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Emailed	X	karla@richardcolearchitecture.com.au
Courier		
By Hand		

Contact: Gray Taylor
Our Ref: P1907237JC01V01
Pages: 3 + 2 Attachments
cc.

22 July 2019

Richard Cole Architecture
Karla Wilford
By email

Dear Karla,

RE: DEVELOPMENT APPLICATION- STORMWATER SYSTEM DESIGN: 13 BRUCE ST, WARRIEWOOD, NSW

1.0 INTRODUCTION

This letter summarises the results of a document review of previous stormwater system design, review of proposed development plans and a site inspection to assess the capacity of the existing stormwater system for the proposed alterations and additions.

We have reviewed the development application plans by Richard Cole Architecture (Project No. 1803 dated February 2013- Revision A, 11 pages plan set, 25.01.2019) for the proposed alterations and additions to the existing dwelling at the site.

We understand that the proposed works include the extension of the lower ground level, an additional level consisting of a study and internal works. We note that there are no modifications to the existing footprint (i.e. roof area) of the dwelling.

2.0 PREVIOUS STORMWATER ENGINEERING WORKS

The existing stormwater system is understood to be designed by Martens and Associates in 2007 as part of a previous development application. The design involves all hardstand and roof areas draining to infiltration trenches as documented in the Martens and Associates (MA) letter P0601550JC03_V1 dated October 2007 (Attachment B).

3.0 SITE INSPECTION

A site inspection by a senior engineer from Martens and Associates was undertaken on the 5th June, 2019 to visually assess the existing condition of the dwelling foundations and existing stormwater system.

The following observations in relation to the existing stormwater system were made during the site inspection:

- Infiltration trenches weren't observed as covered by lawn.
- No surcharge pit was visually observed. However, there was an outlet stormwater pipe under the retaining wall indicating the existence of the surcharge pit.
- A rainwater tank was observed on site, but no inlet or outlet was able to be identified.

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4.0 DISCUSSION

- Assuming there will be no change in the roof/hardstand area, the catchment for the existing stormwater system will remain the same. The catchment draining to the infiltration trenches has an area of approximately 270 m². This combined area consists of a 41 m² garage roof, 169 m² existing dwelling and 59 m² from the courtyard and hardstand areas.

- A field test on the existing stormwater system was conducted on site by running water into the pit adjacent to the garage for more than 10min. As no water was observed at the assumed stormwater outlet (under the retaining wall), it is reasonable to assume that the infiltration trenches were functioning and hence no discharge.
- Assuming that the infiltration trenches have been constructed in accordance with the MA design documented in P061550JC03_V01, the trenches should have a storage capacity of approximately 7540L and are capable of accommodating the overflow generated from a 1:20 year ARI rainfall event with a duration of 5mins.

- The rainwater tank is an addition by the client to the stormwater system. As advised by the client, a portion of the roof area drains to the rainwater tank.

5.0 RECOMMENDATIONS AND CONCLUSIONS

- An investigation shall be undertaken to confirm the location of the surcharge pit and infiltration trenches at construction certificate.

- If the surcharge pit and infiltration trenches haven't been built then a new stormwater design will need to be undertaken in accordance with council policies.

- Based on our site inspection and review of the supplied documentation, we conclude that there will be no change in the hardstand area due to the proposed development application and a portion of the roof area will continue to drain to the rainwater tank. We therefore expect that the existing stormwater system (assuming it is built as per P1601550JC03_V01) will be sufficient for the proposed alterations and additions.

If you require any further information, please do not hesitate to contact the writer.

For and on behalf of

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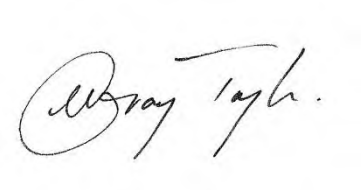

GRAY TAYLOR
BE Engineering
Senior Engineer / Project Manager

Attachments:

1. Richard Cole's Architectural Plans
2. Marten's and Associates Stormwater Infiltration Basin Design

Attachment A – Richard Cole's Architectural Plans

DK Timber Deck
DP Downpipe
EXG Existing
FL Steel Flue
GU Gutter
SK Skylight
SR Steel Roofing

15 BRUCE STREET

existing pine to be retained

3212 exg side setback

Existing Garage

Boundary 26.72

DP

DP

25°

EXG DK

GU

25°

SR

SR

Boundary 17.73

LOT 10 DP15764
13 BRUCE STREET
525.8sqm

25°

5°

SR

10°

SK

garden

Boundary 18.29

Existing screen planting to front boundary

Existing palm tree to be retained

FL

25°

Existing Roof

25°

Existing Pool

Existing Pool Deck

1240 exg side setback

DP

Boundary 33.775

DP

average front setback

Existing feature planting to be retained

foreshore building line

11 BRUCE STREET

BRUCE STREET

D.P.15762

N

1 DA - Site Plan
1 : 200

0 2.0m 4.0m 6.0m 8.0m 10.0m
1:200

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nominated architect: Richard Cole B.Sc.(Arch) (Hons 1) B.Arch.(Hons1) Reg No: 6826

No.	Revision Description	Date
A	Pre DA	25.01.19

KENNETT RESIDENCE
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

Site Plan

Project number	1803	Checked by	RC
Date	February 2019	Scale	1 : 200
Drawn by	EN		DA01

DP Downpipe
MW Masonry Wall
SI Sink
ST Stair
TC Timber Column
TFD Timber Framed Door
TFW Timber Framed Window
TW Timber Framed Wall

2 DA12
1 DA12
1 DA11
1 DA10

Boundary 26.72
Boundary 18.29
Boundary 17.75
Boundary 33.775

existing underground watertank

Bathroom
st
Bedroom 1
Rumpus
RL. 25.080 m
existing walls to be demolished
Bedroom 2
L'dry
WC
f/f
SI
ST
MW
TW
TC
DP

W_LG01 TFW
W_LG02 TFD
W_LG03 TFW
W_LG04 TFW
W_LG05 TFW
W_LG06 TFW
W_LG07 TFW
W_LG08
W_LG09 TFW
W_LG10 TFW
W_LG11 TFW
W_LG12 TFW

1450 580 900 250 WLG05 window box

line of roof above
line of existing deck above
line of proposed deck above
Existing turf
Existing pool
Existing pool deck
Existing service area
Foreshore Building Line

1410 395 940 240

2830 Bath 90 3965 Bed 1 90
8165
7420
5180 Rumpus
200 850 200
110
2905 Ldry 130 1850 WC 2995 Bed 2
375

2065 90 3845 bed 1
200 1710 110 920 110 4230 bed 2
1350 130 901 1785 2565

N

Note:
New windows to pool enclosure WLG07 & WLG08 to be fixed or or with openings less than 100mm to comply with pool safety fence requirements

