


# INFRASTRUCTURE REPORT

## KAPITI COUNTDOWN SITE

160 KAPITI ROAD

PARAPARAUMU

5032

 <b>Maven Associates</b>	<b>Job Number</b> 109022		<b>Rev</b> B
<b>Job Title</b> <b>Title</b> 160 KAPITI ROAD PARAPARAUMU Infrastructure Report	<b>Author</b> CA	<b>Date</b> 02.7.2021	<b>Checked</b> BB

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# 1.0 INTRODUCTION

## 1.1 PROJECT

The purpose of this report is to provide an assessment of earthworks, flooding, stormwater, wastewater, water supply and other service infrastructure associated with the proposed development at 160 Kapiti Road, Paraparaumu, Figure 1.1 Locality Plan below.

The calculations and assessments included in this report are a 'desktop' analysis and are preliminary in nature based on information available at the time of issue. Final design plans and calculations will be provided at the Building Consent stage as required.

This report provides information in support of a resource consent application for land use of the site. This report is to be read in conjunction with all information provided with the report and is to accompany the resource consent application.



Figure 1.1 Locality Plan with existing site layout.

## 1.2 LEGAL DESCRIPTION

The legal description of the Land parcel is as follows:  
160 Kapiti Road, Paraparaumu  
LOT 1 DP 63027  
Area- 2.62 ha  
Current Zoning – Industrial / Service

## 1.3 SITE DESCRIPTION

The site is located at 160 Kapiti Road, Paraparaumu on the Kapiti Coast. Kapiti Coast District Council's GIS currently shows the site as being completely impervious with an existing commercial warehouse in

the centre of the site. The contours show the site slopes inwards from Kapiti Road at roughly 6% through the carpark area and the rest of the site is very flat with an inwards grade from the opposite boundary at roughly 0.5%.

There is existing private wastewater and stormwater infrastructure within the site. The stormwater has discharge points within Birmingham Street and Kapiti Road. The wastewater is pumped into the public network within Birmingham Street via a rising main and private pump station located within the site. The current water supply is from a connection to the mains within Kapiti Road. The northern portion of the site currently has multiple buildings on it which will remain as they are now. This portion of the site is to be subdivided from the parent site, leaving the southern portion (1.6ha) on which the new Countdown building will be constructed. It is understood that a separate subdivision application will be lodged with council.

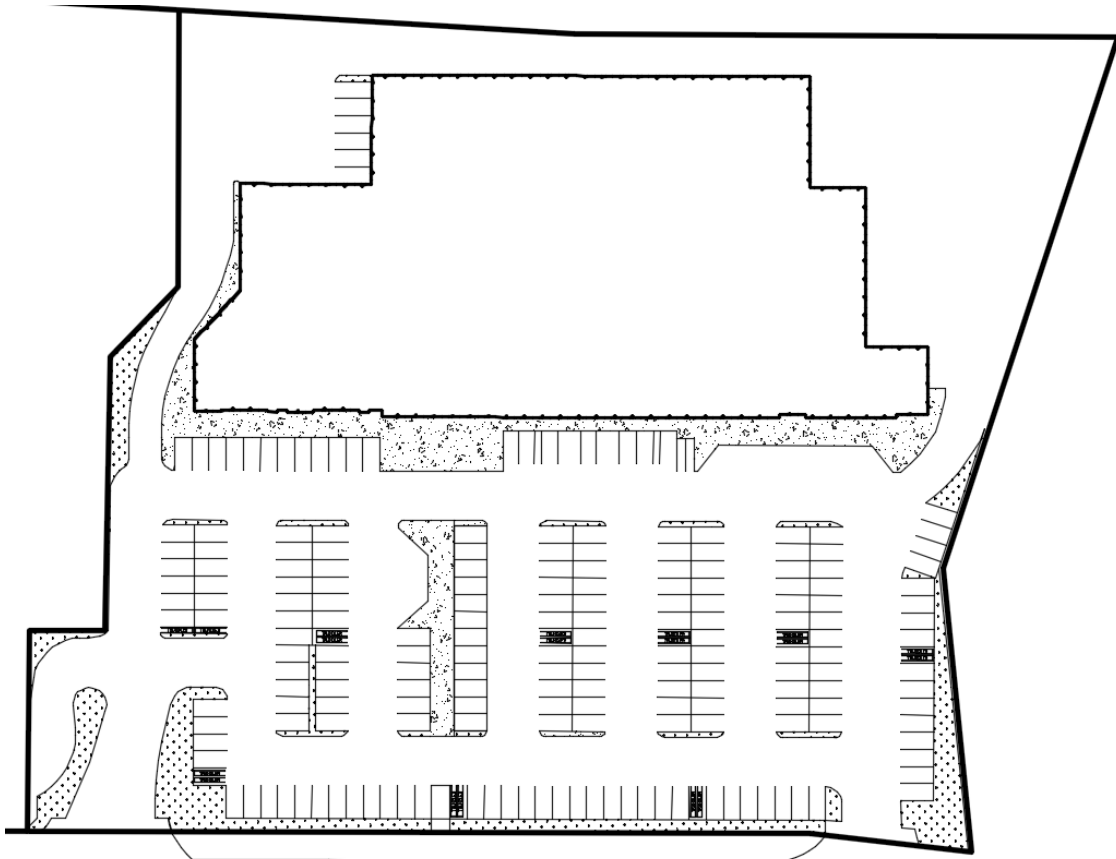


Figure 1.2 Proposed Site Plan

## 2.0 FLOODING

### 2.1 FLOODING AND OVERLAND FLOW

Kapiti Coast District Council's GIS indicates that there is a 100yr ARI Flood Plain within the site. This is an area of ponding during a significant event which will subside once downstream storage areas drain post storm event.

The existing building has a Final Floor Level (FFL) of RL 6.13m  
The proposed building is designed to have a minimum FFL of 6.4m, this provides a freeboard of 0.3m above the top water level considering future climate change effects on flooding.

Maven Associates calculated and modelled the flood volume and extent based on topographical survey data refer figure 2.1.

In a 10year event stormwater flows into two flood storage areas located at the end of Friendship Place and off Te Roto Drive.

GIS does not indicate that there is an Overland Flow Path through the site however with the site being in a natural low point it is likely that kerb and channel flow from Kapiti Road would enter the site.

During a 100 yr. ARI event the stormwater network could be 50% blocked, causing ponding upstream.

The flood storage capacity within the site will be kept the same to ensure that the development does not increase flooding to the neighbouring properties.

The proposed site will allow for ponding around the building and in the carpark without affecting the new building finished floor level. A preliminary general freeboard of 300mm has been provided above the top water level of RL 6.1m. The proposed minimum FFL of new buildings on site is therefore RL 6.4m. It is noted that the 100 Yr. ARI flood event has a top water level of RL6.1m. The design of the carpark contains the ponding up to RL 6.1m to allow for some storage ponding to a safe depth (typically maximum 150mm) within the sealed carpark and to a max of 230mm around the back of the building in a non-public area. Additional stormwater storage will be underground on-site using storage tanks (APD Tanks or similar).

Modelling shows that there is 1,140m<sup>3</sup> of ponding on site at a 6.10m RL, **Refer C201**. The proposed site contains the same flood volume of 1,140m<sup>3</sup> at the RL 6.10 with this volume being split between surface ponding and underground storage **Refer C202**. The general ponding depth throughout the carpark is 150mm with a max of 230mm depth in an isolated non-public area around the back of the site. There is plenty of raised areas for pedestrian egress from the carpark in a 100year event. The carpark can contain roughly 340m<sup>3</sup> of flood storage and the additional 900m<sup>3</sup> volume can be contained within underground flood storage tanks located within the carpark **Refer C410**. Only flooding within the Countdown site has been considered due to the available resources and flood data.

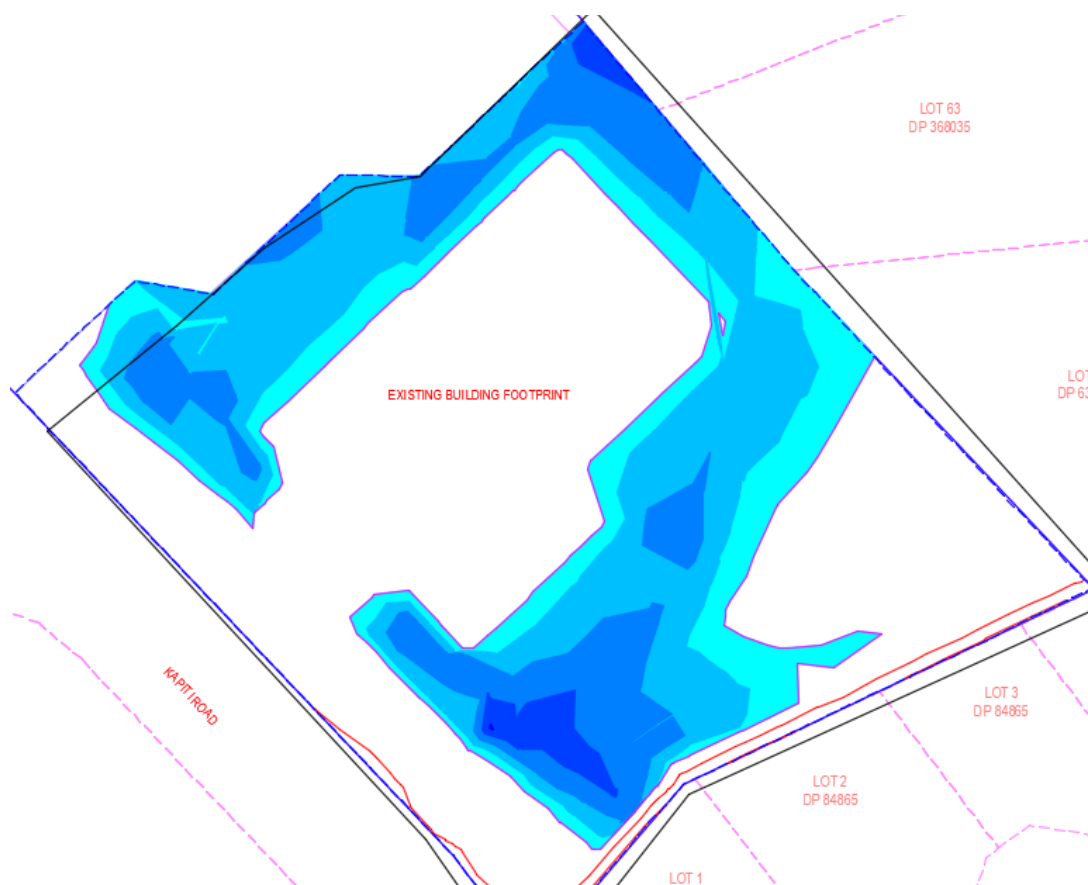


Figure 2.1 Existing Flood Plain Extent

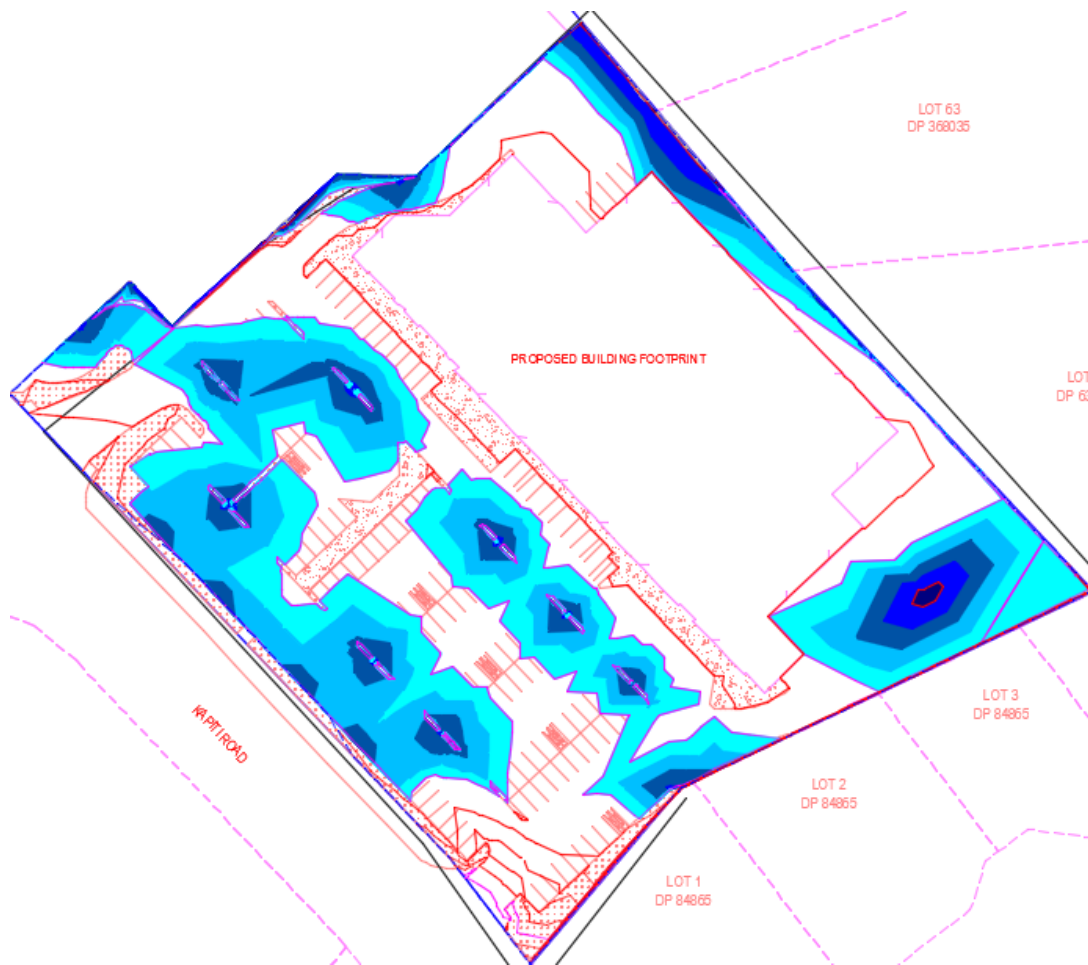


Figure 2.2 Proposed Surface Ponding Extent

## 3.0 EARTHWORKS

### 3.1 PROPOSED EARTHWORKS

The extent of surface work cover most of the 1.66ha site. To complete the development, Earthworks clean fill will only be undertaken in areas required to raise the proposed building footprint. The import of clean fill will be required to achieve a suitable proposed building platform. The new carpark levels will be reworked and resealed where required. Drainage work will require trenching.

### 3.2 PROPOSED SEDIMENT CONTROL

The site earthworks fall inwards away from Kapiti Road. Any dirty water runoff will be contained within the site and cesspit protection will be used to ensure that dirty runoff during construction does not discharge into the public network. Due to the completely impervious nature of the site and working with concrete and hardfill, dust control measures should be put in place to avoid nuisance to Kapiti Road and the surrounding properties.

Sediment control measures should be implemented and maintained in accordance with the KCDP guidelines prior to the earthworks commencing.

### 3.2 EARTHWORKS SUMMARY

Earthworks will involve cut to fill operations with a hardfill excess of 847m<sup>3</sup> and soil excess of 1974m<sup>3</sup>. The Engineering Drawings detail the extent of the works **Refer C201**. The following is a summary of the proposed works:

Total area of ground disturbance	= 16,619 m <sup>2</sup>
Proposed building Footprint	= 3,500 m <sup>2</sup>
Proposed carpark surface area	= 8,681 m <sup>2</sup>
Proposed truck road and staff carpark area	= 4,438 m <sup>2</sup>
Total volume of Cut	= 1,883 m <sup>3</sup>
Total volume of Fill	= 1,036 m <sup>3</sup>
Net Cut to be exported off-site	= 847 m <sup>3</sup>

Below is the initial estimate for the earthworks required for the installation of the flood storage tanks. Any unsuitable material excavated for storage creation and drainage trenches will need to be carted offsite.

Excess carted offsite = 2,281 m<sup>3</sup>

The Soil and Rock Consultants Geotechnical Study W18029 found that the site is in a moderate to high-risk zone pertaining to ground shaking, liquefaction and earthquake induced slope failure. There may be shallow based groundwater present. The report concludes that with a suitably engineered foundation following specific geotechnical investigations the site is suitable for the proposed development. It is envisaged that a detailed design of secondary earthworks and footing preparation for the new building will be necessary at building consent stage. Secondary earthworks have not been factored into the above volumes as the building design is not known at the time of this report.

### 3.3 RETAINING

Retaining will be required along both the south-east and south-west boundaries. The proposed South-west wall is to be maximum 1m in height and the south-east wall ranges in height between 0.5m – 1.8m, **Refer C221**. Final design and specifications to be finalized and is subject to design and Building Consent Approval.

## 4.0 STORMWATER

The Kapiti Coast District Council subdivision guidelines and Proposed District Plan requirements set out design and construction standards for stormwater systems and requires all land development and subdivision projects to be provided with a means of stormwater disposal.

### 4.1 STORMWATER RETICULATION

Existing private manholes, cesspits and pipes are shown within the site on the survey plans. It is proposed that the private network will be reused and upgraded as shown in Appendix B. Any structures under the new building footprint will be abandoned/removed as required. New cesspits have been proposed at the low points of the site and are to be located within the small, raised islands at the end of the carpark aisles. This will ensure the cesspit grates are out of the way and do not pose a risk/nuisance for cars and pedestrians. An extension of the network will be made to service the additional cesspits required within the carpark.

The new roof water system will discharge into the same network within Kapiti Road. This network has been drawn as indicative as the details of the proposed building's roof water drainage system are not known yet and will be confirmed during building consent.

The proposed new private pipes, cesspits and manholes are subject to final investigation and design. **Refer C410** for stormwater design drawings. Private stormwater is subject to building consent approval.

### 4.2 STORMWATER CAPACITY

Using both surveyed and GIS data we can see the immediate downstream pipe is a 1200mmØ pipe at a shallow grade of 0.35% with the capacity to serve 2,253L/s. CCTV of the pipe may be required as part of the final investigation and design of the upstream network.

With the current site being 100% impervious and with the existing warehouse being replaced with a new warehouse of a similar size there should be no resultant change in stormwater runoff, and we do not foresee any capacity issues.

#### **4.3 IMPERVIOUS AREAS AND STORMWATER RUNOFF**

Based on the current architects plans, the impervious area of the site will be 96%, with landscaped areas being about 4% of total.

#### **4.4 STORMWATER QUALITY**

The proposed use of the site will be similar in terms of historic vehicle access. Car parking and truck access will have an impact on stormwater runoff quality. If full treatment is required, then the proposal is to install a SW360 StormFilter Vault to treat all surface runoff from the hardstand areas.

Maintenance of the filter cartridge system will be necessary in the future. Please refer to Appendix C for details of the proposed stormwater treatment device. Alternative SW treatment methods can include rain gardens or a combination of rain gardens, treatment swales and a filter system.

### **5.0 WASTEWATER**

The Kapiti Coast District Council subdivision guidelines and Proposed District Plan requirements set out the design principles for wastewater drainage and requires any development project to be provided with a means of wastewater disposal.

#### **5.1 WASTEWATER RETICULATION**

KCDC Three Waters Service identifies that there is an existing wastewater manhole and 150mm pipe at the end of Birmingham Street which the site discharges into.

There is an existing private pump station on site serving the multiple businesses located within the property and is located within the proposed new building footprint. The pump station pumps the wastewater to the public system in Birmingham Street (easement over private property). GIS indicates this as an 80mm AC Rising Main, the actual material and condition of this pipe will need to be investigated and potentially renewed with a PE pipe however the discharge point into the public network will be kept the same.

The old system is to be removed as required and two new pump stations are proposed for the development. One located within the southern portion and a separate one within the northern portion for the other businesses located on the property. An easement through the southern portion will be required for this rising main.

The new building will flow in gravity via 150mm PVC SN16 pipes through a Humes Grease Interceptor and then into the new pump station location. The building discharge points have been shown as indicative and actual locations are to be confirmed by the architect. The wastewater network for the other buildings will remain as much as possible to avoid disruptions to upstream users. Private pump stations and wastewater network upgrade is subject to design and Building Consent approval.

#### **5.2 WASTEWATER CAPACITY**

A capacity check of the immediate downstream infrastructure shows that the current system has sufficient capacity to cater for the proposed development.

The existing network within Birmingham Street according to GIS is a 150mm pipe with a grade of 0.76%. This pipe has the capacity to service an additional design peak discharge of 11.30L/s. (Refer to **Appendix A**).

Calculations for wastewater demand for all the existing businesses contained within the site and the proposed Supermarket indicate a peak sewer discharge for the proposed development of only 0.74 L/s.



## 6.0 WATER SUPPLY

The Kapiti Coast District Council subdivision guidelines, Water Supply Bylaw 2013 and Proposed District Plan requirements sets out the design principles for water supply and requires it to be designed in accordance with SNZPAS 4509:2008 NZ Fire Service Fire Fighting Water Supply Code of Practice

### 6.1 WATER RETICULATION

KCDC Three Waters Service indicates an existing 250mm AC watermain within the berm of Kapiti Road and a 150mm tee into this which crosses the road and services the site.

The internal site water reticulation is currently unknown however it is assumed that this will be sufficient and can be reused and or modified to provide reticulation for the new building layout. If additional water supply is required, then a second connection into the 250mm main across the road can be made.

The proposed building is to have a separate water supply to the existing businesses at the northern end of the property. GIS does not indicate that there is a separate water supply for the other buildings located on the property, it is assumed they are sharing the same connection into the mains. To provide the other buildings with their own connection, a new road crossing from the 250mm main located within the road reserve will be made.

Final water demand is to be determined with an appropriately sized boundary backflow prevention device and private internal network designed – subject to building consent.

### 6.2 FIRE FIGHTING SUPPLY

The site has 2 existing fire hydrants within range of the subject site, fed from a 250mm watermain.

The minimum firefighting water supply classification for the commercial development is FW6:

- A primary water flow of 100 litres/sec within a radial distance of 135m
- An additional secondary flow of 100 litres/sec within a radial distance of 270m
- The required flow must be achieved from a maximum of eight hydrants operating simultaneously.

It is assumed that the current supply meets the required fire rates however flows and pressures have not been tested to confirm minimum requirements for the water supply classification stipulated in SNZPAS 4509:2008.

The building consent should be accompanied by specific fire design by a Fire Engineer. Flow testing to be performed and reported by them along with details of any fire sprinkler system and the flow/pressure requirements for such a system.

## 7.0 ROADING

Access to the site is off Kapiti Road. The existing use of the site is commercial. The existing building on site has not been in use for some time.

The existing buildings foundations and a portion of the surrounding hardstand area is concrete and total approximately 5,900m<sup>2</sup>. It is envisaged that all existing concrete and sealed areas will be lifted and reworked due to the proposed development levels being close to the existing levels. We recommend the contractor investigates reusing this concrete onsite as crushed aggregate.

The asphalt on the existing yard is to be milled and the levels reworked with the new carpark constructed to suit the new layout, with the levels and grades designed so that the flood plain will be contained within the carpark. The grades throughout the carpark range between 0.8% - 2%. The northern site entrance is at a grade of 1.5% and the southern entrance grades reach a maximum of 7%. Refer to

Appendix B for proposed cross sections of the carpark areas. Refer to plans C300-C314 for levels and grades of the site and C315 for the grades of the entry / exit at the southern end of the site.

## **8.0 OTHER SERVICES**

Telecommunications in the area are managed by Chorus, power by Electra and gas by First Gas.

It is assumed that the existing power and telecom supply will be sufficient to supply the new development. Existing connections will be reused but confirmation is to be made with the service providers regarding the capacity.

The proposed southern portion of the development is to have a separate telecom, power, and water connection. Service plans indicate that the other buildings on the northern portion having a separate telecom connection but there is no indication of separate power and water supply. This will need to be confirmed with the utility providers and new connections made if there is not a separate supply to these buildings.

## **9.0 CONCLUSIONS**

Flooding within the carpark will be to a max depth of 150mm (apart from an isolated non-public low-risk area around the back of the building where it is 250mm deep). Additional underground flood storage can be provided using stormwater tanks (APD or similar) to maintain the existing potential flood volume within the site. The new development will not cause any additional flooding effects upstream or downstream.

The existing private stormwater drainage can be partly reused, partly abandoned, and upgraded for the proposed commercial development.

Wastewater drainage can be provided for the proposed development. The existing wastewater pump station and most of the private wastewater infrastructure will be abandoned or removed. A new network will be constructed to suit the new proposed site layout.

There is public water supply infrastructure on the Kapiti Road front which is assumed as sufficient for potable water and firefighting supply for the proposed commercial development, however, will be subject to testing by a fire engineer.

The existing sealed carpark and surrounding sealed areas will be reworked to ensure that the post development flood storage volumes are no less than the predevelopment volumes.

It is assumed that suitable Power and Telecom connections to the site are present and can be used for the new commercial building.

The information gathered to-date confirms the site is suitable for the proposed commercial development. Infrastructure is subject to final design and Building Consent.

## **APPENDIX A – ENGINEERING CALCULATIONS**




MAVEN ASSOCIATES

Job Number	Sheet	Rev	Job Title: 160 KAPITI ROAD, PARAPARAUMU	Author	Date	Checked
109022	1	A	Calc Title: Stormwater Check	CA	26-May	BB

As per KCDC Standard: 0.96 C value for development I = 77mm/hr 2.42111E-05 (m/sec)  
 Pipe ks factor = 1.5 mm (pipes up to 1.0m dia) I climate = 87.16mm/hr Climate change +2.1degrees (13.2% increase)  
 0.6 mm (pipes over 1.0m dia)

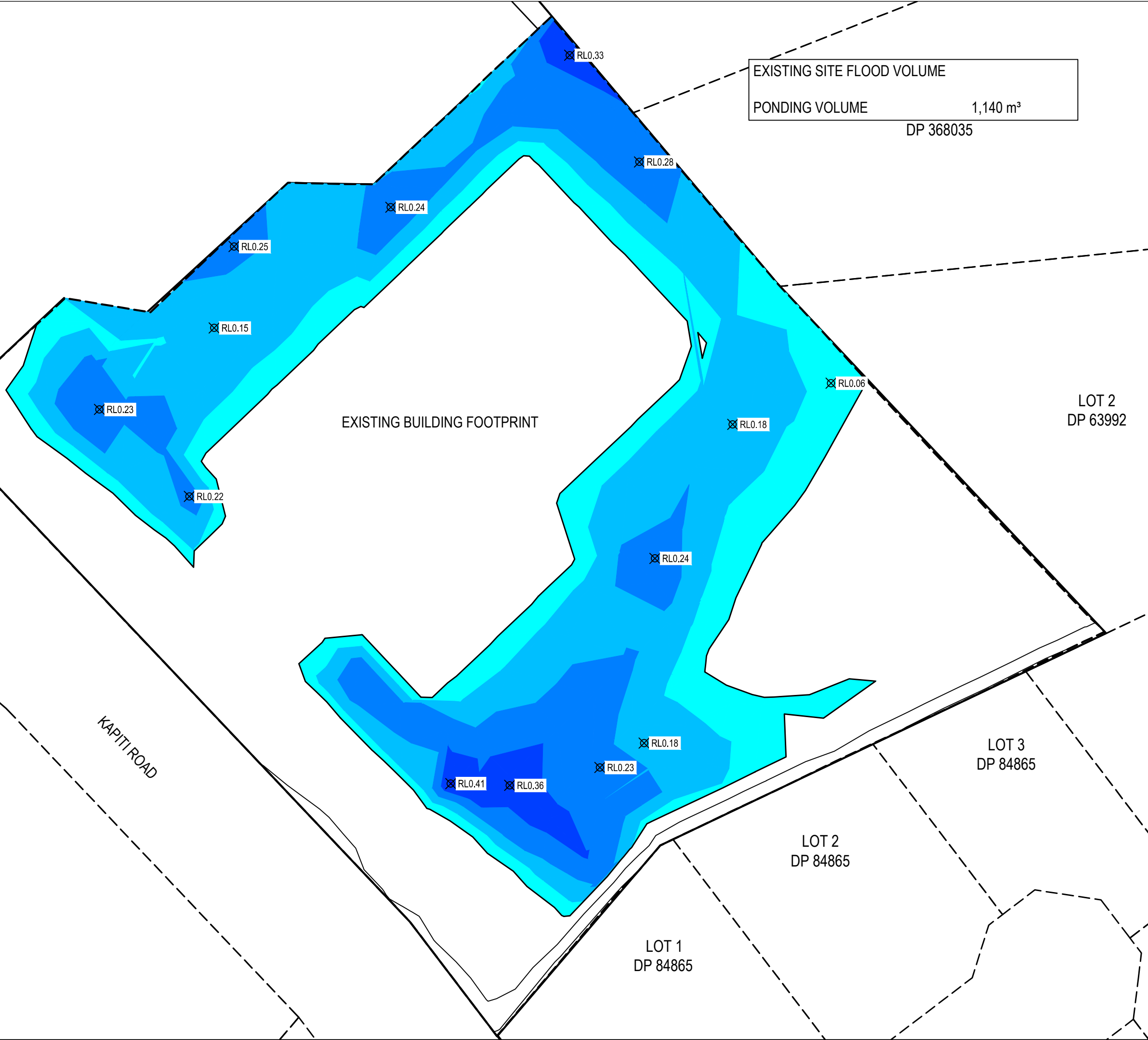
Pipe Line number	Catchment letter	C	Area m <sup>2</sup>	Flow l/s	Cum. Flow l/s	Pipe dia m	Gradient %	Capacity l/s	Velocity m/s	Check OK
Ex 1200 mm		0.96	68096	1582.73	1582.73	1.200	0.35	2252.97	1.99	OK

		<b>Job Number</b> 109022	<b>Sheet</b> 1	<b>Rev</b> A												
<b>Job Title</b> <b>Calc Title</b>	160 KAPITI ROAD, PARAPARAUMU Wastewater Pipe Capacity	<b>Author</b> CA	<b>Date</b> 26-May	<b>Checked</b> BB												
<p style="text-align: center;"> PWWF = 0.74 l/s  ks for uPVC = 0.6 </p> <table border="1"> <thead> <tr> <th>PWW Flow <i>l/s</i></th> <th>Pipe dia <i>m</i></th> <th>Gradient <i>%</i></th> <th>Capacity <i>l/s</i></th> <th>Velocity <i>m/s</i></th> <th>Check <i>OK</i></th> </tr> </thead> <tbody> <tr> <td>0.74</td> <td>0.15</td> <td>0.45</td> <td>12.04</td> <td>0.68</td> <td>OK</td> </tr> </tbody> </table>					PWW Flow <i>l/s</i>	Pipe dia <i>m</i>	Gradient <i>%</i>	Capacity <i>l/s</i>	Velocity <i>m/s</i>	Check <i>OK</i>	0.74	0.15	0.45	12.04	0.68	OK
PWW Flow <i>l/s</i>	Pipe dia <i>m</i>	Gradient <i>%</i>	Capacity <i>l/s</i>	Velocity <i>m/s</i>	Check <i>OK</i>											
0.74	0.15	0.45	12.04	0.68	OK											

## **APPENDIX B – ENGINEERING PLANS**



EXISTING SITE FLOOD VOLUME  
 PONDING VOLUME 1,140 m<sup>3</sup>  
 DP 368035



- Notes
- All works to be in accordance with KCDP council standards.
  - It is the contractors responsibility to locate all services that may be affected by his operations.
  - The contractor shall comply with all relevant Health and Safety requirements.
  - The contractor shall obtain all necessary approval from utility operators before commencing work under or near their services.
  - Sediment control shall be installed and operational before earthworks start onsite in accordance with council standards.
  - Contractor shall provide asbuilt of working sediment control devices and confirmation of pond/decent volumes to engineer.

Legend  
 ——— EX BDY  
 ——— PROP BDY

PONDING DEPTH			
Number #	Minimum Elevation	Maximum Elevation	Color
1	0.000	0.100	
2	0.100	0.200	
3	0.200	0.300	
4	0.300	0.400	
5	0.400	0.500	

Rev	Description	By	Date
A	RC	CA	06/2021
Survey	CUTTRISS		09/16
Design	CA		06/21
Drawn	CA		06/21
Checked	GB		06/21

**M** Maven Associates  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

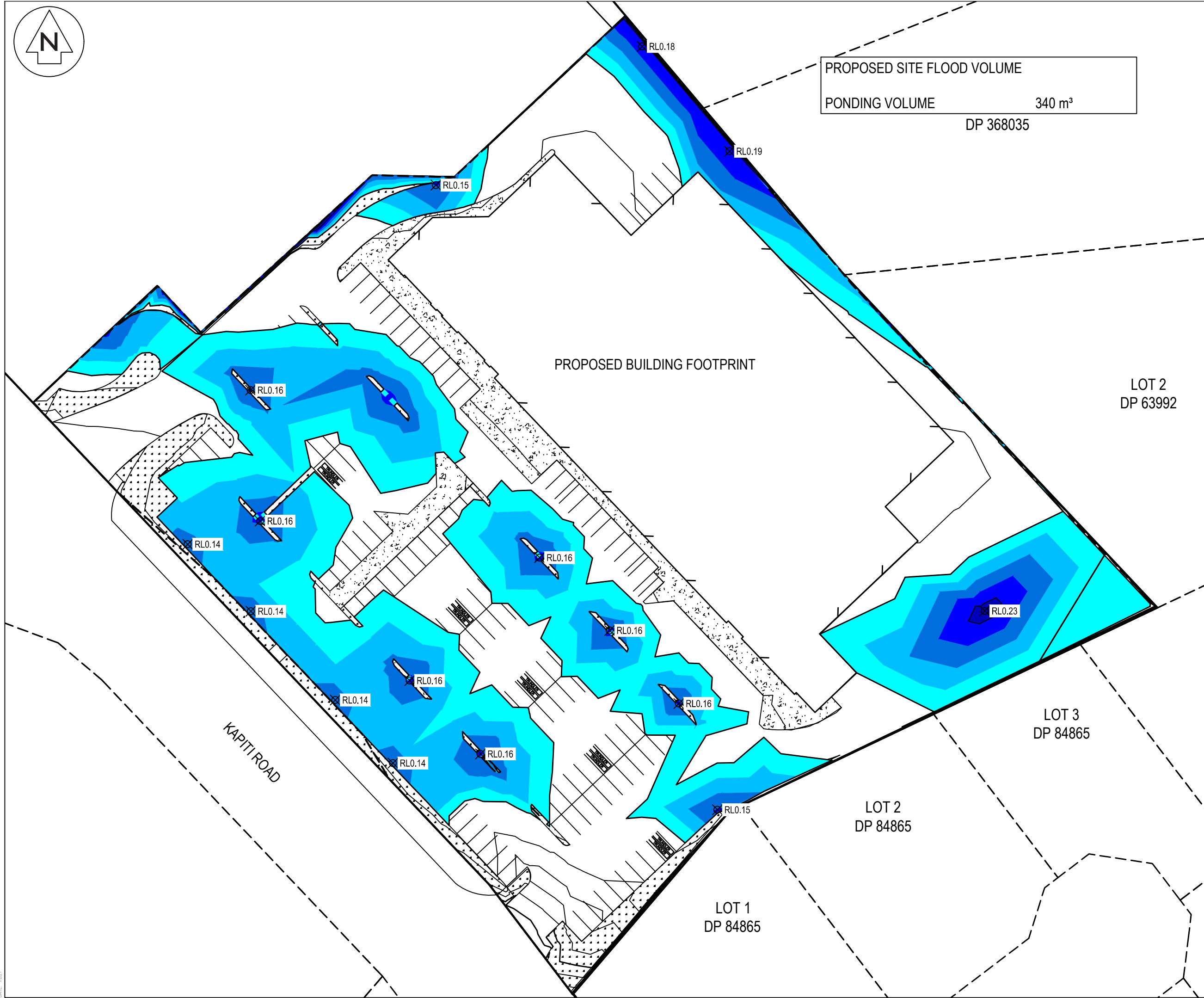
Project  
**160 KAPITI ROAD  
 PARAPARAUMU  
 FOR  
 KAPITI RETAIL HOLDINGS  
 LIMITED**

Title  
**EXISTING  
 SITE FLOOD VOLUME  
 PLAN**

Project no.	109022
Scale	NTS
Cad file	109022 C200 PONDING.DWG
Drawing no.	C201
Rev	<b>A</b>



PROPOSED SITE FLOOD VOLUME  
 PONDING VOLUME 340 m<sup>3</sup>  
 DP 368035



- Notes
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Legend

EX BDY  
 PROP BDY

PONDING DEPTH			
Number #	Minimum Elevation	Maximum Elevation	Color
1	0.000	0.050	Cyan
2	0.050	0.100	Light Blue
3	0.100	0.150	Medium Blue
4	0.150	0.200	Dark Blue
5	0.200	0.250	Very Dark Blue

Rev	Description	By	Date
A	RC	CA	06/2021
Survey	CUTTRISS		09/16
Design	CA		06/21
Drawn	CA		06/21
Checked	GB		06/21

**M** Maven Associates  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160 KAPITI ROAD  
 PARAPARAUMU  
 FOR  
 KAPITI RETAIL HOLDINGS  
 LIMITED**

Title  
**PROPOSED  
 CARPARK FLOOD  
 VOLUME PLAN**

Project no.	109022
Scale	NTS
Cad file	109022 C200 PONDING.DWG
Drawing no.	C202
Rev	<b>A</b>





**BULK SUBGRADE WORKS**

CUT VOLUME 1,883 m<sup>3</sup>  
 FILL VOLUME 1036 m<sup>3</sup>  
 NET CUT 847 m<sup>3</sup>

ADDITIONAL CUT AND CART OFFSITE  
 VOLUME FOR SW TANKS 1,974 m<sup>3</sup>

EARTHWORKS AREA = 16,619m<sup>2</sup> / 1.66 Ha

NOTE: NO ALLOWANCE FOR SERVICES TRENCHES

- Notes
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Legend

EX BDY  
 PROP BDY

Number #	Minimum Elevation	Maximum Elevation	Color
1	-2.000	-1.500	Red
2	-1.500	-1.000	Brown
3	-1.000	-0.500	Light Green
4	-0.500	0.000	Yellow-Green
5	0.000	0.500	Green
6	0.500	1.000	Dark Green

Rev	Description	By	Date
A	RC	CA	06/2021
Survey	CUTTRISS		09/16
Design	CA		06/21
Drawn	CA		06/21
Checked	GB		06/21

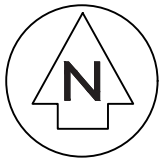
**M** Maven Associates  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160 KAPITI ROAD  
 PARAPARAUMU  
 FOR  
 KAPITI RETAIL HOLDINGS  
 LIMITED**

Title  
**PROPOSED  
 EARTHWORKS  
 PLAN**

Project no.	109022
Scale	NTS
Cad file	109022 C200 PONDING.DWG
Drawing no.	C203
Rev	<b>A</b>





FLOOD STORAGE CHAMBER VOLUME  
 INITIAL CUT VOLUME ESTIMATE 2281 m<sup>3</sup>

LOT 63  
 DP 368035

LOT 2  
 DP 63992

LOT 3  
 DP 84865

LOT 2  
 DP 84865

LOT 1  
 DP 84865

KAPITI ROAD

EXCAVATION AT 1:1 GRADE

CUT -1.67

CUT -1.68

CUT -1.68

CUT -1.68

- Notes
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Legend  
 ——— EX BDY  
 ——— PROP BDY

Cut/Fill Table			
Number #	Minimum Elevation	Maximum Elevation	Color
1	-2.000	-1.500	
2	-1.500	-1.000	
3	-1.000	-0.500	
4	-0.500	0.000	

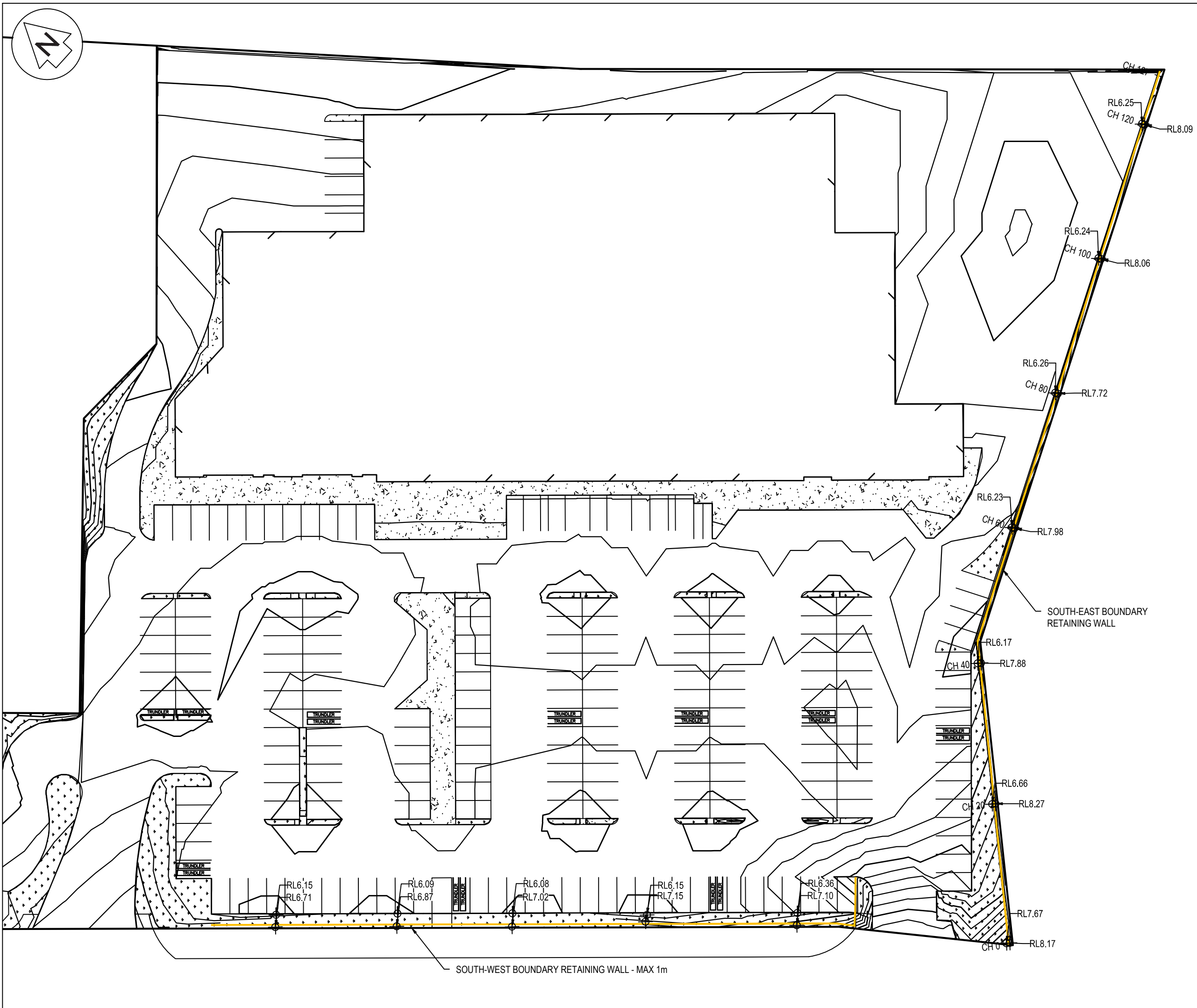
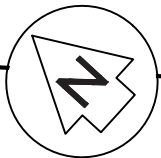
Rev	Description	By	Date
A	RC	CA	06/2021
Survey	CUTTRISS		09/16
Design	CA		06/21
Drawn	CA		06/21
Checked	GB		06/21

**Maven Associates**  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160 KAPITI ROAD  
 PARAPARAUMU  
 FOR  
 KAPITI RETAIL HOLDINGS  
 LIMITED**

Title  
**PROPOSED  
 FLOOD STORAGE TANK  
 EARTHWORKS PLAN**

Project no.	109022
Scale	NTS
Cad file	109022 C200 PONDING.DWG
Drawing no.	C204
Rev	<b>A</b>



- Notes
1. All works to be in accordance with KCDC standards.
  2. It is the contractors responsibility to locate all services that may be affected by his operations.
  3. The contractor shall comply with all relevant Health and Safety requirements.
  4. The contractor shall obtain all necessary approval from utility operators before commencing work under or near their services.

