

**Before the Independent Hearings Panel
For Wellington City Council**

Under The Resource Management Act 1991

In the matter An application for resource consent for an extension to the existing car parking area of the Khandallah New World supermarket at 26 Ganges Road, 3 Dekka Street, 31-33 Nicholson Road, Khandallah

**Statement of Evidence of Sumin Wang on behalf of Foodstuffs North
Island Limited – Stormwater**

Date: 15 April 2024



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INTRODUCTION

- 1 My full name is Sumin Wang. I am a Senior Civil Engineer at Egis NZ Limited (**Egis**), based in Egis' Auckland office.
- 2 I am providing stormwater design evidence on behalf of the Applicant, Foodstuffs North Island Limited (**FSNI**).

QUALIFICATIONS AND EXPERIENCE

- 3 I hold a Bachelor of Engineering Mechanics degree from the Harbin Institute of Technology located in Harbin, Heilongjiang, China, which I obtained in 1983.
- 4 I am a New Zealand Chartered (Civil) Engineer with over 40 years of experience in New Zealand and abroad. I have been involved in all facets of the land development process, including feasibility studies, land use design and assessments, project management and Resource Management Act 1991 (**RMA**) consenting for infrastructure works.
- 5 I am the Senior Design Engineer for a number of commercial developments, including carparks requiring specific stormwater management. Noted projects include:
 - Commercial building development at 131 Boundary Road, Blackhouse Bay, Auckland;
 - 47-49 George St, Newmarket Auckland - Office Development;
 - 21 Oak Road, Auckland – Warehouses;
 - 12-26 Hindmarsh Street, Johnsonville, Wellington – Residential Units;
 - Napier Hospital Redevelopment, Napier;
 - Airport Foodtown, Manukau; and
 - Bluebird Warehouse, Wiri, Auckland.

CODE OF CONDUCT FOR EXPERT WITNESSES

- 6 I have read the Code of Conduct for Expert Witnesses (**Code of Conduct**) set out in the Environment Court of New Zealand's Practice Note 2023. I have complied with all relevant aspects of the Code of Conduct in preparing my statement of evidence and I will continue to comply with it while giving oral evidence before the Independent Hearings Panel.
- 7 My qualifications and experience to assist as an expert are set out at paragraphs 1 – 5 above. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this statement of evidence are within my own area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

SCOPE OF EVIDENCE

- 8 This statement of evidence covers the existing and proposed stormwater run-off conditions on site and downstream of the proposed New World Khandallah carpark expansion (**the Proposed Carpark**) on the three residential lots. The stormwater package is including primary system, secondary system, stormwater quality and detention. I have been involved with this project as the design lead since FSNI sought advice on civil consulting services to design and support the resource consent application of the Proposed Carpark.
- 9 The issues raised in submissions include concerns about:
- 9.1 An increase of impervious surface may increase stormwater runoff onto Nicholson Road and at the intersection with Dekka Street, causing flooding in the public road and causing safety risks to the public;
- 9.2 Ongoing climate change may increase stormwater runoff from the site;

- 9.3 The existing stormwater pipes on Nicholson Road that are known to have failed and be long overdue for replacement. Submitters raised that additional surveys of the existing public stormwater network and its capacity to accommodate the additional volumes proposed should be undertaken prior to any consent application being determined;
- 9.4 A lack of stormwater detention on the Dekka Street parking area for the peak flows into the stream that runs past Khandallah Road;
- 9.5 Safeguarding the hydrology and ecology of the receiving waterway.

10 My statement of evidence addresses the following matters:

- 10.1 The existing stormwater infrastructure;
- 10.2 A summary of the proposed infrastructure;
- 10.3 Response to submitters on the topics of:
 - 10.3.1 Stormwater run-off, permeability and climate change considerations;
 - 10.3.2 Flooding at Nicholson Road and Dekka Street intersection;
 - 10.3.3 Stream flooding/peak flow by Khandallah Road; and
 - 10.3.4 Stormwater retention and quality.

- 11 In preparing my evidence I have considered the following:
- 11.1 The Calibre Infrastructure Report for the New World Khandallah Carpark Expansion dated 29 April 2022 (**Infrastructure Report**) including the 3D modelling, stormwater calculations and drawing attachments;¹
 - 11.2 The updated engineering drawings by Calibre, dated 23 August 2023;²
 - 11.3 High Intensity Rainfall Design System (HIRDS) V4 Rainfall Depth Surfaces New Zealand;³
 - 11.4 Regional Standard for Water Services by Wellington Water December 2021 V3.0 (Regional Standard);⁴
 - 11.5 Water Sensitive Design for Stormwater: Treatment Device Design Guideline by Wellington Water;⁵
 - 11.6 Reference Guide for Design Storm Hydrology Standardised Parameters for Hydrological Modelling;⁶
 - 11.7 Building Code – E1 Surface Water;⁷ and

¹ Calibre Consulting Limited "Infrastructure Report, New World Khandallah Carpark Expansion" (29 April 2022) Wellington City Council Public Notification: 26 Ganges Road, 3 Dekka Street and 31-33 Nicholson Road, Khandallah (Khandallah New World Carpark) Application Documents.

² Calibre Consulting Limited "Updated Engineering Drawings" (21 April 2022) Wellington City Council Public Notification: 26 Ganges Road, 3 Dekka Street and 31-33 Nicholson Road, Khandallah (Khandallah New World Carpark) Application Documents.

³ National Institute of Water and Atmospheric Research (NIWA) "High Intensity Rainfall Design System (HIRDS) Version 4.

⁴ Wellington Water "Regional Standard for Water Services" (December 2021) Version 3.0.

⁵ Wellington Water "Water Sensitive Design for Stormwater: Treatment Device Design Guideline" December 2019 Version 1.1.

⁶ Wellington Water "Regional Guide for Design Storm Hydrology" (9 April 2019).

⁷ New Zealand Building Code "E1 Surface Water" (5 November 2020) First Edition Amendment 11.

11.8 Wellington CC 1m Contours 2017.⁸

INVOLVEMENT WITH THE APPLICATION

12 I was engaged by FSNI to be the stormwater design lead of the project. I have personally reviewed and approved the Infrastructure Report, including the 3D model, stormwater calculations and drawings.

EXISTING STORMWATER INFRASTRUCTURE

13 The current existing stormwater infrastructure on the site is the private stormwater systems servicing the residential houses, which are:

13.1 Inlet structures including roof gutters, downpipes and inground sumps;

13.2 Private pipe systems; and

13.3 Discharge points to the kerb outlets on Dekka Road and Nicholson Street.

PROPOSED STORMWATER INFRASTRUCTURE

14 An updated civil drawing set, showing the most recent proposal, is attached to my evidence at **Attachment A**.

15 As reflected in these drawings, the stormwater infrastructure proposal includes the following, which I then outline in further detail below:

15.1 A collection and assessment of existing data, including Council GIS data for existing pipe systems and local

⁸ Wellington City Council "Wellington CC 1m Contours 2017".

flooding data, on site topographic survey, local rainfall data and the stormwater quality and mitigation product study.

15.2 Stormwater run-off design calculations, including:

(a) Stormwater quality flow calculations.

(b) Pipe capacity calculations.

(c) 10% AEP and 1% AEP peak flow calculations.

(d) Soil loss calculation to estimate sediment yield during construction period.

15.3 Proposed stormwater systems and devices, including:

(a) Two stormwater quality treatment devices (storm filters).

(b) One underground 4.2m³ detention tank for stormwater peak flow mitigation.

(c) Two pipe systems to collect and discharge 10% AEP stormwater run-off to Dekka Street kerbside and to the existing public pipe system on Nicolson Road.

(d) There is no change to the existing overland flow directions and levels.

16 Only Council approved materials have been proposed for the stormwater system to ensure safety in stormwater design.

17 To achieve the working order of the underground device, all underground devices will be operated and require ongoing maintenance as per device suppliers' specifications and at the consent holder's cost.

- 18 I outline below in further detail how this proposal is designed to have stormwater run-off from the site controlled and managed.

Rainfall Data

- 19 The rainfall intensities used for the stormwater flow calculations are as per HIRDS V4⁹ Historical Data + 20% (added to account for potential climate change impacts) in accordance with the Regional Standard for Water Services.¹⁰

⁹ National Institute of Water and Atmospheric Research (NIWA) "High Intensity Rainfall Design System (**HIRDS**) Version 4.

¹⁰ Wellington Water "Regional Standard for Water Services" (December 2021) Version 3.0.

Catchment Areas

- 20 The Proposed Carpark design adjusts the existing ground contours to comply with the supermarket carpark slope requirements as shown in Figure 1 Existing Catchments and Figure 2: Proposed Catchments below.
- 21 Existing and proposed catchment area details are shown in Table 1 below. The proposed catchment areas of Dekka Street have been reduced for both pervious and impervious areas, so the proposed discharge flows to Dekka Street have been reduced.
- 22 Nicholson Road stormwater discharge flows have been managed via on site mitigation as detailed in paragraph 23 below.

Figure 1: Existing Catchments

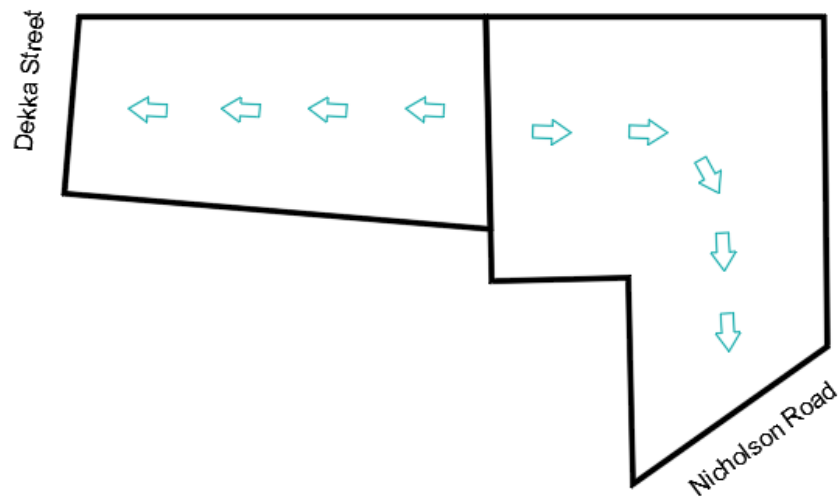


Figure 2: Proposed Catchments

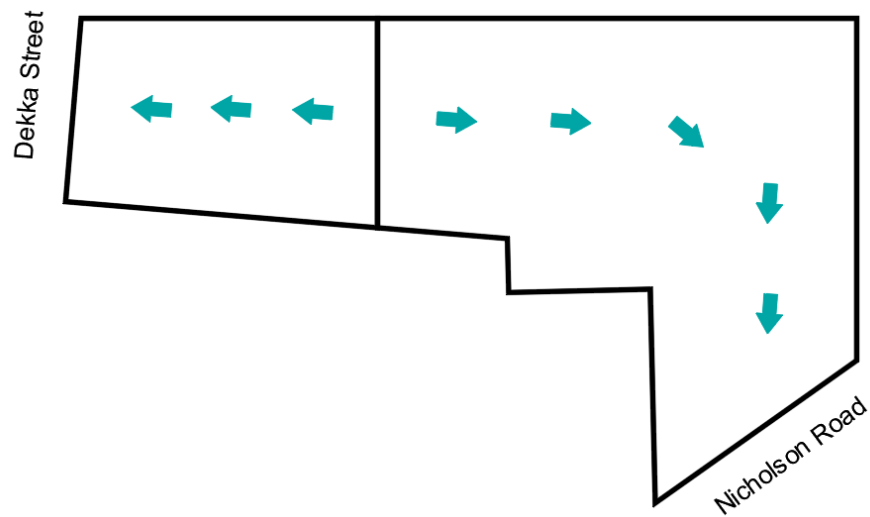


Table 1: Catchment Area Details

Item	Dekka Street Catchment			Nicholson Road Catchment			Total Imp. Area (m ²)	Total Site Area (m ²)
	Imp. Area (m ²)	Per. Area (m ²)	Total Area (m ²)	Imp. Area (m ²)	Per. Area (m ²)	Total Area (m ²)		
Existing	779	372	1151	695	940	1635	1474	2786
Proposed	530	269	799	1562	425	1987	2092	2786

Detention and Mitigation on Site

- 23 Before stormwater is discharged to the public network on Nicholson Road and Dekka Street, it will be retained on site in a detention tank with a volume of 4.2m³. before a slow release. This will mitigate on-site stormwater run-off so that, on completion of the carpark construction, the post development discharge peak flow will be less than the existing peak flow rates for 10-year (10%) and 100-year (1%) Annual Exceedance Probability (AEP) storm events.

Less Stormwater Discharge off Site

- 24 Therefore, effectively less discharge flow has been made to the existing network. That is, the less flows will be discharged to the same stormwater pipe system and in the same overland flow directions without increased peak flow.

Stormwater Quality Management

- 25 Management of the stormwater run-off quality will be provided by installing two StormFilters to screen plastic and other gross pollutants, filter sediment and absorb heavy metals created by the carpark traffic. The filters have been proposed to be installed on the lower areas of Dekka Street and Nicholson Road.

REGIONAL STANDARD AND BUILDING CODE

- 26 The proposed stormwater systems, including stormwater quality, detention and attenuation, piped systems and overland flow rates have been designed in accordance with the Regional Standard¹¹ and the Building Code – E1 Surface Water.¹²

Detention and mitigation

- 27 Regional Standard section 4.4.2.1 Stormwater Detention requires the proposed system to be designed to achieve hydraulic neutrality by limiting the design peak discharge from the development (post-construction) to not greater than the existing design peak discharge (pre-development) in all flood events up to and including the 1% AEP rainfall event.
- 28 The proposal described above meets this standard as on-site detention has been proposed using an underground detention

¹¹ Wellington Water "Regional Standard for Water Services" (December 2021) Version 3.0.

¹² New Zealand Building Code "E1 Surface Water" (5 November 2020) First Edition Amendment 11.

tank with a volume of 4.2m³. The stormwater discharge peak flow rates up to 1% AEP storm events will be reduced to be less than the pre-development peak flows.

Stormwater quality

29 Regional Standard section 4.2.11 Environmental Quality requires downstream impacts, including but are not limited to changes in peak flow and flooding, erosion, sedimentation and contamination, to be managed and mitigated against.

30 The proposal meets this standard through the installation of the two StormFilters on site at the lower side of Dekka Street and Nicholson Road (described above at paragraph 25).

Piped and overland flow systems

31 Stormwater piped systems have been designed in accordance with the Building Code.

32 Similar to the existing stormwater systems, stormwater run-off from the site will be collected by the proposed sumps and discharged through the StormFilters, and detention tank via the private piped systems underground. The discharge locations of the private systems are:

(a) Dekka Street kerb outlet, and;

(b) Nicholson Road existing public stormwater system.

33 Overland flow from the proposed carpark will be discharged to both Dekka Street and Nicholson Road. There is no change to the existing ground conditions in the flow exit points at the site boundaries in terms of locations and ground levels.

Adverse effects

- 34 The design process considered storm events up to 1% AEP only. Any adverse effects above 1% AEP have not been assessed. Beyond a 1% AEP storm event assessment is not a requirement of Regional Standard section 4.2.7.

RESPONSE TO SUBMITTERS

- 35 Stormwater issues were a key and repeated concern for many submitters. I address stormwater concerns as raised by submitters below, issue by issue.

Stormwater run-off, permeability, and climate change

- 36 A repeated issue between submitters was concern about an increase of stormwater runoff due to the increased permeable area in the proposal, and included concern about the impact of climate change.
- 37 Submissions that raised this as an issue include Submission #3, Nicola Molloy, 4 Maldive Street; Submission #10, Fiona Calderwood, 31 Ranui Crescent; Submission #24, Brenda Vale, 42 Ganges Road; Submission #50, Dave Soper and Michelle Soper, 25 Nicholson Road; Submission #63, Ray O'Hagan, 5 Tower Way; and Submission #68, Michael Hayward, 40 Ganges Road.
- 38 The existing site area of 2,768m² has residential houses with the total impervious area of 1,474m², including paved areas and roofs, and pervious area of 1,312m². The proposed carpark will increase the impervious area to 2,092m², being an increase of 618m².
- 39 For the existing impervious area of 1,474m², there is no proposed stormwater run-off increase. For the increase to the existing

pervious area of 618m², any increased stormwater run-off generation will be mitigated on site.