1 DA - Lower Ground Floor Plan
1 : 100

0 1.0m 2.0m 3.0m 4.0m 5.0m
1:100

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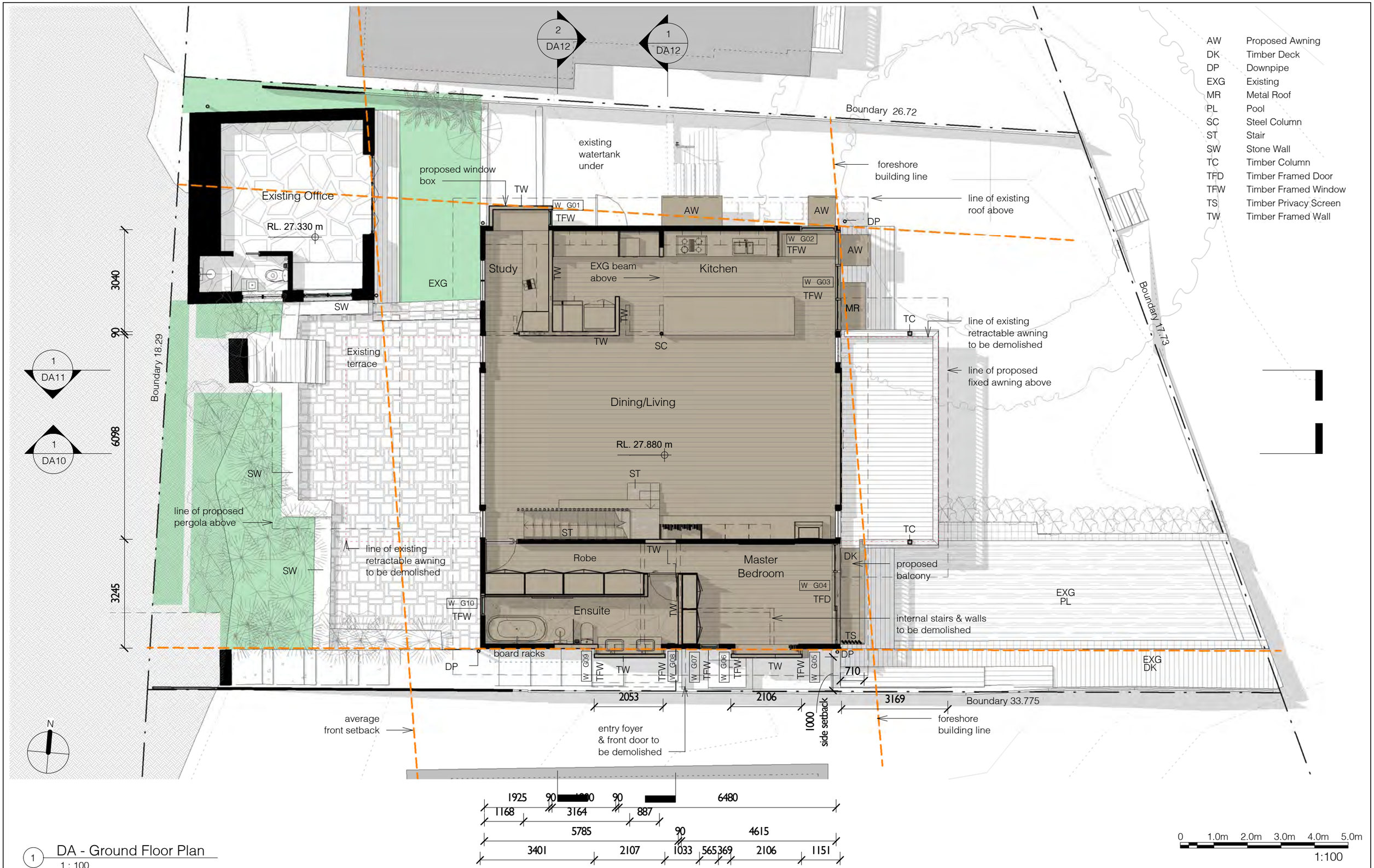
No.	Revision Description	Date
A	Pre DA	25.01.19

KENNETT RESIDENCE
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

Lower Ground Floor Plan

Project number	1803	Checked by	Checker
Date	February 2019	Scale	1 : 100
Drawn by	Author		DA03



1 DA - Ground Floor Plan
1 : 100

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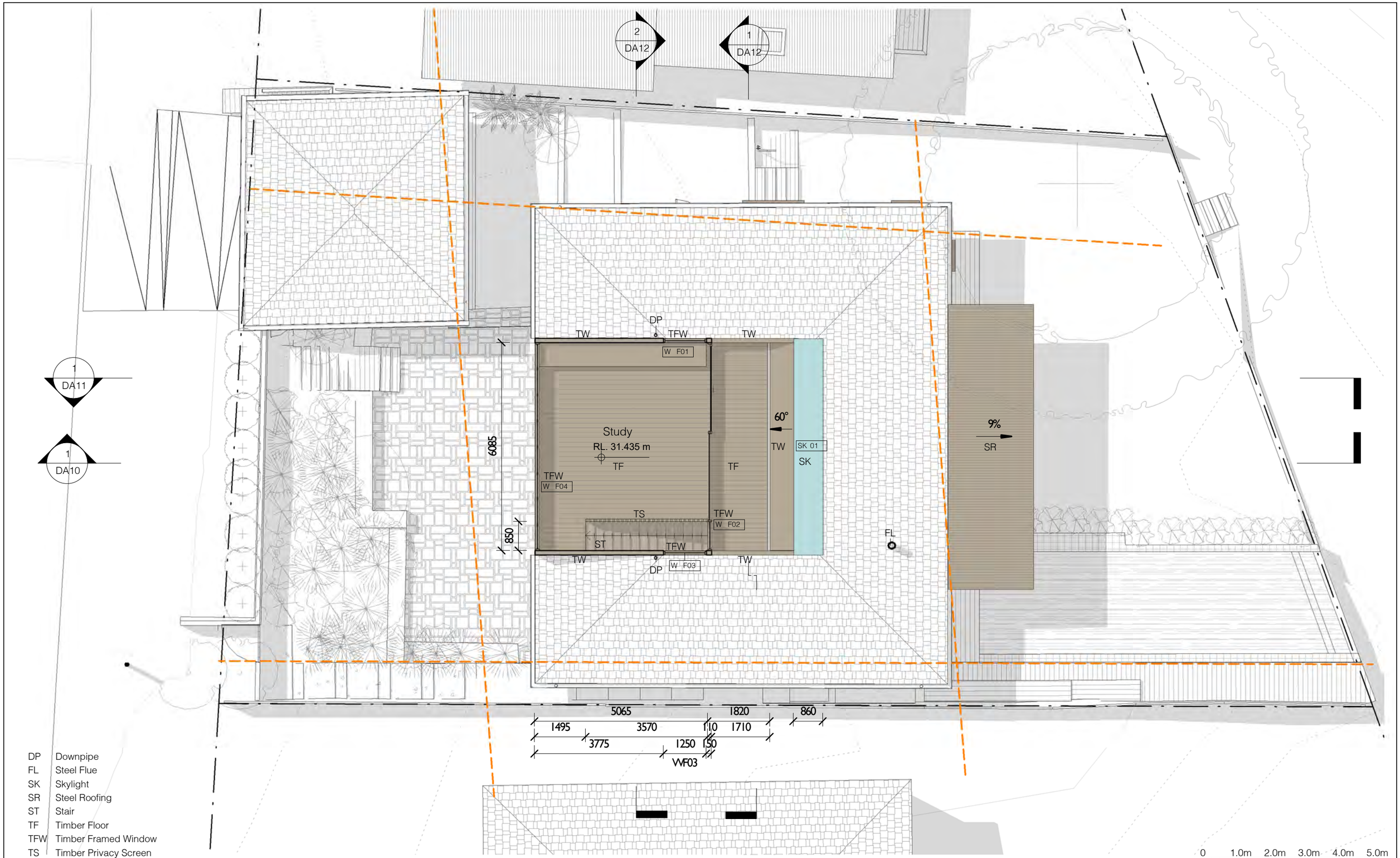
No.	Revision Description	Date
A	Pre DA	25.01.19

