Tonkin+Taylor

Job No: 1016494.0000
10 September 2021

Acanthus Limited
c/- Civix
PO Box 5204
Victoria Street
Auckland 1141

Attention: Nick Mattison

Dear Nick

1 Selfs Road, Papatoetoe
Preliminary geotechnical assessment in support of fast-track consenting

1 Introduction

Acanthus Limited has engaged Tonkin & Taylor Ltd (T+T) to provide a preliminary (desktop) assessment of its proposal to construct some 115 dwelling units and lots at 1 Selfs Road, Papatoetoe (the site).

This assessment was prepared in accordance with our proposal dated 19 February 2021[1] and approval provided on 7 April 2021[2].

2 Development proposal

We understand that Acanthus Limited is seeking approval via the COVID-19 Recovery (Fast-track Consenting) Act 2020 to construct some 115 dwelling units and lots on the site. Preliminary development plans are provided in Appendix A. The proposal will involve benching into the existing slope to form level generally northeast-southwest oriented building platforms stepping up from Selfs Road. The building platforms will be supported by a combination of low retaining walls and batters. Cut depths and retained heights will be subject to detailed design but are currently anticipated to be less than approximately 3 m, and typically less than 2 m.

3 Scope of work

T+T undertook the following to provide a preliminary assessment of geotechnical conditions at the site:

1 Reviewed published geological maps for the site;

[1] 1 Selfs Road, Papatoetoe. Geological, geotechnical and contamination assessments in support of fast-track consenting. Letter to Andrew Fawcet at Myland Partners, dated 19 February 2021.
[2] Email from Andrew Fawcet at Myland Partners to Shane Moore at Tonkin & Taylor Ltd, dated 7 April 2021.

Tonkin & Taylor Ltd | 105 Carlton Gore Rd, Newmarket, Auckland 1023, New Zealand
PO Box 5271, Victoria Street West, Auckland 1142 P +64-9-355 6000 F +64-9-307 0265 E akl@tonkintaylor.co.nz

2 Reviewed T+T's records and the New Zealand Geotechnical Database[3] of geotechnical data from nearby sites;

3 Obtained and reviewed Council property files for relevant geotechnical information;

4 A Senior Geotechnical Engineer reviewed site photographs taken by other T+T personnel; and

5 Preparation of this report.

4 Site description

The site location is shown in Figure 4.1. The site layout including contour information and nearby geotechnical investigation locations are shown in Figure B1 provided in Appendix B. The following section provides a summary of the site setting, with particular focus on features of geotechnical relevance, further information is provided in the geological assessment prepared concurrently by T+T[4].

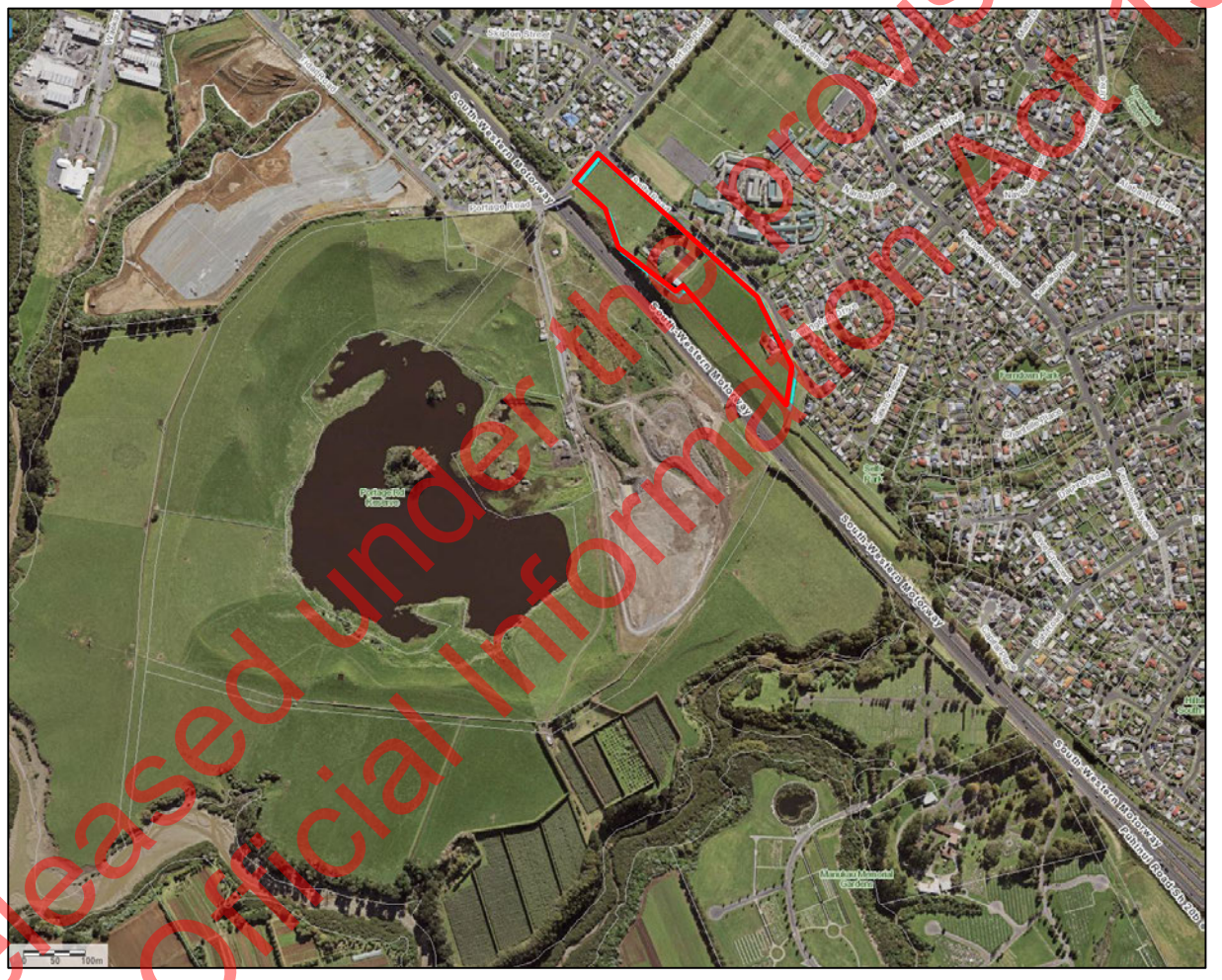


Figure 4.1: Site location (source: Auckland Council GeoMaps)

The site is located on the north-eastern flank of the tuff ring derived from the Crater Hill/Ngā Kapua Kohuora volcanic centre. The geological setting is summarised (from Edbrooke 2001[5]) in Figure 4.2.

[3] www.nzgd.org.nz, accessed on 8 April 2021.
[4] 1 Selfs Road, Papatoetoe. Geological assessment in support of fast-track consenting application. Report prepared for Acanthus Limited by Tonkin & Taylor Ltd, dated 10 September 2021.
[5] Edbrooke, S.W. (compiler) 2001: Geology of the Auckland area: scale 1:250,000. Lower Hutt: Institute of Geological & Nuclear Sciences Limited. Institute of Geological & Nuclear Sciences 1:250,000 geological map 3. 74 p. + 1 folded map

A steep slope is present beyond the south-western boundary of the site, formed by a combination of cutting undertaken to create the South Western Motorway (State Highway 20) and the original inner slope of the tuff ring/explosion crater. The site itself generally slopes at a moderate gradient to the north-east towards Selfs Road.

Figure 4.2: Mapped geology (after Edbrooke[5]) showing approximate site location (red outline)

The site is bordered by Portage and Selfs roads, to the north and east respectively, with existing residential properties beyond, except where Aorere College is located opposite the site along Selfs Road. Vacant lands, owned by Waka Kotahi NZ Transport Agency, border the site to its south and west, with the South Western Motorway beyond. A former quarry, now being filled, is located opposite the South Western Motorway from the site, within the Crater Hill/Ngā Kapua Kohuora volcanic centre. The remainder of the volcano is predominantly under pastoral and horticultural uses.

5 Geotechnical considerations

5.1 Subsurface conditions

Based upon geotechnical investigations undertaken on adjacent sites, including Portage Road overbridge ≈ 30metres to the west and Aorere College ≈ 20metres to the north, the site is likely to be underlain by very stiff to hard ash and tuff originating from the Crater Hill/Ngā Kapua Kohuora volcanic centre. The ash and tuff generally consist of silt sized clasts with occasional lenses of sand and gravel. Insitu shear strength tests are generally in excess of 100 kPa, increasing in strength with depth with SPT N values greater than 50 at depths of less than 4 metres. The groundwater level is uncertain, but is anticipated to be at least 5 metres below the surface, possibly controlled by excavation of the South Western Motorway (which is formed at approximately RL 25m).

5.2 Foundations

The proposed development consists of single level units. Based upon available subsurface information, shallow foundations are likely to be suitable to support the proposed structures. For preliminary design a maximum ULS bearing capacity of 250 kPa may be utilised.

5.3 Stability

Beyond the south western boundary of the development, a steep cut has been formed to create the south western motorway. The maximum height of this slope is approximately 13 metres, with the maximum slope of approximately 1:1. Arcuate features beyond the northern and southern end of the development, forming towards the south western motorway, indicate the possibility of historic ground movement, although these features may be remnants of the volcanic activity that formed the site. The crests of both these slopes are beyond the south-western boundary of the site. Both these arcuate features will need to be investigated during detailed design of the development. In the event that they indicate potential instability that extends to the proposed development, the following options may be considered to create stable building platforms:

1 Set back units further from the crest of the slope. The current proposed development suggests the units are at least 10 to 15 metres beyond the crest of the slope.

2 Lower the units. Removing soil from the top of the slope unloads the slope and improves stability. Current perspective views of the development suggest the proposed units near the crest of the slope will be up to 2 metres below the existing ground level.

3 Construct a palisade wall between the proposed units and the crest of any unstable slope.

In summary, there is a slight risk that the stability of slope beyond the south-western boundary is less than commonly acceptable (factor of safety <1.5). If this is identified during detailed investigation for the development, stable building platforms can readily be formed with careful earthworks.

6 Applicability

This report has been prepared for the exclusive use of our client, Acanthus Limited, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that our client will submit this report as part of an application for resource consent and that the consenting authority will use this report for the purpose of assessing that application.