Legend

	EX BDY
	PROP BDY
	PR MAJOR CONTOUR
	PR MINOR CONTOUR
	PROP RETAINING

Rev	Description	By	Date
A	RC	CA	06/2021
Survey	CUTTRISS		09/16
Design	CA		2021
Drawn	CA		2021
Checked	BB		2021

**M** **Maven Associates**  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160 KAPITI ROAD  
 PARAPARAUMU  
 FOR  
 KAPITI RETAIL HOLDINGS  
 LIMITED**

Title  
**PROPOSED  
 RETAINING  
 PLAN**

Project no.	109022
Scale	1:500 @ A3
Cad file	109022 C220 RETAINING.DWG
Drawing no.	C220
Rev	<b>A</b>

DATE: 7/2/21

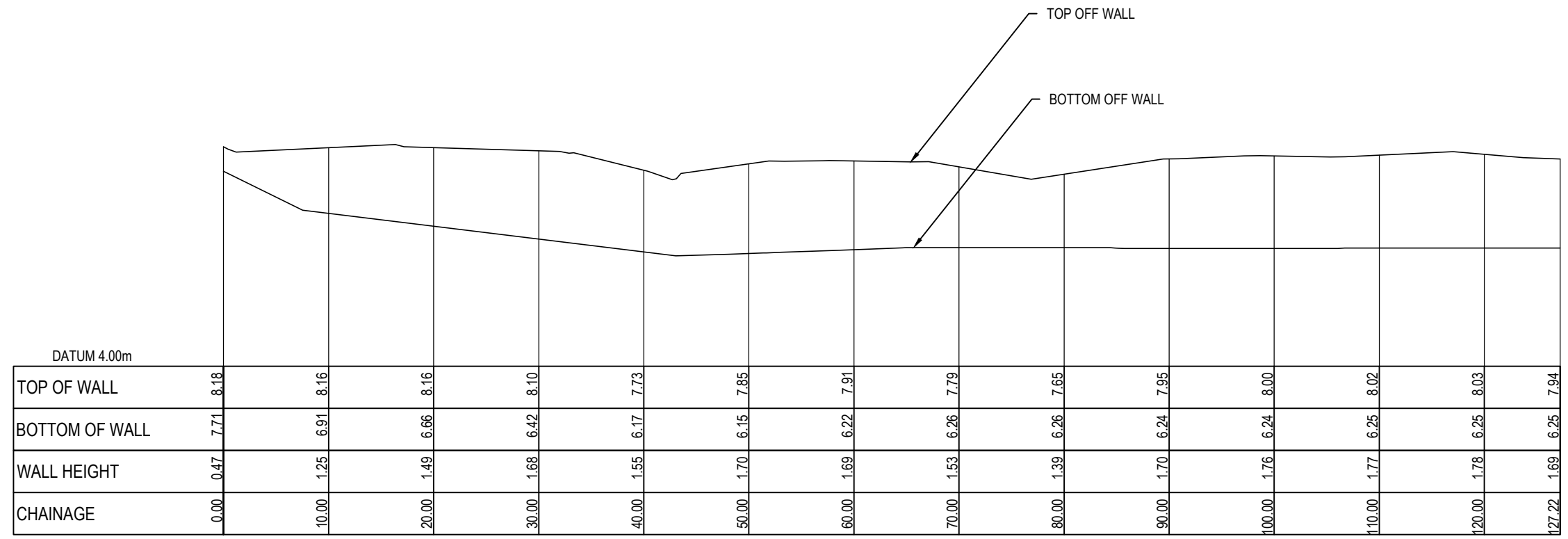
SOUTH-WEST BOUNDARY RETAINING WALL - MAX 1m

SOUTH-EAST BOUNDARY  
 RETAINING WALL

- Notes
1. All works to be in accordance with KCDC standards.
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  3. The contractor shall comply with all relevant Health and Safety requirements.
  4. The contractor shall obtain all necessary approval from utility operators before commencing work under or near their services.

Legend

	EX BDY
	PROP BDY
	PR MAJOR CONTOUR
	PR MINOR CONTOUR
	PROP RETAINING



SOUTH EAST BOUNDARY RETAINING WALL  
SCALE: HORI 1:1000 VERT 1:200

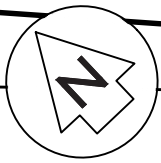
Rev	Description	By	Date
A	RC	CA	06/2021
Survey	CUTTRISS		09/16
Design	CA		2021
Drawn	CA		2021
Checked	BB		2021

**Maven Associates**  
09 571 0050  
info@maven.co.nz  
www.maven.co.nz  
5 Owens Road, Epsom  
Auckland 1023

Project  
**160 KAPITI ROAD  
PARAPARAUMU  
FOR  
KAPITI RETAIL HOLDINGS  
LIMITED**

Title  
**PROPOSED SOUTH-EAST  
RETAINING WALL  
LONG SECTION**

Project no.	109022
Scale	1:500 @ A3
Cad file	109022 C220 RETAINING.DWG
Drawing no.	C221
Rev	<b>A</b>



LOT #2

LOT #1

PROP BUILDING FOOTPRINT

REFER C312

REFER C313

REFER C311

KAPITI ROAD

REFER C314

ENTRY / EXIT

HEAVY DUTY VEHICLE CROSSINGS REFER TO RD-006

ENTRY / EXIT

HEAVY DUTY VEHICLE CROSSINGS REFER TO RD-006

- Notes
- All works to be in accordance with KCDC standards.
  - Pipe bedding: 0 - 10% granular bedding, 10 - 20% weak concrete bedding greater than 20% weak concrete bedding (7mpa plus anti scour blocks at 6m crs).
  - Each connection shall be marked by a 50mmx50mm treated pine stake extending 600mm above ground level with the top painted. This marker post shall be placed alongside a timber marker installed at the time of pipelaying and extending from the connection to 150mm below finished ground level. Connections shall be accurately indicated on "as built" plans.
  - Approved hardfill is to be used in backfilling of all road crossings and vehicle crossings to council standards.
  - Heavy duty manhole lids and frames to be used in trafficked areas.
  - All Manholes are to be 1050mmØ unless shown otherwise.
  - All cesspit leads shall have min cover 0.9m.
  - All lines to be abandoned shall be sealed at each end. timing of all sealing to be coordinated with council staff.

Legend

- EX BDY
- PROP BDY
- ABUTTING BDY'S
- PROP SWCP SINGLE
- PROP SWCP DOUBLE
- PROP RETAINING
- PROP LANDSCAPING
- PROP CONCRETE

A	RC	CA	06/2021
Rev	Description	By	Date

**Maven Associates**  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160**  
**KAPITI ROAD**  
**FOR**  
**KAPITI RETAIL**  
**HOLDINGS LTD**

Title  
**PROPOSED**  
**CARPARK**  
**PLAN**

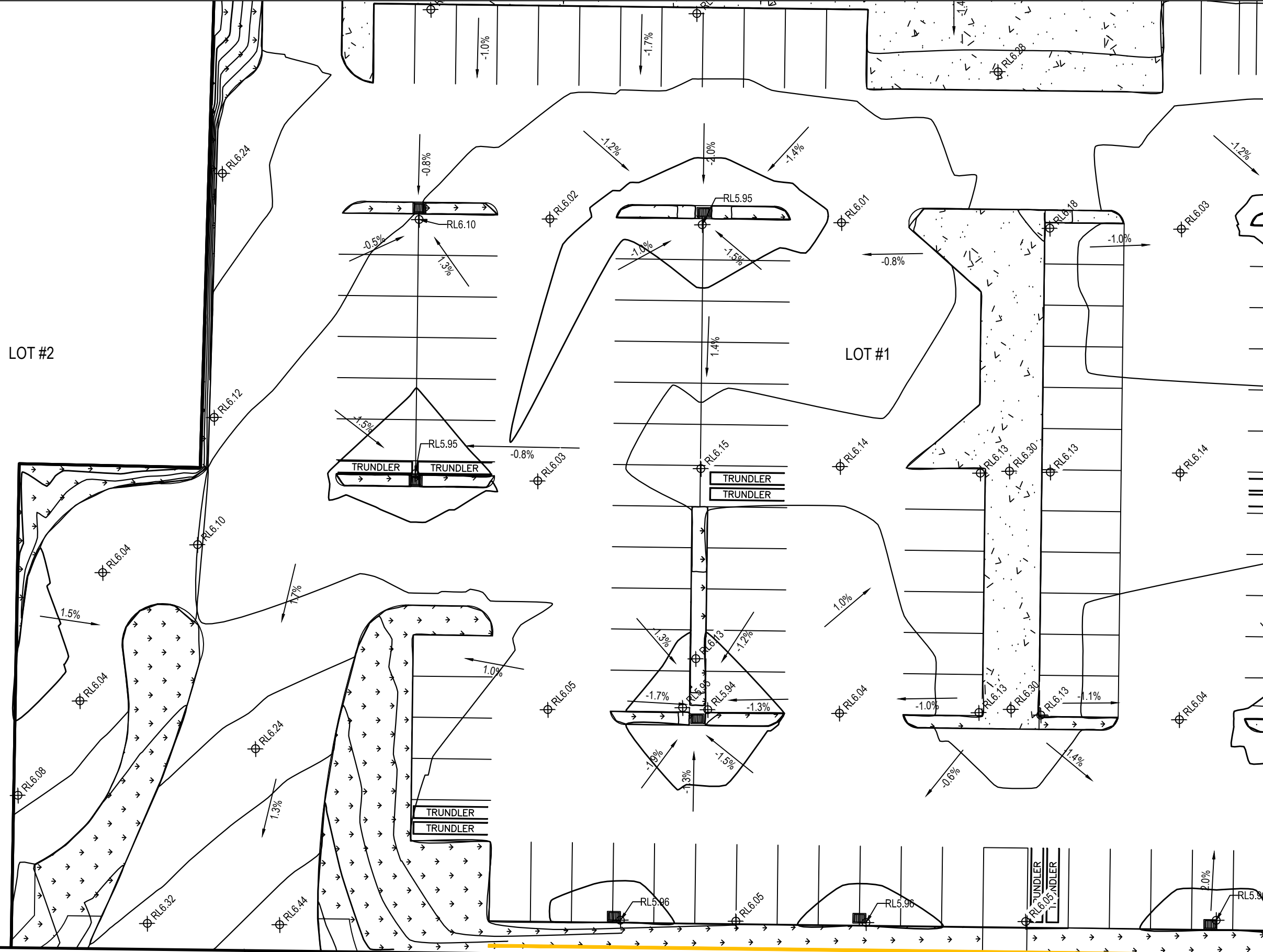
Project no.	109022
Scale	1:500 @ A3
Cad file	109022 C300 SITE PLAN.DWG
Drawing no.	C310
Rev	<b>A</b>



Notes  
 1. All works to be in accordance with KDC standards.

LOT #2

LOT #1



Legend

	EX BDY
	PROP BDY
	ABUTTING BDY'S
	PROP SWCP SINGLE
	PROP SWCP DOUBLE
	PROP RETAINING
	PROP LANDSCAPING
	PROP CONCRETE

Rev	A	RC	CA	06/2021
Rev		Description	By	Date
Survey				
Design	CA			05/2021
Drawn	CA			05/2021
Checked	BB			05/2021

**Maven Associates**  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160**  
**KAPITI ROAD**  
**FOR**  
**KAPITI RETAIL**  
**HOLDINGS LTD**

Title  
**PROPOSED**  
**CARPARK**  
**PLAN**

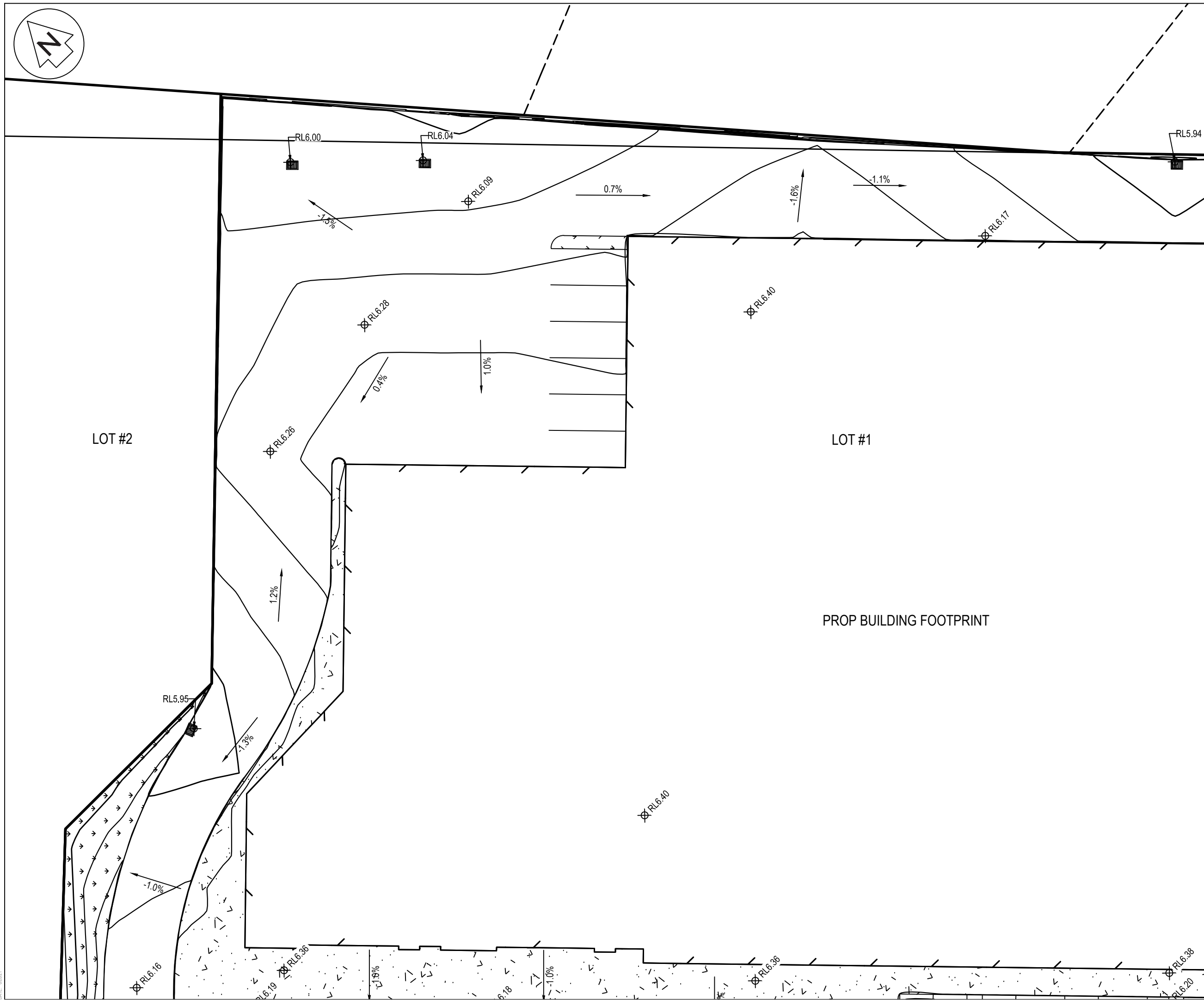
Project no.	109022
Scale	1:250 @ A3
Cad file	109022 C300 SITE PLAN.DWG
Drawing no.	C311
Rev	<b>A</b>

ENTRY / EXIT

HEAVY DUTY VEHICLE CROSSINGS REFER TO RD-006

MAX 1m RETAINING ALONG BOUNDARY

KAPITI ROAD



- Notes
- All works to be in accordance with KCDC standards.
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  - Heavy duty manhole lids and frames to be used in trafficked areas.
  - All Manholes are to be 1050mmØ unless shown otherwise.
  - All cesspit leads shall have min cover 0.9m.
  - All lines to be abandoned shall be sealed at each end. timing of all sealing to be coordinated with council staff.

Legend

	EX BDY
	PROP BDY
	ABUTTING BDY'S
	PROP SWCP SINGLE
	PROP SWCP DOUBLE
	PROP RETAINING
	PROP LANDSCAPING
	PROP CONCRETE

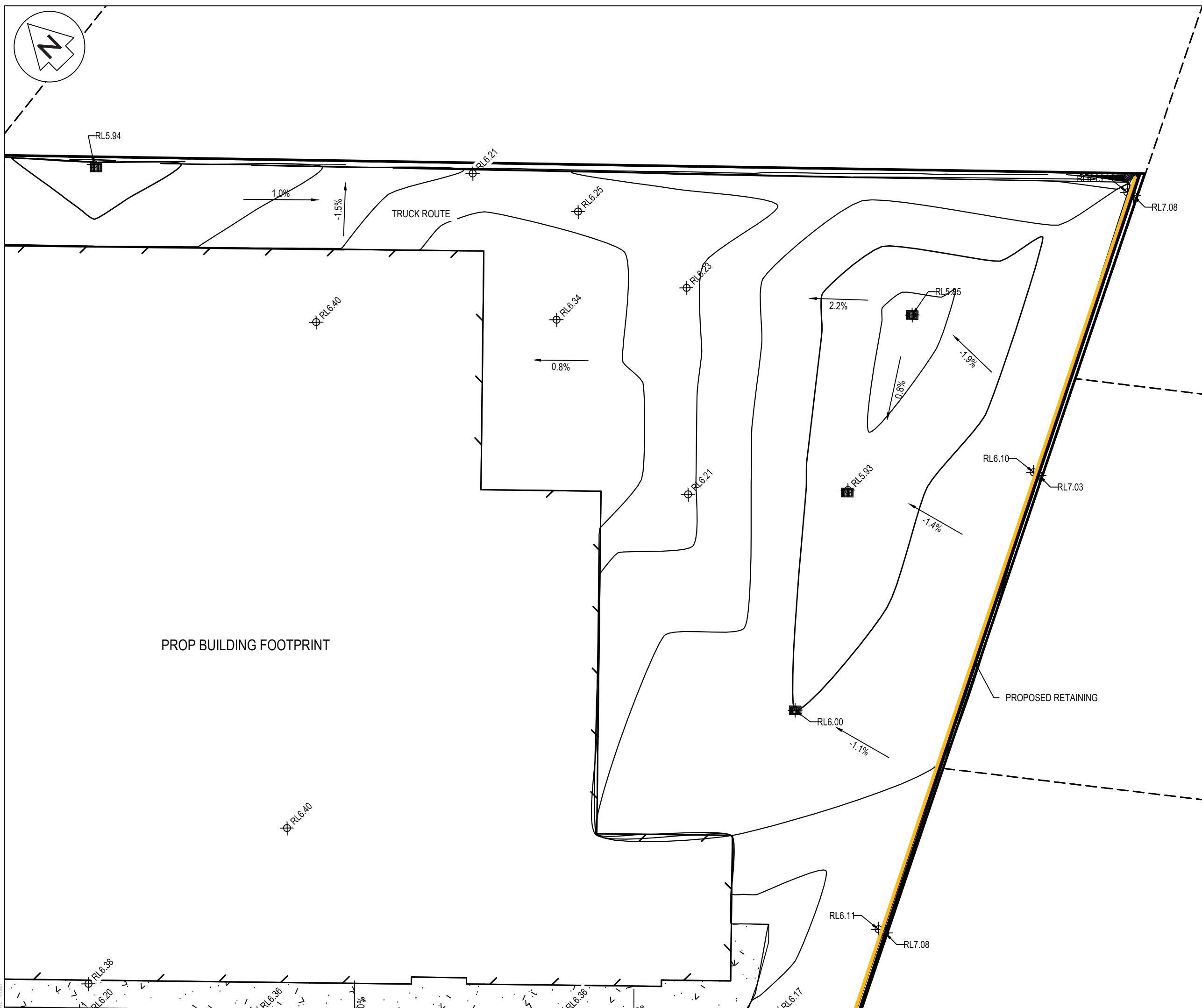
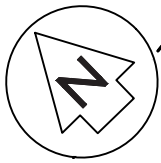
Rev	Description	By	Date
A	RC	CA	06/2021
Survey			
Design	CA		05/2021
Drawn	CA		05/2021
Checked	BB		05/2021

**M** **Maven Associates**  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160**  
**KAPITI ROAD**  
**FOR**  
**KAPITI RETAIL**  
**HOLDINGS LTD**

Title  
**PROPOSED**  
**CARPARK**  
**PLAN**

Project no.	109022
Scale	1:250 @ A3
Cad file	109022 C300 SITE PLAN.DWG
Drawing no.	C312
Rev	<b>A</b>



- Notes
- All works to be in accordance with KCDC standards.
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Legend

	EX BDY
	PROP BDY
	ABUTTING BDY'S
	PROP SWCP SINGLE
	PROP SWCP DOUBLE
	PROP RETAINING
	PROP LANDSCAPING
	PROP CONCRETE

Rev	Description	By	Date
A	RC	CA	06/2021
Survey			
Design	CA		05/2021
Drawn	CA		05/2021
Checked	BB		05/2021

**M** **Maven Associates**  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160**  
**KAPITI ROAD**  
**FOR**  
**KAPITI RETAIL**  
**HOLDINGS LTD**

Title  
**PROPOSED**  
**CARPARK**  
**PLAN**

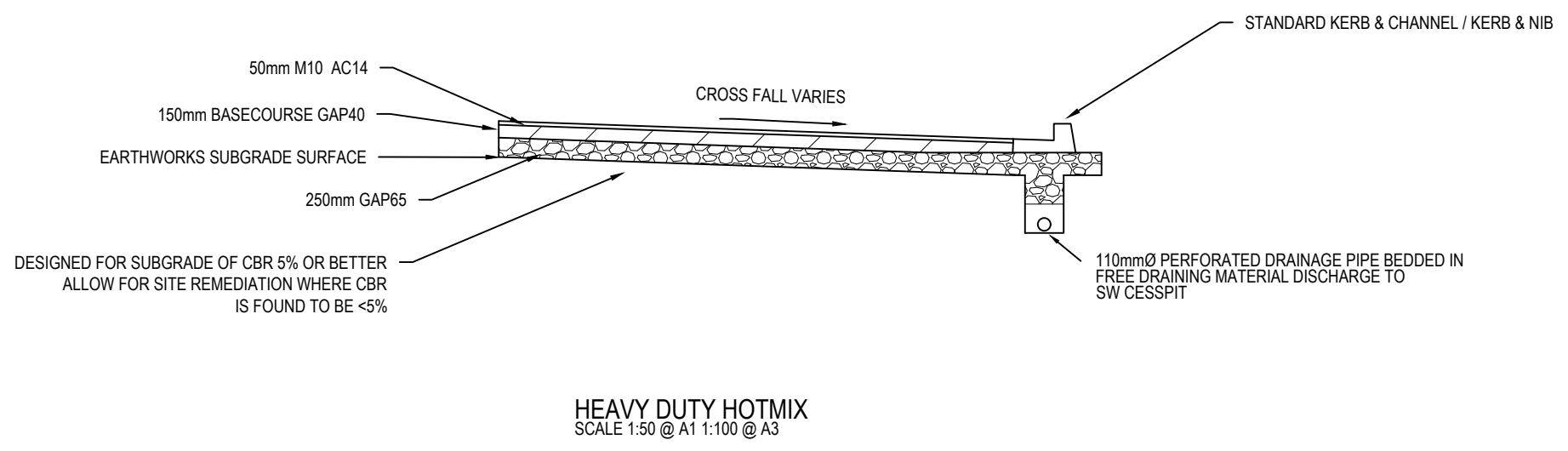
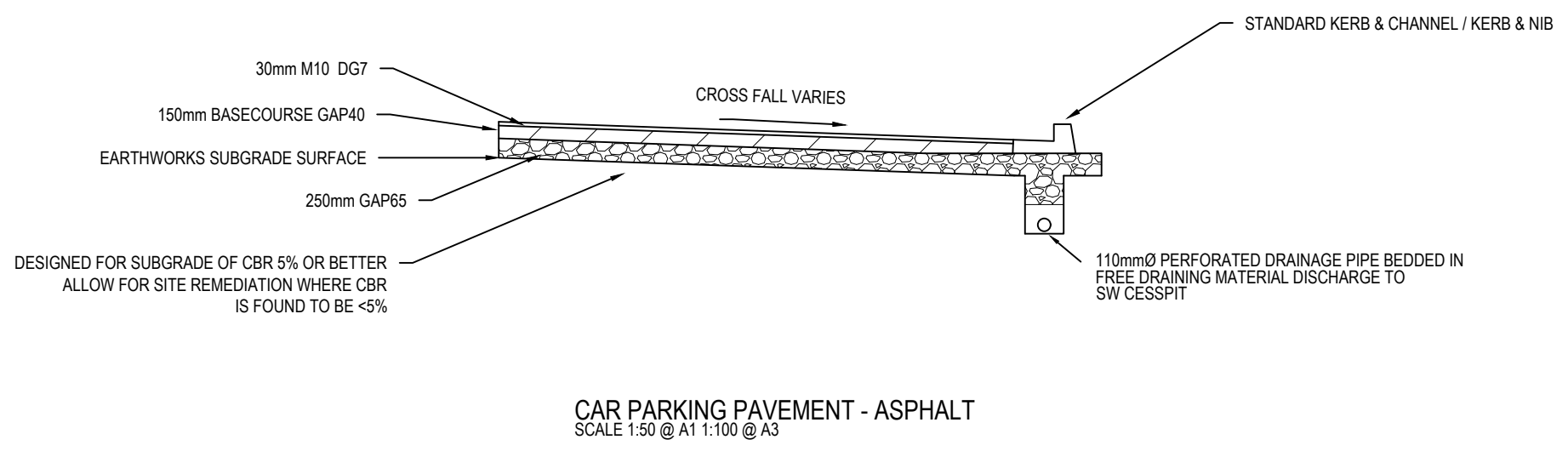
Project no.	109022
Scale	1:250 @ A3
Cad file	109022 C300 SITE PLAN.DWG
Drawing no.	C313
Rev	<b>A</b>

DATE: 02/21





Notes  
 1. All works to be in accordance with KCDC standards.



Rev	Description	By	Date
A	RC	CA	06/2021

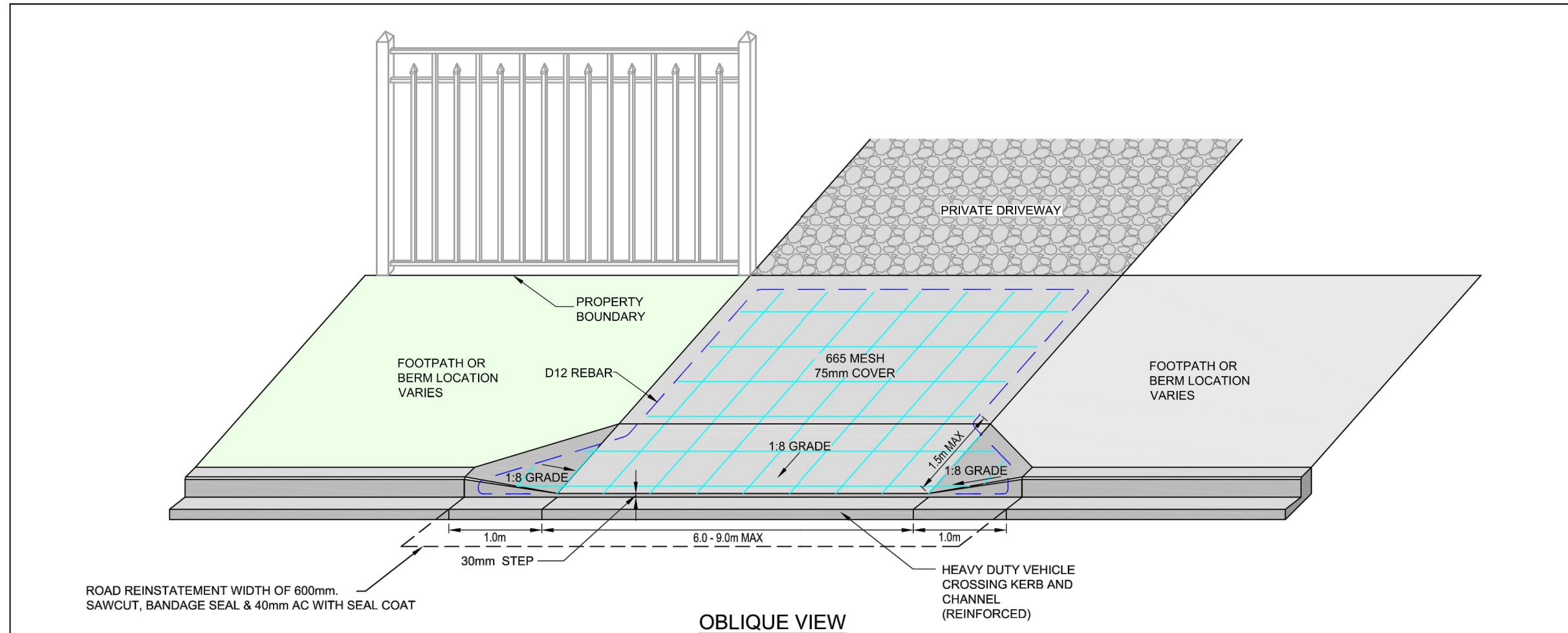
**M** **Maven Associates**  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160**  
**KAPITI ROAD**  
**FOR**  
**KAPITI RETAIL**  
**HOLDINGS LTD**

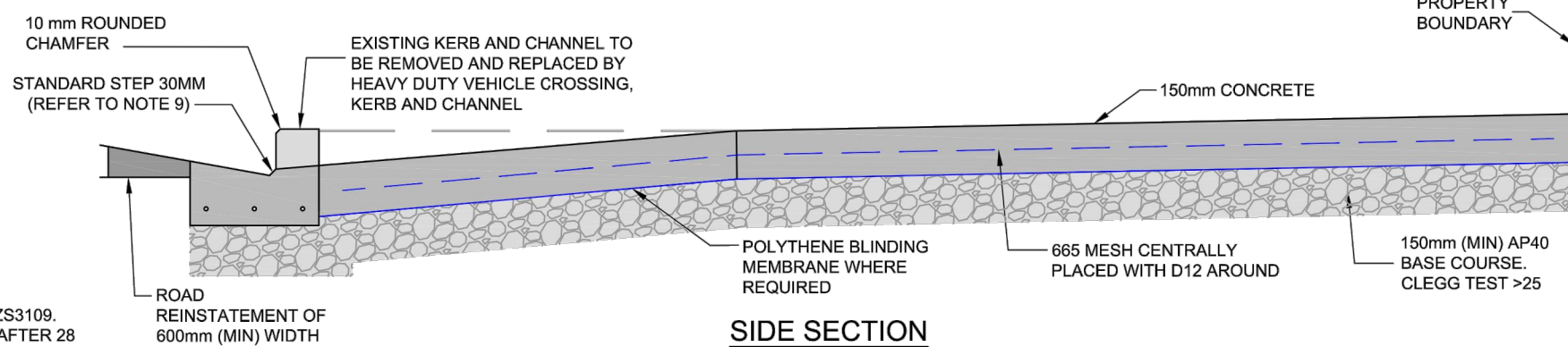
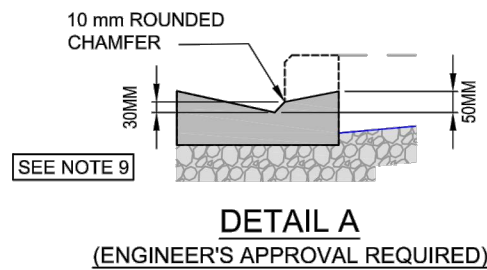
Title  
**PROPOSED**  
**CARPARK**  
**CROSS SECTIONS**

Project no.	109022
Scale	1:250 @ A3
Cad file	109022 C300 SITE PLAN.DWG
Drawing no.	C320
Rev	<b>A</b>

150mm  
100  
50  
10mm  
0



**OBLIQUE VIEW**



**SIDE SECTION**

**NOTE:**

1. SAW CUT FOOTPATH.
2. FOOTPATH LOCATION VARIES.
3. TAPER FROM KERB TO CROSSING, MAX LENGTH 1.5m.
4. ALL CONCRETE SHALL COMPLY IN ALL RESPECTS WITH NZS3109. THICKNESS OF 150mm (MIN) AND HAVE 20MPa STRENGTH AFTER 28 DAYS.
5. ALL CONCRETE SURFACES TO HAVE A BROOM FINISH.
6. CONCRETE TO HAVE A BLACK OXIDE ADDITIVE AT A RATE OF 2kg/m<sup>3</sup> OF CONCRETE UNLESS NOTED AND AGREED WITH A COUNCIL ENGINEER.
7. WIDTH OF DROP KERB, 3m (MIN) TO 6m (MAX) TO BE AGREED AND APPROVED BY COUNCIL ENGINEER.
9. 30MM IS THE STANDARD STEP HEIGHT, A MAXIMUM OF 50MM AT THE BACK OF KERB CAN BE USED WHERE THERE ARE DRAINAGE OR ROAD CLEARANCE ISSUES. PLEASE REFER TO DETAIL A