KENNETT RESIDENCE
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

Ground Floor Plan

Project number	1803	Checked by	RC
Date	February 2019	Scale	1 : 100
Drawn by	EN		DA04



DP	Downpipe
FL	Steel Flue
SK	Skylight
SR	Steel Roofing
ST	Stair
TF	Timber Floor
TFW	Timber Framed Window
TS	Timber Privacy Screen
TW	Timber Framed Wall

1 DA - First Floor Plan
1 : 100

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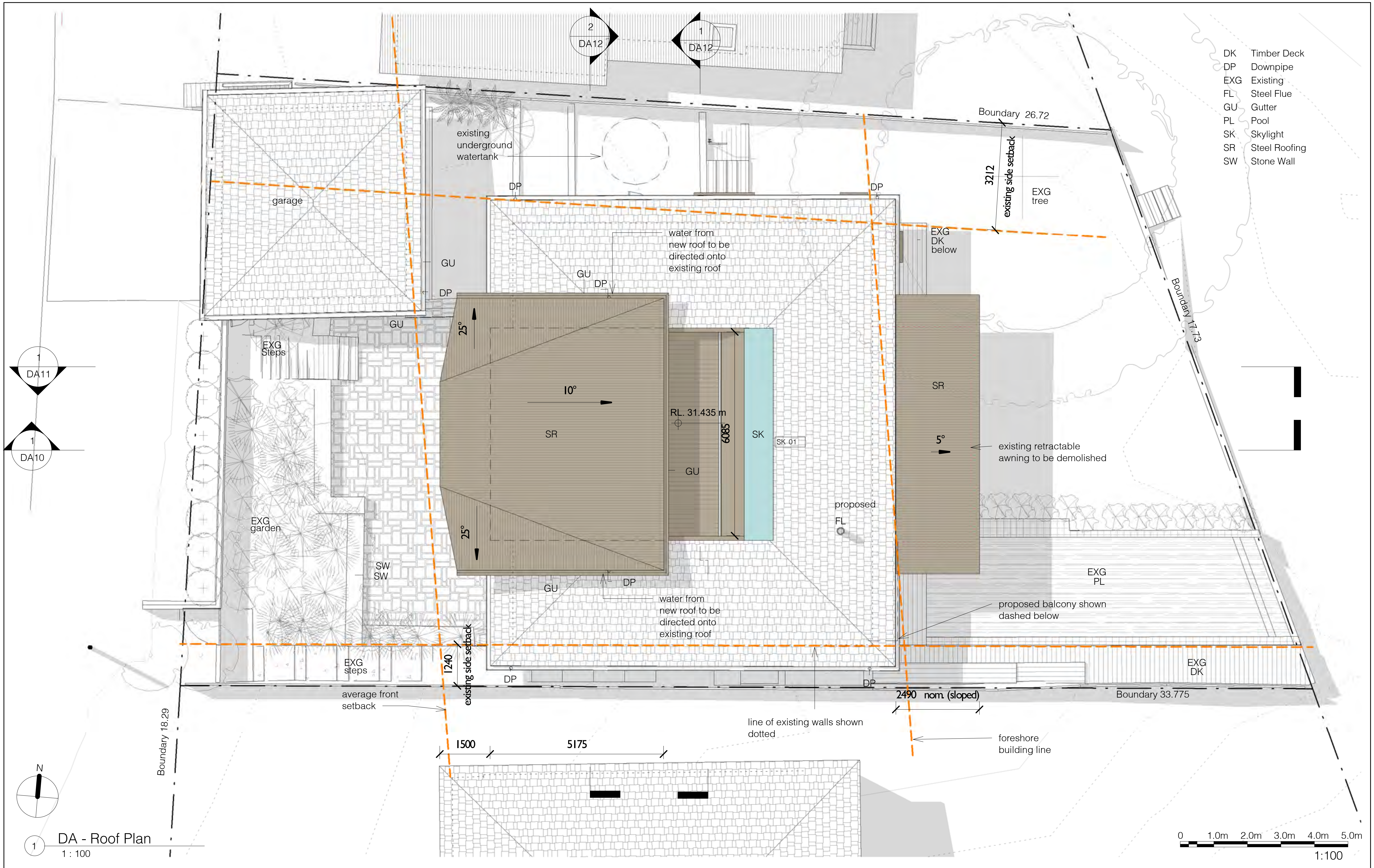
No.	Revision Description	Date

KENNETT RESIDENCE
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

First Floor Plan

Project number	1803	Checked by	Checker
Date	February 2019	Scale	1 : 100
Drawn by	Author		DA05


DK Timber Deck
DP Downpipe
EXG Existing
FL Steel Flue
GU Gutter
PL Pool
SK Skylight
SR Steel Roofing
SW Stone Wall
2 DA12
1 DA12
1 DA11
1 DA10
existing underground watertank
garage
GU
DP
water from new roof to be directed onto existing roof
Boundary 26.72
3212 existing side setback
EXG tree
EXG DK below
EXG Steps
25°
10°
SR
RL. 31.435 m
6085
SK
SK 01
GU
5°
existing retractable awning to be demolished
proposed FL
EXG garden
SW
SW
EXG PL
proposed balcony shown dashed below
EXG steps
1240 existing side setback
average front setback
2490 nom. (sloped)
Boundary 33.775
EXG DK
line of existing walls shown dotted
foreshore building line
1500
5175
Boundary 18.29
Boundary 17.73
N
1 DA - Roof Plan
1 : 100
0 1.0m 2.0m 3.0m 4.0m 5.0m
1:100

