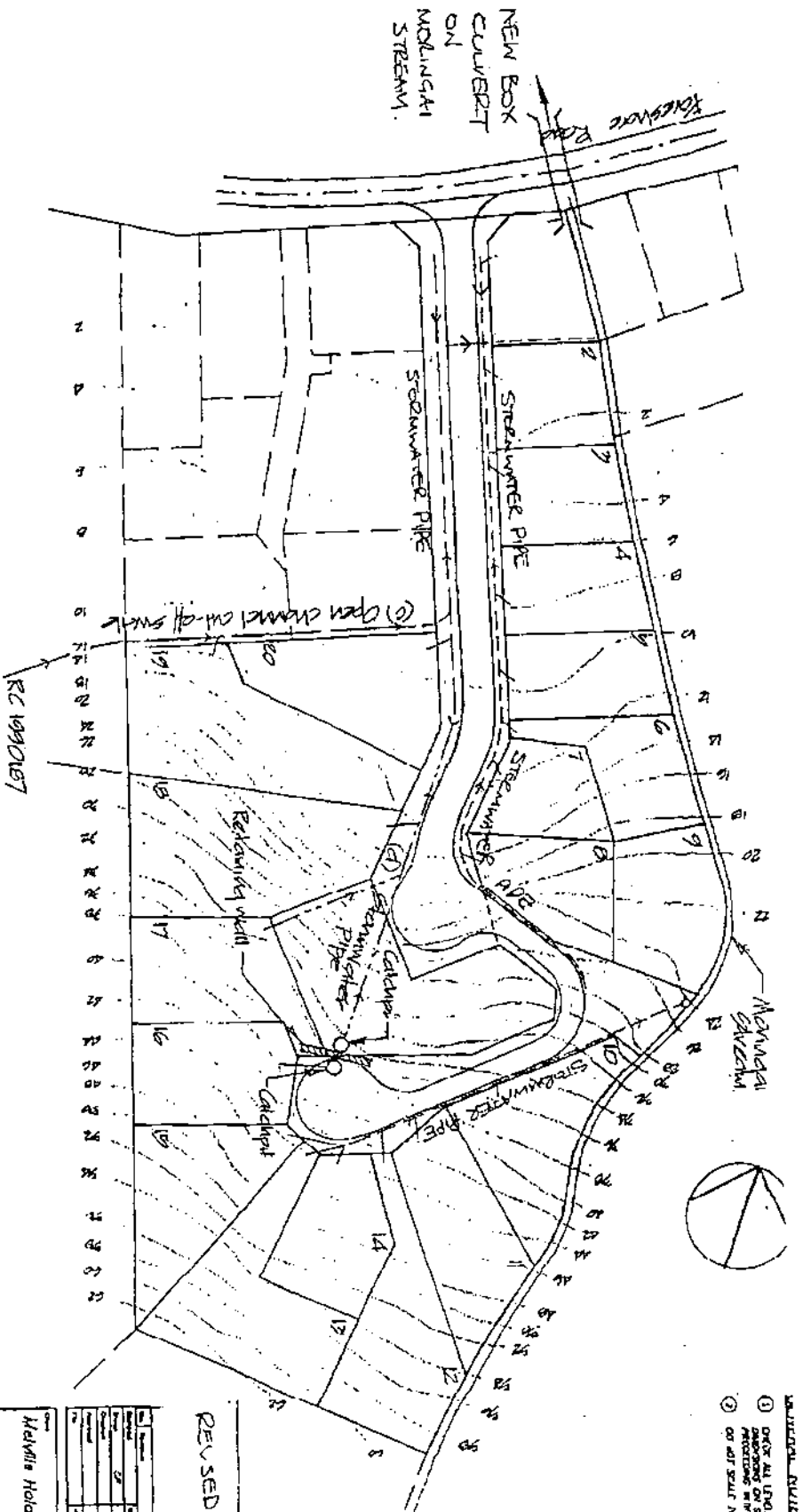
Please contact Dave Brierley in our Kerikeri office for more specific details of how we may be of service to you.

Yours faithfully
BROWN & THOMSON NORTHLAND LTD
per:

A handwritten signature in dark ink, appearing to read 'Dave B.' with a stylized flourish at the end.

D W Brierley

- GENERAL NOTES:**
- ① DETERMINE ALL LINES, ANGLES AND DISTANCES BY THE METHOD OF TRIANGULATION OR BY THE METHOD OF MEASUREMENTS IN THE FIELD.
 - ② ALL DISTANCES ARE IN METERS.



Key to Reticulation:

- (a) & (c) Open channel snail
- (b) Open channel snail
- (c) Open channel cut-off snail
- (d) Steamwater pipe - DISH CROUD ABOVE TO FROM CULVERT FROM PMH.