- 40 As detailed in paragraphs 20 to 22 above, the Proposed Carpark will have the catchment area to Nicholson Road increased to reflect the increased stormwater run-off.
- 41 As both pervious and impervious areas being reduced in the proposal at Dekka Street, these stormwater run-off flows will be reduced.
- 42 As detailed above at paragraph 23, on-site detention has been proposed at the Nicholson Road side using an underground detention tank with a volume of 4.2m³, so that the stormwater discharge peak flow rates up to 1% AEP storm events will be reduced to be *less* than the existing pre-development peak flows. This means the Proposed Carpark will have no peak flow increase to the downstream piped system and overland flow on the public roads. Accordingly, there is no additional adverse effect on the wider environment and public safety relating to increased stormwater runoff or permeability. An updated civil drawing set, showing the most recent proposal, is attached to my evidence at **Attachment A**.
- 43 In regard to concerns relating to climate change, the rainfall intensities used for the stormwater run-off calculations are as per HIRDS V4¹³ Historical Data + 20%, which accounts for climate change in accordance with the Regional Standard for Water Services.¹⁴

¹³ National Institute of Water and Atmospheric Research (NIWA) "High Intensity Rainfall Design System (HIRDS) Version 4.

¹⁴ Wellington Water "Regional Standard for Water Services" (December 2021) Version 3.0.

- 44 The resulting data has determined the detention tank volume to mitigate peak flows up to a 100-year (1% AEP) storm event. There is no peak flow discharge increase from the site. Therefore, there is no adverse effect to the receiving environment, including the properties, public roads and downstream water bodies, and this has accounted for climate change considerations.
- 45 Given the stormwater peak flows have been calculated using the rainfall intensities adjusted for climate change (up to 1% AEP storm events), and the increased flows from the additional impervious area on the Nicholson Road part have been mitigated on site so that there is no adverse effect to the receiving environment, including the downstream properties, public roads and downstream water bodies, I consider that the stormwater design for the proposed carpark addresses the stormwater concerns from the above Submitters.

Flooding at Nicholson Road and Dekka Street intersection

- 46 Submission #3, Nicola Molloy, 4 Maldive Street and Submission #64, Andrew Fleming and Catherine McGachie, 39 Nicholson Road, specifically raised flooding at the Nicholson Road and Dekka Street intersection as a concern.
- 47 The proposed additional impervious area has been designed to accommodate the required detention volume on-site and will not increase peak flow discharge in the piped system or overland flow onto public roads. Accordingly, I consider there is no additional adverse effects on the intersection of Dekka Street and Nicholson Road, or the downstream catchment.

Stream flooding by Khandallah Road

48 Submission #56, John Andrews, 68 Khandallah Road, stated that:

Stormwater detention is required as the water flows into the stream that runs past my house. Peak flooding is an issue.

49 The proposed detention tank has been provided on-site near Nicholson Road. I consider that the tank provided is sufficient for the stormwater peak flow management for up to a 1% AEP storm event at the submitter's property, i.e., no peak flow discharge will increase when the peak flow runs into the stream and past 68 Khandallah Road. Table 2 below provides a comparison of the existing and proposed peak flow details for the subject site.

Table 2: Peak Flow Rate Details

Item	Dekka Street Catchment		Nicholson Road Catchment		
	10% AEP Peak Flow (L/s)	1% AEP Peak Flow (L/s)	10% AEP Peak Flow (L/s)	1% AEP Peak Flow (L/s)	1% AEP Detention Volume (m ³)
Existing	23.5	36.9	27.3	42.8	
Proposed	15.8	27.3	26.3	40.5	4.2

50 With the stormwater mitigation on-site, I consider that the proposed development has no negative peak flow/flooding effects to the downstream residential areas, including 68 Khandallah Road, and receiving water bodies.

Stormwater retention and quality

51 Stormwater retention and run-off quality were concerns from two submitters, who were concerned that the receiving environment could be affected by the carpark development: Submission #58,

Lynn Cadenhead, 69a Cashmere Avenue, and Submission #68,
Michael Hayward, 40 Ganges Road.

- 52 As outlined above, the proposal provides on-site mitigation stormwater storage which means post development peak run off flows will have no increase compared with the pre-development flows.
- 53 In terms of stormwater quality, as outlined above at paragraph 25, two Stormfilters have been proposed on site at the lower parts of the Dekka Street and Nicholson Road. The filters will treat stormwater run-off through a filtration system using media-filled cartridges to absorb and retain pollution in a compact underground system. An updated civil drawing set, showing the most recent proposal, is attached to my evidence at **Attachment A**.
- 54 The stormwater management design complies with the local authorities' standards and guidelines such as the Regional Standard for Water Services by Wellington Water December 2021 V3.0 etc. With the stormwater management design in place, as noted above, the stormwater mitigation including retention and detention, water quality, discharge systems and secondary overland flow rates have no negative impact on public safety and the receiving environment.

OTHER CONSIDERATIONS

- 55 In preparing my evidence I have considered the following:
- 55.1 Safety in stormwater design: only Council approved materials have been proposed for the stormwater system.
- 55.2 Bio-retention systems: Bio-retention systems such as treepits, raingardens and swales etc. were considered un-suitable due to the steep site slope.

55.3 Ongoing maintenance: to achieve the working order of the underground device, all underground devices will be operated and maintained as per device suppliers' specifications and at the consent holder's cost.

CONCLUSIONS

56 In summary, I consider that the proposed stormwater design will not increase stormwater risk to public safety and the receiving environment due to the following:

- a) Stormwater quality will be managed by the proposed two StormFilters devices which will improve the stormwater discharge quality before disposal off site.
- b) Stormwater peak flows up to 1% AEP will be mitigated to the existing peak flow rates by the proposed underground detention tank.
- c) With the stormwater quality and mitigation systems in place, there will be no stormwater quality issues and no peak flow increases within the public piped systems.
- d) As the proposed tank has mitigated 1% AEP storm peak flow, the overland flow rate will be less than the pre-development level.

57 There is existing stormwater run-off from the existing residential housing on site, which is greater in area than the respective grassed areas. There is no stormwater quality control for these existing impervious areas. The proposed carpark will remove existing residential houses and driveways, and implement mitigation methods for these areas. With the proposed stormwater management design in place, I believe that any minor adverse effect to public safety and the receiving environment has been adequately considered and appropriately mitigated, to the

extent that I consider any impacts will be less than the existing consented activity.

Date: 15 April 2024



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Sumin Wang

APPENDIX A: Calibre Engineering Drawings



Document List No. TR4

Project name: NEW WORLD KHANDALLAH CARPARK EXPANSION
 Project Number: 712722
 Client: FOODSTUFFS NORTH ISLAND LTD
 Subject: FOR RESOURCE CONSENT
 Comment: FOR RESOURCE CONSENT
 Date: 10-Apr-24
 Issued by: SW Authorised: RT

Media and Status Details

Print Size	Digital	Media	Purpose	Phase
<input type="checkbox"/> A0 <input type="checkbox"/> B0	<input checked="" type="checkbox"/> PDF	<input type="checkbox"/> Print	<input type="checkbox"/> Preliminary	<input type="checkbox"/> other
<input type="checkbox"/> A1 <input type="checkbox"/> B1	<input type="checkbox"/> DWG	<input type="checkbox"/> Film/Tracing	<input type="checkbox"/> Information	<input type="checkbox"/> Feasibility
<input type="checkbox"/> A2 <input type="checkbox"/> B2	<input type="checkbox"/> DGN	<input type="checkbox"/> CD/Disk	<input type="checkbox"/> Comments	<input checked="" type="checkbox"/> Concept
<input checked="" type="checkbox"/> A3 <input type="checkbox"/> B3	<input type="checkbox"/> PDF+DWG	<input type="checkbox"/> By Hand	<input type="checkbox"/> As Requested	<input type="checkbox"/> Detail Design
<input type="checkbox"/> A4 <input type="checkbox"/> B4	<input type="checkbox"/> PDF+DGN	<input checked="" type="checkbox"/> Email	<input checked="" type="checkbox"/> For Approval	<input type="checkbox"/> For Construction
<input type="checkbox"/> Other <input type="checkbox"/> Other	<input type="checkbox"/> Other	<input type="checkbox"/> LAN/WAN	<input type="checkbox"/> Construction	<input type="checkbox"/> As Built

Distribution Details

2
2

Document Details

Document Number	Rev	Document Title
712722-C000	0	COVER SHEET
712722-C100	0	EXISTING SITE PLAN
712722-C170	3	EROSION AND SEDIMENT CONTROL PLAN
712722-C171	0	EROSION AND SEDIMENT CONTROL DETAILS
712722-C200	4	PROPOSED CONTOUR PLAN
712722-C201	4	CUT AND FILL PLAN
712722-C205	1	SITE SECTIONS
712722-C210	3	RETAINING WALL PLAN
712722-C211	1	RETAINING WALL SECTIONS
712722-C300	4	ACCESSWAY PLAN
712722-C301	0	ACCESSWAY LONG SECTIONS
712722-C302	2	TYPICAL ROAD CROSS SECTIONS
712722-C303	1	ROADING CONSTRUCTION DETAILS
712722-C400	3	DRAINAGE PLAN
712722-C401	3	STORMWATER CATCHMENT PLAN
712722-C405	0	STORMWATER LONG SECTION
712722-C800	0	STANDARD DETAILS SHEET 1

FOODSTUFFS NORTH ISLAND LTD

NEW WORLD KHANDALLAH CAR PARK EXPANSION



712722 DRAWING SCHEDULE



C000 COVER SHEET

EROSION & SEDIMENT CONTROL

C100 EXISTING SITE PLAN
C170 EROSION AND SEDIMENT CONTROL PLAN
C171 EROSION AND SEDIMENT CONTROL DETAILS

EARTHWORKS

C200 PROPOSED CONTOUR PLAN
C201 CUT AND FILL PLAN
C205 SITE SECTIONS
C210 EARTHWORKS SITE SECTION LOCATION PLAN
C211 EARTHWORKS SITE CROSS SECTIONS

SITE

C300 ACCESSWAY PLAN
C301 ACCESSWAY LONG SECTIONS
C302 TYPICAL CARPARK CROSS SECTIONS
C303 ROADING CONSTRUCTION DETAILS

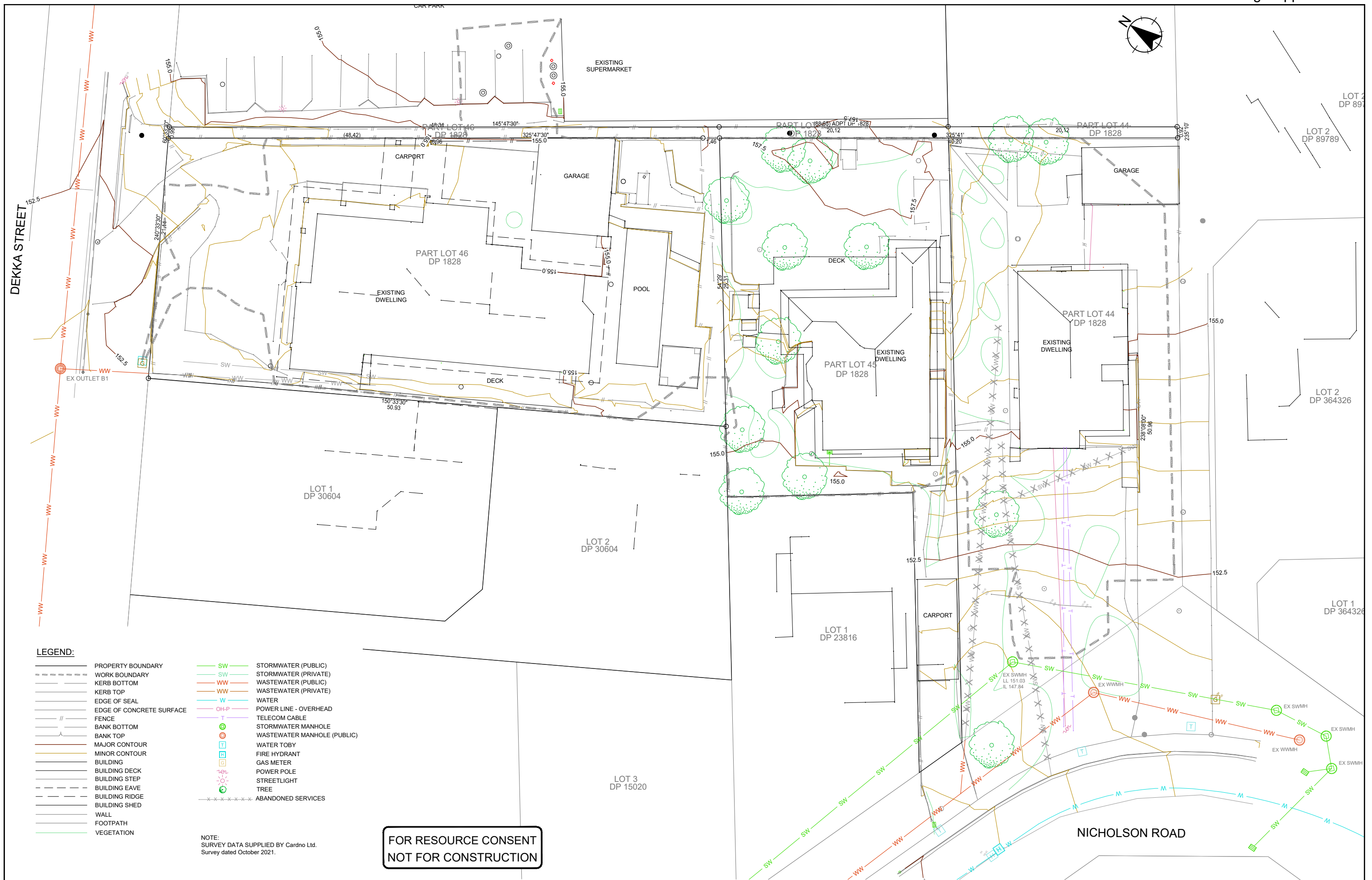
DRAINAGE, WATER & UTILITY

C400 STORMWATER RETICULATION PLAN
C401 STORMWATER CATCHMENT PLAN
C405 STORMWATER LONG SECTIONS
C800 STANDARD DETAILS SHEET1

NOTE:
Due to COVID restrictions, Concept Design has been undertaken using latest information sourced from Wellington City Council GIS Viewer or supplied by others which has not been ground truthed/verified on site. Existing site levels and peripheral boundary heights are subject to field survey. Other Services are subject to verification by underground location/detection providers.