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No.	Revision Description	Date
A	Pre DA	25.01.19

KENNETT RESIDENCE

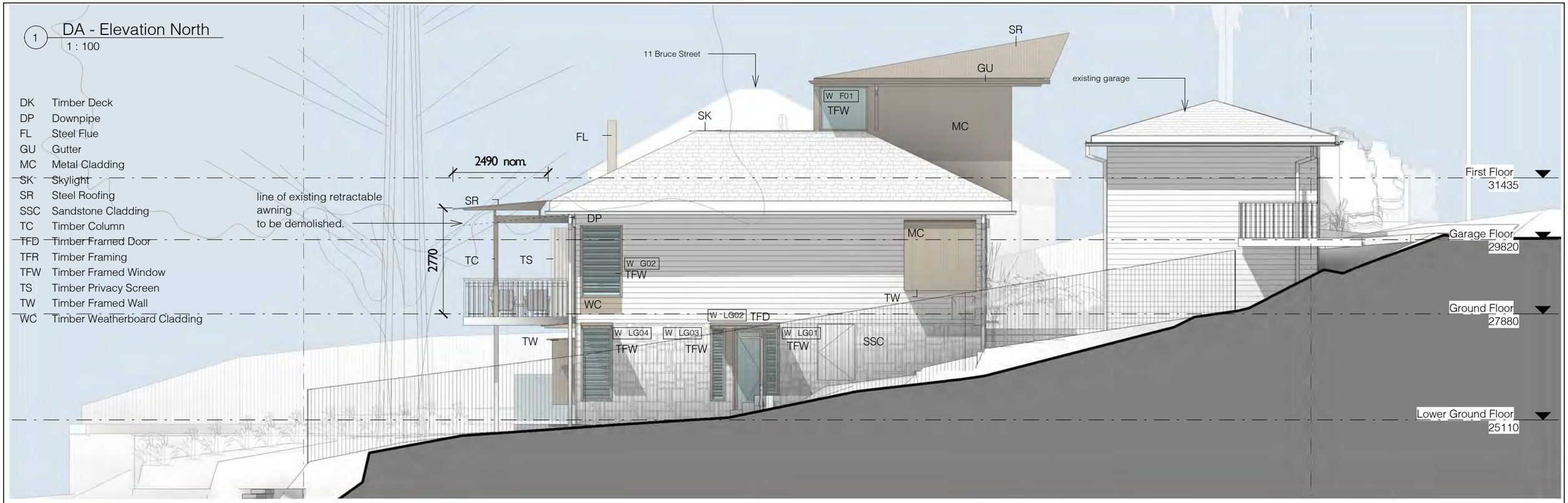
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

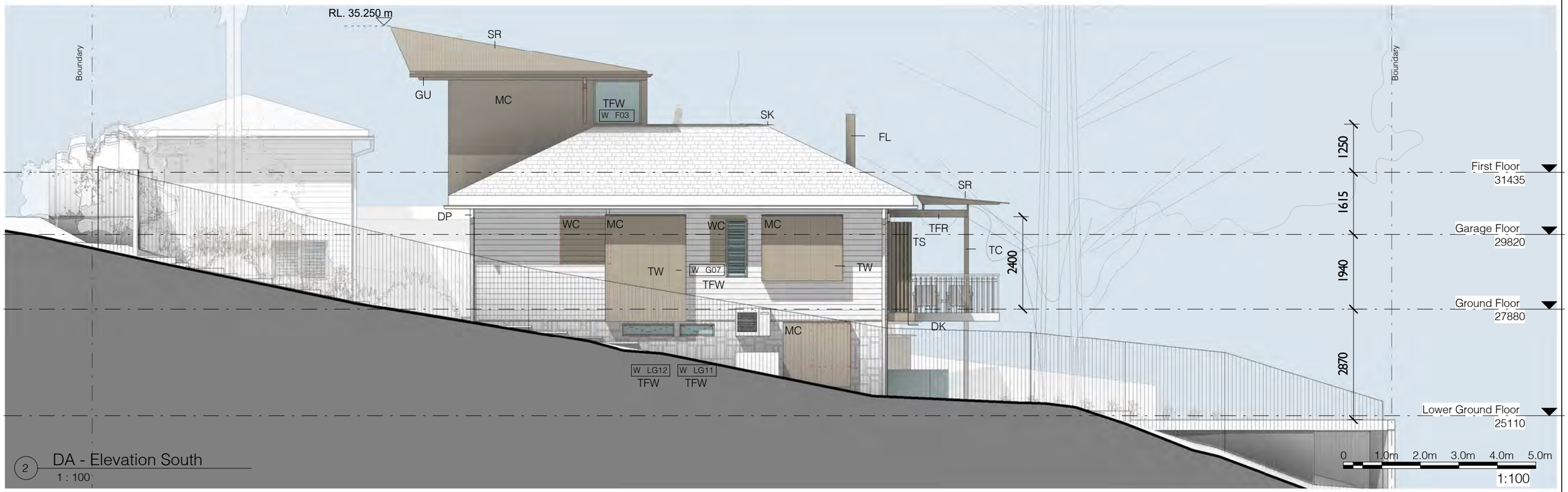
Roof Plan

Project number	1803	Checked by	RC
Date	February 2019	Scale	1 : 100
Drawn by	EN		DA06

1 DA - Elevation North
1 : 100

DK	Timber Deck
DP	Downpipe
FL	Steel Flue
GU	Gutter
MC	Metal Cladding
SK	Skylight
SR	Steel Roofing
SSC	Sandstone Cladding
TC	Timber Column
TFD	Timber Framed Door
TFR	Timber Framing
TFW	Timber Framed Window
TS	Timber Privacy Screen
TW	Timber Framed Wall
WC	Timber Weatherboard Cladding





2 DA - Elevation South
1 : 100

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No.	Revision Description	Date
A	Pre DA	25.01.19

KENNETT RESIDENCE
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

Elevations

Project number	1803	Checked by	Checker
Date	February 2019	Scale	1 : 100
Drawn by	Author		DA07

BA	Timber Balustrade
DK	Timber Deck
EXG	Existing
FL	Steel Flue
SR	Steel Roofing
TFR	Timber Framing
TFW	Timber Framed Window