Recommendations and opinions in this report are based on our desktop review of previous investigations. The nature and continuity of stratigraphy away from the previous investigation locations is inferred but it must be appreciated that actual conditions may vary from the assumed model.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
	
.....	.....
Andrew Langbein Technical Director - Geotechnical	Gerard Bird Project Director

SRMM
p:\1016494\issueddocuments\srmm 20210910.prelimgeotech.v2.docx

Appendix A: Preliminary development plans

SELFS ROAD HOUSING PROPOSAL

1 SELFS ROAD, OTAHUHU
AUCKLAND

CASA
Collingridge And Smith Architects (UK) Ltd | Beautiful Human Spaces

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE

TYPOLOGY SITE PLAN 1:1000

NOTES

All survey information shown supplied from **CIVIX** CASA accept no liability for the accuracy of this information

Landscaping and planting shown is indicative only Refer to Boffa Miskell landscape masterplan for accurate information

N

	TYPE A
	TYPE B
	TYPE D
	TYPE E
	TYPE F
	TYPE G
	TYPE H
	TYPE I
	TYPE J
	TYPE K
	TYPE L
	TYPE M
	SITE BOUNDARY
	SETBACKS
	APPROX TUFF RING

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE
01 WIP	Consents Page			Work in Progress

JOB TITLE

MYLAND PARTNERS

ADDRESS

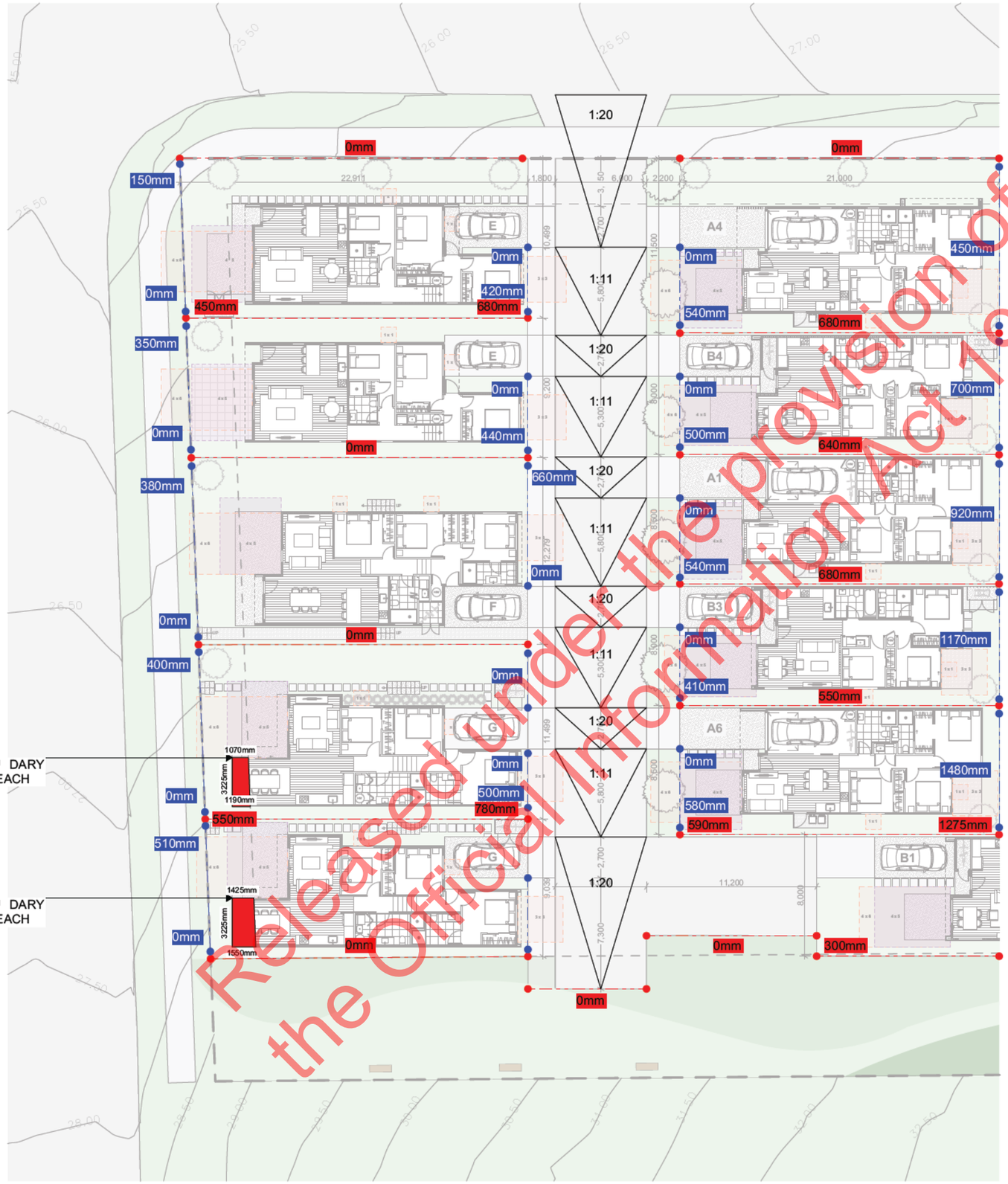
1 SELFS ROAD, PAPATOETOE AUCKLAND

DRAWING TITLE

TYPOLOGY SITE PLAN

SCALE	A1 1:1000 A3 double	JOB NO	PN-0372
DRAWN	DP	SHEET	REVISION
CHECKED		102	01 WIP
DATE	7/09/2021		

CASA
Collingridge And Smith Architects (UK) Ltd | Beautiful Human Spaces
Level 1 2 Wiston Street Remuera Auckland NEW ZEALAND 1050 t: 09 522 2552



0. JOAL 1 INFORMATION 1:150

NOTES

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Retaining information is indicative only CASA always recommends that all earthwork and retaining calculations are confirmed by a civil engineer

N

NW - SE RETAINING
NE - SW RETAINING
JOAL GRADIENT

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE
01 WIP	Consents Page			Work in Progress

JOB TITLE

MYLAND PARTNERS

ADDRESS

1 SELFS ROAD, PAPATOETOE AUCKLAND

DRAWING TITLE

JOAL 1 RETAINING

SCALE	A1 1:100, 1:150 A3 double	JOB NO	PN-0372
DRAWN	DP	SHEET	REVISION
CHECKED		202	01 WIP
DATE	7/09/2021		

CASA

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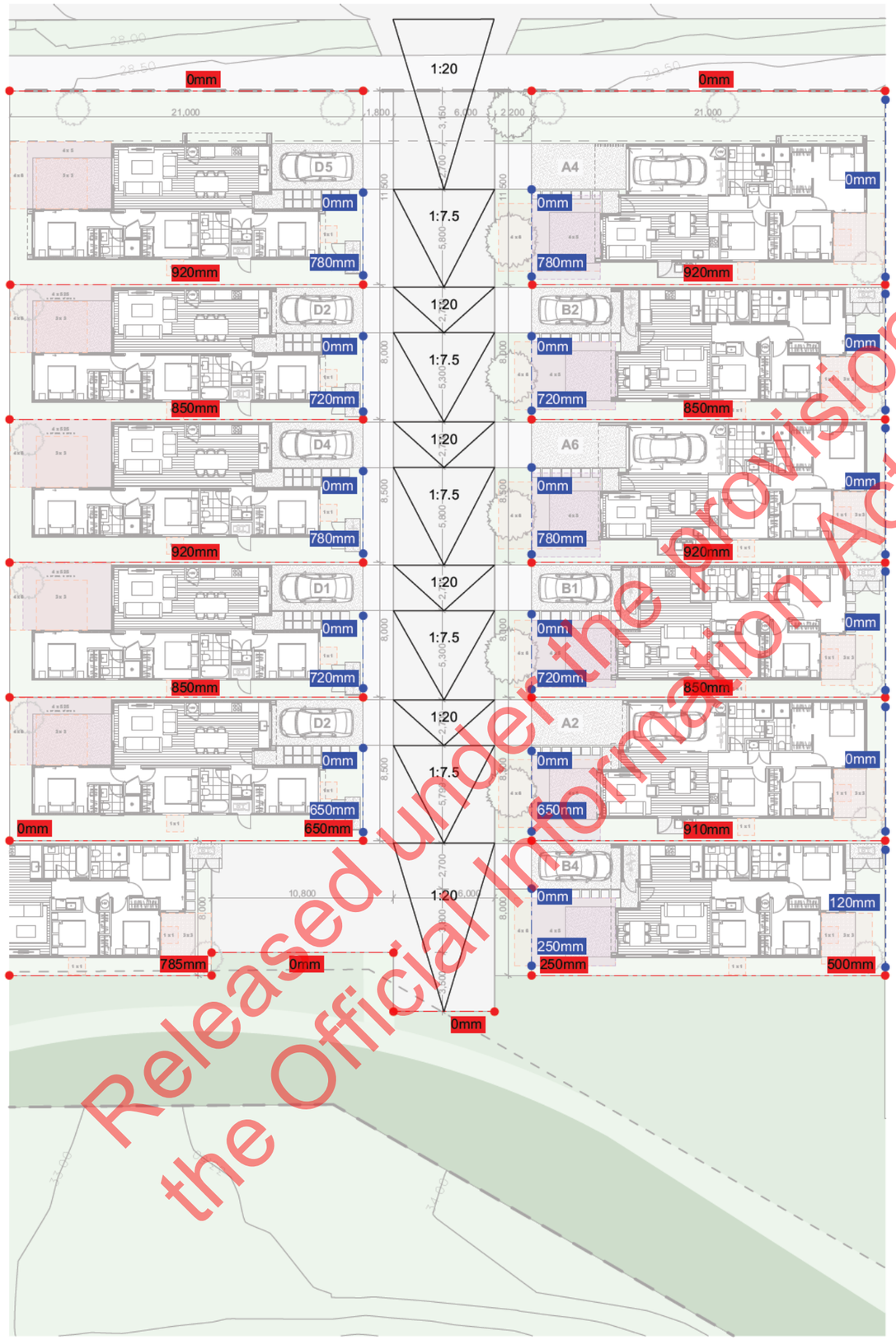