ROADING STANDARDS COMMERCIAL & INDUSTRIAL  
HEAVY DUTY VEHICLE CROSSING

**STANDARD DETAILS**

Drawn	Designed	
T,GE		
Approved	Revision Date	
G. O'Connor	JULY 2018	
Scale	Drawing No.	Revision
NOT TO SCALE	KCDC-RD-006	R4

Original Sheet Size A3 [297x420]

Rev	Description	By	Date
A	RC	CA	06/2021
Survey			
Design	CA		05/2021
Drawn	CA		05/2021
Checked	BB		05/2021

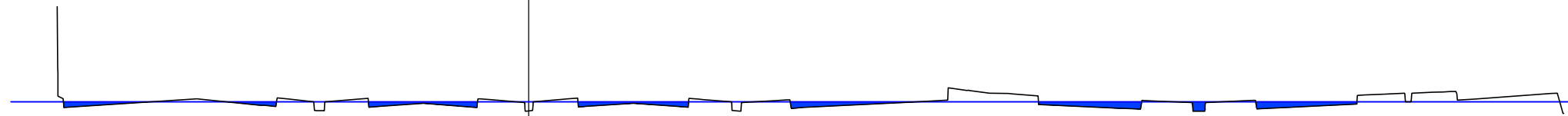


Project  
**160**  
**KAPITI ROAD FOR KAPITI RETAIL HOLDINGS LTD**

Title  
**VEHICLE CROSSING DETAILS**

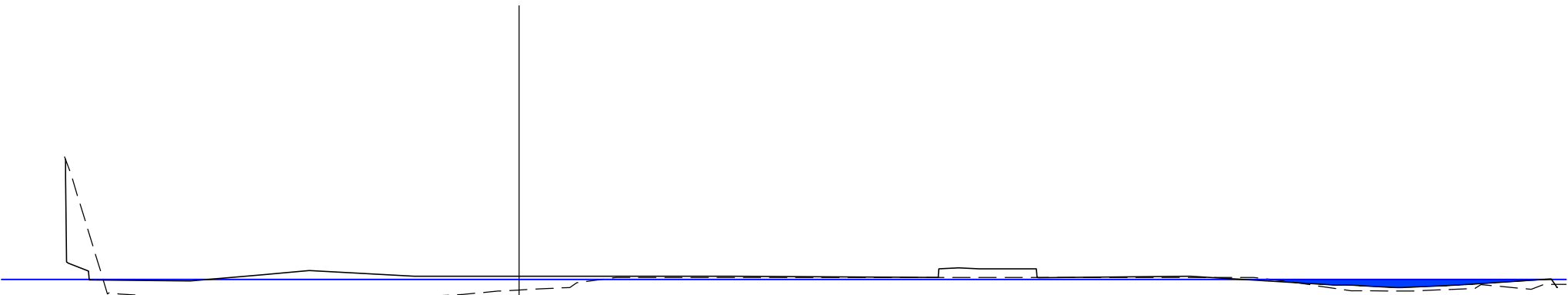
Project no.	109022
Scale	NTS
Cad file	109022 C300 SITE PLAN.DWG
Drawing no.	C390
Rev	<b>A</b>





	DATUMN 4.00																										
EXISTING LEVELS	7.83	6.01	5.90	5.90	5.91	5.85	5.85	5.91	5.96	6.05	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.09	5.99	5.93	5.94	5.94		
DESIGN LEVELS	6.14	6.07	6.13	6.08	6.14	6.14	6.06	6.01	5.94	6.02	6.06	6.14	6.11	6.02	6.07	6.12	6.25	6.04	6.00	6.11	6.11	6.00	6.05	6.25	6.13	6.20	
OFFSETS	-40.00	-35.00	-30.00	-25.00	-20.00	-15.00	-10.00	-5.00	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00

CH 73.76m



	DATUMN 4.00																										
EXISTING LEVELS		5.87	5.81	5.78	5.77	5.76	5.77	5.84	5.92	6.04	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.09	5.95	5.90	5.93	5.97	6.01	
DESIGN LEVELS		6.09	6.08	6.13	6.22	6.22	6.16	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.14	6.13	6.28	6.13	6.14	6.15	6.13	6.06	6.00	5.96	6.00	6.06	
OFFSETS	-40.00	-35.00	-30.00	-25.00	-20.00	-15.00	-10.00	-5.00	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00

CH 89.91m

Legend  
 - - - - EX LEVELS  
 ———— DESIGN LEVELS  
 ———— 100 YEAR FLOOD LEVEL  
 ■■■■■ FLOOD VOLUME

Rev	Description	By	Date
A	DRAFT	MA	05/2021
Survey	BY	DATE	
Design	BY	DATE	
Drawn	MA	05/2021	
Checked	BY	DATE	

**M** Maven Associates  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160 KAPITI ROAD  
 PARAPARAUMU  
 FOR  
 KAPITI RETAIL HOLDINGS  
 LIMITED**

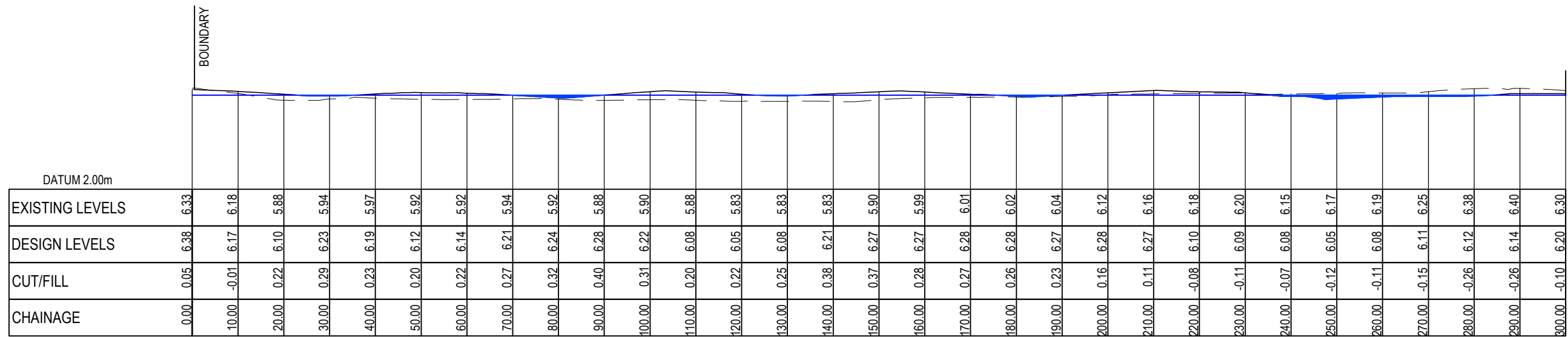
Title  
**STORMWATER  
 FLOODING  
 CROSS SECTIONS**

Project no.	109022
Scale	1:1000 H 1:200 V @ A3
Cad file	109022 C400 COPY.DWG
Drawing no.	C401
Rev	<b>A</b>

**NORTHWEST TO SOUTHEAST OF SITE CROSS SECTIONS**

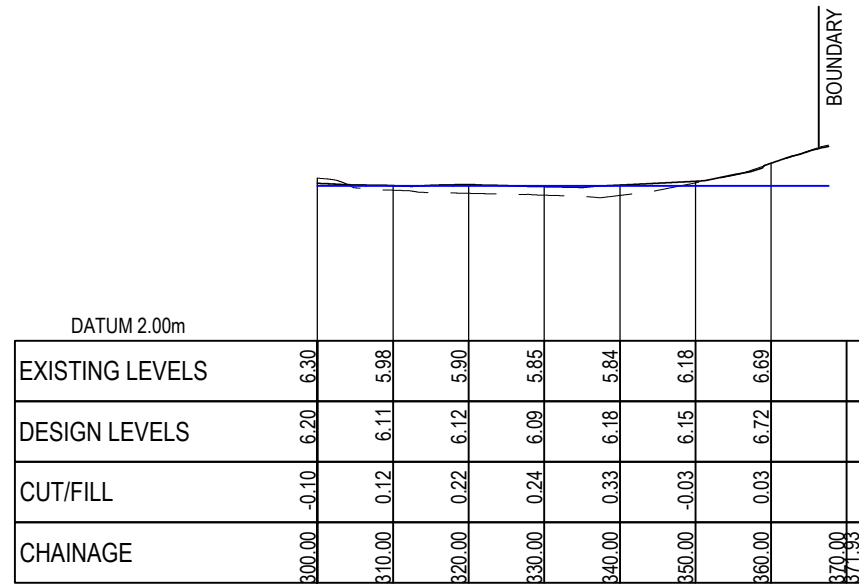
SCALE 1:1000 HORI 1:200 VERT @ A3





PROPOSED TRUCK ACCESS PATH (1 OF 2)  
SCALE: HORI 1:1250 VERT 1:250

Legend  
 - - - - - EX LEVELS  
 ——— DESIGN LEVELS  
 ——— 100 YEAR FLOOD LEVEL RL 6.10m



PROPOSED TRUCK ACCESS PATH (2 OF 2)  
SCALE: HORI 1:1250 VERT 1:250

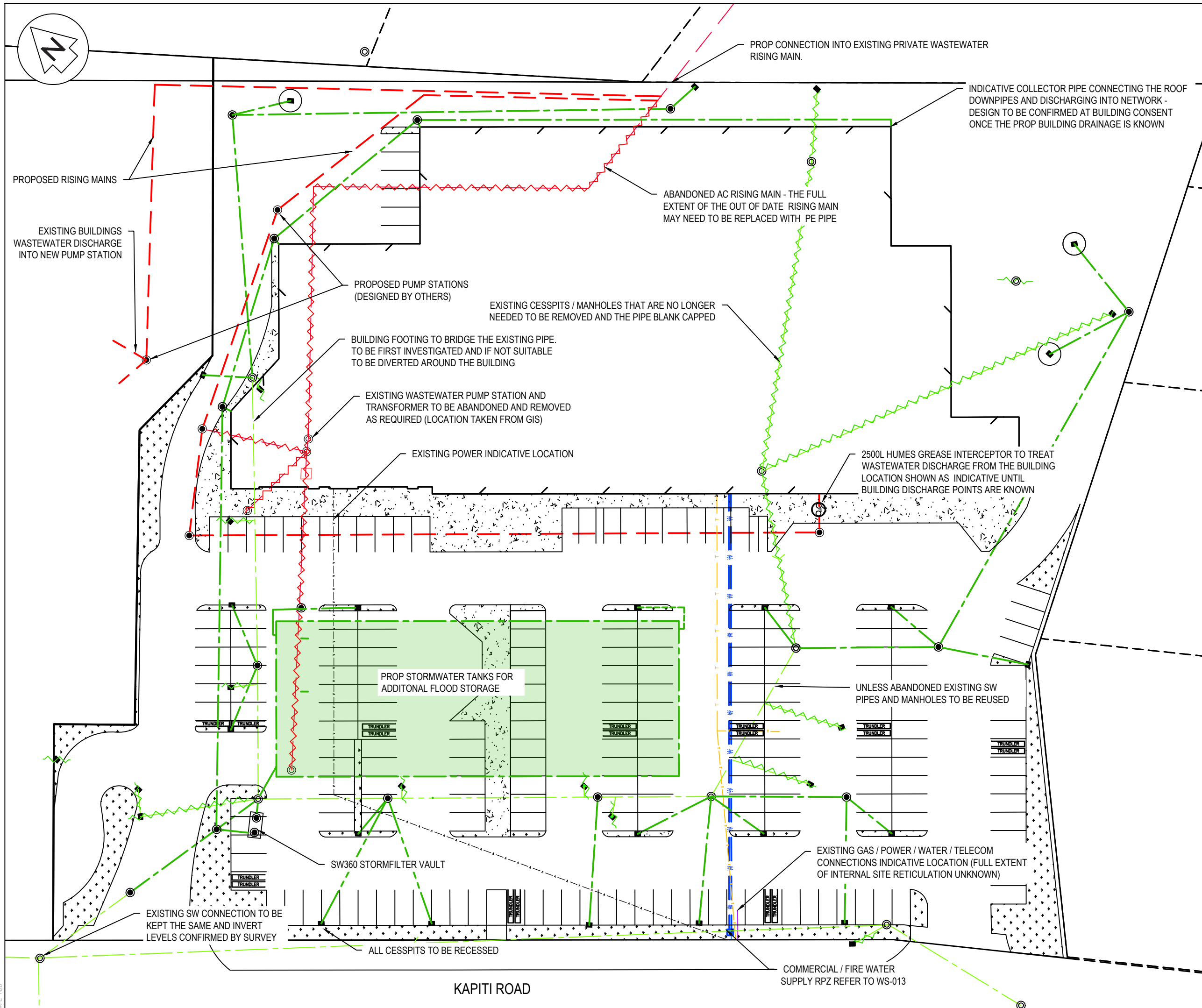
Rev	Description	By	Date
A	DRAFT	MA	05/2021
Survey	BY	DATE	
Design	BY	DATE	
Drawn	MA	05/2021	
Checked	BY	DATE	

**M** **Maven Associates**  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160 KAPITI ROAD  
 PARAPARAUMU  
 FOR  
 KAPITI RETAIL HOLDINGS  
 LIMITED**

Title  
**TRUCK  
 ACCESS  
 LONG SECTION**

Project no.	109022
Scale	1:1000 H 1:200 V @ A3
Cad file	109022 C400 COPY.DWG
Drawing no.	C403
Rev	<b>A</b>



- Notes
- All bends and connections to be no more than 45°
  - All connections to existing drains shall be carried out by a licensed Drainlayer/Plumber.
  - Drainage shall comply in full with E1/AS1 building code for storm water.
  - All cesspits shall have half syphons installed.
  - All sanitary waste drains shall be uPVC to AS/NZS 1260.
  - Sewer shall comply in full with AS/NZS 3500.2 - 2003 and/or G13 Building Code
  - All pipes shall be SN16 grade unless otherwise stated.
  - Drainlayer shall locate and confirm connection invert before starting building works.
  - Plans to be read in conjunction with Hydraulic Engineers and differences shall be clarified before contractor starts.
  - All chamber lids shall have a minimum 200mm maximum 300 throat to provide sufficient cover for landscape and pavement over the top.
  - Building discharge points are indicative to be confirmed at building consent once locations are confirmed by the architect

Legend

---	EX BDY
---	ABUTTING BDY'S
---	PROP BDY
---	PROP BLDG PLATFORM
---	EX STORMWATER
---	EX WASTEWATER
---	PR STORMWATER
---	PR WASTEWATER
---	EX WATERMAIN
---	PROP WATERMAIN
---	EX TELECOM
---	EX POWER
---	EX GAS
---	PROP TELECOM
---	PROP POWER
---	PROP GAS
---	EX/PROP SWMH
---	PROP SWCP SINGLE
---	ABANDONED WW
---	ABANDONED SW
---	FLOOD STORAGE TANKS

A	RC	CA	05/2021
Rev	Description	By	Date
Survey			
Design	CA		05/2021
Drawn	CA		2021
Checked	BB		05/2021

**M** **Maven Associates**  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
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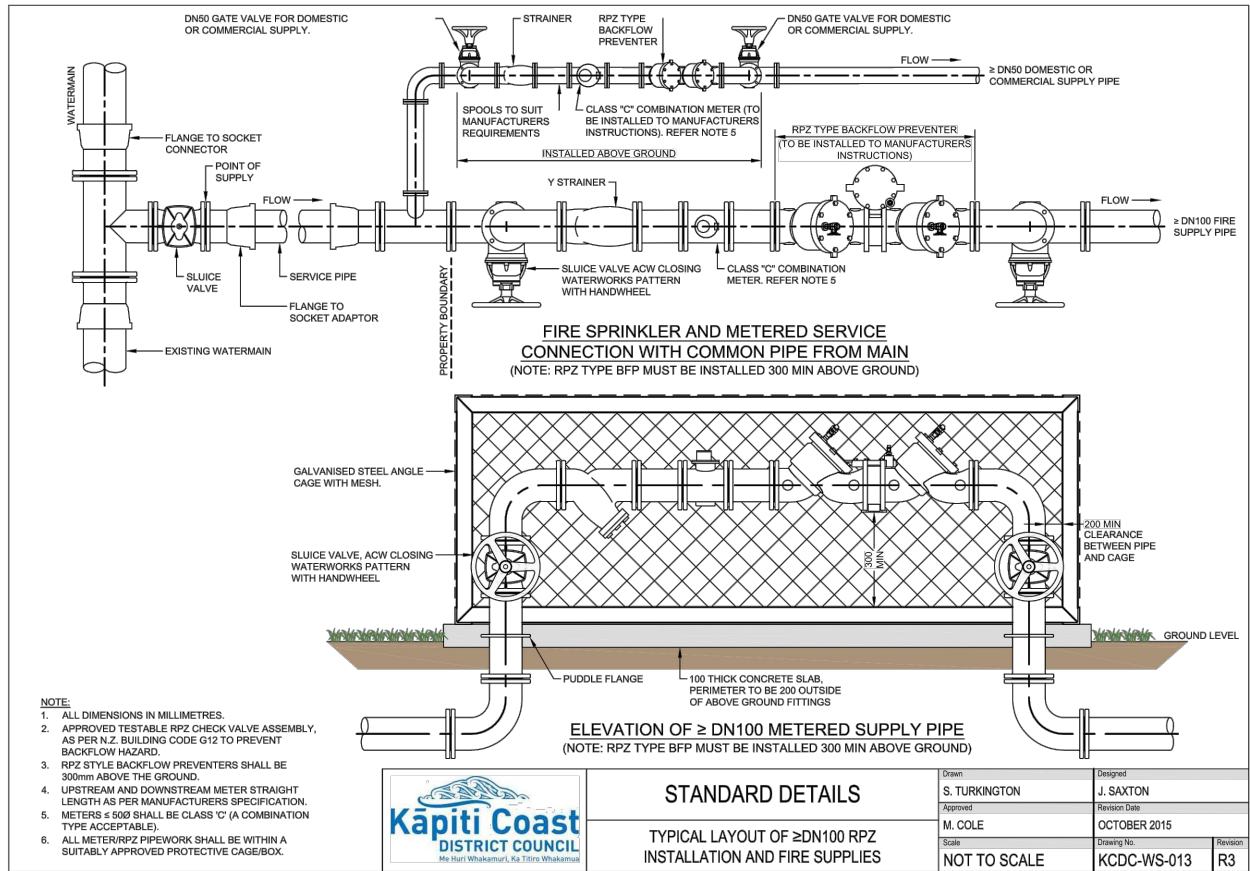
Project  
**160**  
**KAPITI ROAD**  
**FOR**  
**KAPITI RETAIL**  
**HOLDINGS LTD**

Title  
**PROPOSED PRIVATE**  
**SERVICES**  
**PLAN**

Project no.	109022
Scale	1:500 @ A3
Cad file	109022 C410.DWG
Drawing no.	C410
Rev	<b>A</b>

DATE: 7/2/21



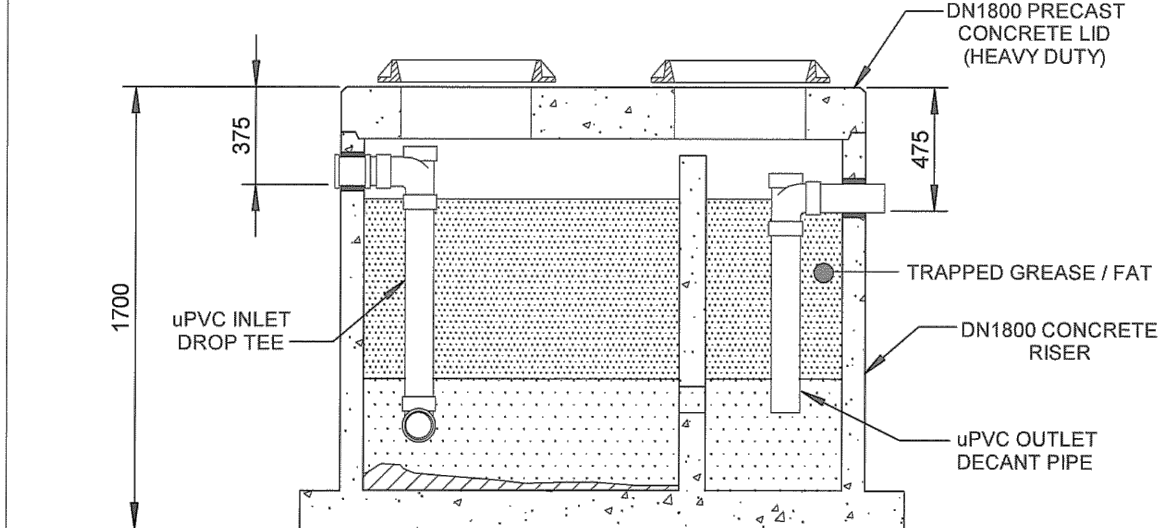
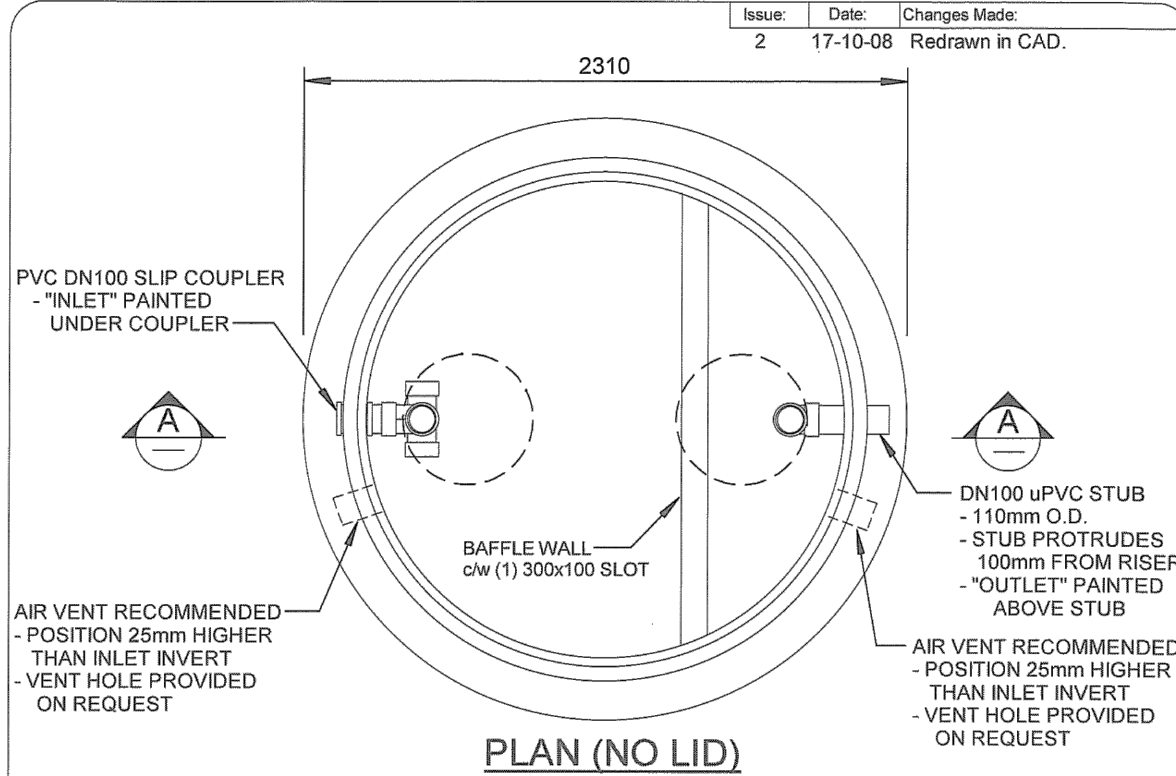


- NOTE:**
1. ALL DIMENSIONS IN MILLIMETRES.
  2. APPROVED TESTABLE RPZ CHECK VALVE ASSEMBLY, AS PER N.Z. BUILDING CODE G12 TO PREVENT BACKFLOW HAZARD.
  3. RPZ STYLE BACKFLOW PREVENTERS SHALL BE 300mm ABOVE THE GROUND.
  4. UPSTREAM AND DOWNSTREAM METER STRAIGHT LENGTH AS PER MANUFACTURERS SPECIFICATION.
  5. METERS ≤ 500 SHALL BE CLASS 'C' (A COMBINATION TYPE ACCEPTABLE).
  6. ALL METER/RPZ PIPEWORK SHALL BE WITHIN A SUITABLY APPROVED PROTECTIVE CAGE/BOX.



<b>STANDARD DETAILS</b>		Drawn S. TURKINGTON	Designed J. SAXTON
TYPICAL LAYOUT OF ≥DN100 RPZ INSTALLATION AND FIRE SUPPLIES		Approved M. COLE	Revision Date OCTOBER 2015
		Scale NOT TO SCALE	Drawing No. KCDC-WS-013
			Revision R3

Original Sheet Size A3 (297x420)



- NOTES:**
1. SWIFTLIFT LIFTING ANCHORS PROVIDED ON ALL COMPONENTS
  2. TOTAL MASS: 5.68 TONNES  
BODY: 4.10 TONNES  
CONC LID: 1.41 TONNES (INCL. CAST IRON COVERS & FRAMES)
  3. LID DESIGN - HEAVY DUTY, 0.85HN VEHICLE LOADS
  4. CAPACITY - 2,706 LITRES, DEFINED AS TANK VOLUME BELOW INVERT LEVEL OF OUTLET PIPE
  5. GREASE STORAGE VOLUME - 2,187 LITRES, S.G. = 0.9



**GREASE INTERCEPTOR  
MODEL GT2500  
(HEAVY DUTY)  
GENERAL ASSEMBLY DETAILS**

Drawn By:	C THORPE	Date:	02-10-07
Checked By:		Scale:	1 : 25
Reference:			
Drawing No.:	HUMES 3031	Issue:	2

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Rev	Description	By	Date
A	RC	CA	05/2021
Survey			
Design	CA		05/2021
Drawn	CA		05/2021
Checked	BB		05/2021



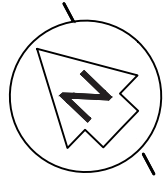
**Maven Associates**  
09 571 0050  
info@maven.co.nz  
www.maven.co.nz  
5 Owens Road, Epsom  
Auckland 1023

Project  
**160**  
**KAPITI ROAD  
FOR  
KAPITI RETAIL  
HOLDINGS LTD**

Title  
**PROPOSED  
SERVICES STANDARD  
DETAILS**

Project no.	109022
Scale	NTS
Cad file	109022 C410.DWG
Drawing no.	C490
Rev	<b>A</b>





- Notes
1. All bends and connections to be no more than 45°
  2. All connections to existing drains shall be carried out by a licensed Drainlayer/Plumber.
  3. Drainage shall comply in full with E1/AS1 building code for storm water.
  4. All cesspits shall have half syphons installed.
  5. All sanitary waste drains shall be uPVC to AS/NZS 1260.
  6. Sewer shall comply in full with AS/NZS 3500.2 - 2003 and/or G13 Building Code
  7. All pipes shall be SN16 grade unless otherwise stated.
  8. Drainlayer shall locate and confirm connection invert before starting building works.
  9. Plans to be read in conjunction with Hydraulic Engineers and differences shall clarified be before contractor starts.
  10. All chamber lids shall have a minimum 200mm maximum 300 throat to provide sufficient cover for landscape and pavement over the top.

Legend

	EX BDY
	ABUTTING BDY'S
	PROP BDY
	PROP BLDG PLATFORM
	EX STORMWATER
	EX WASTEWATER
	PR STORMWATER
	PR WASTEWATER
	EX WATERMAIN
	PROP WATERMAIN
	EX TELECOM
	EX POWER
	EX GAS
	PROP TELECOM
	PROP POWER
	PROP GAS
	EX/PROP SWMH
	PROP SWCP SINGLE

Rev	Description	By	Date
A	RC	CA	05/2021
Survey			
Design	CA		05/2021
Drawn	CA		2021
Checked	BB		05/2021

**Maven Associates**  
 09 571 0050  
 info@maven.co.nz  
 www.maven.co.nz  
 5 Owens Road, Epsom  
 Auckland 1023

Project  
**160 KAPITI ROAD FOR KAPITI RETAIL HOLDINGS LTD**

Title  
**PROPOSED PRIVATE SERVICES PLAN**

Project no.	109022
Scale	1:500 @ A3
Cad file	109022 C420 EXISTING SERVICES PLAN.DWG
Drawing no.	C431
Rev	<b>A</b>

PROP WW RISING MAIN TO TIE INTO EXISTING RISING MAIN / DISCHARGE POINT

PROP WW RISING MAIN FROM NEW PUMP STATION

LOT 2

LOT 1

PROP WW CONNECTIONS

PROP WW PUMP STATION

EXISTING WASTEWATER CONNECTION INTO THE PUMP STATION TO BE ABANDONED

**DRAFT FOR REVIEW**

DATE: 05/2021





## **APPENDIX C – STORMWATER TREATMENT AND STORAGE**

## Project Details

Project Name	160 kapiti road	Project Number	109022
Project Address	160 kapiti road	Local Council	Other
Location	kapiti coast	Author	Cameron Allan

## Catchment Details

Reference	Catchment Type	Runoff Coefficients (C)	Area, m <sup>2</sup> (A)	Product, m <sup>2</sup> (CxA)
	Hardstand/Road	0.85	10369	8813.65
<b>Totals</b>	-	<b>0.85</b>	<b>10369</b>	<b>8813.65</b>

Rainfall Intensity (iwq): **10 mm/hr**

\*Note: The chosen rainfall intensity value is to treat 90% of annual rainfall (10mm/hr for Auckland region as per Auckland Council, 5mm/hr for Christchurch region as per Christchurch City Council, and 10mm/hr for other councils). If unsure, please contact Stormwater360

## Output

Required treatable flow rate (Qwq)	24.48 L/s	Calculated using Rational method $Qwq = C \times iwq \times A$ (L/s)
Cartridge size/height	69cm	Recommended hydraulic effect is 770mm, for lower hydraulic effect option please contact Stormwater360
Media	Perlite	Other media options are available, please contact Stormwater360
Design treatment flow rate per cartridge (Qcart)	1.42 L/s	
No. of cart required (nCart)	18	Calculated - $Qwq/Qcart$ (Rounded up to whole number)
Design StormFilter treatment flow (QSF)	25.56 L/s	Calculated - $Qcart \times nCart$
Is QSF > Qwq?	Yes	
StormFilter model required	Contact Stormwater360	Please refer to drawing for footprint and size

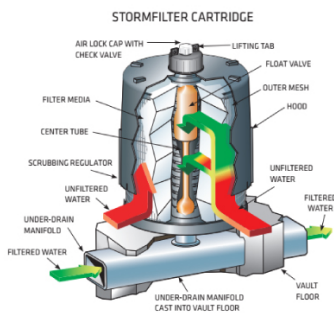


Figure 1: StormFilter Cartridge

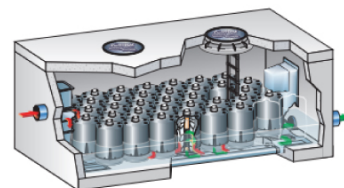
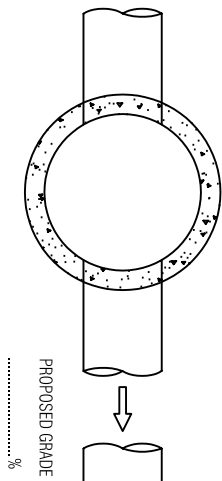
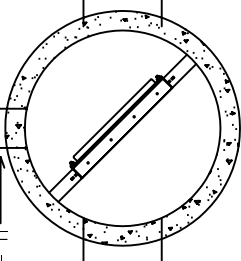


Figure 2: StormFilter Vault

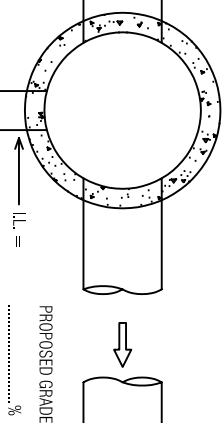
STRUCTURE I.D.  
G.S.L. =  
I.L. =  
CH. =



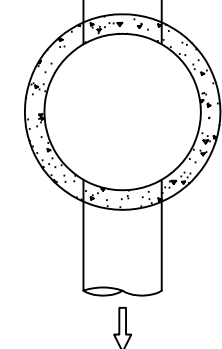
UPSTREAM DIVERSION PIT  
STORMGATE HIGH FLOW  
BYPASS (IF REQUIRED)  
STRUCTURE I.D.  
G.S.L. =  
I.L. =  
CH. =



JUNCTION STRUCTURE  
STRUCTURE I.D.  
G.S.L. =  
I.L. =  
CH. =

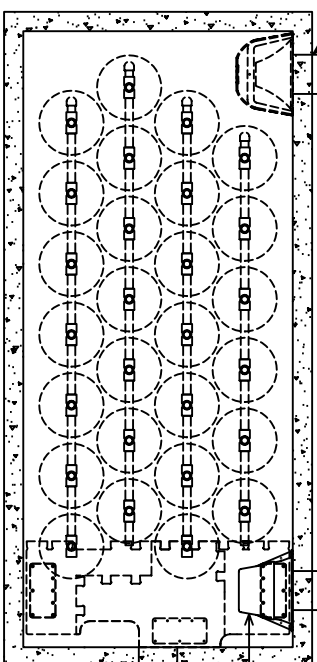


STRUCTURE I.D.  
G.S.L. =  
I.L. =  
CH. =



**GENERAL NOTES**

1. INLET AND OUTLET PIPING SHALL BE SPECIFIED BY SITE CIVIL ENGINEER (SEE PLANS) AND PROVIDED BY CONTRACTOR. STORMFILTER IS PROVIDED WITH OPENINGS AT INLET AND OUTLET LOCATIONS.
2. IF THE PEAK FLOW RATE, AS DETERMINED BY THE SITE CIVIL ENGINEER, EXCEEDS THE PEAK HYDRAULIC CAPACITY OF THE PRODUCT, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED. PLEASE CONTACT STORMWATER360 FOR OPTIONS.
3. THE FILTER CARTRIDGE(S) ARE SIPHON-ACTUATED AND SELF-CLEANING. THE STANDARD DETAIL DRAWING SHOWS THE MAXIMUM NUMBER OF CARTRIDGES. THE ACTUAL NUMBER SHALL BE SPECIFIED BY THE SITE CIVIL ENGINEER ON SITE PLANS OR IN DATA TABLE BELOW. PRECAST STRUCTURE TO BE CONSTRUCTED IN ACCORDANCE WITH AS3600.
4. FOR SHALLOW, LOW DROP OR SPECIAL DESIGN CONSTRAINTS, CONTACT STORMWATER360 FOR DESIGN OPTIONS.
5. ALL WATER QUALITY PRODUCTS REQUIRE PERIODIC MAINTENANCE AS OUTLINED IN THE O&M GUIDELINES. PROVIDE MINIMUM CLEARANCE FOR MAINTENANCE ACCESS.
6. STRUCTURE AND ACCESS COVERS DESIGNED TO MEET AUSTRALAS T44 LOAD RATING WITH 0.2m FILL MAXIMUM.
7. THE STRUCTURE THICKNESSES SHOWN ARE FOR REPRESENTATIONAL PURPOSES AND VARY REGIONALLY.
8. ANY BACKFILL DEPTH, SUB-BASE, AND OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY SITE CIVIL ENGINEER.
9. STORMFILTER BY STORMWATER360:  
SYDNEY (AU) PHONE: (02) 9525 5833.  
BRISBANE (AU) PHONE: (07) 3272 1872.