FOR RESOURCE CONSENT
NOT FOR CONSTRUCTION

Advisory
Surveying
Urban Development
Infrastructure Buildings
Structural Engineering
Civil Engineering



LEGEND:

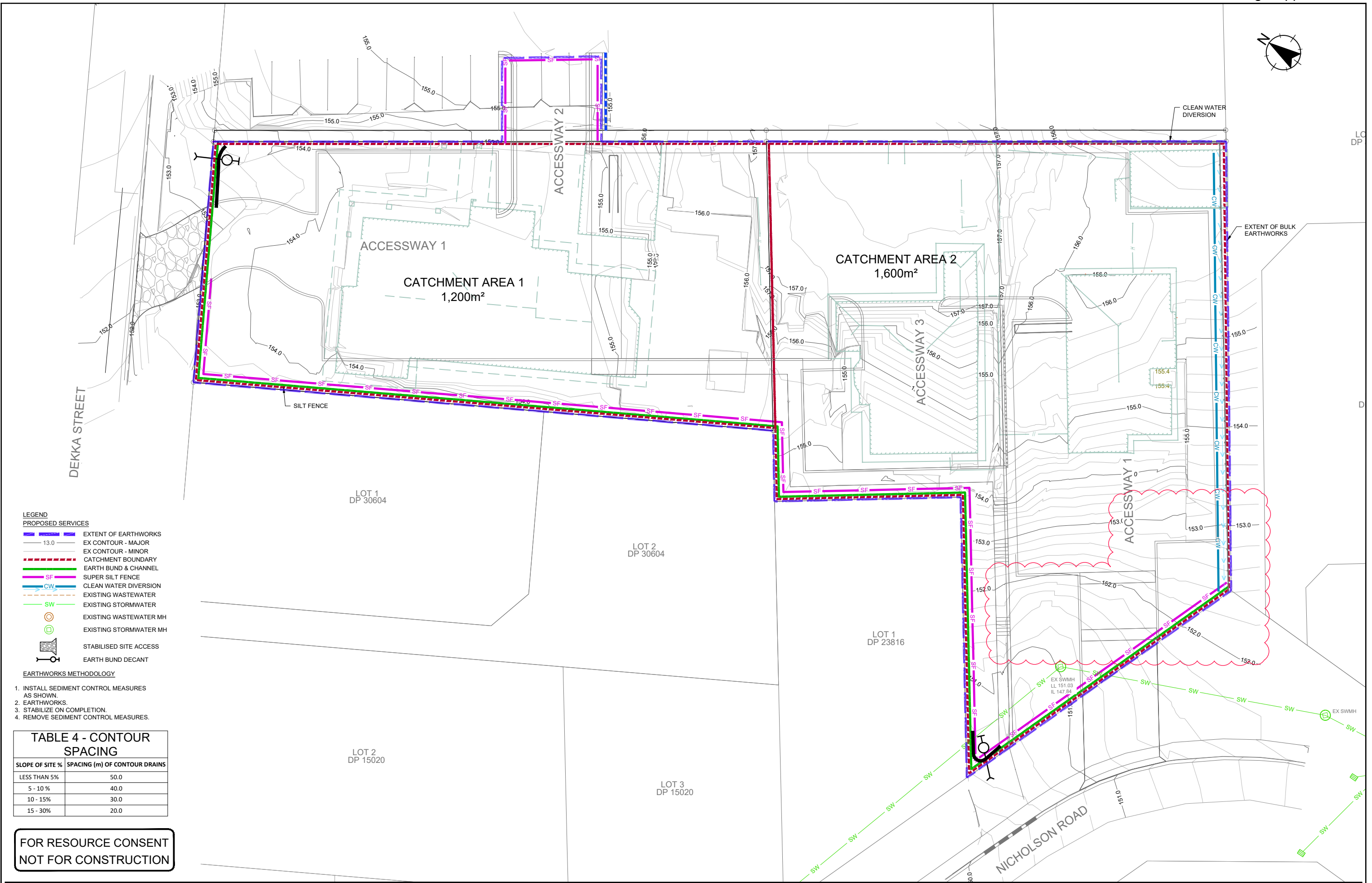
---	PROPERTY BOUNDARY	---	STORMWATER (PUBLIC)
---	WORK BOUNDARY	---	STORMWATER (PRIVATE)
---	KERB BOTTOM	---	WASTEWATER (PUBLIC)
---	KERB TOP	---	WASTEWATER (PRIVATE)
---	EDGE OF SEAL	---	WATER
---	EDGE OF CONCRETE SURFACE	---	POWER LINE - OVERHEAD
---	FENCE	---	TELECOM CABLE
---	BANK BOTTOM	---	STORMWATER MANHOLE
---	BANK TOP	---	WASTEWATER MANHOLE (PUBLIC)
---	MAJOR CONTOUR	---	WATER TOBY
---	MINOR CONTOUR	---	FIRE HYDRANT
---	BUILDING	---	GAS METER
---	BUILDING DECK	---	POWER POLE
---	BUILDING STEP	---	STREETLIGHT
---	BUILDING EAVE	---	TREE
---	BUILDING RIDGE	---	ABANDONED SERVICES
---	BUILDING SHED		
---	WALL		
---	FOOTPATH		
---	VEGETATION		

NOTE:
SURVEY DATA SUPPLIED BY Cardno Ltd.
Survey dated October 2021.

**FOR RESOURCE CONSENT
NOT FOR CONSTRUCTION**

0 FOR RESOURCE CONSENT Revision	RT 21.04.22 App Date	Dec-21 Dec-21 Dec-21 Dec-21	Client FOODSTUFFS NORTH ISLAND LTD	Project Title NEW WORLD KHANDALLAH CAR PARK EXPANSION	Sheet Title EXISTING SITE PLAN	Level 5, Building 3 666 Great South Road Eilerslie Auckland 1051 +64 9 525 9770 calibregroup.com		Scale (A1 Original) 1:150 (A3) 1:300
	Surveyed SW Designed SW Drawn YW Reviewed RD Approved RT	Project No 712722	Sheet C100	Revision 0				

Verify all dimensions on site before commencing work. Prioritise figured dimensions over scaling. Refer all discrepancies to Calibre. This document and the copyright in this document remain the property of Calibre Consulting Limited. The contents of this document may not be reproduced either in whole or in part by any means whatsoever without the prior written consent of Calibre Consulting Limited.



- LEGEND**
- PROPOSED SERVICES**
- EXTENT OF EARTHWORKS
 - EX CONTOUR - MAJOR
 - EX CONTOUR - MINOR
 - - - CATCHMENT BOUNDARY
 - EARTH BUND & CHANNEL
 - SF SUPER SILT FENCE
 - CW CLEAN WATER DIVERSION
 - EXISTING WASTEWATER
 - EXISTING STORMWATER
 - EXISTING WASTEWATER MH
 - EXISTING STORMWATER MH
 - STABILISED SITE ACCESS
 - EARTH BUND DECANT
- EARTHWORKS METHODOLOGY**
1. INSTALL SEDIMENT CONTROL MEASURES AS SHOWN.
 2. EARTHWORKS.
 3. STABILIZE ON COMPLETION.
 4. REMOVE SEDIMENT CONTROL MEASURES.

TABLE 4 - CONTOUR SPACING

SLOPE OF SITE %	SPACING (m) OF CONTOUR DRAINS
LESS THAN 5%	50.0
5 - 10 %	40.0
10 - 15%	30.0
15 - 30%	20.0

**FOR RESOURCE CONSENT
NOT FOR CONSTRUCTION**

Revision	Date	App	Date	Approved	RT	Dec-21
3 LAYOUT UPDATED	10.04.24	RT	10.04.24	Surveyed	SW	Dec-21
2 LAYOUT UPDATED	05.04.24	RT	05.04.24	Designed	SW	Dec-21
1 LAYOUT UPDATED	23.08.23	RT	23.08.23	Drawn	YW/KD	Dec-21
0 FOR RESOURCE CONSENT	21.04.22	RT	21.04.22	Reviewed	RD	Dec-21

Client
FOODSTUFFS
NORTH ISLAND LTD

Project Title
NEW WORLD
KHANDALLAH
CAR PARK EXPANSION

Sheet Title
EROSION AND
SEDIMENT CONTROL
PLAN

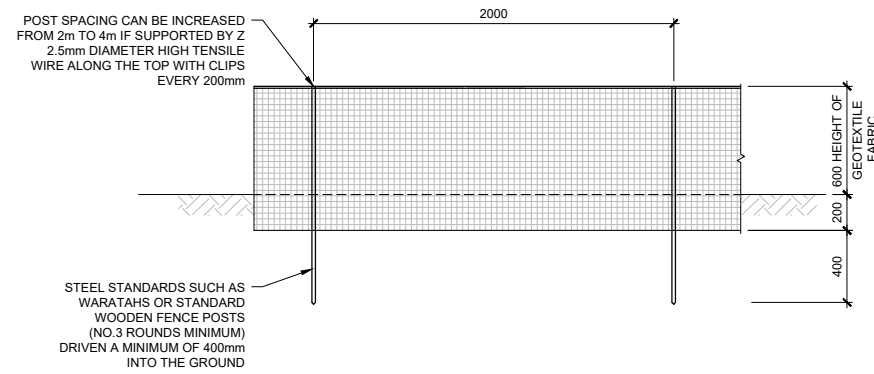
Level 5, Building 3
666 Great South Road
Eilerslie
Auckland 1051
+64 9 525 9770
calibregroup.com



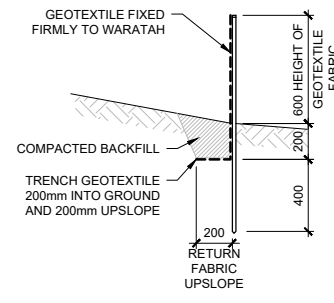
Scale (A1 Original) 1:150 (A3) 1:300

Project No 712722 Sheet C170 Revision 3

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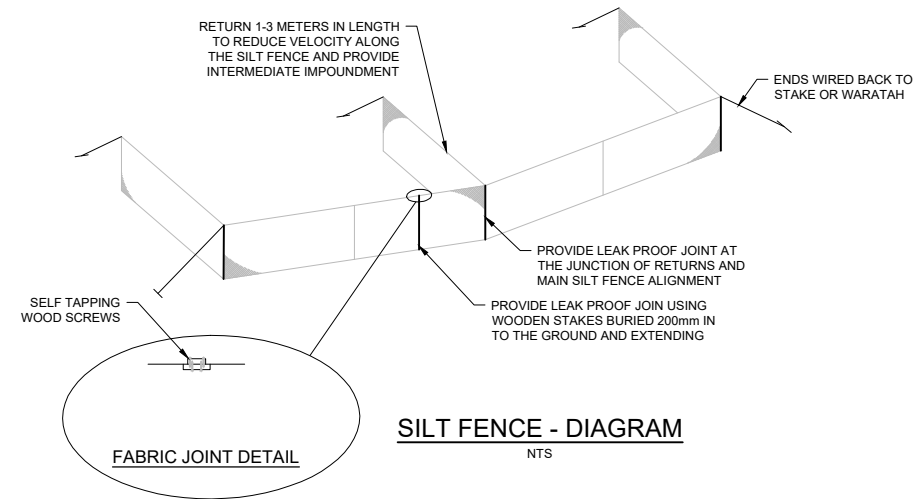
ELEVATION



SECTION

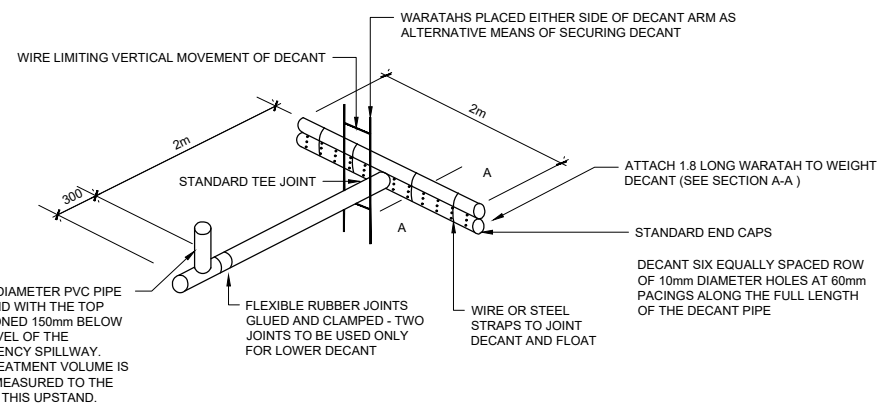
SILT FENCE WITH RETURNS AND SUPPORT WIRE

1:20 @ A1



SILT FENCE - DIAGRAM

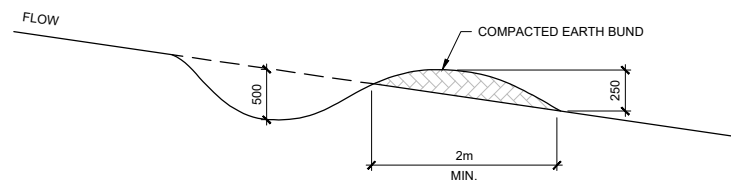
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SECTION A-A

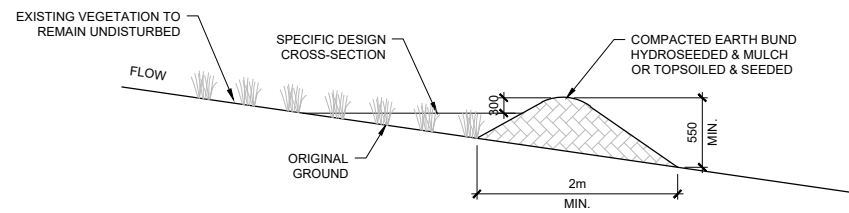
T-BAR DECANT DETAIL

NTS



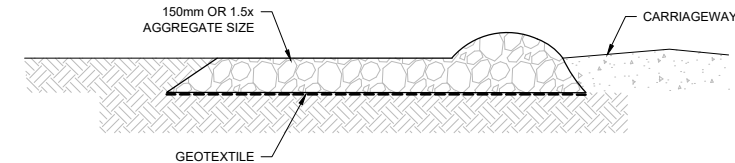
CONTOUR DRAIN

NTS



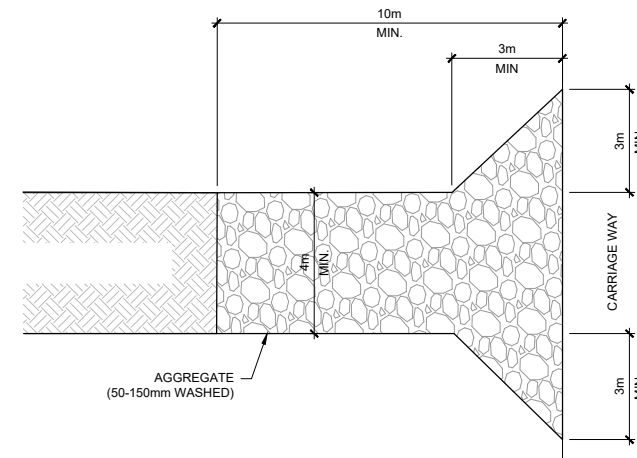
CLEAN WATER RUN OFF DIVERSION BUND

NTS



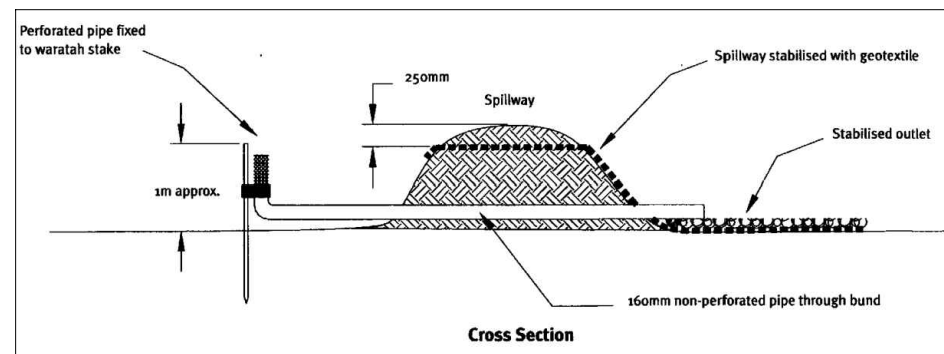
ELEVATION STABILISED SITE ACCESS ENTRANCE