JOAL 2 INFORMATION 1:150

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N

NW - SE RETAINING
NE - SW RETAINING
JOAL GRADIENT

01 WIP	Consents Page			Work in Progress
REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE

MYLAND PARTNERS

1 SELFS ROAD, PAPATOETOE AUCKLAND

JOAL 2 RETAINING

SCALE	A1 1:100, 1:150 A3 double	JOB NO	PN-0372
DRAWN	DP	SHEET	REVISION
CHECKED		204	01 WIP
DATE	7/09/2021		

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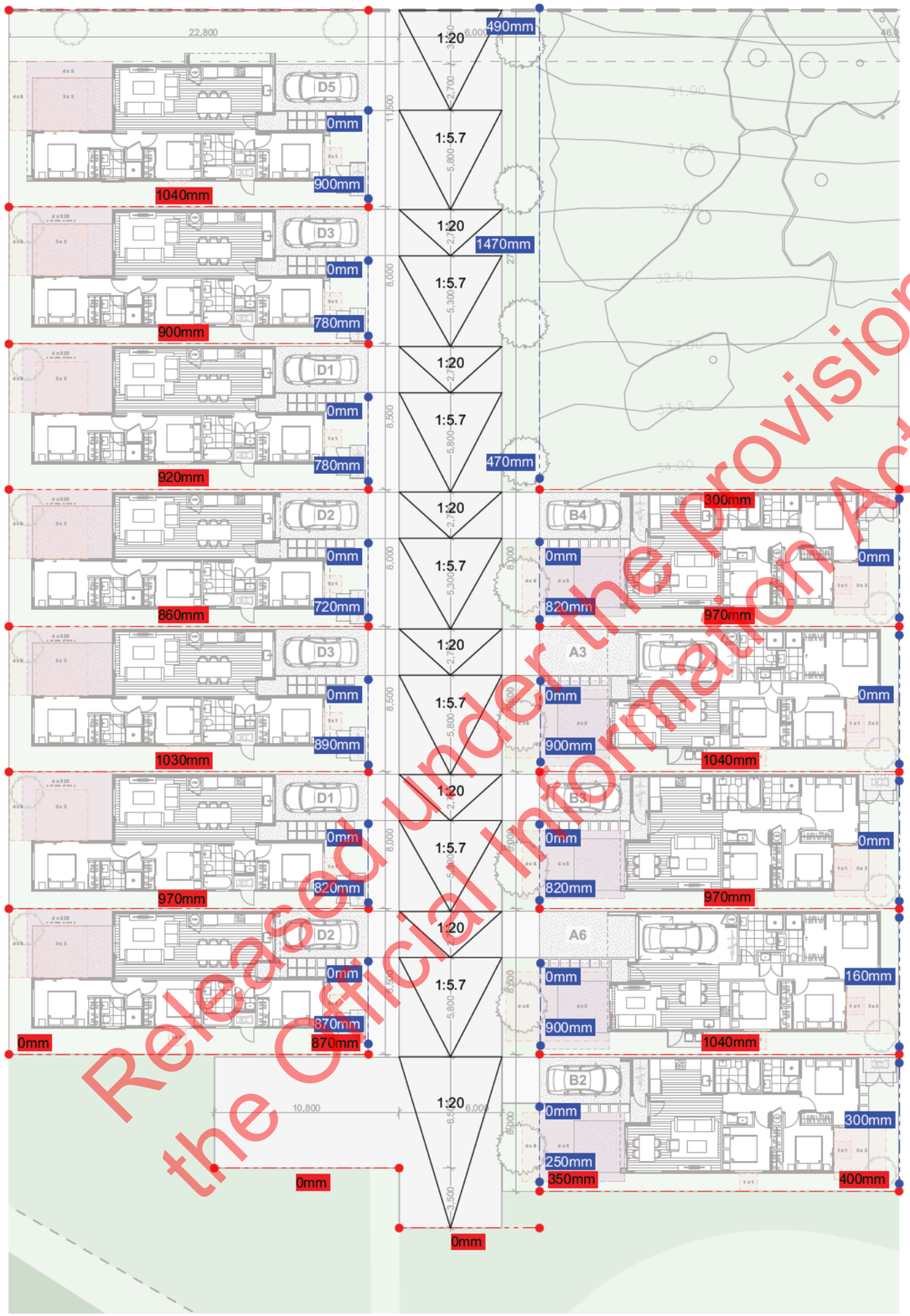

JOAL 3 INFORMATION 1:150

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N

NW - SE RETAINING
NE - SW RETAINING
JOAL GRADIENT

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE
01 WIP	Consents Page			Work in Progress

JOB TITLE
MYLAND PARTNERS

ADDRESS
1 SELFS ROAD, PAPATOETOE AUCKLAND

DRAWING TITLE
JOAL 3 RETAINING

SCALE	A1 1:100, 1:150 A3 double	JOB NO	PN-0372
DRAWN	DP	SHEET	REVISION
CHECKED		206	01 WIP
DATE	7/09/2021		

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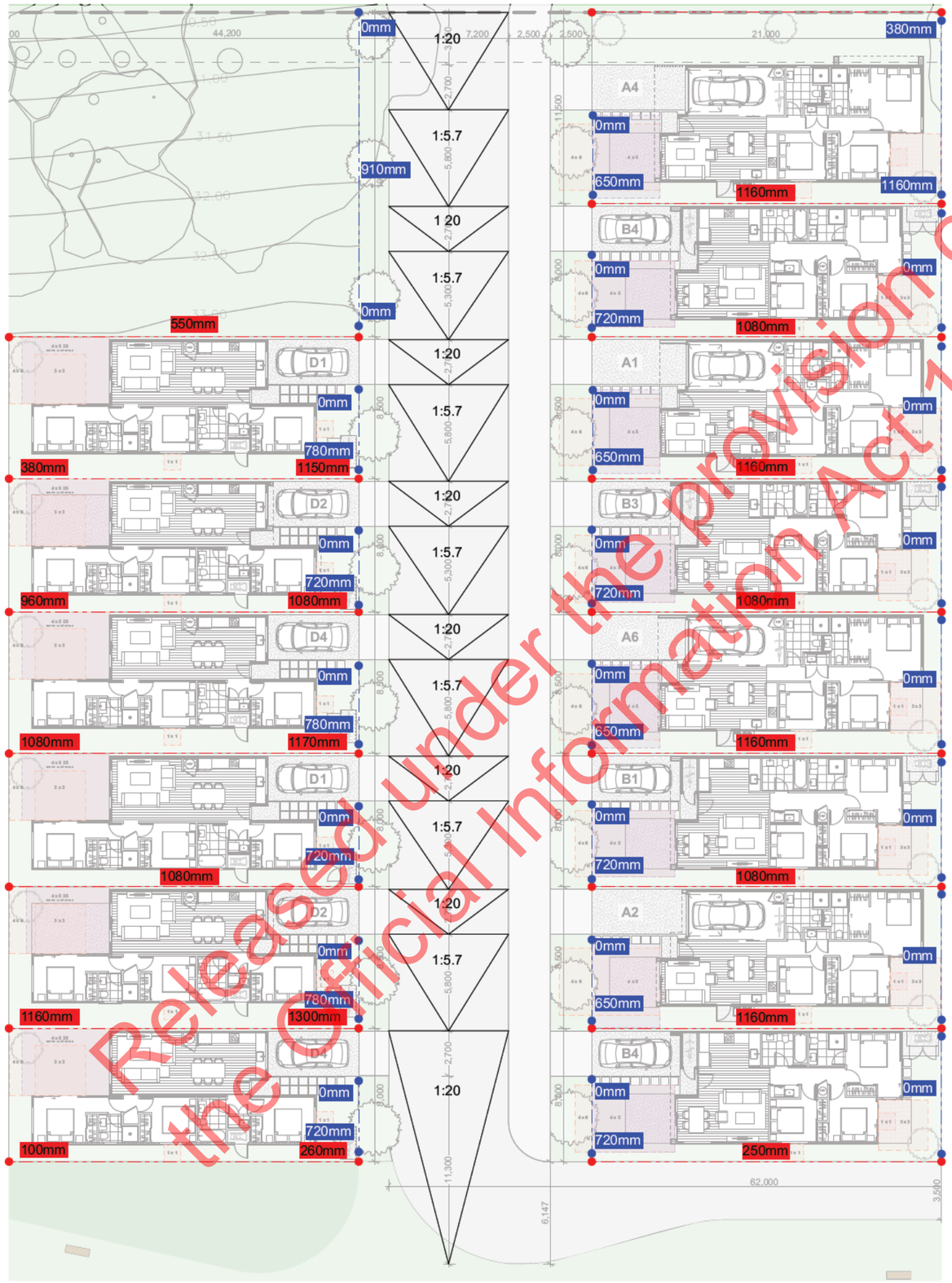

JOAL 4 INFORMATION 1:150

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N

NW - SE RETAINING

NE - SW RETAINING

JOAL GRADIENT

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE
01 WIP	Consents Page			Work in Progress

MYLAND PARTNERS

1 SELFS ROAD, PAPATOETOE AUCKLAND

JOAL 4 RETAINING

SCALE	A1 1:100, 1:150 A3 double	JOB NO	PN-0372
DRAWN	DP	SHEET	208
CHECKED			REVISION 01 WIP
DATE	7/09/2021		

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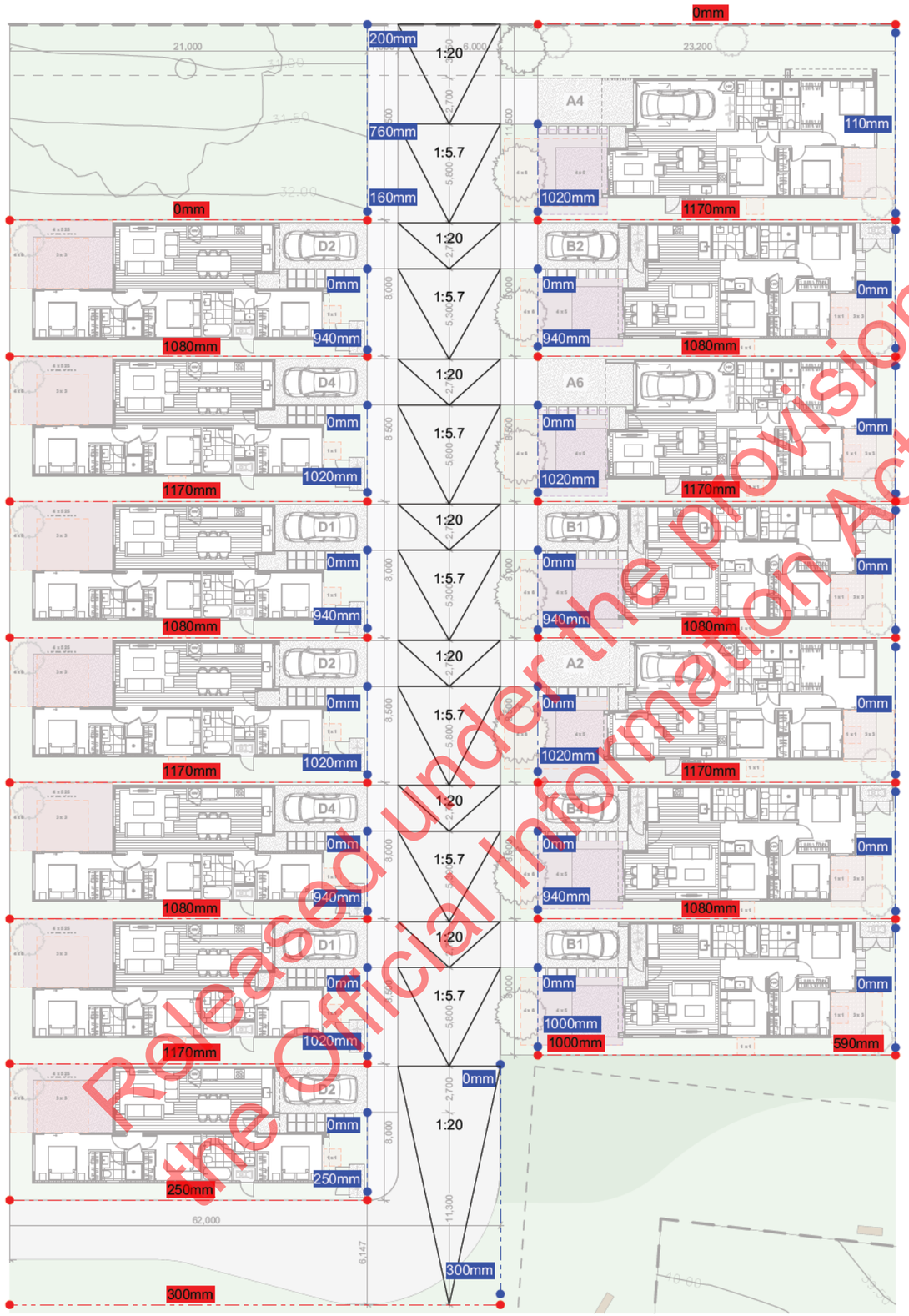