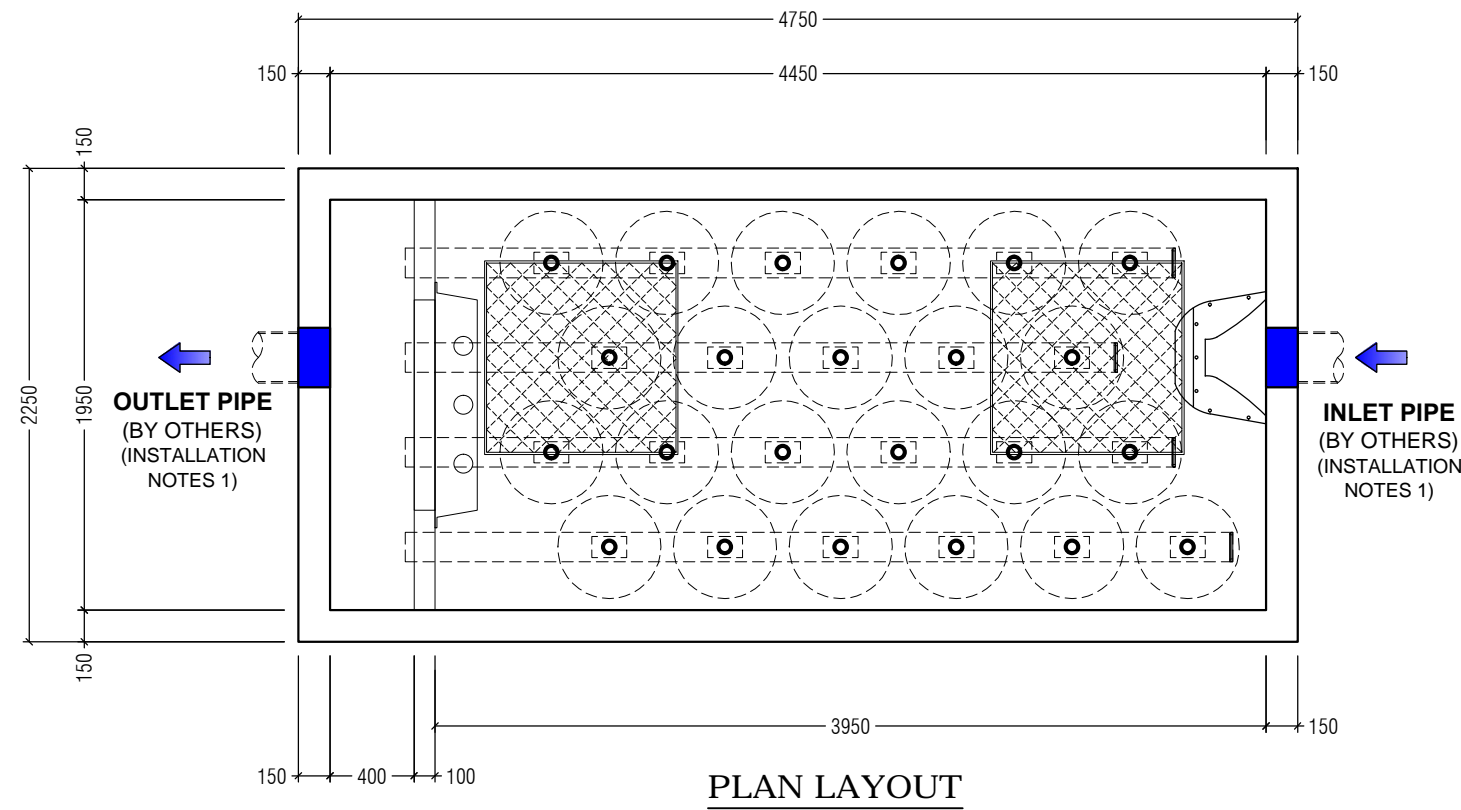
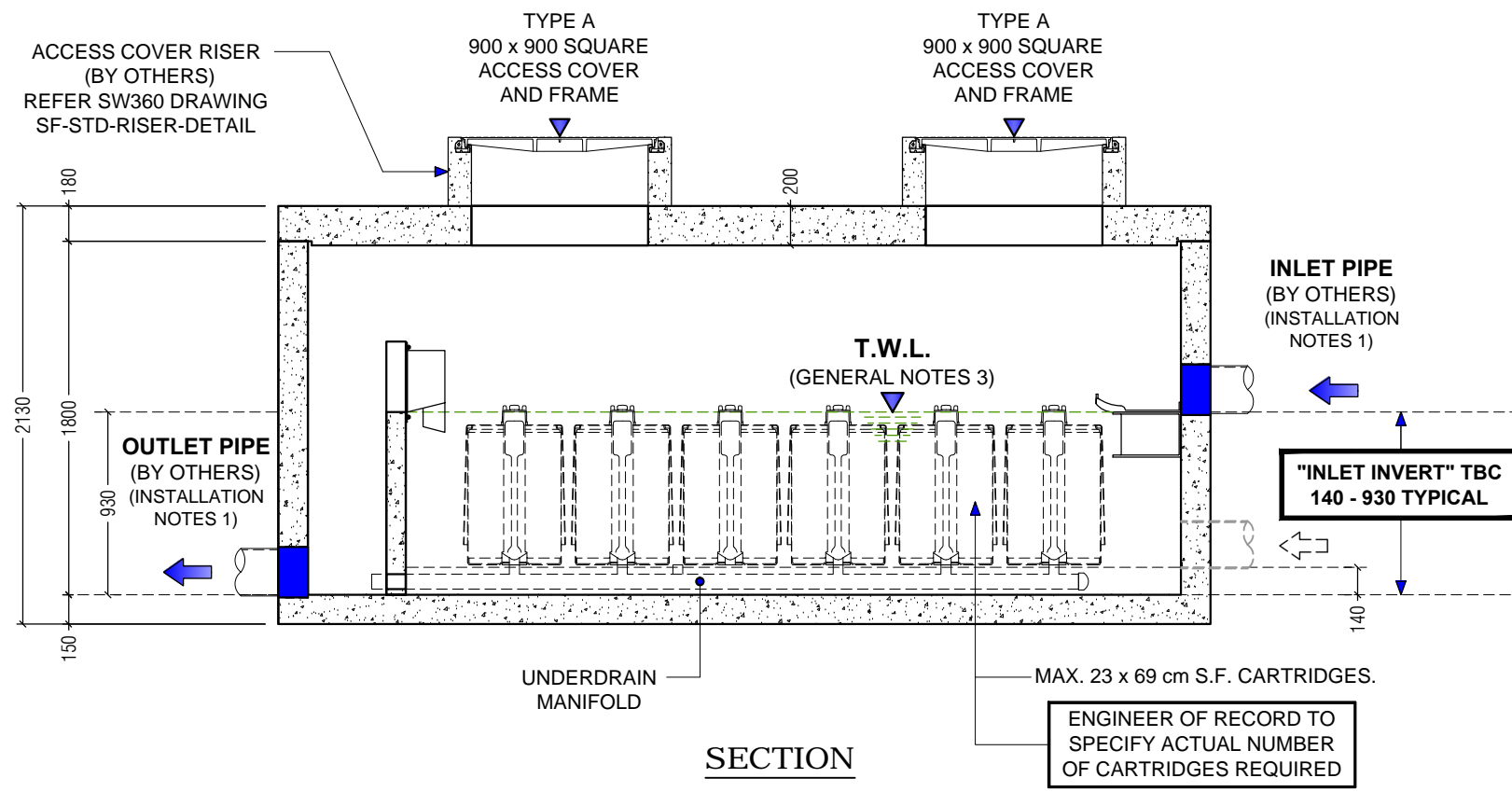
STRUCTURE I.D.  
STORMFILTER CHAMBER  
BY STORMWATER 360  
REFER TO PRODUCT DRAWING  
FOR SYSTEM DETAILS

**PLAN OF TYPICAL OFFLINE LAYOUT**



DATE: 09.03.08		SCALE: N.T.S.	FILE NAME: SFV_OFFLINE_TYP	DRN: R.P.	CHK: M.W.
<b>STORMWATER360</b> <b>TYPICAL OFFLINE LAYOUT</b> <b>STORMGATE HIGH FLOW BYPASS (OPTIONAL)</b> <b>WITH PRECAST VAULT STORMFILTER</b>					
DRAWING					1
A					





### STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD VAULT STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (23). VOLUME SYSTEM IS ALSO AVAILABLE WITH MAXIMUM 23 CARTRIDGE. STORMFILTER PEAK TREATMENT CAPACITY IS 32.66 L/s. IF THE SITE CONDITIONS EXCEED THIS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT (cm)	69	46	30 (LOW DROP)	
RECOMMENDED HYDRAULIC DROP (mm)	930	700	540	
SPECIFIC FLOW RATE (L/s/m <sup>2</sup> )	1.40	0.70	1.40	0.70
CARTRIDGE FLOW RATE (L/s)	1.42	0.71	0.95	0.475
			0.63	0.315

### SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
CATCHMENT AREA	
WATER QUALITY FLOW RATE (L/s)	
PEAK FLOW RATE (L/s)	
RETURN PERIOD OF PEAK FLOW (yrs)	
# OF CARTRIDGES REQUIRED	
CARTRIDGE FLOW RATE	
MEDIA TYPE (ZEO, PER, ZPG, PHS)	
ACCESS COVER TYPE (GRATED, SOLID, OTHER)	

PIPE DATA:	R.L.	MATERIAL	DIAMETER
INLET PIPE #1			
INLET PIPE #2			
OUTLET PIPE			
LID LEVEL		N/A	N/A

AS PER ENGINEER OF RECORD

### GENERAL NOTES :

1. STORMWATER360 TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR SW360 STORMWATER CONSULTANT VIA [www.stormwater360.co.nz](http://www.stormwater360.co.nz), OR 0800 STORMWATER, OR [sales@stormwater360.co.nz](mailto:sales@stormwater360.co.nz).
3. T.W.L. = TREATMENT WATER LEVEL
4. STRUCTURE SHALL MEET NZTA'S HN-HO-72 OR PER APPROVING JURISDICTION TRAFFICKED LOAD REQUIREMENTS, WHICHEVER IS MORE STRINGENT. COVER AND FRAME ARE TO BE RATED TO EITHER CLASS B (FOR PEDESTRIAN AREAS) OR CLASS D (TRAFFICKED ROADS) IN ACCORDANCE WITH AS 3996 : 2006.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO NZS 3109 : 1997 AND NZS 3114 : 1987.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 178 mm. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 39 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (L/s) DIVIDED BY THE FILTER CONTACT SURFACE AREA (m<sup>2</sup>).
8. MINIMUM INVERT DIFFERENCE BETWEEN INLET PIPE AND OUTLET PIPE IS 140 mm.
9. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

### INSTALLATION NOTES :

- A. SIZE AND CLASS OF PIPE OR SQUARE KNOCKOUT SIZE TO BE SPECIFIED ON DRAWING BY CLIENT / CONTRACTOR.
- B. ADDITIONAL RISERS TO BE FORMED ON SITE BY CONTRACTOR (IF REQUIRED).
- C. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- D. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE (LIFTING CLUTCHES PROVIDED).
- E. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- F. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPES.
- G. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

- MAXIMUM CHAMBER WEIGHT = 16400 Kg (APPROX)  
 - LID WEIGHT = 5400 Kg (APPROX)  
 - CONCRETE WEIGHT TOTAL = 21800 Kg (APPROX)

	0800 STORMWATER <a href="mailto:sales@stormwater360.co.nz">sales@stormwater360.co.nz</a> <a href="http://www.stormwater360.co.nz">www.stormwater360.co.nz</a>	<b>CONDITION OF USE</b> © STORMWATER360 2016 Any unauthorised reproduction of this drawing in part or in full is prohibited	<b>STORMFILTER</b> <b>SFV452018 VAULT</b> <b>STANDARD DETAIL</b> <b>GENERAL ARRANGEMENT</b>	DRAWING <b>1</b> <b>A</b>	JOB NO : PROJECT : DEVICE # :		DRN : R.P. 18.10.16 CKD : T.B. 18.10.16
			SCALE : N.T.S.	DRG No : SFV452018-GA			
	Stormwater360 BETWEEN SKY AND SEA						

# STORMFILTER™

High efficiency /  
low maintenance  
stormwater filter.

**SIPHON-ACTUATED FILTRATION** The Stormwater Management StormFilter® cleans stormwater through a patented passive filtration system, effectively removing pollutants to meet the most stringent regulatory requirements. Highly reliable, easy to install and maintain, and proven performance over time, StormFilter products are recognised as a versatile BMP for removing a variety of pollutants, such as sediments, oil and grease, metals, organics, and nutrients. These systems come in variable configurations to match local conditions and come with prolonged maintenance periods to ensure long-term performance and reduce operating costs.

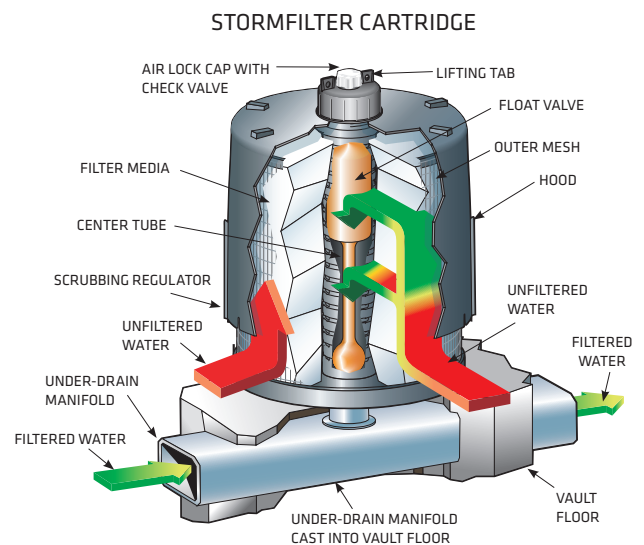
## HOW DOES IT WORK?

During a storm, runoff passes through the filtration media and starts filling the cartridge center tube. Air below the hood is purged through a one-way check valve as the water rises. When water reaches the top of the float, buoyant forces pull the float free and allow filtered water to drain.

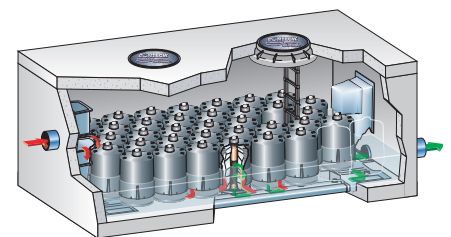
After the storm, the water level in the structure starts falling. A hanging water column remains under the cartridge hood until the water level reaches the scrubbing regulators. Air then rushes through the regulators releasing water and creating air bubbles that agitate the surface of the filter media, causing accumulated sediment to drop to the vault floor. This patented surface-cleaning mechanism helps restore the filter's permeability between storm events.

## PROVEN PERFORMANCE

- **New Zealand's only independently verified filter** by Washington Department of Ecology, New Jersey Department of Environmental Protection and USEPA's Environmental Technology Verification program).
- **Approved Auckland Council** >75% TSS removal and approved on high trafficked roads (>20,000 V.P.D)
- **Over 550 x StormFilter's installed** throughout New Zealand-treating over 3.7 million m<sup>2</sup> of catchment area
- **8th generation of the product.** Design refined and perfected over two decades of research and experience



## STORMFILTER VAULT



## STORMFILTER BENEFITS

### UNDERGROUND SYSTEMS MAXIMISE PROFITABILITY

- Save land space allowing denser developments reducing sprawl
- Add parking spaces and increase building size, increasing profitability
- Compact design reduces construction and installation costs by limiting excavation

### RELIABLE LONGEVITY & LOWER MAINTENANCE COSTS

- Self cleaning hood prevents surface blinding, ensures use of all media and prolongs cartridge life
- 1-3 year maintenance cycles
- 8 years maintenance experience – 1-5 year contracts with cost guarantees
- Minimal or no standing water. Lower disposal costs

## CONTACT DETAILS

### Stormwater360

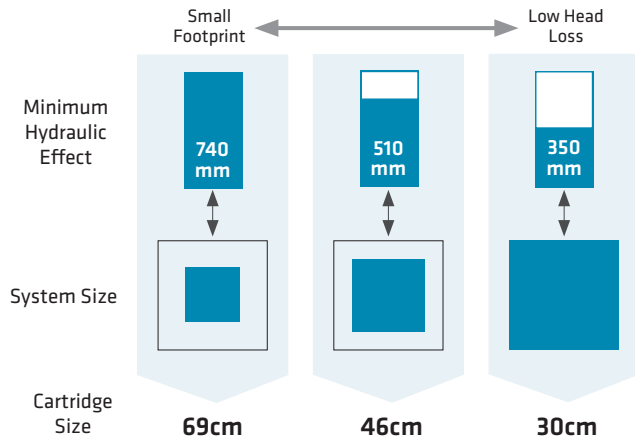
FREEPHONE:  
0800 STORMWATER  
(0800 786769)

[www.stormwater360.co.nz](http://www.stormwater360.co.nz)

Stormwater360®  
BETWEEN SKY AND SEA

### SUPERIOR HYDRAULICS

Multiple cartridge heights gives design solutions for site restraints.



### Other hydraulic benefits

- Low hydraulic effect as low as 350 mm head loss
- Zero surcharge of inlet pipe unlike upward flowing filters
- Can be operated with tail water e.g tidal conditions
- Online and offline configurations can limit hydraulic effects

### MEDIA CHOICES

Our filtration products can be customised using different filter media to target site-specific pollutants. A combination of media is often recommended to maximise pollutant removal effectiveness.



**Perlite** is naturally occurring puffed volcanic ash. Effective for removing TSS, oil and grease.



**ZPG™** is a multi-purpose media option approved for highly trafficked sites or sites with high metal loadings. ZPG is a mixture of Zeolite, Perlite and GAC (granular activated carbon). ZPG is ideal for removing soluble metals, TSS, oils and grease, organics and ammonium.



**Zeolite** is a naturally occurring mineral used to remove soluble metals, ammonium and some organics.



**GAC (Granular Activated Carbon)** has a micro-porous structure with an extensive surface area to provide high levels of adsorption. It is primarily used to remove oil and grease and organics such as PAHs and phthalates.

## CONFIGURATION

Stormfilter's can be configured in any drainage structure. Please contact SW360 for a customised design.



### PRECAST VAULT

- Treats medium sized sites
- Simple installation – arrives on-site fully assembled

### DRYWELL/SOAKAGE

- Provides treatment and infiltration in one structure
- Available for new construction and retrofit applications
- Easy installation
- Shallow and Rock soakage models available



### HIGH FLOW

- Treats flows from large sites
- Consists of large, precast components designed for easy assembly on-site
- Several configurations available, including: Panel Vault, Box Culvert, or Cast-In-Place

### DETENTION

- Meets volume-based stormwater treatment regulations
- Captures and treats site specific Water Quality and Quantity Volume
- StormFilter cartridges provide treatment and control the discharge rate
- Can be designed to capture all, or a portion, of the WQV
- Detention vault configured to provide pre-treatment



### CATCHPIT/ CURB-INLET

- Provides a low cost, low drop, point-of-entry configuration
- Treats sheet flow from small sites
- Accommodates curb inlet openings from 1 to 3 metres long

### PRECAST MANHOLE

- Provides a low drop, point-of-entry configuration
- Uses drop from the curb inlet to the conveyance pipe to drive the passive filtration cartridges
- No crane required (Hi-AB lifting for most sizes)
- 1050-2400mm diameter sizes available



# StormFilter Inspection and Maintenance Procedures



## Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter out and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the StormFilter to its full efficiency and effectiveness.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is a good practice to inspect the system after major storm events.

## Maintenance Procedures

Although there are likely many effective maintenance options, we believe the following procedure is efficient and can be implemented using common equipment and existing maintenance protocols. A two step procedure is recommended as follows:

### 1. Inspection

Inspection of the vault interior to determine the need for maintenance.

### 2. Maintenance

Cartridge replacement

Sediment removal

## Inspection and Maintenance Timing

At least one scheduled inspection should take place per year with maintenance following as warranted.

First, an inspection should be done before the winter season. During the inspection the need for maintenance should be determined and, if disposal during maintenance will be required, samples of the accumulated sediments and media should be obtained.

Second, if warranted, a maintenance (replacement of the filter cartridges and removal of accumulated sediments) should be performed during periods of dry weather.



In addition to these two activities, it is important to check the condition of the StormFilter unit after major storms for potential damage caused by high flows and for high sediment accumulation that may be caused by localised erosion in the drainage area. It may be necessary to adjust the inspection/maintenance schedule depending on the actual operating conditions encountered by the system. In general, inspection activities can be conducted at any time, and maintenance should occur, if warranted, in late summer to early fall when flows into the system are not likely to be present.

## Maintenance Frequency

The primary factor controlling timing of maintenance of the StormFilter is sediment loading.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media inside the cartridges. The flow through the system will naturally decrease as more and more particulates are trapped. Eventually the flow through the cartridges will be low enough to require replacement. It may be possible to extend the usable span of the cartridges by removing sediment from upstream trapping devices on a routine as-needed basis in order to prevent material from being re-suspended and discharged to the StormFilter treatment system.

Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction may need to be inspected and maintained more often than those with fully stabilised surface conditions.

The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after major storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual StormFilter system or site. It is recommended that the site owner develop a database to properly manage StormFilter inspection and maintenance programs.

Prior to the development of the maintenance database, the following maintenance frequencies should be followed:

### Inspection

One time per year

After major storms

### Maintenance

As needed, based on results of inspection (The average maintenance lifecycle is approximately 1-3 years)

Per Regulatory requirement

In the event of a chemical spill

Frequencies should be updated as required. The recommended initial frequency for inspection is one time per year. StormFilter units should be inspected after major storms.

Sediment removal and cartridge replacement on an as needed basis is recommended unless site conditions warrant.

Once an understanding of site characteristics has been

established, maintenance may not be needed for one to three years, but inspection is warranted and recommended annually.

## Inspection Procedures

The primary goal of an inspection is to assess the condition of the cartridges relative to the level of visual sediment loading as it relates to decreased treatment capacity. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, then typically large amounts of sediments will be present and very little flow will be discharged from the drainage pipes. If this is the case, then maintenance is warranted and the cartridges need to be replaced.

**Warning:** In the case of a spill, the worker should abort inspection activities until the proper guidance is obtained. Notify the local hazard control agency and Stormwater360 immediately.

To conduct an inspection:

**Important:** Inspection should be performed by a person who is familiar with the operation and configuration of the StormFilter treatment unit.

1. If applicable, set up safety equipment to protect and notify surrounding vehicle and pedestrian traffic.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the access portals to the vault and allow the system vent.
4. Without entering the vault, visually inspect the inside of the unit, and note accumulations of liquids and solids.



5. Be sure to record the level of sediment build-up on the floor of the vault, in the forebay, and on top of the cartridges. If flow is occurring, note the flow of water per drainage pipe. Record all observations. Digital pictures are valuable for historical documentation.
6. Close and fasten the access portals.
7. Remove safety equipment.
8. If appropriate, make notes about the local drainage area relative to ongoing construction, erosion problems, or high

loading of other materials to the system.

9. Discuss conditions that suggest maintenance and make decision as to whether or not maintenance is needed.

### Maintenance Decision Tree

The need for maintenance is typically based on results of the inspection. The following Maintenance Decision Tree should be used as a general guide. (Other factors, such as Regulatory Requirements, may need to be considered)

1. Sediment loading on the vault floor.
  - a. If >100mm of accumulated sediment, maintenance is required.



2. Sediment loading on top of the cartridge.
  - a. If >5mm of accumulation, maintenance is required.
3. Submerged cartridges.
  - a. If >100mm of static water in the cartridge bay for more than 24 hours after a rain event, maintenance is required.
4. Plugged media.
  - a. If pore space between media granules is absent, maintenance is required.
5. Bypass condition.
  - a. If inspection is conducted during an average rain fall event and StormFilter remains in bypass condition (water over the internal outlet baffle wall or submerged cartridges), maintenance is required.
6. Hazardous material release.
  - a. If hazardous material release (automotive fluids or other) is reported, maintenance is required.
7. Pronounced scum line.
  - a. If pronounced scum line (say  $\geq 5$ mm thick) is present above top cap, maintenance is required.
8. Calendar Lifecycle.
  - a. If system has not been maintained for 3 years maintenance is required.

### Assumptions

- No rainfall for 24 hours or more
- No upstream detention (at least not draining into StormFilter)
- Structure is online

- Outlet pipe is clear of obstruction
- Construction bypass is plugged

## Maintenance

Depending on the configuration of the particular system, maintenance personnel will be required to enter the vault to perform the maintenance.

Important: If vault entry is required, OH&S rules for confined space entry must be followed.

Filter cartridge replacement should occur during dry weather. It may be necessary to plug the filter inlet pipe if base flow is occurring.

Replacement cartridges can be delivered to the site or customers facility. Information concerning how to obtain the replacement cartridges is available from Stormwater360.

Warning: In the case of a spill, the maintenance personnel should abort maintenance activities until the proper guidance is obtained. Notify the local hazard control agency and Stormwater360 immediately.

To conduct cartridge replacement and sediment removal maintenance:

1. If applicable, set up safety equipment to protect maintenance personnel and pedestrians from site hazards.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the doors (access portals) to the vault and allow the system to vent.
4. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
5. Make notes about the external and internal condition of the vault. Give particular attention to recording the level of sediment build-up on the floor of the vault, in the forebay, and on top of the internal components.
6. Using appropriate equipment offload the replacement cartridges and set aside.
7. Remove used cartridges from the vault using one of the following methods:

### Method 1:

- A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Unscrew (counterclockwise rotations) each filter cartridge from the underdrain connector. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

Using appropriate hoisting equipment, attach a cable from the boom, crane, or tripod to the loose cartridge. Contact Stormwater360 for suggested attachment devices.



Important: Take care not to damage the manifold connectors. This connector should remain installed in the manifold and could be capped during the maintenance activity to prevent sediments from entering the underdrain manifold.

- B. Remove the used cartridges from the vault.

Important: Care must be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner unless Stormwater360 performs the maintenance activities and damage is not related to discharges to the system.

- C. Set the used cartridge aside or load onto the hauling truck.
- D. Continue steps a through c until all cartridges have been removed.

### Method 2:

- A. Enter the vault using appropriate confined space protocols.
- B. Unscrew the cartridge cap.
- C. Remove the cartridge hood and float.
- D. At location under structure access, tip the cartridge on its side.

Important: Note that cartridges require unscrewing from their threaded connectors. Take care not to damage the manifold connectors. This connector should remain installed in the manifold and capped if necessary.

- D. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.
- E. Set the empty, used cartridge aside or load onto the hauling truck.
- F. Continue steps a through e until all cartridges have been removed.



- 8. Remove accumulated sediment from the floor of the vault and from the forebay. This can most effectively be accomplished by use of a vacuum truck.
- 9. Once the sediments are removed, assess the condition of the vault and the condition of the connectors. The connectors are short sections of 50mm schedule 40 PVC, or threaded schedule 80 PVC that should protrude about 25mm above the floor of the vault. Lightly wash down the vault interior.
  - a. If desired, apply a light coating of FDA approved silicon lube to the outside of the exposed portion of the connectors. This ensures a watertight connection between the cartridge and the drainage pipe.
  - b. Replace any damaged connectors.
- 10. Using the vacuum truck boom, crane, or tripod, lower and install the new cartridges. Once again, take care not to damage connections.

- 11. Close and fasten the door.
- 12. Remove safety equipment.
- 13. Finally, dispose of the accumulated materials in accordance with applicable regulations. Make arrangements to return the used empty cartridges to Stormwater360.





## Related Maintenance Activities -

Performed on an as-needed basis

StormFilter units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.



## Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads.

Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

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or email us for more information on our Maintenance Compliance Certification Program.

## Support

- Drawings and specifications are available upon request
- Site-specific design support is available from our engineers.

OFFICES : [AUSTRALIA] (NSW) tel. +61 2 9525 5833 (QLD) +61 7 3272 1872 [NEW ZEALAND] (AKL) +64 9 476 5586

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[www.stormwater360.com.au](http://www.stormwater360.com.au)

## Inspection Report

Date: \_\_\_\_\_ Personnel: \_\_\_\_\_

Location: \_\_\_\_\_ System Size: \_\_\_\_\_

System Type: Vault  Cast-In-Place  Linear Catch Basin  Manhole  Other

Sediment Thickness in Forebay: \_\_\_\_\_ Date: \_\_\_\_\_

Sediment Depth on Vault Floor: \_\_\_\_\_

Structural Damage: \_\_\_\_\_

Estimated Flow from Drainage Pipes (if available): \_\_\_\_\_

Cartridges Submerged: Yes  No  Depth of Standing Water: \_\_\_\_\_

StormFilter Maintenance Activities (check off if done and give description)

Trash and Debris Removal: \_\_\_\_\_

Minor Structural Repairs: \_\_\_\_\_

Drainage Area Report \_\_\_\_\_

Excessive Oil Loading: Yes  No  Source: \_\_\_\_\_

Sediment Accumulation on Pavement: Yes  No  Source: \_\_\_\_\_

Erosion of Landscaped Areas: Yes  No  Source: \_\_\_\_\_

Items Needing Further Work: \_\_\_\_\_

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

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Review the condition reports from the previous inspection visits.

# StormFilter Maintenance Report

Date: \_\_\_\_\_ Personnel: \_\_\_\_\_

Location: \_\_\_\_\_ System Size: \_\_\_\_\_

System Type: Vault  Cast-In-Place  Linear Catch Basin  Manhole  Other

List Safety Procedures and Equipment Used: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

### System Observations

Months in Service: \_\_\_\_\_

Oil in Forebay: Yes  No

Sediment Depth in Forebay: \_\_\_\_\_

Sediment Depth on Vault Floor: \_\_\_\_\_

Structural Damage: \_\_\_\_\_

### Drainage Area Report

Excessive Oil Loading: Yes  No  Source: \_\_\_\_\_

Sediment Accumulation on Pavement: Yes  No  Source: \_\_\_\_\_

Erosion of Landscaped Areas: Yes  No  Source: \_\_\_\_\_

### StormFilter Cartridge Replacement Maintenance Activities

Remove Trash and Debris: Yes  No  Details: \_\_\_\_\_

Replace Cartridges: Yes  No  Details: \_\_\_\_\_

Sediment Removed: Yes  No  Details: \_\_\_\_\_

Quantity of Sediment Removed (estimate?): \_\_\_\_\_

Minor Structural Repairs: Yes  No  Details: \_\_\_\_\_

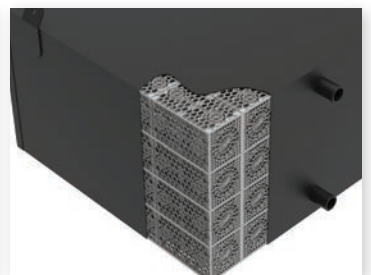
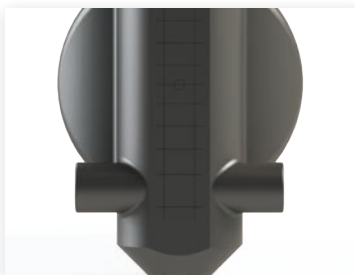
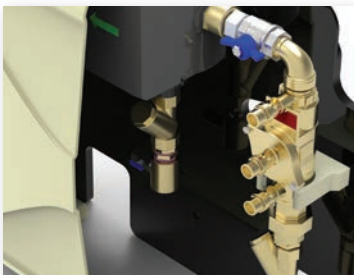
Residuals (debris, sediment) Disposal Methods: \_\_\_\_\_

Notes:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



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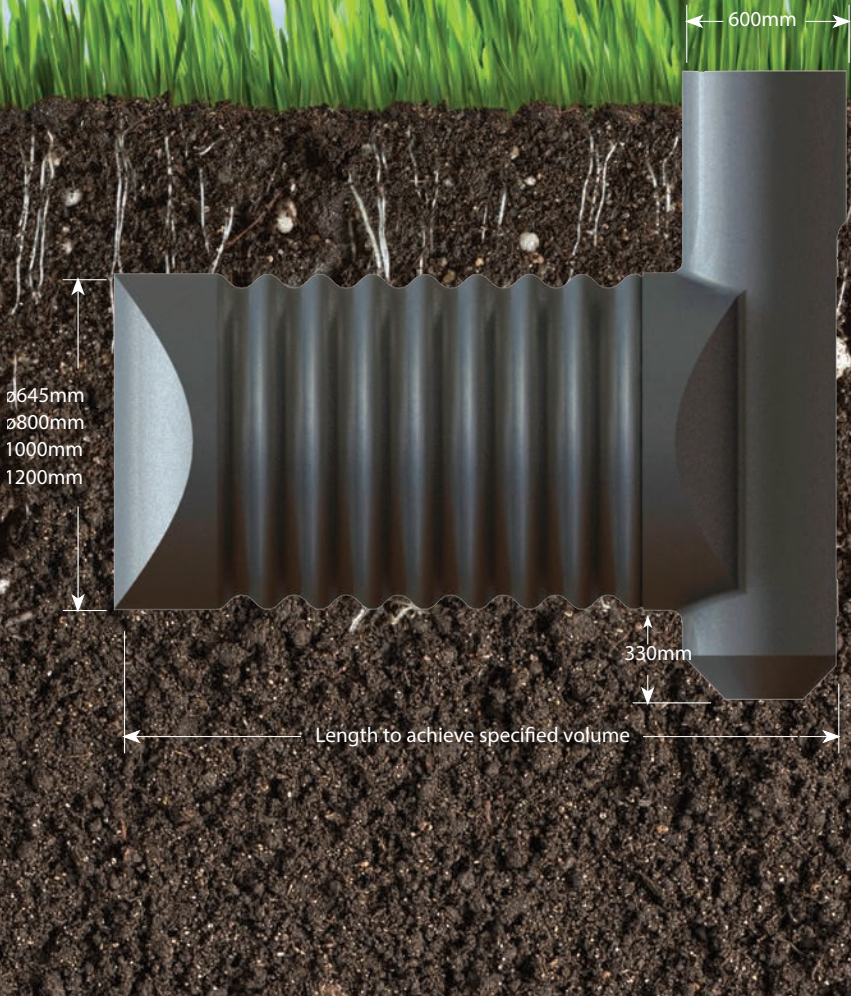
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Our 1200 diameter tanks are made from a potable grade polyethylene, which means they can be used for drinking water.



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All APD StormLite tanks come with a full fittings kit-set consisting of three wallace seals, end cap and leaf trap mesh. The engineered riser shape with flat back panel ensures simple installation of the wallace seals and our lightweight robust design means that APD tanks are easily and safely lifted into place with a digger on site.

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APD provides tanks in 1200mm, 1000mm, 800mm and 645mm to suit your site depth requirements.

**DON'T PAY FOR EXTRA VOLUME YOU DON'T NEED**

All APD StormLite tanks are assembled to the exact volume required and delivered within 2-5 days to site by hiab truck.

**TANK ACCESSORIES**



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Adjustment ring for driveway or concrete install



Standard 100mm fittings kit (150mm available on request)

## THE ECONOMICAL CHOICE, MADE LIGHT AND STRONG

At around 250 kilograms, a 5000 litre StormLite® water tank is a mere fraction of the weight of concrete tanks. This means it can be moved around site with only a small digger. Designed strong, StormLite can go under driveways, carparks, and grass. Tell us your volume requirement, and our make-to-order service will ensure your StormLite tank adheres to council regulations, while making your drainlayer's job a breeze. Make the affordable choice, with made to order economy. Call APD now on (09) 263 7741.



## TANKS THAT LAST

StormLite tanks are made from tough polyethylene corrugated pipe which won't corrode and can be recycled.

APD also provides StormLite tanks with a 10 year guarantee\* and 50 year design life.

\*10 year guarantee subject to APD Terms and Conditions of Trade.

## OUT OF SIGHT

Save precious outdoor space on your section and eliminate the intrusive visual impact of an above ground tank. StormLite tanks are buried out of sight and can be installed under driveways, gardens or lawns.

## HAMMERHEAD DESIGN

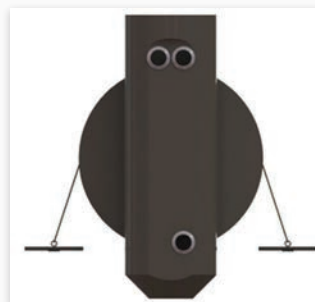
APD's unique hammerhead design with built in silt trap eliminates the cost associated with the installation of a separate silt trap and ensures 100% of the tank capacity can be utilised, avoiding the need for a larger tank. Connections can also be made into the opposite end of the tank if needed.

We can also provide pre-welded spigots to join multiple tanks together and spigots for larger pipe connections.

## TANK ACCESSORIES



Optional pre-welded connecting and joining spigots



Optional Anti-Buoyancy Ground Anchors

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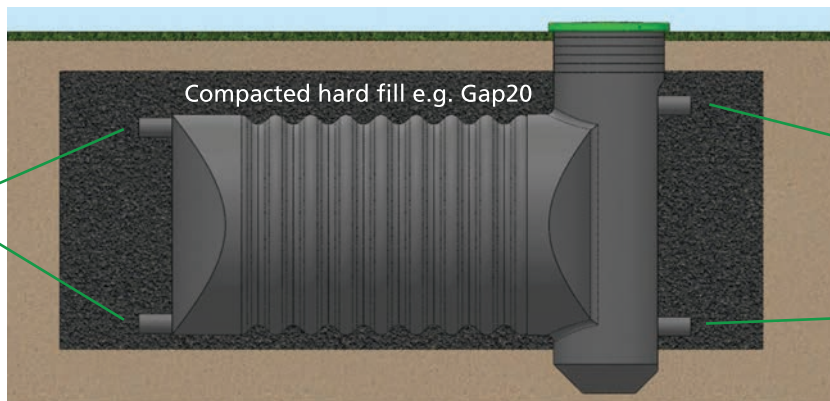
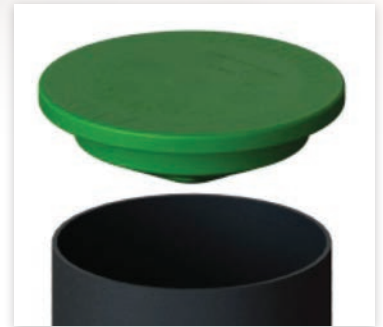
**RESIDENTIAL LAWN INSTALLATION**

**Standard Cover:**

150mm Compacted Hard Fill + 200mm Soil = 350mm Total

- For 1200 diameter tanks, the riser can be cut down to suit finished ground level.
- Ground Anchors: If your site requires less than 350mm cover and/or has a high water table please contact APD.

Detailed engineering drawings are available on request from APD.



Standard Inlet/  
Overflow Location

Standard Outlet  
Orifice Location  
(Detention Only)

**DRIVEWAY INSTALLATION**

**Cover Requirements:**

Compacted Hard Fill + Concrete Thickness = 350mm Min Total Cover  
 200mm Thick Reinforced Concrete Over Tank - Residential Driveway  
 250mm Thick Reinforced Concrete Over Tank - Commercial Driveway

- For 1200 diameter tanks, the riser can be cut down to suit finished ground level.
- Ground Anchors: If your site requires less than 350mm cover and/or has a high water table please contact APD.

Detailed engineering drawings are available on request from APD.



Standard Inlet/  
Overflow Location

Standard Outlet  
Orifice Location  
(Detention Only)

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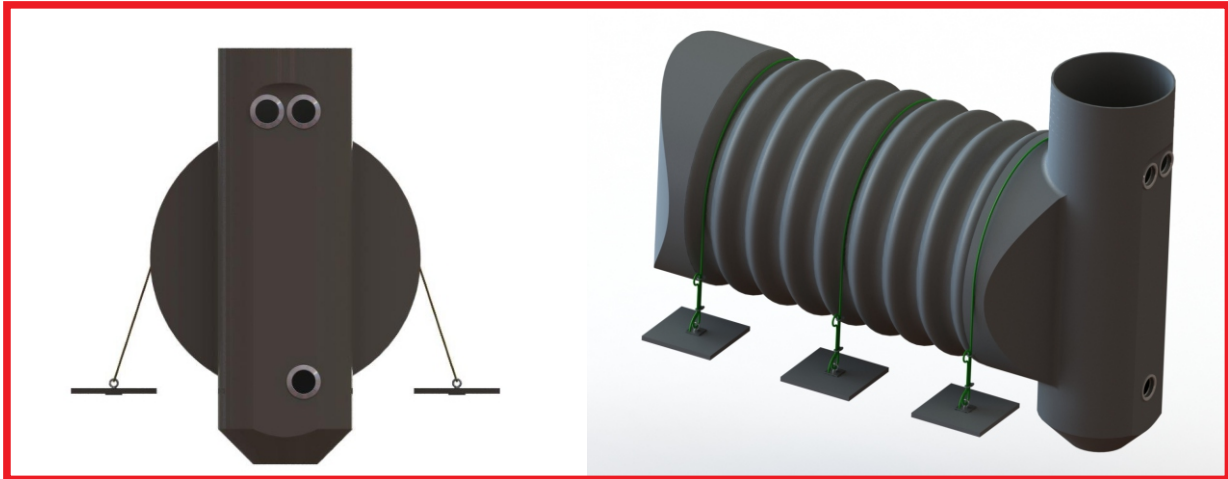
## New Ground Anchor Design

***New slimmer design 300mm wide for narrower trenches. Securing pegs now provided to secure pads in place to prevent pad slippage when backfilling!***

You may need to use ground anchors if:

- You will have less than 350mm of cover over the top of the tank.
- Your site has ground water issues or could have after rainfall.