Proposed Steamwater Reticulation Layout
Scale 1:1000

REVISED 05/04/03
B.B.

NO.	DATE	BY	FOR
1	05/04/03	B.B.	REVISED

Heville Holdings Limited

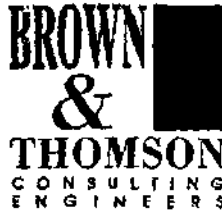
Proposed Subdivision
Furness Road,
Aldora

Proposed Steamwater Reticulation Layout

101432-80 4:2

BROWN & THOMSON
NORFOLK LIMITED

CONSULTING ENGINEER



☒ KERIKERI

Kerikeri Professional Centre • Fairway Drive • PO Box 480 • Kerikeri
Phone (64) (9) 407 9332 • Fax (64) (9) 407 7812
Email: btl@extra.co.nz

☐ KAITIARA

State Highway 1 • Awanui • PO Box 260 • Kaitiara
Phone (64) (9) 408 7401 • Fax (64) (9) 408 7401

24 December 2002

Far North District Council
Private Bag 752
KAIKOHE 0400

Northland Regional Council
Private Bag 9012
WHANGAREI

Attn:
Rex Shand, Development Engineer

Attn:
Janaire Jongkees, Water Resources Officer

Dear Sirs

Re MELVILLE HOLDINGS LTD CON20021061801

PROPOSED SUBDIVISION - FORESHORE ROAD - AHIPARA

**MANAGEMENT PLAN FOR OPERATION AND MAINTENANCE OF STORMWATER
DRAINAGE SYSTEM
AND
MONITORING PROGRAMME**

This management plan and monitoring programme has been developed by Brown & Thomson Northland Ltd. on behalf of the property owners, to address the requirements of the Northland Regional Council. Those requirements being that the Far North District Council shall provide written confirmation that they are prepared to take over the maintenance of the system upon eventual completion.

Management Plan

Item	Action	Frequency
Concrete box culvert passing beneath Foreshore Road on to beach	Remove accumulations of sand and gravel to allow unobstructed water flow	Monthly and immediately following heavy rain or high tides
Concrete box culvert passing beneath Foreshore Road on to beach	Check outfall apron for integrity of rip-rap scour protection	Twice annually and immediately following heavy rain
Terminal manhole immediately upstream of box culvert	Remove accumulations of sand and gravel from manhole sump to allow the manhole sump to act as a sedimentation trap	Monthly and immediately following heavy rain or high tides
Swale drains within the site	Keep grass mown and avoid weed growth	Weekly during growing season
Upstream reticulation, pipes	Check manhole sumps for	Monthly and immediately

Maintenance part of
roadway system

Landowners to maintain on
Private property

BROWN & THOMSON NORTHLAND LTD

What is the
Conditions for - acceptable - do not
have resources
or funds to
undertake mte.
as proposed
maintain a record
with no existing
stats
currently this is
a reactionary
on and when required
AB

and manholes	sedimentation build up and empty as required	following heavy rain or high tides
Outfall into Moringai Stream <i>Would rely on land owner reporting</i>	Check outfall apron for integrity of energy dissipators and scour protection. Re-assemble rock boulder protection as required	Twice annually and immediately following heavy rain

Monitoring Programme

The owners have confirmed that they will employ suitable contractors to implement the management and monitoring of the system performance during the period from practical completion to adoption by Far North District Council

Item	Frequency	Report
Concrete box culvert passing beneath Foreshore Road on to beach - invert	Monthly and immediately following heavy rain or high tides	Depth of silt/sand build up
Concrete box culvert passing beneath Foreshore Road on to beach - outfall	Twice annually and immediately following heavy rain	Any damage. Extent of any damage to concrete apron or rip-rap
Terminal manhole immediately upstream of box culvert	Monthly and immediately following heavy rain or high tides	Depth of silt/sand build up
Swale drains	Weekly during growing season	Establishment of healthy grass. Excessive weed growth
Upstream reticulation, pipes and manholes	Monthly and immediately following heavy rain or high tides	Depth of silt/sand build up
Outfall into Moringai Stream	Twice annually and immediately following heavy rain	Extent of any damage to concrete apron or loose rocks

We also append below the description of the proposed stormwater system, extracted from our Engineering Report, for your reference

4.0 Stormwater Management

4.1 Existing Stormwater System

At present two culverts passing under Foreshore Road from the front of the subdivision carry stormwater from this site and from the land above in open unlined natural watercourses. There is no evidence to suggest continued active erosion of, nor instability in the surface soils, indicating that the existing system is of adequate capacity to cope with the existing catchment flow volumes.