NTS



TYPICAL PLAN STABILISED SITE ACCESS ENTRANCE

NTS



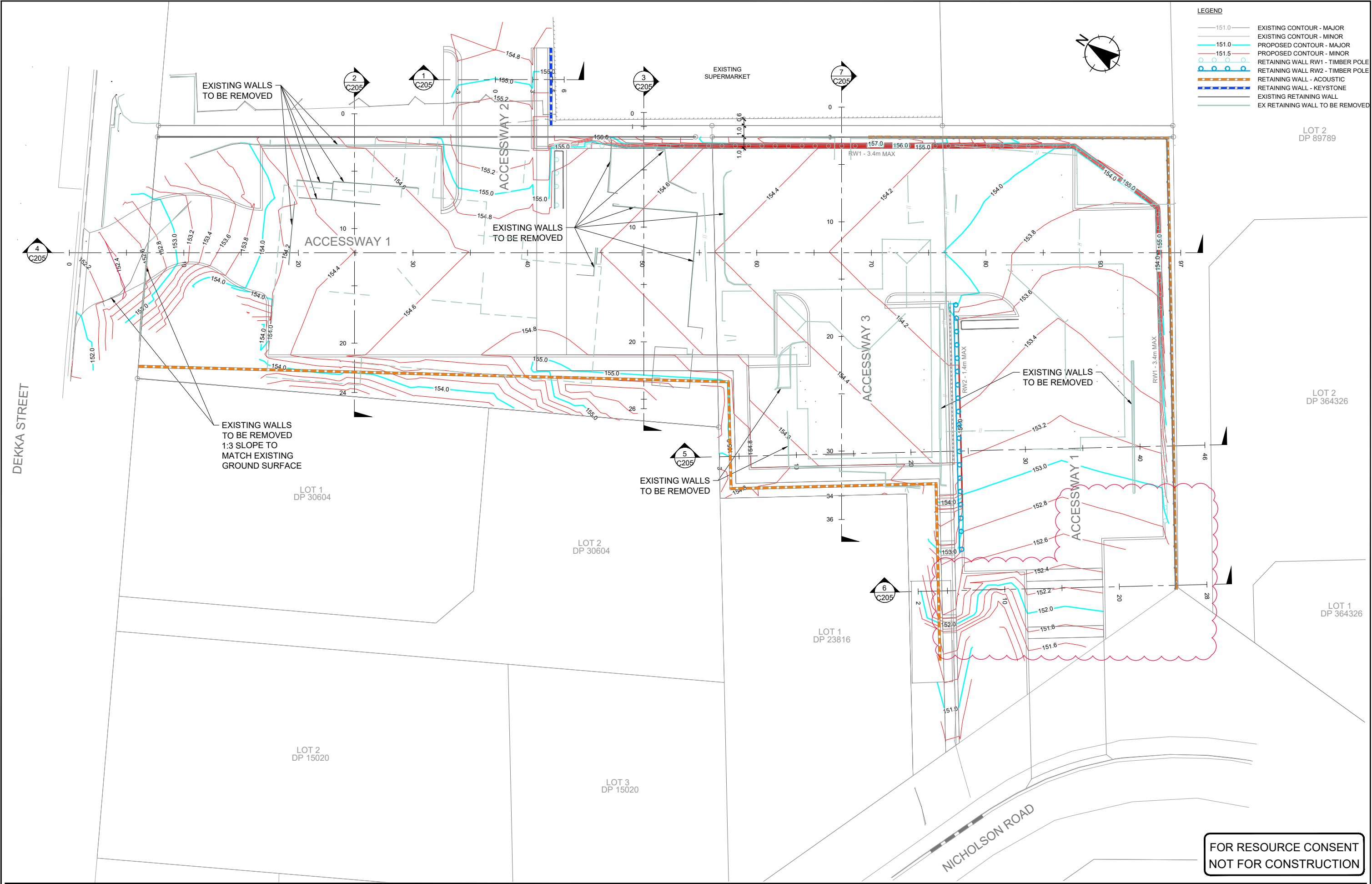
EARTH BUND

N.T.S

**FOR RESOURCE CONSENT
NOT FOR CONSTRUCTION**

0 FOR RESOURCE CONSENT Revision	Surveyed	RT	21.04.22	Client	FOODSTUFFS NORTH ISLAND LTD	Project Title	NEW WORLD KHANDALLAH CAR PARK EXPANSION	Sheet Title	EROSION AND SEDIMENT CONTROL DETAILS	Level 5, Building 3 866 Great South Road Eilerslie Auckland 1051 +64 9 525 9770 calibregroup.com		Scale (A1 Original) 1:	(A3) 1:
	Designed	SW	Dec-21	Project No	712722	Sheet	C171	Revision	0				
	Drawn	YW	Dec-21	Project No	712722	Sheet	C171	Revision	0				
	Reviewed	RD	Dec-21	Project No	712722	Sheet	C171	Revision	0				
	Approved	RT	Dec-21	Project No	712722	Sheet	C171	Revision	0				

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LEGEND

	151.0	EXISTING CONTOUR - MAJOR
	151.0	EXISTING CONTOUR - MINOR
	151.5	PROPOSED CONTOUR - MAJOR
	151.5	PROPOSED CONTOUR - MINOR
		RETAINING WALL RW1 - TIMBER POLE
		RETAINING WALL - ACOUSTIC
		RETAINING WALL - KEYSTONE
		EXISTING RETAINING WALL
		EX RETAINING WALL TO BE REMOVED

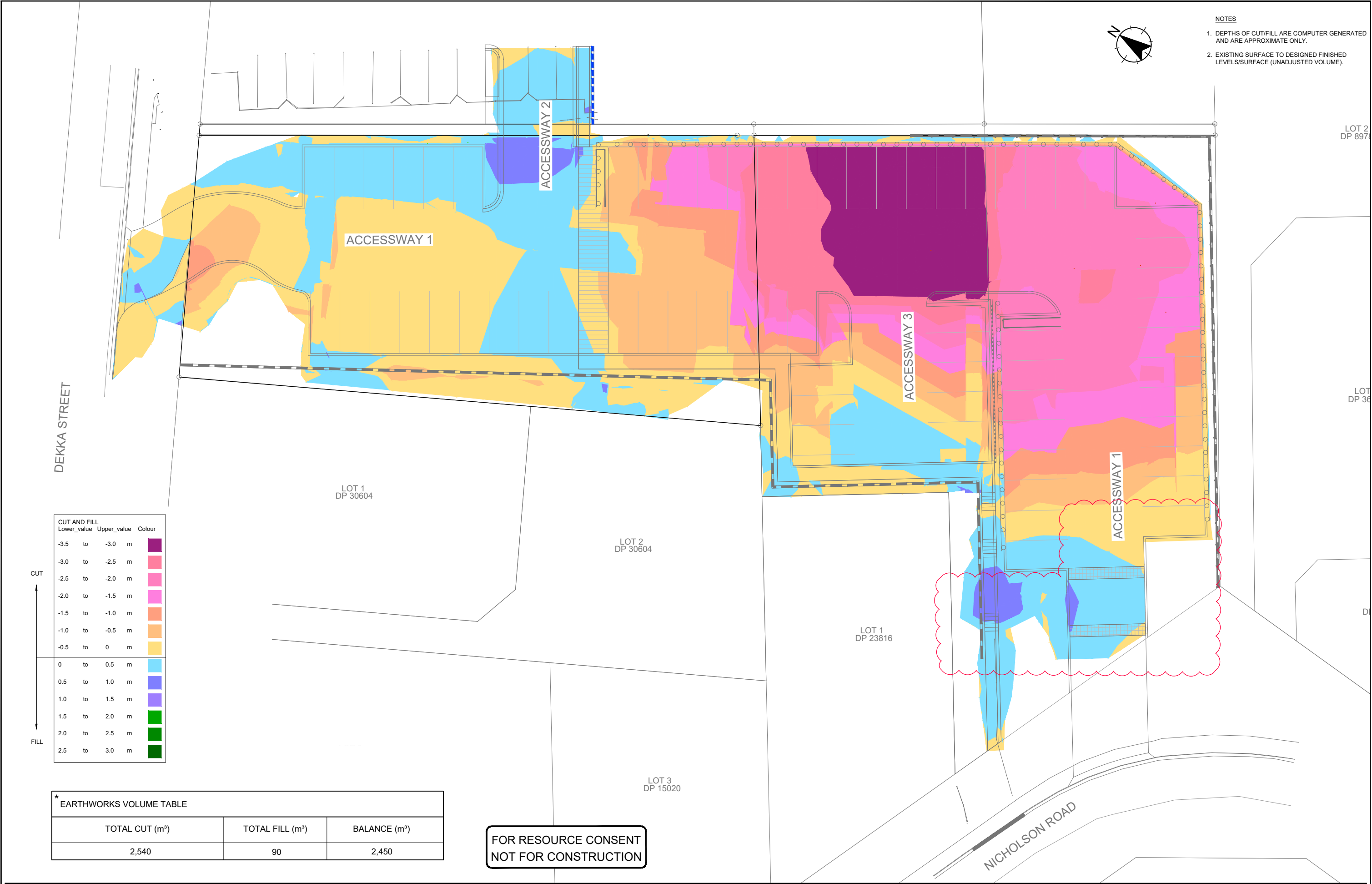
**FOR RESOURCE CONSENT
NOT FOR CONSTRUCTION**

4 LAYOUT UPDATED Revision	RT 10.04.24 App Date	Dec-21 Dec-21 Dec-21	Client FOODSTUFFS NORTH ISLAND LTD	Project Title NEW WORLD KHANDALLAH CAR PARK EXPANSION	Sheet Title ERARHWORNS PROPOSED CONTOUR PLAN	Level 5, Building 3 666 Great South Road Eilerslie Auckland 1051 +64 9 525 9770 calibregroup.com	Scale (A1 Original) 1:150 (A3) 1:300 Project No 712722 Sheet C200 Revision 4
	Surveyed Designed SW Drawn YW/KD Reviewed RD Approved RT	Dec-21 Dec-21 Dec-21	Client FOODSTUFFS NORTH ISLAND LTD	Project Title NEW WORLD KHANDALLAH CAR PARK EXPANSION	Sheet Title ERARHWORNS PROPOSED CONTOUR PLAN	Level 5, Building 3 666 Great South Road Eilerslie Auckland 1051 +64 9 525 9770 calibregroup.com	

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- NOTES**
1. DEPTHS OF CUT/FILL ARE COMPUTER GENERATED AND ARE APPROXIMATE ONLY.
 2. EXISTING SURFACE TO DESIGNED FINISHED LEVELS/SURFACE (UNADJUSTED VOLUME).



CUT AND FILL		
Lower_value	Upper_value	Colour
-3.5	-3.0	Dark Purple
-3.0	-2.5	Red
-2.5	-2.0	Pink
-2.0	-1.5	Light Pink
-1.5	-1.0	Orange
-1.0	-0.5	Light Orange
-0.5	0	Yellow
0	0.5	Light Blue
0.5	1.0	Blue
1.0	1.5	Light Blue
1.5	2.0	Green
2.0	2.5	Dark Green
2.5	3.0	Dark Green

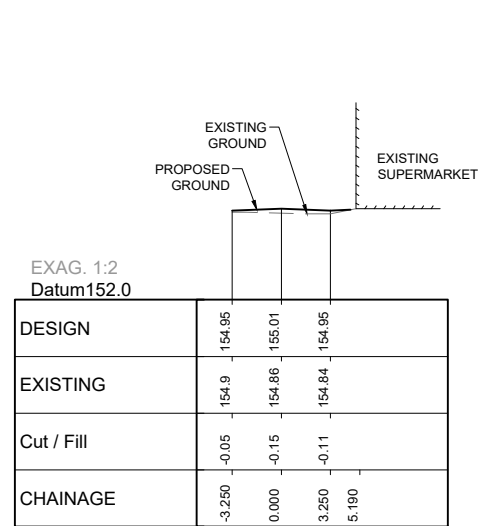
CUT
↑
↓
FILL

* EARTHWORKS VOLUME TABLE		
TOTAL CUT (m³)	TOTAL FILL (m³)	BALANCE (m³)
2,540	90	2,450

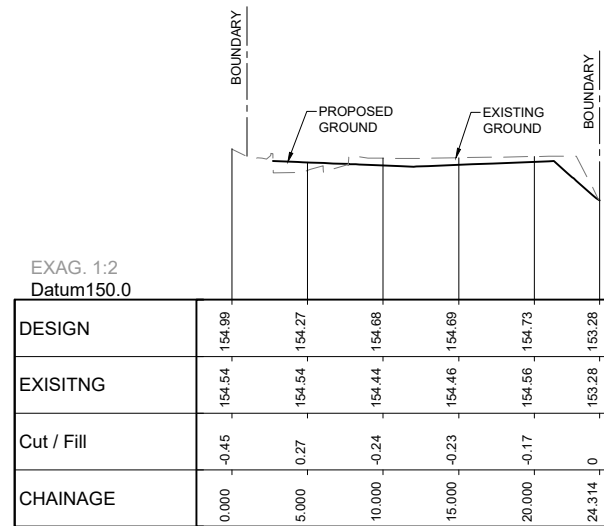
FOR RESOURCE CONSENT
NOT FOR CONSTRUCTION

4 LAYOUT UPDATED Revision	RT 10.04.24 App Date	Surveyed SW Dec-21 Designed YW/KD Dec-21 Drawn RD Dec-21 Reviewed RT Dec-21 Approved RT Dec-21	Client FOODSTUFFS NORTH ISLAND LTD	Project Title NEW WORLD KHANDALLAH CAR PARK EXPANSION	Sheet Title ERARTHWORKS CUT AND FILL PLAN	Level 5, Building 3 666 Great South Road Eilerslie Auckland 1051 +64 9 525 9770 calibregroup.com		Scale (A1 Original) 1:150 (A3) 1:300 	Project No 712722 Sheet C201 Revision 4
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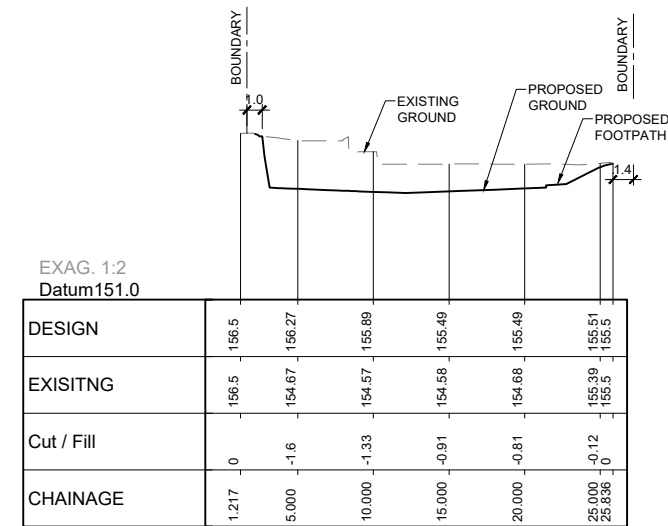
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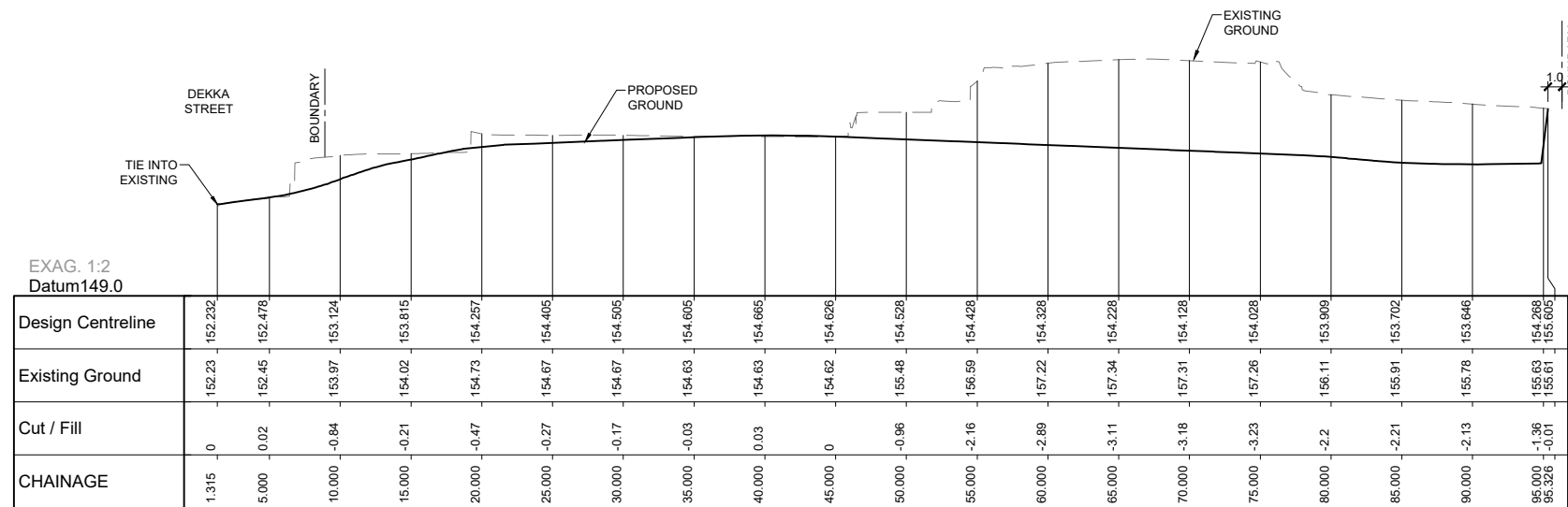
EARTHWORKS SECTION 1
 H 1:250, V 1:125 (A1)
 H 1:500, V 1:250 (A3)
 C200