1 DA - Elevation East
1 : 100

0 1.0m 2.0m 3.0m 4.0m 5.0m
1:100

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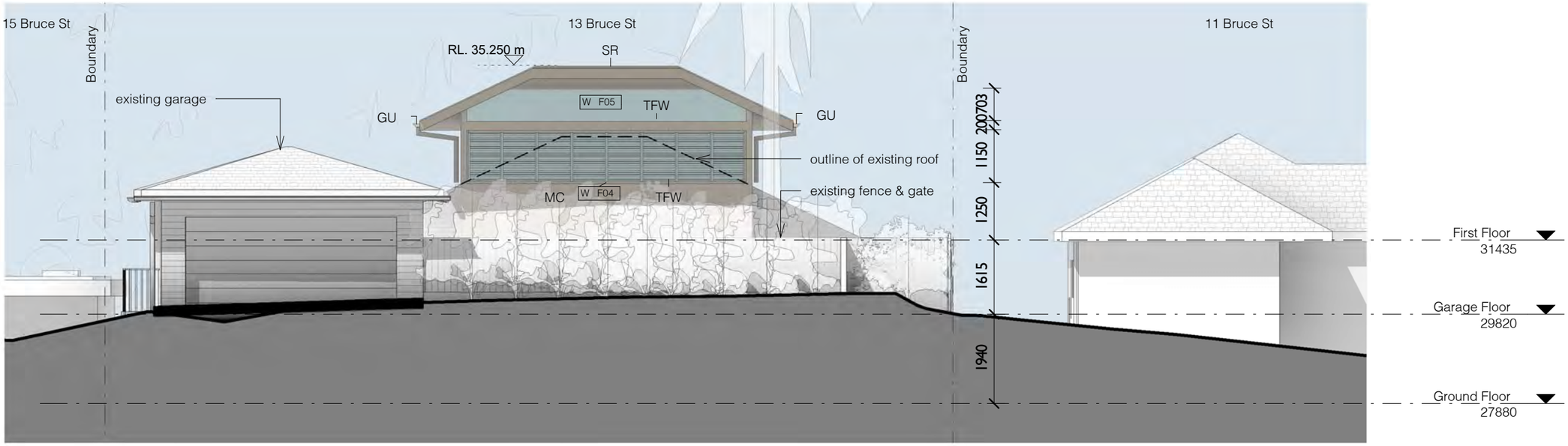
No.	Revision Description	Date
A	Pre DA	25.01.19

KENNETT RESIDENCE
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

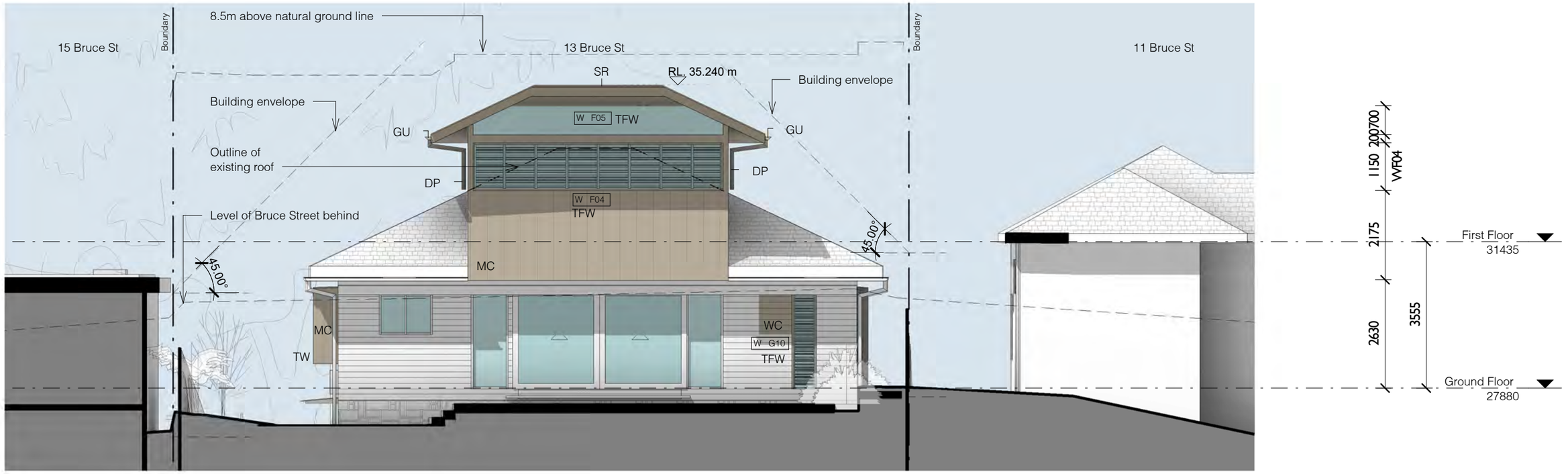
Elevations

Project number	1803	Checked by	Checker
Date	February 2019	Scale	1 : 100
Drawn by	Author		DA08



2 DA - Elevation West

1 : 100



1 DA - Elevation West (Courtyard)

1 : 100

0 1.0m 2.0m 3.0m 4.0m 5.0m

1:100

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No.	Revision Description	Date

KENNETT RESIDENCE
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

Elevation

Project number	1803	Checked by	Checker
Date	February 2019	Scale	1 : 100
Drawn by	Author		DA09

DK	Timber Deck
DP	Downpipe
EXG	Existing
GU	Gutter
TC	Timber Column
TR	Tiled Roof
WC	Timber Weatherboard Cladding

1 DA - Section AA
1 : 100

0 1.0m 2.0m 3.0m 4.0m 5.0m
1:100

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No.	Revision Description	Date
A	Pre DA	25.01.19

KENNETT RESIDENCE
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

Long Section

Project number	1803	Checked by	Checker
Date	February 2019	Scale	1 : 100
Drawn by	Author		DA10