JOAL 5 INFORMATION 1:150

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N

NW - SE RETAINING

NE - SW RETAINING

JOAL GRADIENT

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE
01 WIP	Consents Page			Work in Progress

MYLAND PARTNERS

1 SELFS ROAD, PAPATOETOE AUCKLAND

JOAL 5 RETAINING

SCALE	A1 1:100, 1:150 A3 double	JOB NO	PN-0372
DRAWN	DP	SHEET	REVISION
CHECKED		210	01 WIP
DATE	7/09/2021		

CASA

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The contractor shall check and verify all dimensions levels and angles on site prior to commencing any work. The copyright of these drawings and all parts hereof remains the property of COLLINGRIDGE AND SMITH ARCHITECTS (UK) LTD. Dimensions must not be scaled from this drawings

JOAL 6 INFORMATION 1:150

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N

NW - SE RETAINING
NE - SW RETAINING
JOAL GRADIENT

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE
01 WIP	Consents Page			Work in Progress

MYLAND PARTNERS

1 SELFS ROAD, PAPATOETOE AUCKLAND

JOAL 6 RETAINING

SCALE	A1 1:100, 1:150 A3 double	JOB NO.	PN-0372
DRAWN	DP	SHEET	REVISION
CHECKED		212	01 WIP
DATE	7/09/2021		

CASA
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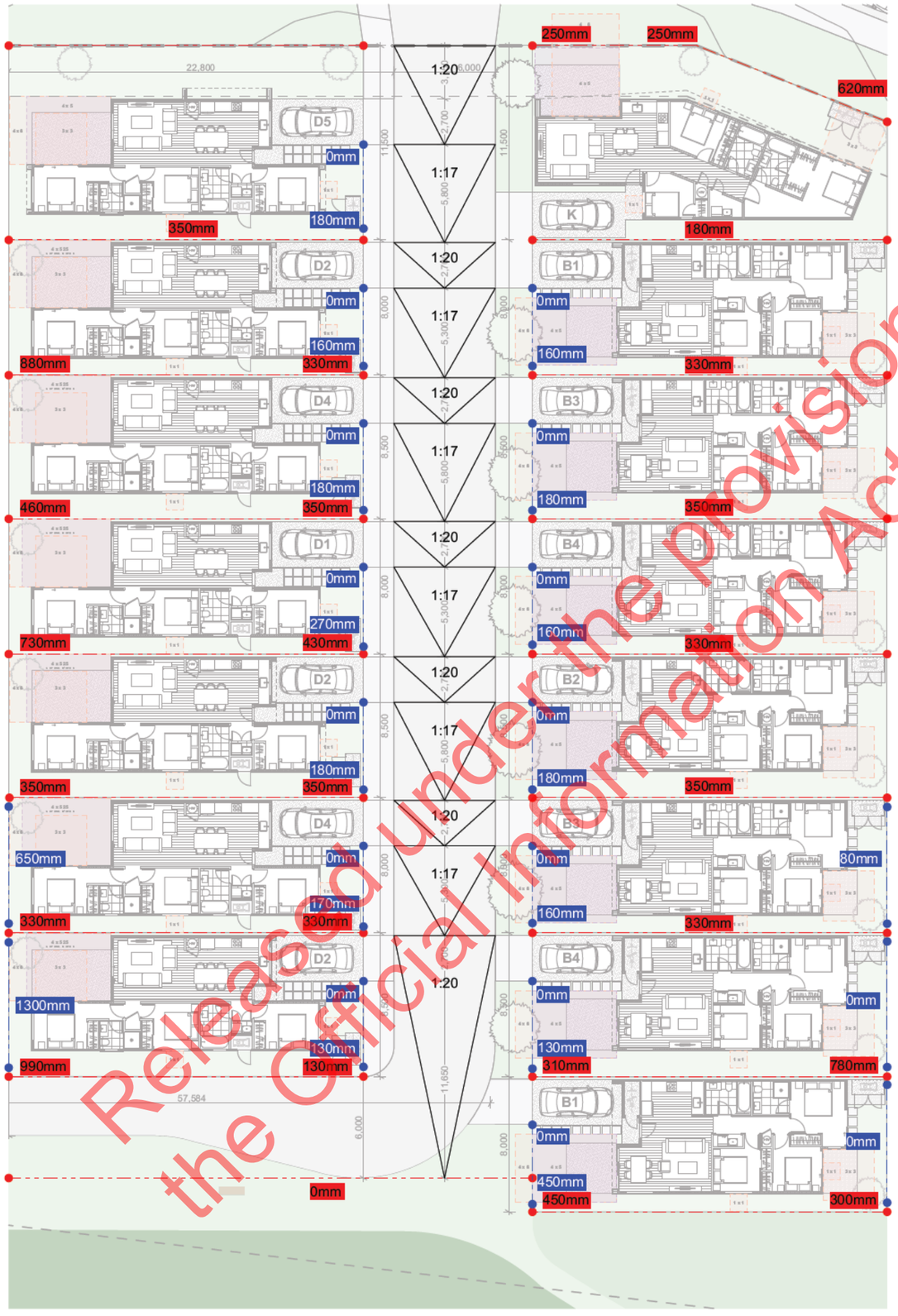

JOAL 7 INFORMATION 1:150

NOTES

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N

NW - SE RETAINING

NE - SW RETAINING

JOAL GRADIENT

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE
01 WIP	Consents Page			Work in Progress

MYLAND PARTNERS

1 SELFS ROAD, PAPATOETOE AUCKLAND

JOAL 7 RETAINING

SCALE	A1 1:100, 1:150 A3 double	JOB NO	PN-0372
DRAWN	DP	SHEET	REVISION
CHECKED		214	01 WIP
DATE	7/09/2021		

CASA

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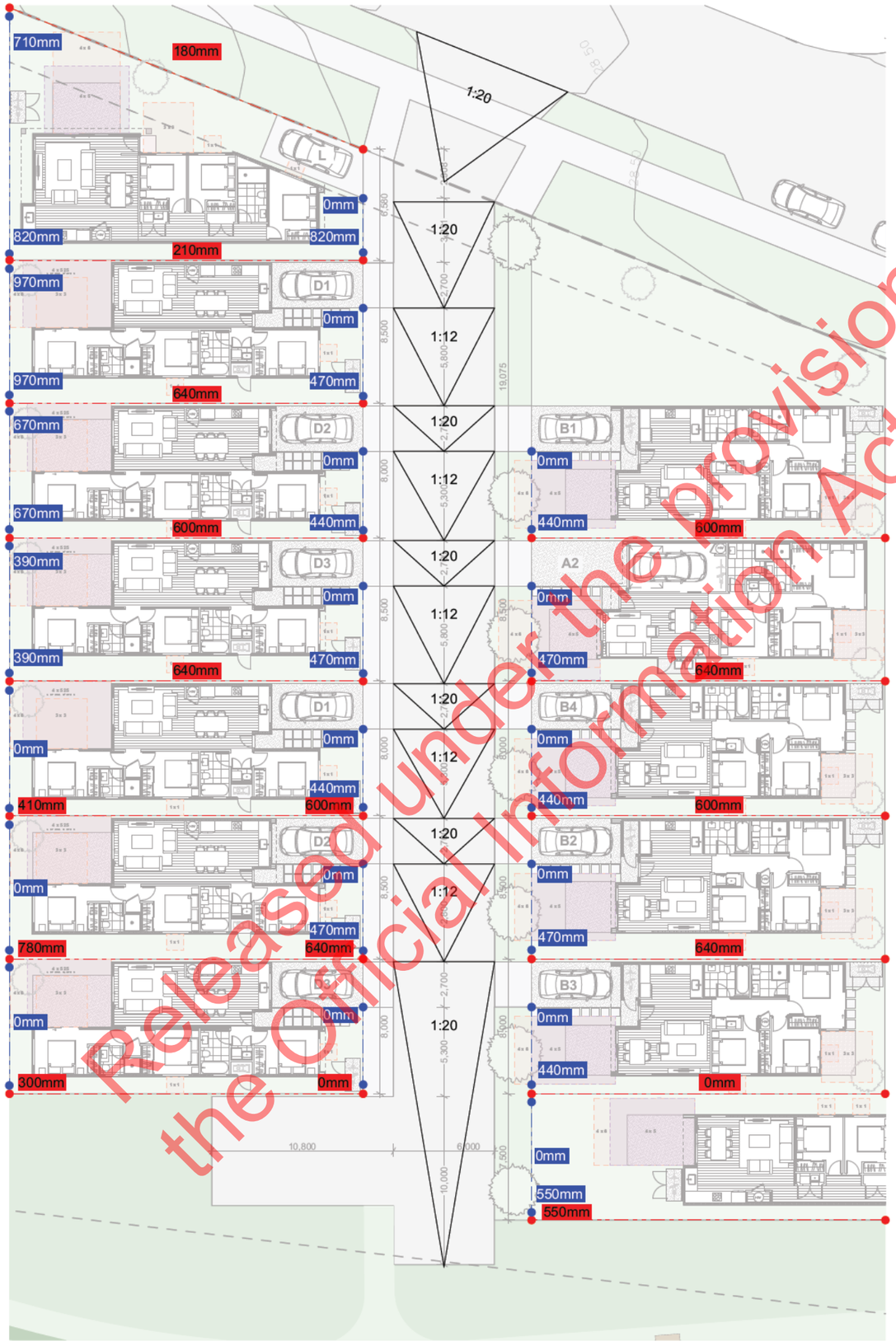

JOAL 8 INFORMATION 1:150

NOTES

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N

NW - SE RETAINING
NE - SW RETAINING
JOAL GRADIENT

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE
01 WIP	Consents Page			Work in Progress