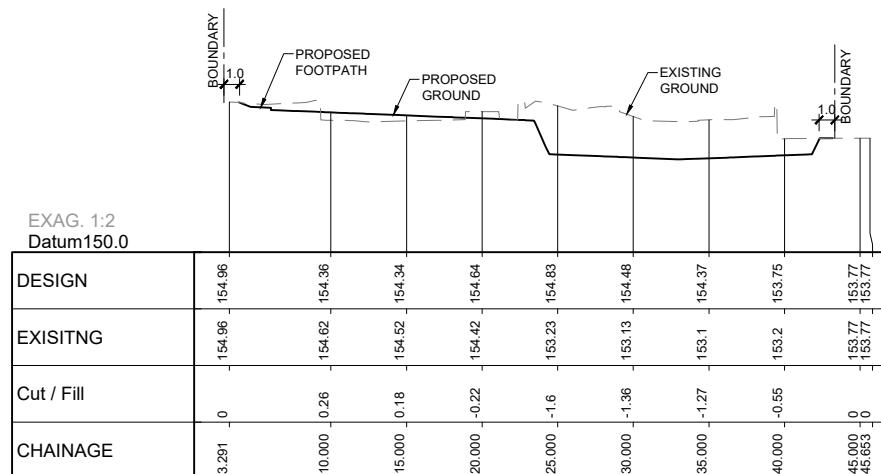
EARTHWORKS SECTION 2
 H 1:250, V 1:125 (A1)
 H 1:500, V 1:250 (A3)
 C200



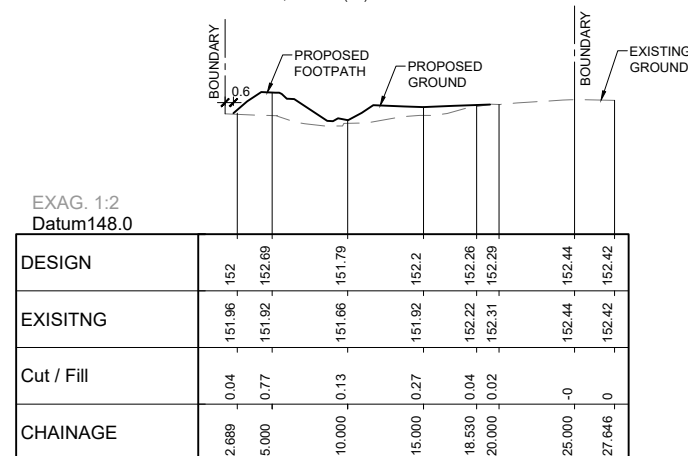
EARTHWORKS SECTION 3
 H 1:250, V 1:125 (A1)
 H 1:500, V 1:250 (A3)
 C200



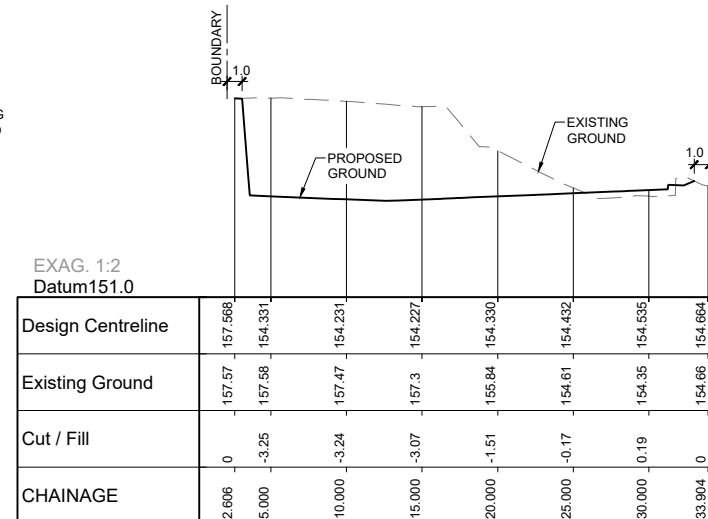
EARTHWORKS SECTION 4
 H 1:250, V 1:125 (A1)
 H 1:500, V 1:250 (A3)
 C200



EARTHWORKS SECTION 5
 H 1:250, V 1:125 (A1)
 H 1:500, V 1:250 (A3)
 C200



EARTHWORKS SECTION 6
 H 1:250, V 1:125 (A1)
 H 1:500, V 1:250 (A3)
 C200



EARTHWORKS SECTION 7
 H 1:250, V 1:125 (A1)
 H 1:500, V 1:250 (A3)
 C200

**FOR RESOURCE CONSENT
 NOT FOR CONSTRUCTION**

1 SECTION 7 ADDED		RT	23.08.23	Designed	SW	Dec-21
0 FOR RESOURCE CONSENT		RT	21.04.22	Drawn	YW/KD	Dec-21
		App		Reviewed	RD	Dec-21
		Date		Approved	RT	Dec-21

Client
 FOODSTUFFS
 NORTH ISLAND LTD

Project Title
 NEW WORLD
 KHANDALLAH
 CAR PARK EXPANSION

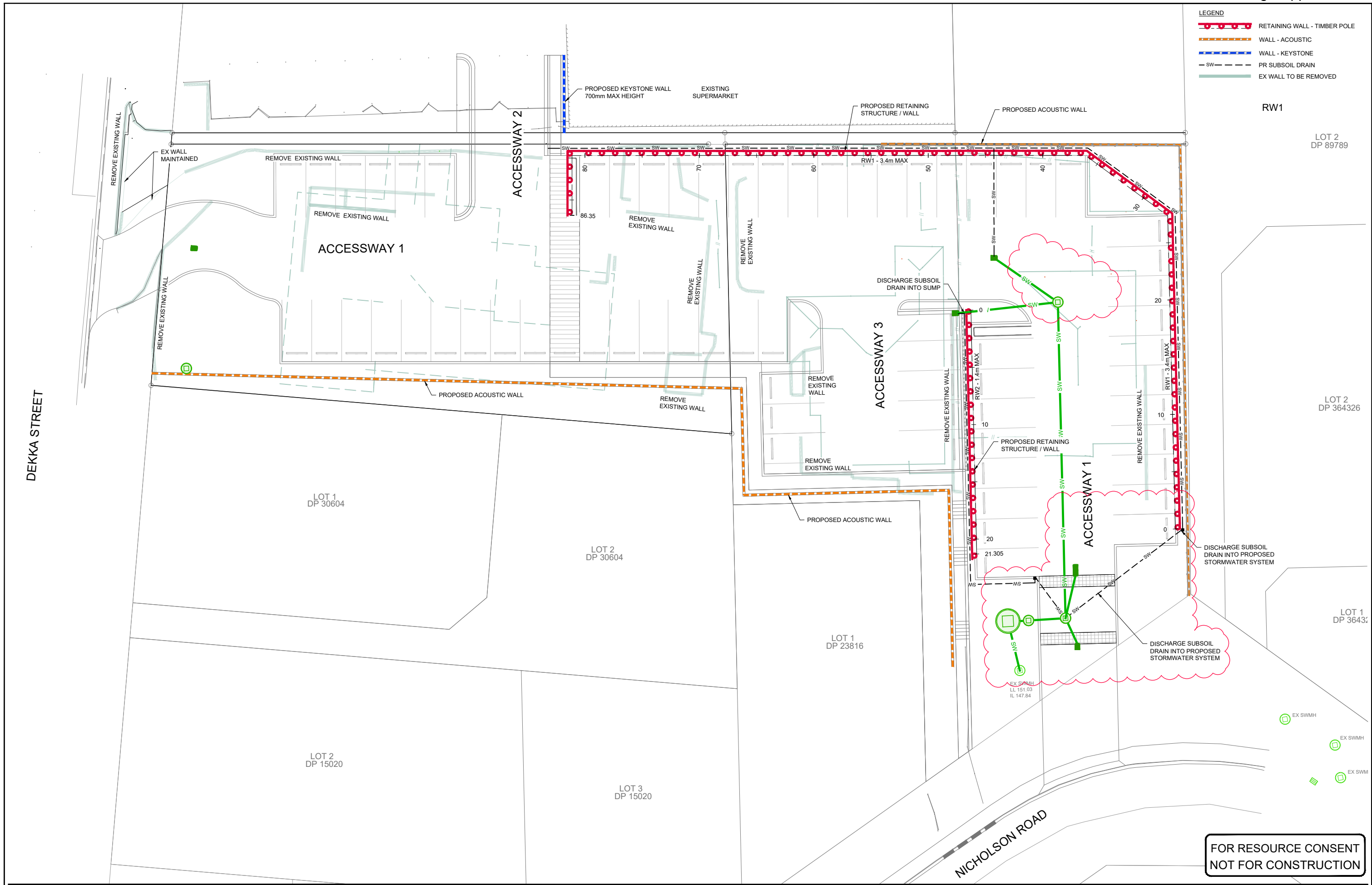
Sheet Title
 ERARTHWORKS
 SITE SECTIONS

Level 5, Building 3
 666 Great South Road
 Ellerslie
 Auckland 1051
 +64 9 525 9770
 calibregroup.com



Scale (A1 Original) 1:250 (A3) 1:500		
5 2.5 0 5 10 15 m		
Project No	Sheet	Revision
712722	C205	1

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3 LAYOUT UPDATED	RT	10.04.24	Surveyed		
2 LAYOUT UPDATED	RT	05.04.24	Designed	SW	Dec-21
1 LAYOUT UPDATED	RT	23.08.23	Drawn	YW/KD	Dec-21
0 FOR RESOURCE CONSENT	RT	21.04.22	Reviewed	RD	Dec-21
Revision	App	Date	Approved	RT	Dec-21

Client
**FOODSTUFFS
 NORTH ISLAND LTD**

Project Title
**NEW WORLD
 KHANDALLAH
 CAR PARK EXPANSION**

Sheet Title
RETAINING WALL PLAN

Level 5, Building 3
 666 Great South Road
 Eilersie
 Auckland 1051
 +64 9 525 9770
 calibregroup.com



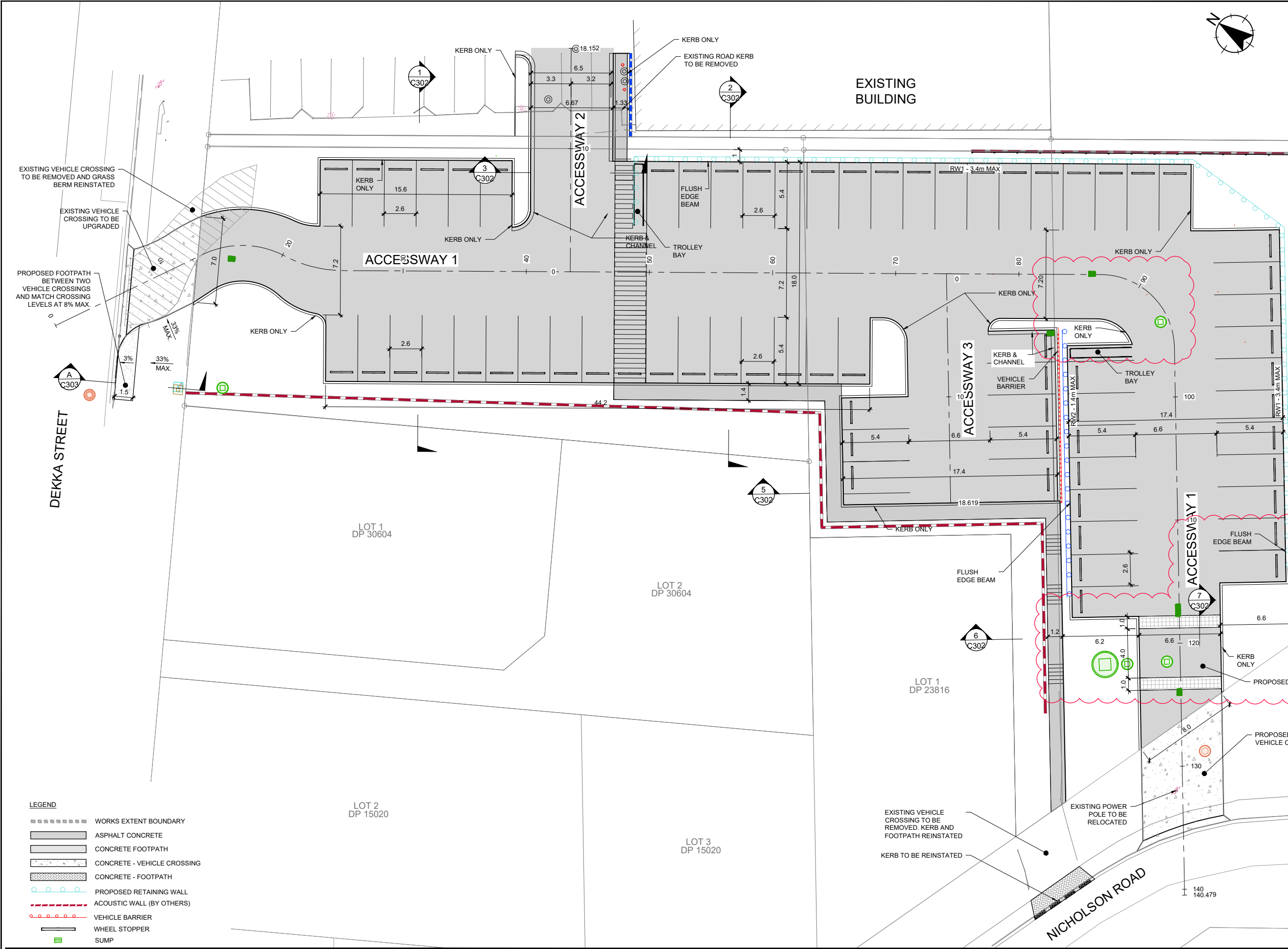
**FOR RESOURCE CONSENT
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Scale (A1 Original) 1:150 (A3) 1:300

Project No 712722 Sheet C210 Revision 3

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- NOTES**
1. THESE DRAWINGS DO NOT NECESSARILY SHOW ALL EXISTING SERVICES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ACCURATELY LOCATE AND PROTECT ALL EXISTING SERVICES BEFORE EXCAVATION AND TAKE ALL CARE TO PROTECT DURING THE CONSTRUCTION PERIOD.
 2. ALL WORKS SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, THE WELLINGTON CITY COUNCIL CODE OF PRACTICE FOR CITY INFRASTRUCTURE & LAND DEVELOPMENT ENGINEERING STANDARDS MANUAL.
 3. REFER TO WCC COP DRAWING R-22-700 "DETAIL A STD KERB AND CHANNEL" FOR PROPOSED KERB AND CHANNEL DESIGN DETAILS



LEGEND

	WORKS EXTENT BOUNDARY
	ASPHALT CONCRETE
	CONCRETE FOOTPATH
	CONCRETE - VEHICLE CROSSING
	CONCRETE - FOOTPATH
	PROPOSED RETAINING WALL
	ACOUSTIC WALL (BY OTHERS)
	VEHICLE BARRIER
	WHEEL STOPPER
	SUMP

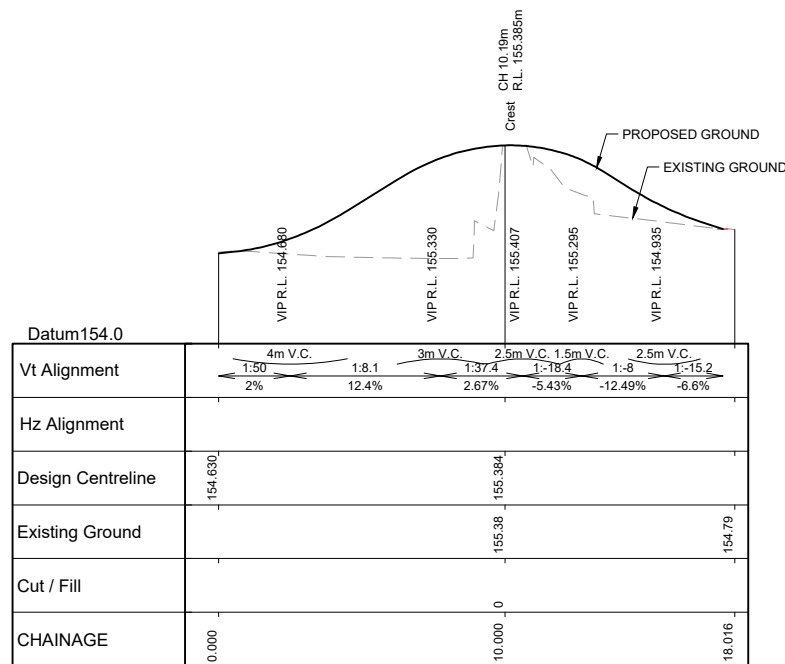
**FOR RESOURCE CONSENT
NOT FOR CONSTRUCTION**