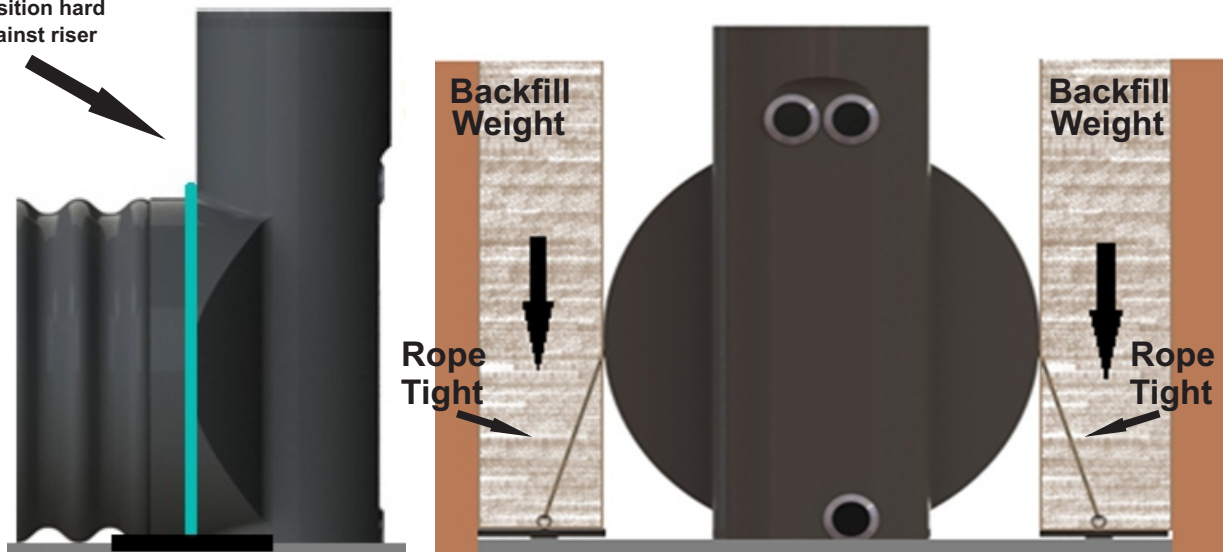
Please contact APD to discuss your installation and to calculate if ground anchors will be required.



### Ground Anchor Installation:

- Anchor pads are 300mm x 500mm.
- Based on your tank buried depth / cover height and max water table level, APD can calculate how many ground anchors you will need.
- Ground anchors are supplied with rope attached and ready to install.
- Pegs provided to secure anchor pad in place to prevent pad slipping when backfilling. 2 pegs per pad.
- Excavation needs to be wide enough to allow for the anchor pads (Eg. 1200 diameter tank needs a minimum 1900mm wide excavation)
- Anchor pads must be placed past edge of tank as per diagram below. Insert pegs into holes drilled to secure pad firmly past edge of tank.
- First ground anchor rope needs to be hard against the riser.
- If the ground anchors are installed correctly as per the diagrams below, then the weight of backfill on top of the pads will stop the tank from lifting up during a heavy rain event or high water table issue.

First anchor rope position hard against riser



## New Ground Anchor Design

***New slimmer design 300mm wide for narrower trenches. Securing pegs now provided to secure pads in place to prevent pad slippage when backfilling!***

### **地面固定锚的安装 (Ground Anchor Installations):**

- 根据你水箱的掩埋深度，回填土高度和地下水位最高点，APD会计算你需要多少固定锚
  - 我们提供的固定锚已经连接好了绳索，可将其直接安装
  - 为防止锚垫在回填时滑动，我们还会提供锚栓来固定锚垫。每片锚垫会配有两个锚栓
  - 每片锚垫尺寸为300X500mm
  - 挖坑时请预留足够宽度给锚垫。1200mm直径的水箱需要1900mm直径的坑
  - 锚垫一定要固定在水箱最大边缘的外侧（如右上图所示）。并且请将锚栓插入钻好的洞里，来固定锚垫在正确的位置上。（超过水箱外缘）。
  - 第一对固定锚的绳索需要紧贴竖管（如左上图所示）
- 为了阻止水箱在大雨时或高地下水位时被浮力抬起，请按照以下图示和回填介绍正确安装所有固定锚和回填土

Pads to be laid length ways along tank. Past the edge of tank and secured firmly with pegs supplied





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**W18029-Geotechnical Desktop Study - Proposed Commercial Development**

**160 Kapiti Road, Paraparaumu**

**September 10<sup>th</sup>, 2018**



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**GEOTECHNICAL DESKTOP STUDY**  
**PROPOSED COMMERCIAL DEVELOPMENT 160 KAPITI ROAD,**  
**PARAPARAUMU**

<b>Job Number:</b>	W18029
<b>Name of Project:</b>	Proposed Commercial Development
<b>Client:</b>	Woolworths New Zealand Limited
<b>Author:</b>	Callum Nicholas, Engineering Geologist
<b>Reviewer:</b>	Christopher Robson, Senior Engineering Geologist, MEngNZ
<b>Authoriser:</b>	Andrew Irvine, Principal Engineering Geologist, CMEngNZ, CEng
<b>Document Version:</b>	A
<b>Printed:</b>	10 September 2018
<b>Author Signature:</b>	
<b>Reviewer Signature:</b>	
<b>Authoriser Signature:</b>	

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## 1 Introduction

### 1.1 Project Brief

Soil & Rock Consultants have been engaged by Jonathon Griffiths on behalf of Woolworths New Zealand Limited, (the Client), to undertake a geotechnical desktop study of the property at 160 Kapiti Road, Paraparaumu, herein after referred to as ('the Site'). This report has been completed in accordance with our proposal and Short Form Agreement with the Client dated 17 August 2018.

The purpose of this desktop study is to establish the likely subsurface ground conditions and to identify the potential geotechnical risks and constraints to the development. This desktop study is provided for due diligence purposes only. It is preliminary in nature and not suitable for a building consent application.

### 1.2 Scope of Works

The following work has been undertaken for this geotechnical assessment:

- A desktop review of available geotechnical data and review of historical aerial imagery;
- Assessment of the current ground conditions and identification of geotechnical risks and constraints;
- Provision of due diligence geotechnical recommendations regarding future development; and
- Preparation of this letter report detailing all the above.

## 2 Site Description

The site is located on the north-east side of Kapiti Road, 150m east of Kapiti Coast Airport and is located in an industrial zone. The site is legally described as Lot 1 DP 63027 with a total area of 24,555m<sup>2</sup>.

The property has relatively level topography and several commercial warehouse buildings exist on the site which include car dealerships, timber yards and hardware buildings. The entire site is sealed with concrete and asphalt. Buried services are thought to exist but their locations are unknown at this stage.

The western boundary of the site is marked by Kapiti Road which trends in a north-west south-east direction from State Highway 1 to Paraparaumu Beach. East of this road is the Kapiti Coast Airport and other commercial developments. The east and south of the site continues into the industrial zone and north of the site borders a residential zone.



Figure 1: Plan view of the site

(New Zealand Geotechnical Database, obtained 14/08/18)

### 3 Proposed Development

We are in receipt of a conceptual plan from Woodhams, Meikle, Zhan Architects, dated November 2017, showing the proposed development to be a Countdown Supermarket building covering 3,500m<sup>2</sup> with the possibility of a 300m<sup>2</sup> further extension. Also shown is car parking for approximately 191 vehicles with drive on access from Kapiti Road and a yet to be confirmed service road in the south east of the site.

The site is currently occupied by an untenanted warehouse (formerly 'Placemakers') and a large carpark. The development area is in the southern half of the site with separate development projects likely (by others) in the remainder of the lot.

### 4 Qualitative Assessment of Geohazards

#### 4.1 Earthquake Maps

The Kapiti Coast Combined Earthquake Risk map (Figure 2) from the Kapiti Coast District Council website shows the site to be located in a moderate to high risk zone pertaining to ground shaking, liquefaction, and earthquake induced slope failure.



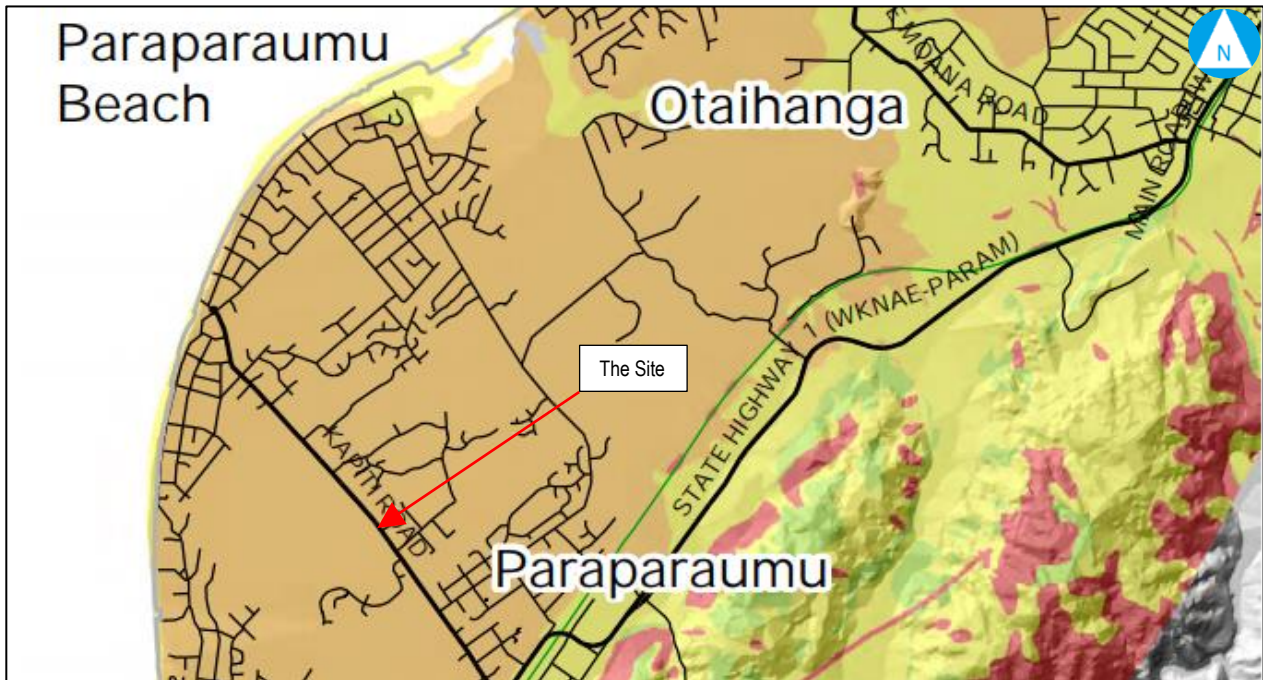


Figure 2. Earthquake Risk Map (Kapiti Coast Combined Earthquake Risk, Scale 1:50,000 source: [www.kapiticoast.govt.nz](http://www.kapiticoast.govt.nz))

## 4.2 Historical Imagery

Historical imagery obtained from Retrolens dated from 1942 to the present day was reviewed for former land use and any associated geotechnical hazards. In 1942 the site consisted of open pasture and the site topography was hummocky land assumed to be sand dunes. The site remained mostly unchanged up until 1977 with the only significant difference being the surrounding land levelled for pasture and development of the airfield to the south-west.

In 1977 to 1981 the neighbouring site had been stripped to be used as a commercial yard, surrounding the site commercial development increased with a definable industrial zone, further expansion and development of the airport was noted also.

In 1987 the site had been stripped, and construction and earthworks was in progress for the existing commercial development.

In 1991 the majority of the buildings on the site today were completed. The larger warehouse on the south side of the site was complete with associated car parks and the smaller warehouse in the north-east corner of the site was also complete and appeared to be used as a timber yard. A residential subdivision was being constructed north of the site and was expanding east.

By 2005 to the airport had started subdividing some of its land to the south-east and further industrial development had taken place to the south of the site. The residential area to the north had expanded east but the majority of the site remained unchanged apart from some minor development of the car dealerships in the north-west corner.

## 5 Ground Conditions

### 5.1 Published Regional Geology

Reference to the Institute of Geological and Nuclear Sciences Geologic Map 10, *Geology of the Wellington Area*, scale 1: 250,000 and dated 2000, (Figure 3) indicates the site is underlain by beach and marginal marine terrace deposits including aeolian sand dune sequences.

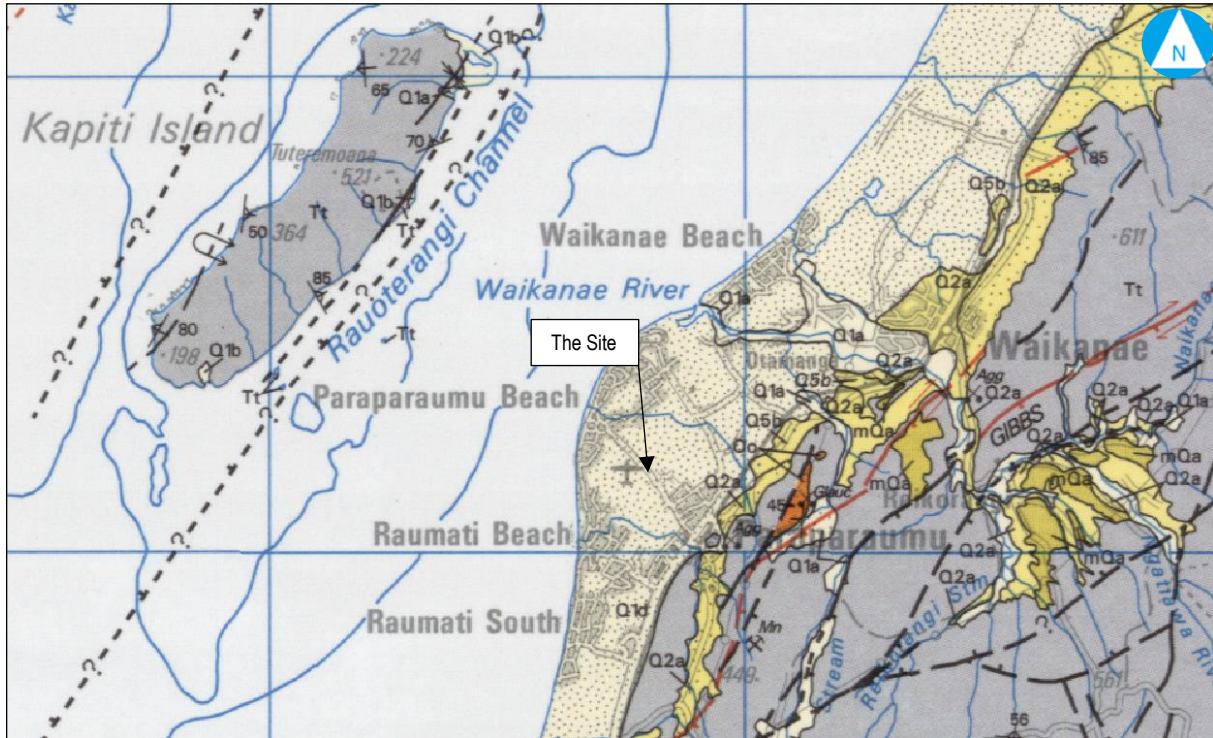


Figure 3. Site Geology from GNS Map 10

(Geology of the Wellington Area, Scale 1:250,000 dated 2000)

### 5.2 Existing Geotechnical Data

Existing geotechnical records from previous geotechnical investigations adjacent to the site have been reviewed and are listed in Table 1 below.

Table 1: Existing geotechnical data.

Test ID.	Proximity to Site	Termination Depth (m bgl)
CPT_90472	7m East	7.3
CPT_90473	17m East	6.7
CPT_90471	37m East	7.3
CPT_90474	49m East	5.3
CPT_90470	55m East	7.7
CPT_90469	72m East	7.2
CPT_90475	83m East	7.7
CPT_90492	16m South	4.9
CPT_90493	28m South	6.3

Three geotechnical boreholes are located approximately 540m away from site but are too far away to be considered for inferring the site specific subsurface geology.

### 5.3 Site Subsurface Conditions

Based on the existing geotechnical data, the inferred soil conditions underlying the site are likely to be interbedded medium dense to dense sands and silty sands to greater than 7m below ground level (bgl). CPT\_90473 and CPT\_90472 show a 200mm to 300mm layer of clay at 2m bgl which is not present in the CPTs reviewed south of the site.

### 5.4 Groundwater

The position of groundwater below the surface remains unknown at this stage though it is thought to be shallow based on experience at nearby project sites.

The Kapiti Coast District Council Planning Map shows some of the site is vulnerable to ponding in a flood event.

### 5.5 Site Subsoil Classification

Applying requirements of NZS 1170.5:2004 the site subsoil seismic class is assumed to be 'Class C – Shallow Soil Site'. This classification has been based on the measured geotechnical properties of the subsoils applied to Table 3.2 "Maximum Depth Limits for Site Subsoil Class C" of the standard. The site subsoils are not expected to exceed the depths listed to be considered Class C soils within Table 3.2, i.e. assumed maximum depth of soil of 25m with representative undrained shear strengths in excess of 25kPa.

This classification is also based on the density of soils encountered within the nearby CPTs. The site subsoil seismic class assessment may change following the detailed site-specific geotechnical investigations.

### 5.6 Liquefaction Analysis of Nearby Data

Liquefaction hazard screening and analysis was carried out using the peak ground acceleration (PGA) calculated using NZS 1170 and Effective Magnitude ( $M_w$ ) from the NZTA Bridge Manual and are presented within Table 2.

**Table 2: Liquefaction analysis results**

Design seismic GWL (mbgl)	ULS Seismic Event (PGA =0.56, Meff = 6.9)		SLS Seismic Event (PGA = 0.15g, Meff = 6.2)	
	Liquefied Soil Depth (mbgl)	Estimated Seismic Vertical Settlement (mm)	Liquefied Soil Depth (mbgl)	Estimated Seismic Vertical Settlement (mm)
0	0 – 5.8	24 - 48	0 – 3.2	4 - 18
1	1 – 5.8	8 - 39	N/A	~ 1
2	2 – 5.8	4 - 26	N/A	< 1
3	3 – 5.8	1 - 15	N/A	< 1

## 6 Geotechnical Constraints and Conclusions

Our preliminary assessment has identified the following geotechnical constraints which may affect the currently proposed commercial development:

- The site is likely to be prone to soil liquefaction induced settlement based on the analysis results from neighbouring CPT data;
- The structure should be designed for 'Class C' subsoil class unless determined otherwise with further testing; and
- Site drainage will need to allow for the surface water ponding risk identified from the Kapiti Coast District Council Planning Maps.

Based on this preliminary assessment we consider the site to be suitable for the currently proposed commercial development from a geotechnical perspective. The foundations will need site specific geotechnical investigations and engineering design to mitigate and manage the risks associated with ground motions and soil deformation.

## 7 Further Geotechnical Involvement

Further fieldwork is recommended to be carried out once all structures and hardstanding areas have been demolished and removed from the site. We recommend the following further geotechnical input to allow for the design of suitable foundations for the proposed development:

- Geotechnical deep testing comprising of at least four Cone Penetration Tests (CPTs) down to a target depth of 15m bgl positioned within the proposed building footprint as well as advancing one sonic HQ borehole to retrieve soil samples for geological logging and laboratory analysis.
- Detailed liquefaction hazard analysis of the site-specific CPT data;
- Hand auger drilling down to a target depth of 3m bgl to determine the depth of unsuitable non-engineered fill, the type and strength of the natural soils and depth to groundwater;
- Dynamic Cone Penetration (DCP-Scala) testing through the augerhole positions; and
- Installation of shallow piezometers to monitor the groundwater levels.

Given the structural details (footing loads and dimensions to resist uplift) of the proposed building are yet to be finalised, additional geotechnical analysis and design will be required to identify a number of suitable foundation options for the proposed development. These will enable the project structural engineer to select the most cost-effective solution during the building design process.

## 8 Limitations

This report has been prepared for the sole benefit of our Client, Woolworths New Zealand Limited, with respect to the particular brief given to us. The reliance by other parties on the information or opinions contained within this report shall, without our prior review and agreement in writing, be at such parties' sole risk.

The recommendations given in this report are based on data adjacent to the site. Inferences about the subsoil conditions away from these test locations have been made but cannot be guaranteed. We have inferred a geotechnical model that can be applied for our analyses, however, variations in ground conditions from those described in this report could exist across the site. Further site specific geotechnical fieldwork has been recommended to facilitate structural design.

The investigation was confined to geotechnical aspects of the site and did not involve assessment or testing for environmental contaminants or flooding potential. Our investigation and assessments have also not taken into account possible fault rupture that may cause deformations and displacements of the ground directly below the site. This is outside of the scope of our engagement and beyond the realms of geotechnical investigation and assessment and from recent accounts nearly impossible to predict.

End of Report – Appendices to Follow

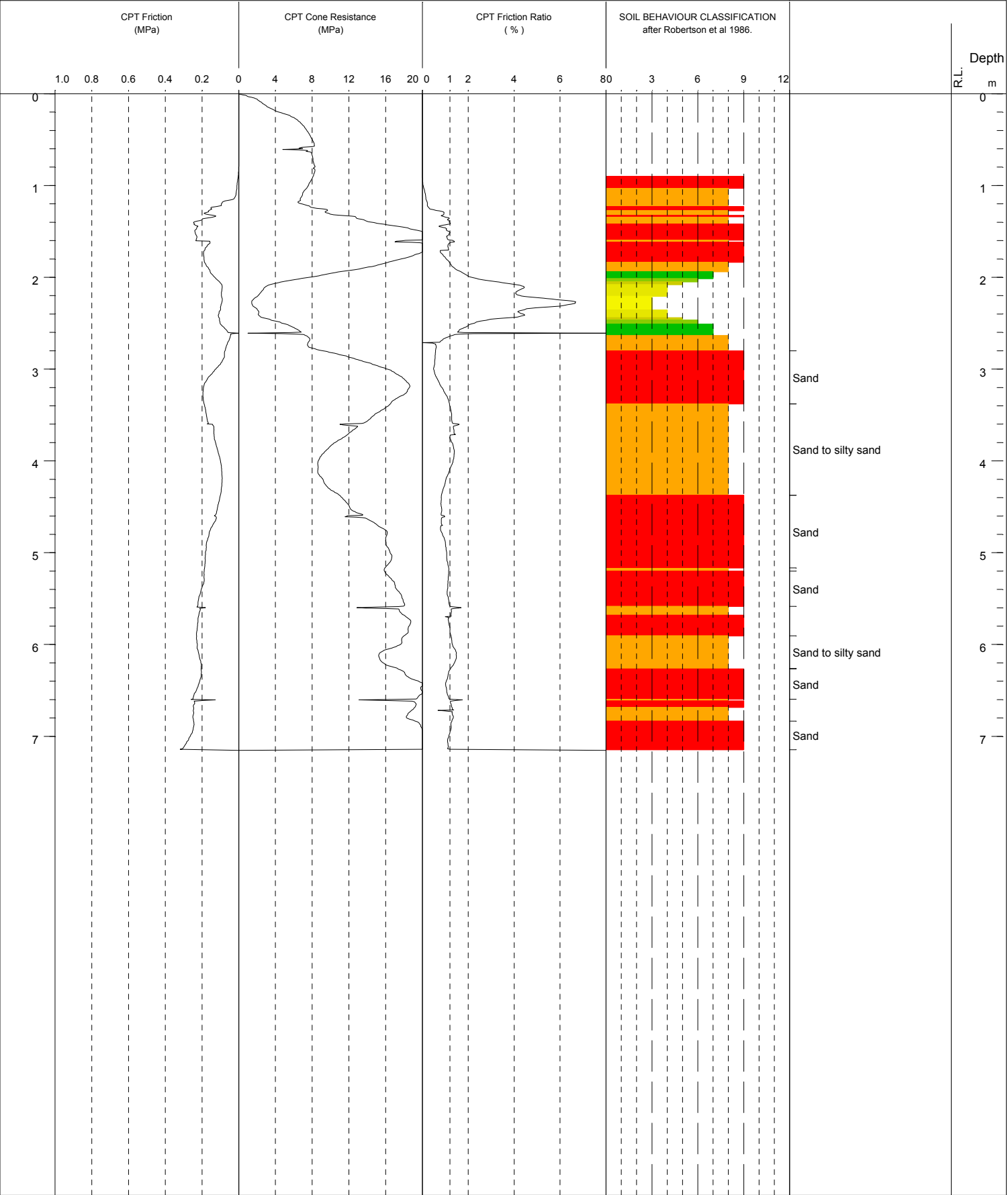
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Appendix A – Existing Geotechnical data

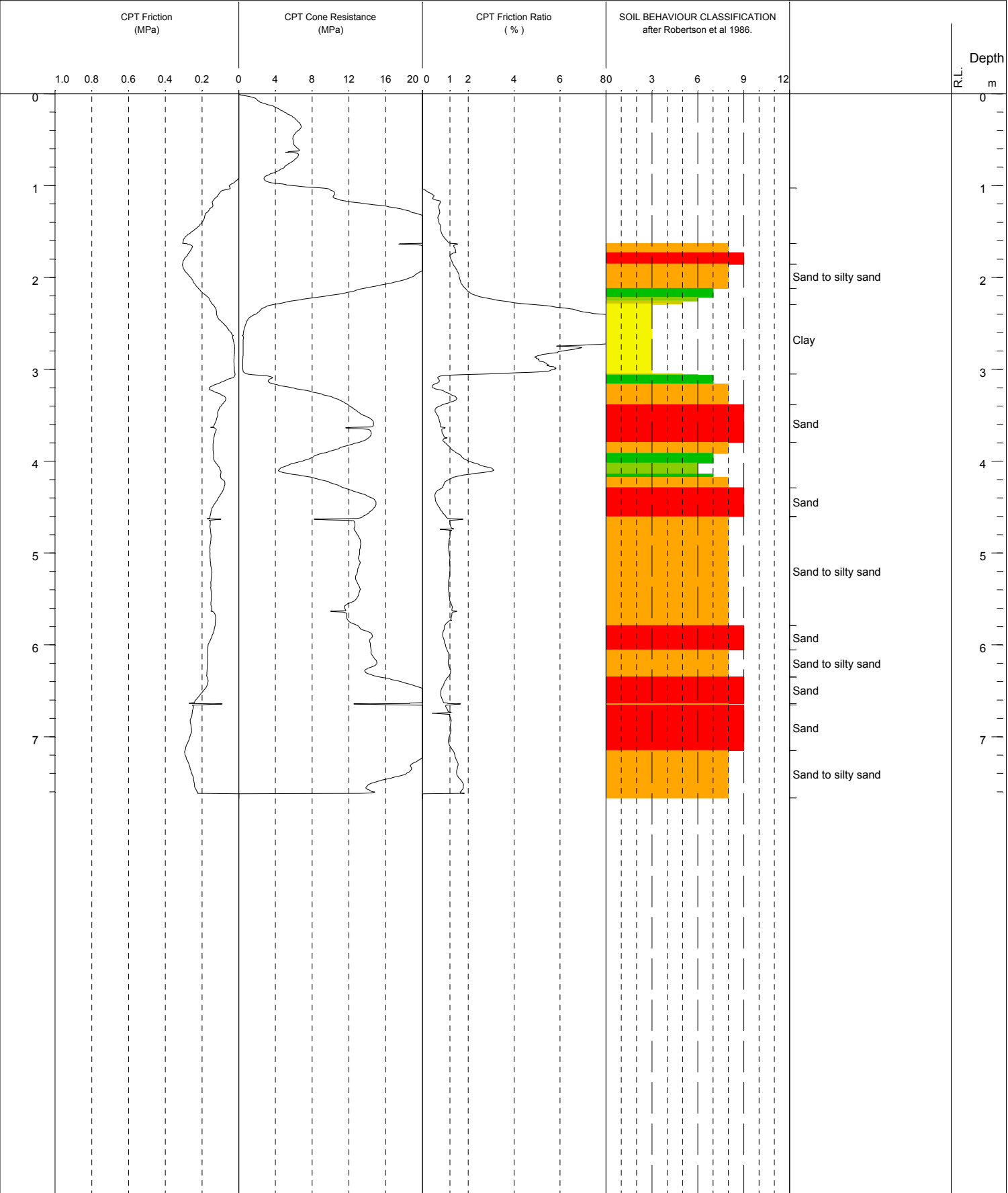
## 9 References

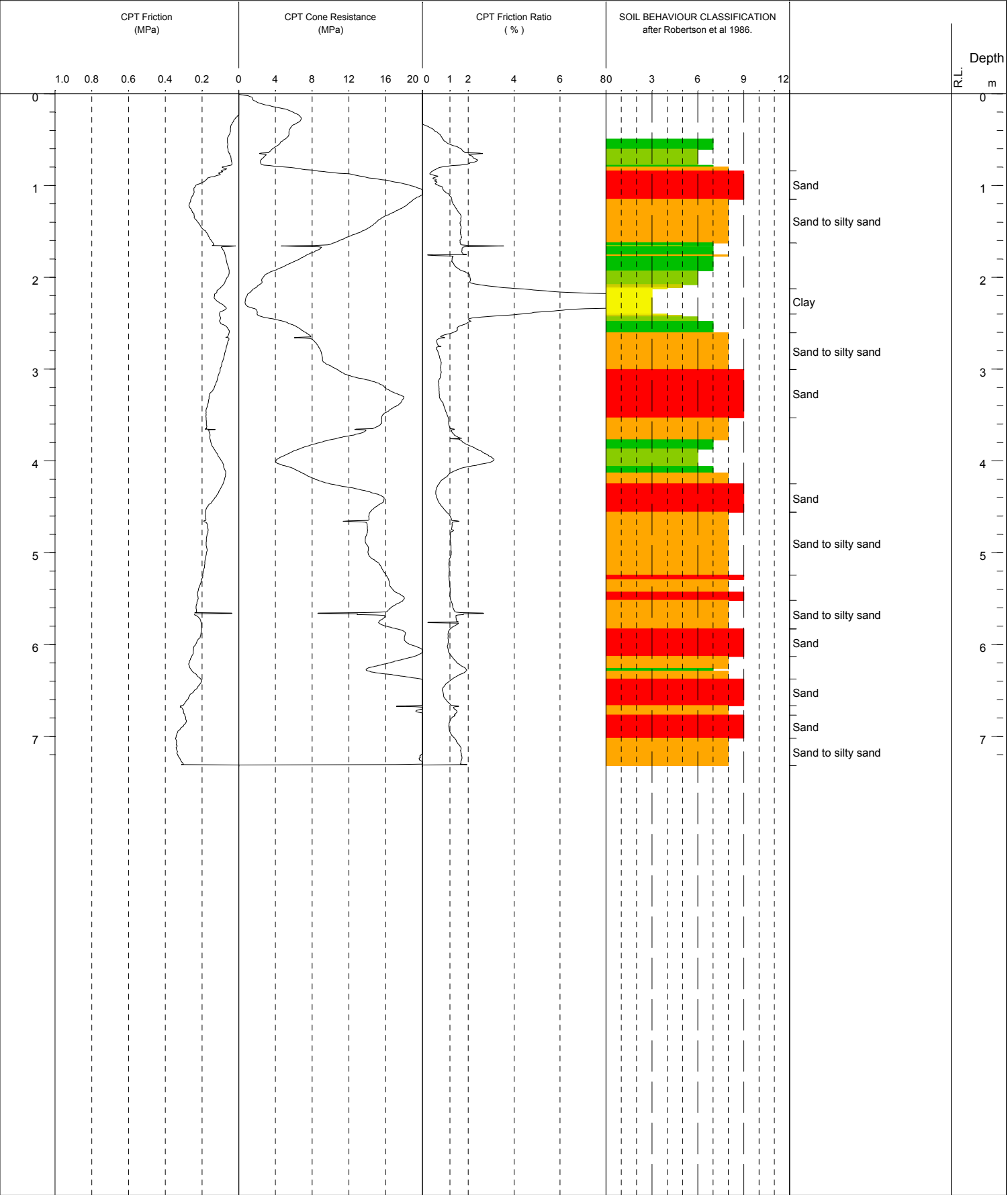
1. Canterbury Earthquake Recovery Authority (CERA), 2015. New Zealand Geotechnical Database (NZGD), Available at <https://nzgd.com> [accessed 5/09/2018]
2. Kapiti Coast District Council District Plan Maps, Available at <https://www.kapiticoast.govt.nz/> [accessed 4/09/2018]
3. NZGS, 2005. Field Description of Soil and Rock. Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes, NZ Geotechnical Society Inc, Wellington, New Zealand.
4. NZS 1170.5:2004, 2004. Structural Design Actions Part 5: Earthquake Actions – New Zealand.
5. NZ Transport Agency, 2013. Bridge Manual SP/M/022
6. Retrolens Historical Image Resource, Available at <http://retrolens.nz/Map/> [accessed 4/09/2018]

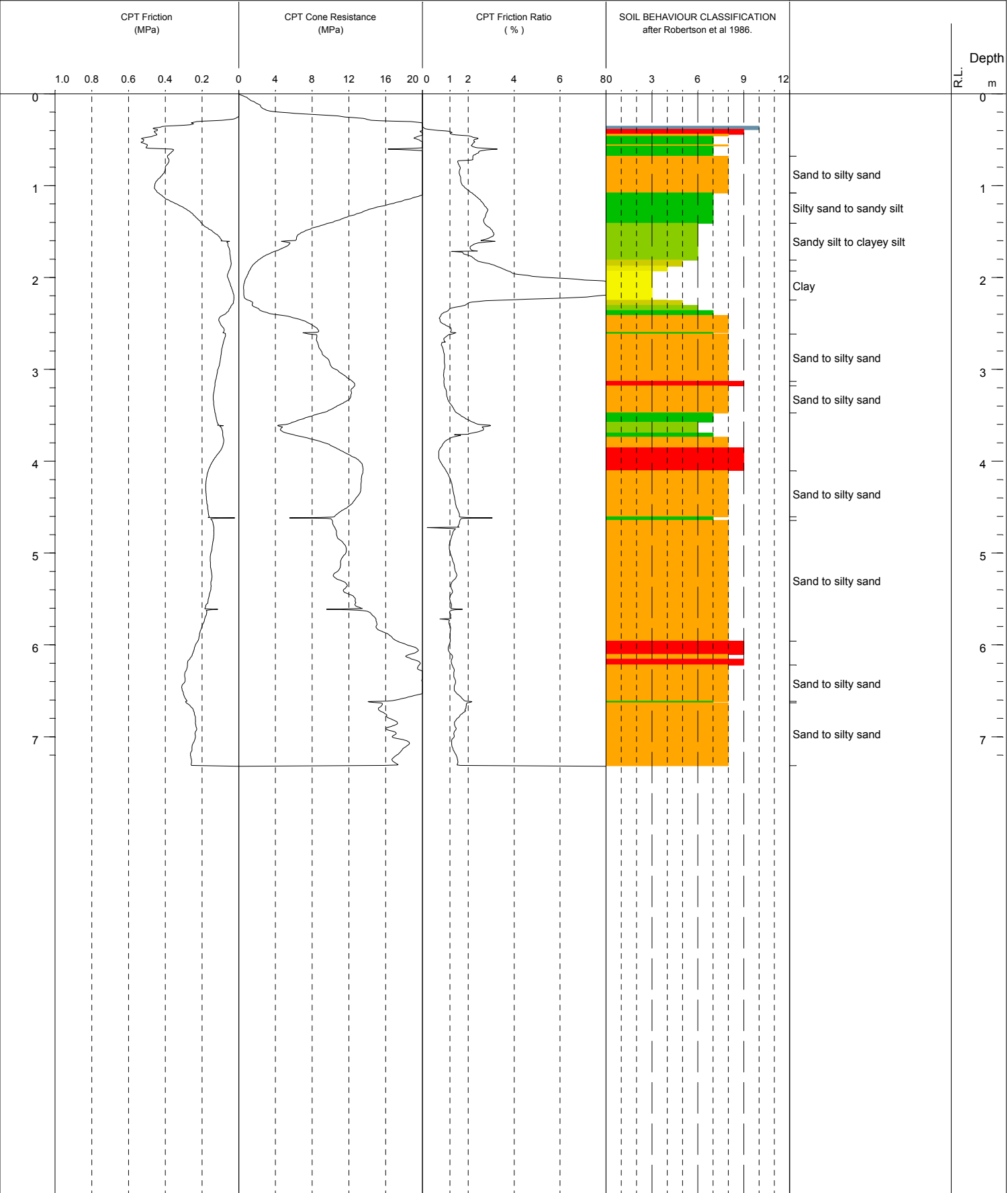
**APPENDIX A**  
**EXISTING GEOTECHNICAL DATA**

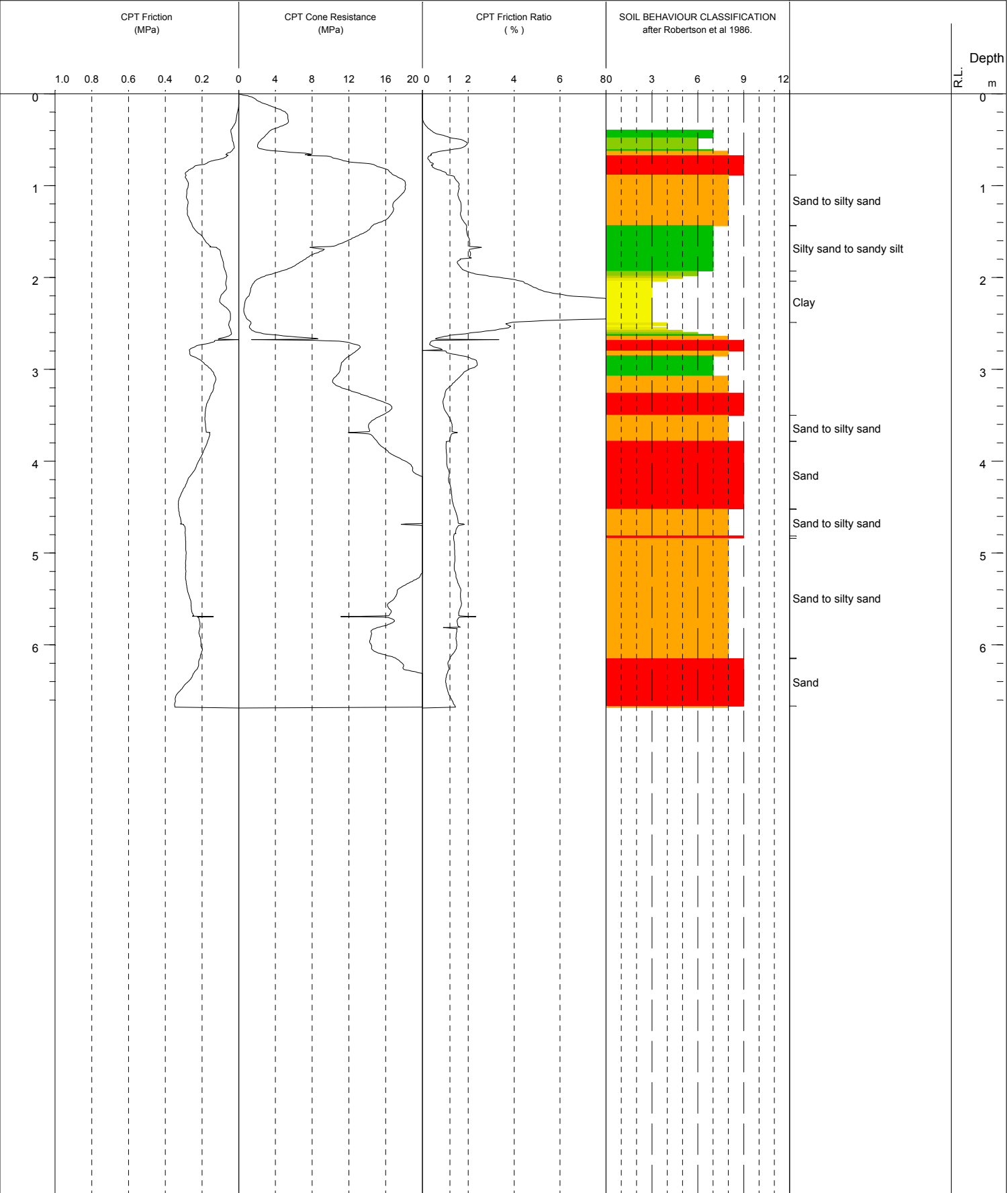












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 Contractor: Geotec Drilling  
 Cone type:  
 Cone range: 100 kN  
 Comment:

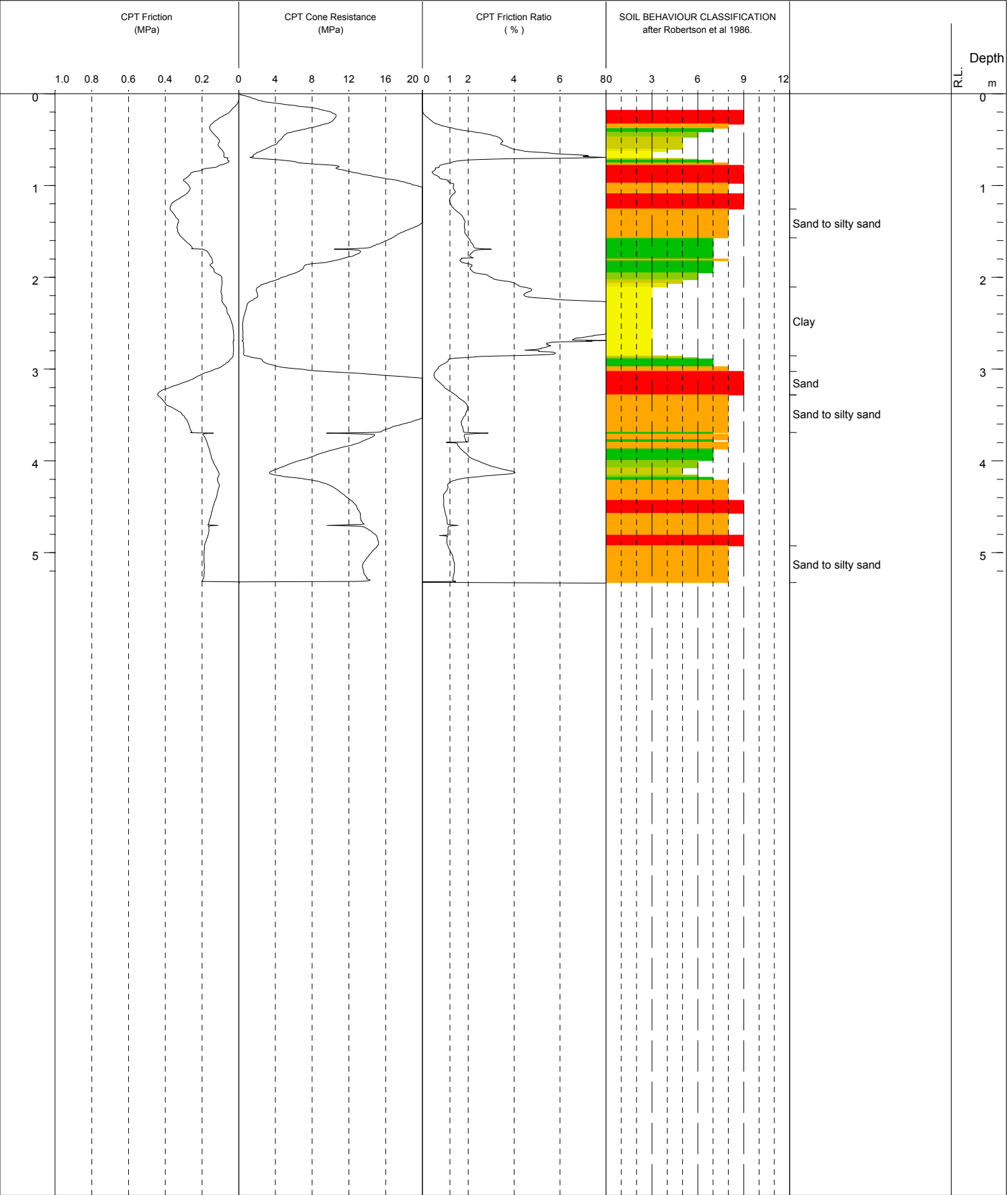
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 (Robertson et al. 1986)  
 1 Sensitive fine-grained  
 2 Organic material  
 3 Clay  
 4 Silty clay to clay  
 5 Clayey silt to silty clay  
 6 Sandy silt to clayey silt  
 7 Silty sand to sandy silt  
 8 Sand to silty sand  
 9 Sand  
 10 Gravelly sand to sand  
 11 very stiff fine grained  
 12 sand to clayey sand

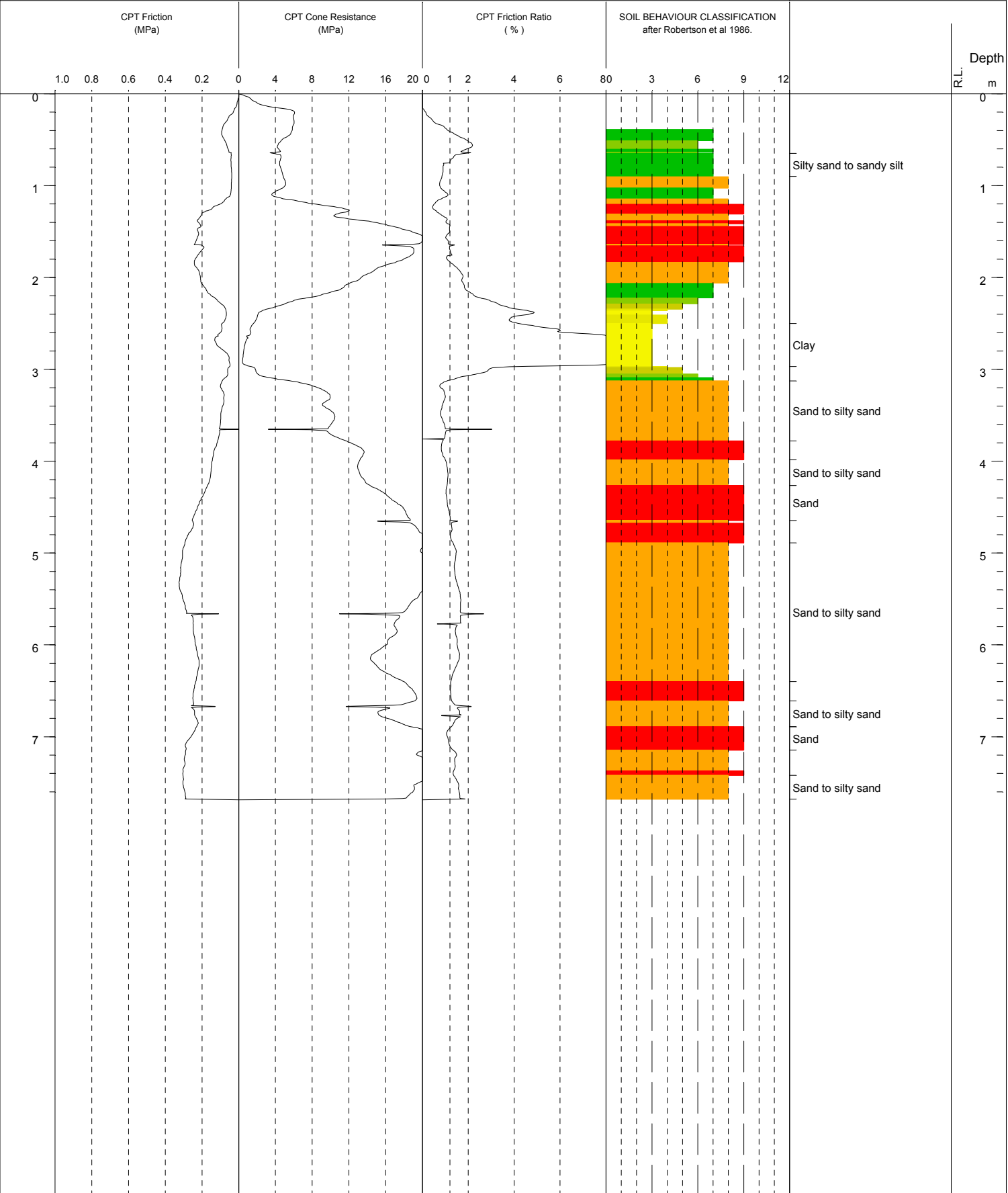
**PROJECT:**  
 BIRMINGHAM RD SITE - PARAPARAUMU

**HOLE**  
 No:

**CPT**  
 No: **950-5**

SHEET 1 OF 1 DRG NO.





**CONE PENETROMETER TEST**  
 Date: 31 May 2007  
 Operator:  
 Contractor: Geotec Drilling  
 Cone type:  
 Cone range: 100 kN  
 Comment:

**SOIL BEHAVIOUR TYPE**  
 (Robertson et al. 1986)  
 1 Sensitive fine-grained  
 2 Organic material  
 3 Clay  
 4 Silty clay to clay  
 5 Clayey silt to silty clay  
 6 Sandy silt to clayey silt  
 7 Silty sand to sandy silt  
 8 Sand to silty sand  
 9 Sand  
 10 Gravelly sand to sand  
 11 very stiff fine grained  
 12 sand to clayey sand

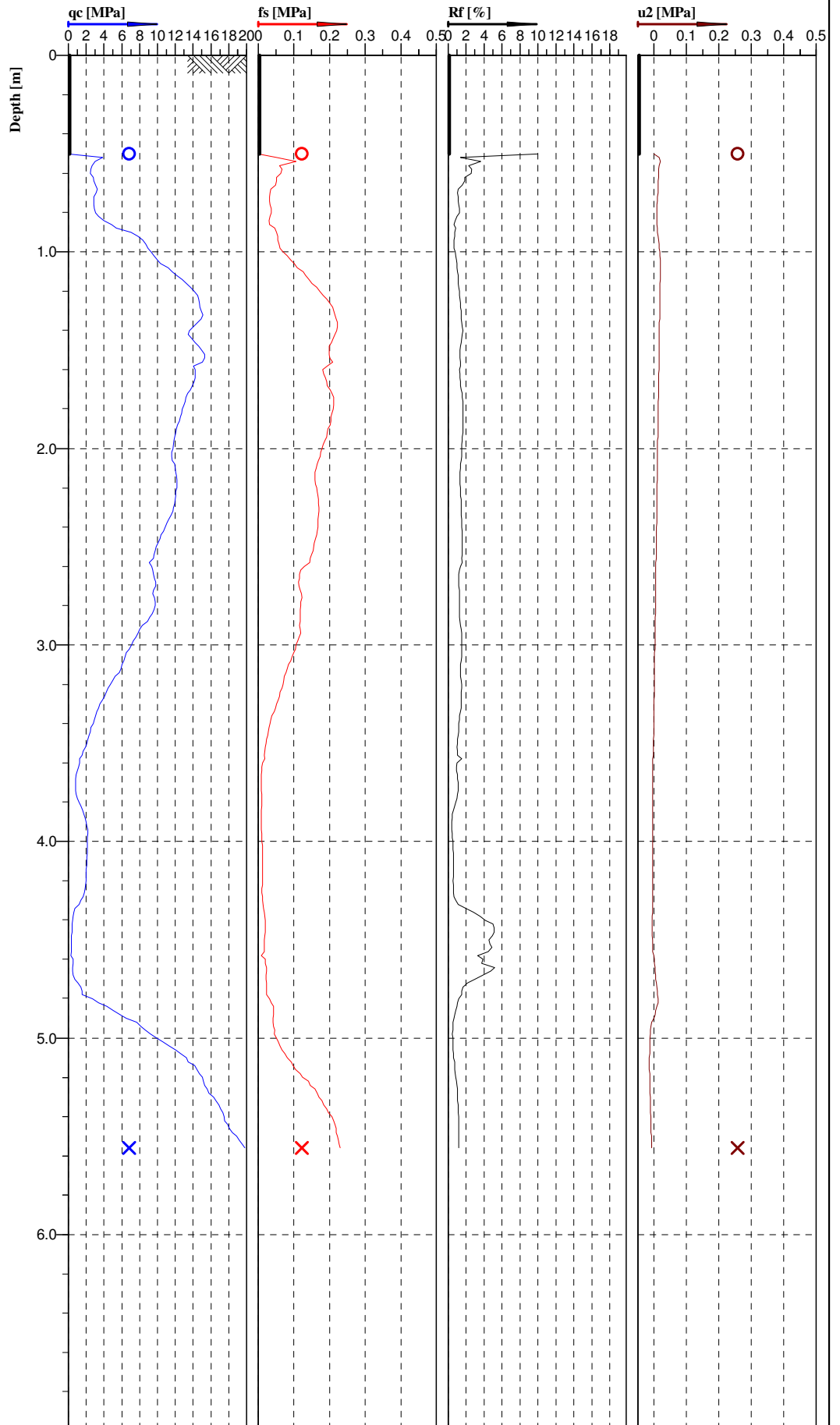
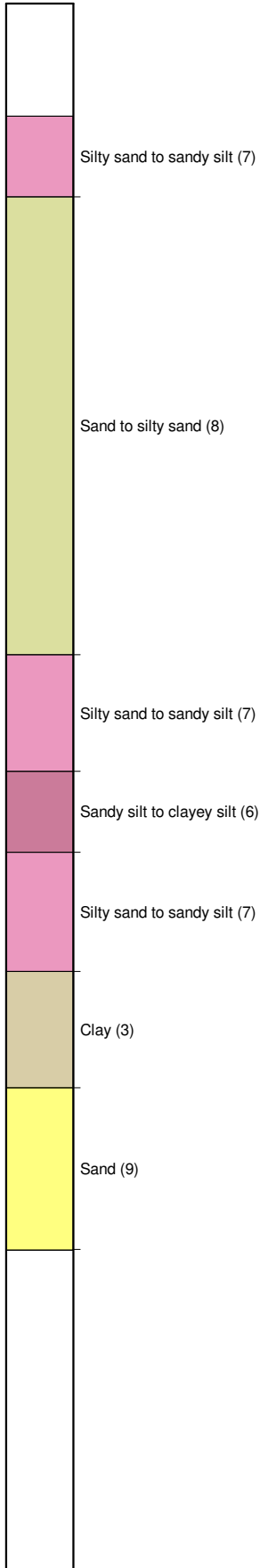
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 No:

**CPT**  
 No: **950-7**

SHEET 1 OF 1 DRG NO.

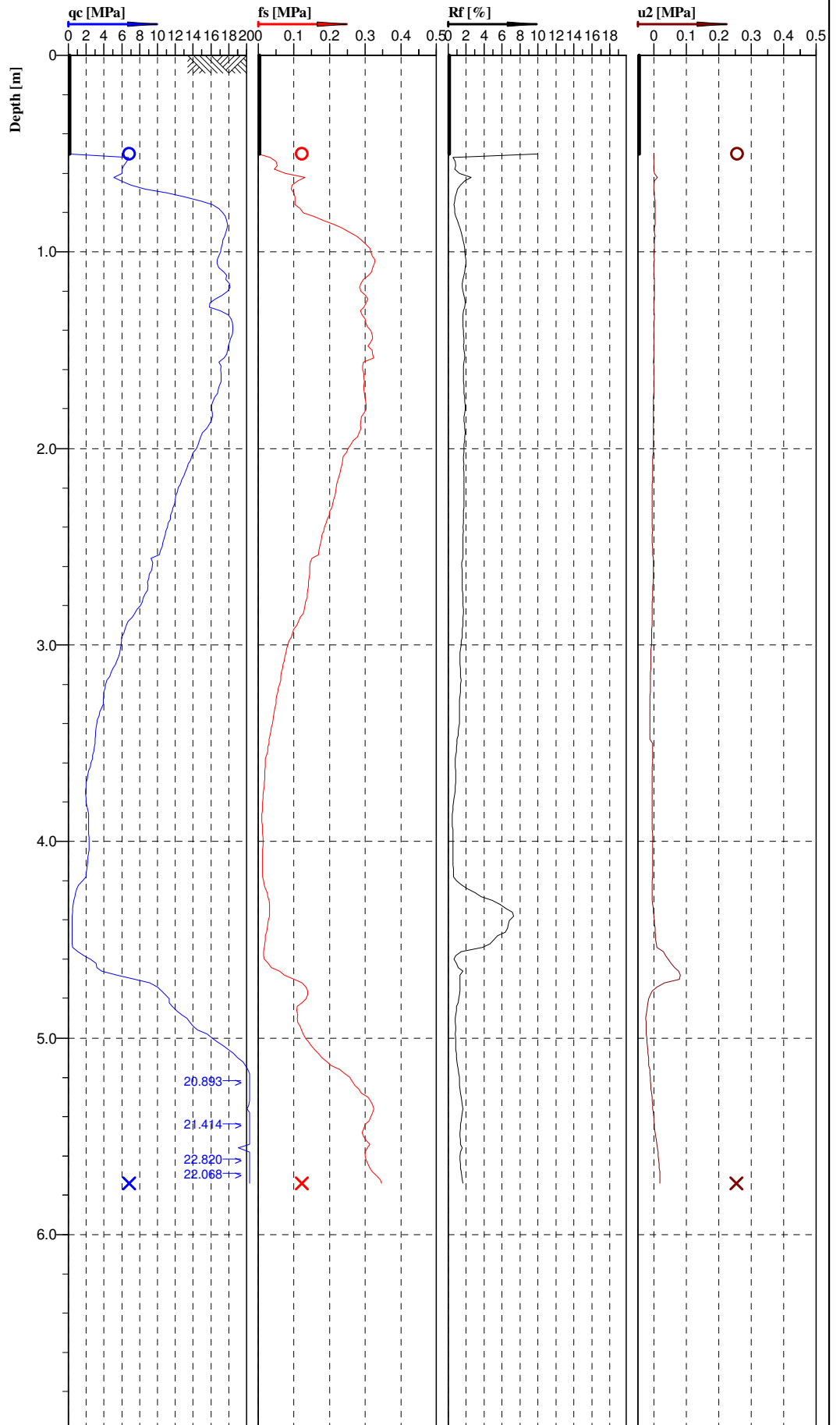
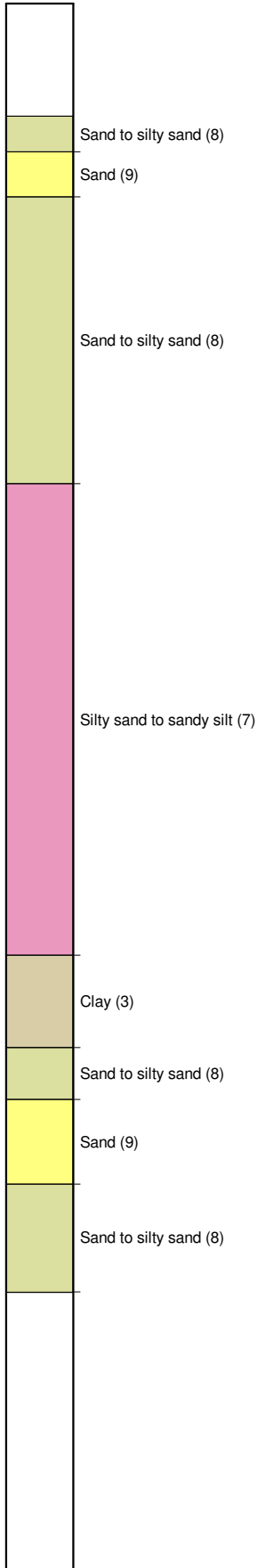
Classification by  
Robertson 1986




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Sleeve area [cm<sup>2</sup>]: 150

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		File: <b>PARA4.CPT</b>	

Classification by  
Robertson 1986

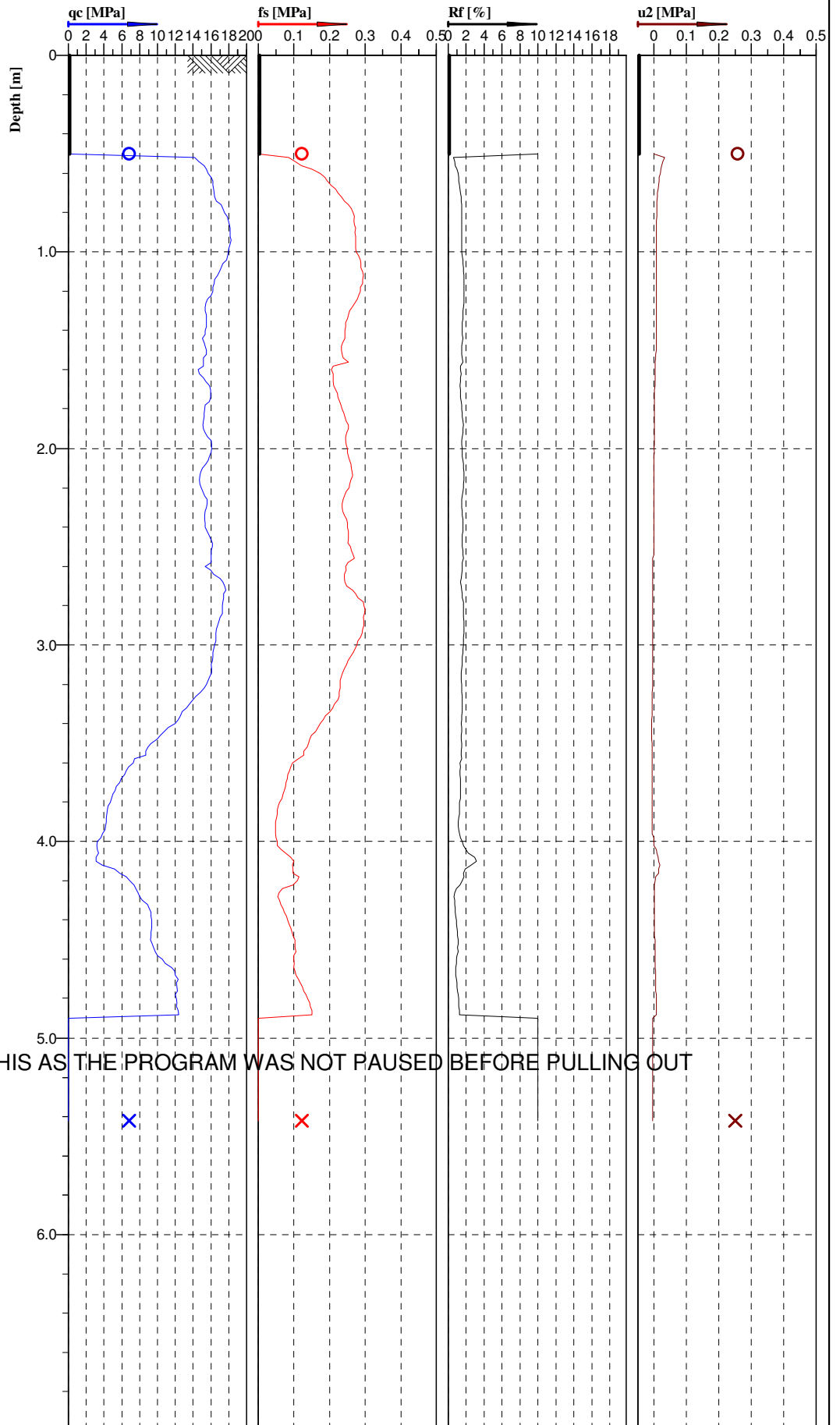
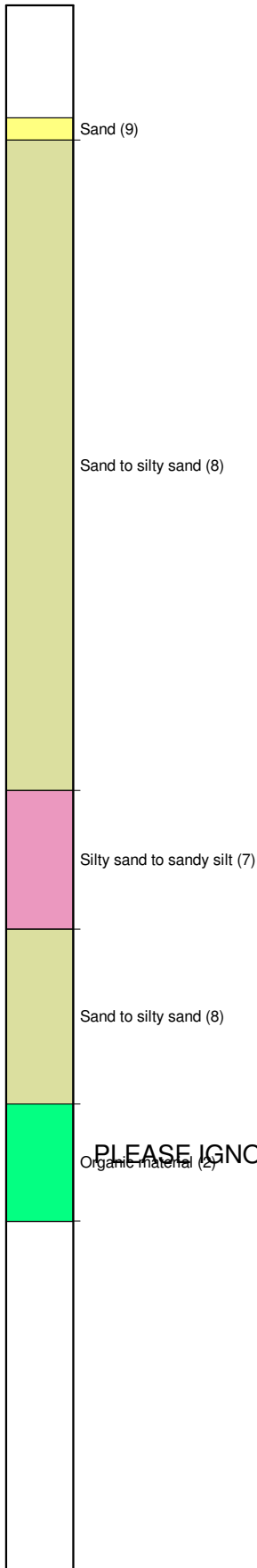



  
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 Sleeve area [cm<sup>2</sup>]: 150

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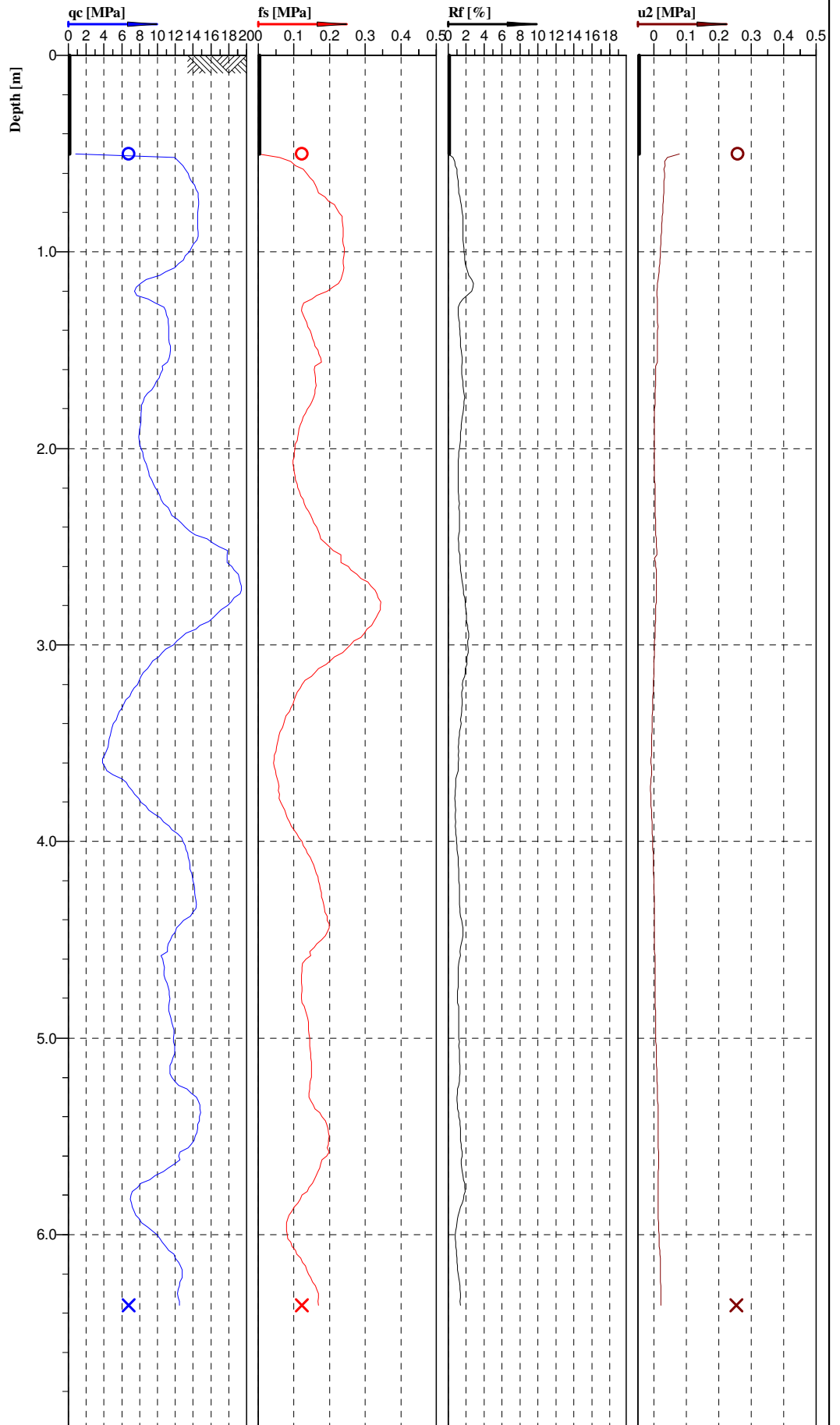
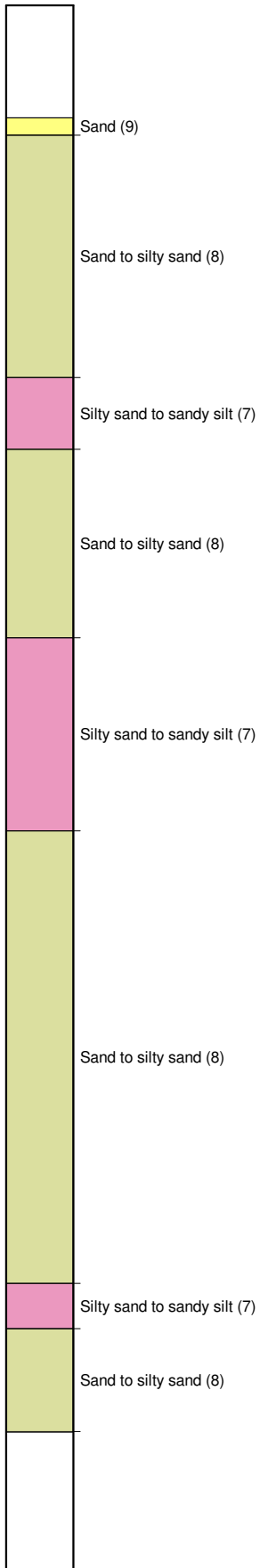
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


  
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 Sleeve area [cm<sup>2</sup>]: 150

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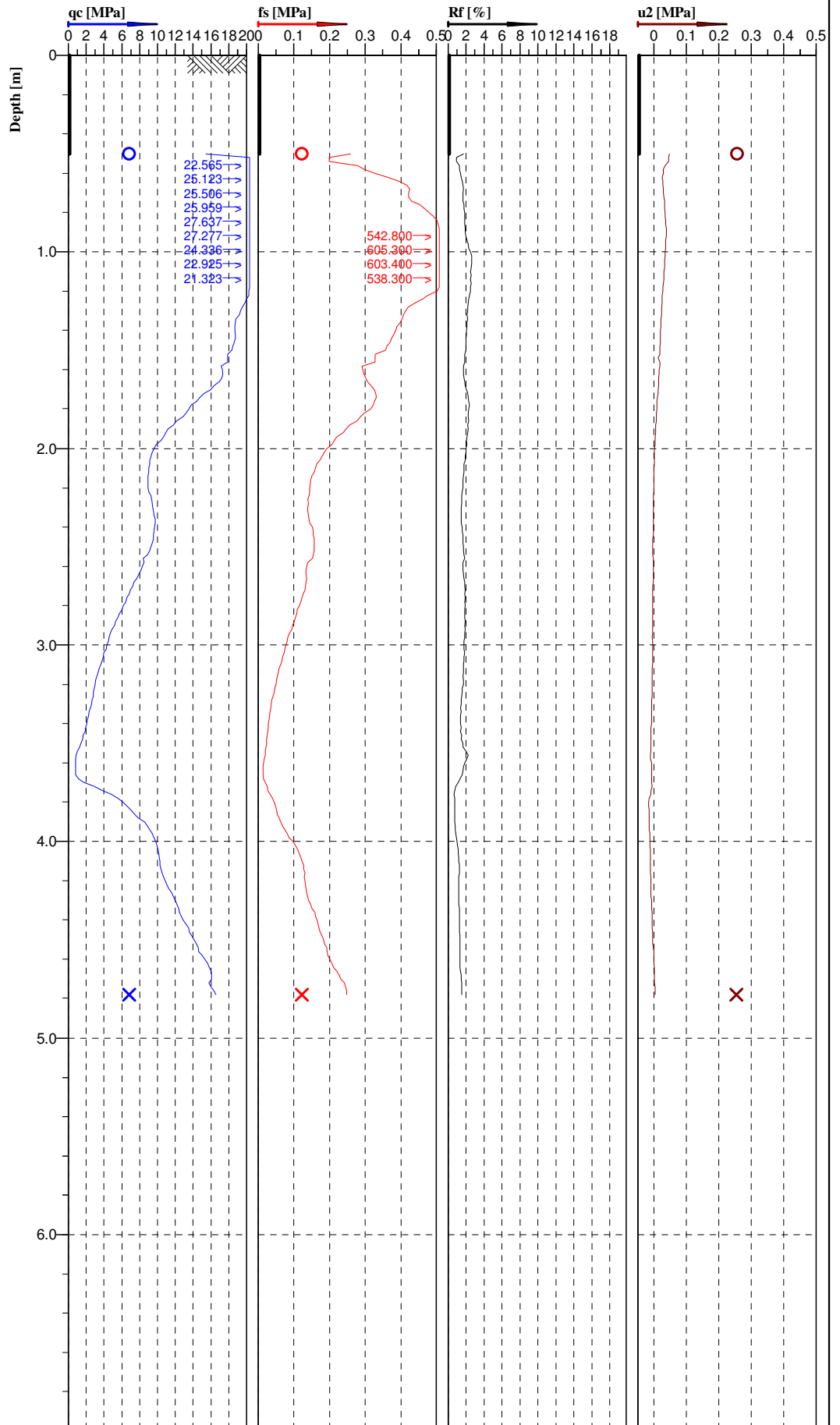
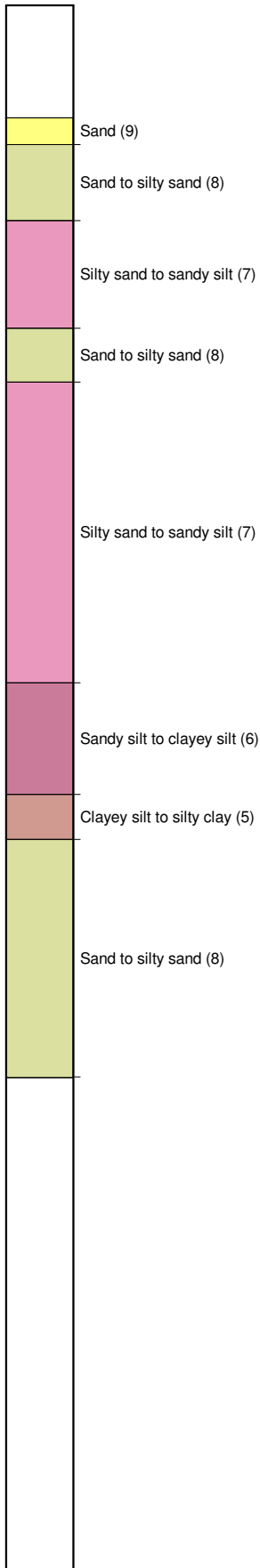
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



  
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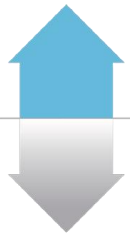
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Classification by  
Robertson 1986



  
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18 September 2018 | S&RC Ref. W18030



**Environmental Site Assessment: Preliminary Site Investigation (PSI)  
Proposed Commercial Development  
160 Kapiti Road, Paraparaumu**



Prepared for Woolworths New Zealand Limited

[www.soilandrock.co.nz](http://www.soilandrock.co.nz)



**ENVIRONMENTAL SITE ASSESSMENT:  
PRELIMINARY SITE INVESTIGATION (PSI)  
PROPOSED COMMERCIAL DEVELOPMENT  
160 KAPITI ROAD, PARAPARAUMU**

<b>Job Number:</b>	W18030
<b>Name of Project:</b>	Environmental Site Assessment: Preliminary Site Investigation (PSI)
<b>Client:</b>	Woolworths New Zealand Limited
<b>Document Version:</b>	A
<b>Printed:</b>	18 September 2018
<b>Author:</b>	<b>Andrew Baxter</b> Environmental & Engineering Geologist
<b>Reviewed By:</b>	<b>Jordan Vaughn</b> Senior Environmental Scientist
<b>Authorised By:</b>	<b>Zeljko Viljevac</b> Senior Hydrogeologist/Engineering Geologist

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Version	Quantity	Issued to	Date
A	PDF	Woolworths New Zealand Limited	18 September 2018

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<b>Appendix B.</b>	<b>Aerial Photographs</b>
<b>Appendix C.</b>	<b>Certificate of Title (LINZ) &amp; Kapiti Coats District Council Property Files</b>
<b>Appendix D.</b>	<b>Contamination Enquiry (GWRC)</b>

## INTRODUCTION

### 1 Project Brief

Soil & Rock Consultants (S&RC) have been engaged by Jonathon Griffiths of Woolworths New Zealand Limited (the Client), to undertake an Environmental Site Assessment (ESA) for the site located at 160 Kapiti Road, Paraparaumu (the 'site') regarding a proposed commercial development.

The purpose of our investigation was to:

- Collect information pertaining to data gaps that may exist for the site; and
- Ascertain whether any previous hazardous activity occurred on site which could result in soil contamination.

This report is in accordance with Ministry for the Environment (MfE) guidelines for contaminated site investigations and Regional/District Council requirements and consists of a Preliminary Site Investigation (PSI) only.