1 DA - Section DD
1 : 100

0 1.0m 2.0m 3.0m 4.0m 5.0m
1:100

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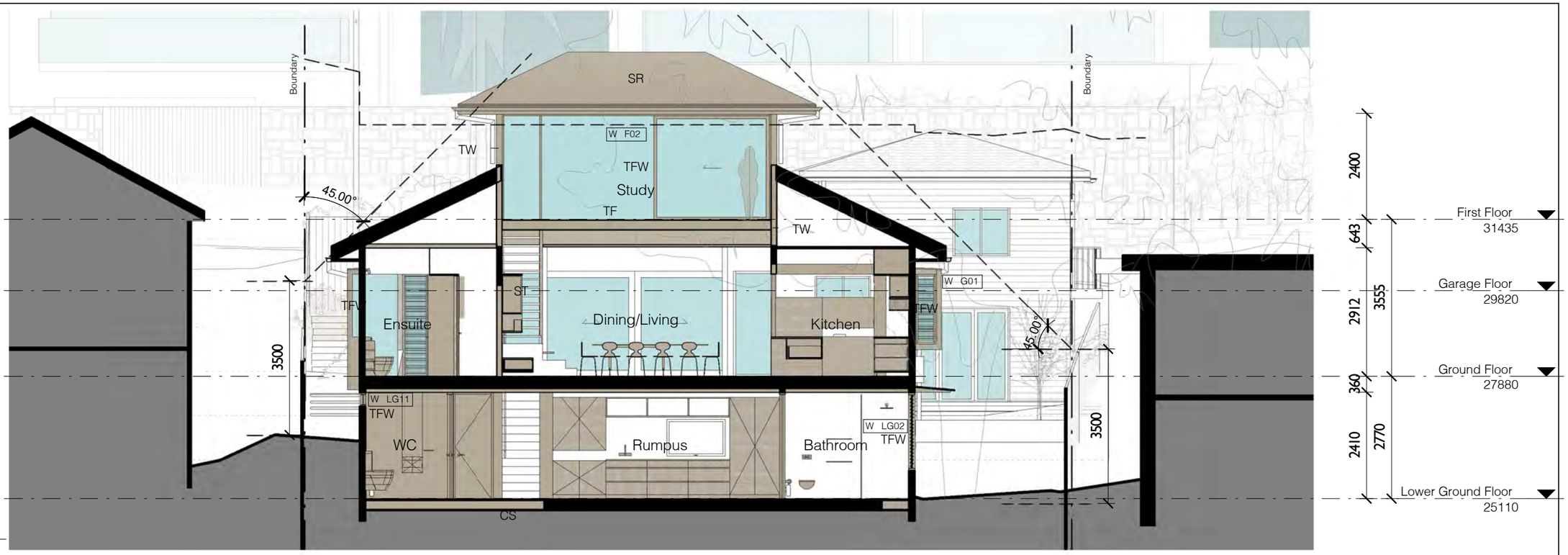
No.	Revision Description	Date

KENNETT RESIDENCE
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

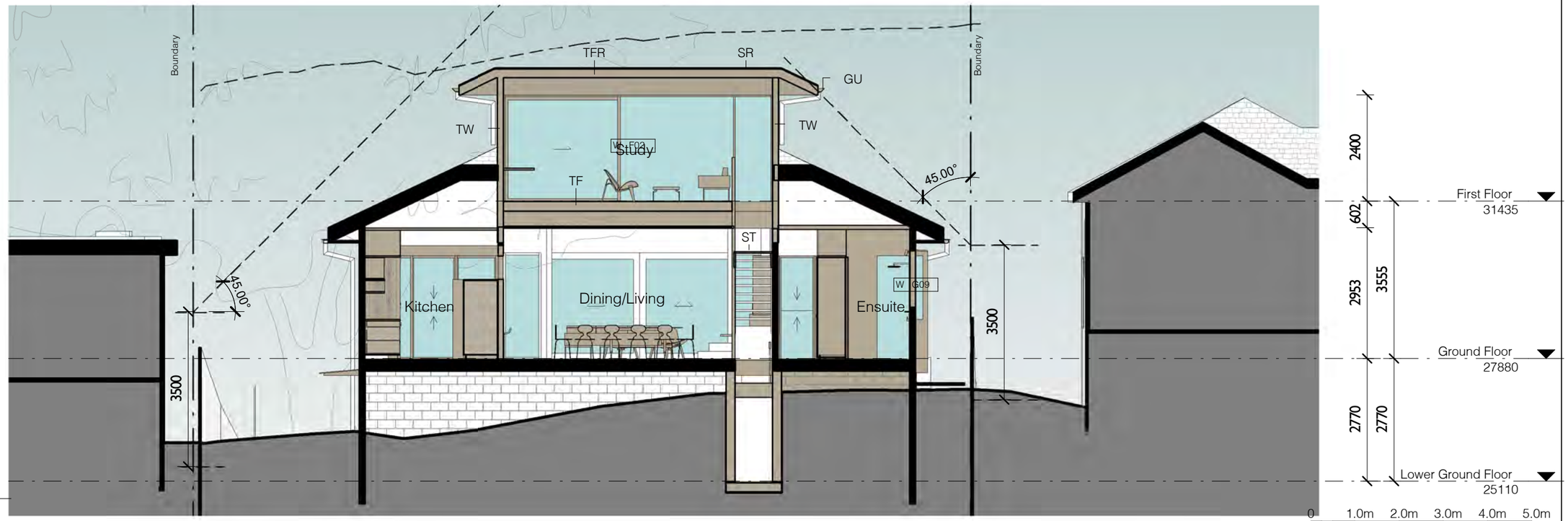
Long Section

Project number	1803	Checked by	Checker
Date	February 2019	Scale	1 : 100
Drawn by	Author		DA11

CS	Concrete Slab
GU	Gutter
SR	Steel Roofing
ST	Stair
TF	Timber Floor
TFR	Timber Framing
TFW	Timber Framed Window
TW	Timber Framed Wall



1 DA - Section BB
1 : 100



2 DA - Section CC
1 : 100

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No.	Revision Description	Date
A	Pre DA	25.01.19

KENNETT RESIDENCE
DEVELOPMENT APPLICATION
Lot 10 DP15764
13 Bruce Street Mona Vale 2103
for
Jason Kennett & Mandy Eilbeck

Cross Sections

Project number	1803	Checked by	Checker
Date	February 2019	Scale	1 : 100
Drawn by	Author		DA12

Attachment B – Martens and Associates Stormwater Infiltration Basin Design (P0601550JC03_V1)

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Contact:		
Our Ref:		P0601550JC03_V1
Pages:		4
cc.		koopman@bigpond.net.au

October 22nd 2007

Michael King
1A Ruskin Road
Avalon, NSW, 2107
Attn: Jim Koopman

Dear Jim,

RE: STORMWATER INFILTRATION BASIN DESIGN: 13 BRUCE STREET WARRIEWOOD

Following discussions with Pittwater Council; completion of soil permeability testing; runoff analysis; and a site investigation, we provide the following hydrological analysis for the proposed stormwater infiltration basin to be sited at 13 Bruce Street, Warriewood, NSW.

It is understood that the existing dwelling never had an infiltration system. The proposed alterations create an additional 24 m² of hardstand area and therefore do not require a rainwater tank or an On-Site Detention (OSD) system in accordance with Pittwater Council DCP21 Section B5 (2004). However it is understood that runoff from the existing dwelling, garage and hard stand areas is to be diverted into an infiltration trench/basin.

CATCHMENT AREA

The catchment draining to the infiltration trench has an area of approximately 270 m². This combined area consists of a 41 m² garage roof, 169m² existing dwelling and 59m² from the courtyard and hardstand areas.

SOIL PERMEABILITY

Permeability testing using the constant head method and subsequent K_{sat} analysis indicates the site has a K_{sat} value of approximately 0.18 m/day or approximately 0.0075 m/hour. The site's soil profile in the vicinity of the proposed infiltration trench/basin was characterised as clay fill to approximately 300mm depth overlying a silty clay subsoil.