<p>4 LAYOUT UPDATED Revision</p>	<p>RT 10.04.24 App Date</p>	<p>Dec-21 Designed SW</p> <p>Dec-21 Drawn YW/KD</p> <p>Dec-21 Reviewed RD</p> <p>Dec-21 Approved RT</p>	<p>Client FOODSTUFFS NORTH ISLAND LTD</p>	<p>Project Title NEW WORLD KHANDALLAH CAR PARK EXPANSION</p>	<p>Sheet Title ACCESSWAY PLAN</p>	<p>Level 5, Building 3 666 Great South Road Eilerslie Auckland 1051 +64 9 525 9770 calibregroup.com</p>		<p>Scale (A1 Original) 1:150 (A3) 1:300</p> <p>Project No 712722 Sheet C300 Revision 4</p>
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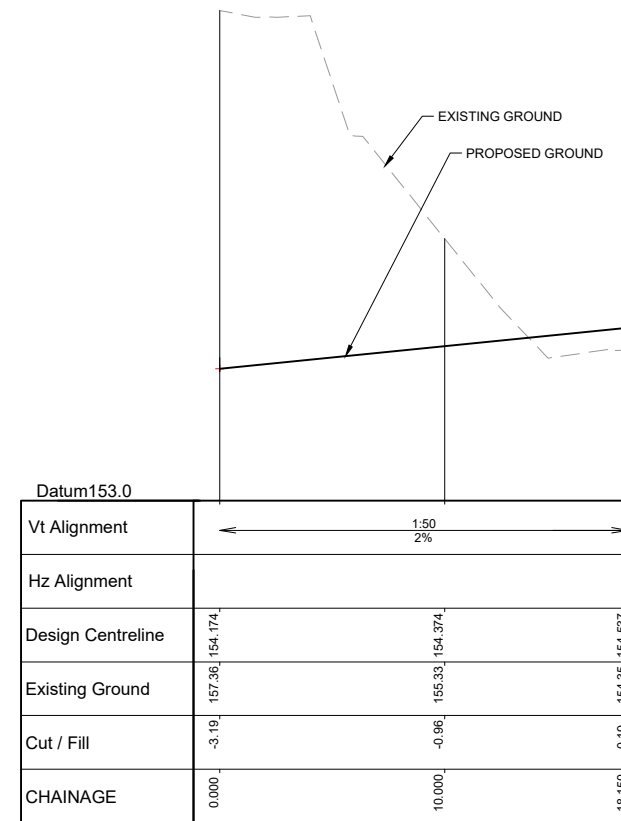
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LEGEND

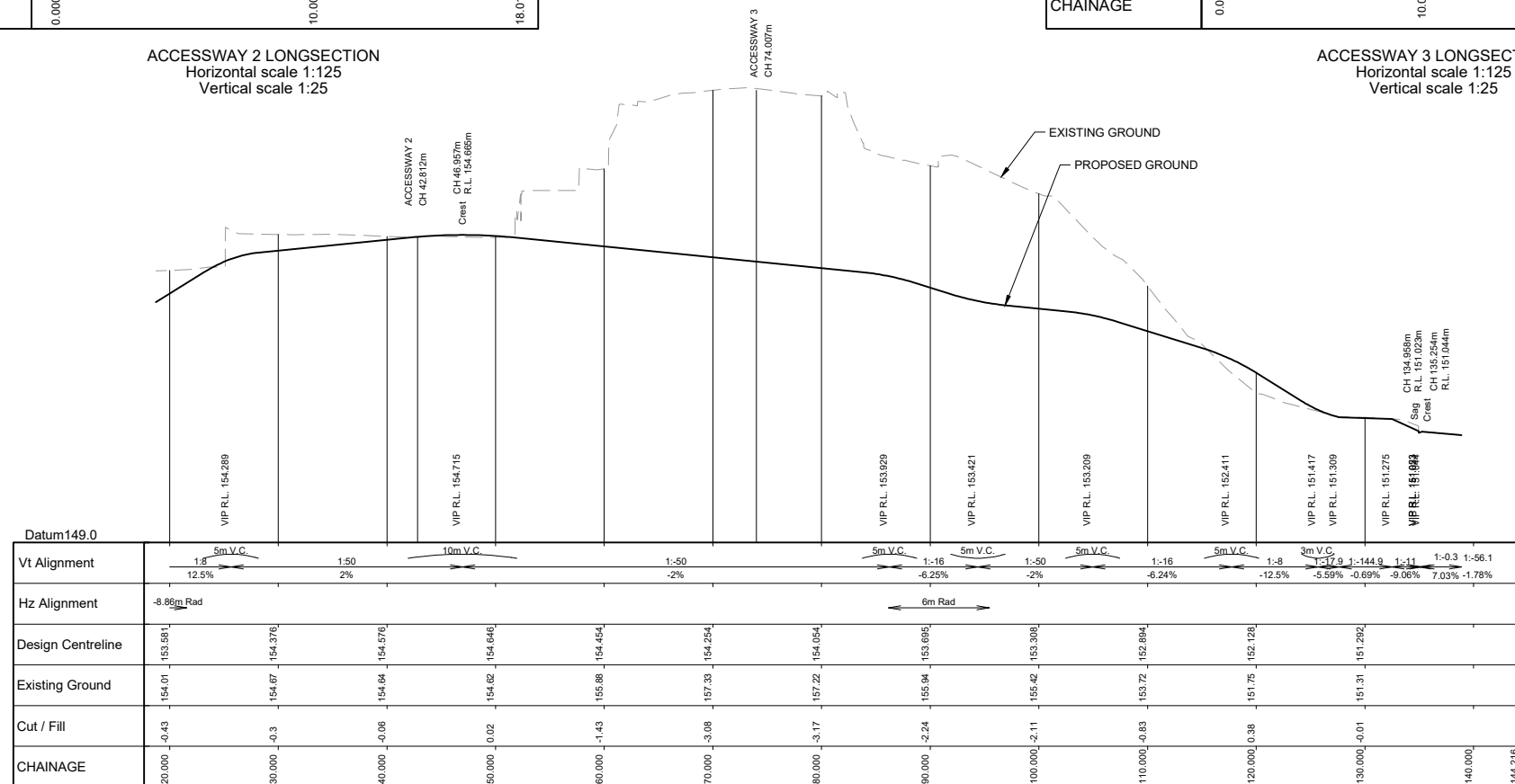
EXISTING GROUND LEVEL
FINISHED GROUND LEVEL



ACCESSWAY 2 LONGSECTION
Horizontal scale 1:125
Vertical scale 1:25



ACCESSWAY 3 LONGSECTION
Horizontal scale 1:125
Vertical scale 1:25



ACCESSWAY 1 LONGSECTION
Horizontal scale 1:250
Vertical scale 1:50

FOR RESOURCE CONSENT
NOT FOR CONSTRUCTION

0 FOR RESOURCE CONSENT Revision	RT	21.04.22	App	Date	Approved	RT	Dec-21
	Designed	SW					Dec-21
	Drawn	YW					Dec-21
	Reviewed	RD					Dec-21
	Approved	RT					Dec-21

Client
**FOODSTUFFS
NORTH ISLAND LTD**

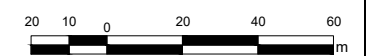
Project Title
**NEW WORLD
KHANDALLAH
CAR PARK EXPANSION**

Sheet Title
**ACCESSWAY
LONG SECTIONS**

Level 5, Building 3
666 Great South Road
Epsom
Auckland 1051
+64 9 525 9770
calibregroup.com



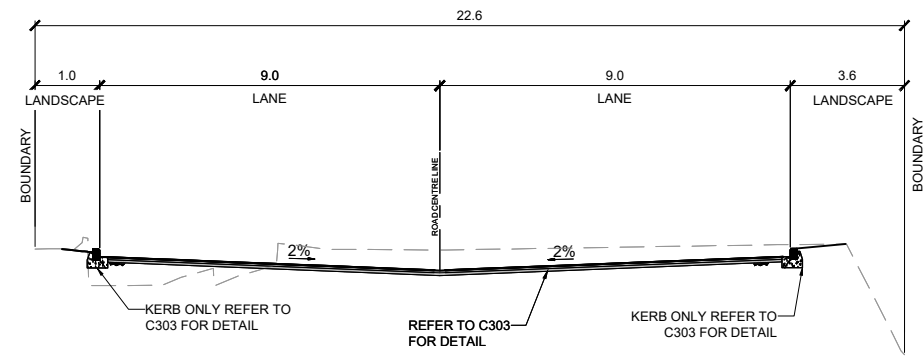
Scale (A1 Original) 1:1000 (A3) 1:2000



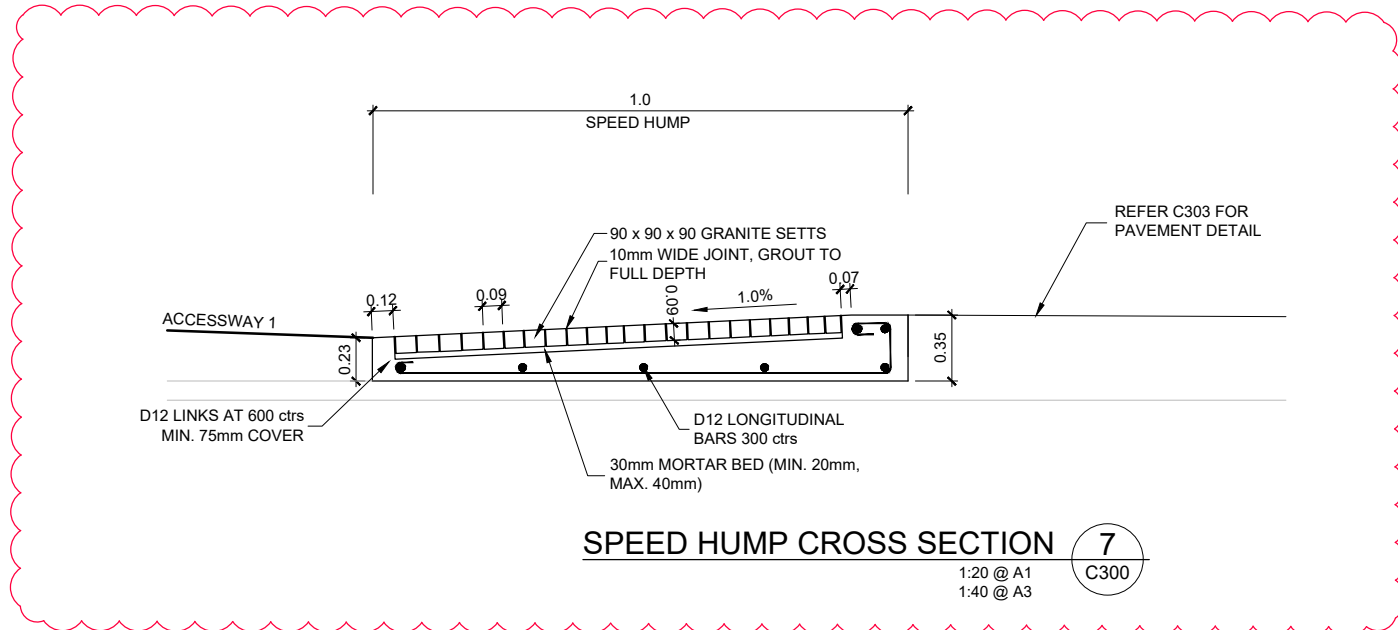
Project No Sheet Revision

712722 C301 0

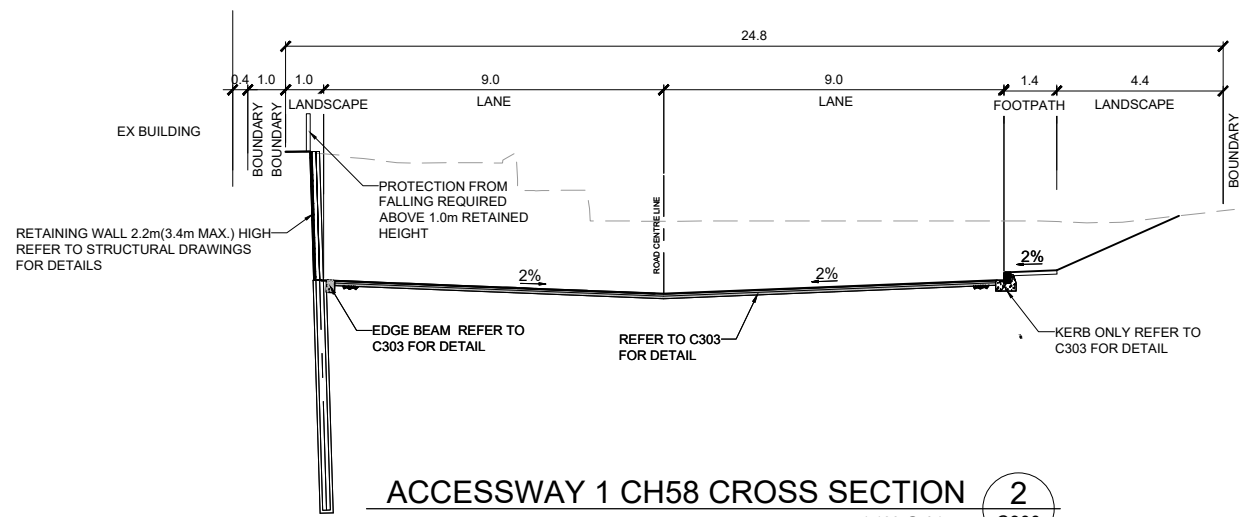
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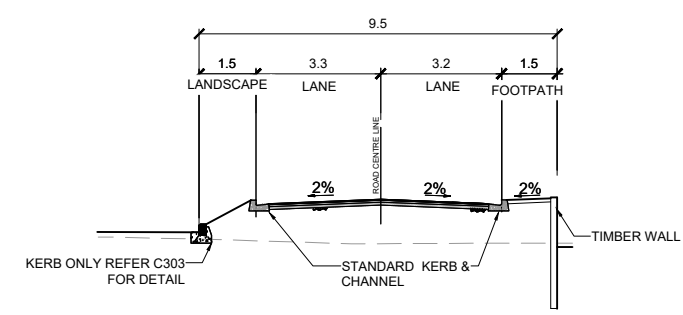
ACCESSWAY 1 CH32 CROSS SECTION 1
 1:100 @ A1
 1:200 @ A3
 C300



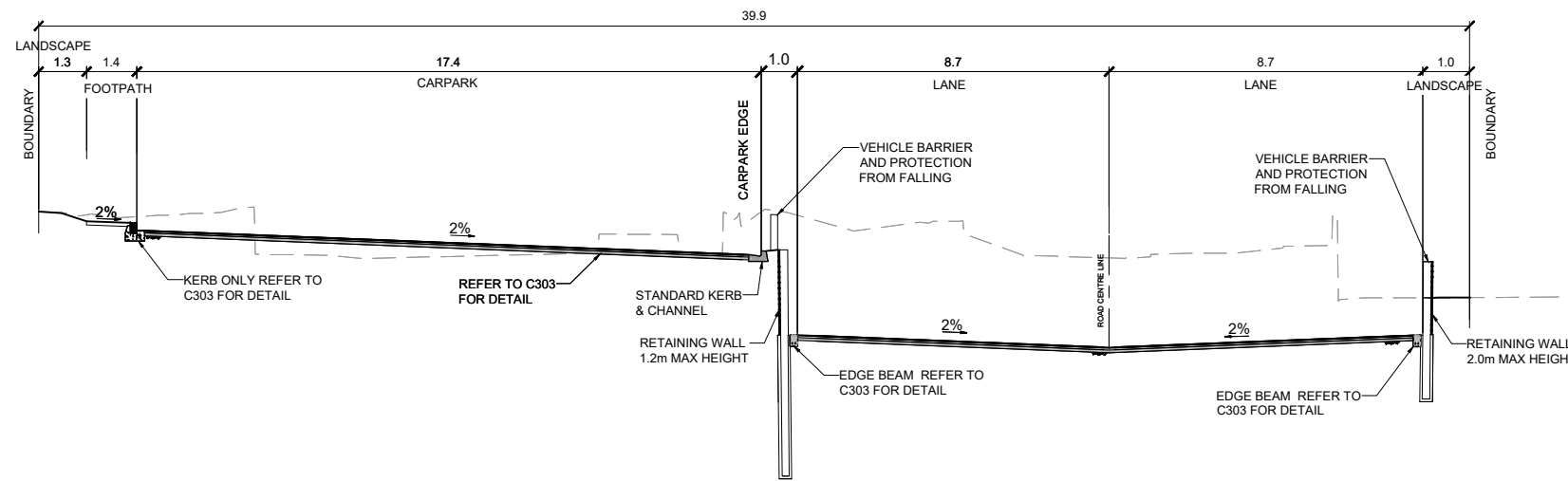
SPEED HUMP CROSS SECTION 7
 1:20 @ A1
 1:40 @ A3
 C300