### 2 Scope of Works

This investigation consisted of a PSI – Stage 1 desktop study to determine the site background and assess previous land use activities within the site. It involved detailed research and investigation of the site history to determine the potential for any past contaminating incidents which may have impact soils underlying the site. In summary, the PSI comprised of the following:

- Review of Historical Information, including:
  - Review historical land uses for the area and for surrounding properties;
  - Review Council records for the property and surrounding area for information relating to potential soil or groundwater contamination;
  - Interpretation of historical aerial photographs for indicators of possible contamination sources and land uses;
  - Interview past/present owners and occupiers, where possible, about the potential for contamination;
- Evaluation of underlying geology and hydrogeology;
- Quantitative interpretation and assessment; and
- Preparation of a PSI report detailing the above.

The investigation and reporting has been prepared by Suitably Qualified and Experienced Practitioners (SQEPs) in accordance with MfE Contaminated Land Management (CLM) guidelines for the assessment of suspected contaminated land.

## PRELIMINARY SITE INVESTIGATION

### 3 Site Description

The site is located on the north-east side of Kapiti Road, 150m east of Kapiti Coast Airport within an industrial zone. The site is legally described as Lot 1 DP 63027 the site and covers a total area of approximately 24,555m<sup>2</sup>.

At the time of this assessment, the site was relatively level with several existing commercial structures including a large warehouse building, a car dealership and a carpet store. The majority of the site appears to be sealed, with asphalt and concrete areas surrounding most existing buildings.

The site and surrounding areas zoned as 'Industrial' under the Kapiti Coast District Council (KCDC) district plan. The surrounding area is generally commercial/industrial with residential areas located to the north.

**Figure 1: Showing the investigation site of 160 Kapiti Road, Paraparaumu**



(New Zealand Geotechnical Database, obtained 14/08/18)

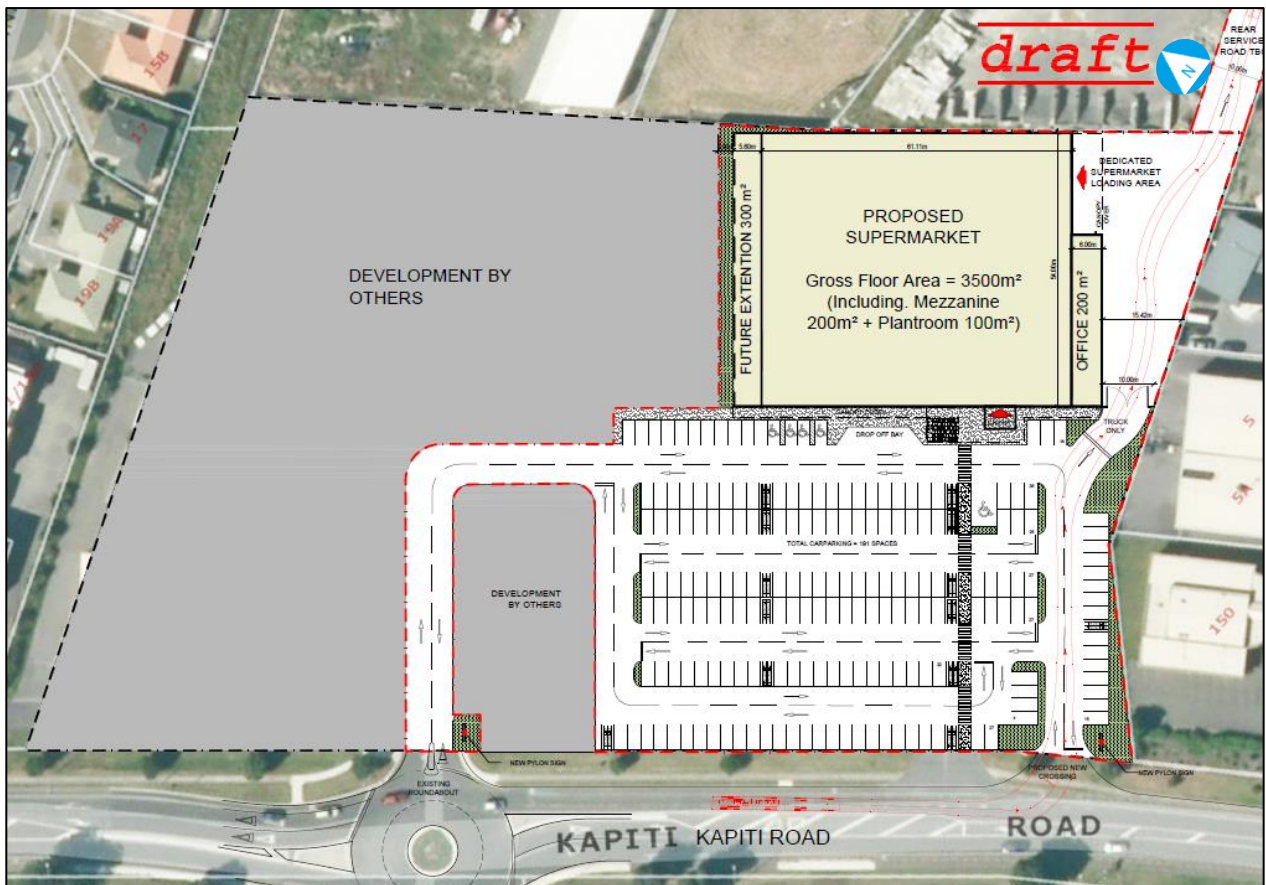


## 4 Proposed Development

We are in receipt of a conceptual plan from Woodhams, Meikle, Zhan Architects, dated November 2017, showing the proposed development as a 3,500m<sup>2</sup> Countdown Supermarket with a possible 300m<sup>2</sup> future extension. Also shown is car parking for approximately 191 vehicles with drive on access from Kapiti Road and a yet to be confirmed service road in the south east of the site.

The site is currently occupied by an untenanted warehouse (formerly 'Placemakers') and a large carpark. The development area is in the southern half of the site with separate development projects likely (by others) in the remainder of the lot.

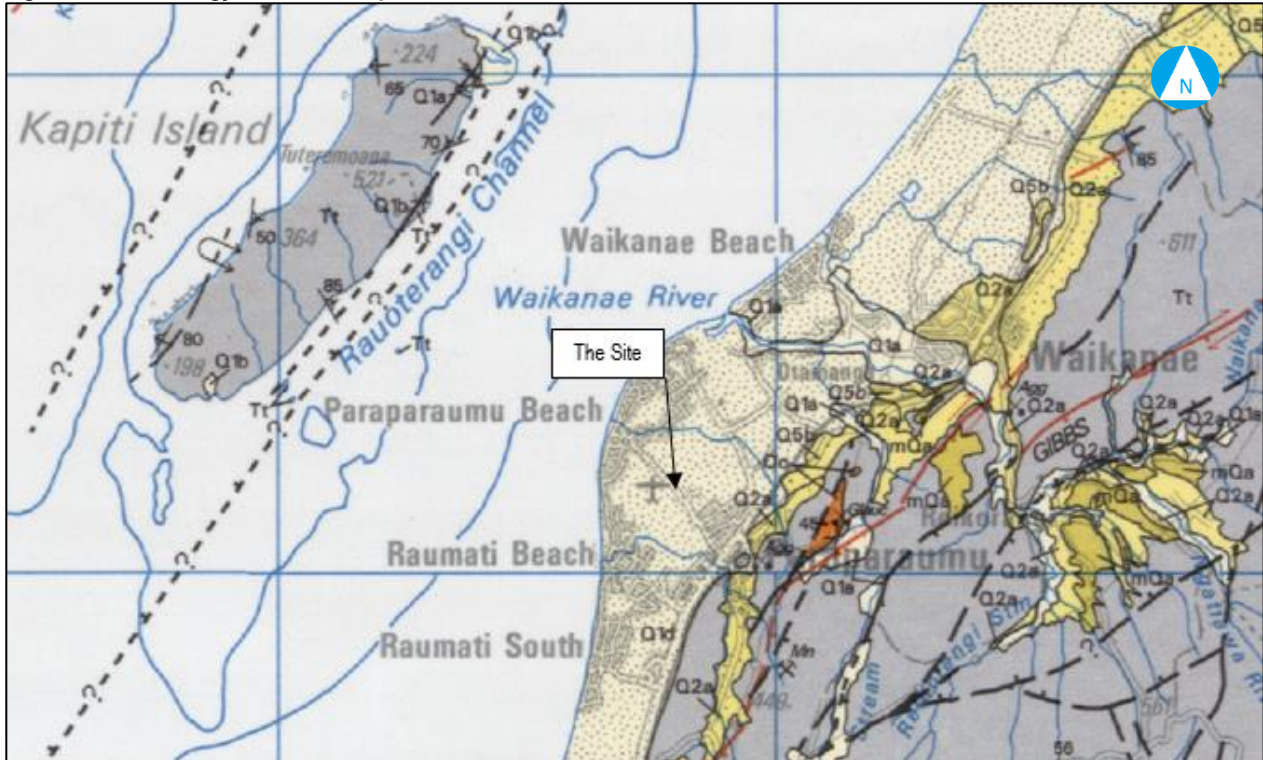
Figure 2: Showing the proposed development layout



## 5 Published Regional Geology

Reference to the Institute of Geological and Nuclear Sciences Geologic Map 10, Geology of the Wellington Area, scale 1: 250,000 and dated 2000, (Figure 3), the site is underlain by beach and marginal marine terrace deposits including aeolian sand dune sequences.

Figure 3. Site Geology from GNS Map 10



(Geology of the Wellington Area, Scale 1:250,000 dated 2000)

## 6 Groundwater

The depth to groundwater beneath the surface remains unknown at this stage, though it is thought to be shallow based on experience at nearby project sites.

The Kapiti Coast District Council (KCDC) Planning Map shows some of the site is vulnerable to ponding in a flood event.

## 7 Site History

The history of the site was established through a review of historical aerial photographs, a search of KCDC property files and Certificates of Title regarding contamination incident files.

### 7.1 Aerial Photography

Aerial photographs of the site were obtained from both Retrolens Website (<http://retrolens.nz/>) and Google Earth. Observations with respect to potential site contamination are summarised below. Aerial photographs are included in Appendix B.

**1942** – The image shows the site as undeveloped pastoral land within a rural area of Paraparaumu, on the northern side of Kapiti Road which is well formed at this time. No structures are visible on this site. The surrounding area on the northern side of Kapiti

Road is also rural with scattered residential dwellings. On the southern side of Kapiti Road is Kapiti Coast Airport, still largely undeveloped but operational at this time.

**1956** – The site remains undeveloped and appears to be used for pastoral purposes. The surrounding is on the northern side of Kapiti Road remains largely undeveloped but historic sand dunes have been significantly levelled. The airport to the south has undergone development through extensions of runways and construction of buildings.

**1977** – The site remains undeveloped however the site immediately adjacent appears to have had a new structure built. A new industrial area has been constructed to the west on the northern side of Kapiti Road. Minimal other changes.

**1981** – Minimal changes noted. Some development of the surrounding area; however, the site remains undeveloped.

**1987** – The site is now under development with the building footprint being visible in the historic imagery. The airport on the southern side of the road has undergone further development. The site immediately northwest of the present day site has also been stripped and appears to be gravel.

**1994** – Significant development of the site and surrounding area has occurred. The commercial building has now been completed and is surrounded by car parks. General changes in the area include the construction of new roads and residential dwellings.

**2005** – The site itself remains largely unchanged however significant residential development has occurred on the northern side of Kapiti Road. The area immediately south of Kapiti road has undergone further development.

**2007** – Minimal changes noted.

**2010** – Minimal changes noted to the site; however, a new structure is noted on the adjacent site to the north.

**2017** – Again little change to the site; however, further development of the adjacent site to the north is noted as well as demolition of the buildings to the south of Kapiti Road.

## 7.2 Certificate of Titles

The following information, presented in Table 1, held by Land Information New Zealand (LINZ), has been considered in determination of historic land ownership of the address of 160 Kapiti Road, Paraparaumu.

**Table 1: LINZ Records**

Address	Identifier	Date of Issue	Prior References:	Legal Descriptions	Proprietors	Original Proprietors
160 Kapiti Road	WN32A/397	12 February 1988	-WN8A/1200 -WN8B/319	Lot 1 DP 63027	Ballinger Industries Ltd	Te Roto Properties Ltd

A copy of the Certificate of Title is attached in Appendix C.

### 7.3 Kapiti Coast District Council (KCDC) Property Files

Information obtained from the KCDC relates to Resource and Building Consents / Permit issued for developments that have occurred across the land parcel of Lot 1 DP 63027 (160 Kapiti Road). Where considered relevant additional notes have also been included, details of items of interest are as follows in Table 2.

**Table 2: Resource & Building Consents / Permit Issued**

Company	Date	Document Type	Document ID	Purpose
Placemakers	29.10.1987	Building Permit	71141	New Factory Building
	09.02.1988	Building Permit	38195	New Commercial Building
	17.05.1988	Building Permit	15013	Sign
	23.07.1992	Building Permit	010	Partitioning & Mezzanine Floor
	26.07.1993	Building Consent	930731	Alterations to entrance.
	08.04.1994	Building Consent	941634	Alterations to existing structure
	07.09.1995	Building Consent	950803	New Building.
	01.06.1999	Building Consent	990652	New Dry Timber Shed
	18.02.2005	Building Consent	041416	Alterations to Retail Area
	10.08.2009	Building Consent	080796	Extension to Showroom
Capital City Ford	10.05.1993	Building Consent	930358	New Vehicle Workshop & Showroom
	13.07.1993	Building Consent	930742	New Sign
	19.09.1994	Building Consent	942417	New Sink & Sewer Connection
	12.09.2002	Building Consent	021202	Extension to Workshop.
Capital (Formally Repco)	20.06.1997	Building Consent	970562	New Commercial Building

The information provided is directly related to the given address of 160 Kapiti Road, Paraparaumu. It should be noted that further information may exist under former land parcels or property titles and supplementary information may exist which may not be available to us at the time of writing this report. Selected Property File documents are attached in Appendix C.

### 7.4 Selected Land-Use Register (SLUR)

A search enquiry was carried out of the Greater Wellington Regional Council (GWRC) Selected Land Use Registry (SLUR) regarding files from their database relating to pollution/contamination incidents within the subject site. Received records indicate that no information relating to Hazardous Activities and Industries List (HAIL) classification or activities on the site of 160 Kapiti Road, Paraparaumu are recorded in the SLUR.

However, due to the nature of the previous and existing operations at the site, which include an automotive sales and service centre (Capital City Ford) as well as a commercial trade and timber store (Placemakers), the following HAIL Categories are considered appropriate for the site.

HAIL Category	HAIL Activity
A - Chemical manufacture, application and bulk storage	<b>A.18</b> - Wood treatment or preservation including commercial use of antiseptics during milling or bulk storage of treated timber outside (Placemakers)
A - Chemical manufacture, application and bulk storage	<b>A.17</b> - Storage tanks or drums for fuel, chemicals or liquid waste (Capital City Ford)
F - Vehicle refuelling, service and repair	<b>F.4</b> - Motor vehicle workshop (Capital City Ford)

Additionally, the neighbouring Firths Concrete Ltd site located at 15 Birmingham Street towards the rear of 160 Kapiti Road, Paraparaumu is listed under HAIL Category E.4 – Commercial concrete manufacture or commercial cement storage.

## 7.5 Summary of Site Historical Information

The PSI identified the following on-site environmental conditions associated with the site:

- The site is generally sealed and near level with several existing commercial structures occupying the site which include car dealership with automotive sales and service centre (Capital City Ford), a Carpet Store (formerly Repco) and also a former trade and timber store (formerly Placemakers);
- Based on available historical photographs the site appears to have been used for pastoral operations purposes prior to the late 1980s, at which time the site was developed for commercial purposes with construction of one warehouse type structure, which was used for storage and sale of treated timber;
- According to property files, the site was initially developed in approximately 1987 with construction of a commercial warehouse structure occupied by Placemakers; additional structures were also constructed at a similar time including a car dealership and automotive parts shop; and
- GWRC has not listed property of 160 Kapiti Road, Paraparaumu as HAIL. However, due to the commercial operations carried out at the site, the following HAIL categories are considered to apply based on information obtained as part of this investigation: A.18 - Wood treatment or preservation including commercial use of antisapstain chemicals during milling or bulk storage of treated timber outside, A.17 – Storage tanks or drums for fuel, chemicals or liquid waste and F4 – Motor vehicle workshop.

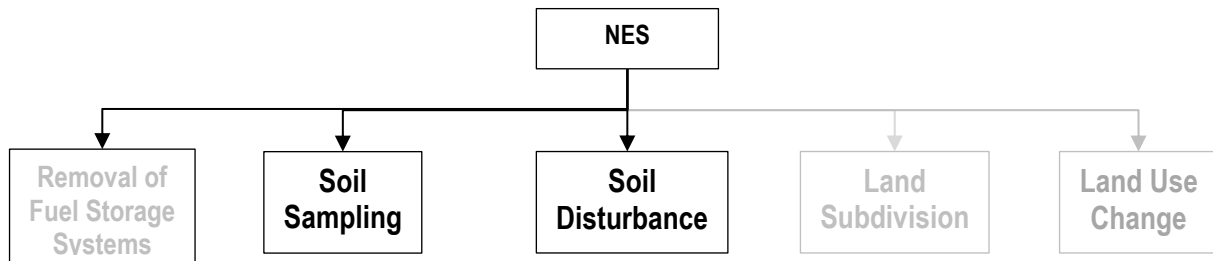
## 7.6 Summary of Previous Land Use

Based on the information obtained and reviewed as part of this investigation, we understand that the site has historically been used for pastoral operations prior to the late 1980s. After which time the site was developed for commercial purposes and several new structures constructed. The structures included a moderately sized warehouse structure occupied by Placemakers and used for the sales and storage of treated timber as well as two other structures used by Capital City Ford as car dealership/service centre and another structure used by Carpet Court (formerly Repco) for the sale of residential and commercial carpets sales.

Due to the nature of the historical and current operations, Heavy Metals (HM), Polycyclic Aromatic Hydrocarbons (PAH), Total Petroleum Hydrocarbons (TPH) and/or Pentachlorophenol (PCP) associated with the storage of fuel/oils as well as treated timber may be present in soils in particular within the vicinity of the former timber yard and automotive service centre.

## 8 National Environmental Standard (NES)

The proposed development will consist of activities wherein site soils are likely to be disturbed and/or potentially transported (or reused) at another location. Below is a schematic diagram of activities covered by the National Environmental Standards (NES), wherein the proposed activity on the site falls under the category of Soil Disturbance and Soil Sampling.



The NES would apply to the proposed activity within the site. This is based on the information gathered and reviewed, which indicated evidence of potentially land-contaminating activities on the site. The HAIL activities depending on location across the site consist of the storage of treated timber, motor vehicle workshop and associated storage of tanks or drums for fuels, chemicals or liquid waste. Due to the historic and existing activities on site, the potential for contamination exists, of which the extent and presence could not be ascertained without onsite testing.

A Detailed Site Investigation (DSI) with sampling of soils is recommended to assess potential for contamination of site soils.

## 9 Conclusions and Recommendations

A PSI was conducted for the site. The PSI encompassed the establishment of the site history and potential for soil contamination based on available information and review of available KCDC and GWRC, which indicated:

- Historical activities undertaken on the site included pastoral operations up until the late 1980s, at which time the site was developed for commercial purposes including automotive and treated timber operations, which are listed as HAIL under Categories A.17, A.18 and F.4;
- The property has generally been in its present state since the late 1980s with several changes to businesses;
- No documentation relating to contamination incidents, spills or remedial actions have been noted; and
- The depth of groundwater is not known; however, the migration of contaminants through surface waters and groundwater flow is considered possible due to close proximity of the sea level and by inundation of the land.

Contamination of site soils in regard to risk to human health is possible based on historical land-use and activities of which the concentration and extent could not be ascertained without further investigation and analysis of site soils.

A DSI to ascertain the potential and/or extent of contamination present in the soils is been recommended. This recommendation is based on the findings of this report and available data, which has identified activities or land-use which could lead to the possibility of subsoil contamination.

## 10 Limitations

This report has been prepared for the sole benefit of our Client, Woolworths New Zealand Limited. It is based upon the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. Professional judgments expressed herein are based on the currently available facts within the limits of the existing data and scope of work.

This report may be used by the KCDC and/or GWRC or their appointed Consultants, if required, and may be relied upon when considering a Resource Consent application in association with a future development. The data and/or opinions contained in this report may not be used in other contexts or for any other purpose without our prior review and agreement. Any additional future development may require further work.

It will also be the client's responsibility to notify all parties, such as KCDC and GWRC. Furthermore, a copy of any completed intrusive investigation report should be supplied to the local and regional Council on completion of the investigation to keep on their records.

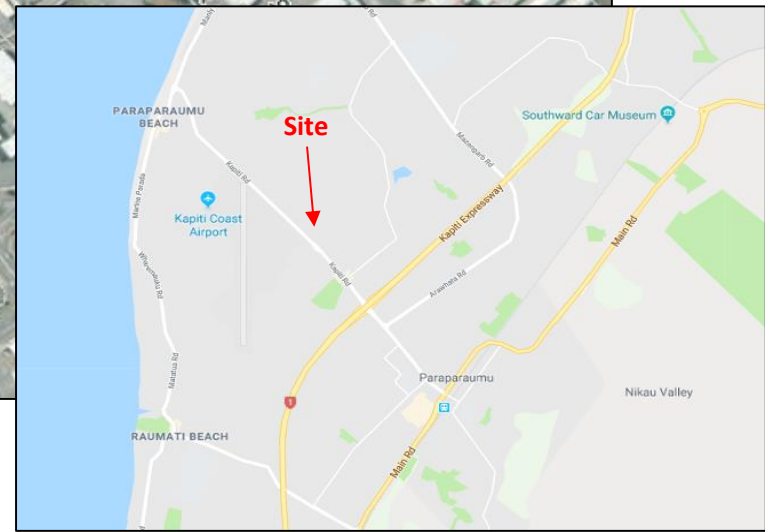
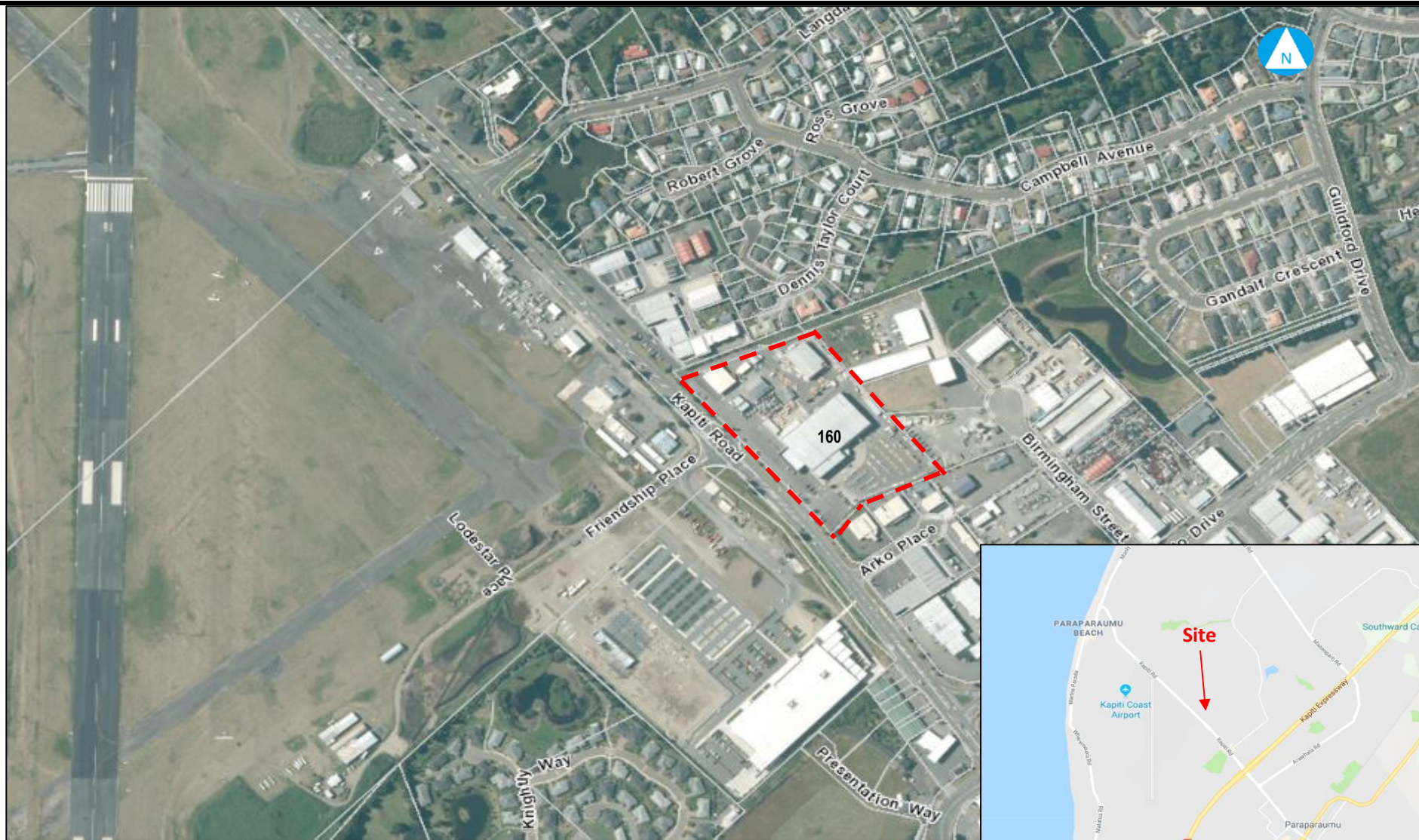
## 11 References

- (i) New Zealand Geotechnical Database (NZGD), Available at <https://nzgd.com> [accessed 5/09/2018]
- (ii) Kapiti Coast District Council District Plan Maps, Available at <https://www.kapiticoast.govt.nz/> [accessed 4/09/2018]
- (iii) NZGS, 2005. Field Description of Soil and Rock. Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes, NZ Geotechnical Society Inc, Wellington, New Zealand.
- (iv) NZS 1170.5:2004, 2004. Structural Design Actions Part 5: Earthquake Actions – New Zealand.
- (v) NZ Transport Agency, 2013. Bridge Manual SP/M/022
- (vi) Retrolens Historical Image Resource, Available at <http://retrolens.nz/Map/> [accessed 4/09/2018]
- (vii) Ministry for the Environment (MfE) Contaminated Land Management Guidelines No 1 – No 5, Available at <http://www.mfe.govt.nz/land/risks-contaminated-land/managing-contaminated-land/contaminated-land-management-guidelines;>
- (viii) Ministry for the Environment (MfE) •User Guide National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health;
- (ix) Ministry for the Environment (MfE) •Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (Revised 2011), Available at <http://www.mfe.govt.nz/publications/hazards/guidelines-assessing-and-managing-petroleum-hydrocarbon-contaminated-sites-new.com;>



## APPENDIX A

### SITE PLAN



**Notes:**

1. Soil & Rock Consultants Site Plan adapted from Greater Wellington Regional Council GIS and Google Maps
2. Locations of features are approximate only
3. Original sheet size A4 4. Buried services to be located prior to construction



DATE:	September 2018
DRAWN:	AB
SCALE:	NTS
CAD REF:	W18030-1.XLS

**SITE PLAN**  
**ENVIRONMENTAL SITE INVESTIGATION**  
**160 KAPITI ROAD**  
**PARAPARAUMU**

DRAWING NO:	<b>W18030</b>
SHEET	1 OF 1

## APPENDIX B

### AERIAL PHOTOGRAPHS

# Historical Imagery - 1981



**Notes:**

1. Soil & Rock Consultants Historical Imagery obtained from Retrolens.
2. Locations of features are approximate only and have been inferred based on aerial interpretations



DATE:	September 2018
DRAWN:	AB
SCALE:	NTS
CAD REF:	W18030/1981

**HISTORICAL IMAGERY  
ENVIRONMENTAL INVESTIGATION**  
160 Kapiti Road  
Paraparaumu

DRAWING NO:

**W18030/1981**

SHEET 1 OF 1

# Historical Imagery - 1987



## Notes:

1. Soil & Rock Consultants Historical Imagery obtained from Retrolens.
2. Locations of features are approximate only and have been inferred based on aerial interpretations



DATE: September 2018

DRAWN: AB

SCALE: NTS

CAD REF: W18030/1987

**HISTORICAL IMAGERY  
ENVIRONMENTAL INVESTIGATION**  
160 Kapiti Road  
Paraparaumu

DRAWING NO:

**W18030/1987**

SHEET 1 OF 1

# Historical Imagery - 1994



**Notes:**

1. Soil & Rock Consultants Historical Imagery obtained from Retrolens.
2. Locations of features are approximate only and have been inferred based on aerial interpretations



DATE:	September 2018
DRAWN:	AB
SCALE:	NTS
CAD REF:	W18030/1994

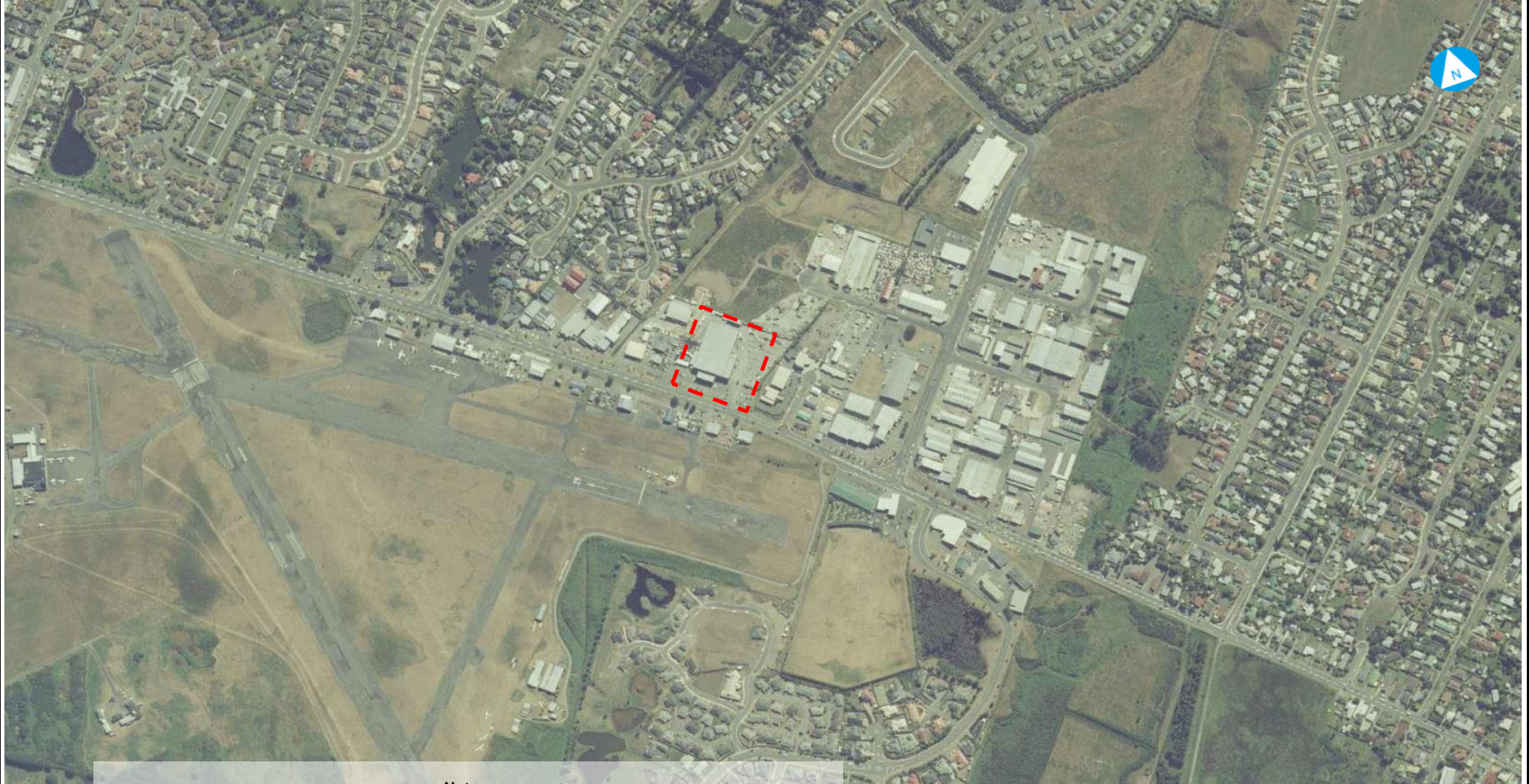
**HISTORICAL IMAGERY  
ENVIRONMENTAL INVESTIGATION**  
160 Kapiti Road  
Paraparaumu

DRAWING NO:

**W18030/1994**

SHEET 1 OF 1

# Historical Imagery - 2005



**Notes:**

1. Soil & Rock Consultants Historical Imagery obtained from Retrolens.
2. Locations of features are approximate only and have been inferred based on aerial interpretations



DATE: September 2018

DRAWN: AB

SCALE: NTS

CAD REF: W18030/2005

**HISTORICAL IMAGERY  
ENVIRONMENTAL INVESTIGATION**  
**160 Kapiti Road  
Paraparaumu**

DRAWING NO:

**W18030/2005**

SHEET 1 OF 1

# Historical Imagery - 2007



**Notes:**

1. Soil & Rock Consultants Historical Imagery obtained from Retrolens.
2. Locations of features are approximate only and have been inferred based on aerial interpretations
3. Original sheet size A4 4.



DATE:	September 2018
DRAWN:	AB
SCALE:	NTS
CAD REF:	W18030/2007

**HISTORICAL IMAGERY  
ENVIRONMENTAL INVESTIGATION**  
160 Kapiti Road  
Paraparaumu

DRAWING NO:

**W18030/2007**

SHEET 1 OF 1



# Historical Imagery - 2010



**Notes:**

1. Soil & Rock Consultants Historical Imagery obtained from Retrolens.
2. Locations of features are approximate only and have been inferred based on aerial interpretations
3. Original sheet size A4 4.



DATE:	September 2018
DRAWN:	AB
SCALE:	NTS
CAD REF:	W18030/2010

**HISTORICAL IMAGERY  
ENVIRONMENTAL INVESTIGATION**  
**160 Kapiti Road  
Paraparaumu**

DRAWING NO:

**W18030/2010**

SHEET 1 OF 1

# Historical Imagery - 2017



**Notes:**

1. Soil & Rock Consultants Historical Imagery obtained from Retrolens.
2. Locations of features are approximate only and have been inferred based on aerial interpretations
3. Original sheet size A4 4.



DATE: September 2018

DRAWN: AB

SCALE: NTS

CAD REF: W18030/2017

**HISTORICAL IMAGERY  
ENVIRONMENTAL INVESTIGATION**  
**160 Kapiti Road  
Paraparaumu**

DRAWING NO:

**W18030/2017**

SHEET 1 OF 1

# Historical Imagery - 1942



**Notes:**

1. Soil & Rock Consultants Historical Imagery obtained from Retrolens.
2. Locations of features are approximate only and have been inferred based on aerial interpretations
3. Original sheet size A4 4.



DATE:	September 2018
DRAWN:	AB
SCALE:	NTS
CAD REF:	W18030/1942

**HISTORICAL IMAGERY  
ENVIRONMENTAL INVESTIGATION**  
160 Kapiti Road  
Paraparaumu

DRAWING NO:

**W18030/1942**

SHEET 1 OF 1

# Historical Imagery - 1956



**Notes:**

1. Soil & Rock Consultants Historical Imagery obtained from Retrolens.
2. Locations of features are approximate only and have been inferred based on aerial interpretations
3. Original sheet size A4 4.



DATE:	September 2018
DRAWN:	AB
SCALE:	NTS
CAD REF:	W18030/1956

**HISTORICAL IMAGERY  
ENVIRONMENTAL INVESTIGATION**  
160 Kapiti Road  
Paraparaumu

DRAWING NO:

**W18030/1956**

SHEET 1 OF 1

# Historical Imagery - 1977



**Notes:**

1. Soil & Rock Consultants Historical Imagery obtained from Retrolens.
2. Locations of features are approximate only and have been inferred based on aerial interpretations



DATE:	September 2018
DRAWN:	AB
SCALE:	NTS
CAD REF:	W18030/1977

**HISTORICAL IMAGERY  
ENVIRONMENTAL INVESTIGATION**  
160 Kapiti Road  
Paraparaumu

DRAWING NO:

**W18030/1977**

SHEET 1 OF 1

**APPENDIX C**  
**CERTIFICATE OF TITLE (LINZ)**  
**&**  
**KAPITI COAST DISTRICT COUNCIL PROPERTY FILES**



# COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952



## Historical Search Copy

R. W. Muir  
Registrar-General  
of Land

**Identifier** **WN32A/397**  
**Land Registration District** **Wellington**  
**Date Issued** 12 February 1988

### Prior References

WN8A/1200                      WN8B/319

---

**Estate** Fee Simple  
**Area** 2.4555 hectares more or less  
**Legal Description** Lot 1 Deposited Plan 63027

### Original Proprietors

Ballingers Limited

---

### Interests

Subject to stormwater drainage rights (in gross) over part marked A on DP 63027 in favour of The Kapiti Borough Council created by Transfer 902900.2 - 12.2.1988 at 11.01 am

The easements created by Transfer 902900.2 are subject to Section 309 (1) (a) Local Government Act 1974

Appurtenant hereto is a sewage drainage right as specified in Easement Certificate 954936.4 - 11.10.1988 at 9.16 am

The easements specified in Easement Certificate 954936.4 are subject to Section 309 (1) (a) Local Government Act 1974

B622323.4 Mortgage to The National Bank of New Zealand Limited - 15.10.1997 at 3.31 pm

Appurtenant hereto is a right to drain stormwater created by Easement Instrument 6132890.6 - 1.9.2004 at 9:00 am

The easements created by Easement Instrument 6132890.6 are subject to Section 243 (a) Resource Management Act 1991

6226129.1 Change of Name of Ballingers Limited to Ballinger Industries Limited - 24.11.2004 at 9:00 am

8198049.1 Notification that a building consent issued pursuant to Section 72 Building Act 2004 identifies potential ponding area as a natural hazard - 17.6.2009 at 9:00 am

10212375.1 Variation of Mortgage B622323.4 - 21.10.2015 at 3:10 pm

References 8A/1200, 8B/319  
Prior C/T

Land and Deeds 69

Transfer No.  
N/C. Order No. 902900.1



REGISTER

No. 32 A / 397

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 12th day of February one thousand nine hundred and eighty-eight under the seal of the District Land Registrar of the Land Registration District of WELLINGTON

WITNESSETH that TE ROTO PROPERTIES LIMITED at Paraparaumu

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 2.4555 hectares more or less situate in the Borough of Kapiti being Lot 1 on Deposited Plan 63027

902900.2 Transfer granting Stormwater drainage rights (in gross) over the part herein marked "A" on Deposited Plan 63027 in favour of the Kapiti Borough Council - 12.2.1988 at 11.01 a.m. (Subject to Section 309(1)(a) Local Government Act 1974)



954936.4 Easement Certificate under Section 90A Land Transfer Act 1952.

TENEMENTS: DP 63992  
(unless otherwise stated)

NATURE	SERVIENT	DOMINANT
Sewage Drainage	Lot 2 'A'	Lot 1 DP 63027

- 11.10.1988 at 9.16 a.m. (Subject when created to Section 309(1)(a) Local Government Act 1974).