MYLAND PARTNERS

1 SELFS ROAD, PAPATOETOE AUCKLAND

JOAL 8 RETAINING

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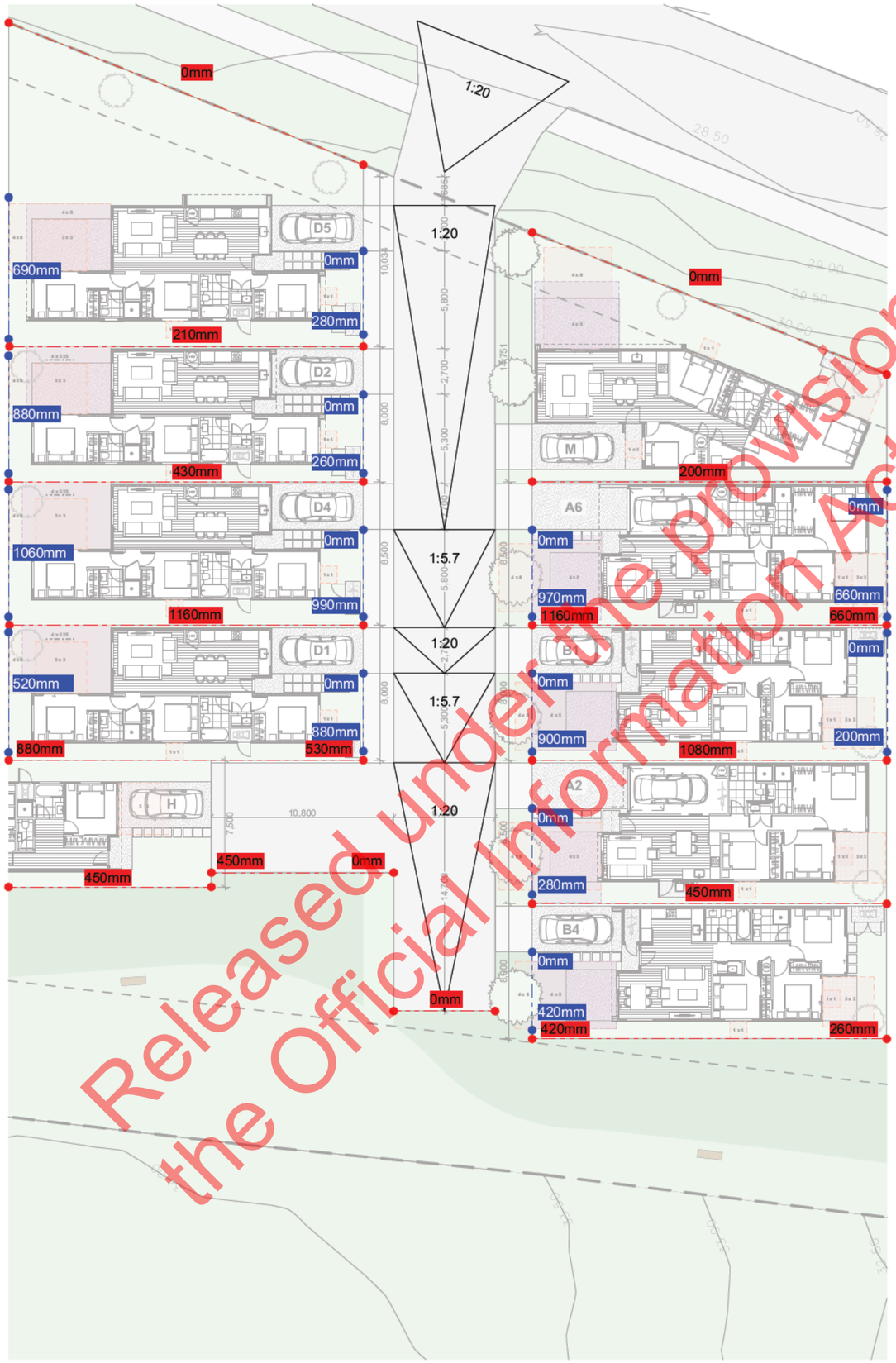

JOAL 9 INFORMATION 1:150

NOTES

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N

NW - SE RETAINING

NE - SW RETAINING

JOAL GRADIENT

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE
01 WIP	Contents Page			Work in Progress

JOB TITLE

MYLAND PARTNERS

ADDRESS

1 SELFS ROAD, PAPATOETOE AUCKLAND

DRAWING TITLE

JOAL 9 RETAINING

SCALE	A1 1:100, 1:150 A3 double	JOB NO	PN-0372
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CHECKED		218	01 WIP
DATE	7/09/2021		

CASA
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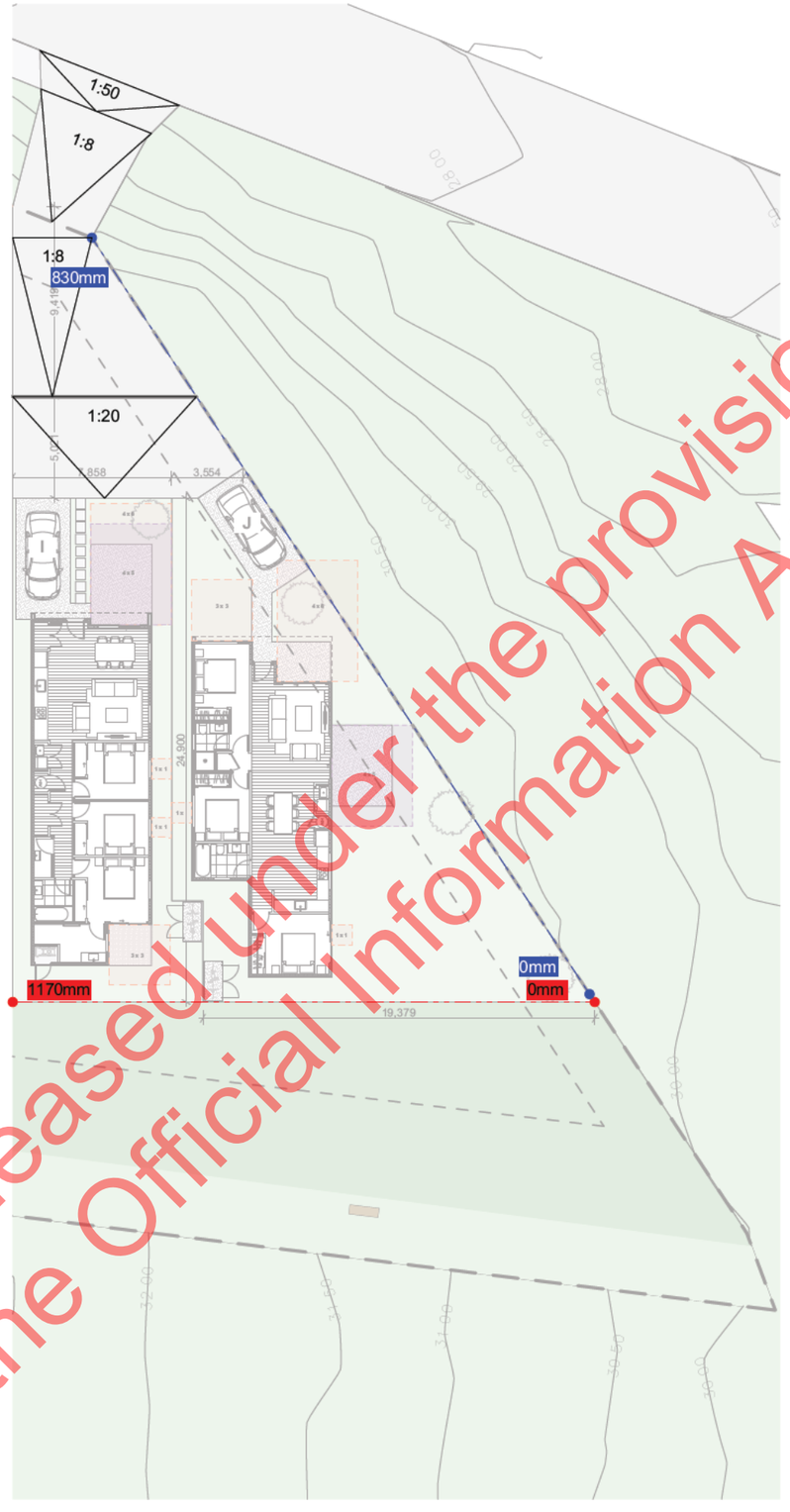

PRIVATE DRIVEWAY INFORMATION 1:150

NOTES

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N

NW - SE RETAINING

NE - SW RETAINING

JOAL GRADIENT

REV	DESCRIPTION	CHANGE ID	CHANGE NAME	DATE
01 WIP	Consents Page			Work in Progress

MYLAND PARTNERS

1 SELFS ROAD, PAPATOETOE AUCKLAND

JOAL 10 RETAINING

SCALE	A1 1:100, 1:150 A3 double	JOB NO	PN-0372
DRAWN	DP	SHEET	REVISION
CHECKED		220	01 WIP
DATE	7/09/2021		

CASA
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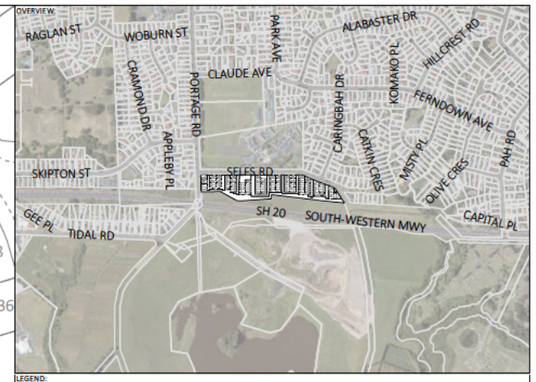


LEGEND:

- RETAINING WALLS W DRAINAGE (H=HEIGHT, C=CHAINAGE, ARROWS SHOW FALL DIRECTION)
- EARTHWORKS SECTIONS
- EX. KERBLINES
- rw top and bottom levels
- EARTHWORKS EXTENT
- PROPOSED PAVEMENTS
- PROPOSED BUILDINGS
- NEW PARCELS
- EXISTING PARCELS

CUT(-) FILL(+)

- -4.0--3.0m
- -3.0--2.0m
- -2.0--1.0m
- -1.0-0.0m
- 0.0-1.0m
- 1.0-2.0m
- 2.0-3.0m
- 3.0-4.0m

CUT FILL VOLUMES

ITEM	UNITS	TOTAL	EW01
AREA	m²	**28,328**	28,328
CUT	m³	**31,143**	31,143
FILL	m³	**575**	575
FILL + 15% BULK F.	m³	**661**	661
CUTFILL BALANCE	m³	**-30,482**	-30,482
EST. CUT EXPORT	TRUCKS	**5,081**	-
BULK CF VOLUME	m³	**31,718**	31,718
MAX CUT DEPTH	m	**3.1**	3.1
MAX FILL HEIGHT	m	**1.3**	1.3
TOPSOIL TO STRIP	m³	**0**	-
TOPSOIL TO PLACE	m³	**2,066**	-
TOPSOIL BALANCE	m³	**2,066**	-
TOPSOIL VOLUME	m³	**2,066**	-
TOTAL EW VOLUME	m³	**33,785**	-
EST. TOPSOIL IMPORT	TRUCKS	**345**	-

CUTFILL ANALYSIS NOTES:

A. Ex. Surf is existing ground level

B. Pr. Surf. is to Building, Pavement and Grass Subgrade

NOTES

1. ALL WORK TO COMPLY WITH COUNCIL AND PUBLIC NETWORK OPERTOR STANDARDS. ANY AMBIGUITY BETWEEN DRAWINGS AND STANDARDS TO BE REPORTED TO THE ENGINEER FOR CLARIFICATION
2. THE CONTRACTOR IS TO PEG INFRASTUCTURE LOCATIONS AND EARTHWORKS LEVELS PRIOR TO ORDERING MATERIALS.
3. UNDERFILL DRAINAGE IS TO BE INSTALLED AT THE DIRECTION OF THE ENGINEER. IF THE CONTRACTOR ENCOUNTERS SPRINGS OR OTHER SOURCES OF WATER THEY ARE TO NOTIFY THE ENGINEER.
4. EARTHWORKS ARE NOT TO BE EXTENDED INTO ADJOINING SITES UNLESS THE ENGINEER HAS ISSUED SPECIFIC INSTRUCTIONS
5. THE CONTRACTOR IS RESPONSIBILE FOR IDENTIFYING AND PROTECTING EXISTING SERVICES AND DRAINAGE ON SITE
6. THE CONTRACTOR SHALL CLARIFY THE AREAS AND EXTENT OF CLEARING WITH THE ENGINEER BEFORE COMMENCEMENT AND CONFIRM THAT ALL NECESSARY CONSENTS ARE IN PLACE.
7. EARTHWORKS TOLERANCES ARE TO BE +-25mm
8. ALL VOLUMES ARE SOLID MEASURE NO BULKING FACTOR APPLIED
9. RETAINING WALL SETOUT - EXACT SETTING OUT POSITION OF RETAINING WALLS IN RELATION TO LOT BOUNDARIES AND BUILDINGS TO BE OBTAINED FROM ARCHITECT OR STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION COMMENCING.