4.2 New Stormwater Management

The outline scheme design for stormwater management involves upgrading and reconstructing the existing central culvert to accept managed flow from the new subdivision development, and channelling a part of the runoff into the existing unlined natural watercourse, Monngai Stream. The following notes are to be read in conjunction with the attached sketch reference 4.2

The existing central culvert is to be replaced and upgraded with a new box culvert designed with sufficient capacity to accept flow from the new subdivision works. A coastal permit is required for the 3.0m wide x 0.6m high box culvert as a discretionary activity under the latest version of the Revised Proposed Regional Coastal Plan for Northland.

The new culvert will accommodate flows from the open channel "swale drains", (a) via a suitably sized piped road crossing and from the open channel "swale drains", (b).

Stormwater runoff from the cul-de-sac pavement is to be collected on one side in a roadside open channel "swale drain", (a) with sufficient capacity to accept individual flows from lots 1-6. The flows from each of these lots is to be connected via the driveway crossing culverts, to avoid any localized scouring & erosion.

An open channel "swale drain", (b) on the Southern side of the cul-de-sac is to collect stormwater runoff from a new open channel cut-off "swale drain", (c) along the Western boundaries of lots 19 & 20, together with any flow from the open unlined natural watercourse in the adjacent lot RC 1990187, should this be required.

Lots 17, 18 & 19 are to be provided with piped connections to a stormwater sewer (d) draining from a catchpit at the top of the recreational reserve to an outfall structure at the head of the open channel "swale drain", (b).

Stormwater runoff from the up slope areas of the access way pavement is to be collected in a roadside open channel "swale drain", (e) with sufficient capacity to accept individual flows from lots 10 to 15 inclusive. The flows from each of these lots is to be connected via the driveway crossing culverts, to avoid any localized scouring & erosion. This open channel is designed to discharge into the unlined natural watercourse, Monngai Stream, with outfall provisions to prevent any erosion of the existing streambed.

The access way cul-de-sac head is to drain to a new catchpit at the Western side, which is to be connected to the lower level catchpit (d).

The attached calculations supporting the Stormwater Management Plan have been designed to cope with volumes from the catchment area above the subdivision.

4.3 Northland Regional Council

The Council will require a discharge permit for stormwater control from the subdivision. Supporting documentation is provided to accompany a discharge permit application as the sealed area of the development exceeds 2500 m², together with a coastal permit for the 3.0m wide x 0.6m high box culvert (as a discretionary activity under the latest version of the Revised Proposed Regional Coastal Plan for Northland).

4.4 Drainage Permits for Far North District Council

FNDC drainage permits are to be applied for in conjunction with the detailed design of the new sewerage and drainage systems.

Please contact Dave Brierley in our Kerikeri office for further details of how we may be of service to you.

Yours faithfully

BROWN & THOMSON NORTHLAND LTD

per



D W Brierley

1:100 yr
return period
for the
catchment
if set
incorporating
devote point

property owners
to maintain
easement in favour
of lots 10-15



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RC 2030509 - MELVILLE HOLDINGS LIMITED
ENGINEERING REPORT ADDENDUM
TO ADDRESS COASTAL HAZARD ZONE 1 & 2 ISSUES

The coastal hazard zones 1 & 2 include the front 60 and 70m respectively of the subject property. Proposed Lots 1 and 2 are directly affected and the following provisions shall be attached as consent conditions.

The finished floor levels of any proposed developments on lots 1 & 2 shall be constructed 800mm above the level of the crown of Foreshore Road. This to avoid flooding or inundation of property by storm surge (wave) flooding and projected increase in sea level due to climatic change.

The foundations of any proposed developments on lots 1 & 2 shall be concrete embedded pile type, which involve minimal excavations or earthworks. The sub floor space shall not be closed in by boarding or the like and shall be left open to allow the free passage of flood waters. Open trellis or vegetation are acceptable alternatives.

Stormwater drainage from any proposed development, including any paved areas, shall be connected to the reticulated system. The downstream manholes of the system are to be provided with sand & silt collection sumps, with invert levels minimum 600mm below their outlets.

The above provisions address the issues of tidal stream back up and avoidance of contaminant discharge to the beach/CMA. However the accumulation of sand in the culverts can best be addressed by ensuring regular cleaning and maintenance is carried out, especially after high tides and storms. A flap valve to prevent ingress of water back through the culverts was not considered appropriate, due to the tendency of the flaps to become lodged by sand in the closed position, effectively blocking the flow through.

The issue of what effect increased stormwater discharge would have on the coastal erosion in the area has been addressed by the adoption of a wide mouthed concrete box culvert, with wing walls and apron structure. The energy dissipating effects of rip-rap boulders on the culvert apron would produce less risk of scouring and erosion than the open pipe arrangements currently in place.

Prepared by
BROWN & THOMSON NORTHLAND LTD
per

A handwritten signature in black ink, appearing to read 'DWB'.

D W Brierley

17 December 2002