*[Signature]*  
A.L.R.

B622323.2 Change of name of the registered proprietor to Kapiti Village Limited

B622323.3 Transfer to Ballingers Limited

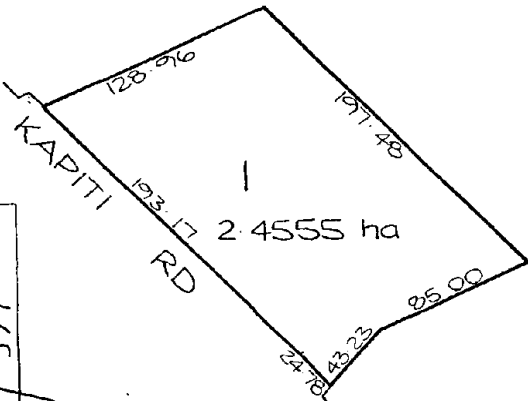
B622323.4 Mortgage to The National Bank of New Zealand Limited all 15.10.1997 at 3.31.

*[Signature]*  
for DLK

906837.1 Mortgage to The National Bank of New Zealand Limited - 3.3.1988 at 2.23 p.m.

DISCHARGED 1997  
*[Signature]*  
for DLK

*[Signature]*  
A.L.R.  
*[Signature]*  
A.L.R.



Measurements are Metric

No. 32 A / 397







# COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952



R. W. Muir  
Registrar-General  
of Land

## Search Copy

**Identifier** **WN32A/397**  
**Land Registration District** **Wellington**  
**Date Issued** 12 February 1988

### Prior References

WN8A/1200                      WN8B/319

---

**Estate**                      Fee Simple  
**Area**                        2.4555 hectares more or less  
**Legal Description**      Lot 1 Deposited Plan 63027

### Proprietors

Ballinger Industries Limited

---

### Interests

Subject to stormwater drainage rights (in gross) over part marked A on DP 63027 in favour of The Kapiti Borough Council created by Transfer 902900.2 - 12.2.1988 at 11.01 am

The easements created by Transfer 902900.2 are subject to Section 309 (1) (a) Local Government Act 1974

Appurtenant hereto is a sewage drainage right as specified in Easement Certificate 954936.4 - 11.10.1988 at 9.16 am

The easements specified in Easement Certificate 954936.4 are subject to Section 309 (1) (a) Local Government Act 1974

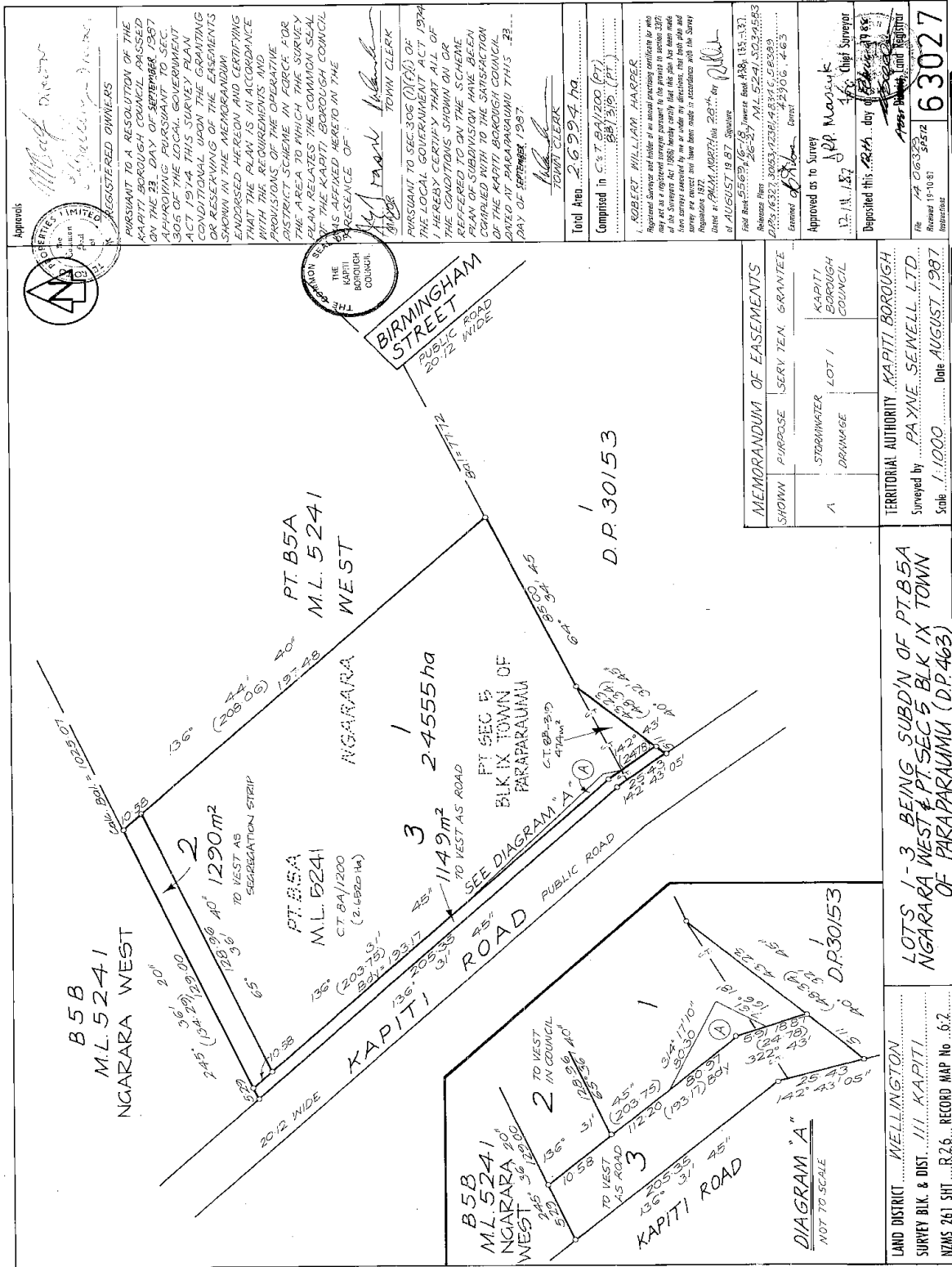
B622323.4 Mortgage to The National Bank of New Zealand Limited - 15.10.1997 at 3.31 pm

Appurtenant hereto is a right to drain stormwater created by Easement Instrument 6132890.6 - 1.9.2004 at 9:00 am

The easements created by Easement Instrument 6132890.6 are subject to Section 243 (a) Resource Management Act 1991

8198049.1 Notification that a building consent issued pursuant to Section 72 Building Act 2004 identifies potential ponding area as a natural hazard - 17.6.2009 at 9:00 am

10212375.1 Variation of Mortgage B622323.4 - 21.10.2015 at 3:10 pm



APPROVED AS TO SURVEY 17.11.187  
 DEPOSITED THIS 23.11.187  
 RE 14 063 2572  
 REFERENCE 63027

APPROVED AS TO SURVEY 17.11.187  
 DEPOSITED THIS 23.11.187  
 RE 14 063 2572  
 REFERENCE 63027

APPROVED AS TO SURVEY 17.11.187  
 DEPOSITED THIS 23.11.187  
 RE 14 063 2572  
 REFERENCE 63027

MAIN

Place Makers Factory  
& Shop.

LAND INFORMATION  
DATA COLLECTOR FORM

160-188 Kapiti Road  
Lot 1 DP 63027  
Lot 3 DP 63992

Property Address (Number and street)  
Legal Description (Lot and DP number)  
Valuation Role Reference (Section/Town/SD)

Valuation Role Reference

Zoning (Zone Name) IND 2.  
Planning Consent (Yes, file number)

Building Restrictions

Coastal

A. Building Restriction Line

B. Relocatable Zone

Height

A. Aerodrome

B. Other

Flood Risk/Other

Building Platform

(Yes/No/L)

Easements

(Yes/None)

Public Drain

(Yes/No)

Common Private Drain

(Yes/-)

Public Utility

(Yes/No)

Sewer Available

(Yes/No)

Sewer Connected

(Yes/No)

Water Available

(Yes/No)

Water Connected

(Yes/No)

Natural Gas Available

(Yes/No)

Natural Gas Connected

(Yes/No)

Electricity Available

(Yes/No)

Electricity Connected

(Yes/No)

BC 95083  
re Nail Factory  
Bldg  
still to have  
Final & CCC  
@ 21/5/99

7  
7  
7

EXISTING

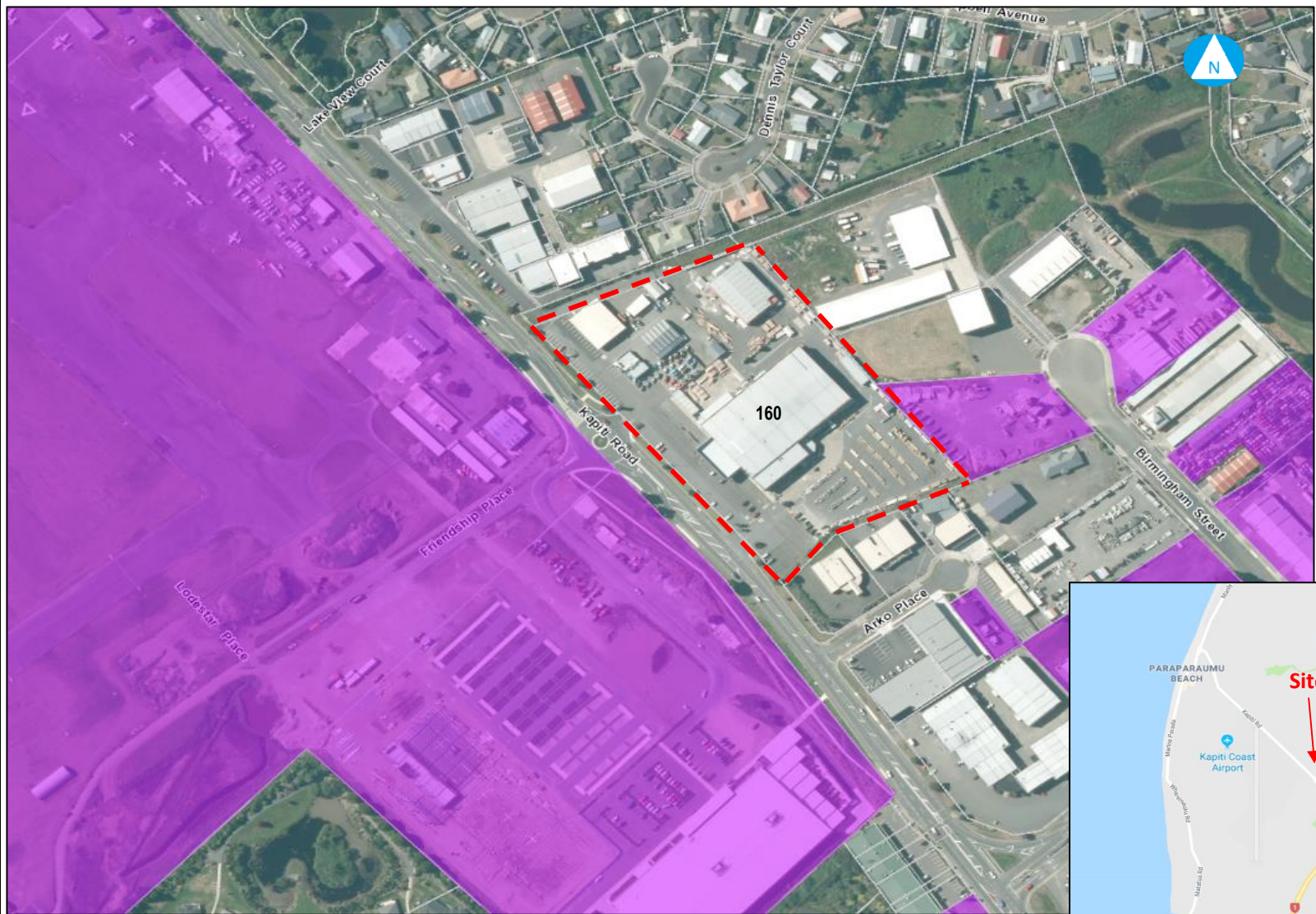
BUILDINGS	Date Permit Issued	Type	Area
1.	29-10-87	91141. Factory Building	800 s.m
2.	09-02-88	38195 Commercial Building	4300 s.m
3.	17-05-88	15013 Sign	
4.	23-07-92	010 Sub tenancy Partitioning & mezzanine floor	
5.	26-07-93	936731 after show room	
6.			

DISPENSATION GRANTED

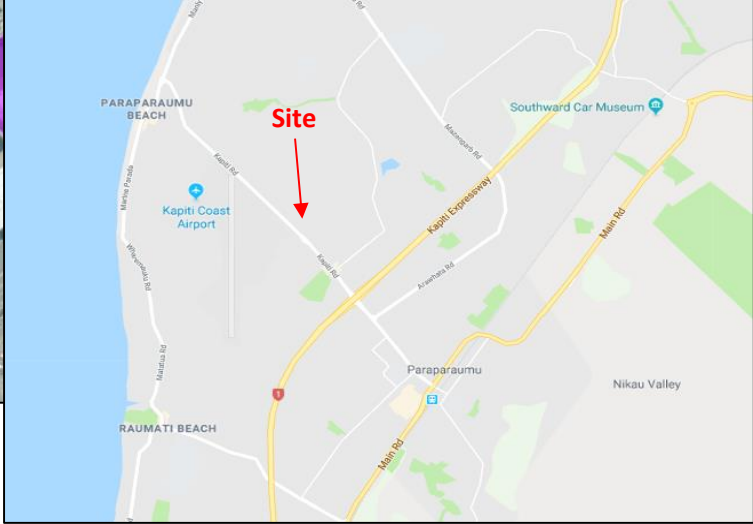
SPECIAL FACTORS

Building permit addenda dated 2/4/92 File 11/664  
" " " 26/1/93 " 25/575


**APPENDIX D**  
**CONTAMINATION ENQUIRY**  
**(GWRC)**



- Legend:**
- - - Approximate Property Boundary
  - SLUR Registered Site



- Notes:**
1. Soil & Rock Consultants Site Plan adapted from Greater Wellington Regional Council GIS and Google Maps
  2. Locations of features are approximate only
  3. Original sheet size A4 4. Buried services to be located prior to construction

	DATE: September 2018	<b>SELECTED LAND USE REGISTER</b> <b>GREATER WELLINGTON REGIONAL COUNCIL</b> <b>160 KAPITI ROAD</b> <b>PARAPARAUMU</b>	DRAWING NO:
	DRAWN: AB		<b>W18030</b>
	SCALE: NTS		SHEET 1 OF 1
	CAD REF: W18030-1.XLS		

## Appendix 10 – Planning Assessment

### 1. Site Information

Address	160 Kapiti Road, Paraparaumu
Land Area	Approx 2.6ha
Title	Lots 1 and 2 DP 63027, Lot 3 DP 63992
Relevant Interests on Title	Refer titles
Current Land Use	Vacant / industrial and retail – formerly Placemakers; northern portion occupied by Capital City Ford motor vehicle sales dealership, Carpet Court showroom and other retail and commercial service activities
Operative District Plan Zone	General Industrial
District Plan Notations	Designation for “plantation reserve” (KCDC-031) – see Figure 2 Transportation Noise Effects Route – see Figure 3 Road hierarchy – major community connector (Kapiti Road) – see Figure 3
Hazards known to Council	Contaminated site Flooding (ponding) (see Figure 4)
Other Information	N/a

Figure 1 - Aerial Photograph of Site (site boundaries approximate)

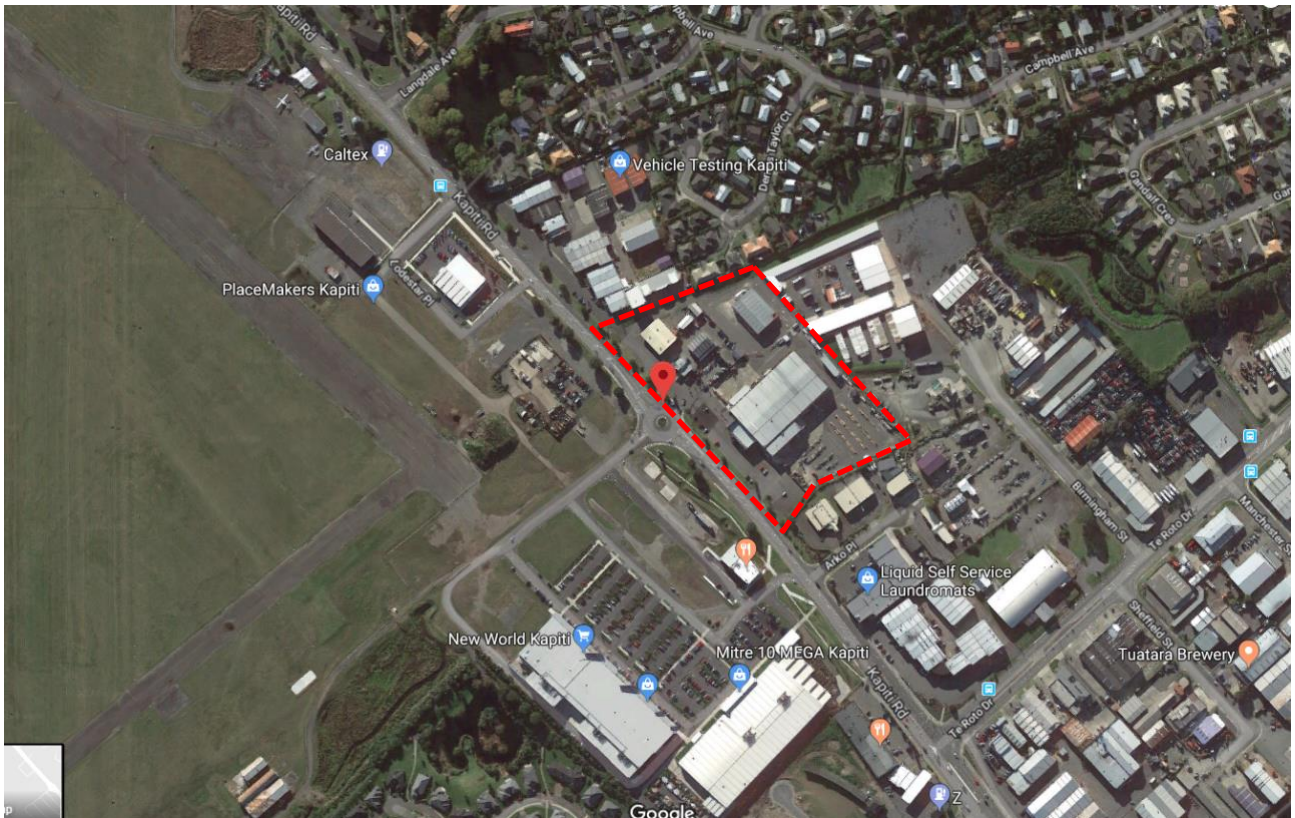


Figure 2 - Operative District Plan 2021 Zoning (site outline in black and white)

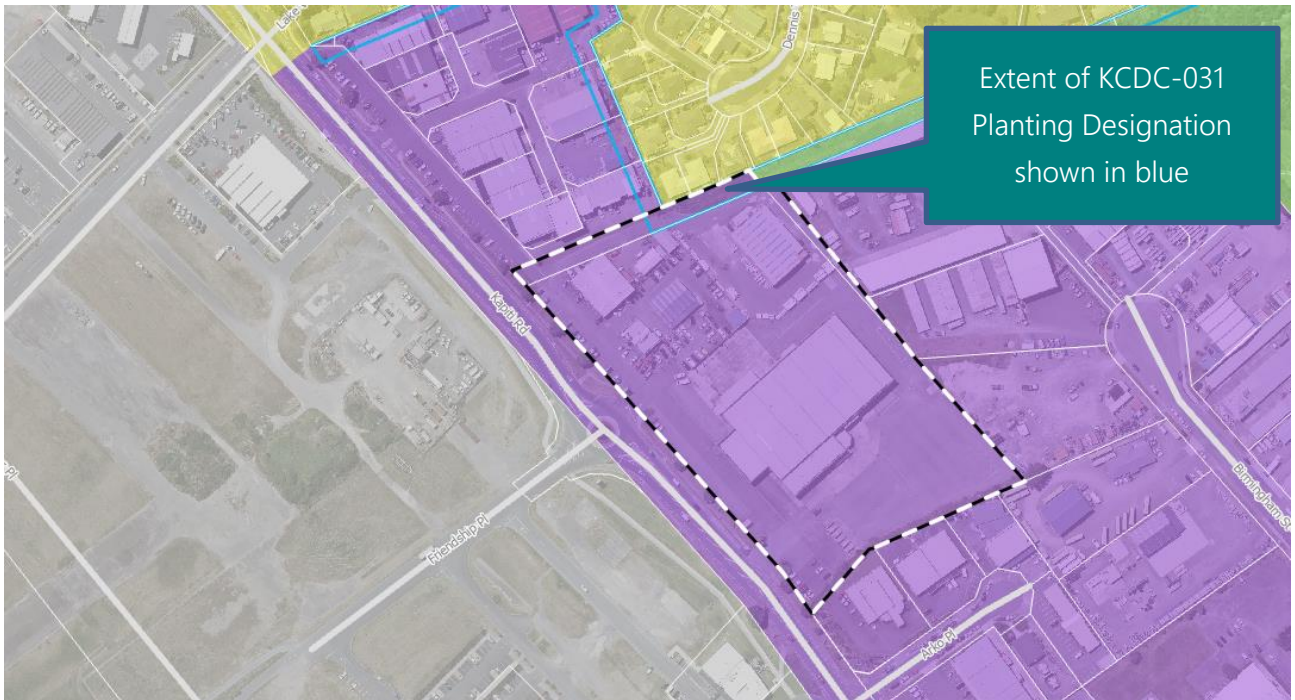


Figure 3 – Other ODP Notations





Figure 4 – Flood hazards map (site outlined in black and white)



## 2. NES – Managing Contaminants

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (“NES – Contamination”) apply because parts of the site are likely to have been used in the past for an activity described in the Ministry for the Environment’s Hazardous Activities and Industries List (namely industrial activities, trade waste and petroleum tanks).

The proposal to change the use of land on either site and large-scale land disturbance. A preliminary site investigation has been carried out and it concludes as follows:

*A PSI was conducted for the site. The PSI encompassed the establishment of the site history and potential for soil contamination based on available information and review of available KCDC and GWRC, which indicated:*

- *Historical activities undertaken on the site included pastoral operations up until the late 1980s, at which time the site was developed for commercial purposes including automotive and treated timber operations, which are listed as HAIL under Categories A.17, A.18 and F.4;*

- *The property has generally been in its present state since the late 1980s with several changes to businesses;*
- *No documentation relating to contamination incidents, spills or remedial actions have been noted; and*
- *The depth of groundwater is not known; however, the migration of contaminants through surface waters and groundwater flow is considered possible due to close proximity of the sea level and by inundation of the land.*

*Contamination of site soils in regard to risk to human health is possible based on historical land-use and activities of which the concentration and extent could not be ascertained without further investigation and analysis of site soils.*

*A DSI to ascertain the potential and/or extent of contamination present in the soils is recommended. This recommendation is based on the findings of this report and available data, which has identified activities or land-use which could lead to the possibility of subsoil contamination.*

Given a detailed site investigation has not been carried out and testing cannot accurately determine the extent of potential contamination until the existing buildings on-site are demolished, it is assumed consent will be required under the NES – Contamination for a discretionary activity, pursuant to Regulation 11(2).

### 3. Regional Plan

Consents may be required under the relevant regional plans in respect of stormwater discharge, and potentially flooding or overland flow and contamination. Consents will therefore be applied for in due course.

## 4. Operative District Plan

### 4.1. Status and Applicability

The Council released Decisions on the Proposed District Plan (“PDP”) in 2017 and as of August 2020, all appeals have now been settled.

For this reason, applications for consent will be required under the now operative District Plan 2021 (“ODP”) and no matters under the formerly operative District Plan remain “live” or require consent in relation to this proposal.

## 5. Operative District Plan 2021

### 5.1. Rule Compliance

Rule	Comment	Resource Consent
Part 2 District-Wide Matters		
Hazards and Risks		
Contaminated Land		
For areas containing contaminated and potentially contaminated land as defined under the NES – Contamination, the NES applies in its entirety.		
Natural Hazards		
NH-Flood Flood Hazards		
NH-Flood-R1	Any activity not specified as a permitted, controlled, restricted discretionary, discretionary, non-complying or prohibited activity and where the activity complies with all permitted activity standards below	
NH-Flood-R2	Any building or structure in any zone, subject to standards below a. buildings shall not be sited within a river corridor or stream corridor b. buildings must not be sited within 5m of a lake	Complies
NH-Flood-R3	New or relocated buildings in ponding, residual ponding and shallow surface flow areas, subject to: 1. the building floor level shall be constructed above the 1% AEP flood event level	Complies
NH-Flood-R4	Earthworks except where associated with the matters listed below – permitted 1. maintenance of a watercourse or stormwater control 2. activities permitted under NH-Flood-R6 3. maintenance activities within legal road 4. private farm tracks..	Exceptions apply – see below

Rule	Comment	Resource Consent
	5. residual ponding areas where permitted activity standards in EW- Earthworks are complied with 6. earthworks subject to NH-Flood-R8 (i.e within a flood storage or fill control area) 7. extractive industries 8. removal or replacement of underground fuel storage tanks 9. N/A	
	Standards 2. In ponding areas, earthworks: a. shall not involve disturbance of more than 20m <sup>3</sup> (vol) in any 10 year period b. shall not alter original ground level by more than 1m	Does not comply – permitted threshold for earthworks in ponding area exceeded
NH-Flood-R5	Fences in the overland flow path shall be post and wire and shall not impede the free flow of flood waters	N/A – only ponding area shown on planning maps, not overland flow
NH-Flood-R6	Flood protection, erosion control and natural hazard mitigation measures including associated structures ....	N/A – Open Space zones etc
NH-Flood-R7	N/A	
NH-Flood-R8	Development and earthworks within any flood storage or fill control area, subject to: 1. Equivalent compensatory storage or another solution to achieve hydraulic neutrality shall be created 2. Development proposals shall be accompanied by sufficient hydraulic modelling of relevant streams to fully test consequences 3. building floor level shall be constructed above 1% AEP flood event level	Does not apply given site subject to ponding rather than identified as floor storage. Notwithstanding, compliance achieved through compensatory storage.
NH-Flood-R9	Any activity listed as a permitted or controlled activity that does not comply with one or more of the associated standards – restricted discretionary	Consent required – restricted discretionary activity (see R11)
NH-Flood-R10	In an overflow path, earthworks which do not comply with the permitted activity	N/A – ponding only, no overflow path identified on site

Rule	Comment	Resource Consent
	standards under NH-Flood-R4 – restricted discretionary	
NH-Flood-R11	In a ponding area which do not comply with one or more of the permitted activities under NH-Flood-R4 – restricted discretionary	Consent required – restricted discretionary activity to exceed earthworks threshold in ponding area
NH-Flood-R12-R19	N/A	
General District Wide Matters		
EW – Earthworks		
EW-R1	Any activity that complies with all permitted activity standards	Does not comply – volume exceeded – see below.
EW-R2	<p>Earthworks must not be undertaken:</p> <ul style="list-style-type: none"> <li>a. on slopes of more than 28 degrees; or</li> <li>b. within 20m of a waterbody</li> </ul> <p>In all other areas except as provided for in Std 3, earthworks must not:</p> <ul style="list-style-type: none"> <li>a. disturb more than 50m<sup>3</sup> (vol) of land per subject site within a 5 year period</li> <li>c. alter the original ground level by more than 1m, measured vertically</li> </ul> <p>Any earthworks must ensure that:</p> <ul style="list-style-type: none"> <li>a. surface runoff from the subject site is isolated from other subject sites and existing infrastructure; and</li> <li>b. the potential for silt and sediment to enter the stormwater system or waterbodies is minimised; and</li> <li>c. erosion and sediment control measures are installed and maintained for the duration of the construction period</li> </ul> <p>Accidental discovery protocols apply</p>	Does not comply – volume exceeded. All other standards met.
EW-R3	N/A	
EW-R4	N/A	
EW-R5	Earthworks not complying with one or more of the permitted activity standards in EW-R2 or EW-R3	Restricted discretionary activity consent required. Volume to exceed 50m <sup>3</sup> .
EW-R6-R9	N/A	

Rule	Comment	Resource Consent
SIGNS		
SIGN-R1	Signs in all zones meeting general permitted activity standards and relevant zone-specific standards – excluding R10	
	<p>Standards:</p> <ol style="list-style-type: none"> <li>1. All signs must be displayed on subject site...</li> <li>2. All free-standing signs within 10m of a vehicle access must be set back 1.5m from road boundary</li> <li>3. All free-standing signs on a corner subject site must be set back at least 10m from the intersection of two roads</li> <li>4. All signs must have external lighting permanently fixed, i.e not flashing</li> <li>5. N/A</li> <li>6. Must not be located and positioned for purpose of being viewed from airspace</li> <li>7. Not emit sound</li> <li>8. Digital / electronic signs must not exceed 0.6m<sup>2</sup> in area and shall be limited to 2 non-moving or changed words</li> <li>9. N/A</li> <li>10. – 14 N/A</li> </ol>	<p>Does not comply – consent required under Standard 8 – digital signs adjacent Pick up area proposed – 2x 0.8m<sup>2</sup> (55 inch) screens with changeable messaging)</p> <p>All other standards complied with</p>
SIGN-R2-R7	N/A	
SIGN-R8	<p>Max total area of signage per business premises / tenancy shall not exceed 5m<sup>2</sup></p> <p>Sites may have 1 free-standing sign per road frontage; doesn't exceed 6m in height, 5m<sup>2</sup> in area; limited to name and logo of businesses, hours of operation</p>	Does not comply – consent required – area on building and area and height of free-standing sign exceeds permitted thresholds
SIGN-Table 2	Free-standing directional signs – 1m in height and 0.5m <sup>2</sup> in area; limited to directional arrows and words "entry" or "exit" or equivalent	Does not comply – consent required
	Wall or window signs on ground floor level – max 20% of wall or max general permitted activity area standard, whichever is the lesser	Does not comply – consent required

Rule	Comment	Resource Consent
	Signs above ground floor level of any building – max one sign	N/A
	Parapet signs – total area no more than 50% of area or max area of signage permitted under general standards, whichever is the lesser	Does not comply – consent required
SIGN-R9 – R10	N/A	
SIGN-R11	Any sign that is expressly provided for as a permitted activity but does not meet one or more of the general permitted activity standards or relevant zone-specific standards	Consent required – restricted discretionary activity
SIGN-R12-R17	N/A	
NOISE		
NOISE-R1-R4	N/A	
NOISE-R5	Noise from activities located with the General Industrial zone – comply with Table 5 below (exceptions include emergency plant, vehicles on public roads and warning devices for emergency services)	
NOISE-Table 5	When measured at boundary of Residential zone: 7am – 7pm: 50dB 7pm – 10pm: 45dB 10pm – 7am: 40dB When measured at boundary or within General Industrial zone: 7am – 7pm: 60dB 7pm – 10pm: 55dB 10pm – 7am: 55dB	Complies – condition can address and distance to nearest residential assists
NOISE-R6-R9	N/A	
NOISE-R10	Construction noise must comply with NZS 6803:1999	Likely to be able to comply – condition can address
NOISE-R11-R20	N/A	
NOISE-R21	Any activity that is not identified and does not comply with one or more standard – discretionary	N/A

Rule	Comment	Resource Consent
NOISE-R22-R26	N/A	
TRANSPORT		
TR-R1	N/A	
TR-R2	Vehicle movements – up to 100 vpd on major community connector routes	Does not comply – consent required.
TR-R3	Every site must provide vehicular access over land or by mutual right of way or service lane for parking and/loading	Complies
	All vehicle accesses must be designed, constructed and maintained to ensure that they are able to be used in all weather conditions; have no adverse impact on roadside drainage; and surface water and detritus does not migrate onto highway pavement	Complies
	Access must be a minimum of 3.5m wide, except as set out below	Complies
	Non-residential sites with more than 6 car parks must provide a two-way access of min 6m width	Complies
	Access to and from state highway	N/A
	Access spacing – 30m min between crossing and intersection	Complies
	Access spacing for major traffic activities – see Table 2	Complies
	Sight distances – see Plan	Likely to comply
	Manoeuvring – see Plan	Likely to comply
	Loading – layout must comply with 90 percentile design two axled truck and Diagram 7	Complies
	Landscaping – all non-residential activities shall provide 2m landscaped width between adjoining sites and parking, loading or trade vehicle storage area	Does not comply – consent required
	Landscaping – all landscaping adjoining road boundary must be designed and maintained so that sight distances achieved	Complies



Rule	Comment	Resource Consent
TR-Table 1	N/A – excludes retail and industrial activities	
TR-Table 2	Access distance dimensions – See Plan	Complies
TR-Table 3	Sight distances – See Plan	Complies – see Transport Assessment
TR-Table 4	N/A	
TR-R4	All parking must be formed, marked out and maintained for use in all weathers; surface water must be managed; vehicles must use formed access point	Complies
TR-R5	Above plus avoid reverse manoeuvring	Complies
	2m wide strip must be formed along the front yard of any car parking area which shall be landscaped to create a visual and physical barrier between the car park area and the road	Complies
	Design for any critical access conditions to accommodate 99 percentile design and comply with Diagram 6	Complies
TR-R6	Heavy trade vehicle access must be designed and constructed to carry the volume and weight of that traffic; surface must be constructed to same standard as carriageway; designed so no heavy trade vehicle has to cross the centre line when making a left turn	Complies
TR-R7-R8	N/A	
TR-Table 5	Min sight distance from access	Complies – see Transport Assessment
TR-Table 6	Min width 6m Max width 9m	Does not comply – consent required – exceeds maximum width of 9m
TR-R9	N/A	
TR-R10	Vehicle movements that do not meet the permitted activity standards – restricted discretionary	Consent required – restricted discretionary activity and Transport Assessment and Travel Plan provided
TR-R11	Any activity which is not permitted, controlled, restricted discretionary or non-complying – discretionary	Consent required – discretionary activity for non-compliance with R3 regarding landscaping of car park to adjacent boundaries
TR-R12	N/A	

Rule	Comment	Resource Consent
TR-R13	Any activity that does not meet any one or more of the permitted activity standards under Rules R4, R5, R6, R7 – discretionary	Complies – no consent required
TR-R14-17	N/A	
TR-Park-R18	Any activity requiring more than 2 car parks – permitted	Complies
TR-Park-R19-20	N/A	
TR-Park-R21	Trade retail requires 3 car parks per 100m <sup>2</sup> GFA	24 parks required – 211 total provided
TR-Park-R22	N/A	
TR-Park-R23	Supermarkets require 5 car parks per 100m <sup>2</sup> GFA	180 parks required – 211 total provided
TR-Park-R31	Shred use of car park by different activities on the same site unable to comply with permitted activity rules under TR-Park – controlled	N/A – parking complies
TR-Park-R32	Any activity which is not permitted or controlled – discretionary	Consent required under R10 and R11 – discretionary overall
Part 3 Area Specific Matters		
Zones		
General Industrial Zone		
GIZ-R1	<p>Any activity that is a permitted activity under the rules in this chapter, provided the following standards are complied with:</p> <ol style="list-style-type: none"> <li>Hours of operation for business activity adjoining or facing residential zones shall be limited to Mon to Sat 7am to 11pm, except during public holidays where no industrial activities will take place</li> <li>N/A</li> <li>2m landscaped strip along front boundary; landscaping shall also be provided in side and rear yards where they adjoin a residential or centres zone</li> </ol>	Complies – noting the “site” does not adjoin residential zones and 2m landscaped strip to front boundary provided

Rule	Comment	Resource Consent
	4. Must not cause objectionable or offensive odour, dust or smoke beyond boundary of site 5. 10 lux maximum, measured 1.5m inside boundary of adjoining residential zone 6. Clear of rubbish etc 7. N/A	
GIZ-R2	Any activity not specified so long as complies with permitted activity standards – permitted	
GIZ-R3	Industrial activities – permitted	
GIZ-R4-R6	N/A	
GIZ-R7	Retail activities are limited to ancillary retail with max retail floorspace of 100m <sup>2</sup> or max building coverage of 20%; service stations; trade supply retail and yard based retail which has a max retail floorspace of 500m <sup>2</sup> ; or food and beverage outlets (with limits)	Does not comply – supermarket not ancillary and exceeds GFA threshold; trade supply retail complies at 400m <sup>2</sup> per tenancy
GIZ-R8-R9	N/A	
GIZ-R10	Any activity listed as permitted or control and which does not comply with associated standards – restricted discretionary	
GIZ-R11 – R14	N/A	
GIZ-R15	Trade supply retail with a retail floor space greater than 500m <sup>2</sup> – restricted discretionary activity	Does not apply – each tenancy measures 400m <sup>2</sup>
GIZ-R16-R21	N/A	
GIZ-R22	Retail activities that do not comply with permitted activity standards – non-complying	Consent required – non-complying activity
Designations		
Designation KCDC-031 applies to north-eastern corner of site and is required as a “plantation reserve”, defined as (with Council the Requiring Authority):		

Rule	Comment	Resource Consent
		<p><i>means an area of land to be covered in trees and other landscaping as a means of providing mitigation between potentially conflicting land use activities, or as a method to improve terrestrial or aquatic ecological values. Plantation reserves may also include ancillary passive recreation facilities, such as footpaths, boardwalks, lighting, benches and other street furniture</i></p>