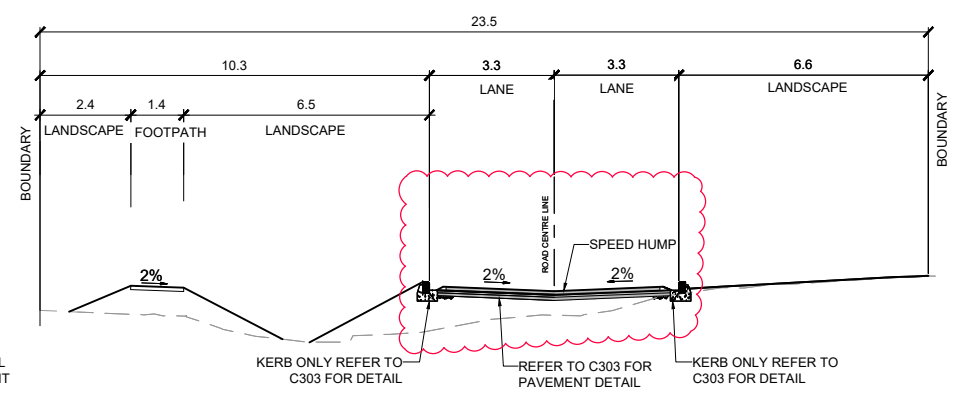
ACCESSWAY 1 CH58 CROSS SECTION 2
 1:100 @ A1
 1:200 @ A3
 C300



ACCESSWAY 2 CH12 CROSS SECTION 3
 1:100 @ A1
 1:200 @ A3
 C300



SECTION 5
 1:100 @ A1
 1:200 @ A3
 C300



ACCESSWAY 1 CH119 CROSS SECTION 6
 1:100 @ A1
 1:200 @ A3
 C300

FOR RESOURCE CONSENT
 NOT FOR CONSTRUCTION

Revision	App	Date	Approved	RT
2 LAYOUT UPDATED	RT	10.04.24	Designed	SW
1 DETAILS ADDED	RT	23.08.23	Drawn	YW/KD
0 FOR RESOURCE CONSENT	RT	21.04.22	Reviewed	RD
	App	Date	Approved	RT

Client
**FOODSTUFFS
 NORTH ISLAND LTD**

Project Title
**NEW WORLD
 KHANDALLAH
 CAR PARK EXPANSION**

Sheet Title
**TYPICAL ROAD
 CROSS SECTIONS**

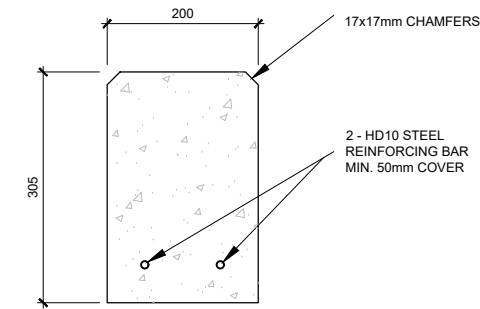
Level 5, Building 3
 666 Great South Road
 Eilerslie
 Auckland 1051
 +64 9 525 9770
 calibregroup.com



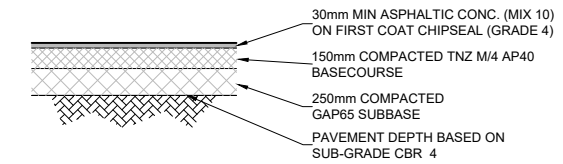
Scale (A1 Original) 1:100 (A3) 1:200

Project No	Sheet	Revision
712722	C302	2

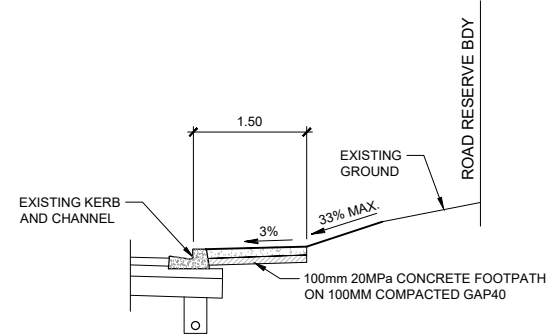
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①
EDGE BEAM & KERB ONLY
 1:10 @ A1



TYPICAL CARRIAGEWAY PAVEMENT DETAIL
 1:10 @ A1



A
 C300
FOOTPATH CROSS SECTION

FOR RESOURCE CONSENT
 NOT FOR CONSTRUCTION

Revision	App	Date	Approved	RT	Dec-21
1	RT	29.08.22	RT	Dec-21	Dec-21
0	RT	21.04.22	RT	Dec-21	Dec-21

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Client
 FOODSTUFFS
 NORTH ISLAND LTD

Project Title
 NEW WORLD
 KHANDALLAH
 CAR PARK EXPANSION

Sheet Title
 ROADING
 CONSTRUCTION DETAILS

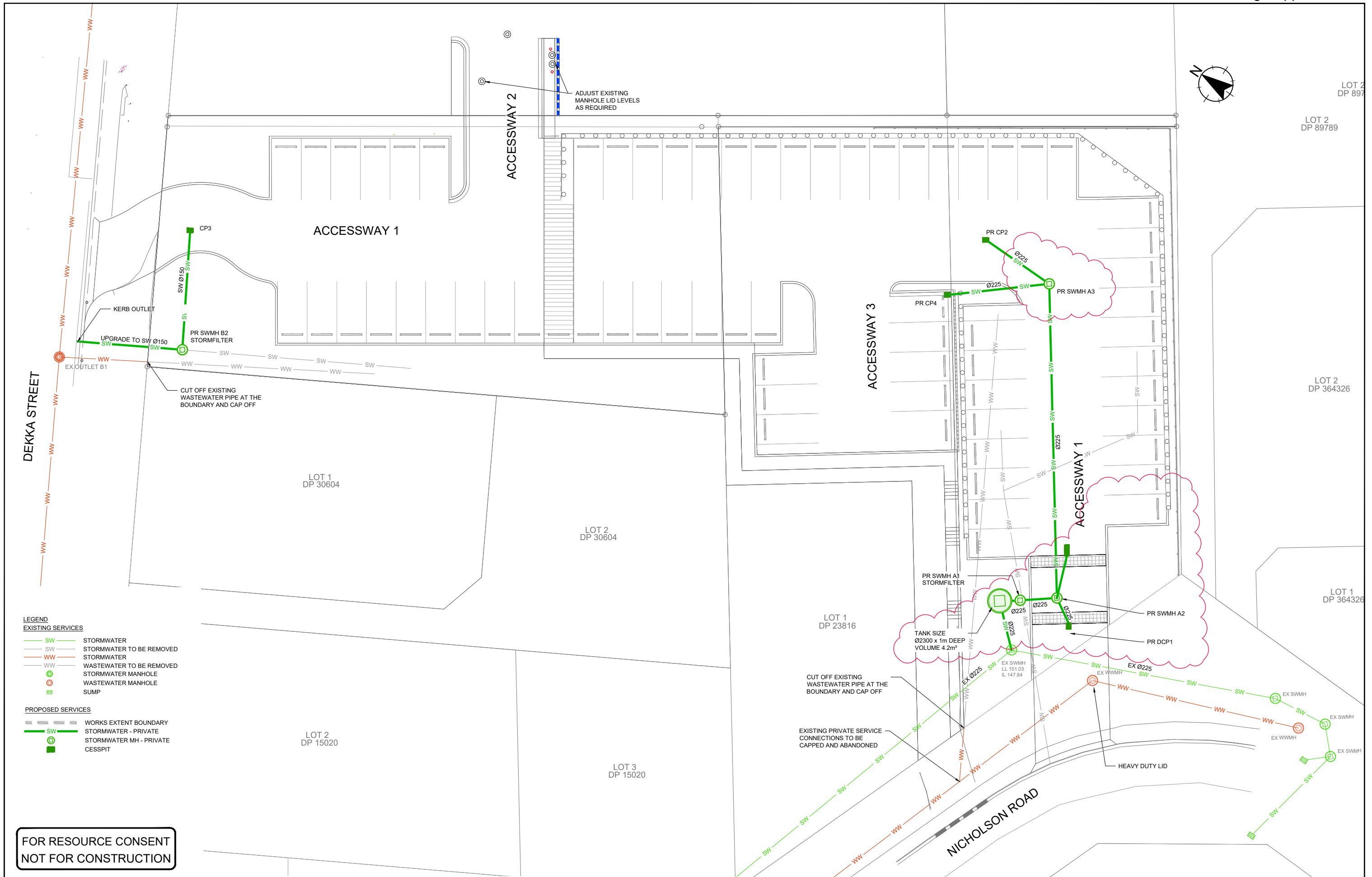
Level 5, Building 3
 666 Great South Road
 Ellerslie
 Auckland 1051
 +64 9 525 9770
 calibregroup.com



Scale (A1 Original) 1:10000 (A3) 1:20000



Project No: 712722 Sheet: C303 Revision: 1



- LEGEND**
- EXISTING SERVICES**
- SW — STORMWATER
 - SW — STORMWATER TO BE REMOVED
 - WW — WASTEWATER
 - WW — WASTEWATER TO BE REMOVED
 - ⊕ SWM — STORMWATER MANHOLE
 - ⊕ WWMH — WASTEWATER MANHOLE
 - ⊕ SUMP — WASTEWATER MANHOLE SUMP
- PROPOSED SERVICES**
- SW — WORKS EXTENT BOUNDARY
 - SW — STORMWATER - PRIVATE
 - ⊕ SWM — STORMWATER MH - PRIVATE
 - ⊕ CP — CESSPIT

**FOR RESOURCE CONSENT
NOT FOR CONSTRUCTION**

3 LAYOUT UPDATED	RT	10.04.24	Surveyed	SW	Dec-21
2 LAYOUT UPDATED	RT	05.04.24	Designed	SW	Dec-21
1 LAYOUT UPDATED	RT	23.08.23	Drawn	YW/KD	Dec-21
0 FOR RESOURCE CONSENT	RT	21.04.22	Reviewed	RD	Dec-21
Revision	App	Date	Approved	RT	Dec-21

Client
FOODSTUFFS
NORTH ISLAND LTD

Project Title
NEW WORLD
KHANDALLAH
CAR PARK EXPANSION

Sheet Title
DRAINAGE PLAN

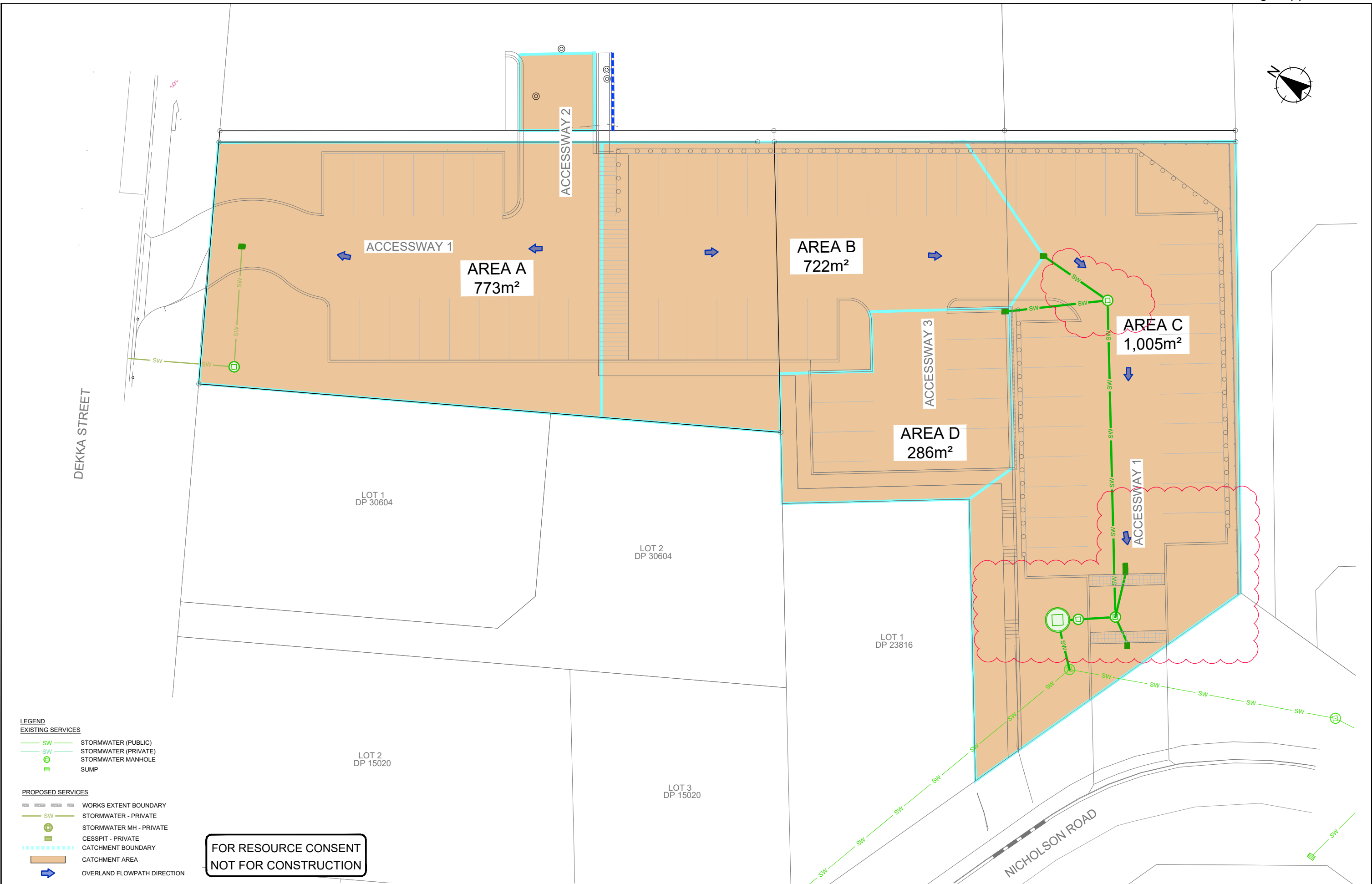
Level 5, Building 3
666 Great South Road
Eilerslie
Auckland 1051
+64 9 525 9770
calibregroup.com



Scale (A1 Original) 1:150 (A3) 1:300

Project No	Sheet	Revision
712722	C400	3

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- LEGEND**
- EXISTING SERVICES**
- SW — STORMWATER (PUBLIC)
 - SW — STORMWATER (PRIVATE)
 - ⊕ STORMWATER MANHOLE
 - SUMP
- PROPOSED SERVICES**
- SW — STORMWATER - PRIVATE
 - ⊕ STORMWATER MH - PRIVATE
 - CESSPIT - PRIVATE
 - CATCHMENT BOUNDARY
 - CATCHMENT AREA
 - ➡ OVERLAND FLOWPATH DIRECTION