REVISION	AMENDMENT	BY

DESIGNED: MO
DRAWN: MO
RELEASED: SB

CIVIX

PROJECT: 7 SELFS ROAD, MANGERE

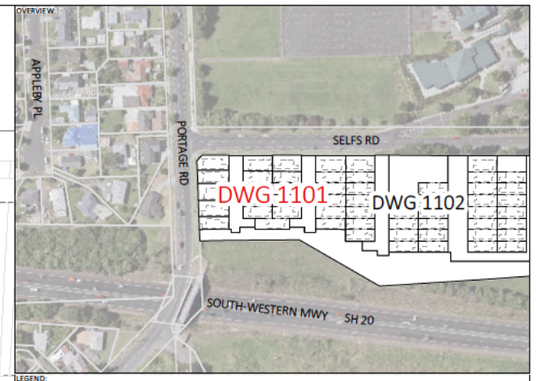
TITLE: CUT FILL PLANS

STATUS: FOR RESOURCE CONSENT

DRAWING NO: 1100

SCALE & SIZE: 1:2,000 A3

REV: 25/06/2021



SELFS RD

PORTAGE RD

LOT 1
LOT 2
EW01
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
LOT 11
LOT 12
LOT 13
LOT 14
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LOT 17
LOT 18
LOT 19
LOT 20
LOT 21
LOT 22
LOT 23
LOT 24
LOT 25
LOT 26
LOT 27
LOT 28
LOT 29

0 10 20 30 40 50 60 70 80 90 100 m

LEGEND:

- RETAINING WALLS W DRAINAGE (H=HEIGHT, C=CHAINAGE, ARROWS SHOW FALL DIRECTION)
- EARTHWORKS SECTIONS
- EX. KERBLINES
- rw top and bottom levels
- EARTHWORKS EXTENT
- PROPOSED PAVEMENTS
- PROPOSED BUILDINGS
- NEW PARCELS
- EXISTING PARCELS

CUT(-) FILL(+)

- -4.0--3.0m
- -3.0--2.0m
- -2.0--1.0m
- -1.0-0.0m
- 0.0-1.0m
- 1.0-2.0m
- 2.0-3.0m
- 3.0-4.0m

CUT FILL VOLUMES

ITEM	UNITS	TOTAL	EW01
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FILL	m^3	**575**	575
FILL + 15% BULK F.	m^3	**661**	661
CUTFILL BALANCE	m^3	**-30,482**	-30,482
EST. CUT EXPORT	TRUCKS	**5,081**	-
BULK CF VOLUME	m^3	**31,718**	31,718
MAX CUT DEPTH	m	**3.1**	3.1
MAX FILL HEIGHT	m	**1.3**	1.3
TOPSOIL TO STRIP	m^3	**0**	-
TOPSOIL TO PLACE	m^3	**2,066**	-
TOPSOIL BALANCE	m^3	**2,066**	-
TOPSOIL VOLUME	m^3	**2,066**	-
TOTAL EW VOLUME	m^3	**33,785**	-
EST. TOPSOIL IMPORT	TRUCKS	**345**	-

CUTFILL ANALYSIS NOTES:

A. Ex. Surf is existing ground level

B. Pr. Surf. is to Building, Pavement and Grass Subgrade

NOTES
1. ALL WORK TO COMPLY WITH COUNCIL AND PUBLIC NETWORK OPERTOR STANDARDS. ANY AMBIGUITY BETWEEN DRAWINGS AND STANDARDS TO BE REPORTED TO THE ENGINEER FOR CLARIFICATION
2. THE CONTRACTOR IS TO PEG INFRASTUCTURE LOCATIONS AND EARTHWORKS LEVELS PRIOR TO ORDERING MATERIALS.
3. UNDERFILL DRAINAGE IS TO BE INSTALLED AT THE DIRECTION OF THE ENGINEER. IF THE CONTRACTOR ENCOUNTERS SPRINGS OR OTHER SOURCES OF WATER THEY ARE TO NOTIFY THE ENGINEER.
4. EARTHWORKS ARE NOT TO BE EXTENDED INTO ADJOINING SITES UNLESS THE ENGINEER HAS ISSUED SPECIFIC INSTRUCTIONS
5. THE CONTRACTOR IS RESPONSIBILE FOR IDENTIFYING AND PROTECTING EXISTING SERVICES AND DRAINAGE ON SITE
6. THE CONTRACTOR SHALL CLARIFY THE AREAS AND EXTENT OF CLEARING WITH THE ENGINEER BEFORE COMMENCEMENT AND CONFIRM THAT ALL NECESSARY CONSENTS ARE IN PLACE.
7. EARTHWORKS TOLERANCES ARE TO BE +-25mm
8. ALL VOLUMES ARE SOLID MEASURE NO BULKING FACTOR APPLIED
9. RETAINING WALL SETOUT - EXACT SETTING OUT POSITION OF RETAINING WALLS IN RELATION TO LOT BOUNDARIES AND BUILDINGS TO BE OBTAINED FROM ARCHITECT OR STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION COMMENCING.

REVISION	AMENDMENT	BY

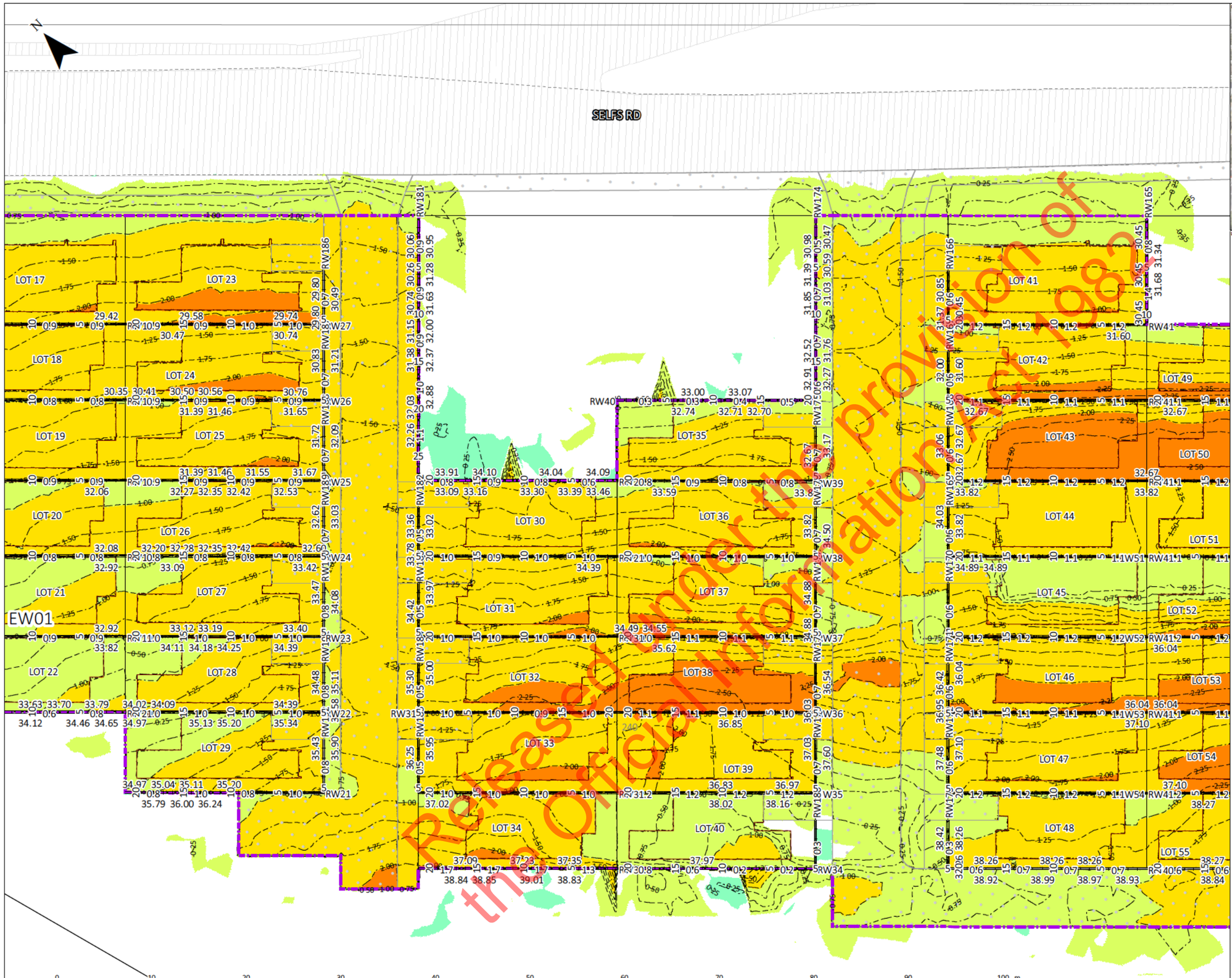
DESIGNED: MO
DRAWN: MO
RELEASED: SB

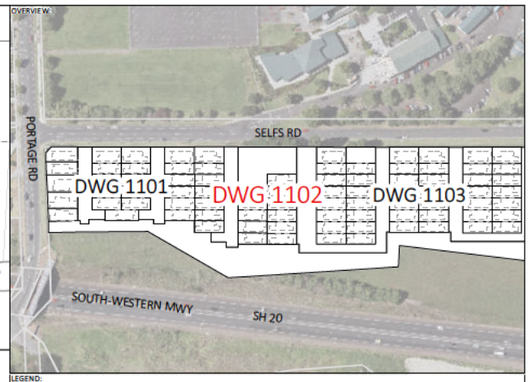
CIVIX

PROJECT: 7 SELFS ROAD, MANGERE

TITLE: CUT FILL PLANS

STATUS: FOR RESOURCE CONSENT
DRAWING NO: 1101
SCALE & SIZE: 1:400 A3
REV: 25/06/2021





LEGEND:

- RETAINING WALLS W DRAINAGE (H=HEIGHT, C=CHAINAGE, ARROWS SHOW FALL DIRECTION)
- EARTHWORKS SECTIONS
- EX. KERBLINES
- rw top and bottom levels
- EARTHWORKS EXTENT
- PROPOSED PAVEMENTS
- PROPOSED BUILDINGS
- NEW PARCELS
- EXISTING PARCELS

CUT(-) FILL(+)

- -4.0--3.0m
- -3.0--2.0m
- -2.0--1.0m
- -1.0-0.0m
- 0.0-1.0m
- 1.0-2.0m
- 2.0-3.0m
- 3.0-4.0m

CUT FILL VOLUMES

ITEM	UNITS	TOTAL	EW01
AREA	m^2	**28,328**	28,328
CUT	m^3	**31,143**	31,143
FILL	m^3	**575**	575
FILL + 15% BULK F.	m^3	**661**	661
CUTFILL BALANCE	m^3	**-30,482**	-30,482
EST. CUT EXPORT	TRUCKS	**5,081**	-
BULK CF VOLUME	m^3	**31,718**	31,718
MAX CUT DEPTH	m	**3.1**	3.1
MAX FILL HEIGHT	m	**1.3**	1.3
TOPSOIL TO STRIP	m^3	**0**	-
TOPSOIL TO PLACE	m^3	**2,066**	-
TOPSOIL BALANCE	m^3	**2,066**	-
TOPSOIL VOLUME	m^3	**2,066**	-
TOTAL EW VOLUME	m^3	**33,785**	-
EST. TOPSOIL IMPORT	TRUCKS	**345**	-

CUTFILL ANALYSIS NOTES:

A. Ex. Surf is existing ground level

B. Pr. Surf. is to Building, Pavement and Grass Subgrade

NOTES

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REVISION	AMENDMENT	BY

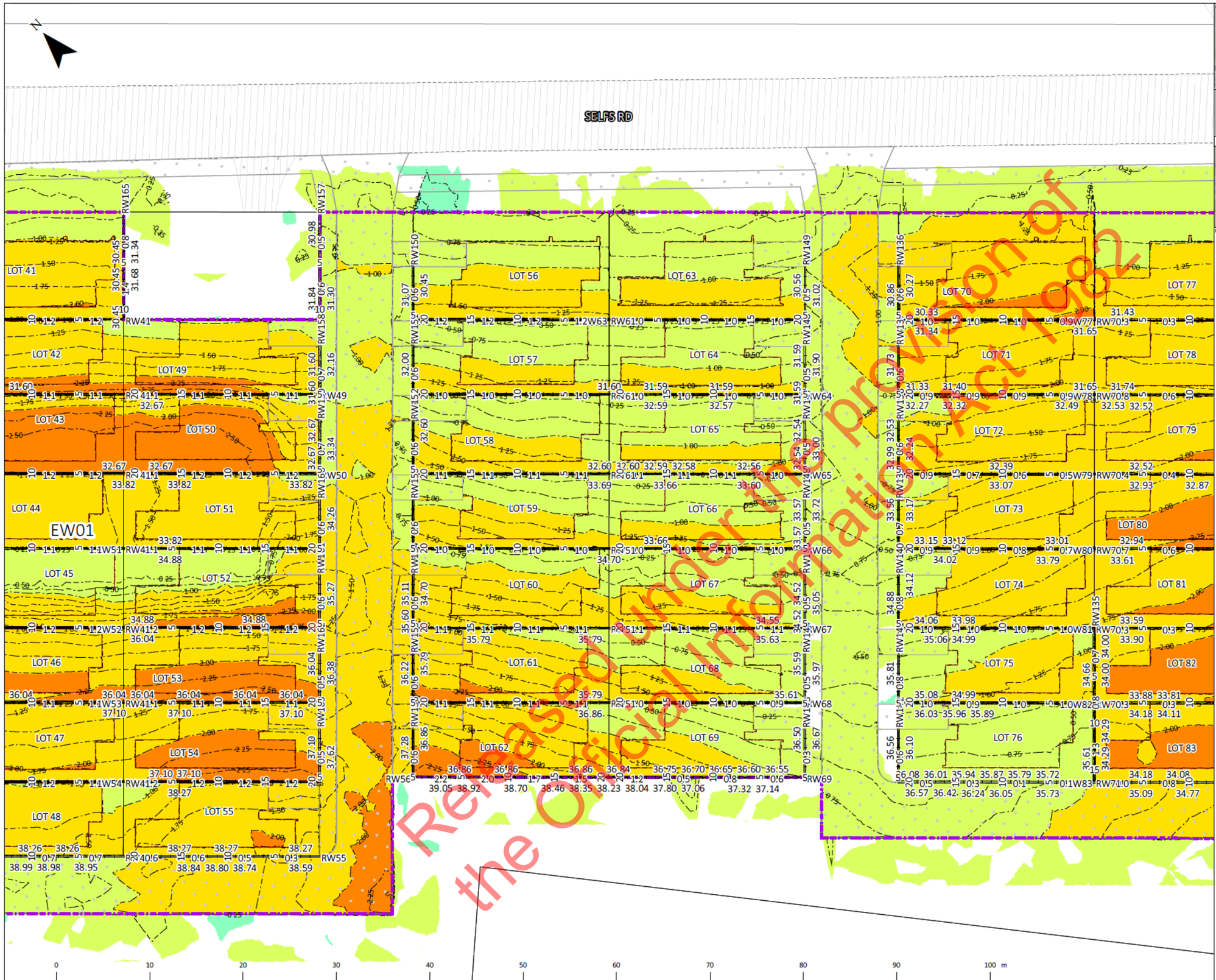
DESIGNED: MO
DRAWN: MO
RELEASED: SB

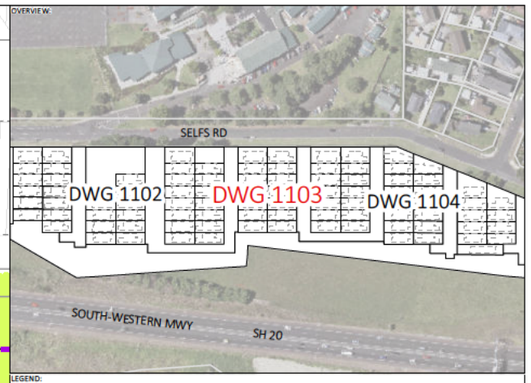
CIVIX

PROJECT: 7 SELFS ROAD, MANGERE

TITLE: CUT FILL PLANS

STATUS: FOR RESOURCE CONSENT
DRAWING NO: 1102
SCALE & SIZE: 1:400 A3
REV: 25/06/2021





LEGEND:

- RETAINING WALLS W DRAINAGE (H=HEIGHT, C=CHAINAGE, ARROWS SHOW FALL DIRECTION)
- EARTHWORKS SECTIONS
- EX. KERBLINES
- rw top and bottom levels
- EARTHWORKS EXTENT
- PROPOSED PAVEMENTS
- PROPOSED BUILDINGS
- NEW PARCELS
- EXISTING PARCELS

CUT(-) FILL(+)

- -4.0--3.0m
- -3.0--2.0m
- -2.0--1.0m
- -1.0-0.0m
- 0.0-1.0m
- 1.0-2.0m
- 2.0-3.0m
- 3.0-4.0m

CUT FILL VOLUMES

ITEM	UNITS	TOTAL	EW01
AREA	m²	**28,328**	28,328
CUT	m³	**31,143**	31,143
FILL	m³	**575**	575
FILL + 15% BULK F.	m³	**661**	661
CUTFILL BALANCE	m³	**-30,482**	-30,482
EST. CUT EXPORT	TRUCKS	**5,081**	-
BULK CF VOLUME	m³	**31,718**	31,718
MAX CUT DEPTH	m	**3.1**	3.1
MAX FILL HEIGHT	m	**1.3**	1.3
TOPSOIL TO STRIP	m³	**0**	-
TOPSOIL TO PLACE	m³	**2,066**	-
TOPSOIL BALANCE	m³	**2,066**	-
TOPSOIL VOLUME	m³	**2,066**	-
TOTAL EW VOLUME	m³	**33,785**	-
EST. TOPSOIL IMPORT	TRUCKS	**345**	-

CUTFILL ANALYSIS NOTES:

A. Ex. Surf is existing ground level

B. Pr. Surf. is to Building, Pavement and Grass Subgrade

NOTES

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REVISION	AMENDMENT	BY

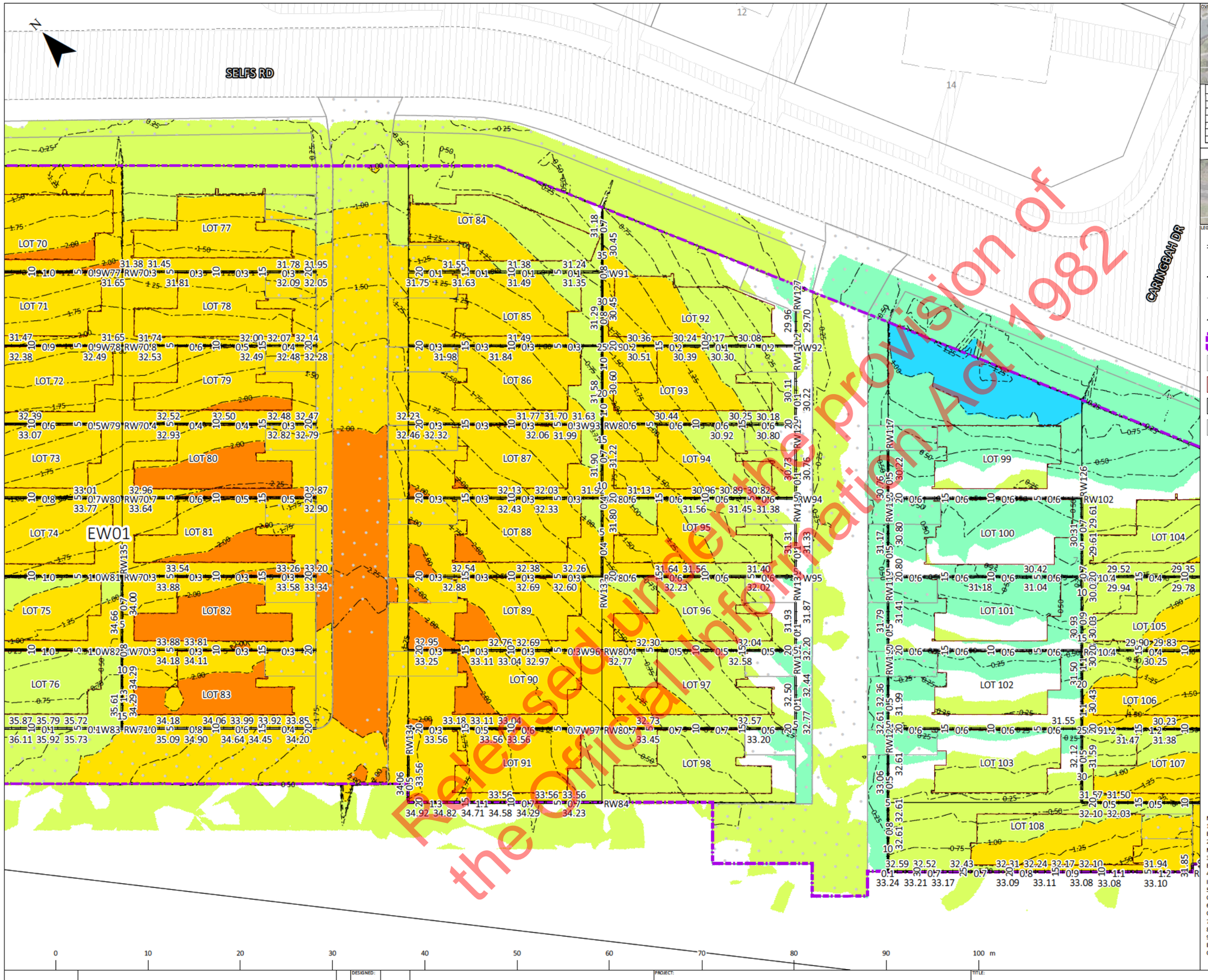
DESIGNED: MO
DRAWN: MO
RELEASED: SB

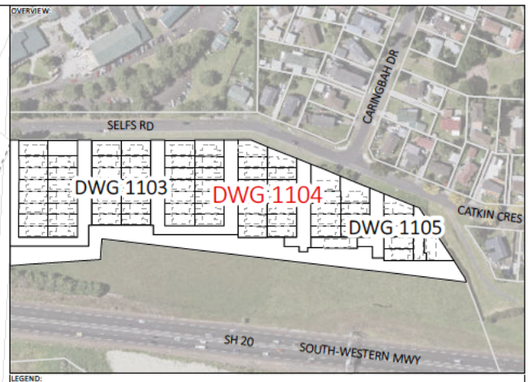
CIVIX

PROJECT: 7 SELFS ROAD, MANGERE

TITLE: CUT FILL PLANS

STATUS: FOR RESOURCE CONSENT
DRAWING NO: 1103
SCALE & SIZE: 1:400 A3
REV: 25/06/2021





LEGEND:

- RETAINING WALLS W DRAINAGE (H=HEIGHT, C=CHAINAGE, ARROWS SHOW FALL DIRECTION)
- EARTHWORKS SECTIONS
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- EARTHWORKS EXTENT
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- PROPOSED BUILDINGS
- NEW PARCELS
- EXISTING PARCELS

CUT(-) FILL(+)

- -4.0--3.0m
- -3.0--2.0m
- -2.0--1.0m
- -1.0-0.0m
- 0.0-1.0m
- 1.0-2.0m
- 2.0-3.0m
- 3.0-4.0m

CUT FILL VOLUMES

ITEM	UNITS	TOTAL	EW01
AREA	m²	**28,328**	28,328
CUT	m³	**31,143**	31,143
FILL	m³	**575**	575
FILL + 15% BULK F.	m³	**661**	661
CUTFILL BALANCE	m³	**-30,482**	-30,482
EST. CUT EXPORT	TRUCKS	**5,081**	-
BULK CF VOLUME	m³	**31,718**	31,718
MAX CUT DEPTH	m	**3.1**	3.1
MAX FILL HEIGHT	m	**1.3**	1.3
TOPSOIL TO STRIP	m³	**0**	-
TOPSOIL TO PLACE	m³	**2,066**	-
TOPSOIL BALANCE	m³	**2,066**	-
TOPSOIL VOLUME	m³	**2,066**	-
TOTAL EW VOLUME	m³	**33,785**	-
EST. TOPSOIL IMPORT	TRUCKS	**345**	-

CUTFILL ANALYSIS NOTES:

A. Ex. Surf is existing ground level

B. Pr. Surf. is to Building, Pavement and Grass Subgrade

NOTES

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REVISION	AMENDMENT	BY

DESIGNED: MO
DRAWN: MO
RELEASED: SB

CIVIX

PROJECT: 7 SELFS ROAD, MANGERE

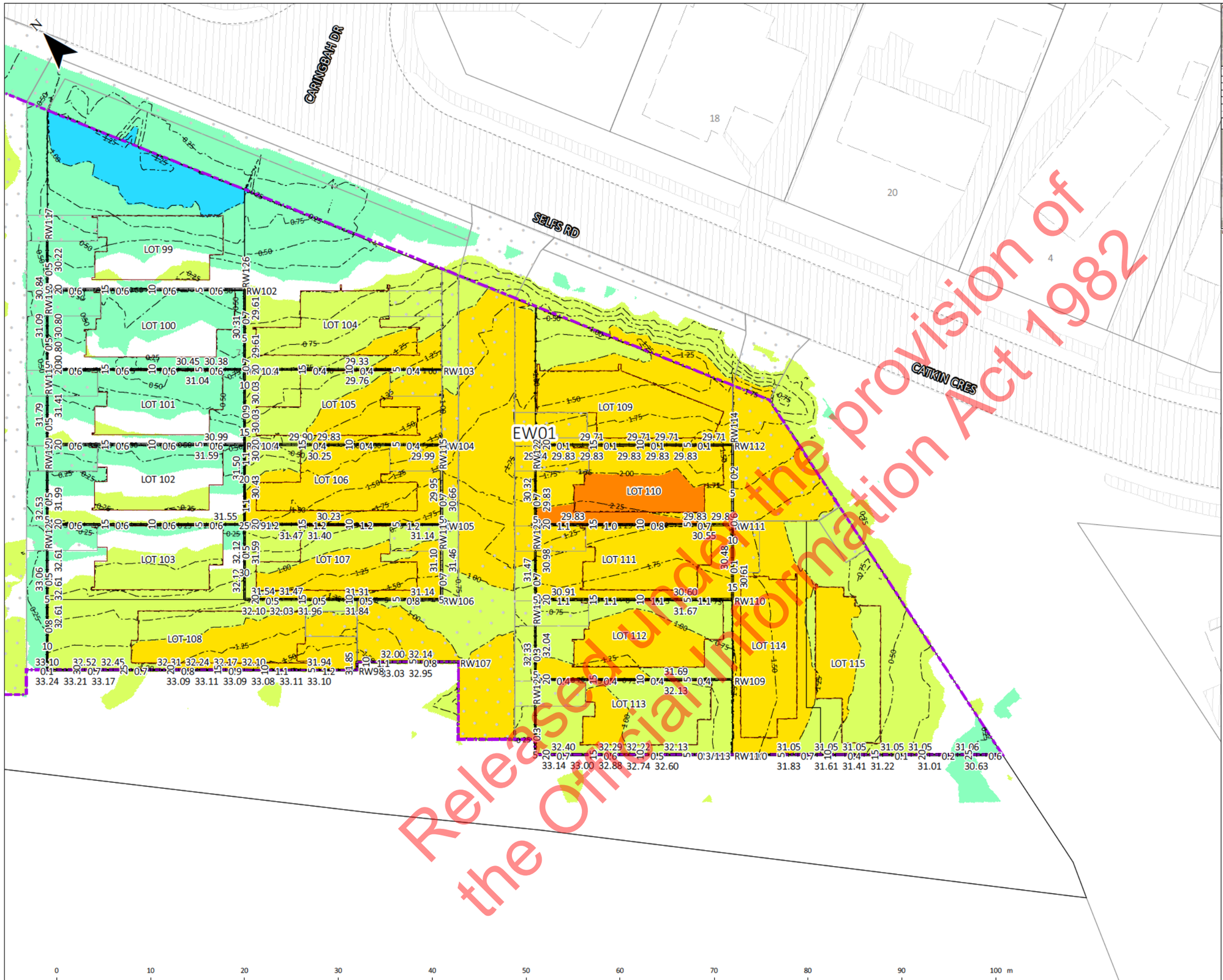
TITLE: CUT FILL PLANS

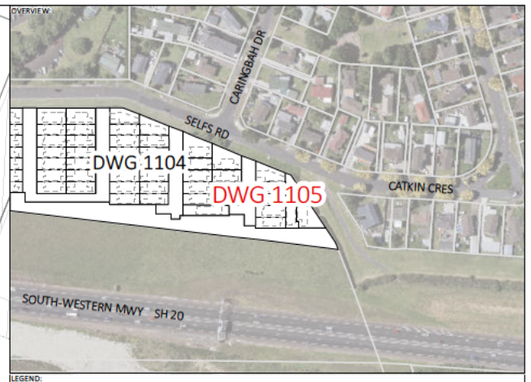
STATUS: FOR RESOURCE CONSENT

DRAWING NO: 1104

SCALE & SIZE: 1:400 A3

REV: 25/06/2021





LEGEND:

- RETAINING WALLS W DRAINAGE (H=HEIGHT, C=CHAINAGE, ARROWS SHOW FALL DIRECTION)
- EARTHWORKS SECTIONS
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- EARTHWORKS EXTENT
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- EXISTING PARCELS

CUT(-) FILL(+)

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- -2.0--1.0m
- -1.0-0.0m
- 0.0-1.0m
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- 2.0-3.0m
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CUT FILL VOLUMES

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CUTFILL BALANCE	m³	**-30,482**	-30,482
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BULK CF VOLUME	m³	**31,718**	31,718
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TOPSOIL TO STRIP	m³	**0**	-
TOPSOIL TO PLACE	m³	**2,066**	-
TOPSOIL BALANCE	m³	**2,066**	-
TOPSOIL VOLUME	m³	**2,066**	-
TOTAL EW VOLUME	m³	**33,785**	-
EST. TOPSOIL IMPORT	TRUCKS	**345**	-

CUTFILL ANALYSIS NOTES:

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REVISION	AMENDMENT	BY

DESIGNED: MO
DRAWN: MO
RELEASED: SB

CIVIX

PROJECT: 7 SELFS ROAD, MANGERE

TITLE: CUT FILL PLANS

STATUS: FOR RESOURCE CONSENT

DRAWING NO: 1105

SCALE & SIZE: 1:400 A3

REV: 25/06/2021

Appendix B: Nearby geotechnical investigations

LEGEND

T+T Pre 2011 (TT Sites)

Investigation Type

- Hand Auger Borehole Location
- Hand Auger

Geotechnics (TT Sites)

Investigation Type

- Scala Penetrometer Location

NZGD

Investigation Type

- Machine Borehole
- 1m Contour
- 5m Contour
- Property Boundary

A3 SCALE: 1:2,500

0 25 50 75 100 125 (m)

1. Property Boundary,Street Name,Street Number sourced from the LINZ Data Service and licensed for re-use under the Creative Commons Attribution 3.0 New Zealand licence.
2. World Imagery Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Created On:	08/04/2021
Created By:	ALangbein
Approved By:	
TT Proj Ref:	1016494
TT Map Ref:	TTMAPREF1433463001.902

Tonkin+Taylor
105 Carlton Gore Road, Newmarket, Auckland
www.tonkintaylor.co.nz

FIGURE No.