INFILTRATION TRENCH CAPACITY

According to Australian Rainfall and Run-off (AR&R) data and the probabilistic Rational Method, design storage volume for the trench in a 1:20 year 5 minute rainfall event equates to a capacity of 4524.8 (270 x 201.1/12). Infiltration trench size was calculated to accommodate this capacity.

Table 1: Calculated discharge and rainfall intensity for the 1:5 - 5 minute, 1:20 - 5 minute and 1:100 - 5 minute rainfall event on the proposed carport/garage at 13 Bruce Street, Mona Vale, NSW.

ARI/Duration	Rainfall Intensity (mm/hr)	Discharge (m³/s)	Discharge (L/s)
5 year – 5 min	157.7	0.007	7.3
20 year – 5 min[1]	201.1	0.011	11.8
100 year – 5 min	257.6	0.019	19.1

Note: [1] Design discharge applicable to the infiltration trench.

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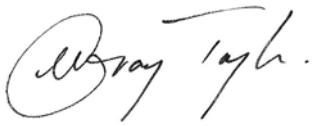
RECOMMENDATIONS

To accommodate and subsequently absorb the overflow generated from a 1:20 year ARI rainfall event with duration of 5 minutes the infiltration trench will require a total storage capacity of 7541.3 litres ((1/0.6) x 4524.8 = 7541.3). This figure was calculated based on a trench porosity of 60%. To achieve this, the infiltration trench requires dimensions of 15000 mm x 600 mm x 660 mm. These dimensions are a minimum and have been derived assuming all hardstand flows go to the infiltration trench/basin. Refer to Attachment 1 for plan and section drawings of the site and proposed infiltration trench.

For and on behalf of

MARTENS & ASSOCIATES PTY LTD



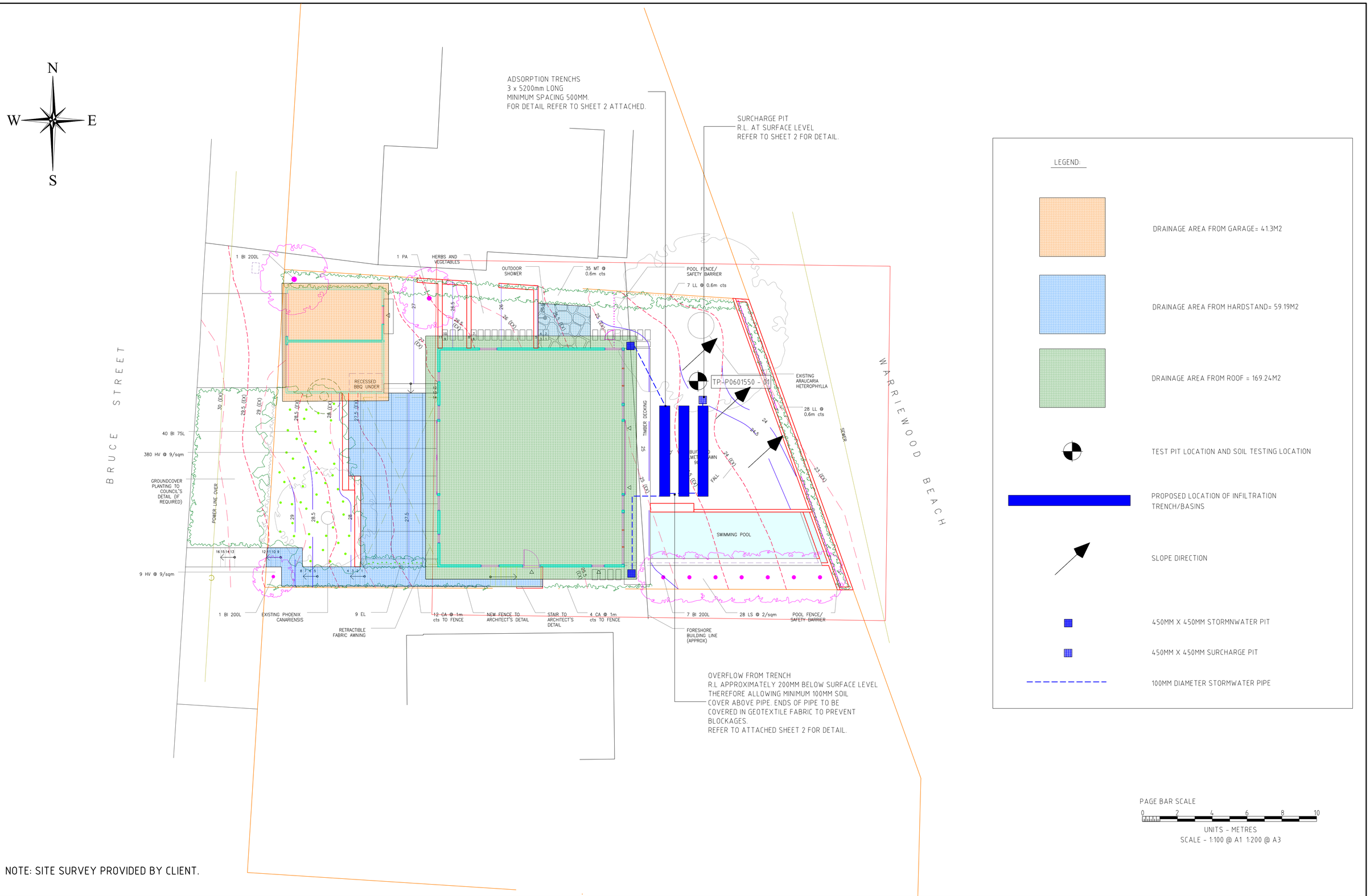
GRAY TAYLOR

BE Engineering

Environmental Engineer

Attachments:

1. Plan and Section drawings for proposed stormwater infiltration trench.



PAGE BAR SCALE

0 2 4 6 8 10

UNITS - METRES

SCALE - 1:100 @ A1 1:200 @ A3

NOTE: SITE SURVEY PROVIDED BY CLIENT.

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Sustainable Solutions
Environmental - Geotechnical - Civil
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CLIENT/ ADDRESS
MICHAEL KING
13 BRUCE STREET WARRIEWOOD

THIS PLAN MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED BY PRINCIPAL CERTIFYING AUTHORITY
All measurements in mm unless otherwise specified.