**FOR RESOURCE CONSENT
NOT FOR CONSTRUCTION**

Revision	App	Date	Approved	RT	Dec-21
3 LAYOUT UPDATED	RT	10.04.24	Surveyed		
2 LAYOUT UPDATED	RT	05.04.24	Designed	SW	Dec-21
1 LAYOUT UPDATED	RT	23.08.23	Drawn	YW/KD	Dec-21
0 FOR RESOURCE CONSENT	RT	21.04.22	Reviewed	RD	Dec-21

Client
FOODSTUFFS
NORTH ISLAND LTD

Project Title
NEW WORLD
KHANDALLAH
CAR PARK EXPANSION

Sheet Title
STORMWATER
CATCHMENT PLAN

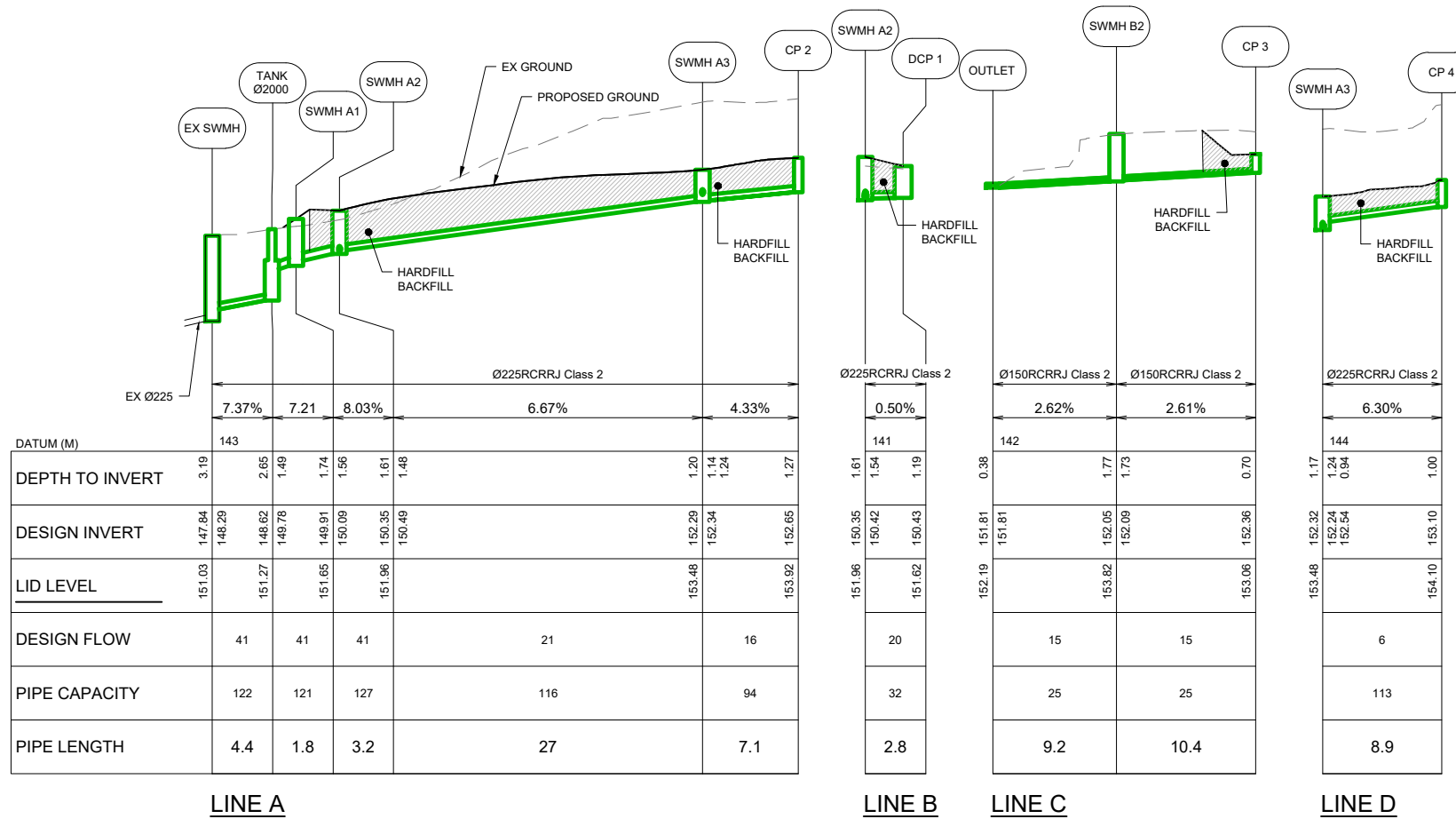
Level 5, Building 3
666 Great South Road
Eilerslie
Auckland 1051
+64 9 525 9770
calibregroup.com



Scale (A1 Original) 1:150 (A3) 1:300

Project No 712722 Sheet C401 Revision 3

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0 FOR RESOURCE CONSENT	RT	21.04.22	App	Date	Approved	RT	Dec-21
Surveyed SW Dec-21 Designed YW Dec-21 Drawn RD Dec-21 Reviewed RT Dec-21 Approved RT Dec-21							

Client
**FOODSTUFFS
NORTH ISLAND LTD**

Project Title
**NEW WORLD
KHANDALLAH
CAR PARK EXPANSION**

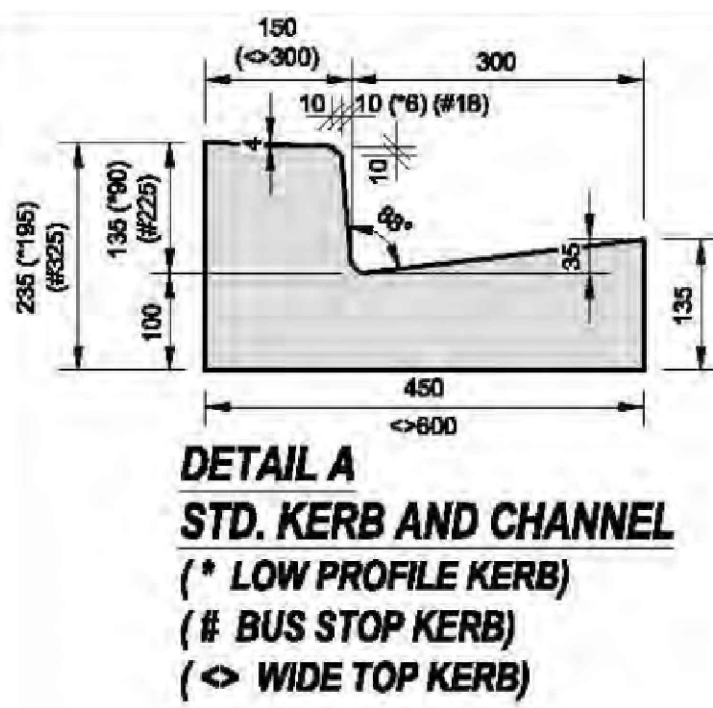
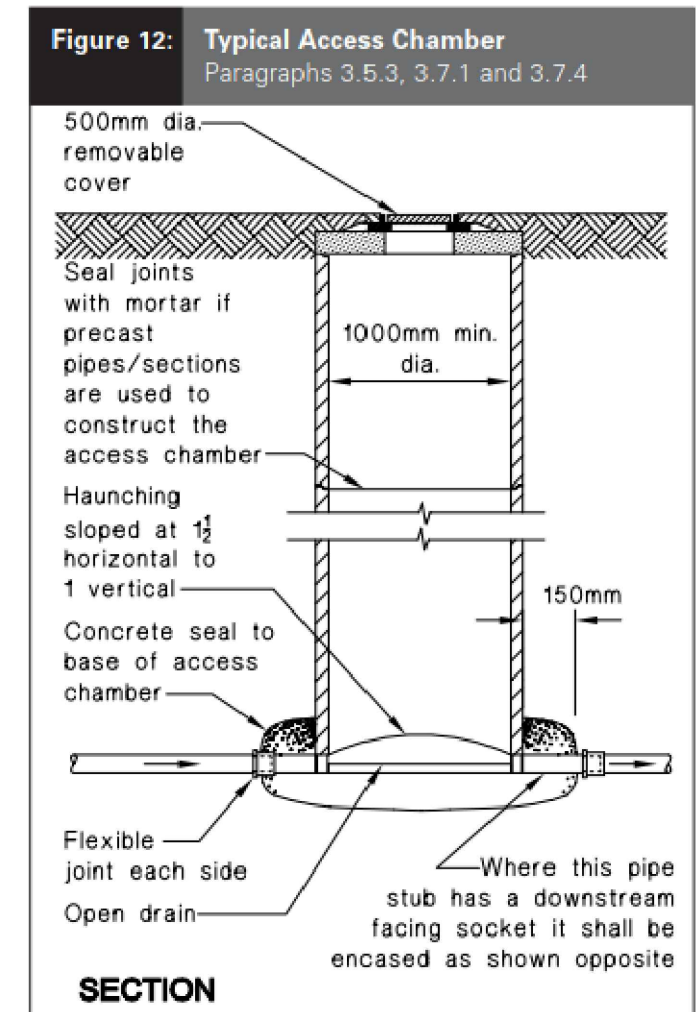
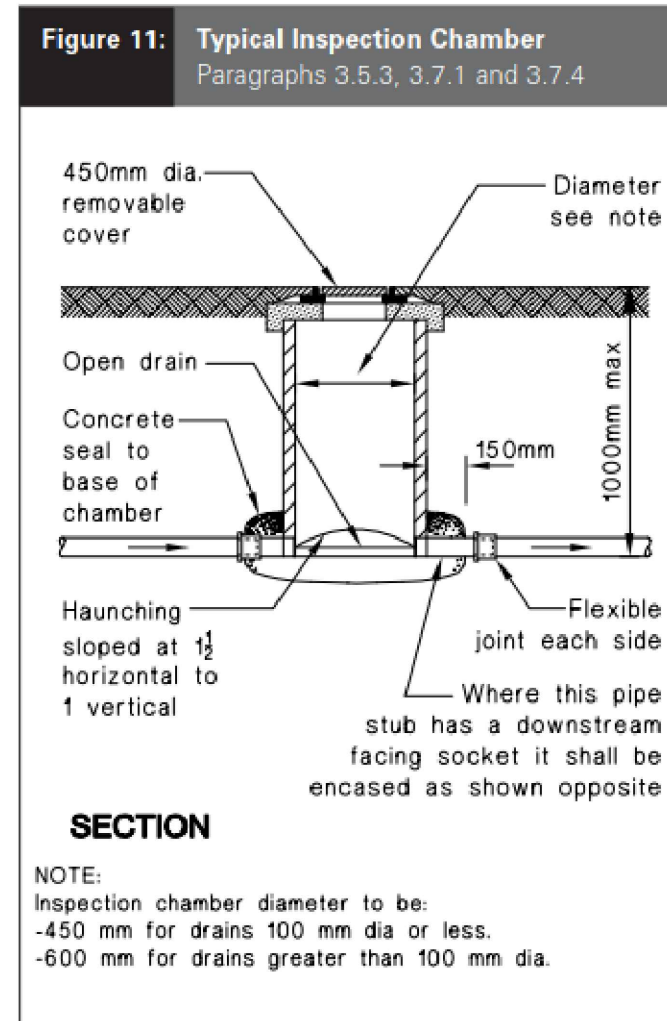
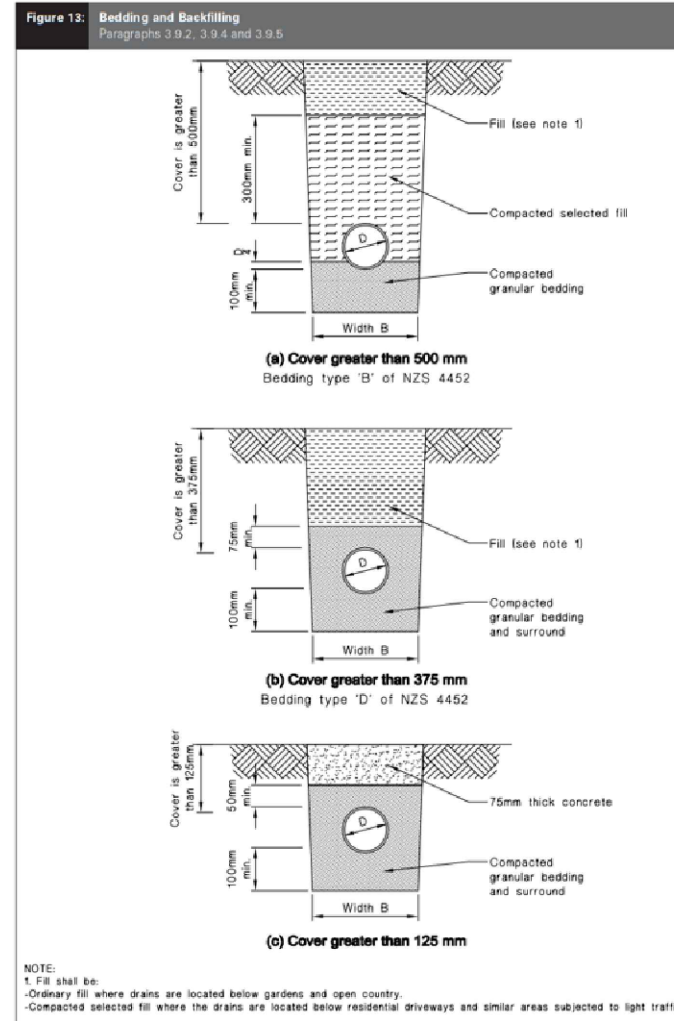
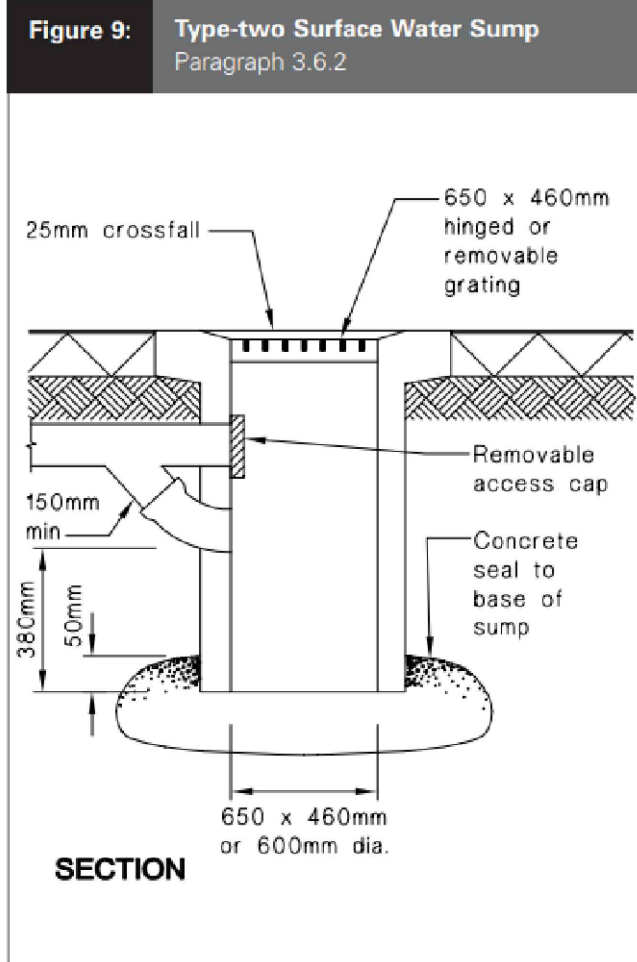
Sheet Title
**STORMWATER
LONG SECTION**

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Scale (A1 Original)		
HORIZONTAL SCALE 1:500 (A1) 1:1000 (A3)		
VERTICAL SCALE 1:100 (A1) 1:200 (A3)		
Project No	Sheet	Revision
712722	C405	0

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0 FOR RESOURCE CONSENT Revision	RT 21.04.22 App Date	Surveyed Designed SW Dec-21 Drawn YW Dec-21 Reviewed RD Dec-21 Approved RT Dec-21	Client FOODSTUFFS NORTH ISLAND LTD	Project Title NEW WORLD KHANDALLAH CAR PARK EXPANSION	Sheet Title STANDARD DETAILS SHEET 1	Level 5, Building 3 888 Great South Road Eilerslie Auckland 1051 +64 9 525 9770 calibregroup.com		Scale (A1 Original) 1:### (A3) 1:### ### ### 0 ### # ### Project No 712722 Sheet C800 Revision 0
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