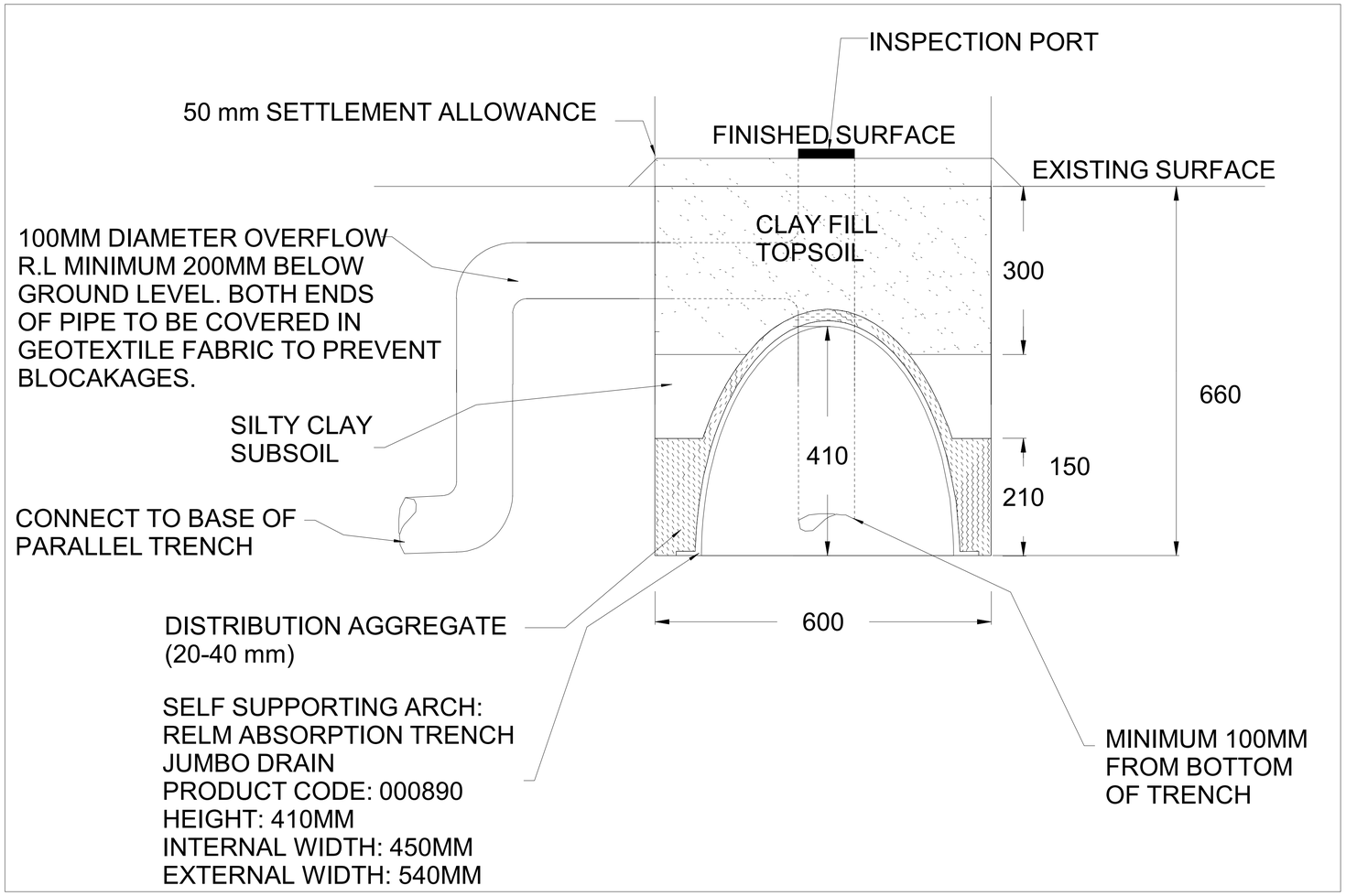
TITLE
SITE PLAN

PROJECT MANAGER: MR ANDREW NORRIS

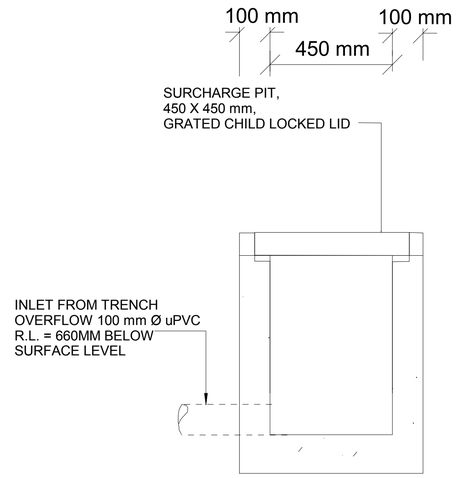
DRAWING NUMBER: P0601550JD01_V2

DESIGNED:	GT
DRAWN:	GT
REVIEWED:	AN
DATUM:	AHD
HORIZONTAL RATIO:	1:100 @ A1 1:200 @ A3
VERTICAL RATIO:	1:100 @ A1 1:200 @ A3
SHEET	1 OF 2 SHEETS
PAPER SIZE:	A1 / A3

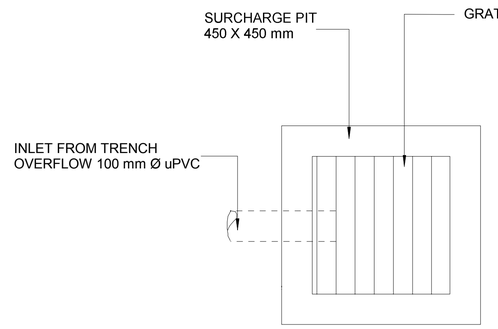
REV.	DESCRIPTION	DATE	ISSUED
1	INFILTRATION TRENCH DESIGN	22.10.2007	GT



TRENCH SECTION
SCALE 1:20



SECTION OF SURCHARGE PIT



SURCHARGE PIT DETAIL

SCALE 1:20

martens
6/37 Leighton Place
Hornsby, NSW 2077 Australia
Phone: (02) 9476 8777
Fax: (02) 9476 8767
Email: mail@martens.com.au
Internet: http://www.martens.com.au

MARTENS & ASSOCIATES PTY LTD
Sustainable Solutions
Environmental - Geotechnical - Civil
Hydraulic - Wastewater Engineers

CLIENT/ ADDRESS
MICHAEL KING
13 BRUCE STREET WARRIEWOOD

THIS PLAN MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED BY PRINCIPAL CERTIFYING AUTHORITY
All measurements in mm unless otherwise specified.

TITLE
SURCHARGE PIT AND INFILTRATION TRENCH DETAIL

PROJECT MANAGER: MR ANDREW NORRIS
DRAWING NUMBER: P0601550JD02_V2

DESIGNED:	GT
DRAWN:	GT
REVIEWED:	AN
DATUM:	AHD
HORIZONTAL RATIO:	1:10 @ A1 1:20 @ A3
VERTICAL RATIO:	1:10 @ A1 1:20 @ A3
SHEET	2
OF	2 SHEETS
PAPER SIZE:	A1 / A3

REV.	DESCRIPTION	DATE	ISSUED
1	INFILTRATION TRENCH DESIGN	22.10.2007	GT